Llŷr 1 Floating Offshore Wind Farm

Environmental Statement

Volume 6: Appendix 19D - Proposed Export Cable Route Benthic Characterisation Drop Down Video (DDV) Survey

August 2024

Prepared by: Llŷr Floating Wind Ltd

FLOVENTIS ENERGY

Document Status

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Approved by	Jay Hilton-Miller

Glossary of project terms

Term	Definition
The Applicant	The developer of the Project, Llŷr Floating Wind Limited.
Array	All wind turbine generators, inter array cables, mooring lines, floating sub-structures and supporting subsea infrastructure within the Array Area, as defined, when considered collectively, excluding the offshore export cable(s).
Array Area	The area within which the wind turbine generators, inter array cables, mooring lines, floating sub-structures and supporting subsea infrastructure will be located.
Floventis Energy	A joint venture company between Cierco Ltd and SBM Offshore Ltd of which Llŷr Floating Wind Limited is a wholly owned subsidiary.
Landfall	The location where the offshore export cable(s) from the Array Area, as defined, are brought onshore and connected to the onshore export cables (as defined) via the transition joint bays.
Llŷr 1	The proposed Project, for which the Applicant is applying for Section 36 and Marine Licence consents. Including all offshore and onshore infrastructure and activities, and all project phases.
Marine Licence	A licence required under the Marine and Coastal Access Act 2009 for marine works which is administered by Natural Resources Wales (NRW) Marine Licensing Team on behalf of the Welsh Ministers.
Offshore Development Area	The footprint of the offshore infrastructure and associated temporary works, comprised of the Array Area and the Offshore Export Cable Corridor, as defined, that forms the offshore boundary for the S36 Consent and Marine Licence application.
Offshore Export Cable	The cable(s) that transmit electricity produced by the WTGs to landfall.
Offshore Export Cable Corridor (OfECC)	The area within which the offshore export cable circuit(s) will be located, from the Array Area to the Landfall.
Onshore Development Area	The footprint of the onshore infrastructure and associated temporary works, comprised of the Onshore Export Cable Corridor and the Onshore Substation, as defined, and including new access routes and visibility splays, that forms the onshore boundary for the planning application.
Onshore Export Cable(s)	The cable(s) that transmit electricity from the landfall to the onshore substation.
Onshore Export Cable Corridor (OnECC)	The area within which the onshore export cable circuit(s) will be located.
proposed Project	All aspects of the Llŷr 1 development (i.e. the onshore and offshore components).
Onshore Substation	Located within the Onshore Development Area, converts high voltage generated electricity into low voltage electricity that can be used for the grid and domestic consumption.
Section 36 consent	Consent to construct and operate an offshore generating station, under Section 36 (S.36) of the Electricity Act 1989. This includes deemed planning permission for onshore works.

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Llŷr Floating Offshore Wind Farm – Proposed Export Cable Route Benthic Characterisation Survey 2023:

Survey Report

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Updates

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Abbreviations

CLOC	Clear Liquid Optical Chamber
DDC	Drop-Down Camera
ECR	Export Cable Route
EIA	Environmental Impact Assessment
EPS	European Protected Species
FLO	Fisheries Liaison Officer
FOWF	Floating offshore wind farms
GPS	Global Positioning System
HD	High Definition
INNS	Invasive Non-Native Species
JNCC	Joint Nature Conservation Committee
LAT	Lowest Astronomical Tide
LED	Light-Emitting Diode
MCA	Maritime and Coastguard Agency
MCZ	Marine Conservation Zone
MOD	Ministry of Defence
MP	Megapixel
MPA	Marine Protected Area
NRW	Natural Resources Wales
NtM	Notice to Mariners
OEL	Ocean Ecology Limited
OWF	Offshore Wind farm
SAC	Special Area of Conservation
SBAS	Satellite-Based Augmentation System
SSL	Seabed Survey Licence
SVP	Sound Velocity Profiler
TCE	The Crown Estate
UPS	Uninterruptable Power Supply
USBL	Ultra-Short Baseline
UTC	Universal Time Coordinated

UTM	Universal Transverse Mercator
VOR	Value of risk

1. Introduction

1.1. Project Overview

Llŷr 1 (the proposed Project) is a Floating offshore wind farm (FOWF) being developed by Floventis Energy Limited (Floventis). The proposed Project is located in the approaches to the Bristol Channel in the Celtic Sea, approximately 44 km from the Lundy Island shore, 62 km from the Devon coastline and 35 km from the Welsh coastline (Figure 1). The proposed Export Cable Route (ECR) is located in water depths ranging between 15 m to 60 m and will run north towards Pembroke.

The proposed Project came forward through The Crown Estate's (TCE) Test & Demonstration leasing opportunity which was created to support the development and commercialisation of pioneering, floating wind technologies. The proposed Project is intended to test new floating platform and mooring technologies and explore innovative designs, materials, and construction approaches.

1.2. Requirement

There was a requirement to assess the suitability of the Llŷr FOWF ECR Survey Area (Figure 1) as a potential cable route option by checking whether there was a sufficient area of loose sediment (channel) to run an offshore export cable without disturbing any sensitive habitats such as Annex I reef.

Floventis therefore contracted Ocean Ecology Limited (OEL) to carry out a drop-down camera (DDC) transect survey to assess the seabed characterisation across the proposed survey area.

1.3. Aims and Objectives

The key aim of the DDC survey was to obtain imagery and videos to determine if the proposed nearshore cable route is viable and to subsequently inform the design of the Project.

This was achieved through the acquisition of DDC imagery and videos to:

- Map the extent and location of habitats present in the nearshore survey area.
- Identify and assess the status of species and habitats of conservation importance, including Annex I protected species and habitats, and Annex V species[1] of the Habitats Regulations, species listed under Schedule 5 of the Wildlife & Countryside Act[2], OSPAR species and habitats[3] and designated features of the Marine Protected Area (MPA) network (e.g., Special Area of Conservation (SAC) and Marine Conservation Zone (MCZ)).

[1] https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019-species/
[2] https://www.legislation.gov.uk/ukpga/1981/69/schedule/5
[3] https://www.ospar.org/work-areas/bdc/species-habitats/list-of-threatened-declining-species-habitats

1.4. Document Overview

This document details the setup, progress, and initial field observations of the DDC survey undertaken by OEL between February and April 2024. Further detail is also provided on site information and sampling strategy.

