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Beatrice Offshore Wind Farm

Pre-construction Annex I Habitat survey of the OfTW

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Executive Summary

As part of a pre-construction sampling programme, APEM Ltd was commissioned by Beatrice Offshore Windfarm Ltd (BOWL) to undertake a benthic survey of the Beatrice Offshore Transmission Works (OfTW) cable corridor in June 2015. The primary objective of the survey was to determine the distribution and extent of potential cobble reef habitat which constitutes Annex I habitat under the EC Habitats Directive (Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora). In addition, a single pockmark location was surveyed to determine the potential presence of submarine structures made by leaking gases, which is also an Annex I habitat under the Habitats Directive.

Survey stations for the reef feature and pockmark surveys were selected based on interpretation of geophysical survey data and were investigated using two intersecting Drop Down Video transects, orientated approximately north to south and east to west. Continuous video footage and digital stills were captured along each transect. Digital stills were analysed using the criteria from Irving (2009) to assign levels of 'reefiness' which included the recording of abundances of epifaunal taxa based on the SACFOR scale (MNCR, 1996).

All stations, except Station 1 which was the most landward, were found to resemble cobble reef, ranging from 'Low' to 'Medium' resemblance based on guidance in Irving (2009), with no areas of High resemblance reef. Irving (2009) indicates that any reef containing a Low score for any of the four reef categories used for classification requires strong justification to be considered Annex I habitat. Consequently, in the absence of strong justification to the contrary any areas with an overall status of Low resemblance reef along the OfTW corridor have not been considered to represent Annex I habitat, while areas of Medium resemblance reef have been considered representative of Annex I habitat.

On the east to west transect of Station 2, and both transects at Stations 3 and 8, the 'biota' category was considered to be representative of Low resemblance reef but the overall reef status was considered to be Medium resemblance and therefore representative of Annex I habitat. The reason for this was that although biological diversity was lower along these transects than within other areas classed as Medium resemblance reef, the % composition along these transects was high and the elevation and extent characteristics met the requirements for Medium resemblance reef.

Station 10, located furthest offshore along the OfTW corridor but still within 8 km of the coast, consisted primarly of Low resemblance reef (predominantly not Annex I habitat). There was a mix of Low and Medium resemblance reef habitat along transects at Stations 2, 6, 7 and 9 (representing some areas of Annex I habitat).

Stations 3 to 5 and Station 8 were found to be characterised by Medium resemblance reef (i.e. predominantly Annex I habitat). The abundance of epifauna was greater in areas characterised by reef substrate compared to soft sediment areas and biota was characterised as part of the reef assessment. In terms of characteristic marine megafauna both Serpulidae worms and Galatheoidea squat lobsters were Common across almost all stations. Other characteristic marine fauna were found to vary in abundance across the stations including echinoderms (*Henricia* sp., *Crossaster papposus*, *Asterias rubens,* Ophiuroidea, *Echinus esculentus*), polychaetes (*Lanice conchilega*), molluscs (*Gibbula* sp.), crustaceans (*Cancer pagarus*) and fish (*Myoxocephalus scorpius,* Gobiidae, *Diplecogaster*

bimaculatus). In total 76 taxa were recorded across the survey, none of which were protected or invasive non-native species and no Scottish Priority Marine Features (PMFs) were recorded (SNH 2014).

At the pockmark survey location there was no evidence of the Annex I feature 'submarine structures made by leaking gases'. The sediment was found to primarily be comprised of fine silt and mud with a high density of faunal burrows, however, there was insufficient evidence of any sea-pens at the survey location to suggest that this location could constitute a 'seapen and burrowing megafauna habitat' under the OSPAR (2008) list of threatened and/or declining species and habitats. In addition, no Scottish PMFs were recorded at this location (SNH 2014).

1 Project Overview

1.1 Project Background

The Beatrice Offshore Wind Farm received consent under Section 36 of the Electricity Act 1989 from the Scottish Ministers on 19th March 2014 ("the S.36 Consent") and was issued two Marine Licences from the Scottish Ministers, for the Offshore Wind Farm (OWF) and for the Offshore Transmission Works (OfTW) respectively, on the 2nd September 2014 ("the Marine Licences").

This report presents the results of a habitat investigation survey undertaken by APEM Ltd along the Beatrice Offshore Transmission Works (OfTW) cable corridor. The survey was conducted to fulfil Part 3, Condition 3.2.2.10 (b) of the OfTW Marine Licence which requires that BOWL submit a Cable Plan which must include the following:

b) The results of survey work (including geophysical, geotechnical and benthic surveys) which will inform cable routing.

The results of this survey will inform the routing of the export cable to enable Condition 3.2.2.10 (b) to be discharged.

The work forms part of the benthic monitoring strategy for the Beatrice OWF and Offshore Transmission Works (OfTW) cable corridor for Beatrice Offshore Windfarm Ltd (BOWL). The wider survey included benthic grab sampling within the OWF site and investigation of targets of potential archaeological importance. Results of the benthic grab survey and the archaeological survey are provided in separate reports (BOWL Ref: LF000005-REP-585 and LF000005-REP-575, respectively). The scope of the pre-construction survey was presented and discussed at a technical consultation meeting between BOWL, Marine Scotland, Scottish Natural Heritage (SNH) and the Joint Nature Conservation Committee (JNCC) on 19th January 2015. The survey scope was subsequently discussed at a meeting of the Moray Firth Regional Advisory Group (MFRAG) on 11th May 2015, thereafter it was agreed with Marine Scotland Science (MSS) prior to survey and confirmed via e-mail on 18th June 2015.

The wider survey was conducted between 22nd to 27th June 2015, with all Annex I habitat investigation work completed between the 25th to 27th June.

1.2 Survey Objectives

The objective of the survey was to use Drop Down Video (DDV) and digital stills to investigate and delineate locations with potential Annex I cobble reef habitat (EC Habitats Directive 92/43/EEC) to determine distribution and extent of this habitat within the landward 10 km of the OfTW corridor (as agreed with Marine Scotland), and to inform cable routing. A further aim was to investigate a pockmark along the export route to determine the potential presence of the Annex I feature 'submarine structures made by leaking gases'.

As part of the assessment, any other species/habitats of conservation importance such as those on the International Union for Conservation of Nature (IUCN) Red List of Globally Threatened Species, the OSPAR (2008) list of threatened and/or declining species and habitats, and the Scottish Priority Marine Features (PMFs) list (SNH 2014) were noted.

1.2.1 Methodology

The project adopted a two stage approach. Firstly a desk-based review was conducted of existing data from previous surveys along the Beatrice OfTW corridor which included consideration of geophysical and environmental reports and further interpretation of available geophysical survey outputs as outlined below. This information was used to identify the potential locations of likely reef habitat and pockmarks within the OfTW corridor and to design the field survey to target these habitats. The second stage of the project was the completion of the required ground truthing survey work.

1.3 Preliminary desk-based assessment

Geophysical survey work was undertaken in 2011 to inform cable route options for the Beatrice OfTW using single and multi-beam echosounders, sidescan sonar, magnetometer and a sub-bottom profiler (Gardline 2011). Geophysical data for the survey area was interpreted to target the locations of the DDV sampling stations which were all within the landward 10 km of the OfTW corridor. These data were analysed in ArcGIS which included review of sidescan sonar data to determine areas of high reflectivity (hard substratum more likely associated with reef structures) and low reflectivity (softer sediments), and the production of shaded relief figures based on interpolation of bathymetric data from the multi-beam echo sounder. The shaded relief figures enabled rapid visual assessment of changes in topography, with areas of high topographic diversity likely to be more representative of reef habitat.

The seabed features data from Gardline (2011) were also utilised which provided indications on the anticipated sediment types (originally acquired using geophysical and geotechnical sampling such as magnetometer and sub-bottom profiler), as well as positions of boulders, iceberg ploughmarks, anchor scars and other geological features of interest on the seafloor. These data revealed several boulder fields towards the landward end of the OfTW corridor. A benthic characterisation survey was conducted along the OfTW corridor in 2010 in support of the Environmental Impact Assessment (EIA) (CMACS 2012). At the time of the surveys, however, the geophysical data was not available and the survey provided general coverage of the OfTW, without targeting any specific geophysical features on the seafloor. The current pre-construction survey aimed to target these data gaps and ensure habitats were sufficiently mapped.

Following the interpretation of the Gardline (2011) geophysical data and consideration of data in CMACS (2012), locations of ten potential reef locations were selected for investigation (see Table 1 and Figure 1 to Figure 4). At each location two intersecting transects were selected for survey with a DDV system.

The desk-based review highlighted the presence of several pockmarks along the OfTW corridor, all of which were considered to be relatively minor when compared to other North Sea pockmarks such as the Scanner pockmark and others within the Fladen Grounds and Witch Basin of the North Sea (Dando, 1991; Gafiera *et al*., 2012; Ingrassia *et al.* 2015). The largest of the recorded pockmarks along the OfTW corridor (as confirmed through review of side scan sonar data, shaded relief figures and the Gardline (2011) geophysical report) was selected for further survey (Table 1). The pockmark was approximately 27 km from the landfall end of the OfTW corridor, east of the centre line by approximately 170 m, and 28 km from the nearest part of the OWF boundary, although the corridor route itself extends some

distance beyond this initial part of the OWF boundary. The pockmark was approximately 200 m in length and 180 m at its widest point and water depth was around 80 m (to Lowest Astronomical Tide). For comparison, the pockmark adjacent and to the east of the proposed pockmark selected for investigation had a width and length of about 80 m, whilst another more sizable pockmark feature, approximately 23 km from the landward end of the route, had a width and length of approximately 150 m.

Table 1: Target locations for investigation of potential cobble reef and pockmark features. Actual sampling positions may vary slightly from target locations (e.g. by 10 to 20 metres), and are detailed in Appendix 1.

Location	Transect	SOL Easting	SOL Northing	EOL Easting	EOL Northing
Reef 1	W-E	497945	6391753	498152	6391755
	N-S	498045	6391843	498049	6391656
Reef 2	S-N	497830	6392752	497815	6393214
	W-E	497424	6392928	497930	6392932
Reef 3	W-E	497903	6394136	498110	6394138
	S-N	498007	6394039	498001	6394311
Reef 4	S-N	498336	6394591	498331	6394973
	W-E	498145	6394784	498438	6394784
Reef 5	S-N	498012	6395043	498006	6395442
	W-E	497809	6395235	498312	6395236
Reef 6	S-N	498292	6395740	498285	6396034
	E-W	498390	6395940	498186	6395937
Reef 7	S-N	498015	6396488	498011	6396825
	W-E	497806	6396600	498114	6396601
Reef 8	S-N	498349	6397143	498342	6397451
	E-W	498448	6397256	498145	6397253
Reef 9	W-E	498320	6399718	498613	6399719
	S-N	498514	6399607	498508	6399814
Reef 10	S-N	498678	6401134	498660	6401357
	W-E	498574	6401244	498660	6401357
Pockmark	S-N	498180	64189023	498778	6401246
	E-W	498182	64190343	498013	6418925

SOL = Start of line, EOL = End of line

Figure 1 provides a visual representation of the locations of the proposed sampling transects across the five reef investigation locations closest to shore with integrated shaded relief of the seafloor, whilst Figure 2 shows the sampling transects in relation to the Gardline (2011) seabed features data which highlights broad areas of differing sediment composition. Depth at the landward end of the OfTW corridor was relatively shallow (~6 m depth) and the geophysical data indicated significant areas of boulders and hard substratum along the export route corridor within the last few kilometres. The spatial distribution of the five remaining stations (Stations 6-10) which were further offshore (but still within the landward 10 km of the corridor that was the focus of the survey) is indicated in Figures 3 and 4. To optimise survey efficiency the aim was to target areas likely to be representative of reef

habitat. Length and location of transects was based on interpretation of the geophysical data (Gardline, 2011) and previous benthic characterisation surveys (CMACS, 2012) and the survey was designed to cover areas potentially resembling cobble reef which has not been previously surveyed, including areas expected to include gradients of change in reefiness. The transect approach was favoured over specific drop locations as it enabled greater coverage with the DDV system and provided a clearer understanding of small and large-scale spatial variation in cobble reef characteristics, giving increased confidence in the data as well as enabling more time and cost efficient sampling. The aim was to provide data to groundtruth the geophysical data and, within areas not covered by the DDV survey, to enable extrapolation of the reefiness assessment across the OfTW survey area based on the geophysical outputs.

Figure 5 indicates the location of the pockmark feature selected for further investigation, which can be clearly seen as a depression on the shaded relief data.

1.4 DDV survey

The pre-construction Annex I habitat survey was completed between the 25-27th June 2015. Survey work was undertaken aboard the Moray First Marine vessel Coral Wind with operations undertaken from Lossiemouth.

1.4.1 DDV System

A MOD 4 camera system with instant shutter capability provided 24 megapixel resolution images and real-time streaming of footage at 550 TVL. For the pockmark transects a freshwater lens was attached to the camera to reduce the chance of turbidity from the finer sediments obscuring the view.

The DDV camera system consisted of a Nikon D5200 with a Nikon SB-700 external flash unit in custom-built housings with custom built LED continuous lighting units (within the camera housing and externally mounted). The live video footage was displayed on an LCD monitor and the stills were reviewed using a laptop.

The DDV system was equipped with laser scaling and lamps were fitted to the camera frame to help provide clear imagery of the seabed.

1.4.2 DDV Deployment

DDV deployment followed methodology proposed in the JNCC Marine Monitoring Handbook and guidance produced as part of the Mapping European Seabed Habitats project (MESH) (Coggan *et al*. 2007) and Cooper (2014) Regional Seabed Monitoring Programme (RSMP) guidance.

Prior to deployment, the stern gate of the vessel was removed and taglines were attached to the frame to prevent excessive swinging whilst the frame was lowered. Once the camera frame reached the seabed the vessel proceeded at a speed of 0.5-1 knots along the target transect lines, with still images taken at 15 second intervals.

The DDV was towed along two transects at each location, one running north to south, the other east to west, intersecting at a central point of the target potential cobble reef location

(Figures 1-4). The direction of each transect (e.g. S-N or N-S) was determined at each station based on the prevailing current, wind and tide. An external GPS antenna was mounted beneath the A-Frame on the back deck (i.e. camera deployment position) and position data were continuously overlaid onto the video feed.

A camera operator watched the live video feed and relayed instructions to the winch operator and the camera was raised or lowered accordingly to adjust the position of the DDV system within the water column and to reduce risk of contact with the seafloor.

The lighting and flash units were fully checked when the camera was first set up at the mobilisation stage. In addition, prior to each deployment all of the equipment (lighting, flash, video and stills) was tested to ensure they were in good working order. The LED lighting units (one in the camera housing and two externally mounted) could be operated independently from the control unit and their use was adapted according to the image quality observed. When the clarity of the water enabled the freshwater lens to be removed (i.e. at all stations with the exception of the pockmark station) the position of the camera and lighting were rearranged to a more oblique angle to allow a wider field of view.

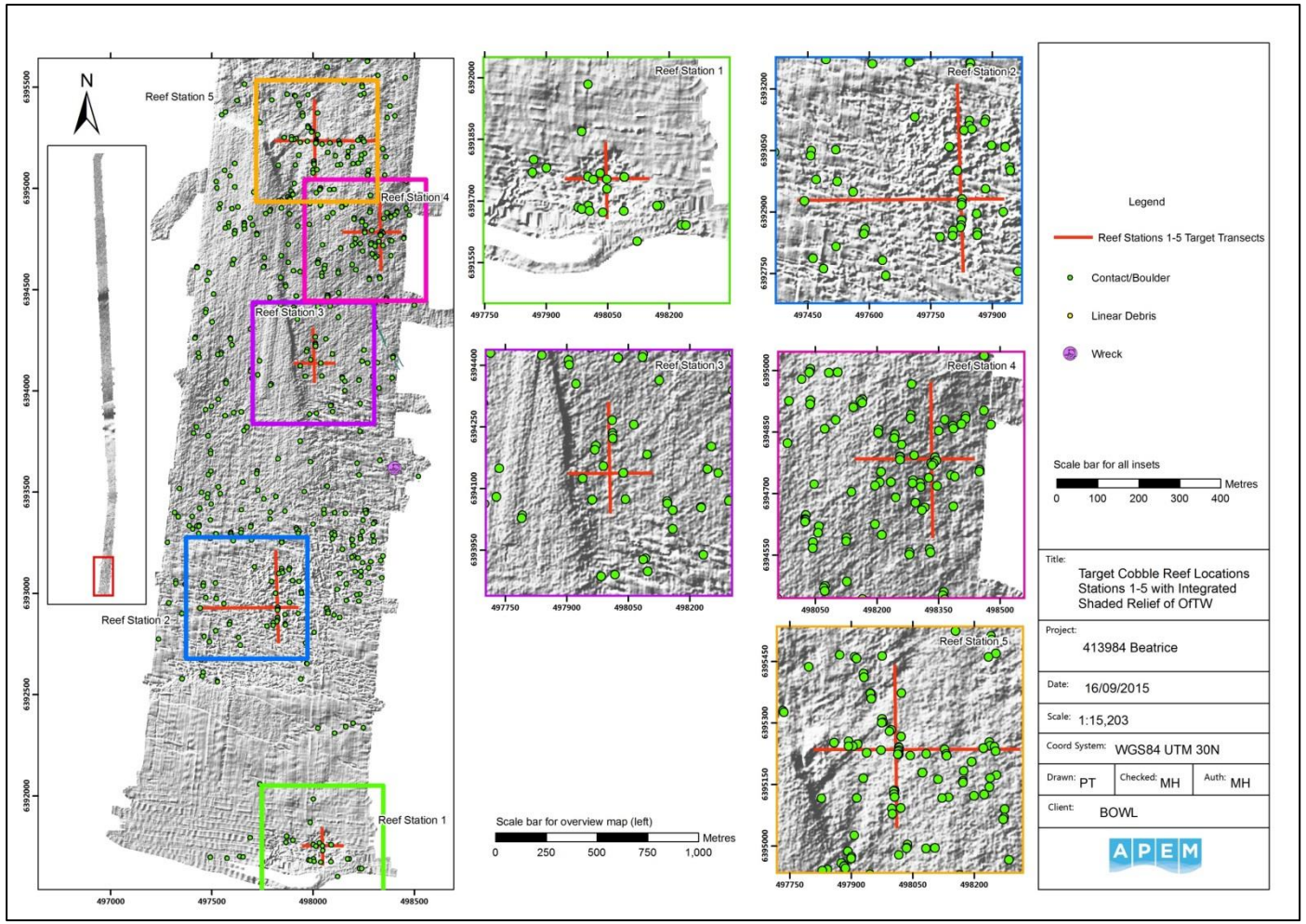


Figure 1: Target locations of reef investigation Stations 1 to 5 within the most landward 4 km of the Beatrice OfTW corridor.

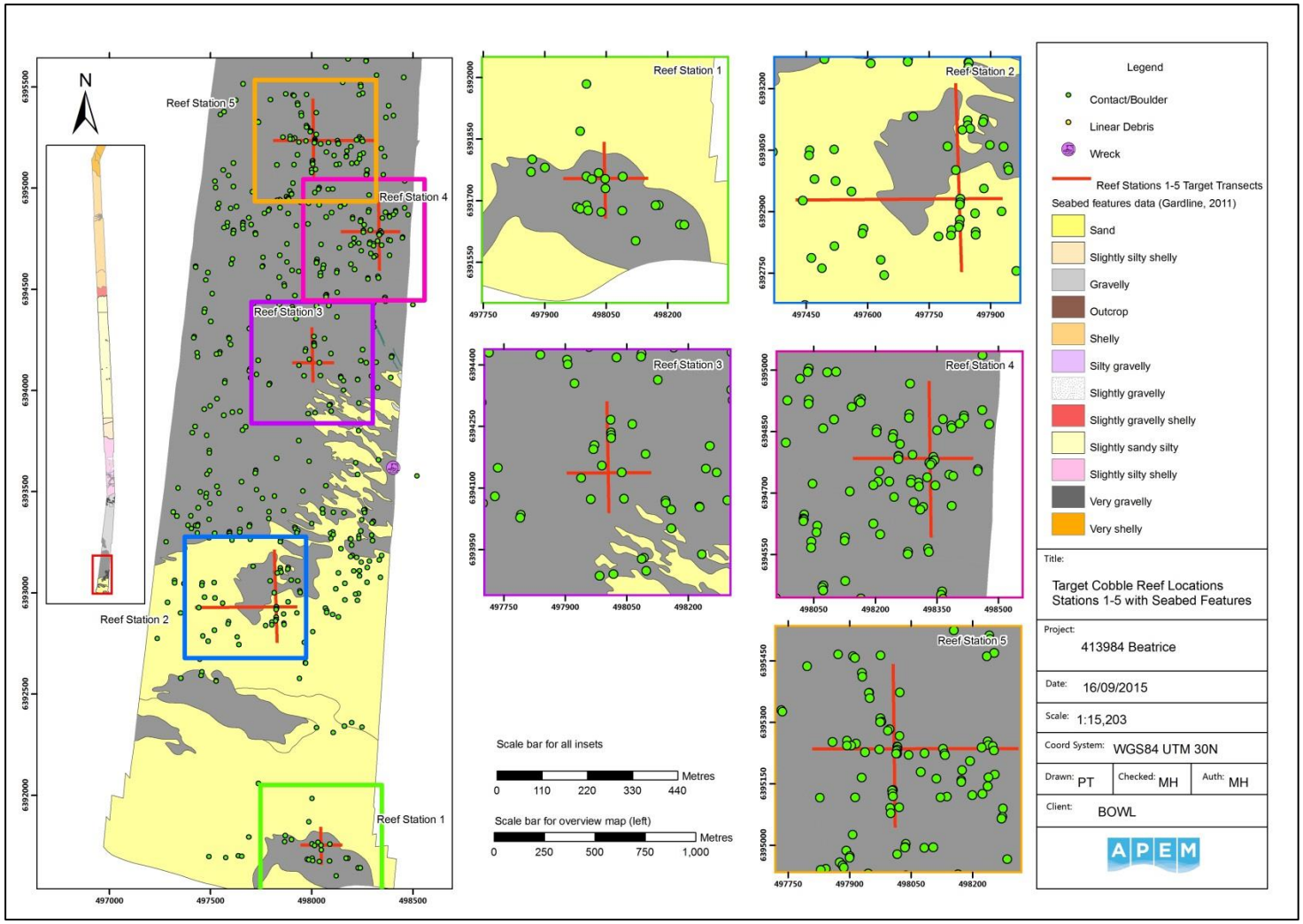


Figure 2: Target locations of reef investigation Stations 1 to 5 with integrated seabed features data (Gardline, 2011).

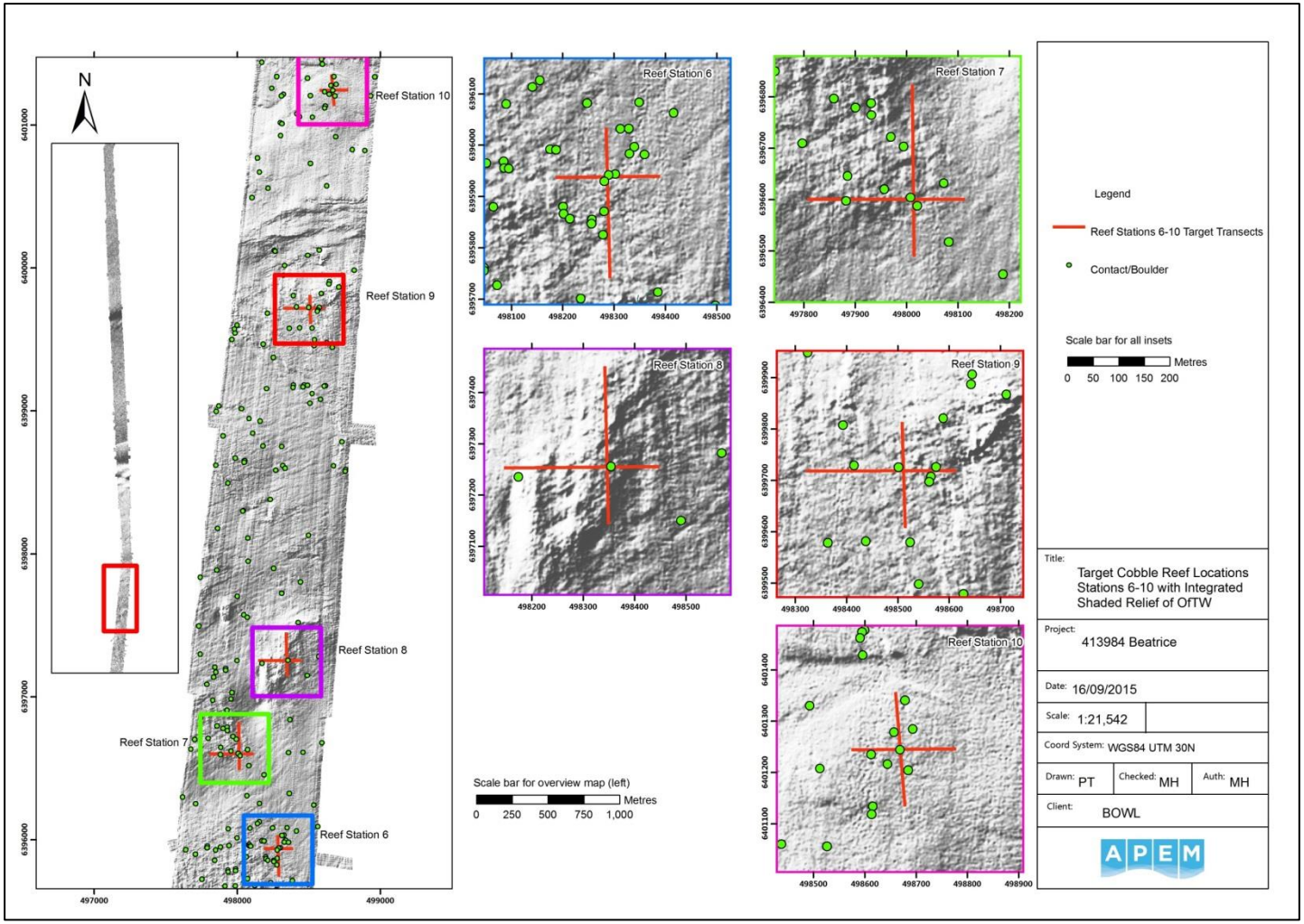


Figure 3: Target locations of reef investigation Stations 6 to 10 between 4 to 8 km along the landward end of the Beatrice OfTW corridor.

