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Hartland Point to Tintagel MCZ 2019 Survey Report

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Foreword

Natural England commission a range of reports from external contractors to provide evidence and advice to assist us in delivering our duties. The views in this report are those of the authors and do not necessarily represent those of Natural England.

Background

Following designation, Natural England started a baseline monitoring programme across all marine protected areas.

This report was commissioned as part of an inshore benthic marine survey of the Hartland Point to Tintagel MCZ.

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Hartland Point to Tintagel MCZ 2019 Survey Report

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L. Parkhouse	Devon and Severn Inshore Fisheries and Conservation Authority Environment Officer
C. Trundle	Cornwall Inshore Fisheries and Conservation Authority Conservation and Research Manager

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1. Introduction

Following the introduction of the Marine and Coastal Access Act in 2009, the UK Government is creating an ecologically coherent network of Marine Conservation Zones (MCZs) in British waters. The MCZ network will exist alongside other Marine Protected Areas (MPAs), including Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Sites of Special Scientific Interest (SSSIs) and Ramsar sites to help conserve marine biodiversity, in particular habitats and species of national importance.

Forming part of this network, the Hartland Point to Tintagel MCZ was formally designated on the 17th January 2016[1]. The site has been created to protect Fragile Sponge and Anthozoan Communities, as well as Pink Sea-Fans (*Eunicella verrucosa*) and reefs formed by the Honeycomb Worm (*Sabellaria alveolata*) (Table 1). Following designation, Natural England* have started a programme of monitoring and the initial datasets gathered will be used, along with all other available information, to assess the condition of the features in the site using Natural England marine condition assessment methodology. The method uses attributes set out in the sites supplementary advice on conservation objectives to form an overall decision about the condition of the features, and this work will inform the assessment of specific attributes. The results from the condition assessment will inform future monitoring planning and management of the site.

*inshore Statutory Nature Conservation Body

1.1 Site Description

The Hartland Point to Tintagel MCZ is located on the north coast of Devon and Cornwall in the south-west of England (Figure 1). The inshore site covers 304 km^2 and the site boundary follows the coastline along the mean high water mark from Tintagel Head to Hartland Point (Natural England, 2017). The MCZ is overlapped by the Tintagel-Marsland-Clovelly Coast SAC. The Bristol Channel Approaches SAC, which is designated for Harbour porpoise (*Phocoena phocoena*), overlaps the entire MCZ (Natural England, 2017) (Figure 1).

[1] This report was produced before the Tranche 3 designation announcement on 31st May 2019 and as such all content was correct at the time of writing.

The majority of the site contains rocky habitats in deeper waters (circalittoral rock) interspersed with sublittoral coarse sediment. In this stable rocky surface, marine species such as sponges, anemones and sea fan corals are found. Intertidal sand and rocky areas provide habitats for many species, including the Honeycomb Worm *(Sabellaria alveolata)* (Natural England, 2017). Honeycomb Worm reefs are formed through the closely-packed sand tubes constructed by these colonial worms. In turn, these reefs are able to support a wide range of shore-dwelling species including anemones, snails, shore crabs and seaweeds (Natural England, 2017). In deeper water offshore, the Pink Sea-Fan coral occurs. These are slow-growing colonies of tiny anemone-like animals which feed from the water column and can provide shelter to other species (Natural England, 2017).

The MCZ overlaps both Cornwall Inshore Fisheries and Conservation Authority (IFCA) and Devon and Severn IFCA districts. Neither IFCA have direct management measures in place for the site. The MCZ extends across the 6 nm boundary so is also covered by the Marine Management Organisation (MMO) jurisdiction, however no MMO management measures are currently in place.

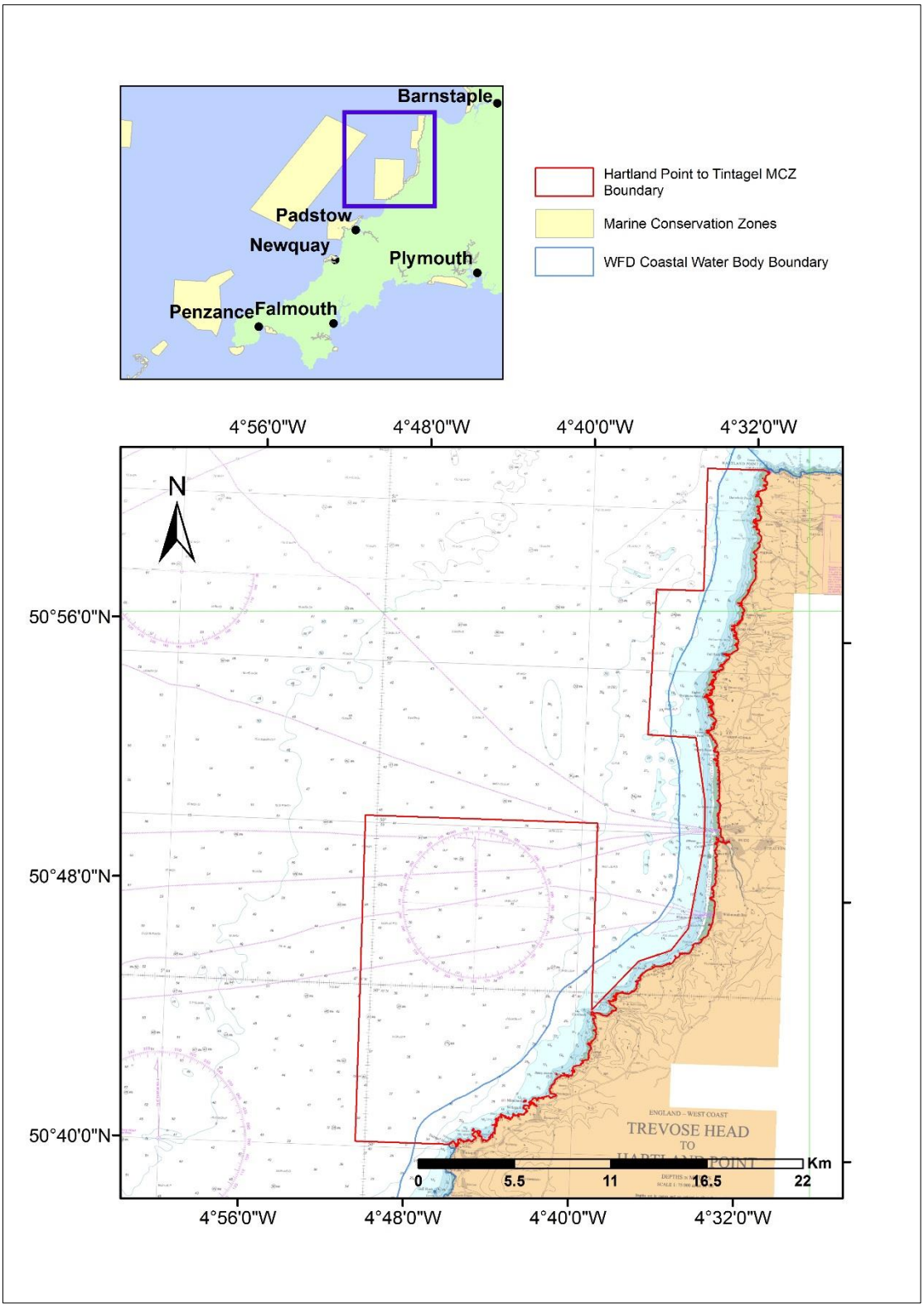


Figure 1. Location of the Hartland Point to Tintagel Marine Conservation Zone (MCZ) in the context of other MCZs off the south-west of England.

The Features of Conservation Importance (FOCI) protected under the MCZ designation order are presented in Table 1 alongside the General Management Approach for each. The survey planned here will focus on those features indicated by blue shading (Table 1).