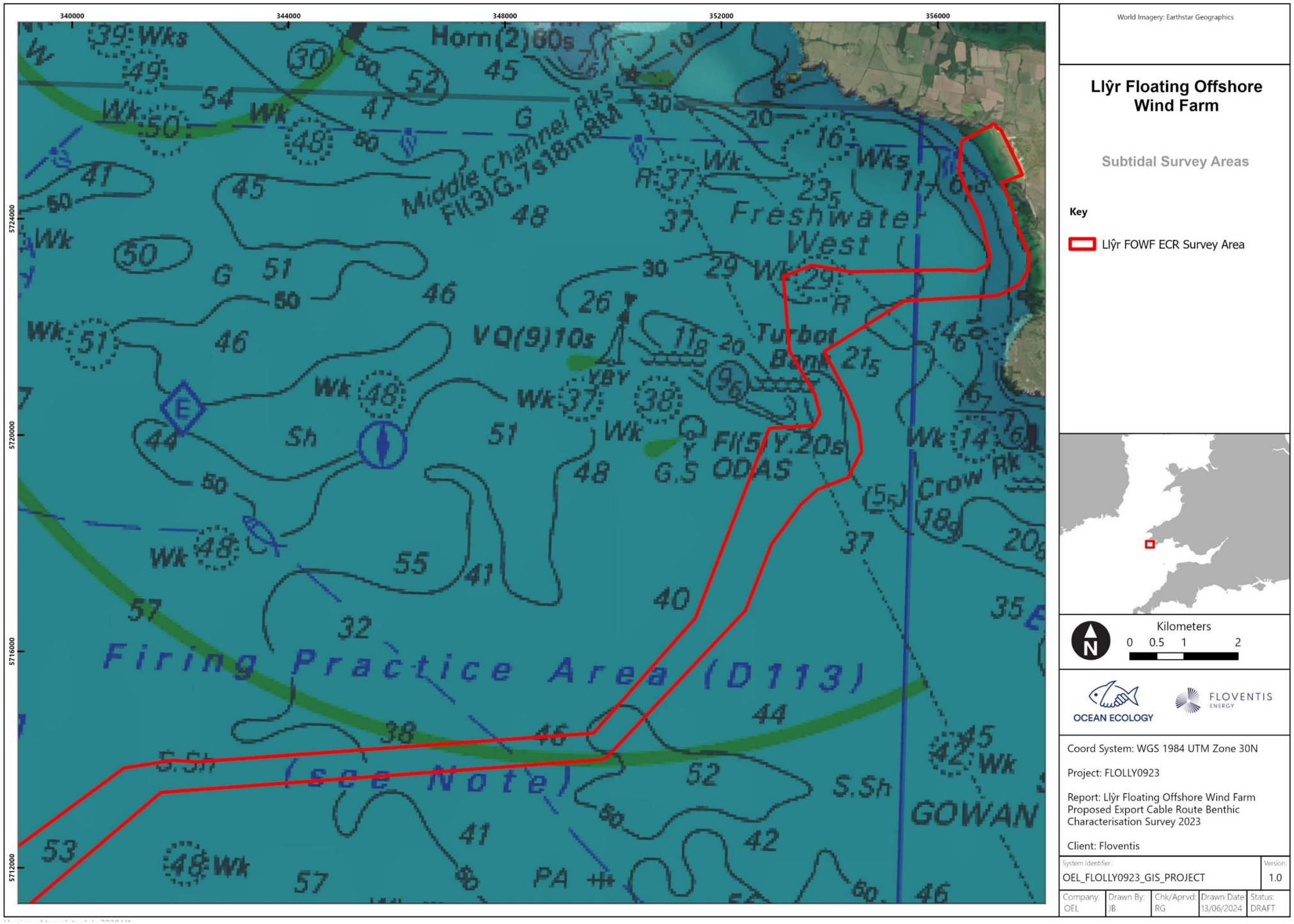

Figure 1 Overview of the Llŷr FOWF ECR Survey Area.

1.5. Designated Sites

The proposed survey area intersects and lies close to a number of Marine Protected Areas (MPAs) as set out below and presented in **Error! Reference source not found.**Figure 2.

Pembrokeshire Marine SAC

The proposed ECR landfall location in west Wales intersects the Pembrokeshire Marine SAC which is a designated marine protected area covering 1,380 km^2 in southwest Wales. This SAC is designated for the protection of the following habitats and species:

- Annex I reef
- Fragile sponge & anthozoan communities on subtidal rocky habitats
- Maerl
- Mussel beds
- *Musculus discors* beds
- *Ostrea edulis* beds
- Seagrass beds

Further features designated within this SAC include:

- Estuaries
- Large shallow inlets and bays
- Reefs
- Sandbanks which are slightly covered by seawater all the time
- Mudflats and sandflats not covered by seawater at low tide
- Coastal lagoons
- Atlantic salt meadows
- Submerged or partially submerged sea caves
- Grey seal (*Halichoerus grypus*)
- Shore duck (*Rumex rupestris*)
- Sea lamprey (*Petromyzon marinus*)
- River lamprey (*Lampetra fluviatillis*)
- Allis shad (*Alosa alosa*)
- Twaite shad (*Alosa fallax*)
- Otter (*Lutra lutra*)

West Wales Marine SAC

The proposed ECR intersects the West Wales Marine SAC which is situated off the coast of Wales extending from the Llŷn peninsula in the north, to Pembrokeshire in the southwest. The SAC has been identified as an area of importance for harbour porpoise (*Phocoena phocoena)*.

Skomer, Skokholm and the Seas off Pembrokeshire SPA

The proposed ECR intersects the eastern extent of the Skomer, Skokholm and the Seas off Pembrokeshire Special Protected Area (SPA) which is classified for the protection of: European storm-petrel (*Hydrobates pelagicus*), Manx shearwater (*Puffinus puffinus*), Atlantic puffin (*Fratercula arctica*), and lesser black-backed gull (*Larus fuscus*), as well as red-billed chough (*Pyrrhocorax pyrrhocorax*), short-eared owl (*Asio flammeus*) and breeding seabird assemblage. The SPA extends beyond the 12 nautical mile boundary, lying partly in Welsh territorial waters and partly in UK offshore waters meaning Natural Resources Wales (NRW) and JNCC are responsible for providing statutory advice.