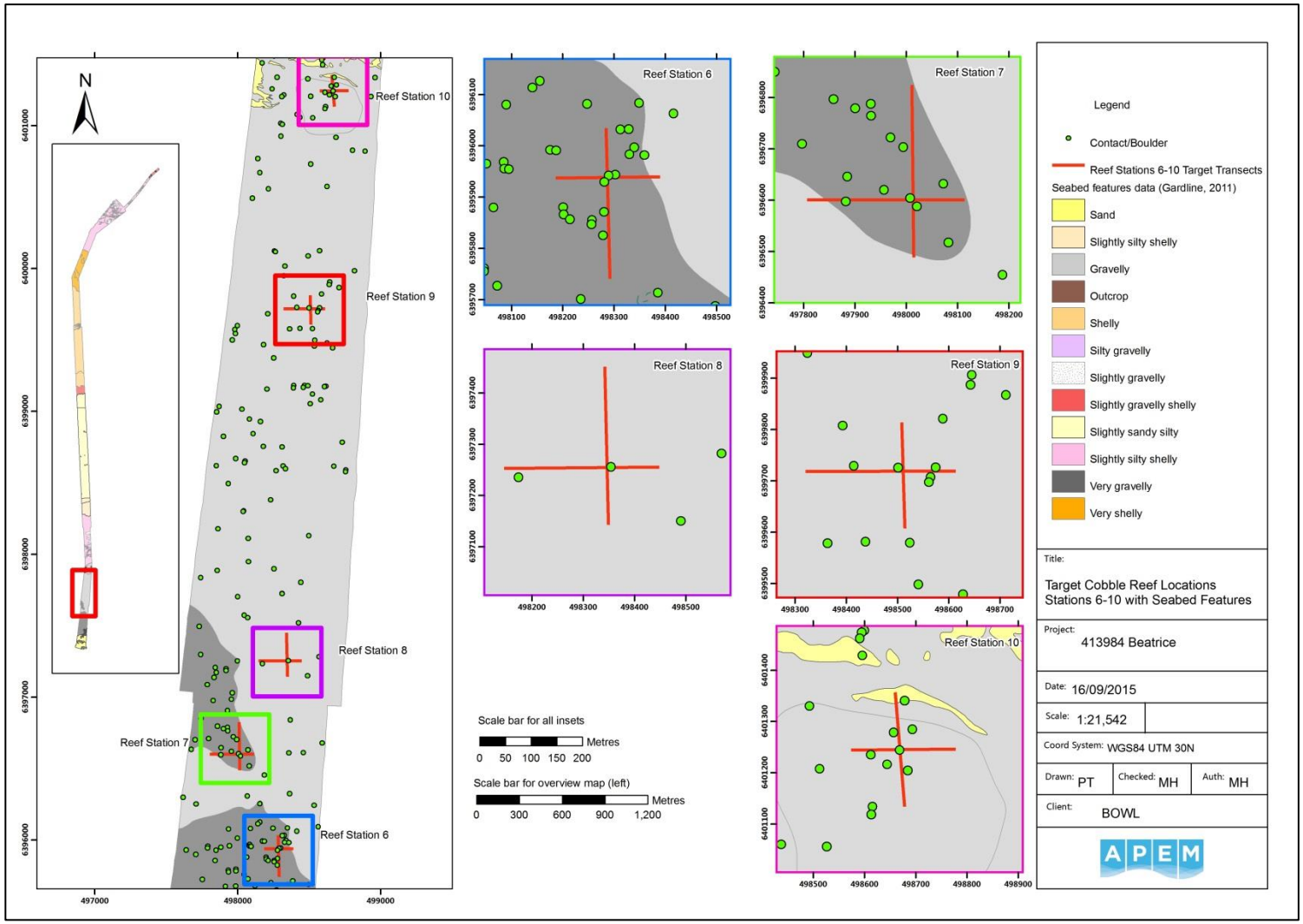


Figure 4: Target locations of reef investigation Stations 6 to 10 with integrated seabed features data (Gardline, 2011).

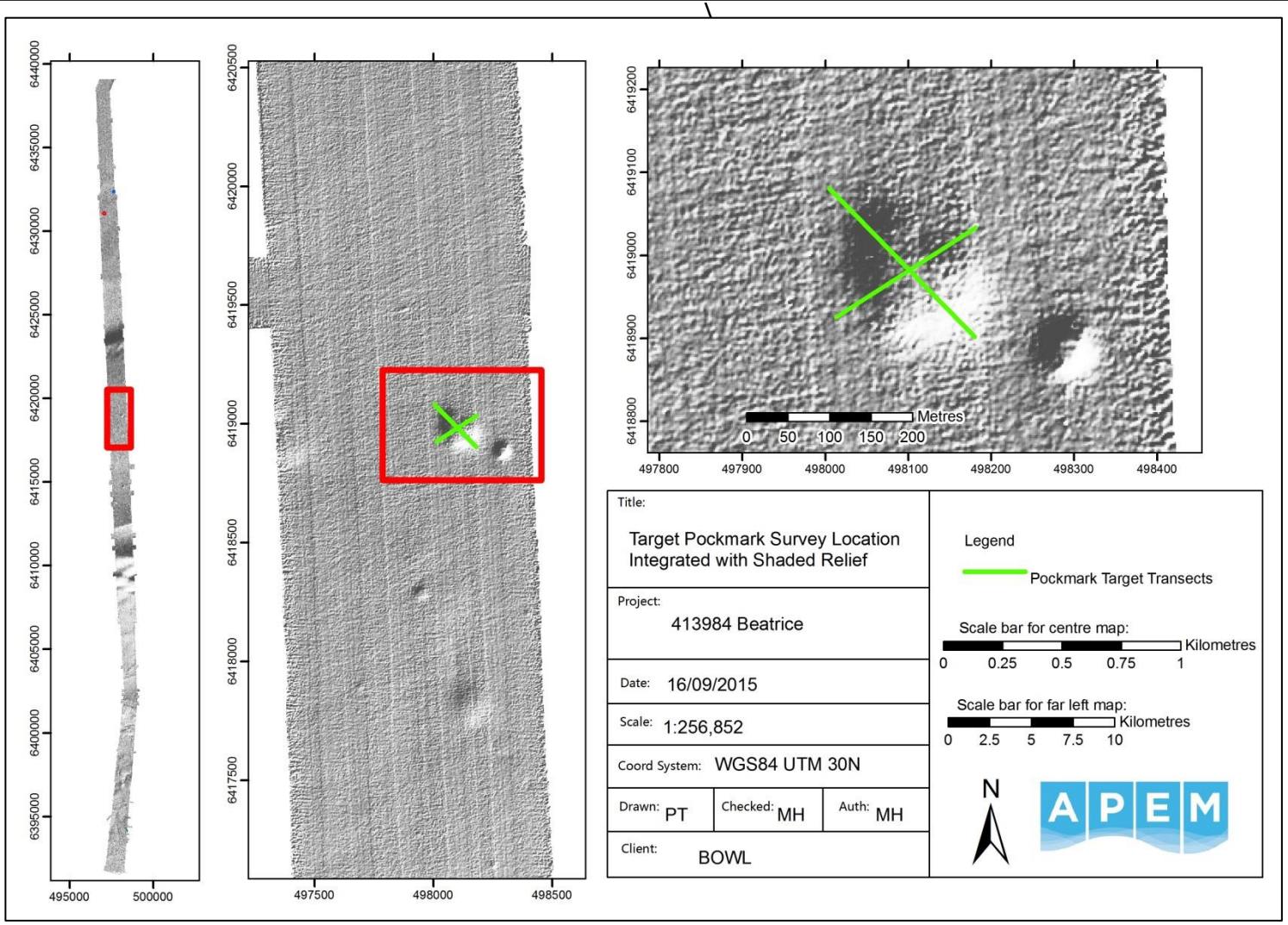


Figure 5: Target location for pockmark investigation along the OfTW corridor.

1.5 Habitat Assessment

1.5.1 Cobble Reef Criteria

The live video feed was observed on board the survey vessel, by a suitably qualified and experience marine ecologist with extensive experience of video survey of marine habitats. Any notable habitat features and fauna/flora were recorded. Further detailed analysis of the footage and digital stills was conducted in the laboratory post-survey.

Cobble reef assessments were undertaken using the criteria and methods in Irving (2009), which are frequently applied for the investigation and analysis of hard substratum reefs in offshore waters. Boulders and cobbles are generally considered to be greater than 64 mm diameter and the cobble reef assessment criteria are based on this approach. Following Irving (2009), Composition, Elevation and Biota characteristics were considered to assess whether a location (survey station) resembled cobble reef. Characteristics were scored as 'Low', 'Medium' or 'High' resemblance to cobble reef, or 'No resemblance' and the specific criteria for scoring each of these characteristics is indicated in Table 2.

The Irving (2009) criterion for biota for Low and Medium resemblance reef is less clearly defined than the other criteria due to the difficulty of enumerating epifauna in reef habitats, with emphasis on the physical aspects of reef habitat. To provide further information to characterise biological assemblages associated with the benthic habitats, an assessment of taxon abundance was conducted based on SACFOR (Superabundant, Abundant, Common, Frequent, Occasional, Rare) analysis (see Appendix 2 for criteria for allocation of SACFOR categories). The assessments were undertaken in accordance with Marine Nature Conservation Review methods for SACFOR abundance determination (MNCR 1996). A sub-set of the still images (one still for every minute of footage) were subjected to SACFOR analysis to obtain semi-quantitative estimates of abundance of epibenthic taxa. It should be noted, however, that the number of individuals or percent coverage of each epifaunal taxon is often difficult to determine accurately as many species live amongst the substratum in areas of higher rugosity, and are hidden from view. Consequently, the assessment was undertaken with the understanding that the approach would derive an underestimate of the abundance of taxa recorded on the reef habitat.

When classifying stations in terms of overall resemblance to Annex I cobble reef habitat, if a station contained a large number of stills covering more than one resemblance level, both levels have been indicated (e.g. if across a station there were a number of stills indicating both 'Low' and 'Medium' resemblance then the station has been classified as 'Low to Medium' resemblance, as opposed to just applying the highest resemblance score (i.e. 'Medium')). This approach was taken to increase the resolution of the results and provide a more representative determination of reefiness at different stations.

Table 2: Criteria to assess Reefiness (Irving, 2009)

Characteristic	Resemblance to a Stony Reef			
	Not a stony reef	Low	Medium	High
Composition (% of particles >64 mm diameter) [a]	<10%	10-40%	40-95%	>95%
Elevation	Flat seabed	<6.4 cm	6.4 cm to 5 m	>5 m
Extent [b]	<25 m^2	>25 m^2	>25 m^2	>25 m^2
Biota [c]	Dominated by infauna	Based on SACFOR scale	Based on SACFOR scale	>80% of species present are epifaunal

[a] *Based on >64 mm representing cobbles/boulders.*

[b] *Extent of the field of view was typically 1 m^2 and extent for the reef assessment was considered on a per station basis.*

[c] *Criteria for Biota for Low and Medium reef are not clearly indicated in Irving (2009), however, an assessment of biota abundance based on SACFOR was conducted to provide further information to inform the reef assessment.*

1.5.2 Pockmark Investigation

The pockmark feature was assessed to determine the potential presence of the Annex I habitat 'submarine structures made by leaking gases'. Typically such features are Methane Derived Authigenic Carbonate structures (MDAC) formed due to the precipitation of authigenic carbonates associated with the seepage of methane-rich fluids. These formations are usually interspersed with gas vents that intermittently release gas.

The pockmark was also investigated for any other habitats or species of conservation importance using both digital stills and video footage. The orientation of the intersecting transects for the pockmark required adjustment due to local environmental conditions at the time of survey, notably current direction.

2 Results

2.1 Annex I Reef Assessment

A summary of cobble reef resemblance at each Station is provided in Table 3, and a more detailed table indicating the scores allocated to Composition, Elevation and Biota for each transect and an overall reef status score category for each station is provided in Appendix 3. Irving (2009) indicates that any reef containing a Low score for any of the four reef categories used for classification requires strong justification to be considered representative of Annex I habitat. Consequently, in the absence of strong justification to the contrary any areas with an overall reef resemblance category of Low along the OfTW corridor have been considered to not represent Annex I habitat, while areas allocated an overall resemblance of Medium reef have been considered representative of Annex I habitat.

On the east to west transect of Station 2, and both transects at Stations 3 and 8, the biota category was considered to be representative of Low resemblance reef but the overall reef status was considered to be Medium resemblance and is therefore representative of Annex I habitat (Appendix 3). The reason for this was that the criteria for biota to assign reef resemblance are less clearly defined that the structural criteria, and although biological diversity was lower along these transects than within other areas classed as Medium resemblance reef, the % composition (i.e. % of particles >64 mm in diameter) along these transects was very high (>80% at the west to east transect at Station 2, and both transects at Station 3; >67% on both transects at Station 8), and the elevation and extent characteristics met the requirements for Medium resemblance reef.

Table 3: Summary of Reef Resemblance Results

Station	Overall Annex I Reef Resemblance	Total of 'No resemblance' stills	Total of 'Low resemblance' stills	Total of 'Medium resemblance' stills
1	No Resemblance	36	1	0
2	Low to Medium	10	47	53
3	Medium	0	0	65
4	Medium	0	0	89
5	Medium	0	7	99
6	Low to Medium	0	40	26
7	Low to Medium	0	34	61
8	Medium	0	9	72
9	Low to Medium	10	22	47
10	Low	39	15	30

Figures indicating the spatial distribution of stills analysed along the transects are provided in Appendix 4, along with the resemblance score for each still and examples of stills taken. The full results of the SACFOR analysis are provided separately to this report as an electronic data file (Appendix 5) and the SACFOR criteria are presented in Appendix 2. Example images for Low, Medium and No resemblance reef digital stills from the survey are provided in Figure 6.

Station 1 primarily consisted of large homogenous areas of soft sediment with no topographic diversity. SACFOR analysis indicated Station 1 to have a relatively impoverished epibenthic marine community, likely due to the low topographic heterogeneity and primarily flat sandy seabed. The macroalga *Chorda filum* was the main floral taxon and was on average Common throughout the location. Other biota were sparse, with several Rare and Occasional macroalgae e.g. *Furcellaria lumbricalis* and *Mastocarpus stellatus*. Few fauna were present.

For the remaining locations, resemblance to cobble reef varied from Low to Medium, as indicated below, with no areas of High resemblance reef. Reef habitat was present in the majority of digital stills reviewed for each location, and across these locations the habitat extent was greater than the required 25 m^2 area necessary to assign potential Annex I reef habitat status.

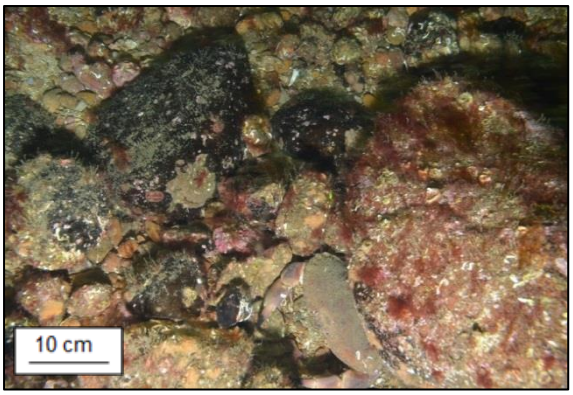
Station 10 was classified as Low resemblance reef, with imagery revealing significant coverage of flat featureless seafloor, with mainly Low resemblance reef and some small and patchily distributed areas of Medium resemblance reef.. SACFOR indicated that there were typically less large characteristic epifauna at this location compared to the areas with Medium resemblance reef. Hydrozoa sp. B and Hydrozoa/Bryozoa were recorded as Superabundant. Galatheoidea and Serpulidae were recorded as Common. The common sunstar *Crossaster papposus* was recorded as Rare. Other taxa noted were the starfish *Henricia* sp., brittlestars (Ophiuroidea), the common starfish *Asterias rubens* and solitary sea squirts (Ascidiacea). Based on guidance in Irving (2009) this station was not considered to be representative of Annex I habitat.

A mix of Low and Medium resemblance reef habitat was present at Stations 2, 6, 7 and 9 featuring large areas of cobbles of varying sizes. Elevation ranged from <64 mm to between 64 mm and 0.5 m and Composition (% of particles >64 mm diameter) ranged between 10-90% across the majority of digital stills. Review of the abundance of epifauna and comparison to infauna supported that these locations were typically richer in epifaunal abundance and diversity compared to Station 1 or 10. Station 6 was one of the most biologically diverse reef stations with a high abundance of epibenthic organisms. Serpulid worms (Serpulidae) and squat lobster (Galatheoidea) were Common and the fanworm *Myxicola infundibulum* was Frequent. Other characteristic species present but with abundances lower than the requirement for Rare included the common sea urchin *E. esculentus,* Gobiidae fish and the demersal fish species short-spined sea scorpion *Myoxocephalus scorpius*. Across the other locations there was also greater taxon richness and abundance of characteristic epifauna such as edible crab *Cancer pagarus, E. esculentus, Henricia* sp., *Gibbula* sp. molluscs and *A. rubens,* two-spotted clingfish *Diplecogaster bimaculatus* and *C. papposus*. These stations featured numerous areas of Medium resemblance reef. At Station 2 there was an almost continuous stretch of Medium resemblance reef running from east to west, and and an almost continuous stretch of Low resemblance reef running from north to south. At stations 6, 7 and 9 there were frequent transitions from Low to Medium resemblance reef across survey transects. The areas of Medium resemblance reef had notable elevation and a high % composition value supporting a diverse faunal abundance and these sections of the reef are considered to be representative of Annex I habitat. The areas of Low resemblance reef which also cover expansive areas are not considered to be representative of Annex I habitat.

Stations 3 to 5 and Station 8 were all found to constitute Medium resemblance reef with almost all digital stills indicating cobbles to be present, with elevation typically between

64 mm – 0.5 m and composition of cobbles/boulders constituting >40% of the seafloor, supported by a matrix of smaller course sediments. A small number of stills were determined to be of Low resemblance reef across these stations. In places, cobbles covered >95% of the field of view and created a very topographically diverse hard substratum habitat. Coralline algae (Corallinaceae) was Superabundant at Station 5, Serpulidae were Common across all the stations, and the sea slug *Elysia viridis* was found to be Frequent at Station 3. At both Station 5 and Station 8 Galatheoidea were found to be Common. Other characteristic epibenthos such as sea anemones (Actiniaria), Caridean shrimps, *A. rubens, M. scorpius* and *M. infundibulum* were also recorded in low abundances across these stations. These stations therefore are considered to consititute Annex I reef habitat.

The information from the cobble reef survey and interpretation of geophysical data was used to produce a map providing a broad indication of the distribution of reef and non-reef habitats throughout the survey area (Figure 7). As targeted areas were surveyed a precautionary approach has been applied to indicate the broad coverage with a higher reef score assigned where coverage has been extrapolated based on geophysical survey outputs. The extrapolated broad coverage utilised information from the shaded relief plots, existing geophysical data (Gardline, 2011) and the distribution of areas of varying sediment composition and occurrence of boulder (fields) to help determine extent of areas of varying reef resemblance. For example, at Station 1 the shaded relief plots and seabed features data clearly indicated a boundary change in habitat complexity and type to the north of the surveyed location before reaching Station 2, with a transition from smoother soft sediments and a low occurrence of boulders to a more heterogeneous hard substratum habitat with a higher density of boulders at Station 2 (reflecting the mix of Low and Medium resemblance reef at this station). Between Stations 3 and 6 the seabed features map generated from geophysical data (Figure 2) classified the whole of the area as very gravelly (this is the highest level of rugosity assigned to the OfTW survey area), this is supported by the mainly Medium resemblance reef, with some isolated areas of Low resemblance reef recorded along transects in the area which, taking the precautionary approach, was mapped as Medium resemblance reef throughout. Between Stations 6 and 9 the geophysical data indicated a reduction in both hard substratum and occurrence of boulders, characteristic of a transition to a more mixed area of Low and Medium resemblance reef. Station 8 transects, however, were targeted to a raised section of the seabed (apparent in the Station 8 shaded relief Figure in Appendix 4), which was found to be an area of topographically diverse habitat and was categorised as Medium reef. It was considered appropriate to highlight this area as Medium reef in Figure 7 (with an area of 7,2285 m^2). Although areas of Low resemblance reef are present at the extremes of the transects it is expected that a mix of Low and Medium resemblance reef is present outside this area and it has been represented as such on Figure 7. At Station 10 there is clear shift in habitat indicated on the shaded relief plots (Figure 4) (and other reviewed geophysical data) moving further north, with sandy sediments becoming more common in place of Low resemblance reef.

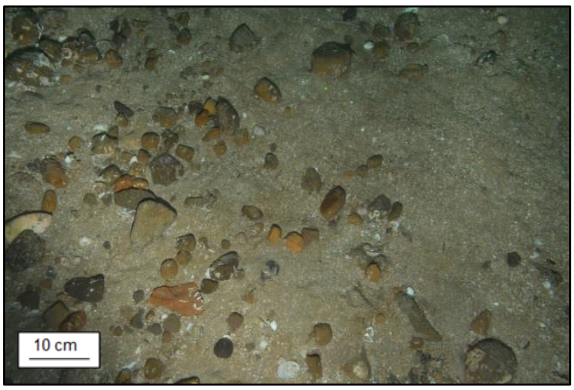


Medium Resemblance Reef

40-95% composition
(% of particles >64 mm diameter)

6.4 cm to 5 m in height

Higher diversity of epifauna



Low Resemblance Reef

<40% composition of stony reef
(% of particles >64 mm diameter)

Almost no elevation
<6.4 cm in height

Lower epifaunal diversity

No Resemblance to Reef

Not a reef / <10% compositon
(% of particles >64 mm diameter)

Flat seabed

Epifauna sparse. Community expected to be dominated by infauna

Figure 6: Example images of No resemblance, Low and Medium resemblance cobble reef habitat.

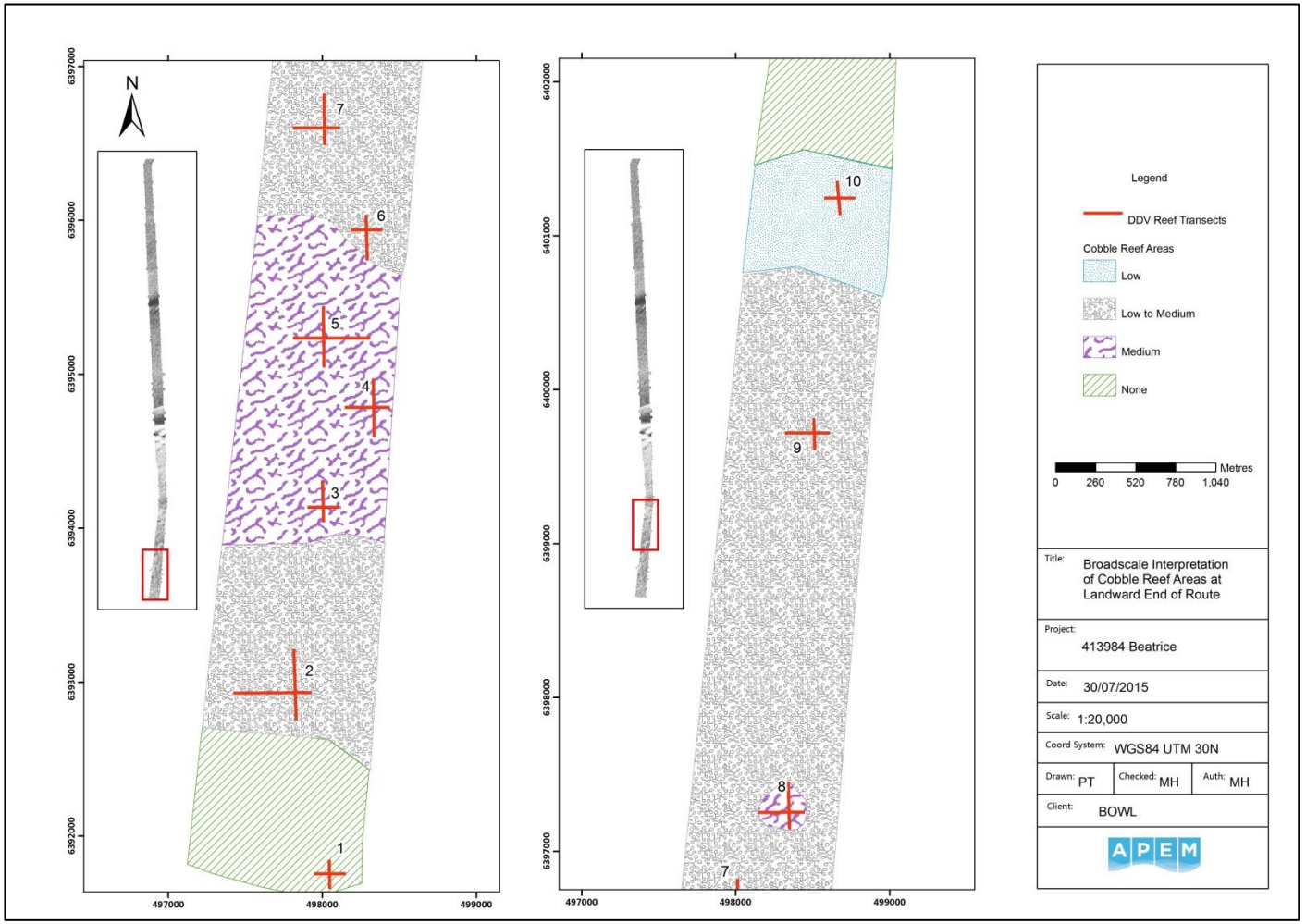


Figure 7: Extrapolated cobble reef areas within the landward 10 km of the OfTW.

2.2 Pockmark Investigation

A figure indicating the track of the DDV across the pockmark is provided at the end of Appendix 4, along with examples of stills taken.

DDV investigation of the pockmark feature indicated that no Annex I submarine structures made by leaking gases e.g. MDAC, were present at the location. The investigated pockmark was found to consist of relatively featureless soft silty sediments without any hard structures, no signs of any leaking gases and with no topographic heterogeneity. Visible epifauna was sparse with occasional recordings including dab *Limanda limanda*, annelid worms and faunal burrows. Low epifaunal abundance is often associated with pockmark environments as the within the depression there is reduced flow and water becomes stagnated which can lead to reduced oxygen content. Such hypoxic conditions are less favourable to most marine fauna and can lead to impoverished communities.

Burrowing specialists with behavioural or physiological adaptations for hypoxic conditions may do well in this environment and a high density of faunal burrows was noted. There was no evidence, however, from video or digital stills, of the presence of any sea-pens within, or in association with, the pockmark environment and as such there was insufficient evidence to assign the protected OSPAR habitat “seapen and burrowing megafauna habitat” to the pockmark area (OSPAR 2008 and 2010) and no Scottish PMFs (SNH 2014) were observed.

3 Conclusion

Investigation of the ten potential reef locations indicated that no High resemblance reef was recorded during the survey. At the majority of stations Low (Station 10), Low to Medium (Stations 2, 6, 7, and 9) and Medium (Stations 3, 4, 5 and 8) resemblance cobble reef was recorded, which is consistent with the previous geophysical survey outputs and the findings of the EIA DDV characterisation surveys. Based on interpretation of Irving (2009), Medium resemblance reef is considered to be representative of Annex I habitat and, as such, Stations 3, 4, 5 and 8 constituted Annex I habitat, with some areas of Annex I habitat also present at Stations 2, 6, 7 and 9.

Station 1 was found to have No resemblance to reef and Station 10 was categorised as Low resemblance cobble reef, Irving (2009) indicates that any reef containing a Low score for any of the four reef categories used for classification requires strong justification to be considered Annex I habitat. In the absence of strong justification to the contrary it is considered that substrate at Station 10 is not representative of Annex I habitat. On the east to west transect of Station 2, and both transects at Stations 3 and 8, the biota category was considered to be representative of Low resemblance reef but the overall reef status was considered to be Medium resemblance and therefore representative of Annex I habitat. The justification for this was that although biological diversity was lower along these transects than within other areas classed as Medium resemblance reef, the % composition along these transects was very high with the elevation and extent characteristics also meeting the requirements for Medium resemblance reef (Appendix 3).

SACFOR analysis of the digital stills indicated that areas of reef were associated with a notable increase in diversity and abundance of epibenthic taxa compared to soft substrates. Overall, 75 different species of marine epibenthos were recorded from the SACFOR analysis of the digital stills across the ten reef investigation stations. No protected or invasive non-native species were recorded. There was no evidence of the Annex I feature ‘submarine

structures made by leaking gases' within the investigated pockmark location and no other protected species or habitats were recorded at the pockmark location.