Table 1. Designation status and the current General Management Approach (GMA) for the Features of Conservation Importance present in the Hartland Point to Tintagel Marine Conservation Zone. The survey planned here will focus on those features indicated by blue shading.

	Features Present	Designated	GMA
Broadscale Habitat (BSH)	Coastal saltmarshes and saline reedbeds	✓	Maintain
	Low energy intertidal rock	✓	Maintain
	Moderate energy intertidal rock	✓	Maintain
	High energy intertidal rock	✓	Maintain
	Intertidal coarse sediment	✓	Maintain
	Intertidal sand and muddy sand	✓	Maintain
	Moderate energy infralittoral rock	✓	Maintain
	High energy infralittoral rock	✓	Maintain
	Moderate energy circalittoral rock	✓	Recover
	High energy circalittoral rock	✓	Recover
	Subtidal coarse sediment	✓	Recover
	Subtidal sand	✓	Recover
Habitat FOCI	Honeycomb Worm (*Sabellaria alveolata*) reefs	✓	Maintain
	Fragile Sponge & Anthozoan Communities on Subtidal Rocky Habitats	✓	Recover
Species FOCI	Pink Sea-Fan (*Eunicella verrucosa*)	✓	Recover

1.2 Survey Aim and Objectives

To undertake a survey of selected Hartland Point to Tintagel MCZ designated features (Table 1) to obtain new evidence which can be used by Natural England, alongside all other relevant information, to detect change over time and ascribe condition to inform future monitoring and management measures.

Objective 1:

A Drop Camera and grab survey of subtidal sediment and rock features with a significant focus between Hartland Point and Crackington.

Objective 2:

A Drop Camera and grab survey of subtidal sediment and rock features in the entire southern section of the MCZ (Crackington to Tintagel - inshore and offshore areas).

Objective 3:

A towed video survey focussing on the Pink Sea-Fan feature to assess the following attributes from Natural England's Supplementary Advice on Conservation Objectives (Natural England, 2017):

1) Population structure – Population size is the number of individuals within a population that contribute to the species viability at a local, national and bio-geographic scale. Population size relates to the abundance of a species. It should include all the populations of a species within the site.

2) Population: recruitment and reproductive capability - Recruitment and reproductive capability reflect the health and success of the population in terms of maintaining and / or restoring numbers. A reduction in the availability of individuals able to successfully reproduce, and survival rates, may impact the overall size and age-structure of the population.

3) Presence and spatial distribution of the species - The presence describes the species occurrence, with the spatial distribution providing a more detailed overview of the location(s) and pattern of occurrence within a site. It is important to consider the various life stages of a species as this may influence its distribution. Disturbance caused by human activities should not adversely affect the species.

4) Supporting Processes: physico-chemical properties and water quality (dissolved oxygen, turbidity) - The physico-chemical properties that influence the species include salinity, pH and temperature. These abiotic factors can affect the species in different ways depending on species-specific tolerances. Temperature and salinity are closely linked and can act either alone or in combination and can ultimately

determine the success of a population, most notably in coastal habitats. Changes in any of these properties, as a result of human activity, may also impact the supporting habitats and the food favoured by the species.

Dissolved Oxygen (DO) levels affect the condition and health of species. A reduction in oxygen concentration may cause some individuals of a Pink Sea-Fan population to die.

Water turbidity is a result of material suspended in the water, including sediment, plankton, pollution or other matter washed into the sea from land sources. In coastal environments turbidity levels can rise and fall rapidly as a result of biological (e.g. plankton blooms), physical (e.g. storm events) or human (e.g. coastal development) factors. Prolonged increases in turbidity could affect the ability of the species to feed and respire.

Incidental information may be gathered on the Sea-Fan Anemone (*Amphianthus dohrnii*), which occurs in association with Pink Sea-Fans (the Sea-Fan Anemone is extremely difficult to observe from video and still images).

Objective 4:

A video survey focussing on the habitat FOCI Fragile Sponge and Anthozoan Communities to assess the following attributes from Natural England's Supplementary Advice on Conservation Objectives (Natural England, 2017):

1) Extent and distribution: presence and spatial distribution of the community - A variety of communities make up the habitat. Listed component communities reflect the habitat's overall character and conservation interest. Changes to the spatial distribution of communities across the feature, could highlight changes to the overall feature. The extent describes the presence and area of the habitat. It's the total area of the habitat across the site as a whole, even where it's patchy. The extent of subtidal rock is important as it provides the platform for the Fragile Sponge and Anthozoan Communities.

2) Structure: species composition of component communities - Species composition of communities includes a consideration of both the overall range of species present within the community, as well as their relative abundance.

3) Structure and function: presence and abundance of key structural and influential species - Structural species are those that form part of the habitat structure or help to define a key biotope. Influential species are those that are likely to have a key role affecting the structure and function of the habitat (such as bioturbators (mixers of sediment), grazers, surface borers, predators or other species with a significant functional role linked to the habitat).

4) Supporting processes: physico-chemical properties and water quality (dissolved oxygen, turbidity) - The physico-chemical properties that influence habitats include salinity, pH and temperature. They can act alone or in combination to

affect habitats and their communities in different ways, depending on species-specific tolerances.

Dissolved Oxygen (DO) levels affect the condition and health of features. Excessive nutrients and / or high turbidity can lead to a drop in DO, especially in warmer months. Low DO can have sub-lethal and lethal impacts on fish and infauna and epifauna communities.

Water turbidity is a result of material suspended in the water, including sediment, plankton, pollution or other matter washed into the sea from land sources. Prolonged changes in turbidity may influence the amount of light reaching the seabed, affecting the primary production and nutrient levels of the habitat's associated communities.

1.3 Survey Team

The Hartland Point to Tintagel MCZ survey took place between the 30th July 2018 and 21st March 2019. The survey team comprised marine monitoring specialists from the Environment Agency. The coastal survey vessels *Severn Guardian* and *Solent Guardian*, staffed and operated by Briggs Marine (Figure 2 and 3, Annex 7.1) were used to conduct the survey work reported here.

Figure 2. Coastal survey vessel *Solent Guardian,* operated by Briggs Marine.

Figure 3. Coastal survey vessel *Severn Guardian*, operated by Briggs Marine

2. Survey Design and Methods

2.1 Survey Design and Planning Phase

Objective 1: A Drop Camera (DC) and grab survey of subtidal sediment and rock features with a significant focus at the north of the MCZ between Hartland Point and Crackington.

During the 2013 MCZ verification survey (Godsell, 2014), there was limited benthic sampling of the inshore subtidal sediment features between Hartland Point and Crackington. A detailed survey was deemed appropriate in order to validate the Broadscale Habitat map produced following the verification survey (Green et al. 2016) and provide community data. DSIFCA also requested broad spatial sampling in this section of the MCZ to aid management measures.

Forty-four Mini-Hamon Grab stations were selected using a 1.5 km triangular grid, information from Admiralty Charts and the verification survey (Figure 4). Historical sampling and the interpreted habitat map suggested sediment was present in a narrow band inshore following the coastline out to the 10 m contour line, and further offshore from the 20 m contour line to the seaward boundary of the MCZ. Stations were placed within these interpreted 'A5.1 Subtidal coarse sediment' and 'A5.2 Subtidal sand' features, as well as in the 'A4.1 High energy circalittoral rock' and 'A4.2 Moderate energy circalittoral rock' feature to verify the habitat map.

Two stations (HRPT54 and 73) were selected for contaminants (TBT, PAHs, PCBs and heavy metals) sampling by 0.1m^2 Day Grab. These stations were placed in the mapped 'A5.1 Subtidal coarse sediment' feature.