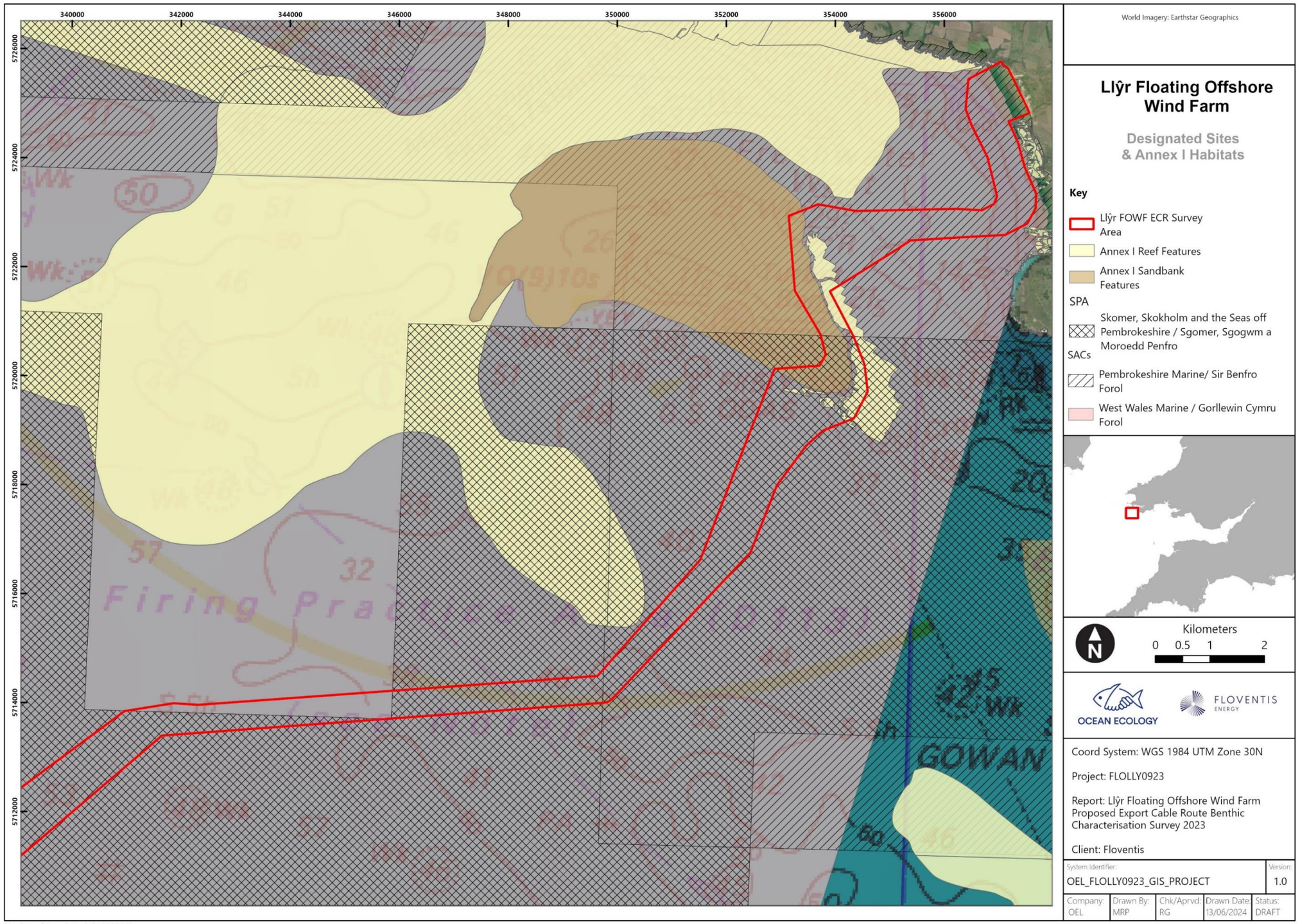

Figure 2 Overview of designated sites and Annex I habitats in the vicinity of the Llŷr FOWF ECR Survey Area.

2. Scope

The focus of this survey was to collect high resolution seabed imagery within the Llŷr FOWF ECR Survey Area for the determination of a suitable placement option for a proposed ECR for the Llŷr FOWF projects.

The survey aimed to ground-truth the presence and suitability of a sediment channel identified within available historic multibeam echosounder (MBES) data from Bangor University and geospatial data for the placement of the proposed project export cables.

DDC imagery from across 17 transects of varying length were used to assess the presence/absence of reef and sediment habitats and to provide information on the epibiota present (e.g. mussel beds, sea fans). Transects were specifically positioned based on features identified within the MBES data that indicated the presence of a channel within areas of reef (i.e. sharp contrast in colouring). Where there was a gap in the MBES data, transects were positioned using available geospatial data.

Transects were prioritised based on their location, position and orientation in relation to the sediment channel identified based on the interpretation of MBES and geospatial data. Transects crossing the width of the sediment channel were generally surveyed first to delineate the feature boundaries followed by perpendicular transects to ensure that cables could be laid along the channel. The sampling was heavily influenced by periods of adverse weather and access restrictions imposed by the neighbouring Ministry of Defence (MOD) Castlemartin Firing Range between February 1 and June 28, 2024. Access during this period was limited to weekends and weekdays outside of the firing exercise hours of 09:00 – 16:00 and 18:00 – 23:00, with a two-week exception around Easter. Sampling was also influenced by the Greenlink exclusion zone. Vessel access was restricted within the exclusion zone during periods of operation that occurred simultaneously to this survey. Furthermore, static fishing gear was redistributed throughout the Llŷr FOWF ECR Survey Area as a result of the Greenlink exclusion zone.

3. Survey Design

3.1. Overview

The sampling plan was developed to provide maximum geographic coverage of the proposed survey area, whilst also ensuring that all key habitats and communities likely to be encountered across the survey area were adequately targeted. The key principles underpinning the design of this sampling plan were therefore to:

- Provide adequate spatial coverage of the proposed nearshore ECR corridor areas;
- Ensure representative visual sampling of all main sediment types was undertaken; and
- Ensure representative examples of all potential features of conservation interest (e.g., Annex I reefs) were adequately ground-truthed.

3.2. Rationale

The micro-siting of transect stations was informed by a detailed review of the available MBES and geospatial data and in consideration of all information available in relation to surface, subsurface and subsea hazards across the entire survey area. This included all available GIS shapefiles and rasters in ESRI format including the proposed nearshore ECR corridor areas, the planned survey area, any existing infrastructure including all oil and gas surface and subsurface infrastructure within the project boundary or within proximity to it. It also included the latest relevant MPA boundaries and admiralty charts for the survey area (where available).

The proposed survey sampling plan and rationale of each DDC transect are outlined in Table 1**Error! Reference source not found.** and presented in **Error! Reference source not found.** and **Error! Reference source not found.**.

Table 1 DDC Transects surveyed within the Llŷr FOWF ECR Survey Area.