The 24 megapixel digital stills, in combination with the streamed footage, ensured a high quality of seabed imagery data was acquired. These data have provided a high level of confidence in the results for the areas surveyed and have provided effective groundtruthing of the geophysical data to enable mapping of areas beyond the survey transects. In addition, the transect approach was effective at determining transition areas from one type of habitat to another across the survey area (e.g. areas of Low to Medium reef). Extrapolation of survey data using geophysical outputs was required to map the area of cobble reef across the whole of the OfTW corridor, however, by considering the geophysical data and applying a precautionary approach it is considered that the results effectively provide a broad indication of the coverage of the different levels of cobble reef resemblance across the corridor.

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Appendix 1 – Station location log

Time Taken	Date Taken	Station	Pic Filename	Easting	Northing
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14:21:02	25/06/2015	Pmark_T1	PMT1_0834.jpg	498076.02	6418919.45
14:22:44	25/06/2015	Pmark_T1	PMT1_0835.jpg	498081.05	6418905.53
14:23:25	25/06/2015	Pmark_T1	PMT1_0836.jpg	498092.12	6418913.51
14:35:28	25/06/2015	Pmark_T2	Pmark_T2_0831.jpg	498094.12	6418963.42
14:35:48	25/06/2015	Pmark_T2	Pmark_T2_0832.jpg	498086.71	6418963.42
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14:38:00	25/06/2015	Pmark_T2	Pmark_T2_0836.jpg	498041.87	6418957.69
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Time Taken	Date Taken	Station	Pic Filename	Easting	Northing
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12:46:51	26/06/2015	Reef2	Reef2_0900.jpg	497942.60	6392943.75
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12:49:04	26/06/2015	Reef2	Reef2_0907.jpg	497872.72	6392938.22
12:49:18	26/06/2015	Reef2	Reef2_0908.jpg	497864.17	6392937.30
12:49:35	26/06/2015	Reef2	Reef2_0909.jpg	497851.35	6392937.11
12:49:57	26/06/2015	Reef2	Reef2_0910.jpg	497833.36	6392940.10
12:50:29	26/06/2015	Reef2	Reef2_0911.jpg	497810.60	6392941.22
12:50:53	26/06/2015	Reef2	Reef2_0912.jpg	497794.40	6392943.64
12:51:44	26/06/2015	Reef2	Reef2_0913.jpg	497756.93	6392947.93
12:51:59	26/06/2015	Reef2	Reef2_0914.jpg	497745.30	6392949.41
12:52:13	26/06/2015	Reef2	Reef2_0915.jpg	497736.36	6392952.02
12:52:27	26/06/2015	Reef2	Reef2_0916.jpg	497726.52	6392952.77

Time Taken	Date Taken	Station	Pic Filename	Easting	Northing
12:52:41	26/06/2015	Reef2	Reef2_0917.jpg	497718.37	6392953.52
12:52:51	26/06/2015	Reef2	Reef2_0918.jpg	497712.11	6392954.63
12:53:06	26/06/2015	Reef2	Reef2_0919.jpg	497701.27	6392955.57
12:53:20	26/06/2015	Reef2	Reef2_0920.jpg	497691.73	6392955.76
12:53:35	26/06/2015	Reef2	Reef2_0921.jpg	497681.50	6392956.69
12:53:49	26/06/2015	Reef2	Reef2_0922.jpg	497673.84	6392952.24
12:54:06	26/06/2015	Reef2	Reef2_0923.jpg	497662.81	6392950.58
12:54:20	26/06/2015	Reef2	Reef2_0924.jpg	497656.05	6392949.66
12:54:35	26/06/2015	Reef2	Reef2_0925.jpg	497647.20	6392946.87
12:54:49	26/06/2015	Reef2	Reef2_0926.jpg	497639.15	6392944.66
12:55:03	26/06/2015	Reef2	Reef2_0927.jpg	497631.89	6392943.17
12:55:07	26/06/2015	Reef2	Reef2_0928.jpg	497629.70	6392942.99
12:55:22	26/06/2015	Reef2	Reef2_0929.jpg	497622.54	6392940.96
12:55:36	26/06/2015	Reef2	Reef2_0930.jpg	497616.28	6392938.36
12:55:50	26/06/2015	Reef2	Reef2_0931.jpg	497608.73	6392935.96
12:56:04	26/06/2015	Reef2	Reef2_0932.jpg	497601.77	6392934.47
12:56:26	26/06/2015	Reef2	Reef2_0933.jpg	497589.34	6392930.59
12:56:41	26/06/2015	Reef2	Reef2_0934.jpg	497582.18	6392929.10
12:56:55	26/06/2015	Reef2	Reef2_0935.jpg	497573.14	6392929.47
12:57:09	26/06/2015	Reef2	Reef2_0936.jpg	497563.20	6392932.27
12:57:23	26/06/2015	Reef2	Reef2_0937.jpg	497553.86	6392933.39
12:57:47	26/06/2015	Reef2	Reef2_0938.jpg	497538.25	6392936.74
12:58:02	26/06/2015	Reef2	Reef2_0939.jpg	497527.62	6392938.97
12:58:16	26/06/2015	Reef2	Reef2_0940.jpg	497517.48	6392942.13
12:58:30	26/06/2015	Reef2	Reef2_0941.jpg	497508.54	6392944.91
12:58:44	26/06/2015	Reef2	Reef2_0942.jpg	497499.40	6392947.15
12:59:01	26/06/2015	Reef2	Reef2_0943.jpg	497486.68	6392950.12
12:59:12	26/06/2015	Reef2	Reef2_0944.jpg	497479.22	6392952.91
12:59:28	26/06/2015	Reef2	Reef2_0945.jpg	497467.40	6392957.19
12:59:42	26/06/2015	Reef2	Reef2_0946.jpg	497458.25	6392959.24
12:59:56	26/06/2015	Reef2	Reef2_0947.jpg	497449.41	6392961.65
13:00:10	26/06/2015	Reef2	Reef2_0948.jpg	497440.37	6392966.67
13:00:23	26/06/2015	Reef2	Reef2_0949.jpg	497430.43	6392971.32
13:00:43	26/06/2015	Reef2	Reef2_0950.jpg	497417.31	6392977.07
13:30:03	26/06/2015	Reef3	Reef3_0832.jpg	497898.80	6394150.75
13:30:38	26/06/2015	Reef3	Reef3_0833.jpg	497913.01	6394160.01
13:31:10	26/06/2015	Reef3	Reef3_0834.jpg	497928.61	6394161.67
13:31:25	26/06/2015	Reef3	Reef3_0835.jpg	497937.36	6394161.67
13:31:39	26/06/2015	Reef3	Reef3_0836.jpg	497944.21	6394161.48
13:31:53	26/06/2015	Reef3	Reef3_0837.jpg	497950.28	6394161.48
13:32:07	26/06/2015	Reef3	Reef3_0838.jpg	497956.63	6394159.62
13:32:43	26/06/2015	Reef3	Reef3_0839.jpg	497973.23	6394158.50
13:32:58	26/06/2015	Reef3	Reef3_0840.jpg	497979.09	6394156.83
13:33:12	26/06/2015	Reef3	Reef3_0841.jpg	497985.05	6394155.15
13:33:26	26/06/2015	Reef3	Reef3_0842.jpg	497991.31	6394153.85
13:33:40	26/06/2015	Reef3	Reef3_0843.jpg	497997.87	6394154.96
13:34:01	26/06/2015	Reef3	Reef3_0844.jpg	498007.71	6394155.70

Time Taken	Date Taken	Station	Pic Filename	Easting	Northing
13:34:16	26/06/2015	Reef3	Reef3_0845.jpg	498013.37	6394154.40
13:34:30	26/06/2015	Reef3	Reef3_0846.jpg	498020.82	6394152.54
13:34:44	26/06/2015	Reef3	Reef3_0847.jpg	498028.37	6394151.23
13:34:58	26/06/2015	Reef3	Reef3_0848.jpg	498035.83	6394151.79
13:35:08	26/06/2015	Reef3	Reef3_0849.jpg	498040.50	6394151.42
13:35:23	26/06/2015	Reef3	Reef3_0850.jpg	498048.35	6394151.22
13:35:38	26/06/2015	Reef3	Reef3_0851.jpg	498056.20	6394151.04
13:35:52	26/06/2015	Reef3	Reef3_0852.jpg	498064.24	6394150.66
13:36:06	26/06/2015	Reef3	Reef3_0853.jpg	498071.99	6394149.73
13:36:20	26/06/2015	Reef3	Reef3_0854.jpg	498079.74	6394149.73
13:36:34	26/06/2015	Reef3	Reef3_0855.jpg	498088.99	6394150.09
13:36:49	26/06/2015	Reef3	Reef3_0856.jpg	498097.13	6394149.53
13:37:03	26/06/2015	Reef3	Reef3_0857.jpg	498103.79	6394148.23
13:37:17	26/06/2015	Reef3	Reef3_0858.jpg	498110.65	6394147.67
13:37:30	26/06/2015	Reef3	Reef3_0859.jpg	498120.28	6394146.37
13:43:11	26/06/2015	Reef3	Reef3_0861.jpg	498007.93	6394009.12
13:43:37	26/06/2015	Reef3	Reef3_0862.jpg	498013.80	6394017.46
13:43:52	26/06/2015	Reef3	Reef3_0863.jpg	498016.59	6394024.33
13:44:07	26/06/2015	Reef3	Reef3_0864.jpg	498015.60	6394031.75
13:44:21	26/06/2015	Reef3	Reef3_0865.jpg	498014.71	6394041.96
13:44:35	26/06/2015	Reef3	Reef3_0866.jpg	498013.72	6394049.00
13:44:49	26/06/2015	Reef3	Reef3_0867.jpg	498013.12	6394057.92
13:45:03	26/06/2015	Reef3	Reef3_0868.jpg	498013.03	6394066.26
13:45:18	26/06/2015	Reef3	Reef3_0869.jpg	498012.73	6394072.20
13:45:32	26/06/2015	Reef3	Reef3_0870.jpg	498013.43	6394080.74
13:45:46	26/06/2015	Reef3	Reef3_0871.jpg	498013.84	6394089.09
13:46:16	26/06/2015	Reef3	Reef3_0872.jpg	498014.54	6394108.01
13:46:32	26/06/2015	Reef3	Reef3_0873.jpg	498014.05	6394116.54
13:46:46	26/06/2015	Reef3	Reef3_0874.jpg	498014.05	6394123.79
13:47:00	26/06/2015	Reef3	Reef3_0875.jpg	498013.06	6394131.76
13:47:14	26/06/2015	Reef3	Reef3_0876.jpg	498013.16	6394140.10
13:47:28	26/06/2015	Reef3	Reef3_0877.jpg	498011.28	6394149.95
13:47:43	26/06/2015	Reef3	Reef3_0878.jpg	498010.19	6394158.11
13:47:57	26/06/2015	Reef3	Reef3_0879.jpg	498009.70	6394165.72
13:48:11	26/06/2015	Reef3	Reef3_0880.jpg	498010.50	6394173.32
13:48:25	26/06/2015	Reef3	Reef3_0881.jpg	498010.01	6394181.49
13:48:41	26/06/2015	Reef3	Reef3_0882.jpg	498010.70	6394188.91
13:48:56	26/06/2015	Reef3	Reef3_0883.jpg	498012.10	6394197.44
13:49:10	26/06/2015	Reef3	Reef3_0884.jpg	498012.30	6394208.02
13:49:25	26/06/2015	Reef3	Reef3_0885.jpg	498013.10	6394215.81
13:49:39	26/06/2015	Reef3	Reef3_0886.jpg	498014.60	6394225.64
13:49:53	26/06/2015	Reef3	Reef3_0887.jpg	498015.30	6394235.85
13:50:07	26/06/2015	Reef3	Reef3_0888.jpg	498016.30	6394243.08
13:50:22	26/06/2015	Reef3	Reef3_0889.jpg	498016.20	6394251.25
13:50:36	26/06/2015	Reef3	Reef3_0890.jpg	498017.00	6394260.71
13:50:50	26/06/2015	Reef3	Reef3_0891.jpg	498013.92	6394268.88
13:51:15	26/06/2015	Reef3	Reef3_0892.jpg	498013.04	6394283.53

Time Taken	Date Taken	Station	Pic Filename	Easting	Northing
13:51:30	26/06/2015	Reef3	Reef3_0893.jpg	498011.75	6394290.96
13:51:45	26/06/2015	Reef3	Reef3_0894.jpg	498010.46	6394300.42
13:51:59	26/06/2015	Reef3	Reef3_0895.jpg	498008.48	6394308.41
13:52:13	26/06/2015	Reef3	Reef3_0896.jpg	498006.79	6394316.01
13:52:27	26/06/2015	Reef3	Reef3_0897.jpg	498004.51	6394324.55
13:52:41	26/06/2015	Reef3	Reef3_0898.jpg	498003.92	6394332.71
13:52:56	26/06/2015	Reef3	Reef3_0899.jpg	498003.23	6394341.61
13:53:10	26/06/2015	Reef3	Reef3_0900.jpg	498001.05	6394351.46
13:53:24	26/06/2015	Reef3	Reef3_0901.jpg	497997.37	6394357.76
14:06:58	26/06/2015	Reef4	Reef4_0830.jpg	498140.56	6394800.22
14:07:24	26/06/2015	Reef4	Reef4_0831.jpg	498152.18	6394795.21
14:07:39	26/06/2015	Reef4	Reef4_0832.jpg	498160.13	6394794.28
14:07:51	26/06/2015	Reef4	Reef4_0833.jpg	498165.39	6394794.65
14:08:06	26/06/2015	Reef4	Reef4_0834.jpg	498174.33	6394793.90
14:08:20	26/06/2015	Reef4	Reef4_0835.jpg	498182.28	6394795.75
14:08:34	26/06/2015	Reef4	Reef4_0836.jpg	498190.73	6394796.86
14:08:49	26/06/2015	Reef4	Reef4_0837.jpg	498200.86	6394799.27
14:09:03	26/06/2015	Reef4	Reef4_0838.jpg	498208.91	6394799.44
14:09:17	26/06/2015	Reef4	Reef4_0839.jpg	498216.46	6394801.31
14:09:31	26/06/2015	Reef4	Reef4_0840.jpg	498224.81	6394801.67
14:09:45	26/06/2015	Reef4	Reef4_0841.jpg	498233.05	6394800.37
14:10:00	26/06/2015	Reef4	Reef4_0842.jpg	498240.80	6394797.03
14:10:31	26/06/2015	Reef4	Reef4_0843.jpg	498257.99	6394793.12
14:10:46	26/06/2015	Reef4	Reef4_0844.jpg	498265.74	6394791.44
14:11:00	26/06/2015	Reef4	Reef4_0845.jpg	498271.30	6394791.63
14:11:14	26/06/2015	Reef4	Reef4_0846.jpg	498278.85	6394787.17
14:11:29	26/06/2015	Reef4	Reef4_0847.jpg	498286.30	6394788.47
14:11:43	26/06/2015	Reef4	Reef4_0848.jpg	498294.55	6394786.61
14:11:57	26/06/2015	Reef4	Reef4_0849.jpg	498303.39	6394786.42
14:12:11	26/06/2015	Reef4	Reef4_0850.jpg	498309.65	6394788.83
14:12:25	26/06/2015	Reef4	Reef4_0851.jpg	498317.40	6394788.45
14:12:40	26/06/2015	Reef4	Reef4_0852.jpg	498325.64	6394791.80
14:13:08	26/06/2015	Reef4	Reef4_0853.jpg	498342.34	6394797.91
14:13:23	26/06/2015	Reef4	Reef4_0854.jpg	498350.39	6394800.32
14:13:37	26/06/2015	Reef4	Reef4_0855.jpg	498355.45	6394804.03
14:13:51	26/06/2015	Reef4	Reef4_0856.jpg	498363.80	6394806.62
14:14:05	26/06/2015	Reef4	Reef4_0857.jpg	498372.25	6394807.54
14:14:19	26/06/2015	Reef4	Reef4_0858.jpg	498379.10	6394808.10
14:14:34	26/06/2015	Reef4	Reef4_0859.jpg	498384.77	6394809.21
14:14:48	26/06/2015	Reef4	Reef4_0860.jpg	498390.93	6394809.95
14:15:02	26/06/2015	Reef4	Reef4_0861.jpg	498395.99	6394805.12
14:15:16	26/06/2015	Reef4	Reef4_0862.jpg	498403.04	6394802.71
14:15:35	26/06/2015	Reef4	Reef4_0863.jpg	498413.67	6394801.03
14:15:50	26/06/2015	Reef4	Reef4_0864.jpg	498421.52	6394799.92
14:16:04	26/06/2015	Reef4	Reef4_0865.jpg	498428.97	6394798.43
14:16:18	26/06/2015	Reef4	Reef4_0866.jpg	498437.22	6394800.66
14:16:32	26/06/2015	Reef4	Reef4_0867.jpg	498444.37	6394799.72

Time Taken	Date Taken	Station	Pic Filename	Easting	Northing
14:16:47	26/06/2015	Reef4	Reef4_0868.jpg	498451.92	6394799.54
14:17:01	26/06/2015	Reef4	Reef4_0869.jpg	498461.36	6394801.01
14:17:15	26/06/2015	Reef4	Reef4_0870.jpg	498465.53	6394800.46
14:17:29	26/06/2015	Reef4	Reef4_0871.jpg	498472.69	6394798.41
14:17:44	26/06/2015	Reef4	Reef4_0872.jpg	498481.03	6394798.04
14:27:30	26/06/2015	Reef4	Reef4_0873.jpg	498333.10	6394567.65
14:27:50	26/06/2015	Reef4	Reef4_0874.jpg	498332.61	6394578.41
14:28:35	26/06/2015	Reef4	Reef4_0875.jpg	498331.23	6394601.42
14:28:50	26/06/2015	Reef4	Reef4_0876.jpg	498332.23	6394610.51
14:29:04	26/06/2015	Reef4	Reef4_0877.jpg	498331.44	6394619.23
14:29:19	26/06/2015	Reef4	Reef4_0878.jpg	498330.64	6394626.47
14:29:33	26/06/2015	Reef4	Reef4_0879.jpg	498330.35	6394635.74
14:29:47	26/06/2015	Reef4	Reef4_0880.jpg	498330.95	6394643.17
14:30:01	26/06/2015	Reef4	Reef4_0881.jpg	498330.95	6394649.47
14:30:15	26/06/2015	Reef4	Reef4_0882.jpg	498330.26	6394656.72
14:30:33	26/06/2015	Reef4	Reef4_0883.jpg	498329.87	6394668.03
14:30:48	26/06/2015	Reef4	Reef4_0884.jpg	498329.57	6394676.38
14:31:02	26/06/2015	Reef4	Reef4_0885.jpg	498330.27	6394683.62
14:31:16	26/06/2015	Reef4	Reef4_0886.jpg	498332.36	6394693.82
14:31:31	26/06/2015	Reef4	Reef4_0887.jpg	498335.84	6394699.95
14:31:45	26/06/2015	Reef4	Reef4_0888.jpg	498333.76	6394706.62
14:31:59	26/06/2015	Reef4	Reef4_0889.jpg	498333.96	6394713.67
14:32:13	26/06/2015	Reef4	Reef4_0890.jpg	498335.05	6394720.17
14:32:28	26/06/2015	Reef4	Reef4_0891.jpg	498335.45	6394727.03
14:32:42	26/06/2015	Reef4	Reef4_0892.jpg	498335.06	6394735.20
14:32:56	26/06/2015	Reef4	Reef4_0893.jpg	498335.96	6394742.24
14:33:10	26/06/2015	Reef4	Reef4_0894.jpg	498335.16	6394748.93
14:33:24	26/06/2015	Reef4	Reef4_0895.jpg	498335.07	6394756.17
14:33:39	26/06/2015	Reef4	Reef4_0896.jpg	498333.48	6394762.10
14:33:53	26/06/2015	Reef4	Reef4_0897.jpg	498331.20	6394769.71
14:34:07	26/06/2015	Reef4	Reef4_0898.jpg	498331.80	6394778.61
14:34:21	26/06/2015	Reef4	Reef4_0899.jpg	498332.10	6394784.93
14:34:35	26/06/2015	Reef4	Reef4_0900.jpg	498331.61	6394792.16
14:34:50	26/06/2015	Reef4	Reef4_0901.jpg	498331.41	6394798.47
14:35:04	26/06/2015	Reef4	Reef4_0902.jpg	498332.51	6394806.07
14:35:18	26/06/2015	Reef4	Reef4_0903.jpg	498332.61	6394812.38
14:35:32	26/06/2015	Reef4	Reef4_0904.jpg	498333.90	6394820.55
14:35:46	26/06/2015	Reef4	Reef4_0905.jpg	498336.39	6394829.27
14:36:01	26/06/2015	Reef4	Reef4_0906.jpg	498336.59	6394835.95
14:36:15	26/06/2015	Reef4	Reef4_0907.jpg	498336.99	6394843.37
14:36:29	26/06/2015	Reef4	Reef4_0908.jpg	498336.20	6394849.68
14:36:43	26/06/2015	Reef4	Reef4_0909.jpg	498335.61	6394856.17
14:36:58	26/06/2015	Reef4	Reef4_0910.jpg	498335.41	6394863.60
14:37:12	26/06/2015	Reef4	Reef4_0911.jpg	498335.91	6394870.27
14:37:26	26/06/2015	Reef4	Reef4_0912.jpg	498336.21	6394880.29
14:37:47	26/06/2015	Reef4	Reef4_0913.jpg	498336.71	6394891.80
14:38:02	26/06/2015	Reef4	Reef4_0914.jpg	498338.41	6394899.22

Time Taken	Date Taken	Station	Pic Filename	Easting	Northing
14:38:16	26/06/2015	Reef4	Reef4_0915.jpg	498340.50	6394908.31
14:38:31	26/06/2015	Reef4	Reef4_0916.jpg	498343.18	6394914.24
14:38:45	26/06/2015	Reef4	Reef4_0917.jpg	498345.17	6394920.74
14:38:59	26/06/2015	Reef4	Reef4_0918.jpg	498344.97	6394927.05
14:39:13	26/06/2015	Reef4	Reef4_0919.jpg	498344.68	6394933.54
14:39:27	26/06/2015	Reef4	Reef4_0920.jpg	498345.38	6394943.56
14:39:42	26/06/2015	Reef4	Reef4_0921.jpg	498346.08	6394951.54
14:39:56	26/06/2015	Reef4	Reef4_0922.jpg	498350.45	6394956.73
14:40:10	26/06/2015	Reef4	Reef4_0923.jpg	498352.54	6394964.52
14:40:24	26/06/2015	Reef4	Reef4_0924.jpg	498354.23	6394973.06
14:40:39	26/06/2015	Reef4	Reef4_0925.jpg	498356.92	6394981.22
14:40:53	26/06/2015	Reef4	Reef4_0926.jpg	498358.81	6394988.83
14:41:07	26/06/2015	Reef4	Reef4_0927.jpg	498360.20	6394998.85
14:50:41	26/06/2015	Reef5	Reef5_0830.jpg	498005.95	6395022.76
14:50:56	26/06/2015	Reef5	Reef5_0831.jpg	498005.95	6395022.38
14:51:10	26/06/2015	Reef5	Reef5_0832.jpg	498007.44	6395024.24
14:51:24	26/06/2015	Reef5	Reef5_0833.jpg	498008.34	6395029.44
14:51:38	26/06/2015	Reef5	Reef5_0834.jpg	498011.72	6395034.26
14:52:23	26/06/2015	Reef5	Reef5_0835.jpg	498010.74	6395068.96
14:52:56	26/06/2015	Reef5	Reef5_0836.jpg	498012.94	6395087.70
14:53:11	26/06/2015	Reef5	Reef5_0837.jpg	498014.53	6395096.04
14:53:25	26/06/2015	Reef5	Reef5_0838.jpg	498016.12	6395105.14
14:53:39	26/06/2015	Reef5	Reef5_0839.jpg	498013.94	6395112.37
14:53:54	26/06/2015	Reef5	Reef5_0840.jpg	498013.75	6395121.65
14:54:08	26/06/2015	Reef5	Reef5_0841.jpg	498014.05	6395128.89
14:54:22	26/06/2015	Reef5	Reef5_0842.jpg	498015.54	6395135.38
14:54:36	26/06/2015	Reef5	Reef5_0843.jpg	498017.04	6395143.72
14:54:51	26/06/2015	Reef5	Reef5_0844.jpg	498018.23	6395154.67
14:55:05	26/06/2015	Reef5	Reef5_0845.jpg	498018.73	6395162.66
14:55:19	26/06/2015	Reef5	Reef5_0846.jpg	498021.22	6395171.37
14:55:33	26/06/2015	Reef5	Reef5_0847.jpg	498020.93	6395178.06
14:55:47	26/06/2015	Reef5	Reef5_0848.jpg	498019.34	6395185.85
14:56:02	26/06/2015	Reef5	Reef5_0849.jpg	498020.34	6395194.01
14:56:16	26/06/2015	Reef5	Reef5_0850.jpg	498019.05	6395201.80
14:56:30	26/06/2015	Reef5	Reef5_0851.jpg	498018.76	6395209.60
14:56:44	26/06/2015	Reef5	Reef5_0852.jpg	498018.96	6395218.32
14:56:58	26/06/2015	Reef5	Reef5_0853.jpg	498019.66	6395227.41
14:57:13	26/06/2015	Reef5	Reef5_0854.jpg	498020.76	6395235.39
14:57:27	26/06/2015	Reef5	Reef5_0855.jpg	498021.06	6395243.56
14:57:41	26/06/2015	Reef5	Reef5_0856.jpg	498022.75	6395251.53
14:57:55	26/06/2015	Reef5	Reef5_0857.jpg	498022.66	6395260.25
14:58:09	26/06/2015	Reef5	Reef5_0858.jpg	498022.76	6395266.55
14:58:24	26/06/2015	Reef5	Reef5_0859.jpg	498021.47	6395273.79
14:58:38	26/06/2015	Reef5	Reef5_0860.jpg	498022.47	6395280.66
14:58:52	26/06/2015	Reef5	Reef5_0861.jpg	498022.07	6395288.45
14:59:06	26/06/2015	Reef5	Reef5_0862.jpg	498021.78	6395295.51
14:59:21	26/06/2015	Reef5	Reef5_0863.jpg	498019.80	6395303.67