A total of 13 DC stations were selected to meet Objectives 1 and 4 (Figure 5). Ten of these stations were placed in areas identified as rock features on the interpreted Broadscale Habitat map and in areas which had little DC data from the verification survey. Three stations were placed on historical records of the Habitat FOCI for Objective 4.

Stations were not placed within 250 m of subsea cables, underwater obstructions or charted wrecks.

Objective 2: A Drop Camera (DC) and grab survey of subtidal sediment and rock features in the entire southern section of the MCZ (Crackington to Tintagel - inshore and offshore areas).

The southern section of the MCZ (Crackington to Tintagel) was extensively surveyed by DC during the verification survey, but only five stations were successfully grabbed. To provide more detailed benthic community data and verification of the interpreted Broadscale Habitat map, 31 stations were selected using a 3 km triangular grid (Figure 4). Power analysis was not undertaken due to the lack of infauna data from the verification survey and the large area covered by this section of the MCZ, leading to high variation in benthic communities. CIFCA also requested broad spatial sampling in this section of the MCZ to aid management measures.

Stations were not placed within 250 m of subsea cables, underwater obstructions, charted wrecks or near records of Habitat FOCI.

Four stations (HRPT02, 04, 19, 32) were selected for contaminants (TBT, PAHs, PCBs and heavy metals) sampling by 0.1m^2 Day Grab. These stations were placed in the mapped 'A5.1 Subtidal coarse sediment' feature.

An additional 32 DC stations were selected to meet both Objectives 2 and 4 (Figures 5). Ten of these stations were placed in the northern offshore section of the site (HRPT17, 21, 25-32) where no previous DC data had been obtained. Twenty-two stations were placed on records of Habitat FOCI Fragile Sponge and Anthozoan Communities to meet Objective 4.

Objective 3: Towed video survey of the Pink Sea-Fan (*Eunicella verrucosa*)

Records of Pink Sea-Fans were obtained from SeaSearch data and the 2013 MCZ verification survey. These were mapped across the MCZ and 300 m x 300 m survey boxes were drawn around historical records. Six survey boxes (C, G, H, I, K and L) were placed within the MCZ boundary to encompass these records (Figure 5) to provide data on this feature following the guidance in Annex 7.6.

Objective 4: Video survey of the 'Fragile Sponge and Anthozoan Communities'

Records of the feature 'Fragile Sponge and Anthozoan Communities' were obtained from the 2013 MCZ verification survey. These were mapped across the MCZ and 300 m x 300 m sample boxes were drawn around historical records. Ten boxes were placed within the MCZ boundary to encompass historical stations which had over five still images noting the presence of this feature (Figure 5). Some of the survey boxes also contained records of Pink Sea-Fan for Objective 3.

Stations which had fewer than five historical stills recording this feature, had a single-tow DC station located there instead of a sample box. Twenty-five single-tow DC stations were placed throughout the MCZ to provide data on this feature following the guidance in Annex 7.6.

Stations were not placed within 250 m of subsea cables, underwater obstructions and charted wrecks.

Marine specialists from the Environment Agency and Natural England reviewed the plan. The following hazards were identified from the UKHO Admiralty charts: underwater cables, shallow water depths and underwater obstructions. Sampling stations were relocated to avoid these hazards as far as possible.

A ‘Notification of an exempt activity form’ for ‘samples and investigations’ was submitted to the Marine Management Organisation prior to the survey being carried out.

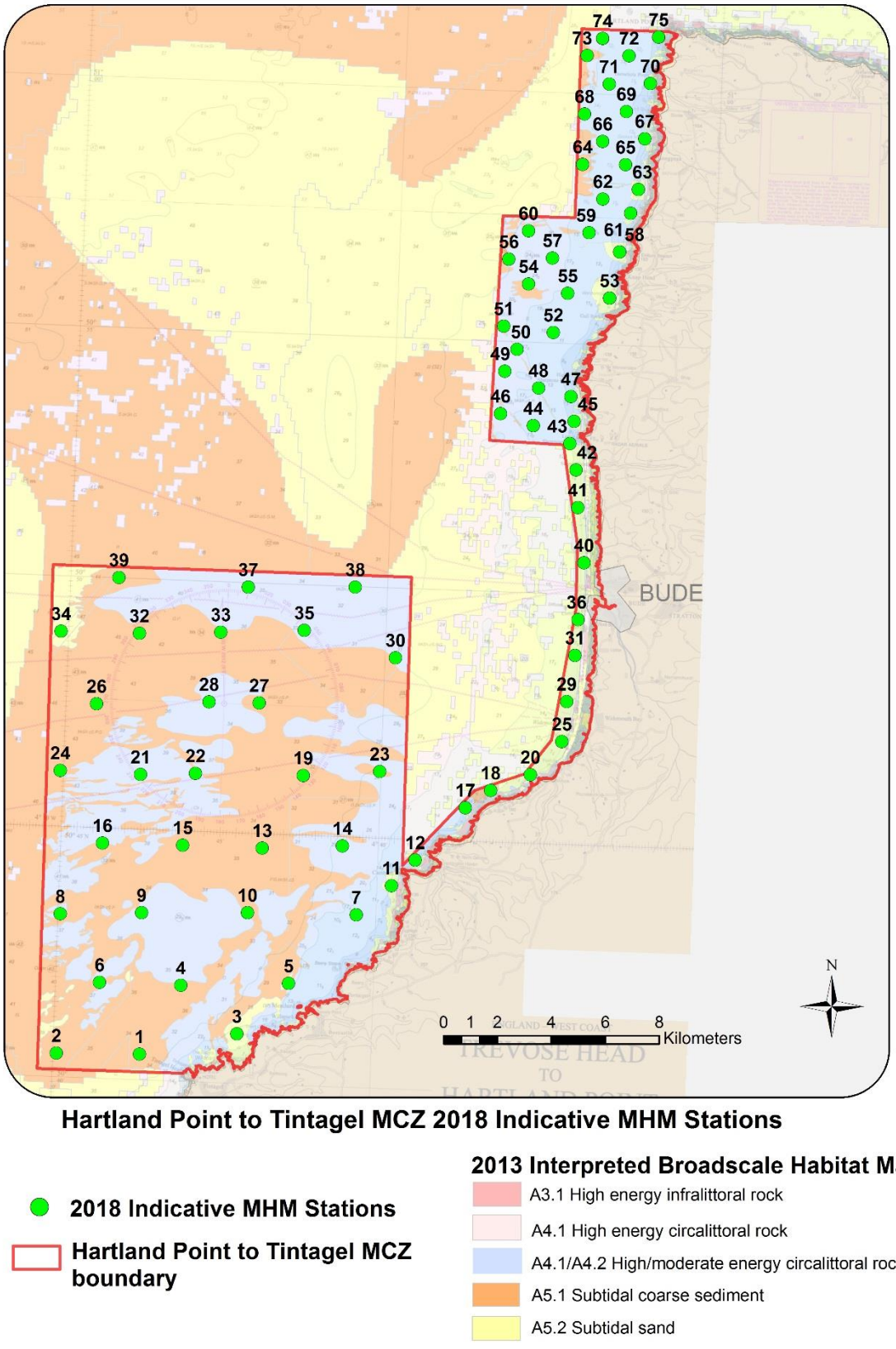
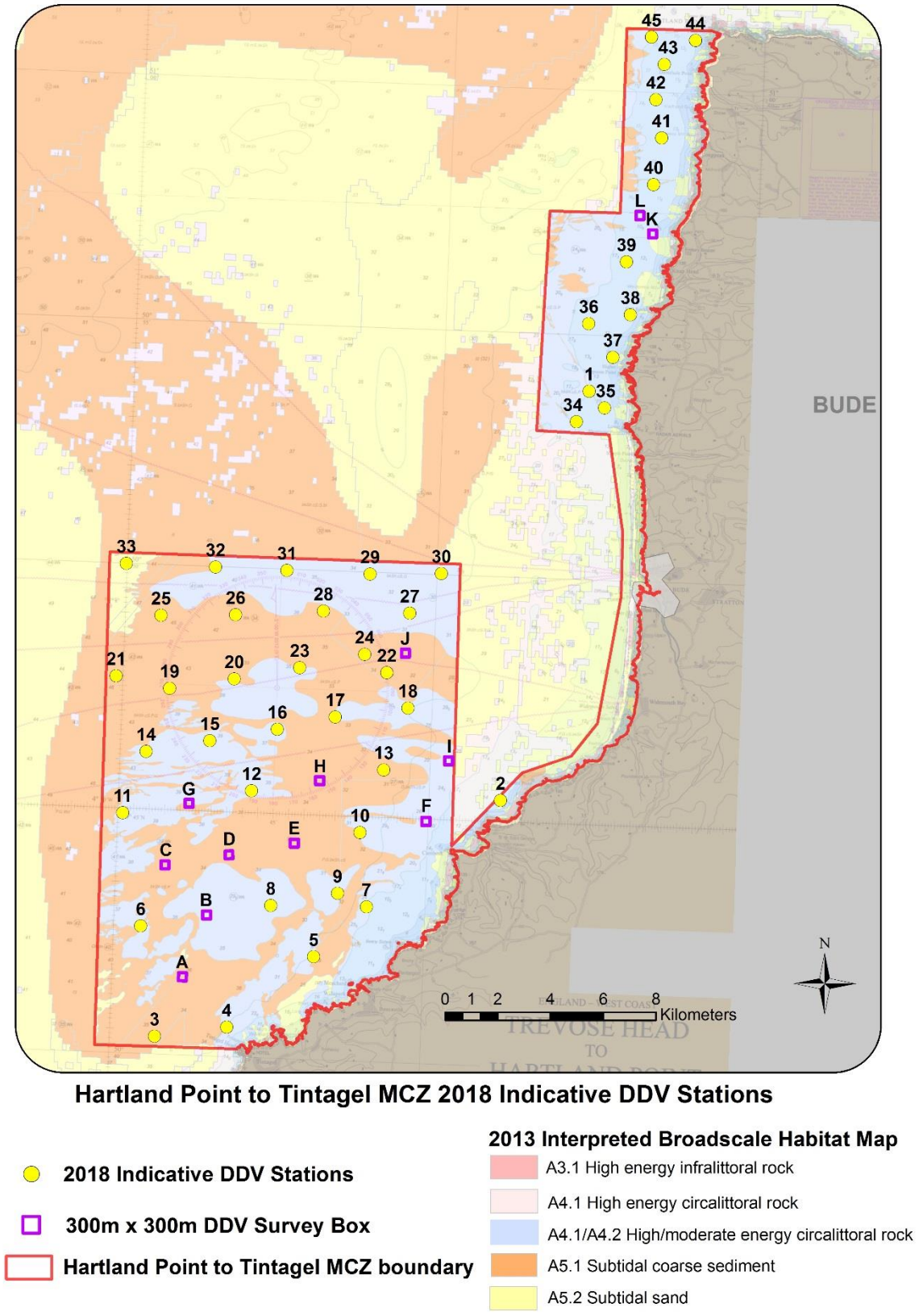