Transect ID	Rationale	Transect Length (m)
T006	Positioned perpendicular to T008a to confirm potential channel and delineate feature boundaries.	559
T007	Positioned based on interpretation of MBES data.	2,430
T007a	Positioned perpendicular to T008a to confirm potential channel and delineate feature boundaries.	347
T008a	Positioned to run along a potential loose sediment channel identified in the MBES data.	2,871
T009a	Positioned perpendicular to T008a to confirm potential channel and delineate feature boundaries.	144
T010a	Positioned perpendicular to T008a to confirm potential channel and delineate feature boundaries.	190
T011a	Positioned perpendicular to T008a to confirm potential channel and delineate feature boundaries.	201
T012a	Positioned perpendicular to T015 to confirm potential channel and delineate feature boundaries.	86
T013a	Positioned perpendicular to T015 to confirm potential channel and delineate feature boundaries.	126
T014a	Positioned perpendicular to T015 to confirm potential channel and delineate feature boundaries.	154
T015	Extension from T008a to follow identified channel. Transect runs slightly to the north and at an angle from T008a to capture potential continuation of loose sediment channel.	1,508
T015a	Positioned perpendicular to T015 to confirm potential channel and delineate feature boundaries.	399
T016a	Positioned perpendicular to T015 to confirm potential channel and delineate feature boundaries.	281
T017a	Positioned perpendicular to orientation of T015 to confirm the potential continuation of the channel surveyed using T015 and delineate feature boundaries.	345
T018a	Positioned to delineate habitat feature boundaries identified within geospatial shapefile data that indicate a potential channel running southwards between the Turbot Bank Sandbank and neighbouring reef to the east.	596
T019a	Positioned to delineate habitat feature boundaries identified within geospatial shapefile data that indicate a potential channel running southwards between the Turbot Bank Sandbank and neighbouring reef to the east.	257
T020	Positioned to run along area of proposed ECR that connects the main survey area to existing order limits.	311
Total		**10,805**

3.3. Sampling Approach

The following section describes the sampling approach used to undertake the seabed characterisation survey.

Seventeen DDC transects were surveyed to assess the suitability of a potential sediment channel identified within the available MBES data and geospatial data (Figure 3 and **Error! Reference source not found.**). Transect T008a was positioned along the length of the sediment channel in an east to west (EW) orientation and extended 2.8 km. A series of perpendicular north to south (NS) transects were then used to delineate the feature boundaries through the width of the channel. These included T007, T009a, T010a, T007a, T011a, T006 and T012a. These transects measured approximately 2.4 km, 0.14 km, 0.19 km, 0.35 km, 0.2 km, 0.6 km 0.09 km in length respectively.

A slight deviation in the channel orientation was observed at the juncture of transect T012a and T008a. Transect T015 was therefore positioned to follow the direction of the channel from this point seaward and measured approximately 1.5 km in length. A series of perpendicular NS transects were again positioned to delineate the feature boundaries across the width of the channel. These included transects T013a, T014a, and T015a which measured approximately 0.13 km, 0.15 km, and 0.4 km in length respectively.

As the channel appeared to broaden in the MBES data, Transects T016a and T017a were positioned in a NS orientation to the south (T016a) and slightly offset to the southwest (T017a) from T015. These measured approximately 0.28 km and 0.35 km in length respectively.

As the survey area encroached on the Turbot Bank Sandbank to the west the remaining transects were positioned to ground-truth the presence of a channel between the sand bank and the neighbouring reef to the east. Both transects were positioned in a northwest to southeast (NWSE) orientation with T018a being positioned on the western end of the previously mentioned transects approximately 0.35 km from T017a. Transect T019a was positioned in a parallel NWSE orientation approximately 0.6 km to the south of T018a. These transects measured approximately 0.5 km and 0.2 km respectively.

A final transect, T020 was positioned at the distal end of the survey area closest to the existing order limits in an EW orientation. This measured approximately 0.3 km. This transect was not affected by the firing range restrictions and therefore allowed for the optimisation of sampling efficiencies where possible around the remaining transects.

During the survey, high resolution digital photography (stills and video footage) were acquired by a 'bed-hopping' technique to identify habitat boundaries along each transect. The camera was housed within a freshwater lens to provide optimum image clarity in the potentially turbid waters on site. Transects run in the direction of tide and current where possible to further optimise image and video quality.

A positional fix was taken each time the camera made contact with the seabed and was used as a high-level preliminary assessment of habitat. Each fix was allocated a habitat type of either 'Reef', 'Sediment' or 'Unknown'. The allocation of 'Reef' and 'Sediment' labels to the fix position reflected a preliminary assessment on the suitability of the area for cable placement. The third allocation of 'Unknown' indicated the inability of assigning the positional fix to a specific habitat type while on survey and the need of a thorough review of this assessment post-survey.

Detailed survey methods for seabed imagery acquisition are presented in Section 4.5.

3.4. Timing

The survey was undertaken during periods of favourable weather between the 08 February and 26 April 2024.