Time Taken	Date Taken	Station	Pic Filename	Easting	Northing
14:59:35	26/06/2015	Reef5	Reef5_0864.jpg	498019.40	6395312.02
14:59:49	26/06/2015	Reef5	Reef5_0865.jpg	498018.81	6395319.81
15:00:33	26/06/2015	Reef5	Reef5_0866.jpg	498020.21	6395342.26
15:00:48	26/06/2015	Reef5	Reef5_0867.jpg	498019.62	6395350.98
15:01:03	26/06/2015	Reef5	Reef5_0868.jpg	498020.22	6395359.89
15:01:17	26/06/2015	Reef5	Reef5_0869.jpg	498020.13	6395368.79
15:01:31	26/06/2015	Reef5	Reef5_0870.jpg	498019.73	6395376.77
15:01:45	26/06/2015	Reef5	Reef5_0871.jpg	498019.14	6395385.31
15:01:59	26/06/2015	Reef5	Reef5_0872.jpg	498019.24	6395392.55
15:02:14	26/06/2015	Reef5	Reef5_0873.jpg	498019.25	6395401.27
15:02:28	26/06/2015	Reef5	Reef5_0874.jpg	498018.95	6395408.13
15:02:42	26/06/2015	Reef5	Reef5_0875.jpg	498018.26	6395415.37
15:02:56	26/06/2015	Reef5	Reef5_0876.jpg	498018.37	6395424.09
15:03:10	26/06/2015	Reef5	Reef5_0877.jpg	498019.56	6395431.88
15:03:25	26/06/2015	Reef5	Reef5_0878.jpg	498020.06	6395440.04
15:03:39	26/06/2015	Reef5	Reef5_0879.jpg	498019.17	6395444.68
15:03:53	26/06/2015	Reef5	Reef5_0880.jpg	498018.98	6395453.04
15:13:03	26/06/2015	Reef5	Reef5_0884.jpg	497791.28	6395225.86
15:13:51	26/06/2015	Reef5	Reef5_0885.jpg	497807.97	6395229.93
15:14:06	26/06/2015	Reef5	Reef5_0886.jpg	497817.70	6395232.89
15:14:21	26/06/2015	Reef5	Reef5_0887.jpg	497825.45	6395232.89
15:14:35	26/06/2015	Reef5	Reef5_0888.jpg	497833.40	6395232.52
15:14:49	26/06/2015	Reef5	Reef5_0889.jpg	497842.14	6395230.84
15:15:03	26/06/2015	Reef5	Reef5_0890.jpg	497850.98	6395229.54
15:15:18	26/06/2015	Reef5	Reef5_0891.jpg	497859.13	6395227.67
15:15:32	26/06/2015	Reef5	Reef5_0892.jpg	497868.86	6395225.45
15:15:46	26/06/2015	Reef5	Reef5_0893.jpg	497876.11	6395225.81
15:16:00	26/06/2015	Reef5	Reef5_0894.jpg	497884.46	6395226.55
15:16:15	26/06/2015	Reef5	Reef5_0895.jpg	497892.80	6395228.58
15:16:29	26/06/2015	Reef5	Reef5_0896.jpg	497899.36	6395232.10
15:16:43	26/06/2015	Reef5	Reef5_0897.jpg	497906.02	6395234.14
15:16:57	26/06/2015	Reef5	Reef5_0898.jpg	497913.57	6395235.26
15:17:11	26/06/2015	Reef5	Reef5_0899.jpg	497919.93	6395236.18
15:17:25	26/06/2015	Reef5	Reef5_0900.jpg	497929.76	6395235.61
15:17:40	26/06/2015	Reef5	Reef5_0901.jpg	497939.50	6395235.61
15:17:54	26/06/2015	Reef5	Reef5_0902.jpg	497946.75	6395235.98
15:18:08	26/06/2015	Reef5	Reef5_0903.jpg	497954.99	6395235.05
15:18:22	26/06/2015	Reef5	Reef5_0904.jpg	497962.74	6395235.60
15:18:37	26/06/2015	Reef5	Reef5_0905.jpg	497970.79	6395235.97
15:18:51	26/06/2015	Reef5	Reef5_0906.jpg	497979.03	6395235.78
15:19:05	26/06/2015	Reef5	Reef5_0907.jpg	497986.19	6395235.78
15:19:19	26/06/2015	Reef5	Reef5_0908.jpg	497993.93	6395234.29
15:19:34	26/06/2015	Reef5	Reef5_0909.jpg	498001.58	6395234.10
15:19:48	26/06/2015	Reef5	Reef5_0910.jpg	498008.64	6395234.28
15:20:02	26/06/2015	Reef5	Reef5_0911.jpg	498016.58	6395234.27
15:21:00	26/06/2015	Reef5	Reef5_0912.jpg	498047.38	6395228.51
15:21:15	26/06/2015	Reef5	Reef5_0913.jpg	498056.61	6395226.83

Time Taken	Date Taken	Station	Pic Filename	Easting	Northing
15:21:29	26/06/2015	Reef5	Reef5_0914.jpg	498063.77	6395225.35
15:21:43	26/06/2015	Reef5	Reef5_0915.jpg	498070.32	6395224.04
15:21:57	26/06/2015	Reef5	Reef5_0916.jpg	498077.47	6395223.11
15:22:12	26/06/2015	Reef5	Reef5_0917.jpg	498084.23	6395224.41
15:22:26	26/06/2015	Reef5	Reef5_0918.jpg	498092.08	6395224.96
15:22:40	26/06/2015	Reef5	Reef5_0919.jpg	498099.13	6395226.81
15:22:54	26/06/2015	Reef5	Reef5_0920.jpg	498106.38	6395229.59
15:23:09	26/06/2015	Reef5	Reef5_0921.jpg	498113.64	6395230.70
15:23:23	26/06/2015	Reef5	Reef5_0922.jpg	498120.29	6395231.63
15:23:37	26/06/2015	Reef5	Reef5_0923.jpg	498125.56	6395235.15
15:23:51	26/06/2015	Reef5	Reef5_0924.jpg	498133.41	6395236.44
15:24:05	26/06/2015	Reef5	Reef5_0925.jpg	498141.75	6395235.89
15:24:20	26/06/2015	Reef5	Reef5_0926.jpg	498150.89	6395236.43
15:24:34	26/06/2015	Reef5	Reef5_0927.jpg	498158.54	6395236.81
15:24:48	26/06/2015	Reef5	Reef5_0928.jpg	498168.18	6395235.50
15:25:02	26/06/2015	Reef5	Reef5_0929.jpg	498176.22	6395233.27
15:25:17	26/06/2015	Reef5	Reef5_0930.jpg	498186.45	6395230.49
15:25:31	26/06/2015	Reef5	Reef5_0931.jpg	498195.19	6395229.18
15:25:45	26/06/2015	Reef5	Reef5_0932.jpg	498201.95	6395224.91
15:25:59	26/06/2015	Reef5	Reef5_0933.jpg	498209.79	6395223.24
15:26:13	26/06/2015	Reef5	Reef5_0934.jpg	498217.04	6395220.08
15:26:28	26/06/2015	Reef5	Reef5_0935.jpg	498222.61	6395217.29
15:26:42	26/06/2015	Reef5	Reef5_0936.jpg	498231.45	6395216.54
15:26:56	26/06/2015	Reef5	Reef5_0937.jpg	498237.61	6395215.43
15:27:10	26/06/2015	Reef5	Reef5_0938.jpg	498244.46	6395215.43
15:27:25	26/06/2015	Reef5	Reef5_0939.jpg	498251.12	6395216.35
15:27:39	26/06/2015	Reef5	Reef5_0940.jpg	498259.76	6395219.32
15:27:53	26/06/2015	Reef5	Reef5_0941.jpg	498265.33	6395222.10
15:28:05	26/06/2015	Reef5	Reef5_0942.jpg	498270.29	6395225.07
15:28:20	26/06/2015	Reef5	Reef5_0943.jpg	498277.94	6395229.51
15:28:35	26/06/2015	Reef5	Reef5_0944.jpg	498285.50	6395233.59
15:28:49	26/06/2015	Reef5	Reef5_0945.jpg	498292.25	6395237.86
15:29:03	26/06/2015	Reef5	Reef5_0946.jpg	498300.30	6395239.89
15:29:17	26/06/2015	Reef5	Reef5_0947.jpg	498307.55	6395241.20
15:29:31	26/06/2015	Reef5	Reef5_0948.jpg	498316.00	6395242.12
15:38:31	26/06/2015	Reef6	Reef6_0001.jpg	498298.91	6395716.20
15:38:38	26/06/2015	Reef6	Reef6_0002.jpg	498301.39	6395717.31
15:38:45	26/06/2015	Reef6	Reef6_0003.jpg	498303.08	6395719.34
15:39:59	26/06/2015	Reef6	Reef6_0006.jpg	498308.46	6395746.43
15:41:20	26/06/2015	Reef6	Reef6_0007.jpg	498308.77	6395783.91
15:41:34	26/06/2015	Reef6	Reef6_0008.jpg	498307.09	6395790.22
15:41:50	26/06/2015	Reef6	Reef6_0009.jpg	498307.29	6395798.21
15:42:04	26/06/2015	Reef6	Reef6_0010.jpg	498307.09	6395806.00
15:42:18	26/06/2015	Reef6	Reef6_0011.jpg	498306.90	6395812.31
15:42:32	26/06/2015	Reef6	Reef6_0012.jpg	498307.20	6395819.54
15:42:47	26/06/2015	Reef6	Reef6_0013.jpg	498306.51	6395827.33
15:43:01	26/06/2015	Reef6	Reef6_0014.jpg	498306.41	6395833.83

Time Taken	Date Taken	Station	Pic Filename	Easting	Northing
15:43:15	26/06/2015	Reef6	Reef6_0015.jpg	498306.41	6395838.84
15:43:29	26/06/2015	Reef6	Reef6_0016.jpg	498307.41	6395847.37
15:43:44	26/06/2015	Reef6	Reef6_0017.jpg	498308.41	6395857.58
15:43:58	26/06/2015	Reef6	Reef6_0018.jpg	498307.71	6395863.89
15:44:12	26/06/2015	Reef6	Reef6_0019.jpg	498307.12	6395870.20
15:44:26	26/06/2015	Reef6	Reef6_0020.jpg	498306.73	6395876.50
15:44:41	26/06/2015	Reef6	Reef6_0021.jpg	498307.13	6395884.86
15:44:55	26/06/2015	Reef6	Reef6_0022.jpg	498307.92	6395892.65
15:45:09	26/06/2015	Reef6	Reef6_0023.jpg	498307.83	6395899.32
15:45:23	26/06/2015	Reef6	Reef6_0024.jpg	498306.94	6395906.19
15:45:37	26/06/2015	Reef6	Reef6_0025.jpg	498306.74	6395914.72
15:45:51	26/06/2015	Reef6	Reef6_0026.jpg	498305.26	6395921.23
15:46:06	26/06/2015	Reef6	Reef6_0027.jpg	498304.07	6395927.90
15:46:20	26/06/2015	Reef6	Reef6_0028.jpg	498301.98	6395934.40
15:46:34	26/06/2015	Reef6	Reef6_0029.jpg	498300.40	6395940.52
15:46:48	26/06/2015	Reef6	Reef6_0030.jpg	498298.31	6395946.28
15:47:03	26/06/2015	Reef6	Reef6_0031.jpg	498295.83	6395953.33
15:47:17	26/06/2015	Reef6	Reef6_0032.jpg	498294.94	6395961.12
15:47:31	26/06/2015	Reef6	Reef6_0033.jpg	498295.54	6395968.73
15:47:47	26/06/2015	Reef6	Reef6_0034.jpg	498296.04	6395975.78
15:48:00	26/06/2015	Reef6	Reef6_0035.jpg	498297.63	6395981.90
15:48:16	26/06/2015	Reef6	Reef6_0036.jpg	498298.23	6395990.62
15:48:30	26/06/2015	Reef6	Reef6_0037.jpg	498298.14	6395997.30
15:48:44	26/06/2015	Reef6	Reef6_0038.jpg	498297.54	6396004.53
15:48:58	26/06/2015	Reef6	Reef6_0039.jpg	498297.15	6396012.89
15:49:13	26/06/2015	Reef6	Reef6_0040.jpg	498297.05	6396019.93
15:49:27	26/06/2015	Reef6	Reef6_0041.jpg	498295.57	6396026.25
15:49:41	26/06/2015	Reef6	Reef6_0042.jpg	498293.78	6396033.85
15:49:55	26/06/2015	Reef6	Reef6_0043.jpg	498290.80	6396039.42
15:50:09	26/06/2015	Reef6	Reef6_0044.jpg	498290.01	6396044.99
15:50:30	26/06/2015	Reef6	Reef6_0045.jpg	498285.25	6396056.67
15:58:50	26/06/2015	Reef6	Reef6_0047.jpg	498409.15	6395936.39
15:59:23	26/06/2015	Reef6	Reef6_0048.jpg	498408.36	6395942.52
15:59:41	26/06/2015	Reef6	Reef6_0049.jpg	498401.11	6395944.38
15:59:56	26/06/2015	Reef6	Reef6_0050.jpg	498394.36	6395946.05
16:00:10	26/06/2015	Reef6	Reef6_0051.jpg	498388.60	6395947.35
16:00:25	26/06/2015	Reef6	Reef6_0052.jpg	498381.65	6395948.10
16:00:39	26/06/2015	Reef6	Reef6_0053.jpg	498375.98	6395948.47
16:00:53	26/06/2015	Reef6	Reef6_0054.jpg	498370.32	6395947.36
16:01:07	26/06/2015	Reef6	Reef6_0055.jpg	498363.27	6395945.51
16:01:21	26/06/2015	Reef6	Reef6_0056.jpg	498356.02	6395945.33
16:01:36	26/06/2015	Reef6	Reef6_0057.jpg	498347.48	6395944.59
16:01:50	26/06/2015	Reef6	Reef6_0058.jpg	498340.13	6395945.70
16:02:04	26/06/2015	Reef6	Reef6_0059.jpg	498332.18	6395945.34
16:02:18	26/06/2015	Reef6	Reef6_0060.jpg	498324.34	6395946.45
16:02:33	26/06/2015	Reef6	Reef6_0061.jpg	498316.89	6395947.19
16:02:47	26/06/2015	Reef6	Reef6_0062.jpg	498308.44	6395948.68

Time Taken	Date Taken	Station	Pic Filename	Easting	Northing
16:03:01	26/06/2015	Reef6	Reef6_0063.jpg	498301.00	6395948.50
16:03:15	26/06/2015	Reef6	Reef6_0064.jpg	498293.65	6395946.83
16:03:29	26/06/2015	Reef6	Reef6_0065.jpg	498287.19	6395946.65
16:03:44	26/06/2015	Reef6	Reef6_0066.jpg	498278.55	6395944.43
16:03:58	26/06/2015	Reef6	Reef6_0067.jpg	498270.20	6395941.46
16:04:12	26/06/2015	Reef6	Reef6_0068.jpg	498264.14	6395939.79
16:04:26	26/06/2015	Reef6	Reef6_0069.jpg	498256.79	6395938.13
16:04:41	26/06/2015	Reef6	Reef6_0070.jpg	498249.15	6395938.87
16:04:55	26/06/2015	Reef6	Reef6_0071.jpg	498242.09	6395938.88
16:05:09	26/06/2015	Reef6	Reef6_0072.jpg	498234.35	6395936.47
16:05:23	26/06/2015	Reef6	Reef6_0073.jpg	498226.70	6395937.77
16:05:37	26/06/2015	Reef6	Reef6_0074.jpg	498220.14	6395939.63
16:05:52	26/06/2015	Reef6	Reef6_0075.jpg	498213.89	6395940.56
16:06:06	26/06/2015	Reef6	Reef6_0076.jpg	498205.54	6395941.67
16:06:20	26/06/2015	Reef6	Reef6_0077.jpg	498198.59	6395942.98
16:06:34	26/06/2015	Reef6	Reef6_0078.jpg	498190.65	6395945.02
16:06:49	26/06/2015	Reef6	Reef6_0079.jpg	498182.30	6395946.51
16:07:03	26/06/2015	Reef6	Reef6_0080.jpg	498176.15	6395947.81
16:16:58	26/06/2015	Reef7	Reef7_0005.jpg	498032.09	6396479.10
16:17:34	26/06/2015	Reef7	Reef7_0006.jpg	498031.10	6396491.53
16:17:52	26/06/2015	Reef7	Reef7_0007.jpg	498030.31	6396496.17
16:18:07	26/06/2015	Reef7	Reef7_0008.jpg	498029.42	6396501.73
16:18:21	26/06/2015	Reef7	Reef7_0009.jpg	498030.52	6396508.97
16:18:36	26/06/2015	Reef7	Reef7_0010.jpg	498028.43	6396515.84
16:18:50	26/06/2015	Reef7	Reef7_0011.jpg	498028.54	6396521.04
16:19:04	26/06/2015	Reef7	Reef7_0012.jpg	498029.83	6396528.27
16:19:18	26/06/2015	Reef7	Reef7_0013.jpg	498030.33	6396534.21
16:19:32	26/06/2015	Reef7	Reef7_0014.jpg	498030.43	6396541.08
16:19:47	26/06/2015	Reef7	Reef7_0015.jpg	498028.45	6396548.31
16:20:01	26/06/2015	Reef7	Reef7_0016.jpg	498026.37	6396554.99
16:20:15	26/06/2015	Reef7	Reef7_0017.jpg	498025.38	6396561.85
16:20:29	26/06/2015	Reef7	Reef7_0018.jpg	498022.70	6396569.65
16:20:44	26/06/2015	Reef7	Reef7_0019.jpg	498021.71	6396577.99
16:20:58	26/06/2015	Reef7	Reef7_0020.jpg	498020.52	6396585.61
16:21:12	26/06/2015	Reef7	Reef7_0021.jpg	498019.83	6396592.85
16:21:26	26/06/2015	Reef7	Reef7_0022.jpg	498020.93	6396600.64
16:21:40	26/06/2015	Reef7	Reef7_0023.jpg	498022.22	6396608.24
16:21:55	26/06/2015	Reef7	Reef7_0024.jpg	498024.21	6396615.30
16:22:09	26/06/2015	Reef7	Reef7_0025.jpg	498025.31	6396622.72
16:22:23	26/06/2015	Reef7	Reef7_0026.jpg	498025.71	6396630.69
16:22:37	26/06/2015	Reef7	Reef7_0027.jpg	498025.22	6396636.26
16:22:52	26/06/2015	Reef7	Reef7_0028.jpg	498024.52	6396644.24
16:23:06	26/06/2015	Reef7	Reef7_0029.jpg	498022.54	6396651.48
16:23:20	26/06/2015	Reef7	Reef7_0030.jpg	498019.37	6396656.86
16:23:34	26/06/2015	Reef7	Reef7_0031.jpg	498016.39	6396662.79
16:23:48	26/06/2015	Reef7	Reef7_0032.jpg	498015.40	6396671.15
16:24:03	26/06/2015	Reef7	Reef7_0033.jpg	498015.41	6396678.75

Time Taken	Date Taken	Station	Pic Filename	Easting	Northing
16:24:17	26/06/2015	Reef7	Reef7_0034.jpg	498017.20	6396684.51
16:24:31	26/06/2015	Reef7	Reef7_0035.jpg	498017.10	6396692.85
16:24:45	26/06/2015	Reef7	Reef7_0036.jpg	498018.49	6396699.35
16:24:59	26/06/2015	Reef7	Reef7_0037.jpg	498020.19	6396707.14
16:25:14	26/06/2015	Reef7	Reef7_0038.jpg	498021.08	6396715.49
16:25:28	26/06/2015	Reef7	Reef7_0039.jpg	498021.19	6396723.28
16:25:42	26/06/2015	Reef7	Reef7_0040.jpg	498020.30	6396728.48
16:25:56	26/06/2015	Reef7	Reef7_0041.jpg	498019.21	6396734.42
16:26:11	26/06/2015	Reef7	Reef7_0042.jpg	498018.71	6396742.95
16:26:25	26/06/2015	Reef7	Reef7_0043.jpg	498017.33	6396749.63
16:26:39	26/06/2015	Reef7	Reef7_0044.jpg	498015.54	6396755.02
16:26:53	26/06/2015	Reef7	Reef7_0045.jpg	498013.56	6396761.51
16:27:08	26/06/2015	Reef7	Reef7_0046.jpg	498010.39	6396771.16
16:27:22	26/06/2015	Reef7	Reef7_0047.jpg	498010.39	6396777.84
16:27:36	26/06/2015	Reef7	Reef7_0048.jpg	498010.59	6396784.52
16:27:50	26/06/2015	Reef7	Reef7_0049.jpg	498012.58	6396792.12
16:28:04	26/06/2015	Reef7	Reef7_0050.jpg	498016.26	6396798.43
16:28:19	26/06/2015	Reef7	Reef7_0051.jpg	498020.73	6396805.48
16:28:33	26/06/2015	Reef7	Reef7_0052.jpg	498022.62	6396812.52
16:28:47	26/06/2015	Reef7	Reef7_0053.jpg	498023.62	6396819.03
16:29:01	26/06/2015	Reef7	Reef7_0054.jpg	498025.31	6396825.71
16:29:15	26/06/2015	Reef7	Reef7_0055.jpg	498028.59	6396831.65
16:29:30	26/06/2015	Reef7	Reef7_0056.jpg	498028.99	6396839.06
16:38:08	26/06/2015	Reef7	Reef7_0058.jpg	497801.85	6396590.91
16:38:39	26/06/2015	Reef7	Reef7_0059.jpg	497807.32	6396597.04
16:38:59	26/06/2015	Reef7	Reef7_0060.jpg	497808.31	6396597.04
16:40:12	26/06/2015	Reef7	Reef7_0061.jpg	497844.76	6396602.95
16:40:31	26/06/2015	Reef7	Reef7_0062.jpg	497853.20	6396604.25
16:40:47	26/06/2015	Reef7	Reef7_0063.jpg	497860.15	6396602.95
16:41:02	26/06/2015	Reef7	Reef7_0064.jpg	497867.20	6396603.31
16:41:17	26/06/2015	Reef7	Reef7_0065.jpg	497874.45	6396603.31
16:41:31	26/06/2015	Reef7	Reef7_0066.jpg	497881.50	6396602.38
16:41:45	26/06/2015	Reef7	Reef7_0067.jpg	497887.86	6396601.07
16:41:59	26/06/2015	Reef7	Reef7_0068.jpg	497893.12	6396600.14
16:42:13	26/06/2015	Reef7	Reef7_0069.jpg	497902.26	6396600.70
16:42:28	26/06/2015	Reef7	Reef7_0070.jpg	497911.20	6396601.62
16:42:42	26/06/2015	Reef7	Reef7_0071.jpg	497917.85	6396603.29
16:42:56	26/06/2015	Reef7	Reef7_0072.jpg	497924.80	6396602.54
16:43:10	26/06/2015	Reef7	Reef7_0073.jpg	497932.65	6396604.95
16:43:25	26/06/2015	Reef7	Reef7_0074.jpg	497940.49	6396606.99
16:43:39	26/06/2015	Reef7	Reef7_0075.jpg	497950.33	6396607.72
16:43:53	26/06/2015	Reef7	Reef7_0076.jpg	497958.67	6396608.09
16:44:07	26/06/2015	Reef7	Reef7_0077.jpg	497968.40	6396608.64
16:44:21	26/06/2015	Reef7	Reef7_0078.jpg	497977.14	6396609.20
16:44:36	26/06/2015	Reef7	Reef7_0079.jpg	497986.47	6396608.26
16:44:50	26/06/2015	Reef7	Reef7_0080.jpg	497995.01	6396607.89
16:45:04	26/06/2015	Reef7	Reef7_0081.jpg	498004.55	6396609.18

Time Taken	Date Taken	Station	Pic Filename	Easting	Northing
16:45:18	26/06/2015	Reef7	Reef7_0082.jpg	498012.49	6396608.99
16:45:33	26/06/2015	Reef7	Reef7_0083.jpg	498019.54	6396609.91
16:45:47	26/06/2015	Reef7	Reef7_0084.jpg	498027.88	6396609.91
16:46:01	26/06/2015	Reef7	Reef7_0085.jpg	498035.23	6396610.83
16:46:15	26/06/2015	Reef7	Reef7_0086.jpg	498043.97	6396610.64
16:46:29	26/06/2015	Reef7	Reef7_0087.jpg	498052.61	6396611.38
16:46:44	26/06/2015	Reef7	Reef7_0088.jpg	498060.95	6396611.56
16:46:58	26/06/2015	Reef7	Reef7_0089.jpg	498070.79	6396611.19
16:47:12	26/06/2015	Reef7	Reef7_0090.jpg	498080.02	6396610.81
16:47:26	26/06/2015	Reef7	Reef7_0091.jpg	498086.67	6396609.69
16:47:41	26/06/2015	Reef7	Reef7_0092.jpg	498095.61	6396608.20
16:47:55	26/06/2015	Reef7	Reef7_0093.jpg	498103.26	6396608.94
16:48:09	26/06/2015	Reef7	Reef7_0094.jpg	498111.90	6396608.57
16:48:23	26/06/2015	Reef7	Reef7_0095.jpg	498120.04	6396608.38
16:48:37	26/06/2015	Reef7	Reef7_0096.jpg	498128.08	6396608.38
16:48:52	26/06/2015	Reef7	Reef7_0097.jpg	498138.31	6396606.33
16:49:06	26/06/2015	Reef7	Reef7_0098.jpg	498145.86	6396606.33
16:49:20	26/06/2015	Reef7	Reef7_0099.jpg	498153.70	6396605.77
16:49:34	26/06/2015	Reef7	Reef7_0100.jpg	498159.66	6396606.14
16:49:48	26/06/2015	Reef7	Reef7_0101.jpg	498163.04	6396604.46
16:50:03	26/06/2015	Reef7	Reef7_0102.jpg	498165.42	6396602.98
17:01:13	26/06/2015	Reef8	Reef8_0002.jpg	498363.95	6397127.06
17:01:45	26/06/2015	Reef8	Reef8_0003.jpg	498362.16	6397132.26
17:02:00	26/06/2015	Reef8	Reef8_0004.jpg	498361.47	6397141.36
17:02:14	26/06/2015	Reef8	Reef8_0005.jpg	498360.08	6397146.92
17:02:28	26/06/2015	Reef8	Reef8_0006.jpg	498361.28	6397151.37
17:02:43	26/06/2015	Reef8	Reef8_0007.jpg	498362.47	6397156.01
17:02:57	26/06/2015	Reef8	Reef8_0008.jpg	498363.56	6397161.95
17:03:11	26/06/2015	Reef8	Reef8_0009.jpg	498364.26	6397165.47
17:03:25	26/06/2015	Reef8	Reef8_0010.jpg	498363.77	6397171.79
17:03:40	26/06/2015	Reef8	Reef8_0011.jpg	498363.07	6397177.90
17:03:54	26/06/2015	Reef8	Reef8_0012.jpg	498361.19	6397184.96
17:04:08	26/06/2015	Reef8	Reef8_0013.jpg	498359.31	6397191.82
17:04:22	26/06/2015	Reef8	Reef8_0014.jpg	498356.53	6397198.32
17:04:37	26/06/2015	Reef8	Reef8_0015.jpg	498358.32	6397207.22
17:04:51	26/06/2015	Reef8	Reef8_0016.jpg	498360.31	6397214.46
17:05:05	26/06/2015	Reef8	Reef8_0017.jpg	498360.01	6397221.89
17:05:19	26/06/2015	Reef8	Reef8_0018.jpg	498358.82	6397228.75
17:05:33	26/06/2015	Reef8	Reef8_0019.jpg	498357.44	6397236.17
17:05:48	26/06/2015	Reef8	Reef8_0020.jpg	498354.26	6397242.85
17:06:02	26/06/2015	Reef8	Reef8_0021.jpg	498350.79	6397248.98
17:06:16	26/06/2015	Reef8	Reef8_0022.jpg	498347.81	6397253.80
17:06:30	26/06/2015	Reef8	Reef8_0023.jpg	498347.02	6397261.22
17:06:45	26/06/2015	Reef8	Reef8_0024.jpg	498346.53	6397269.94
17:06:59	26/06/2015	Reef8	Reef8_0025.jpg	498345.04	6397276.62
17:07:13	26/06/2015	Reef8	Reef8_0026.jpg	498346.14	6397284.60
17:07:27	26/06/2015	Reef8	Reef8_0027.jpg	498347.93	6397291.65