Figure 4. Hartland Point to Tintagel MCZ survey plan showing the indicative Mini-Hamon Grab sampling stations mapped over interpreted Broadscale Habitat data from the 2013 verification survey (Natural England, 2018).



Hartland Point to Tintagel MCZ 2018 Indicative DDV Stations

2018 Indicative DDV Stations

300m x 300m DDV Survey Box

Hartland Point to Tintagel MCZ boundary

2013 Interpreted Broadscale Habitat Map

A3.1 High energy infralittoral rock

A4.1 High energy circalittoral rock

A4.1/A4.2 High/moderate energy circalittoral rock

A5.1 Subtidal coarse sediment

A5.2 Subtidal sand

Figure 5. Hartland Point to Tintagel MCZ survey plan showing the indicative Drop Camera (DC) stations and 300 m x 300 m survey boxes mapped over interpreted Broadscale Habitat data from the 2013 verification survey (Natural England, 2018)

2.2 Sample Collection Methodology

2.2.1 Habitat Characterisation

Drop Camera equipment (Annex 7.2.2 and 7.2.3) was deployed in accordance with the MESH 'recommended operating guidelines (ROG) for underwater video and photographic imaging techniques' (Coggan et al., 2007). The Subsea Technology & Rentals (STR) SeaSpyder camera system was deployed from the stern of the survey vessel, as shown in Figure 6. Real time navigation data acquisition and manual position fixing when the gear contacted the seabed was captured via Trimble® HYDRO*pro*™ software and logged by the survey officer. The mid-point of the vessel's stern gantry was used as the default offset for position fixing (see Annex 7.2.1 for further details). Video files and digital still images were transmitted via the sea cable to be captured and saved directly to a computer in the survey cabin. The video footage was annotated with time and position using a GPS (SIMRAD MX512 DGPS) referenced video overlay (uncorrected position data). Images of the seabed were captured approximately every 10 to 15 metres over a distance of >150 metres. Extra photographs were taken in heterogeneous areas of BSH and if particular habitat/species FOCI were observed. If a BSH habitat boundary was detected towards the end of a tow, the camera deployment was extended to confirm the change. The drop frame depth was controlled via a winch operator receiving instructions from the survey cabin. For further deployment details please see the 'EA underwater video procedure_version 2.4' in Annex 7.3.

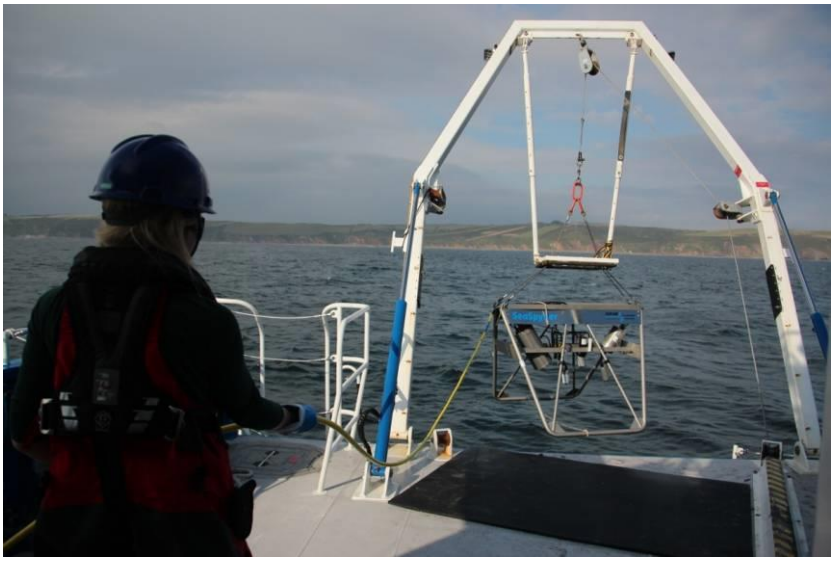


Figure 6. STR SeaSpyder Drop Camera system being deployed from the stern of the coastal survey vessel.

During each Drop Camera deployment, a member of the survey team continuously monitored the real-time video feed, recording general station notes, underwater visibility (Annex 7.4), habitat information and fauna observations. Please see Annex 7.5 for a worked example of the video logsheet.