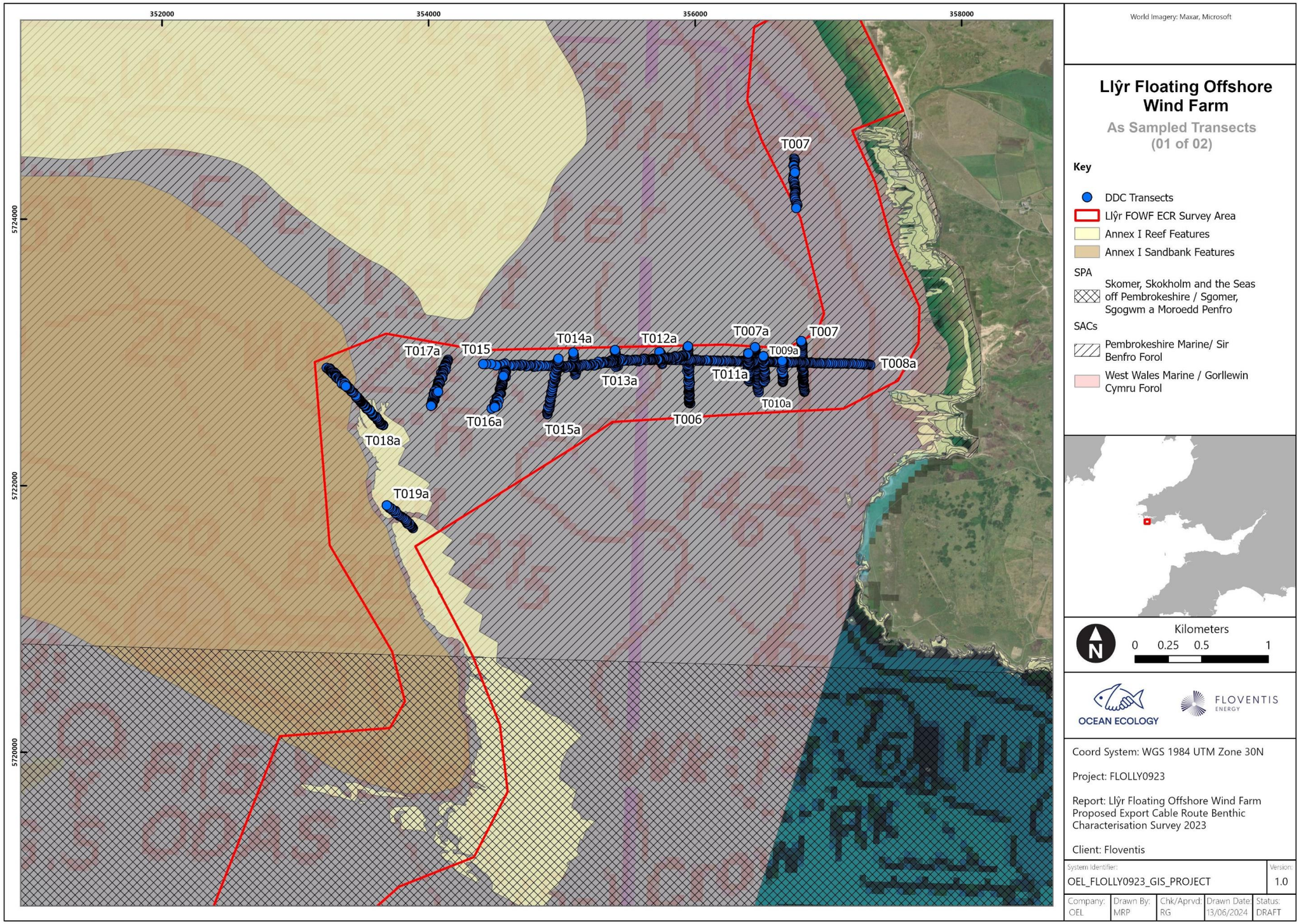

Figure 3 Overview of the DDC transects as sampled within the Llŷr FOWF ECR Survey Area.

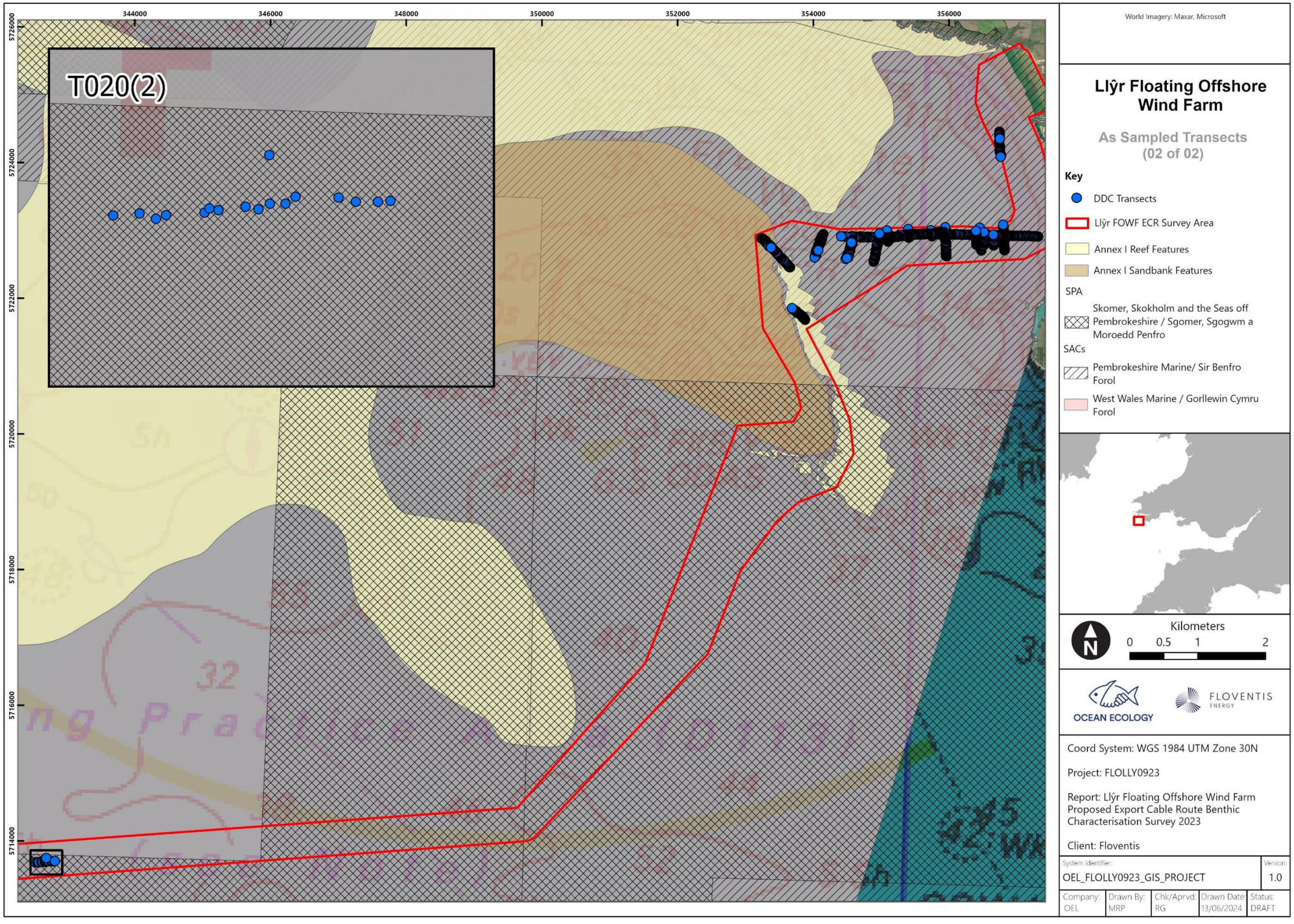

Figure 4 Overview of the DDC transect T020(2) as sampled in relation to the remaining transects presented in **Error! Reference source not found.** within the Llŷr FOWF ECR Survey Area.

4. Survey Methods

4.1. Licensing and Consents

The following permits and licences were secured in advance of mobilisation of the environmental characterisation survey and conditions adhered to for the duration of the survey:

- Crown Estate Seabed Survey Licence
- European Protected Species (EPS) Licence

A Notice to Mariners (NtM) was also issued and updated where necessary throughout the survey in conjunction with ongoing dialogue with commercial fishers through the project Fisheries Liaison Officer (FLO).

4.2. Survey Vessel

The survey was conducted aboard OEL's 11.7 m MCA Category 2 survey vessel '*Argyll Explorer*' (Table 2 and Plate 1). The vessel mobilised and operated out of Neyland Marina on a 12-hour basis, operating in daylight hours only, and returning to port each day.

Table 2 Vessel details

Vessel Name	Argyll Explorer
Area of operation	Offshore
Call Sign	MWFU
IMO Number	235057487
Mobilisation Port	Neyland Marina, Milford Haven
Length	11.7 m
Beam	5.5 m
Draft	1.5 m

Plate 1 OEL's dedicated survey vessel Argyll Explorer.

4.3. Geodetic Parameters

4.3.1. Horizontal Datum

Table 3 Geodetic parameters

Parameter	Details
Name	World Geodetic System 1984 (WGS84)
Ellipsoid	WGS 84
Semi-Major Axis (a)	6378137.000 m
Semi-Minor Axis (b)	6356752.314 m
Inverse Flattening	298.257 223 563
Geodetic parameters EPSG Code	4326

Table 4 Projection parameters.