Time Taken	Date Taken	Station	Pic Filename	Easting	Northing
17:07:41	26/06/2015	Reef8	Reef8_0028.jpg	498350.31	6397298.70
17:07:56	26/06/2015	Reef8	Reef8_0029.jpg	498351.91	6397304.09
17:08:10	26/06/2015	Reef8	Reef8_0030.jpg	498349.82	6397312.06
17:08:24	26/06/2015	Reef8	Reef8_0031.jpg	498348.73	6397318.37
17:08:38	26/06/2015	Reef8	Reef8_0032.jpg	498346.16	6397324.68
17:08:52	26/06/2015	Reef8	Reef8_0033.jpg	498340.80	6397330.81
17:09:07	26/06/2015	Reef8	Reef8_0034.jpg	498335.04	6397336.38
17:09:21	26/06/2015	Reef8	Reef8_0035.jpg	498331.17	6397343.98
17:09:35	26/06/2015	Reef8	Reef8_0036.jpg	498328.10	6397354.00
17:09:49	26/06/2015	Reef8	Reef8_0037.jpg	498328.60	6397364.02
17:10:04	26/06/2015	Reef8	Reef8_0038.jpg	498329.59	6397374.79
17:10:18	26/06/2015	Reef8	Reef8_0039.jpg	498328.51	6397384.43
17:10:32	26/06/2015	Reef8	Reef8_0040.jpg	498325.73	6397391.85
17:10:46	26/06/2015	Reef8	Reef8_0041.jpg	498323.65	6397401.50
17:11:01	26/06/2015	Reef8	Reef8_0042.jpg	498319.68	6397411.71
17:11:15	26/06/2015	Reef8	Reef8_0043.jpg	498315.81	6397421.17
17:11:29	26/06/2015	Reef8	Reef8_0044.jpg	498310.16	6397431.20
17:11:43	26/06/2015	Reef8	Reef8_0045.jpg	498306.59	6397438.80
17:11:57	26/06/2015	Reef8	Reef8_0046.jpg	498303.81	6397449.39
17:12:12	26/06/2015	Reef8	Reef8_0047.jpg	498305.80	6397459.78
17:12:26	26/06/2015	Reef8	Reef8_0048.jpg	498308.98	6397469.61
17:12:40	26/06/2015	Reef8	Reef8_0049.jpg	498312.66	6397473.50
17:12:54	26/06/2015	Reef8	Reef8_0050.jpg	498314.55	6397475.91
17:17:37	26/06/2015	Reef8	Reef8_0052.jpg	498473.11	6397237.05
17:20:12	26/06/2015	Reef8	Reef8_0053.jpg	498448.49	6397234.28
17:20:31	26/06/2015	Reef8	Reef8_0054.jpg	498443.62	6397237.06
17:20:44	26/06/2015	Reef8	Reef8_0055.jpg	498437.47	6397239.29
17:21:07	26/06/2015	Reef8	Reef8_0056.jpg	498426.74	6397239.48
17:21:22	26/06/2015	Reef8	Reef8_0057.jpg	498413.84	6397239.85
17:21:36	26/06/2015	Reef8	Reef8_0058.jpg	498405.59	6397238.19
17:21:51	26/06/2015	Reef8	Reef8_0059.jpg	498395.66	6397236.71
17:22:05	26/06/2015	Reef8	Reef8_0060.jpg	498387.13	6397236.53
17:22:19	26/06/2015	Reef8	Reef8_0061.jpg	498377.99	6397237.09
17:22:33	26/06/2015	Reef8	Reef8_0062.jpg	498368.76	6397239.87
17:22:47	26/06/2015	Reef8	Reef8_0063.jpg	498359.03	6397240.25
17:23:02	26/06/2015	Reef8	Reef8_0064.jpg	498349.40	6397240.82
17:23:16	26/06/2015	Reef8	Reef8_0065.jpg	498341.36	6397242.30
17:23:30	26/06/2015	Reef8	Reef8_0066.jpg	498331.43	6397243.05
17:23:44	26/06/2015	Reef8	Reef8_0067.jpg	498325.97	6397245.09
17:23:59	26/06/2015	Reef8	Reef8_0068.jpg	498315.64	6397245.09
17:24:13	26/06/2015	Reef8	Reef8_0069.jpg	498305.81	6397247.14
17:24:27	26/06/2015	Reef8	Reef8_0070.jpg	498296.88	6397249.74
17:24:41	26/06/2015	Reef8	Reef8_0071.jpg	498287.84	6397249.93
17:24:56	26/06/2015	Reef8	Reef8_0072.jpg	498277.81	6397249.01
17:25:10	26/06/2015	Reef8	Reef8_0073.jpg	498266.69	6397247.71
17:25:24	26/06/2015	Reef8	Reef8_0074.jpg	498256.96	6397245.31
17:25:38	26/06/2015	Reef8	Reef8_0075.jpg	498248.52	6397243.82

Time Taken	Date Taken	Station	Pic Filename	Easting	Northing
17:25:52	26/06/2015	Reef8	Reef8_0076.jpg	498238.99	6397242.90
17:26:07	26/06/2015	Reef8	Reef8_0077.jpg	498228.36	6397243.46
17:26:21	26/06/2015	Reef8	Reef8_0078.jpg	498220.72	6397243.65
17:26:35	26/06/2015	Reef8	Reef8_0079.jpg	498210.29	6397244.40
17:26:49	26/06/2015	Reef8	Reef8_0080.jpg	498200.86	6397247.56
17:27:04	26/06/2015	Reef8	Reef8_0081.jpg	498192.52	6397251.83
17:27:18	26/06/2015	Reef8	Reef8_0082.jpg	498183.79	6397251.83
17:27:32	26/06/2015	Reef8	Reef8_0083.jpg	498175.05	6397249.61
17:27:46	26/06/2015	Reef8	Reef8_0084.jpg	498167.30	6397243.86
17:28:00	26/06/2015	Reef8	Reef8_0085.jpg	498157.27	6397241.45
17:28:15	26/06/2015	Reef8	Reef8_0086.jpg	498144.16	6397237.38
17:28:29	26/06/2015	Reef8	Reef8_0087.jpg	498132.94	6397235.16
17:28:43	26/06/2015	Reef8	Reef8_0088.jpg	498122.81	6397234.05
17:28:57	26/06/2015	Reef8	Reef8_0089.jpg	498114.47	6397231.08
17:29:12	26/06/2015	Reef8	Reef8_0090.jpg	498104.54	6397229.23
17:29:26	26/06/2015	Reef8	Reef8_0091.jpg	498096.40	6397229.60
17:29:40	26/06/2015	Reef8	Reef8_0092.jpg	498087.26	6397229.05
17:29:54	26/06/2015	Reef8	Reef8_0093.jpg	498078.43	6397229.24
17:30:08	26/06/2015	Reef8	Reef8_0094.jpg	498070.88	6397229.61
17:30:23	26/06/2015	Reef8	Reef8_0095.jpg	498069.39	6397229.81
17:30:37	26/06/2015	Reef8	Reef8_0096.jpg	498071.88	6397229.99
09:14:00	27/06/2015	Reef9	Reef9_0001.jpg	498310.52	6399722.15
09:15:02	27/06/2015	Reef9	Reef9_0002.jpg	498326.11	6399734.02
09:15:27	27/06/2015	Reef9	Reef9_0003.jpg	498340.39	6399733.08
09:15:37	27/06/2015	Reef9	Reef9_0004.jpg	498345.85	6399732.34
09:15:52	27/06/2015	Reef9	Reef9_0005.jpg	498354.98	6399731.22
09:16:06	27/06/2015	Reef9	Reef9_0006.jpg	498362.32	6399729.37
09:16:21	27/06/2015	Reef9	Reef9_0007.jpg	498372.74	6399726.39
09:16:35	27/06/2015	Reef9	Reef9_0008.jpg	498380.68	6399725.09
09:16:49	27/06/2015	Reef9	Reef9_0009.jpg	498387.42	6399723.60
09:17:03	27/06/2015	Reef9	Reef9_0010.jpg	498395.46	6399723.41
09:17:18	27/06/2015	Reef9	Reef9_0011.jpg	498405.78	6399722.86
09:17:32	27/06/2015	Reef9	Reef9_0012.jpg	498413.42	6399721.55
09:17:46	27/06/2015	Reef9	Reef9_0013.jpg	498421.56	6399720.25
09:18:00	27/06/2015	Reef9	Reef9_0014.jpg	498430.09	6399719.88
09:18:57	27/06/2015	Reef9	Reef9_0015.jpg	498463.63	6399714.30
09:19:11	27/06/2015	Reef9	Reef9_0016.jpg	498472.36	6399712.81
09:19:26	27/06/2015	Reef9	Reef9_0017.jpg	498480.80	6399711.50
09:19:40	27/06/2015	Reef9	Reef9_0018.jpg	498489.13	6399710.02
09:19:54	27/06/2015	Reef9	Reef9_0019.jpg	498496.97	6399709.64
09:20:08	27/06/2015	Reef9	Reef9_0020.jpg	498503.32	6399708.16
09:20:23	27/06/2015	Reef9	Reef9_0021.jpg	498512.55	6399706.85
09:20:37	27/06/2015	Reef9	Reef9_0022.jpg	498519.89	6399705.36
09:20:51	27/06/2015	Reef9	Reef9_0023.jpg	498528.42	6399703.69
09:21:05	27/06/2015	Reef9	Reef9_0024.jpg	498536.46	6399702.58
09:21:19	27/06/2015	Reef9	Reef9_0025.jpg	498544.89	6399702.21
09:21:34	27/06/2015	Reef9	Reef9_0026.jpg	498553.73	6399700.72

Time Taken	Date Taken	Station	Pic Filename	Easting	Northing
09:21:48	27/06/2015	Reef9	Reef9_0027.jpg	498559.68	6399699.60
09:22:02	27/06/2015	Reef9	Reef9_0028.jpg	498568.71	6399698.68
09:22:16	27/06/2015	Reef9	Reef9_0029.jpg	498576.25	6399697.55
09:22:31	27/06/2015	Reef9	Reef9_0030.jpg	498584.29	6399696.81
09:22:45	27/06/2015	Reef9	Reef9_0031.jpg	498592.62	6399695.87
09:22:59	27/06/2015	Reef9	Reef9_0032.jpg	498600.26	6399695.87
09:23:05	27/06/2015	Reef9	Reef9_0033.jpg	498603.64	6399696.06
09:23:13	27/06/2015	Reef9	Reef9_0034.jpg	498607.11	6399695.69
09:23:28	27/06/2015	Reef9	Reef9_0035.jpg	498616.24	6399694.94
09:23:42	27/06/2015	Reef9	Reef9_0036.jpg	498623.08	6399694.57
09:23:56	27/06/2015	Reef9	Reef9_0037.jpg	498631.42	6399694.01
09:24:10	27/06/2015	Reef9	Reef9_0038.jpg	498638.56	6399694.01
09:35:21	27/06/2015	Reef9	Reef9_0040.jpg	498520.54	6399579.20
09:35:36	27/06/2015	Reef9	Reef9_0041.jpg	498521.43	6399577.90
09:36:15	27/06/2015	Reef9	Reef9_0042.jpg	498514.69	6399592.19
09:36:31	27/06/2015	Reef9	Reef9_0043.jpg	498509.33	6399595.53
09:36:54	27/06/2015	Reef9	Reef9_0044.jpg	498508.14	6399609.07
09:37:10	27/06/2015	Reef9	Reef9_0045.jpg	498507.06	6399621.13
09:37:25	27/06/2015	Reef9	Reef9_0046.jpg	498508.25	6399630.23
09:37:40	27/06/2015	Reef9	Reef9_0047.jpg	498508.35	6399634.68
09:37:54	27/06/2015	Reef9	Reef9_0048.jpg	498508.55	6399639.32
09:38:08	27/06/2015	Reef9	Reef9_0049.jpg	498508.85	6399644.33
09:38:22	27/06/2015	Reef9	Reef9_0050.jpg	498506.97	6399651.19
09:38:37	27/06/2015	Reef9	Reef9_0051.jpg	498503.10	6399655.65
09:38:51	27/06/2015	Reef9	Reef9_0052.jpg	498501.71	6399662.70
09:39:05	27/06/2015	Reef9	Reef9_0053.jpg	498501.12	6399672.16
09:39:19	27/06/2015	Reef9	Reef9_0054.jpg	498503.71	6399679.95
09:39:34	27/06/2015	Reef9	Reef9_0055.jpg	498507.18	6399691.27
09:39:48	27/06/2015	Reef9	Reef9_0056.jpg	498508.08	6399701.48
09:40:02	27/06/2015	Reef9	Reef9_0057.jpg	498507.09	6399708.34
09:40:16	27/06/2015	Reef9	Reef9_0058.jpg	498506.00	6399718.36
09:40:31	27/06/2015	Reef9	Reef9_0059.jpg	498504.42	6399728.20
09:40:45	27/06/2015	Reef9	Reef9_0060.jpg	498503.73	6399737.48
09:40:59	27/06/2015	Reef9	Reef9_0061.jpg	498505.91	6399744.90
09:41:13	27/06/2015	Reef9	Reef9_0062.jpg	498506.21	6399756.59
09:41:27	27/06/2015	Reef9	Reef9_0063.jpg	498506.52	6399768.65
09:41:42	27/06/2015	Reef9	Reef9_0064.jpg	498508.21	6399777.92
09:41:56	27/06/2015	Reef9	Reef9_0065.jpg	498511.19	6399787.94
09:42:10	27/06/2015	Reef9	Reef9_0066.jpg	498512.48	6399798.88
09:42:24	27/06/2015	Reef9	Reef9_0067.jpg	498513.28	6399807.42
09:42:39	27/06/2015	Reef9	Reef9_0068.jpg	498513.88	6399816.51
09:42:53	27/06/2015	Reef9	Reef9_0069.jpg	498512.69	6399825.98
09:43:07	27/06/2015	Reef9	Reef9_0070.jpg	498512.59	6399828.76
09:43:21	27/06/2015	Reef9	Reef9_0071.jpg	498514.88	6399830.99
10:00:16	27/06/2015	Reef10	Reef10_0005.jpg	498695.19	6401112.69
10:00:43	27/06/2015	Reef10	Reef10_0006.jpg	498690.33	6401107.12
10:00:54	27/06/2015	Reef10	Reef10_0007.jpg	498688.14	6401109.35

Time Taken	Date Taken	Station	Pic Filename	Easting	Northing
10:01:07	27/06/2015	Reef10	Reef10_0008.jpg	498687.45	6401111.95
10:01:17	27/06/2015	Reef10	Reef10_0009.jpg	498686.86	6401113.24
10:01:28	27/06/2015	Reef10	Reef10_0010.jpg	498684.77	6401116.04
10:01:46	27/06/2015	Reef10	Reef10_0011.jpg	498681.70	6401121.23
10:02:08	27/06/2015	Reef10	Reef10_0012.jpg	498682.79	6401130.32
10:02:28	27/06/2015	Reef10	Reef10_0013.jpg	498683.10	6401140.52
10:02:33	27/06/2015	Reef10	Reef10_0014.jpg	498681.51	6401142.01
10:02:51	27/06/2015	Reef10	Reef10_0015.jpg	498678.24	6401146.46
10:03:07	27/06/2015	Reef10	Reef10_0016.jpg	498676.55	6401152.03
10:03:22	27/06/2015	Reef10	Reef10_0017.jpg	498675.76	6401158.53
10:03:28	27/06/2015	Reef10	Reef10_0018.jpg	498675.37	6401162.05
10:03:36	27/06/2015	Reef10	Reef10_0019.jpg	498675.07	6401165.76
10:03:39	27/06/2015	Reef10	Reef10_0020.jpg	498674.67	6401166.88
10:03:50	27/06/2015	Reef10	Reef10_0021.jpg	498673.29	6401172.07
10:03:59	27/06/2015	Reef10	Reef10_0022.jpg	498672.79	6401178.19
10:04:04	27/06/2015	Reef10	Reef10_0023.jpg	498673.09	6401180.23
10:04:18	27/06/2015	Reef10	Reef10_0024.jpg	498674.48	6401188.58
10:04:33	27/06/2015	Reef10	Reef10_0025.jpg	498672.80	6401195.82
10:04:47	27/06/2015	Reef10	Reef10_0026.jpg	498672.40	6401201.20
10:05:01	27/06/2015	Reef10	Reef10_0027.jpg	498669.03	6401210.11
10:05:15	27/06/2015	Reef10	Reef10_0028.jpg	498668.04	6401216.79
10:05:30	27/06/2015	Reef10	Reef10_0029.jpg	498668.74	6401225.32
10:05:44	27/06/2015	Reef10	Reef10_0030.jpg	498670.53	6401233.67
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10:06:12	27/06/2015	Reef10	Reef10_0032.jpg	498670.73	6401250.00
10:06:27	27/06/2015	Reef10	Reef10_0033.jpg	498669.25	6401257.79
10:06:41	27/06/2015	Reef10	Reef10_0034.jpg	498666.67	6401265.58
10:06:55	27/06/2015	Reef10	Reef10_0035.jpg	498666.97	6401273.38
10:07:09	27/06/2015	Reef10	Reef10_0036.jpg	498667.77	6401280.43
10:07:24	27/06/2015	Reef10	Reef10_0037.jpg	498669.75	6401291.19
10:07:38	27/06/2015	Reef10	Reef10_0038.jpg	498671.44	6401298.99
10:07:52	27/06/2015	Reef10	Reef10_0039.jpg	498674.32	6401305.85
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10:10:14	27/06/2015	Reef10	Reef10_0049.jpg	498665.42	6401383.04
10:10:20	27/06/2015	Reef10	Reef10_0050.jpg	498665.82	6401385.45
10:10:28	27/06/2015	Reef10	Reef10_0051.jpg	498666.71	6401389.72
10:10:43	27/06/2015	Reef10	Reef10_0052.jpg	498666.42	6401399.00
10:10:57	27/06/2015	Reef10	Reef10_0053.jpg	498667.21	6401406.05
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Time Taken	Date Taken	Station	Pic Filename	Easting	Northing
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10:11:54	27/06/2015	Reef10	Reef10_0057.jpg	498664.25	6401436.10
10:12:08	27/06/2015	Reef10	Reef10_0058.jpg	498663.65	6401442.61
10:12:22	27/06/2015	Reef10	Reef10_0059.jpg	498664.05	6401450.95
10:24:14	27/06/2015	Reef10	Reef10_0063.jpg	498804.83	6401234.19
10:24:30	27/06/2015	Reef10	Reef10_0064.jpg	498803.20	6401234.43
10:24:51	27/06/2015	Reef10	Reef10_0065.jpg	498801.17	6401234.77
10:25:09	27/06/2015	Reef10	Reef10_0066.jpg	498798.69	6401235.30
10:25:57	27/06/2015	Reef10	Reef10_0067.jpg	498776.47	6401238.28
10:26:24	27/06/2015	Reef10	Reef10_0068.jpg	498760.30	6401237.72
10:26:28	27/06/2015	Reef10	Reef10_0069.jpg	498758.61	6401237.54
10:26:42	27/06/2015	Reef10	Reef10_0070.jpg	498749.49	6401239.59
10:26:58	27/06/2015	Reef10	Reef10_0071.jpg	498740.06	6401239.96
10:27:12	27/06/2015	Reef10	Reef10_0072.jpg	498730.84	6401241.64
10:27:26	27/06/2015	Reef10	Reef10_0073.jpg	498722.71	6401243.68
10:27:40	27/06/2015	Reef10	Reef10_0074.jpg	498717.35	6401242.57
10:27:54	27/06/2015	Reef10	Reef10_0075.jpg	498710.70	6401242.19
10:28:09	27/06/2015	Reef10	Reef10_0076.jpg	498703.96	6401241.45
10:28:23	27/06/2015	Reef10	Reef10_0077.jpg	498697.01	6401240.72
10:28:37	27/06/2015	Reef10	Reef10_0078.jpg	498688.48	6401242.20
10:28:51	27/06/2015	Reef10	Reef10_0079.jpg	498680.85	6401244.25
10:29:06	27/06/2015	Reef10	Reef10_0080.jpg	498673.31	6401244.43
10:29:20	27/06/2015	Reef10	Reef10_0081.jpg	498667.85	6401243.51
10:29:34	27/06/2015	Reef10	Reef10_0082.jpg	498660.31	6401243.70
10:29:48	27/06/2015	Reef10	Reef10_0083.jpg	498651.78	6401244.81
10:30:02	27/06/2015	Reef10	Reef10_0084.jpg	498644.84	6401245.19
10:30:17	27/06/2015	Reef10	Reef10_0085.jpg	498638.59	6401245.74
10:30:31	27/06/2015	Reef10	Reef10_0086.jpg	498631.05	6401246.67
10:30:45	27/06/2015	Reef10	Reef10_0087.jpg	498624.11	6401247.61
10:30:59	27/06/2015	Reef10	Reef10_0088.jpg	498616.18	6401246.87
10:31:14	27/06/2015	Reef10	Reef10_0089.jpg	498610.12	6401244.46
10:31:28	27/06/2015	Reef10	Reef10_0090.jpg	498604.07	6401243.16
10:31:42	27/06/2015	Reef10	Reef10_0091.jpg	498599.21	6401240.94
10:31:56	27/06/2015	Reef10	Reef10_0092.jpg	498589.89	6401239.45
10:32:11	27/06/2015	Reef10	Reef10_0093.jpg	498582.05	6401238.34
10:32:25	27/06/2015	Reef10	Reef10_0094.jpg	498573.92	6401239.09
10:32:39	27/06/2015	Reef10	Reef10_0095.jpg	498566.87	6401238.72
10:32:53	27/06/2015	Reef10	Reef10_0096.jpg	498561.62	6401238.91
10:33:07	27/06/2015	Reef10	Reef10_0097.jpg	498554.57	6401240.02
10:33:22	27/06/2015	Reef10	Reef10_0098.jpg	498548.72	6401241.70
10:33:36	27/06/2015	Reef10	Reef10_0099.jpg	498544.56	6401242.99
10:33:50	27/06/2015	Reef10	Reef10_0100.jpg	498543.86	6401242.44

Appendix 2 – SACFOR assessment table

Growth form	Size of individuals/colonies							
% cover	Crust/meadow	Massive/Turf	<1cm	1-3 cm	3-15 cm	>15 cm	Density	
>80%	S		S				>1/0.001 m2 (1x1 cm)	>10,000 / m2
40-79%	A	S	A	S			1-9/0.001 m2	1000-9999 / m2
20-39%	C	A	C	A	S		1-9 / 0.01 m2 (10 x 10 cm)	100-999 / m2
10-19%	F	C	F	C	A	S	1-9 / 0.1 m2	10-99 / m2
5-9%	O	F	O	F	C	A	1-9 / m2	
1-5% or density	R	O	R	O	F	C	1-9 / 10m2 (3.16 x 3.16 m)	
<1% or density		R		R	O	F	1-9 / 100 m2 (10 x 10 m)	
					R	O	1-9 / 1000 m2 (31.6 x 31.6 m)	
						R	<1/1000 m2	

SACFOR Scale from the JNCC website accessed July 2015 http://jncc.defra.gov.uk/page-2684

Appendix 3 – Results of reef assessment for each station and for each criterion.

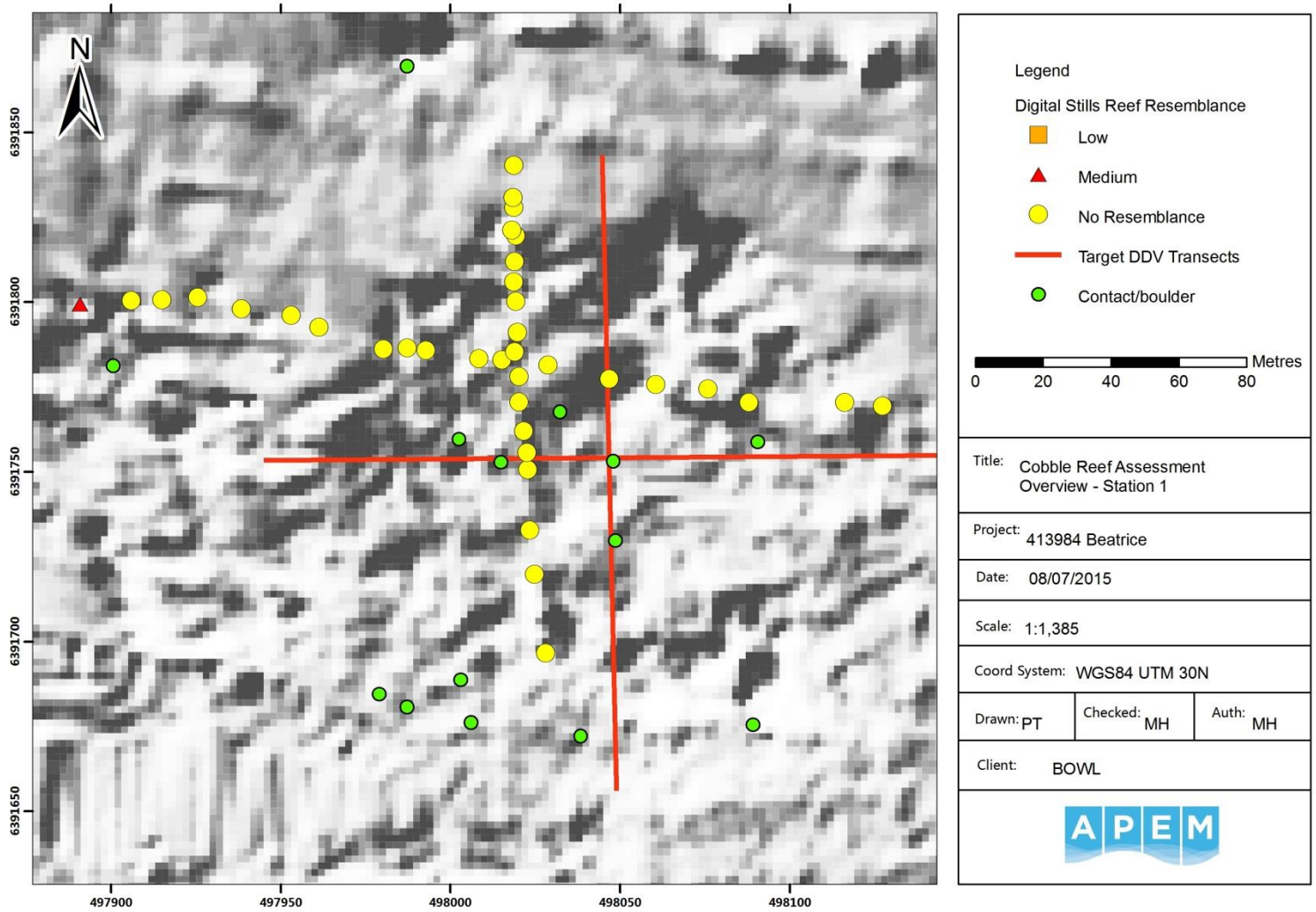
Blue shading = No resemblance; Yellow = Low resemblance; Orange = Medium resemblance; Pink = Low to Medium resemblance.