The procedure for surveying Pink Sea-Fans and Fragile Sponge and Anthozoan Communities involved completing five randomly distributed video tows within a 300 m x 300 m pre-selected survey box. The video tows were undertaken across the survey box, with a minimum tow length of 150 m (as per MESH guidance, Coggan et al., 2007). Every effort was made to ensure video tows did not cross one another. Video was recording for the duration of the tow, with images taken every five seconds. The camera system was towed at a maximum speed over ground of 1.5 knots and hovered at a maximum height of 50 cm above the seabed. The drop frame depth was controlled via a winch operator receiving instructions from the survey cabin. For further procedure details please see the 'Pink Sea-Fan (*Eunicella verrucosa*) and Fragile Sponge and Anthrozoan Communities DC Survey Guidance' in Annex 7.6.

2.2.2 Broadscale Habitat Groundtruthing

A Mini-Hamon Grab (Figure 7), with a sampling area of 0.1 m^2, was deployed from the stern gantry of the vessel to collect sediment from the seabed, as described by Ware and Kenny (2011). Sampling positions were recorded (fixed) using Hydropro data acquisition software when the gear contacted the seabed, with the mid-point of the vessel's stern gantry being used as the default offset for position fixing (see Annex 7.2.1 for further details).

Once recovered, the sample was emptied into a suitable container, photographed, and the sample volume measured. A minimum of three attempts was made at each station to obtain a valid grab sample before the station was abandoned. A sample volume of 5 litres was required to qualify as a valid sample. Samples of <5 litres were ordinarily discarded. However, when it was difficult to obtain a valid sample, a sample with <5 litres of material was retained at the discretion of the lead scientist if it was deemed representative across all attempts made at that station. For valid samples, a small scoop was used to remove a sub-sample (approx. 500 ml) of sediment for particle size analysis (PSA). The remaining sample was washed over a 1 mm sieve to retain the faunal fraction (Figure 7), photographed and preserved with a buffered 4% formaldehyde solution for transfer ashore to a specialist laboratory for analysis.

If the volume of sediment collected was insufficient for faunal analysis in each grab attempt made at a particular station, a photograph was taken and, if possible, material removed for PSA. The station was then abandoned.

Figure 7. Mini-Hamon Grab (left), and equipment for sieving benthic fauna samples (right).

Sediment descriptions were recorded for each sample collected. For consistency across all the MCZ benthic habitat surveys, these were based on a pictorial field guide produced by Cefas marine sedimentologists, a modified Folk seabed sediment classification system (Long, 2006) (Figure 8) and the Wentworth Scale (Table 2).

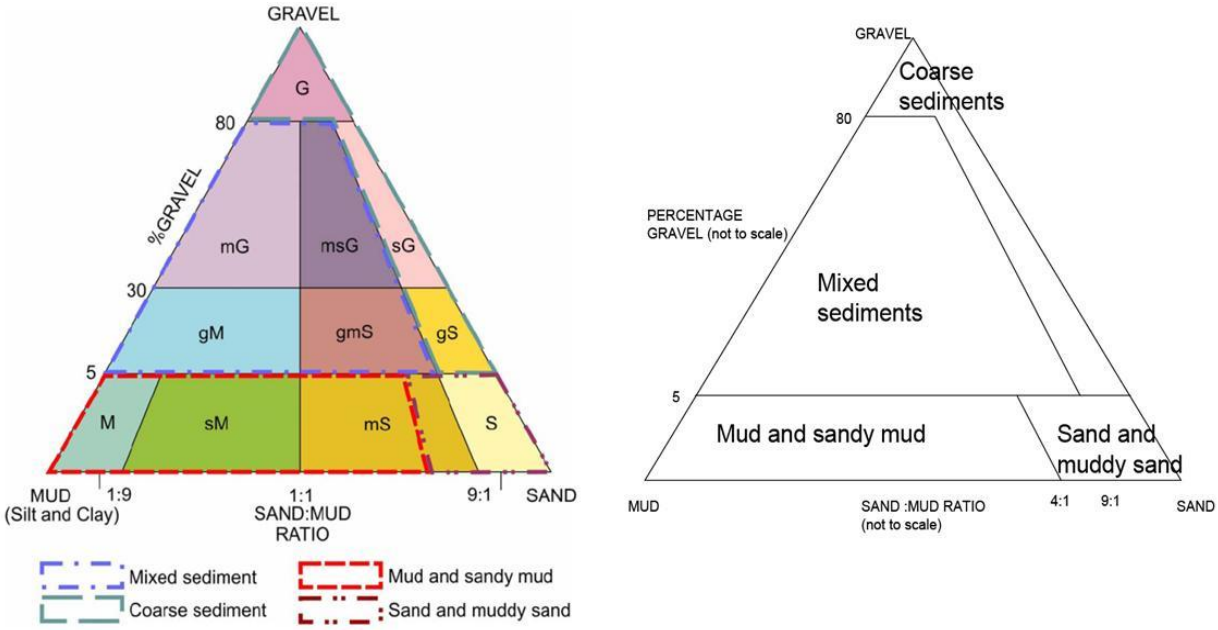


Figure 8. Simplified sediment classification of the Folk triangle for UK SeaMap (Long, 2006).

Table 2. Sediment grade terms and size limits (Wentworth, 1922).

Size	Grade Terms
>256 mm	Boulder
>64-256 mm	Cobble
4-64 mm	Pebble

3. Survey Narrative

Between the 30th July 2018 and 21st March 2019 the Hartland Point to Tintagel MCZ survey took six 'on-task' days to complete (Table 3). Daily progress reports are available from the Environment Agency on request.

Table 3. Summary of equipment deployments during the 2019 Hartland Point to Tintagel Marine Conservation Zone survey.

Equipment	Dates	Duration
Drop Camera deployments	21st and 22nd August 2018	2 days
Mini-Hamon Grab deployments	26th and 27th February 2019, 20th and 21st March 2019	4 days

Environment Agency survey personnel mobilised to the survey vessel *Solent Guardian* berthed in Padstow Harbour on 30th July 2018. The STR SeaSpyder camera system was assembled. The following day the team encountered a 1.7 m swell (Perranporth Waverider Buoy), after a test deployment of the camera, the team decided conditions were unsuitable and returned to Padstow Harbour. Sea and wind conditions were unfavourable the following day and the weather was forecast to deteriorate further over the next few days. Therefore operations were temporarily suspended, the survey vessel, crew and equipment were relocated onto the 'Runnel Stone MCZ' due to the sites being sheltered by the Southwest Peninsula.

On the 6th August 2018 the survey recommenced on *Severn Guardian*. The following day with high water at 01:56 UTC, tidal times were inappropriate for survey work. This allowed time for equipment maintenance, calibration and set up. At 05:15 UTC on the 8th August the vessel departed for the survey area. With a force 3-5 west to north-west wind, accompanied by a moderate sea state with 1.7 m swell, the decision was made that conditions were unsafe for the deployment of camera gear and a water quality survey was completed instead. A man over board safety drill was also carried out in the afternoon.

Between the 9th August and 20th August 2018 the survey vessel *Severn Guardian* was down-weathered in Padstow Harbour for a total of 12 days due to adverse weather conditions. Weather conditions improved on the 21st August, with force 3-4 westerly winds, a moderate sea state and a swell of 1.2 m decreasing throughout the day. The vessel arrived at the first station at 13:30 UTC. After a vessel safety briefing, the team captured digital still images and video footage at 22 stations within the southern section of the MCZ (Crackington to Tintagel, inshore and offshore). The survey finished at 21:15 UTC and the vessel transited back to Padstow Harbour.

The following day, 22nd August, weather conditions improved further, with force 3-4 south-west winds, a slight sea state and less than 0.8 m swell (Perranporth Waverider Buoy CEFAS WaveNet). The vessel left the harbour at 13:15 UTC and was on site at 15:46 UTC. During the first station, the camera cable encountered an umbilical break by the boat's propeller. No further DC camera and video work was possible, no still photos or videos were able to be recovered and the survey vessel returned to Padstow Harbour at 16:30 UTC.