Projection	Transverse Mercator 6 NW
Name	UTM Zone 30 N
Longitude of Natural Origin	6° West
Latitude of Natural Origin	0°
False Easting	1 500 000.00 m
False Northing	0.00 m
Scale Factor at Natural Origin	1
Units	metres

4.3.2. Datum Transformation Parameters

All data is referenced to WGS84, UTM Zone 30 N, with no datum transformation need. No conversion or test coordinate was provided by the Client.

4.3.3. Vertical Datum

All altitude and depth data above seabed are referenced to LAT. All depth data below the seabed is referenced to LAT where available, depths may be reported as derived from ultra-short baseline (USBL) beacon.

4.3.4. Unit Format and Conversions

The following have been used throughout this project and are expressed using the following conventions.

Table 5 Project unit format and convention details.

Unit Formats and Conventions	
Geographical Coordinates	Latitude N DD˚MM.mmmmmm' to 6 decimal places. Longitude E/W DD˚MM.mmmmmm' to 6 decimal places.
Grid Coordinates	Meters in the following format: Easting EEE EEE.eee m to 3 decimal places. Northing NNN NNN.nnn m to 3 decimal places.
Linear distances	Meters to 1 decimal places.
Offset measurement sign conventions	Meters in the following format: 'Y' is positive forward. 'X' is positive to starboard. 'Z' values are positives upwards from the waterline.
Time	UTC (GMT).

4.4. Survey Navigation

4.4.1. Surface Positioning

The *Argyll Explorer* was equipped with a Hemisphere V104s Global Positioning System (GPS) compass system. The Hemisphere V104s's internal GPS receiver automatically searches for and uses a minimum of 4 GPS satellites and manages the navigation information required for position to within 3 m (95% accuracy). Since there is some error in the GPS data calculations, the V104s also automatically tracks a Satellite-Based Augmentation System (SBAS) differential correction to improve its position accuracy to better than 1.0 m 95%.

The V104s has an integrated gyro and two tilt sensors to provide an accurate heading for the navigation software.

4.4.2. Subsea Positioning

The vessel was equipped with an Easytrak Nexus 2 Lite Ultra-Short Baseline (USBL) system and 1329A Omni-directional +/-90° Micro Beacons for subsea positioning of the sampling equipment. The Easytrak Nexus 2 Lite is an advanced USBL positioning and tracking system that determines the position of dynamic subsea targets through the transmission and reception of acoustic signals between the submerged transceiver and a target beacon. The USBL was fully calibrated prior to survey operations using a Valeport SWiFT sound velocity profiler (SVP). Readings were obtained daily from both the up-cast and down-cast.

4.4.3. Navigation Software

A vessel-based positioning system was employed utilizing EIVA NaviPac V4.6 software to ensure the accurate positioning of the vessel and subsea positioning of the sampling equipment via the USBL system as well as recording continuous track plots of the sampling equipment and recording sampling fixes. A navigation screen, displaying EIVA Helmsman Display was used at the helm position of the vessel by the Skipper as well as for the Environmental Scientist in the wheelhouse.

4.4.4. Positional Checks & Calibrations

The GPS has an internal precision calculation which outputs a graphical representation of horizontal accuracy, displaying numerical precision as easting and northing. The accuracy of vessel heading, and reference systems was verified during mobilisation using agreed reference points.

A USBL calibration was undertaken using the inbuilt Easytrak Nexus calibration software package to eliminate any alignment errors of the installation. Offsets were measured dynamically between the Easytrak Nexus transceiver head and the external sensors interfaced. This enabled accurate operation of the Easytrak Nexus tracking system when pole-mounted onto a vessel with external VRU and gyro.

4.5. Survey Equipment and Sampling

4.5.1. DDC System and Seabed Imagery Collection

Seabed imagery (simultaneous video and stills) was acquired at each station using OEL's SubC Rayfin PLE camera system, set up to obtain 1080p High Definition (HD) video and 20 Megapixel (MP) still images. The camera system consisted of a SubC Imaging Rayfin PLE camera mounted in a Clear Liquid Optical Chamber (CLOC) (otherwise known as a 'freshwater lens') filled with fresh water to ensure imagery of suitable quality is obtained regardless of turbidity. The frame included light emitting diode (LED) strip lamps and a 10 cm point laser scaling array that is projected into the field of view and topside computer. The camera was powered with the use of an Uninterruptable Power Supply (UPS) to ensure no damage would be caused should the vessel have lost power or in the case of a power surge. A full redundancy SubC Rayfin PLE camera system was stored onboard throughout the survey but was not required.

Plate 2 Left: OEL CLOC camera system. Right: The camera system topside setup.

All DDC stations and transects were sampled in line with the Joint Nature Conservation Committee (JNCC) epibiota remote monitoring operational guidelines (Hitchin et al. 2015). For transects, the camera was deployed to the seabed over the target start / end transect location and slowly 'flown' just above the seabed along the transect to obtain both continuous video footage and still images. A live feed was displayed on a monitor and photographs taken continually along the transects. Whenever a photograph was taken a positional fix was taken of the USBL beacon position in the navigation software.

The camera system was deployed from the hydraulic 'A' frame on the aft deck of the *Argyll Explorer* using the following method:

- As the vessel approached the target location, deck personnel began to prepare lifting equipment, camera, and readied the coaxial winch control.
- Deck personnel were alerted by the vessel master once on position, and the camera was raised using the A-frame and coaxial winch and lowered into the water column.
- Once the camera system was within 5 m of the seabed, video recording was started, and sampling conducted in line with the methodology set out above.
- Following the capture of the final image, the camera was lifted, video recording was stopped, and the camera was slowly brought to the surface.
- The winch operator then took the tension on the wire and once the vessel master had confirmed sea conditions were suitable, the camera system was recovered aboard and lowered onto the deck.

During the deployment, all footage underwent a preliminary review *in situ* by OEL's onboard Environmental Scientists. Each image was then assessed *in situ* and assigned one of three fix labels: 'Reef', 'Sediment' or 'Unknown' depending on the habitat type observed. Detailed notes were also taken in the logs of visible sediment conditions and seabed features, obvious fauna, and habitat-related features whilst in the field.

5. Results

5.1. Survey Progress

The DDC survey was conducted aboard the *Argyll Explorer* between 08 February and 26 April 2024.

A total of 934 raw images were collected across 105 videos. A summary of the data collection is detailed within Table 6.

A summary of the transects as sampled are presented within **Error! Reference source not found.** and **Error! Reference source not found.**.

Due to a technical issue with USBL system at the time of survey, Transect T020 was re-run and renamed as T020(2). The transect position and length remained the same as T020. The positional data acquired for T020(2) was accurate and therefore the imagery data collected along this transect was used in place of that collected during T020.