Transect	Composition (% particles >64mm diameter) (mean and SD)	Elevation (m)	Extent (m2) based on stills and video	Biota	Other Information	Reef Status Per Transect (excluding extent)	Overall Reef Status
1 W-E	7 ± 18	0.064-5	<25	Impoverished epibenthic community. Dominated by infauna.	Primarily soft sandy sediments	No resemblance	No resemblance
1 N-S	0 ± 1	<0.064	<25			No resemblace	
2 S-N	35 ± 23	0.064-5	>25	Biologically diverse epibenthic community containing a range of abundant macroalgae, bryozoans and hydrozoans with other smaller epibenthic invertebrates present e.g. Serpulidae worms	Patchy reef interspersed with some sandy sediment	Low	Low to Medium
2 W-E	81 ± 18	0.064-5	>25			Medium	
3 W-E	81 ± 8	0.064-5	>25	*D. aculeata* and Serpulidae were found to be Common, whilst the sea slug *Elysia viridis* was found to be Frequent. The filamentous *Rhodophyta* sp. B was Rare at Station 3.	Dense reef with no patchy areas of sand	Medium	Medium
3 S-N	84 ± 6	0.064-5	>25			Medium	
4 W-E	73 ± 9	0.064-5	>25	Diverse and abundant epifaunal community. Serpulidae were Common whilst filamentous Phaeophyceae was recorded as Occasional. Encrusting Corrallinaceae was Rare. A number of characteristic fauna such as the nudibranch *Elysia viridis* , Galatheoidea (squat lobsters), edible crab *Cancer pagarus* and common starfish *Asterias rubens* were present in very low abundance	Dense reef with no patchy areas of sand	Medium	Medium
4 S-N	75 ± 13	0.064-5	>25			Medium	
5 S-N	70 ± 18	0.064-5	>25	Diverse and abundant epifaunal community. Corrallinaceae was Superabundant with Serpulidae Common. Galatheoidea were found to be Common with several taxa recorded as Rare, including the common sea urchin *Echinus esculentus* and Galatheoidea. Other taxa included bryozoans, hydrozoans, Actiniaria (sea anemones) and Caridean shrimps.	Dense reef with virtually no patchy areas of sand	Medium	Medium
5 W-E	66 ± 17	0.064-5	>25			Medium	

Transect	Composition (% particles >64mm diameter) (mean and SD)	Elevation (m)	Extent (m2) based on stills and video	Biota		Reef Status Per Transect (excluding extent)	Overall Reef Status
6 S-N	40 ± 8	0.064-5	>25	One of the most biologically diverse reef stations with a high abundance of organisms. Serpulidae and Galatheoidea were Common and the fanworm *Myxicola infundibulum* was Frequent. Other characteristics species present but with abundances lower than the requirement for Rare included *E. esculentus*, Gobiidae fish and the short-spined sea scorpion *Myoxocephalus scorpius*.	Areas of reef with some areas of more gravelly sediment	Low to Medium	Low to Medium
6 E-W	32 ± 12	0.064-5	>25			Low	
7 S-N	41 ± 16	0.064-5	>25	Corrallinaceae, *Hydrozoa* sp. C and Hydrozoa/Bryozoa were Superabundant. Galatheoidea were found to be Common. The starfish *Henricia* sp. was recorded as Rare. A number of characteristic fauna such as *C. pagarus, E. esculentus, Henricia* sp. (star fish), *Gibbula* molluscs and *A. rubens* were present in very low abundance.	Areas of reef with some areas of more gravelly sediment	Low to Medium	Low to Medium
7 W-E	53 ± 16	0.064-5	>25			Medium	
8 S-N	70 ± 18	0.064-5	>25	Galatheoidea and Serpulidae were Common. Few other taxa were found in any abundance, although megafauna such as *A. rubens, M. scorpius* and *M. infundibulum* were also noted.	Areas of reef with some areas of more gravelly sediment	Medium	Medium
8 E-W	67 ± 20	0.064-5	>25			Medium	
9 W-E	48 ± 16	0.064-5	>25	Increased algal abundance and diversity with filamentous Chlorophyta recorded as Superabundant. Galatheoidea and Serpulidae classed as Common. *Diplecogaster bimaculatus* (Two-spotted clingfish) and *Crossaster papposus* (common sunstar) were recorded as were *Gibbula* sp. and *E. esculentus*.	Areas of reef with some areas of more gravelly sediment	Low to Medium	Low to Medium
9 S-N	49 ± 22	0.064-5	>25			Low to Medium	
10 S-N	18 ± 19	0.064-5	>25	*Hydrozoa* sp. B and Hydrozoa/Bryozoa were all recorded as Superabundant. Galatheoidea and Serpulidae were recorded as Common. *C. papposus* was recorded as Rare. Other taxa noted were *Henricia* sp., Ophiuroidea (brittle stars), *A. rubens* and solitary Ascidiaceans (sea squirts).	Patchy reef interspersed with some sandy sediment	Low	Low
10 W-E	28 ± 17	0.064-5	>25			Low	

Appendix 4 – Cobble reef assessment and pockmark station overviews

Station 1


N
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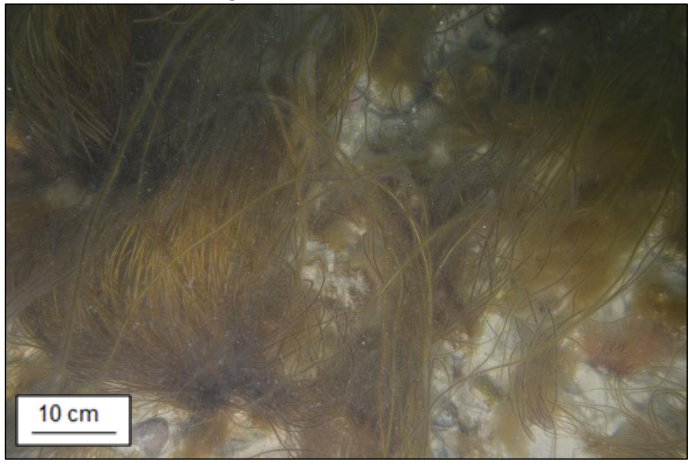
6391750
6391700
6391650
497900
497950
498000
498050
498100
Legend
Digital Stills Reef Resemblance
Low
Medium
No Resemblance
Target DDV Transects
Contact/boulder
Metres
0
20
40
60
80
Title: Cobble Reef Assessment Overview - Station 1
Project: 413984 Beatrice
Date: 08/07/2015
Scale: 1:1,385
Coord System: WGS84 UTM 30N
Drawn: PT
Checked: MH
Auth: MH
Client: BOWL
APEM

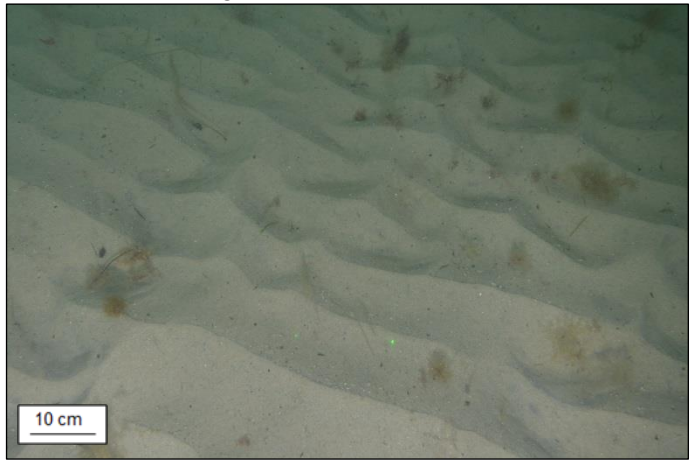
Station 1

Transect: W-E Image: 831 Reef resemblance: Medium

Transect: N-S Image: 868 Reef resemblance: None

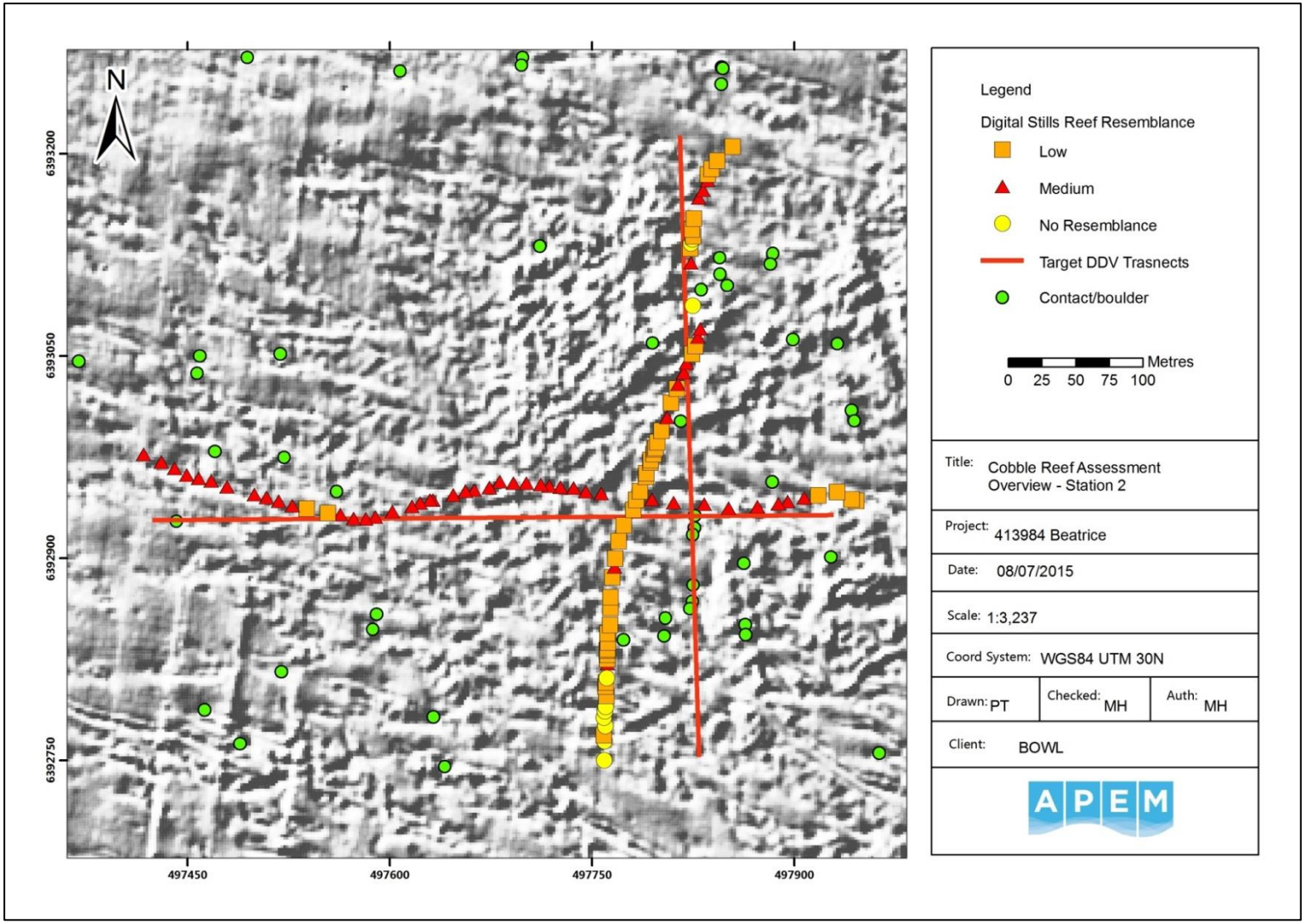


Transect: N-S Image: 857 Reef resemblance: None



Transect: W-E Image: 868 Reef resemblance: None

Station 2


N
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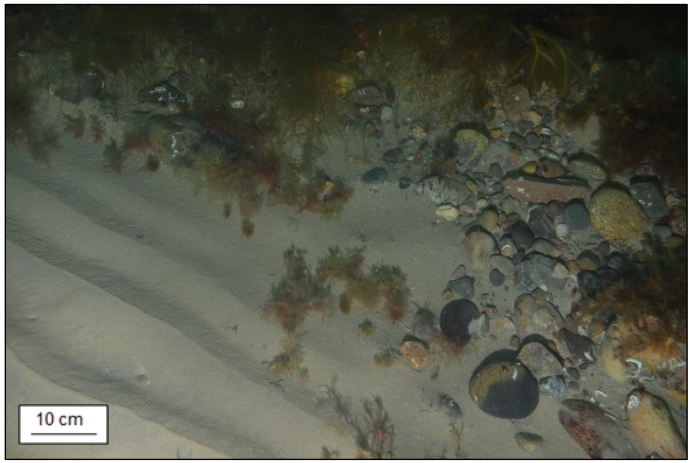
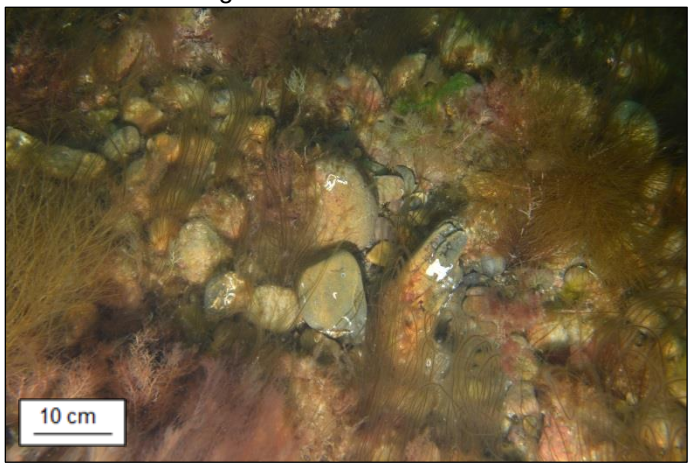
6393050
6392900
6392750
497450
497600
497750
497900
Legend
Digital Stills Reef Resemblance
Low
Medium
No Resemblance
Target DDV Trasnects
Contact/boulder
Metres
0 25 50 75 100
Title: Cobble Reef Assessment Overview - Station 2
Project: 413984 Beatrice
Date: 08/07/2015
Scale: 1:3,237
Coord System: WGS84 UTM 30N
Drawn: PT
Checked: MH
Auth: MH
Client: BOWL
APEM

Station 2

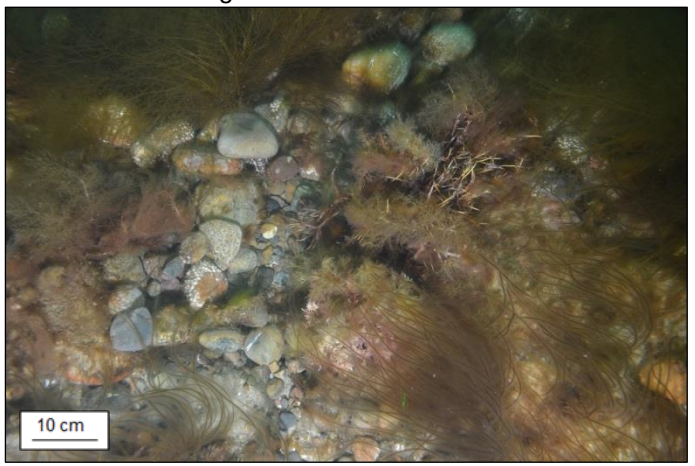


Transect: S-N Image: 838 Reef resemblance: Low

Transect: S-N Image: 842 Reef resemblance: Medium

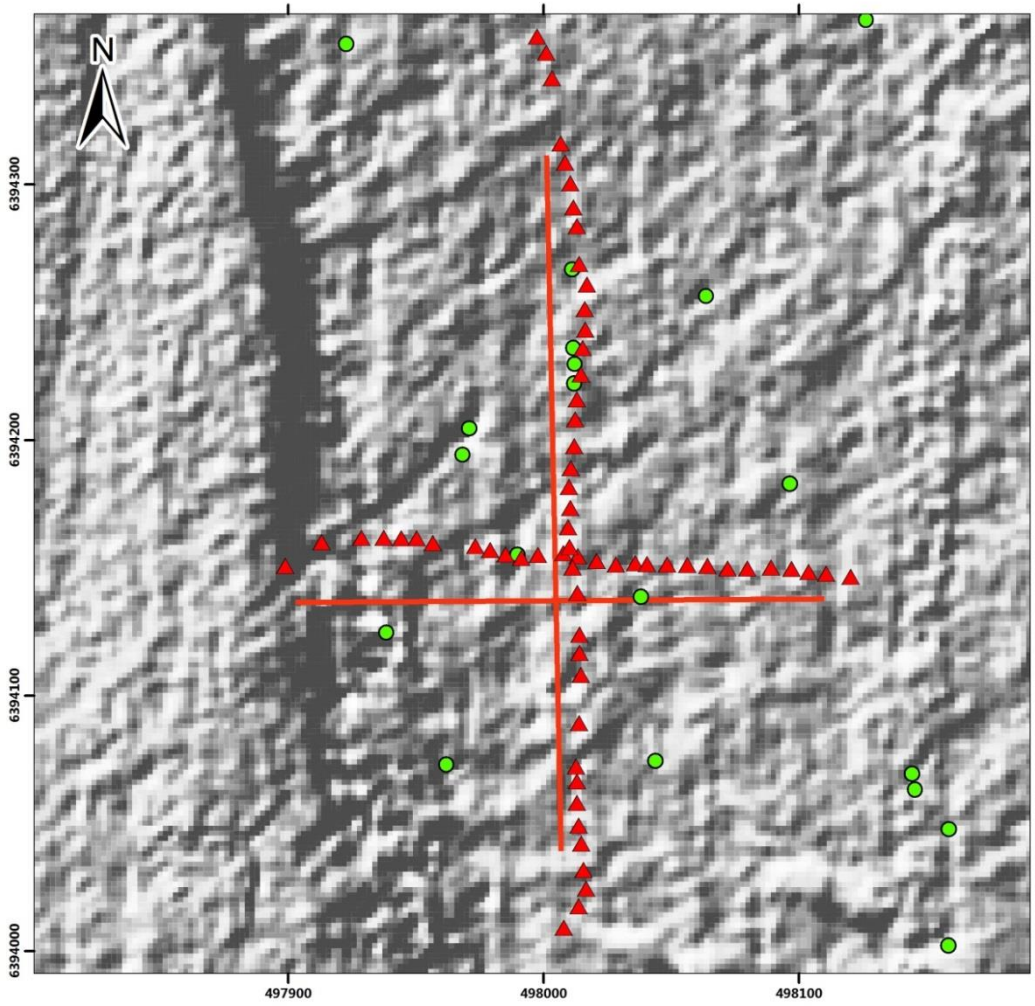


Transect: W-E Image: 874 Reef resemblance: Medium



Transect: S-N Image: 932 Reef resemblance: Medium

Station 3



Legend

Digital Stills Reef Resemblance

- Low
- Medium
- No Resemblance
- Target DDV Transects
- Contact/boulder

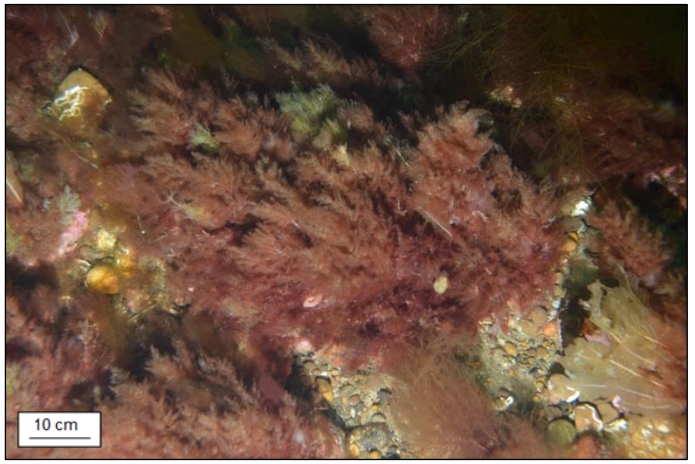
0 25 50 75 100 Metres

Title:	Cobble Reef Assessment Overview - Station 3
Project:	413984 Beatrice
Date:	08/07/2015
Scale:	1:2,026
Coord System:	WGS84 UTM 30N
Drawn: PT	Checked: MH / Auth: MH
Client:	BOWL

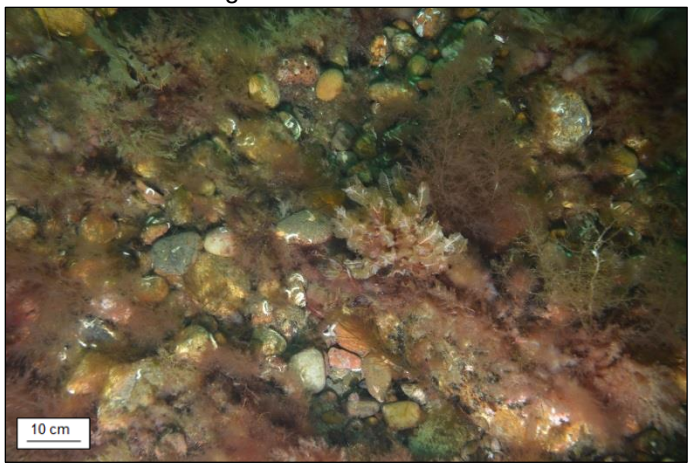
APEM

Station 3

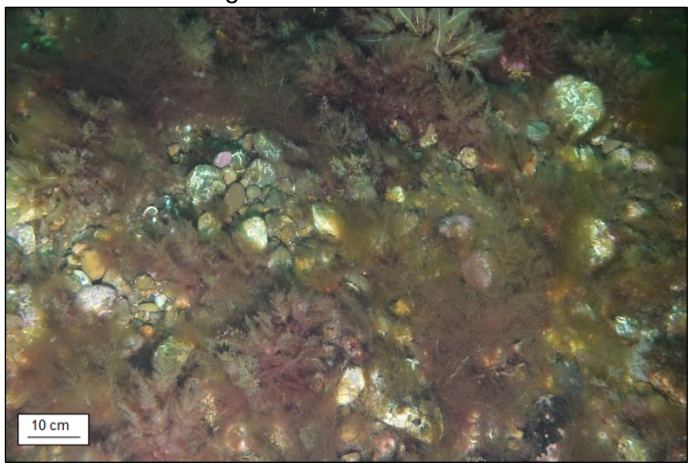
Transect: W-E Image: 846 Reef resemblance: Low



Transect: W-E Image: 848 Reef resemblance: Medium

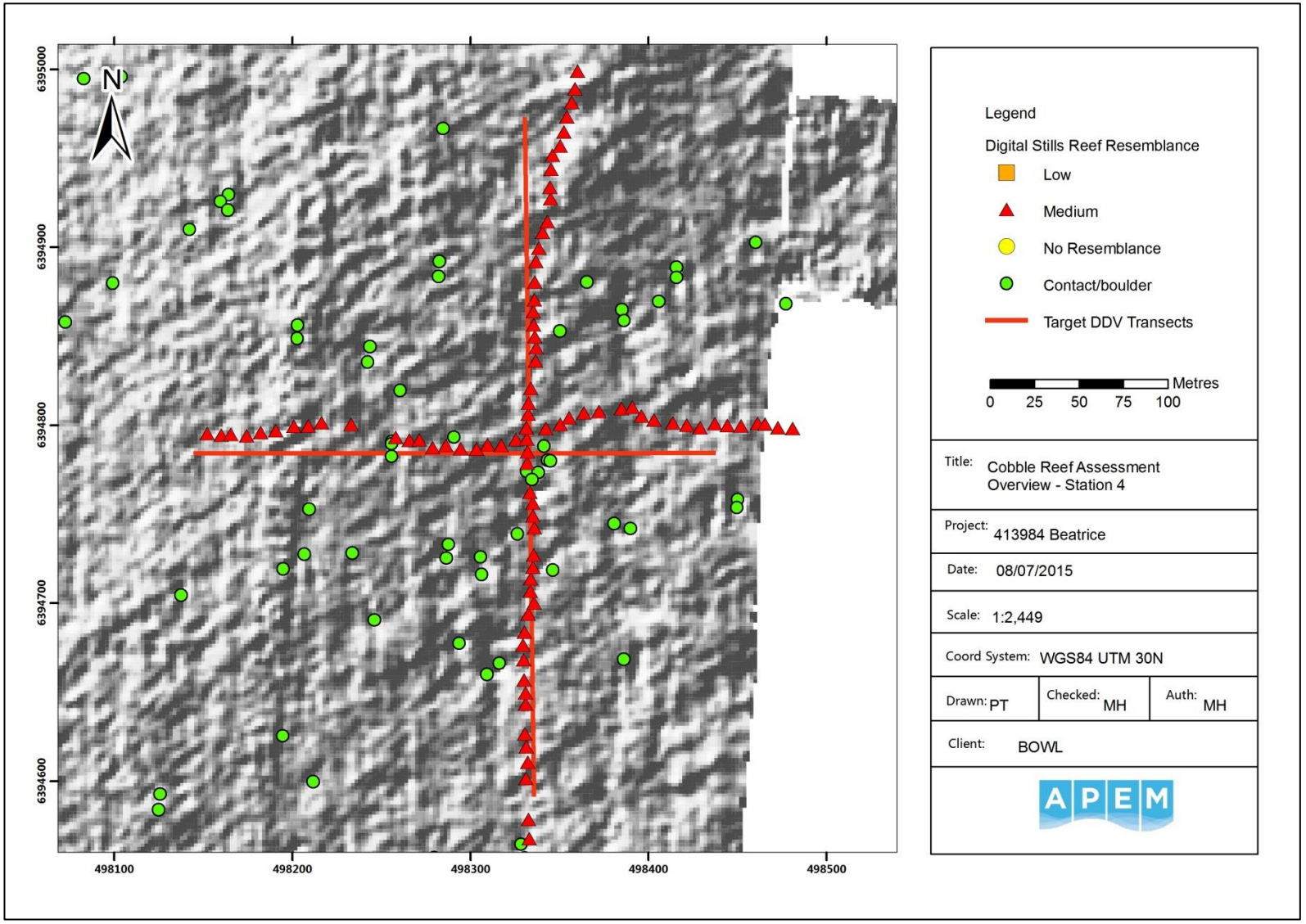


Transect: S-N Image: 863 Reef resemblance: Medium

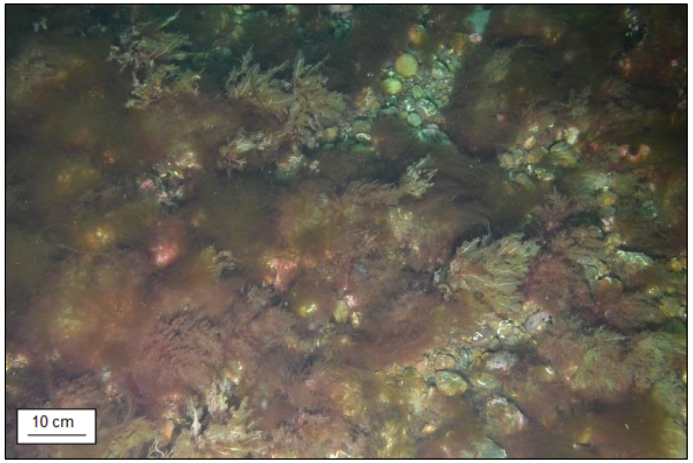


Transect: S-N Image: 893 Reef resemblance: Medium

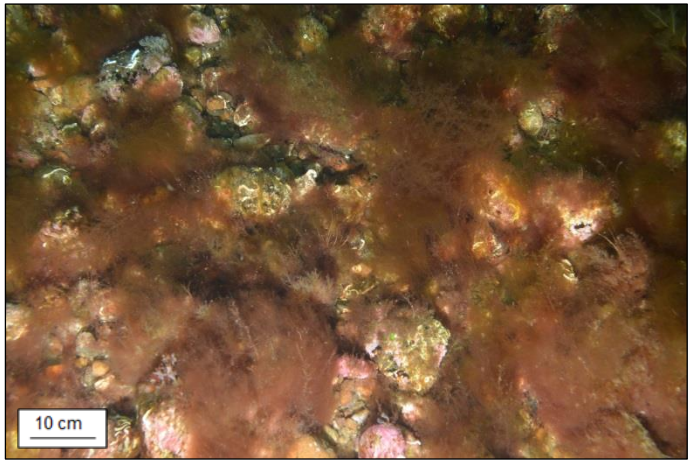
Station 4


N
6395000
6394900
6394800
6394700
6394600
498100
498200
498300
498400
498500
Legend
Digital Stills Reef Resemblance
Low
Medium
No Resemblance
Contact/boulder
Target DDV Transects
Metres
0 25 50 75 100
Title: Cobble Reef Assessment Overview - Station 4
Project: 413984 Beatrice
Date: 08/07/2015
Scale: 1:2,449
Coord System: WGS84 UTM 30N
Drawn: PT
Checked: MH
Auth: MH
Client: BOWL
APEM