The Hartland Point to Tintagel MCZ survey was met again with poor weather conditions between 23rd to the 27th August 2018. A weather window looked possible on the 28th August, with force 3-4 south-west winds, a moderate sea state and a 1.8 m swell. After a safety briefing due to change-over of survey staff, *Severn Guardian* began to passage towards the survey area. After two DC attempts however, it was identified by the survey team as an unsafe sea state to work. The vessel transited back to Padstow Harbour. The poor weather continued until the 29th August, and an attempted to transit to the survey area on the 30th August was made, but conditions were unfavourable.

Improvements in weather conditions on the 31st August, allowed the survey vessel to leave Padstow Harbour. The forecast was for force 2-3 south-west winds, a slight sea state and 0.5 m swell. A fault occurred with the navigational software onboard, resulting in survey equipment downtime. The decision was made to use this time to passage to Ilfracombe to begin work on the Bideford to Foreland Point MCZ. Due to the exposed location of Hartland Point to Tintagel MCZ and the prevailing southwesterly winds, an executive decision was made that survey work would cease over Winter and be resumed in 2019.

Environment Agency survey personnel mobilised to the survey vessel *Solent Guardian* on the 25th February 2019 in Padstow Harbour. The following day on the 26th February 2019 the vessel left Padstow Harbour at 08:35 UTC and arrived in the south-west part of the survey area at 10:20 UTC. On the way a vessel safety induction and a toolbox talk was carried out. Weather conditions for the next 24 hours included force variable 3-4 winds, a slight to moderate sea state and 1.7 m swell. During the day, a total of 20 Mini-Hamon Grab stations were visited. Viable samples for infauna and particle size analysis were collected at ten stations and an additional station was sampled for PSA only. Nine samples were discarded due to lack of sample or stone caught in the jaw of the grab. Benthic survey work stopped at 18:35 UTC and the survey vessel transited back to Padstow Harbour, arriving at 19:45 UTC. Infauna samples were fixed with 4% formaldehyde in Padstow Harbour and the survey team demobilised.

On the 27th February 2019 *Solent Guardian* left Padstow Harbour at 08:00 UTC and transited to the Hartland to Tintagel MCZ survey area. Weather conditions included 2-3 force variable winds with a slight to moderate sea state and 1 m swell. The vessel

arrived in the south-west part of the survey area at 09:00 UTC. Twenty-four Mini-Hamon Grab station were visited during the day. Viable samples for infauna and PSA were collected at 13 stations, five stations were sampled for PSA only, and eight were discarded due to insufficient quantity of sediment. The vessel departed the survey area at 18:40 UTC and arrived back in Padstow Harbour at 20:35 UTC.

The following day strong southwesterly winds were forecast, which were unsuitable for using the Mini-Hamon Grab. On the 1st March 2019 Environment Agency survey staff demobilised from *Solent Guardian.* Collection the remainder of the Mini-Hamon Grab stations would be attempted later in March 2019.

On the 19th March 2019 Environment Agency staff and the survey vessel *Severn Guardian* mobilised to Padstow Harbour. The following day on the 20th March 2019, weather conditions were favourable with force 3-4 variable winds, a smooth to slight sea state and 1.1 m swell. *Severn Guardian* departed Padstow Harbour at 05:50 UTC and transited to the north-east area of the MCZ. A safety briefing and toolbox talk was held during transit. During the day, 20 grab stations were visited with only six stations sampled for infauna and PSA and 14 stations discarded or unable to obtain sample due to presence of rock. The survey vessel transited back to Padstow Harbour at 14:25 UTC with ropes on at 17:55 UTC.

On the 21st March 2019 *Severn Guardian* mobilised to the north-east area of the MCZ at 06:15 UTC from Padstow Harbour arriving at 08:30 UTC. The weather was similar to the previous day with force 3-4 variable winds and a slight sea state. The last section of Hartland Point to Tintagel MCZ survey was completed from 08:30 UTC to 11:20 UTC with the final 11 stations yielding a total of four viable infauna and PSA samples. *Severn Guardian* returned to Ilfracombe Harbour at 17:10 UTC having attempted all target stations.

4. Data Acquisition

4.1 Survey plan changes

When the survey resumed in 2019, the remaining DC stations and video tow survey boxes were halted due to Natural England reprioritisation of delivery resources. Stills and video was therefore only obtained from 22 of the planned 45 DC stations for Objective 1 and 2. No video tow data was collected in the survey boxes for Objectives 3 and 4.

The contaminants (TBT, PAHs, PCBs and heavy metals) sampling by 0.1m^2 Day Grab was not carried out as suitable sediment material was not identified from the Mini-Hamon Grab survey.

It is currently unknown how the reduced sampling will impact the ability to meet the main aim of the survey and beyond the scope of this survey report. Further analysis will be required to determine whether the reduced sampling will provide sufficient data.

4.2 Sample collection summary

Samples collected during the 2018-19 Hartland Point to Tintagel MCZ survey are summarised in Table 4.

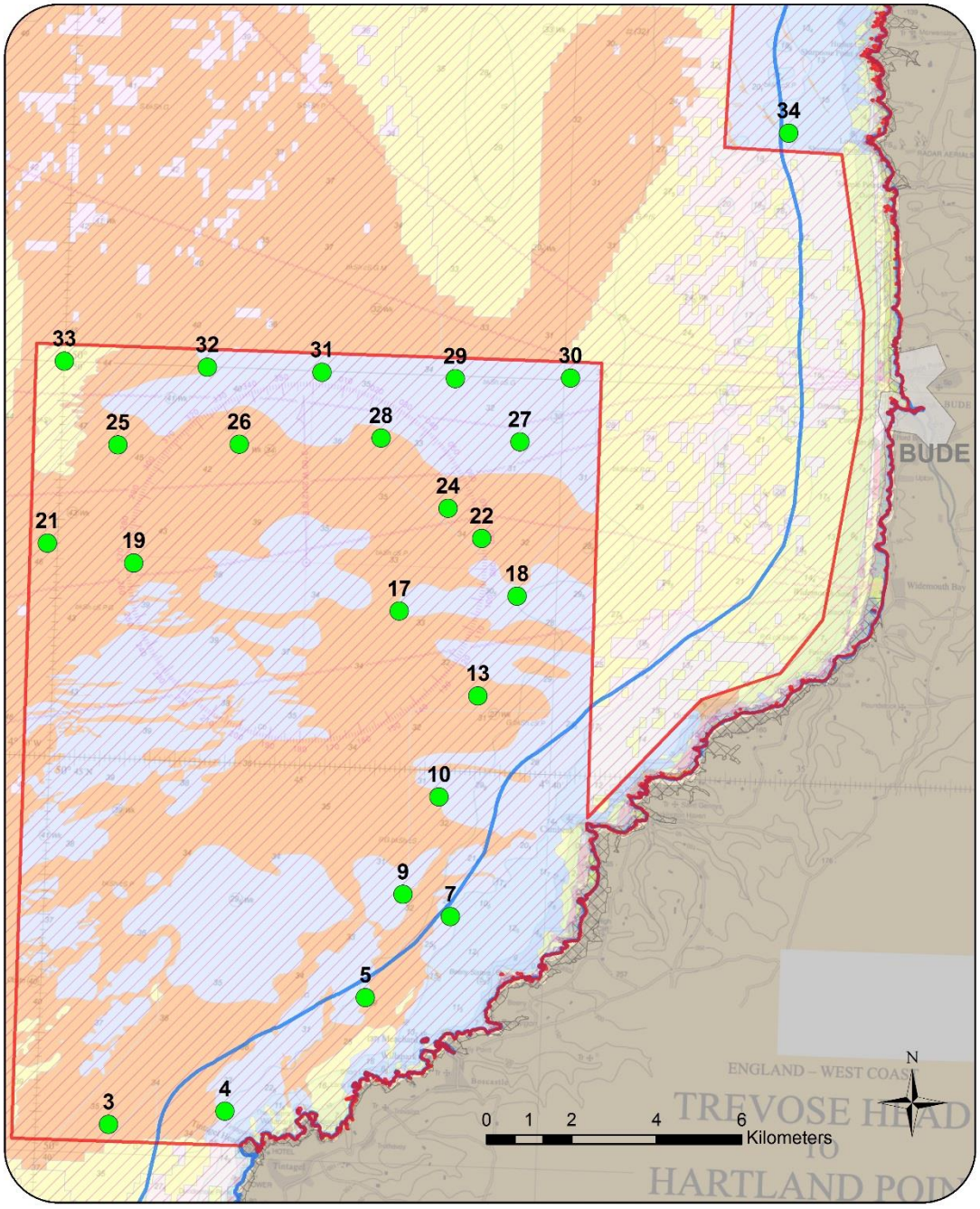
Table 4. Summary of samples collected during the 2019 Hartland Point to Tintagel Marine Conservation Zone survey.