Table 6 Summary of sampling design**.**

Transect ID	Number of videos	Number of images
T006	6	66
T007	14	114
T007a	5	44
T008a	15	133
T009a	3	18
T010a	2	31
T011a	3	26
T012a	2	13
T013a	3	18
T014a	3	21
T015	17	146
T015a	5	52
T016a	5	52
T017a	6	70
T018a	7	81
T019a	3	25
T020*	3	13
T020(2)	3	24
Total	**102**	**934**

*T020 not to be analysed due to issues with the USBL system; T020(2) is the re-run to be analysed.

5.2. Seabed Imagery

A total of 886 digital photographic stills were reviewed *in situ* to assess for the presence of Annex I reef features and areas of sediment for the suitability of the proposed nearshore ECR (Full preliminary assessment provided in Appendix III). The *in situ* review of the still images indicated that the majority of stills were representative of reefs, while 15 images were not assigned to a specific habitat type and instead were annotated as 'Unknown' (Table 7).

Table 7 Results of the *in situ* seabed imagery assessment.

Row Labels	Preliminary Reef Assessment
Reef	492
Sediment	379
Unknown	15
Total	**886**

Upon completion of the survey, the preliminary assessment carried out *in situ* was revised as summarised in Table 8. Out of the 15 images initially labelled as 'Unknown,' three were reclassified as 'Reef' and the remaining 12 were classified as 'Sediment' (Table 8). To note that six images were also reassigned during the QC process where three images initially annotated as 'Reef' were revised as 'Sediments', and vice versa. The revised, QC assessment is mapped in Figure 5.

Example imagery collected during the survey is presented in Plate 3, Plate 4, and Plate 5.

Table 8 Results of the revised seabed imagery assessment.

Row Labels	Revised Reef Assessment (QC)
Reef	495
Sediment	391
Total	**886**

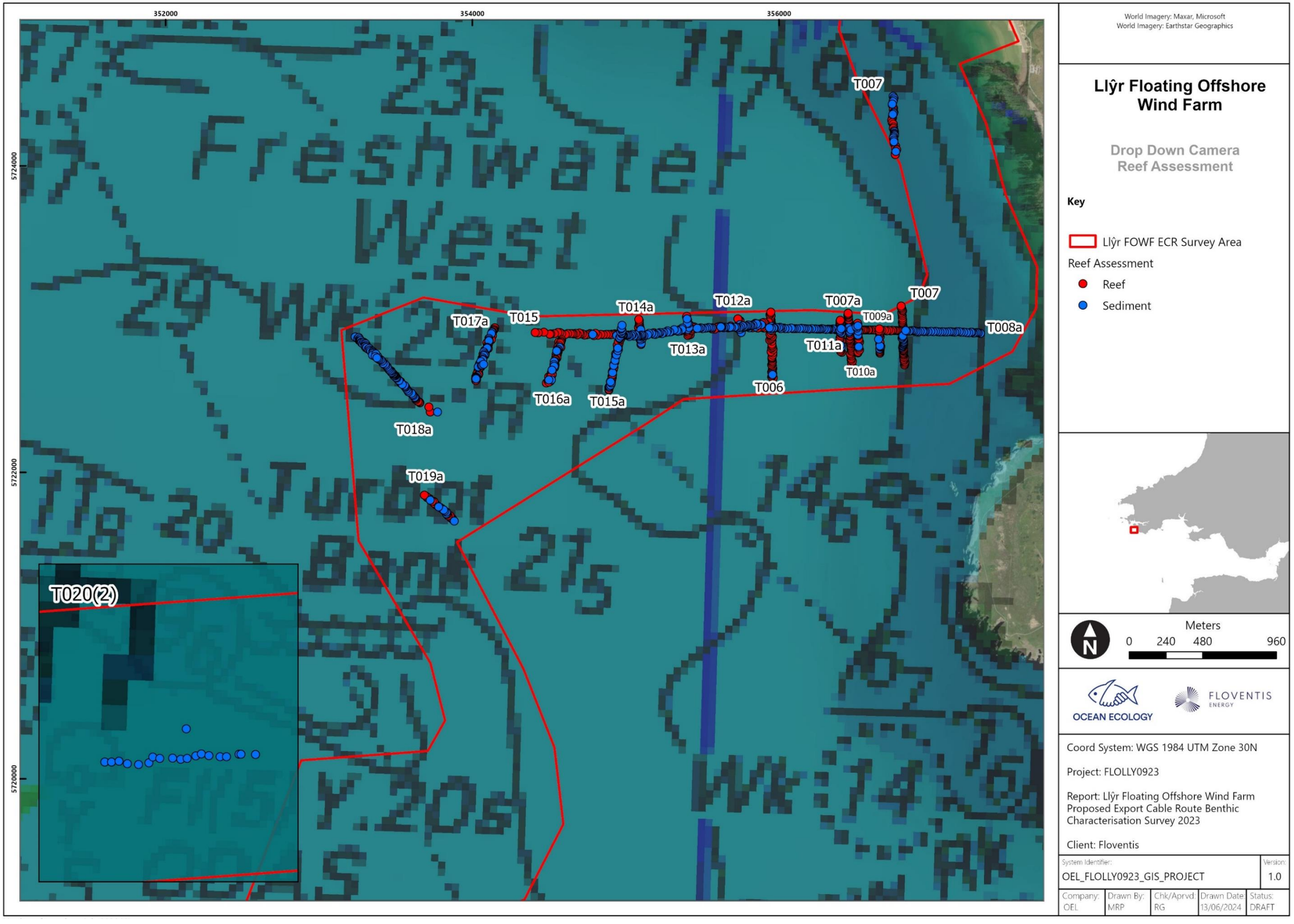

Figure 5 Results of the preliminary reef assessment following the QC of data within the Llŷr FOWF ECR Survey Area.

Plate 3 Example images of potential Annex I reef observed at DDC transects. To note that along T017a potential mussel bed was observed.