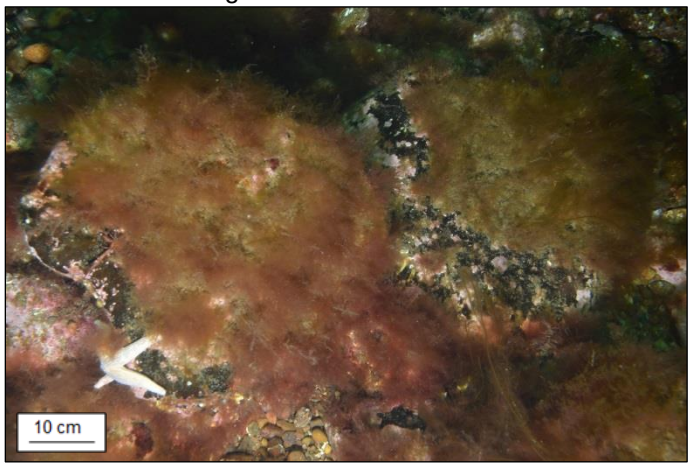
Station 4



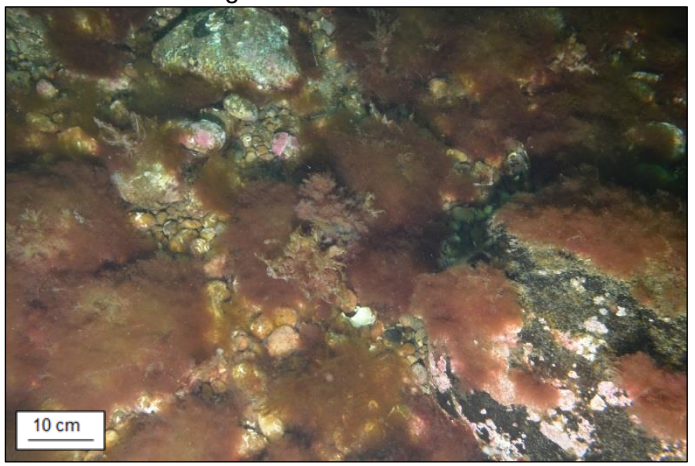
Transect: W-E Image: 832 Reef resemblance: Medium



Transect: W-E Image: 857 Reef resemblance: Medium

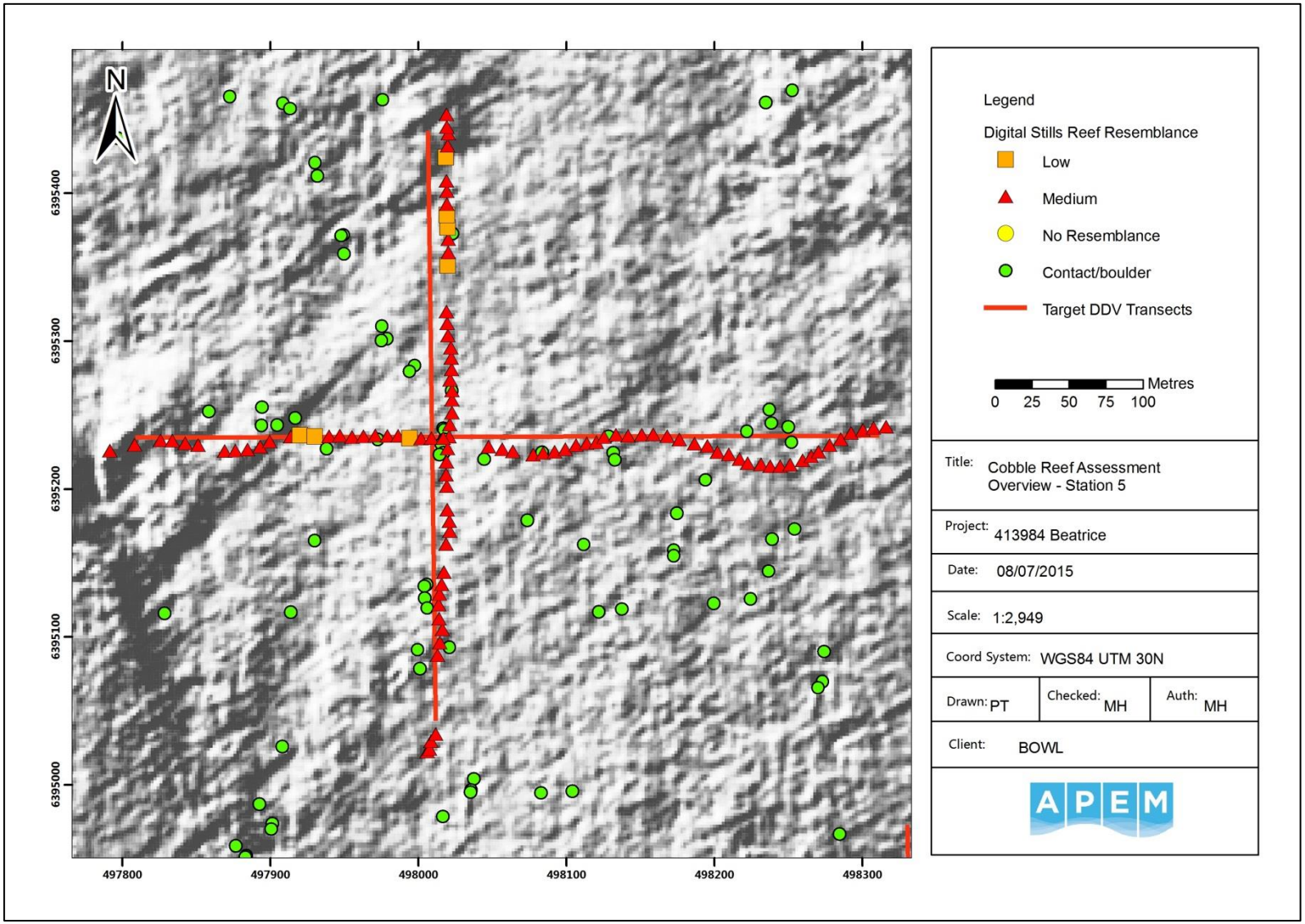


Transect: S-N Image: 888 Reef resemblance: Medium

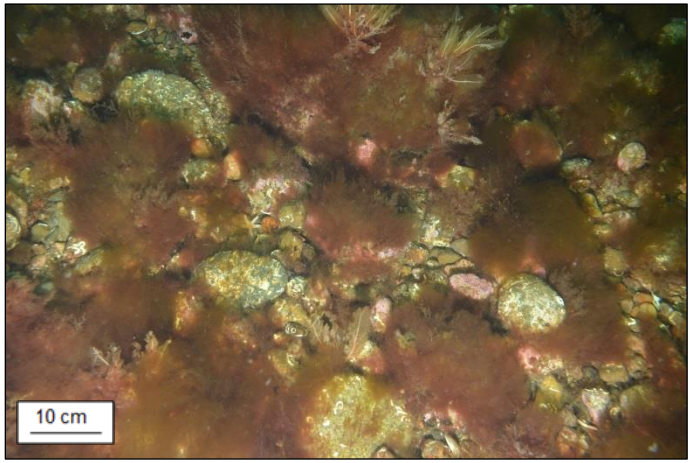


Transect: S-N Image: 908 Reef resemblance: Medium

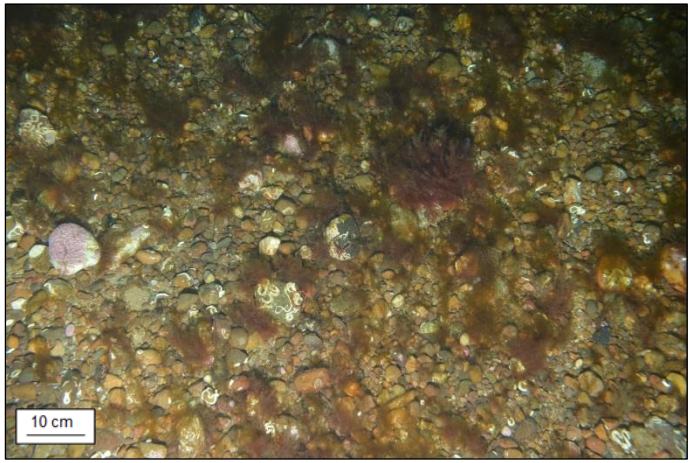
Station 5


N
6395400
6395300
6395200
6395100
6395000
497800
497900
498000
498100
498200
498300
Legend
Digital Stills Reef Resemblance
Low
Medium
No Resemblance
Contact/boulder
Target DDV Transects
Metres
0 25 50 75 100
Title: Cobble Reef Assessment Overview - Station 5
Project: 413984 Beatrice
Date: 08/07/2015
Scale: 1:2,949
Coord System: WGS84 UTM 30N
Drawn: PT
Checked: MH
Auth: MH
Client: BOWL
APEM

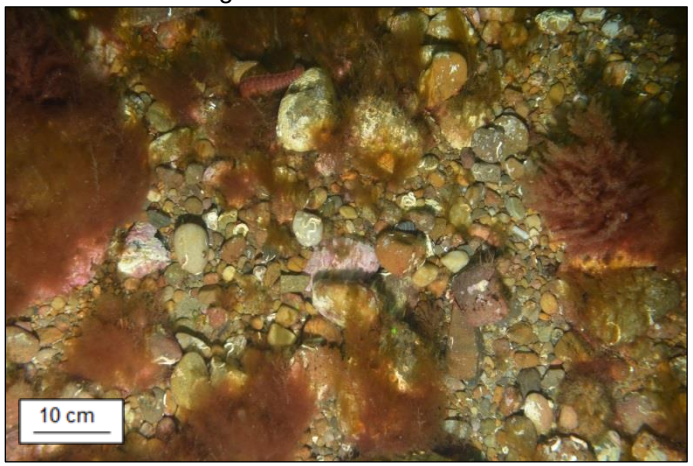
Station 5



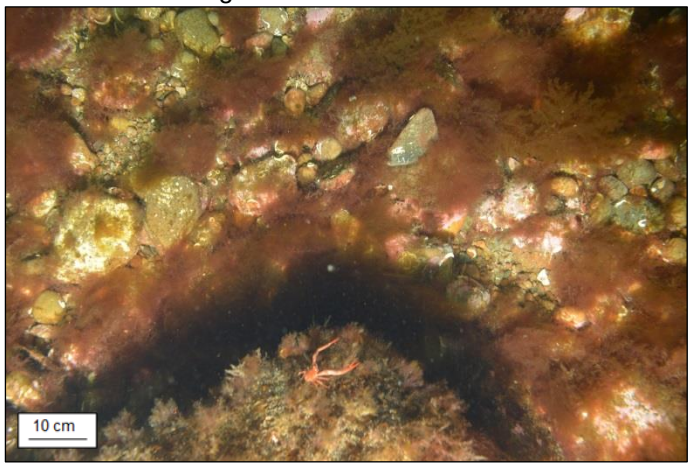
Transect: S-N Image: 833 Reef resemblance: Medium



Transect: S-N Image: 867 Reef resemblance: Low

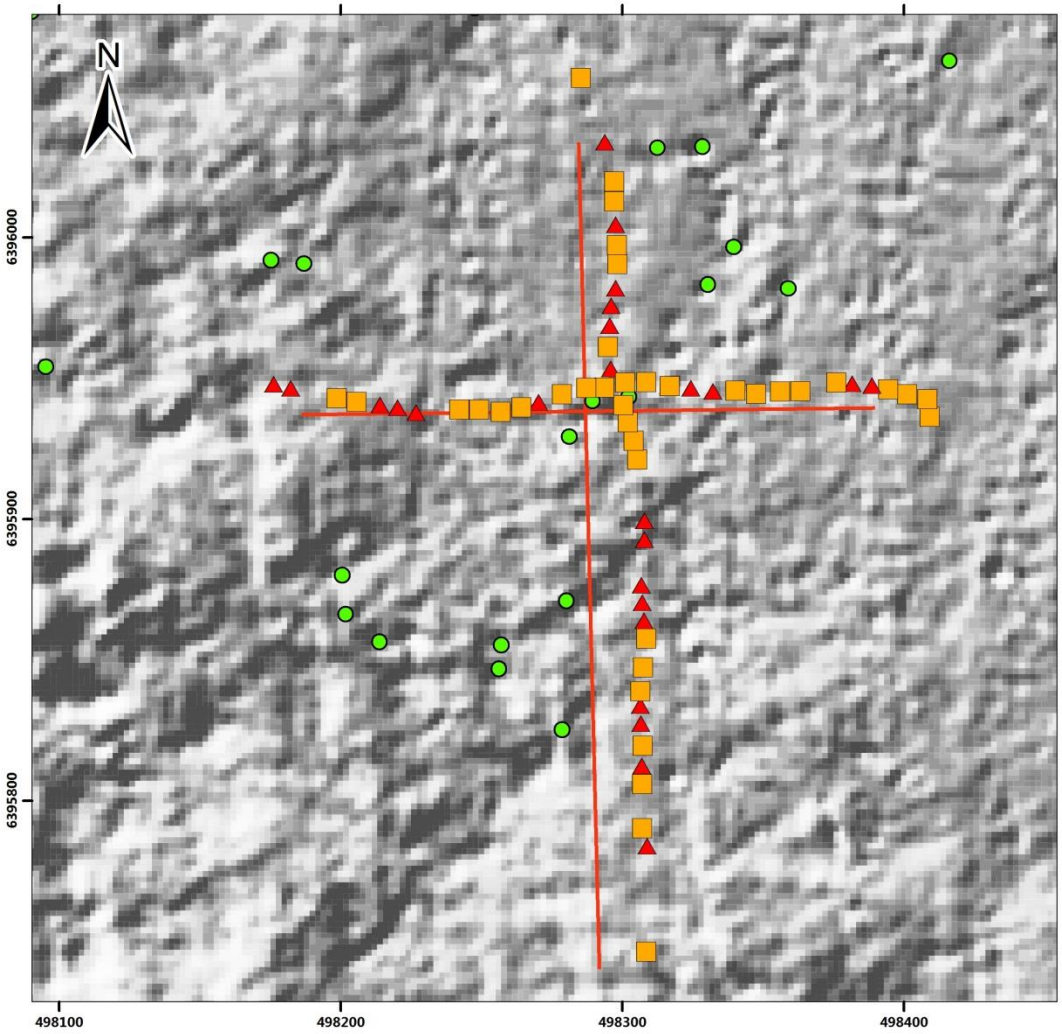


Transect: W-E Image: 888 Reef resemblance: Medium



Transect: W-E Image: 911 Reef resemblance: Medium

Station 6



Legend

Digital Stills Reef Resemblance

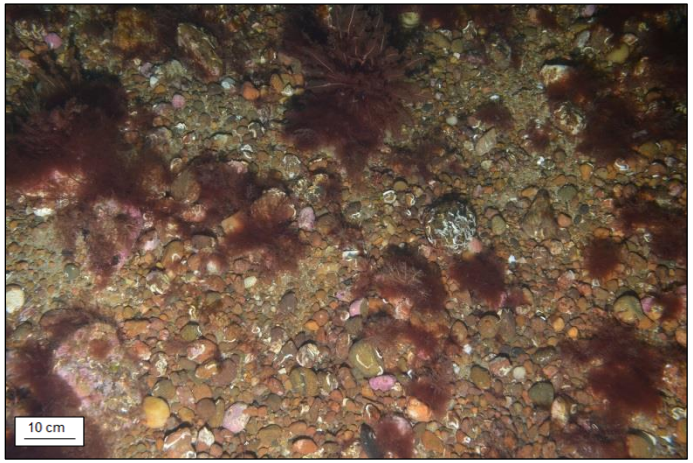
- Low
- Medium
- No Resemblance
- Contact/boundary
- Target DDV Transects

0 25 50 75 100 Metres

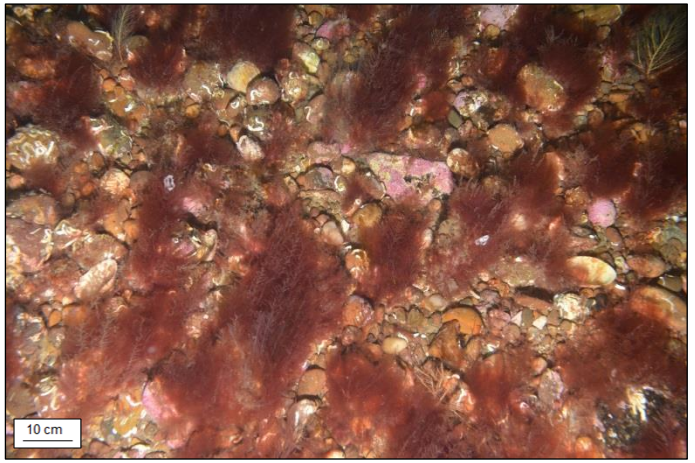
Title:	Cobble Reef Assessment Overview - Station 6
Project:	413984 Beatrice
Date:	08/07/2015
Scale:	1:1,891
Coord System:	WGS84 UTM 30N
Drawn: PT	Checked: MH / Auth: MH
Client:	BOWL

APEM

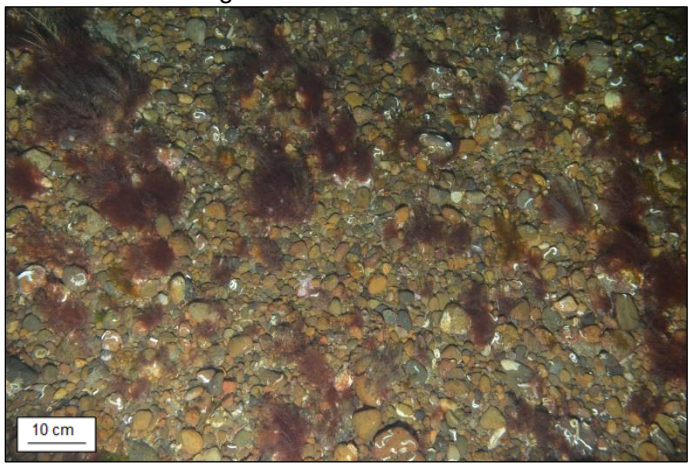
Station 6



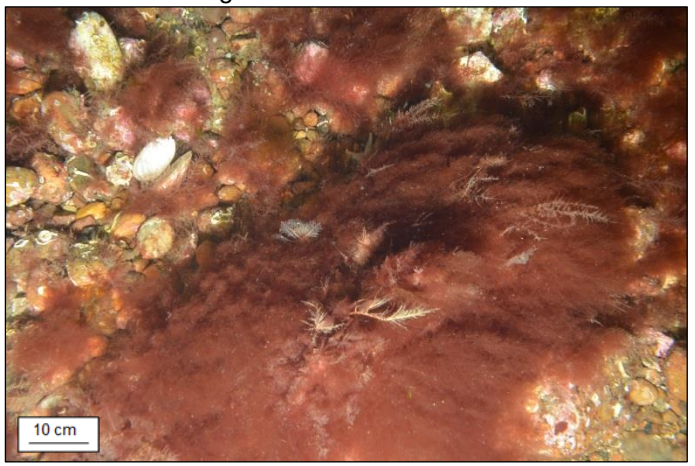
Transect: S-N Image: 12 Reef resemblance: Low



Transect: S-N Image: 38 Reef resemblance: Medium

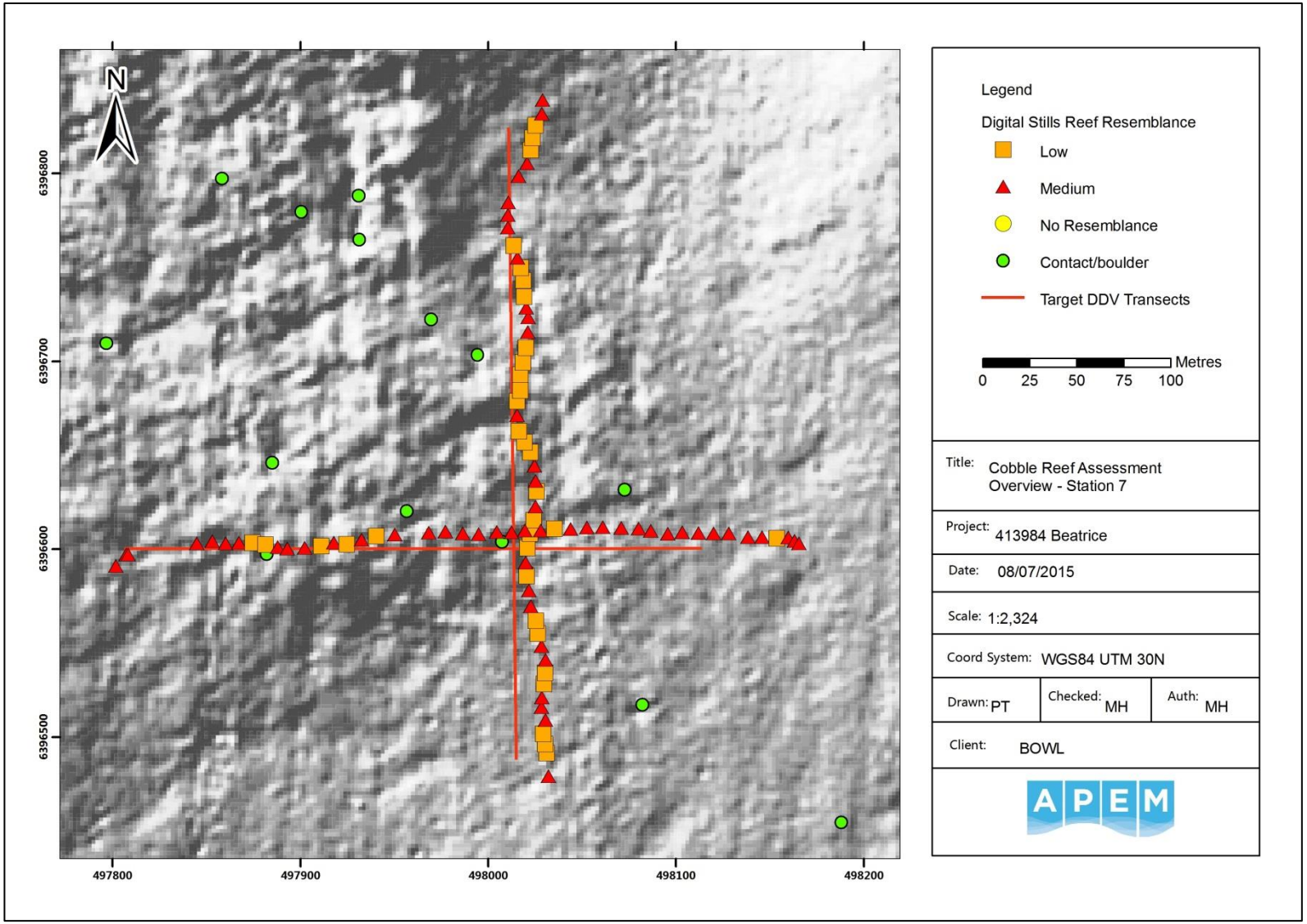


Transect: E-W Image: 62 Reef resemblance: Low



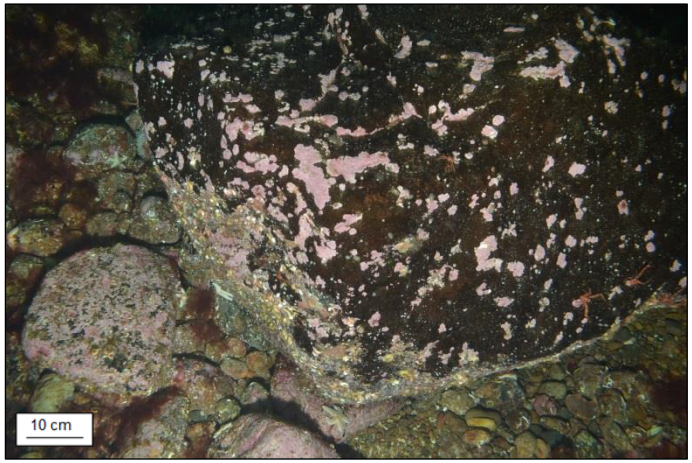
Transect: E-W Image: 67 Reef resemblance: Medium

Station 7

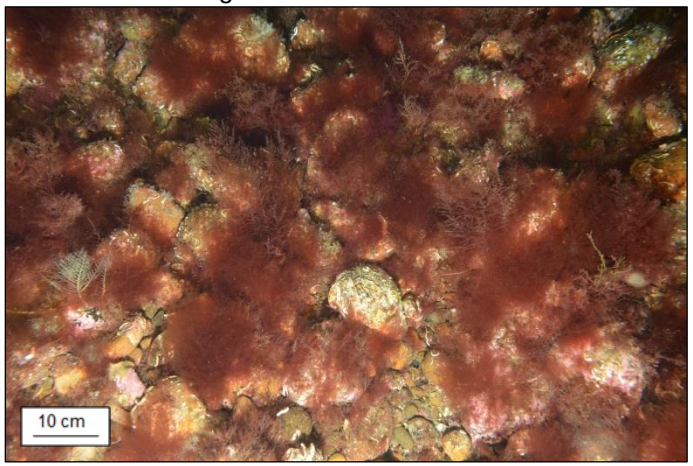

N
6396800
6396700
6396600
6396500
497800
497900
498000
498100
498200
Legend
Digital Stills Reef Resemblance
Low
Medium
No Resemblance
Contact/boulder
Target DDV Transects
Metres
0 25 50 75 100
Title: Cobble Reef Assessment Overview - Station 7
Project: 413984 Beatrice
Date: 08/07/2015
Scale: 1:2,324
Coord System: WGS84 UTM 30N
Drawn: PT
Checked: MH
Auth: MH
Client: BOWL
APEM

Station 7

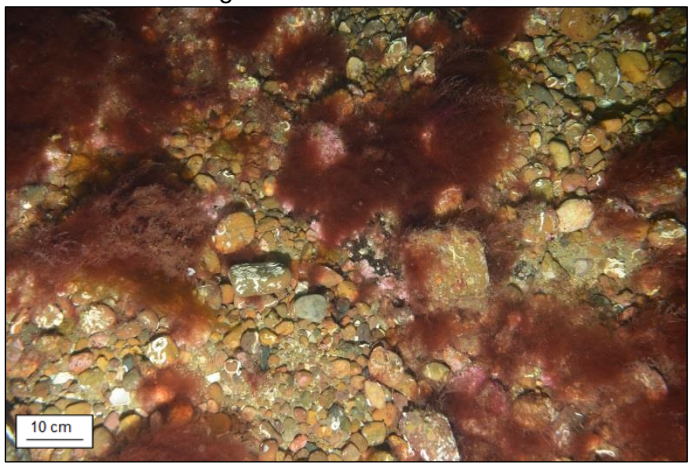
Transect: S-N Image: 13 Reef resemblance: Low