Equipment	Data Type	No. of samples
Drop Camera	Video and still images	23 videos, 340 images
Mini-Hamon Grab	Infauna and PSA	33
	PSA only	6

Viable grab samples were successfully recovered from across the survey area. Samples for both infaunal and particle size analyses were collected at 33 stations, using the Mini-Hamon Grab (Figure 10 and 11). At six stations, the quantity of sediment collected was only sufficient for particle size analysis. Thirty-eight stations selected for groundtruthing yielded only discards (please refer to metadata in Annex 7.8). Definitive classification of habitat features present was not possible prior to the results of the more detailed sample analyses carried out in the laboratory being available.

Video footage and digital photographs of the seabed were captured at 22 stations (Figure 9). European Nature Information System (EUNIS) Level 3 BSH classifications

and species identifications will be assigned to each station following detailed independent analysis of the usable video footage and stills.



Hartland Point to Tintagel MCZ 2018/2019 DDV Data Aquisition

DDV Mid-Point Coordinates

Hartland Point to Tintagel MCZ boundary

Cornwall North Coastal Water Framework Directive Waterbody

Special Areas of Conservation (SACs)

Bristol Channel Approaches / Dynesfeydd Mor Hafren

Tintagel-Marsland-Clovelly Coast

2013 Interpreted Broadscale Habitat Map

A3.1 High energy infralittoral rock

A4.1 High energy circalittoral rock

A4.1/A4.2 High/moderate energy circalittoral rock

A5.1 Subtidal coarse sediment

A5.2 Subtidal sand

Figure 9. Drop Camera Mid-Points from the Hartland Point to Tintagel MCZ Summer 2018 survey, mapped over interpreted Broadscale Habitat data from the 2013 verification survey (Natural England, 2018).

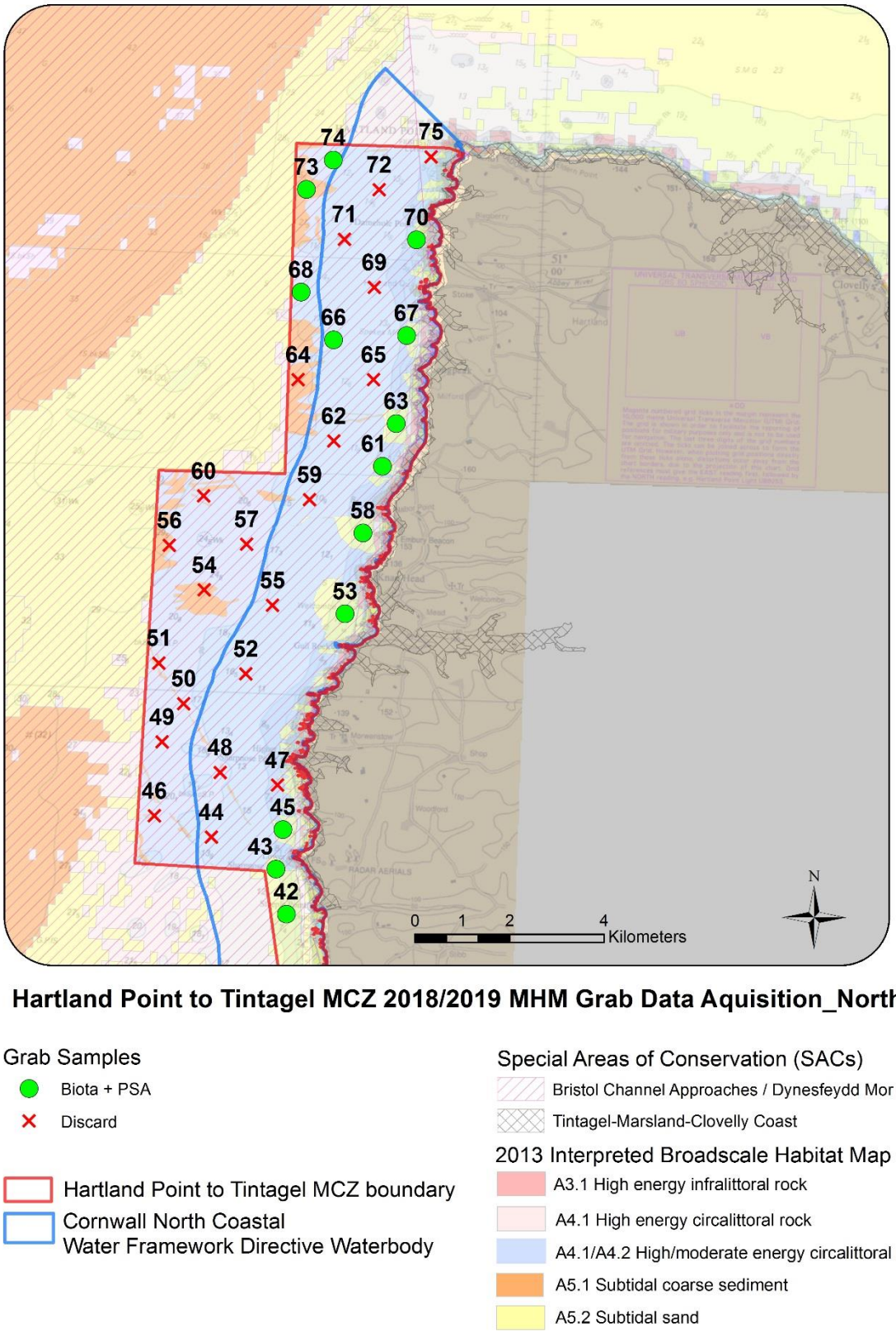
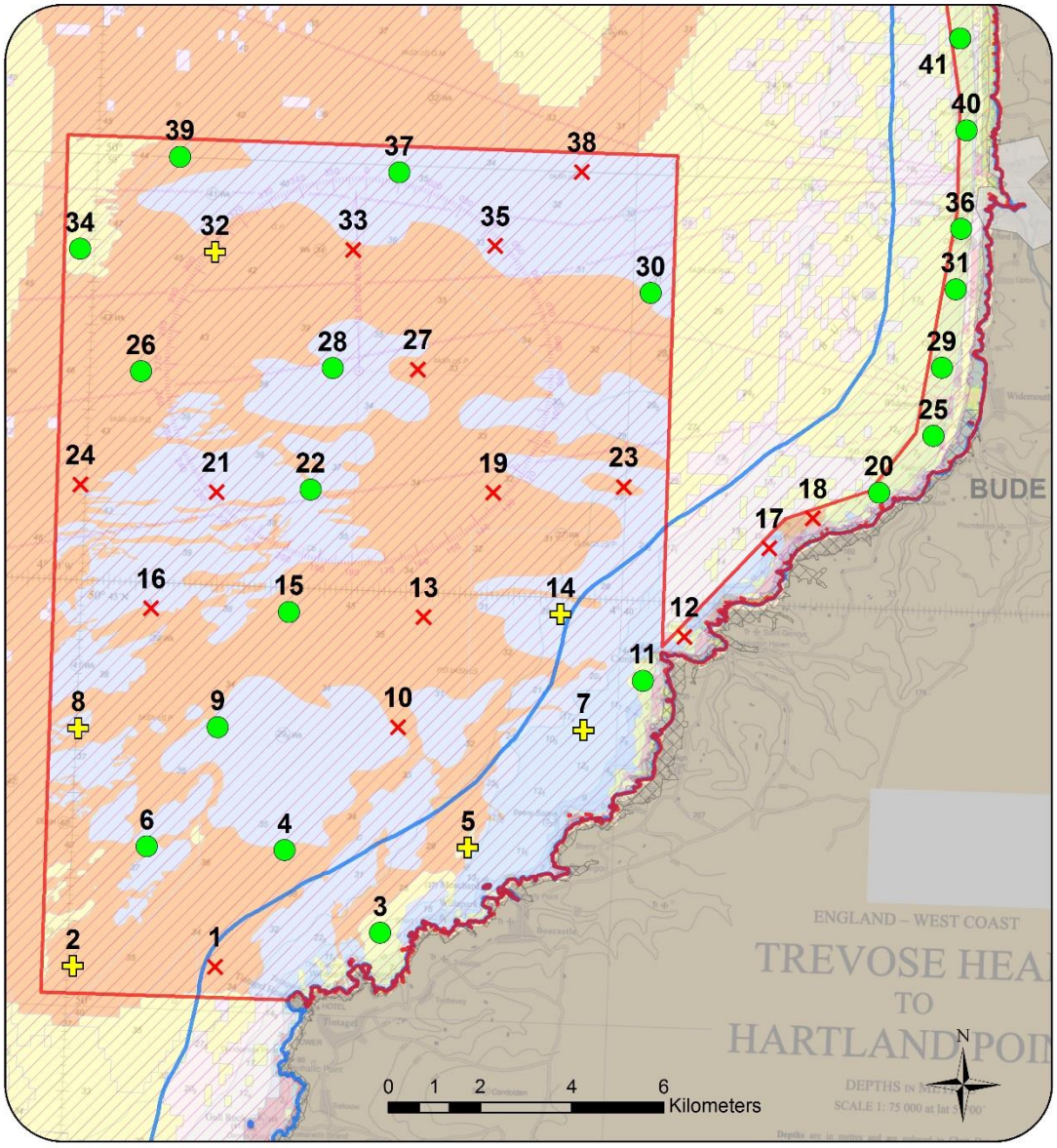