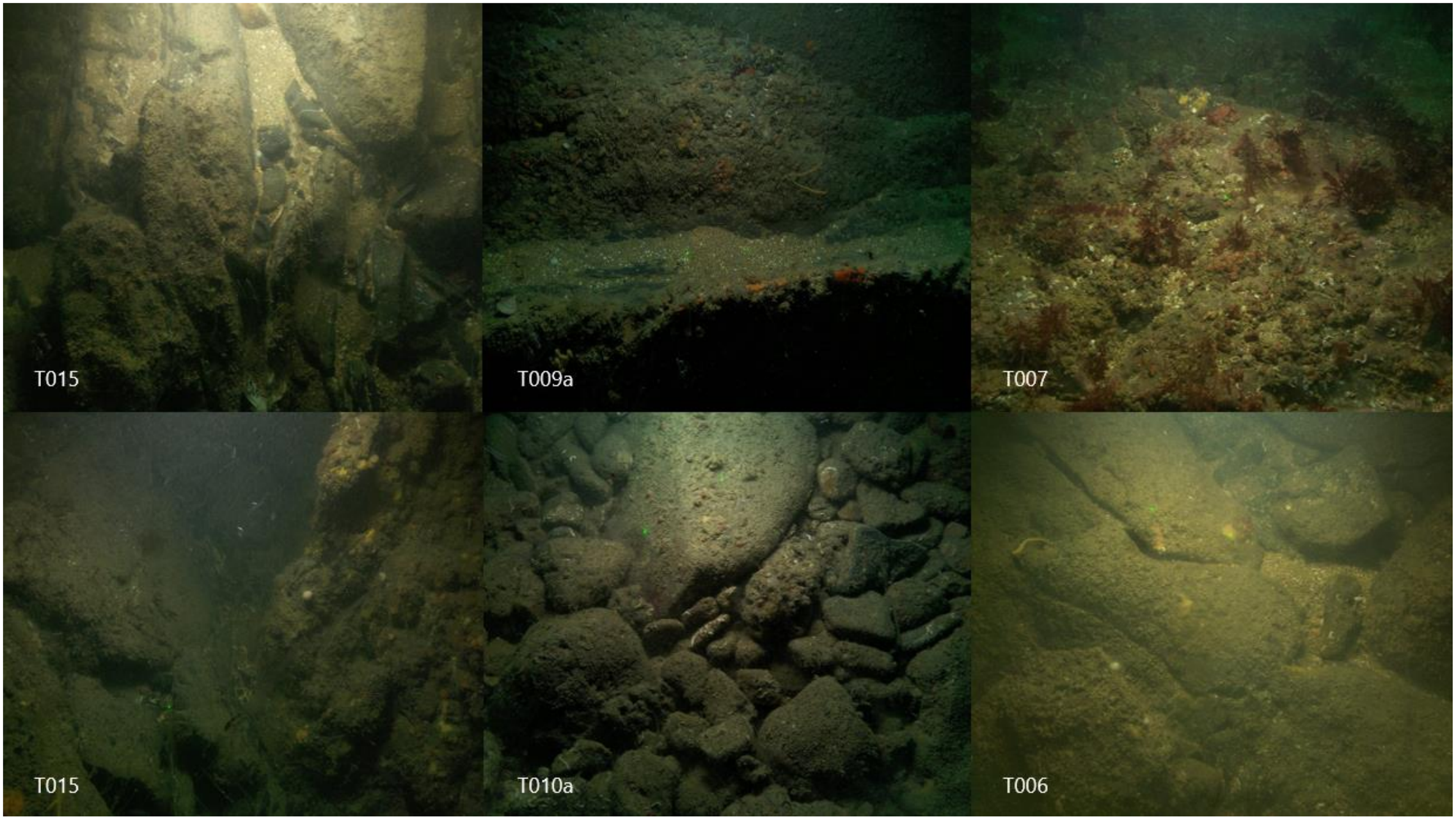

Plate 4 Example images of potential Annex I reef observed across DDC transects.

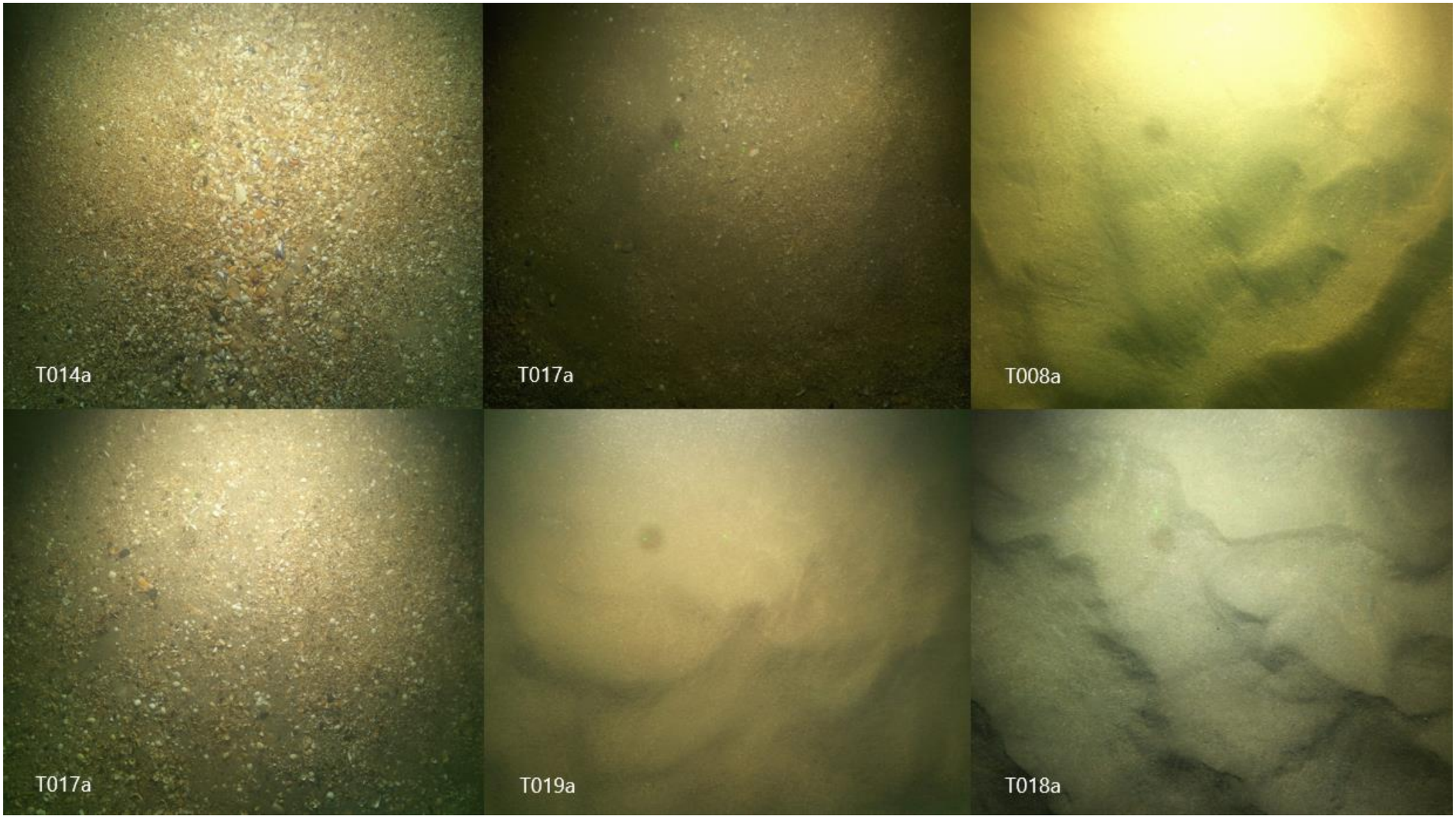

Plate 5 Examples of loose sediment types observed at across the DDC transects.

5. References

Hitchin R, Turner, Verling (2015) Epibiota Remote Monitoring from Digital Imagery: Operational Guidelines.

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