Transect: S-N Image: 40 Reef resemblance: Medium

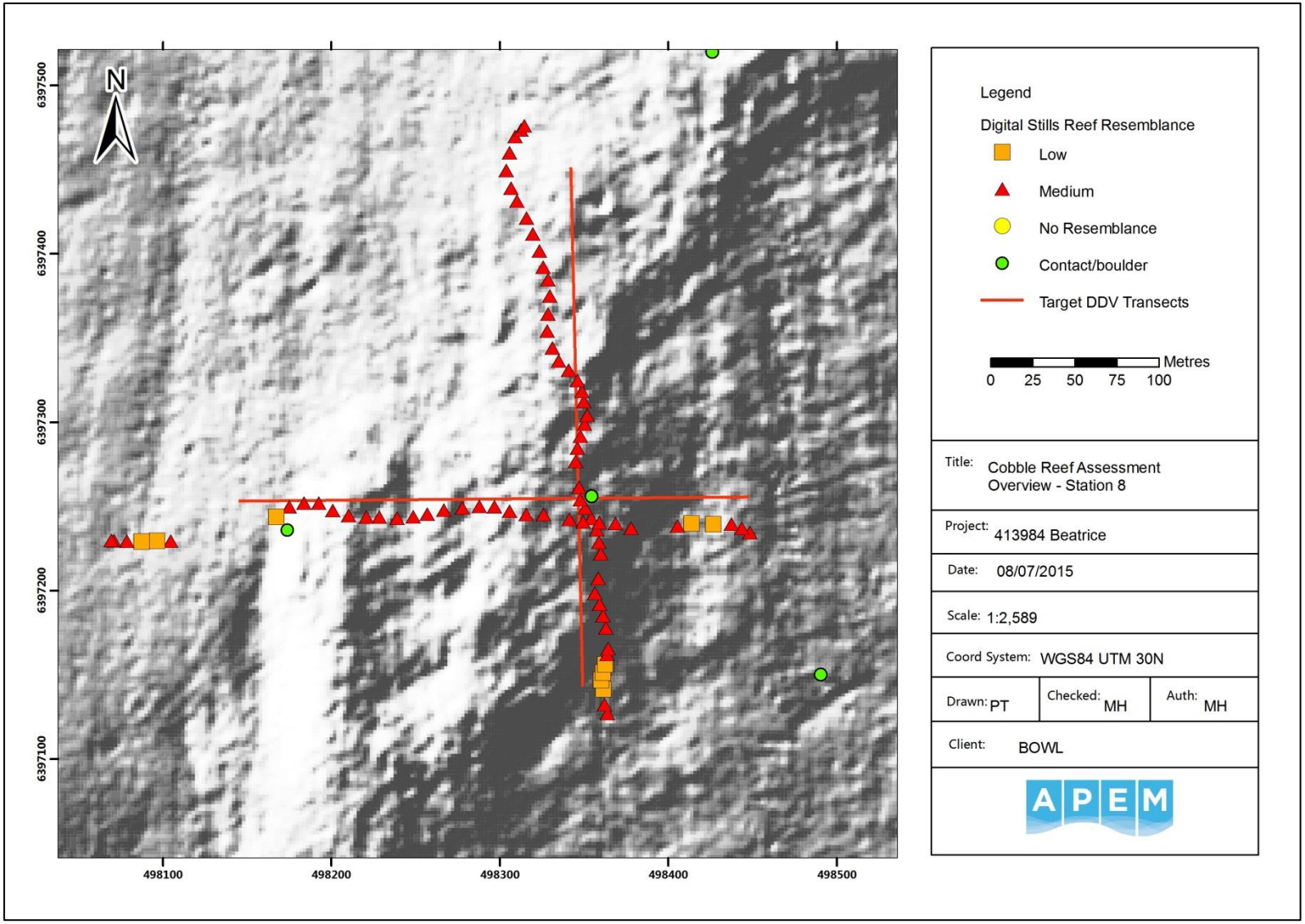


Transect: W-E Image: 61 Reef resemblance: Medium

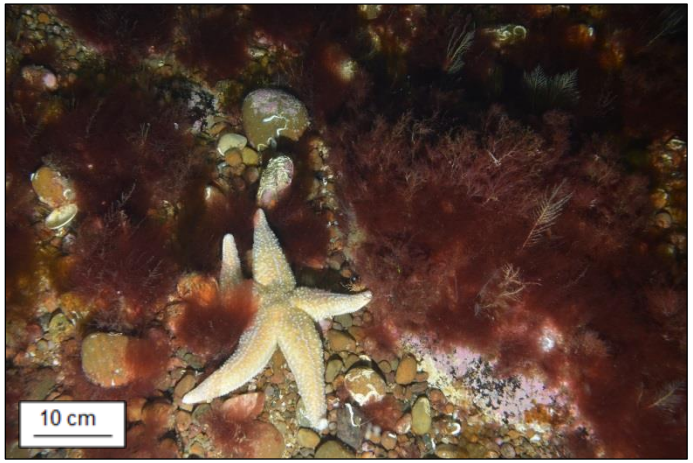


Transect: W-E Image: 66 Reef resemblance: Low

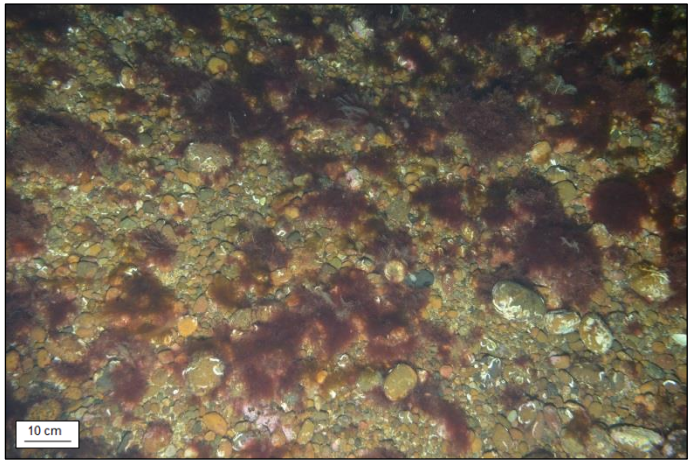
Station 8


N
6397500
6397400
6397300
6397200
6397100
498100
498200
498300
498400
498500
Legend
Digital Stills Reef Resemblance
Low
Medium
No Resemblance
Contact/boulder
Target DDV Transects
Metres
0 25 50 75 100
Title: Cobble Reef Assessment Overview - Station 8
Project: 413984 Beatrice
Date: 08/07/2015
Scale: 1:2,589
Coord System: WGS84 UTM 30N
Drawn: PT
Checked: MH
Auth: MH
Client: BOWL
APEM

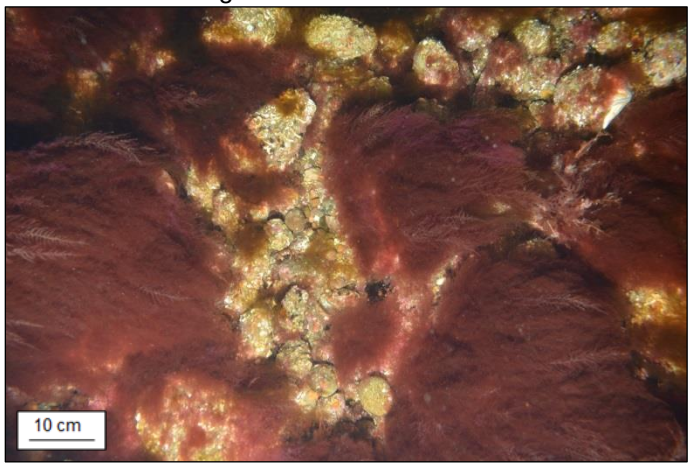
Station 8



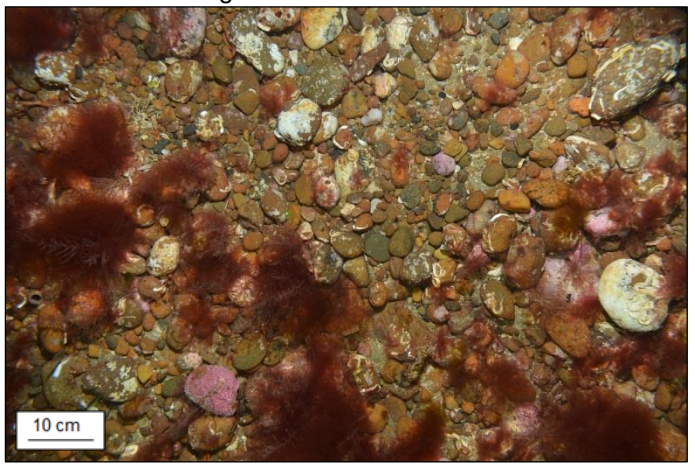
Transect: S-N Image: 3 Reef resemblance: Medium



Transect: S-N Image: 5 Reef resemblance: Low

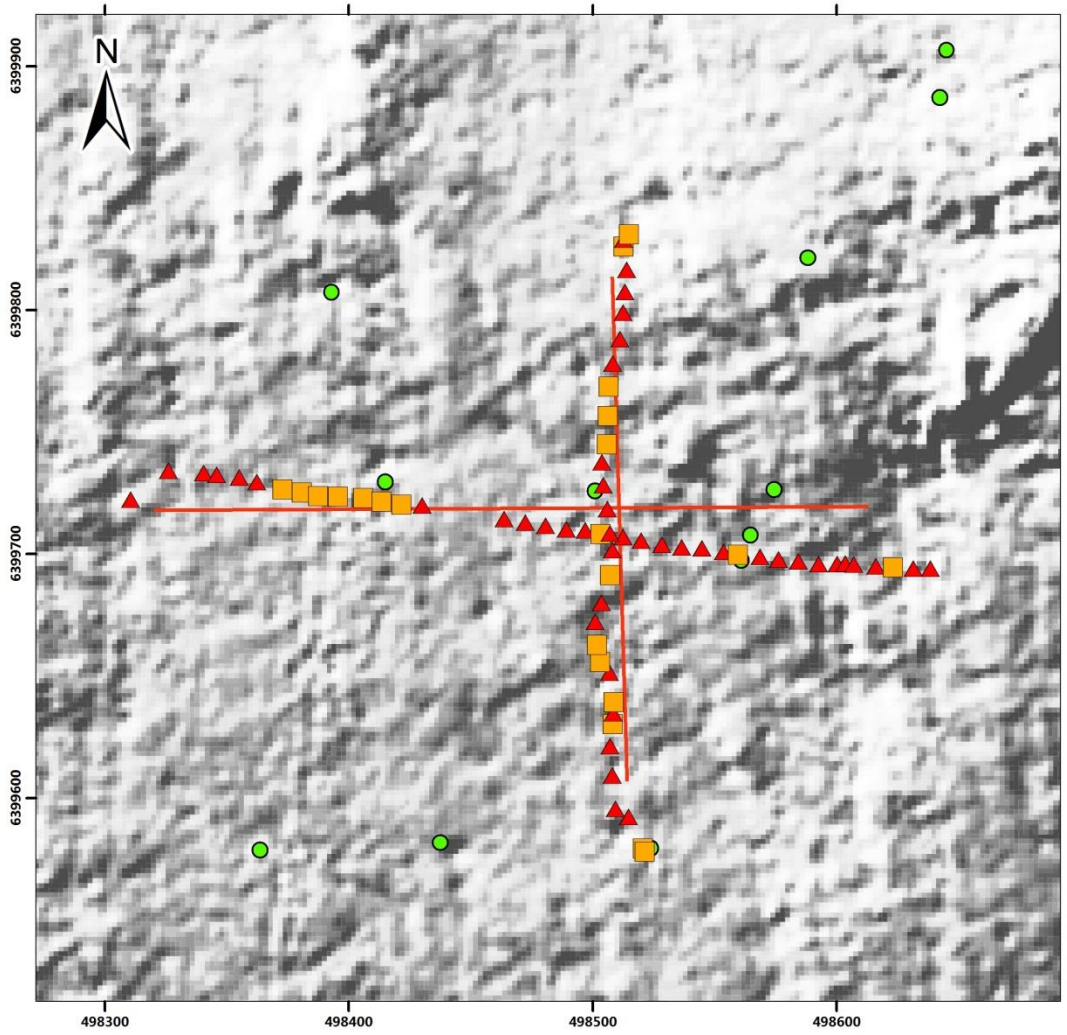


Transect: E-W Image: 73 Reef resemblance: Medium



Transect: E-W Image: 91 Reef resemblance: Low

Station 9



Legend

Digital Stills Reef Resemblance

- Low
- Medium
- No Resemblance
- Contact/boulder
- Target DDV Transects

Metres
0 25 50 75 100

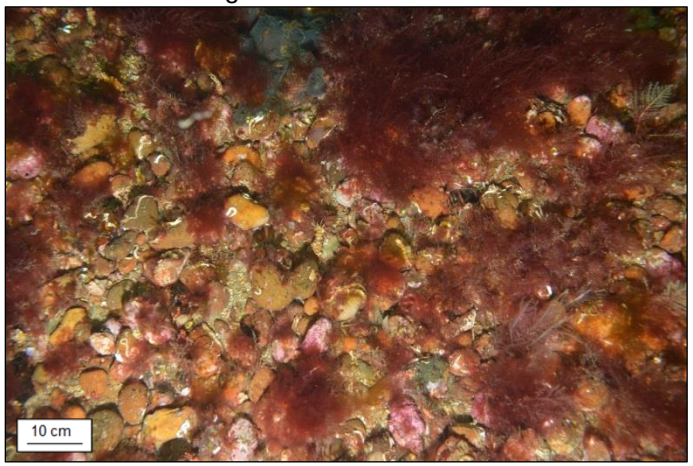
Title:	Cobble Reef Assessment Overview - Station 9
Project:	413984 Beatrice
Date:	08/07/2015
Scale:	1:2,183
Coord System:	WGS84 UTM 30N
Drawn: PT	Checked: MH / Auth: MH
Client:	BOWL

APEM

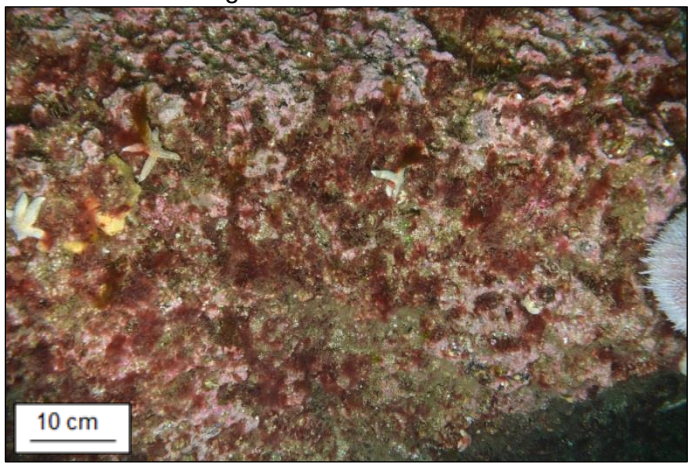
Station 9

Transect: W-E Image: 3 Reef resemblance: Medium

Transect: W-E Image: 9 Reef resemblance: Low

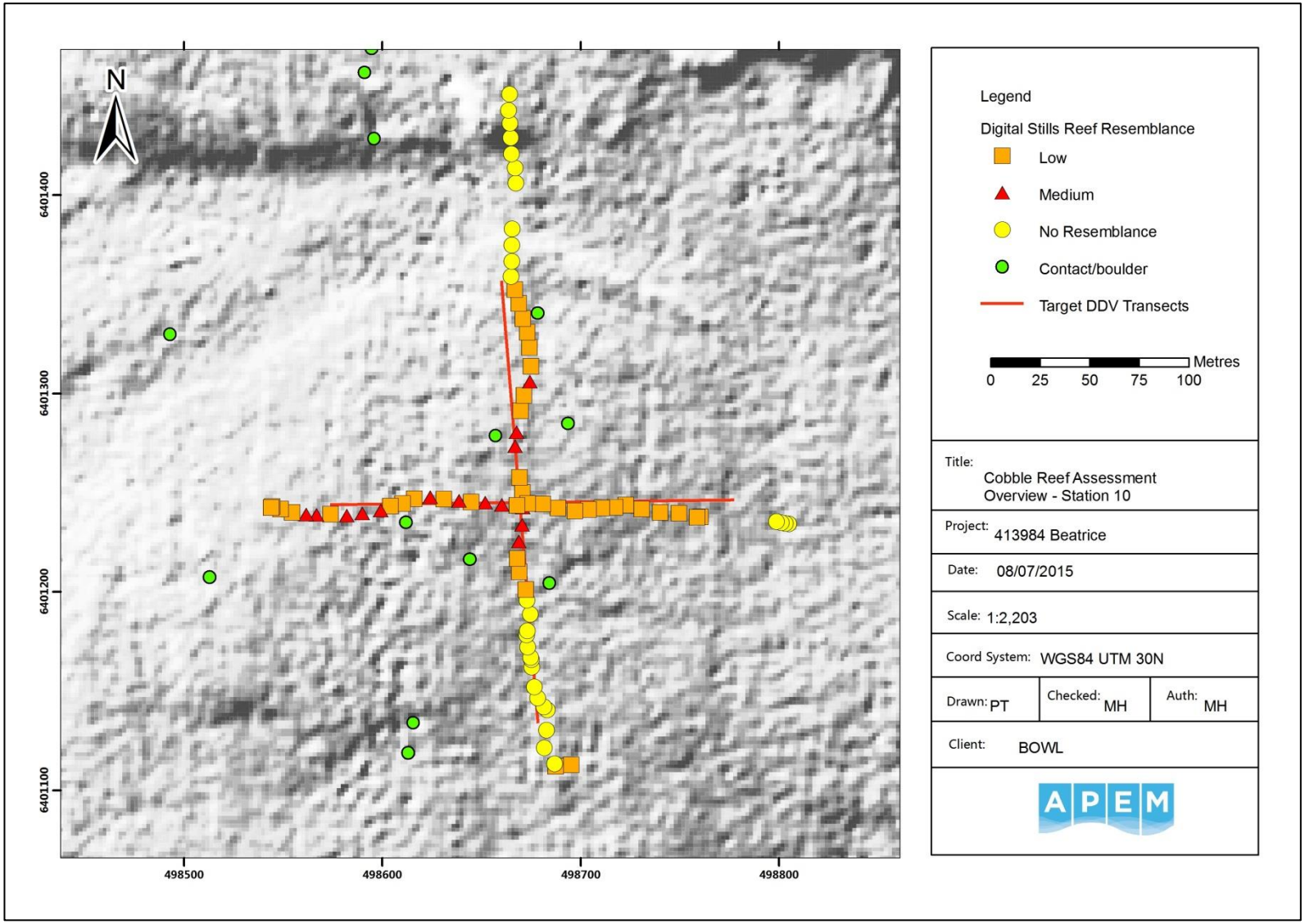


Transect: S-N Image: 46 Reef resemblance: Low



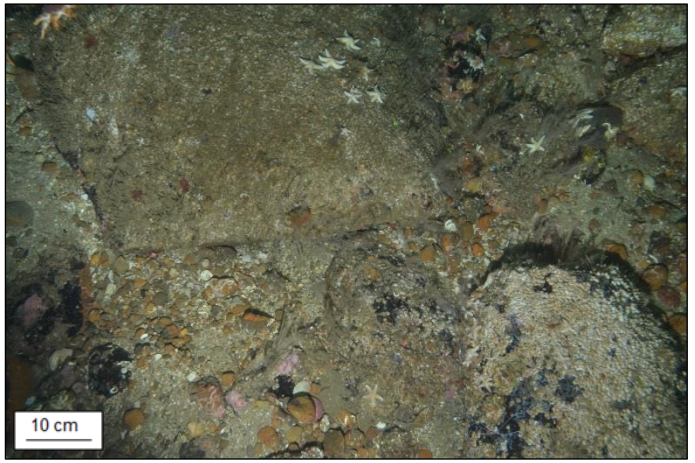
Transect: S-N Image: 47 Reef resemblance: Medium

Station 10


N
6401400
6401300
6401200
6401100
498500
498600
498700
498800
Legend
Digital Stills Reef Resemblance
Low
Medium
No Resemblance
Contact/boulder
Target DDV Transects
Metres
0 25 50 75 100
Title: Cobble Reef Assessment Overview - Station 10
Project: 413984 Beatrice
Date: 08/07/2015
Scale: 1:2,203
Coord System: WGS84 UTM 30N
Drawn: PT
Checked: MH
Auth: MH
Client: BOWL
APEM

Station 10

Transect: S-N Image: 11 Reef resemblance: None

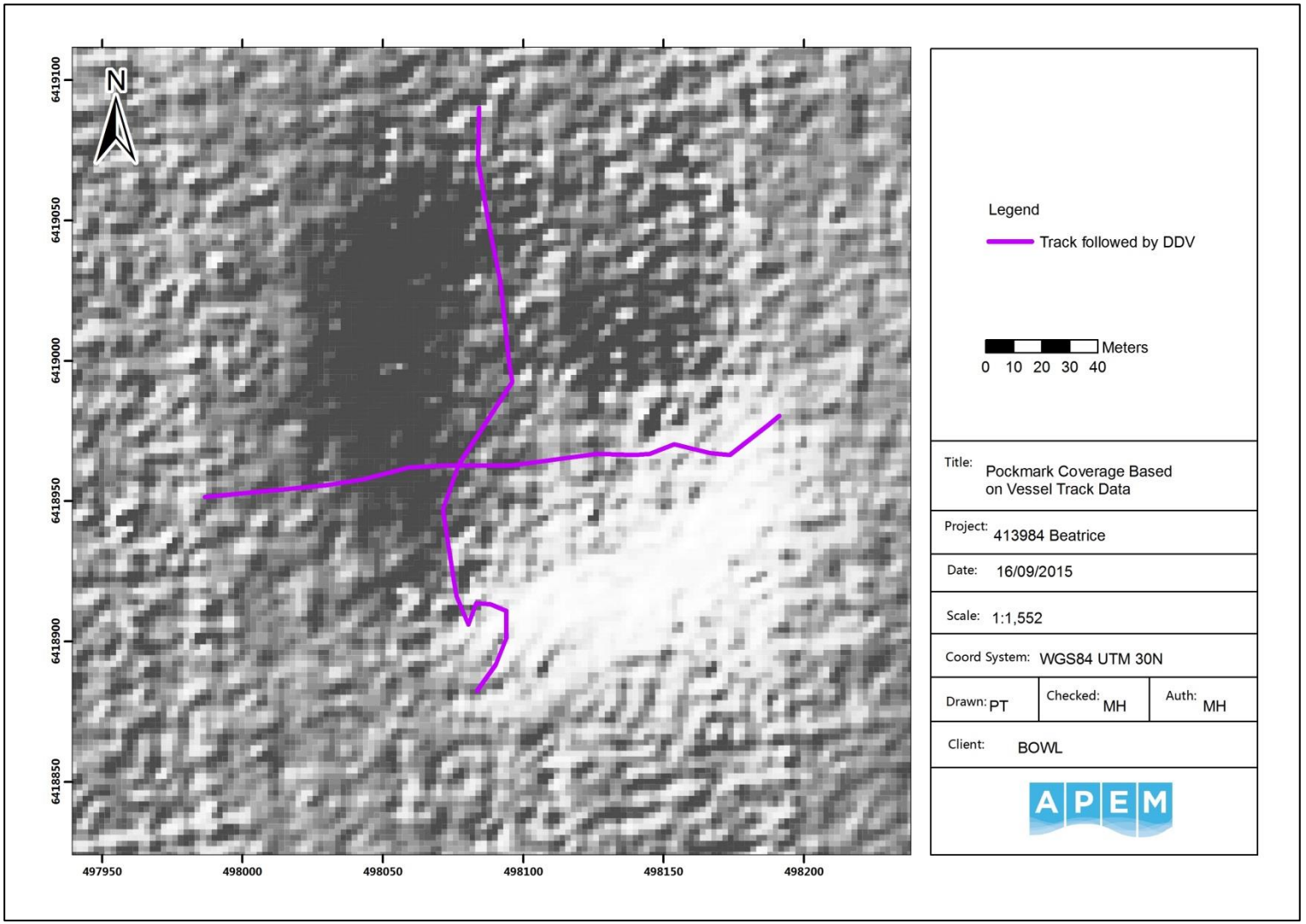


Transect: S-N Image: 29 Reef resemblance: Medium

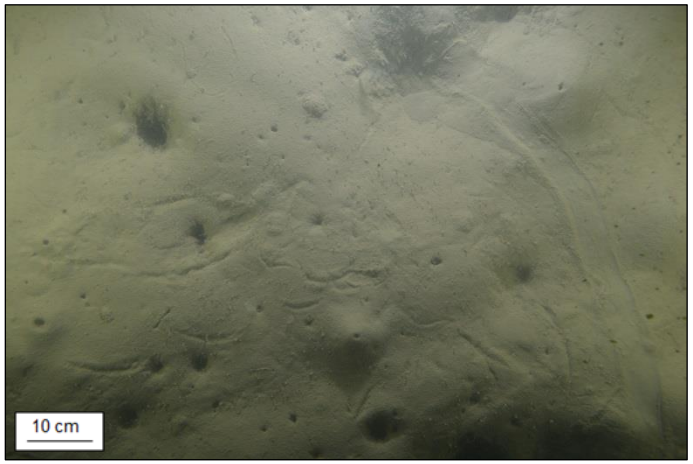
Transect: W-E Image: 64 Reef resemblance: None

Transect: W-E Image: 83 Reef resemblance: Medium

Pockmark

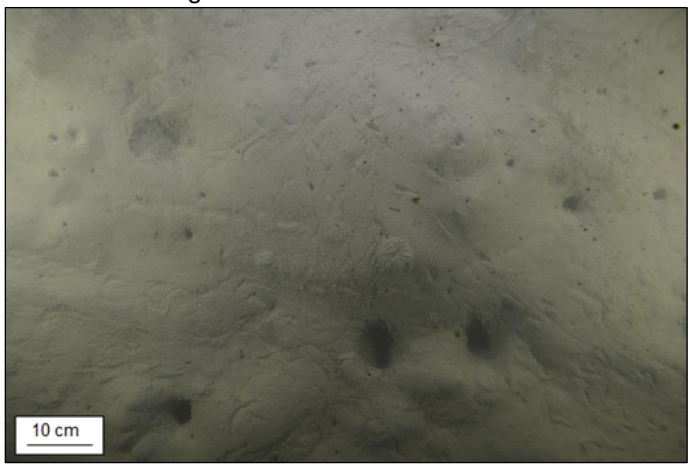

N
6419100
6419050
6419000
6418950
6418900
6418850
497950
498000
498050
498100
498150
498200
Legend
Track followed by DDV
Meters
0 10 20 30 40
Title: Pockmark Coverage Based on Vessel Track Data
Project: 413984 Beatrice
Date: 16/09/2015
Scale: 1:1,552
Coord System: WGS84 UTM 30N
Drawn: PT
Checked: MH
Auth: MH
Client: BOWL
APEM

Pockmark

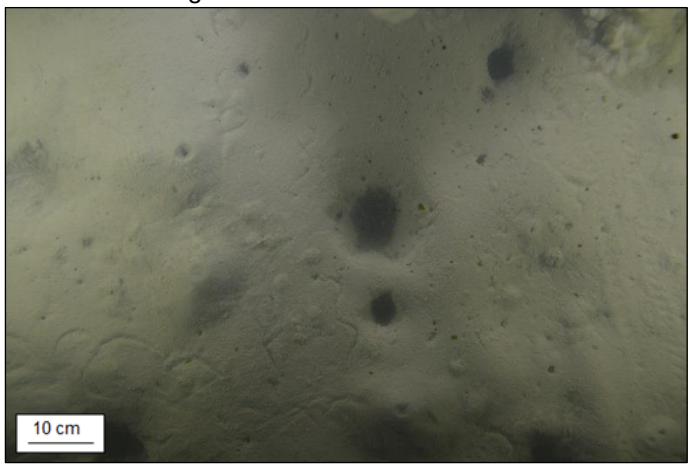


Transect: 1 Image: 828

Transect: 1 Image: 833



Transect: 2 Image: 835



Transect: W-E Image: 837

Appendix 5 – SACFOR results (provided as separate electronic spreadsheet)