Figure 10 Hartland Point to Tintagel MCZ Winter/Spring 2019 Mini-Hamon Grab survey results - North, mapped over interpreted Broadscale Habitat data from the 2013 verification survey (Natural England, 2018).



Hartland Point to Tintagel MCZ 2018/2019 MHM Grab Data Aquisition_South

Grab Samples
- Biota + PSA
- Discard
- PSA only
- Hartland Point to Tintagel MCZ boundary
- Cornwall North Coastal Water Framework Directive Waterbody

Special Areas of Conservation (SACs)
- Bristol Channel Approaches / Dynesfeydd Mor Hafren
- Tintagel-Marsland-Clovelly Coast

2013 Interpreted Broadscale Habitat Map
- A3.1 High energy infralittoral rock
- A4.1 High energy circalittoral rock
- A4.1/A4.2 High/moderate energy circalittoral rock
- A5.1 Subtidal coarse sediment
- A5.2 Subtidal sand

Figure 11. Hartland Point to Tintagel MCZ Winter/Spring 2019 Mini-Hamon Grab survey results - South, mapped over interpreted Broadscale Habitat data from the 2013 verification survey (Natural England, 2018).

4.3 Evidence of anthropogenic impacts

Fishing gear was identified at station HRPT05 during a camera tow on the 21st August 2018. This had no impact on the sampling and the survey continued as planned.

5. References

Coggan, R., Mitchell, A., White, J. and Golding, N. (2007). Recommended operating guidelines (ROG) for underwater video and photographic imaging techniques. Mapping European Seabed Habitats (MESH) video working group report v.11.2 [online]. Available from: http://www.emodnet-seabedhabitats.eu/PDF/GMHM3_Video_ROG.pdf [Accessed 12/03/2019]

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Natural England, (2017) Designated Sites View, Hartland Point to Tintagel MCZ. Supplementary advice [online]. Available from: https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UKMCZ0034&SiteName=MCZ&SiteNameDisplay=Hartland+Point+to+Tintagel+MCZ&countyCode=&responsiblePerson=&SeaArea=&IFCAArea= [Accessed 12/03/2019]

Natural England. (2018). Internal Marine Data Release - June 2018. Internal Geographic Information package.

Ware, S.J. and Kenny, A.J. (2011). Guidelines for the Conduct of Benthic Studies at Marine Aggregate Extraction Sites (2nd Edition). Marine Aggregate Levy Sustainability Fund, 80 pp.

Wentworth, C.K. (1922). A scale of grade and class terms for clastic sediments. The Journal of Geology 30, 377-392.

6. General List of Abbreviations

BSH	Broadscale Habitat
Cefas	Centre for Environment, Fisheries and Aquaculture Science
CHP	Civil Hydrography Programme
CS	Camera Sledge
CSV	Coastal Survey Vessel
DC	Drop Video Camera
Defra	Department for Environment, Food and Rural Affairs
DG	Day Grab
EA	Environment Agency
ECMAS	Estuarine and Coastal Monitoring & Assessment Service
ENG	Ecological Network Guidance
EUNIS	European Nature Information System
FOCI	Features Of Conservation Importance
IFCA	Inshore Fisheries and Conservation Authority
MCZ	Marine Conservation Zone
MESH	Mapping European Seabed Habitats
PAH	Polyaromatic Hydrocarbons
PCB	Polychlorinated Bipenyls
PSA	Particle Size Analysis
REC	Regional Environmental Characterisation
RSG	Regional Stakeholder Group
SAC	Special Area of Conservation
SAD	Site Assessment Document
SNCB	Statutory Nature Conservation Body
SOP	Standard Operating Procedure
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
STR	Subsea Technology and Rentals
TBT	Tributyltin
UTC	Coordinated Universal Time

7. Annexes

7.1 Coastal Survey Vessel General Information

Briggs Marine and Environmental Services Ltd.
Seaforth House, Seaforth Place, Burtisland, Fife, KY3 9AX.
Tel: +44(0)1592 872939
Email: marketing@briggsmarine.com
Website: www.briggsmarine.com

Solent Guardian

General Information
Length: 18.3 m
Beam: 6.3 m
Draft (baseline): 1.15 m
Draught (skegs): 2.2 m
Displacement (light ship): 22 T
Displacement (full load): 30 T
Service Speed: 16 knots
Maximum Speed: 18 knots

Main Equipment
Main Engines: 2 x Volvo D9-MH 261 bkW @ 2200 rpm. Twin Disc MGX-5075 integral vee-drive
Crew: 2
Scientific Officers: Up to 10
Accommodation: 3 x twin cabins and mess
Data network to share information around vessel
Wet lab/bench for processing water, sediment and ecology samples
Fridge/freezer for sample storage
Dry lab space for two computers and data processing
Large aft deck working area
A frame – 2 T SWL
Double Independent Drum Trawl Winch – 2 T SWL
Hydraulic crane

Briggs Marine and Environmental Services Ltd.
Seaforth House, Seaforth Place, Burtisland, Fife, KY3 9AX.
Tel: +44(0)1592 872939
Email: marketing@briggsmarine.com
Website: www.briggsmarine.com

Severn Guardian

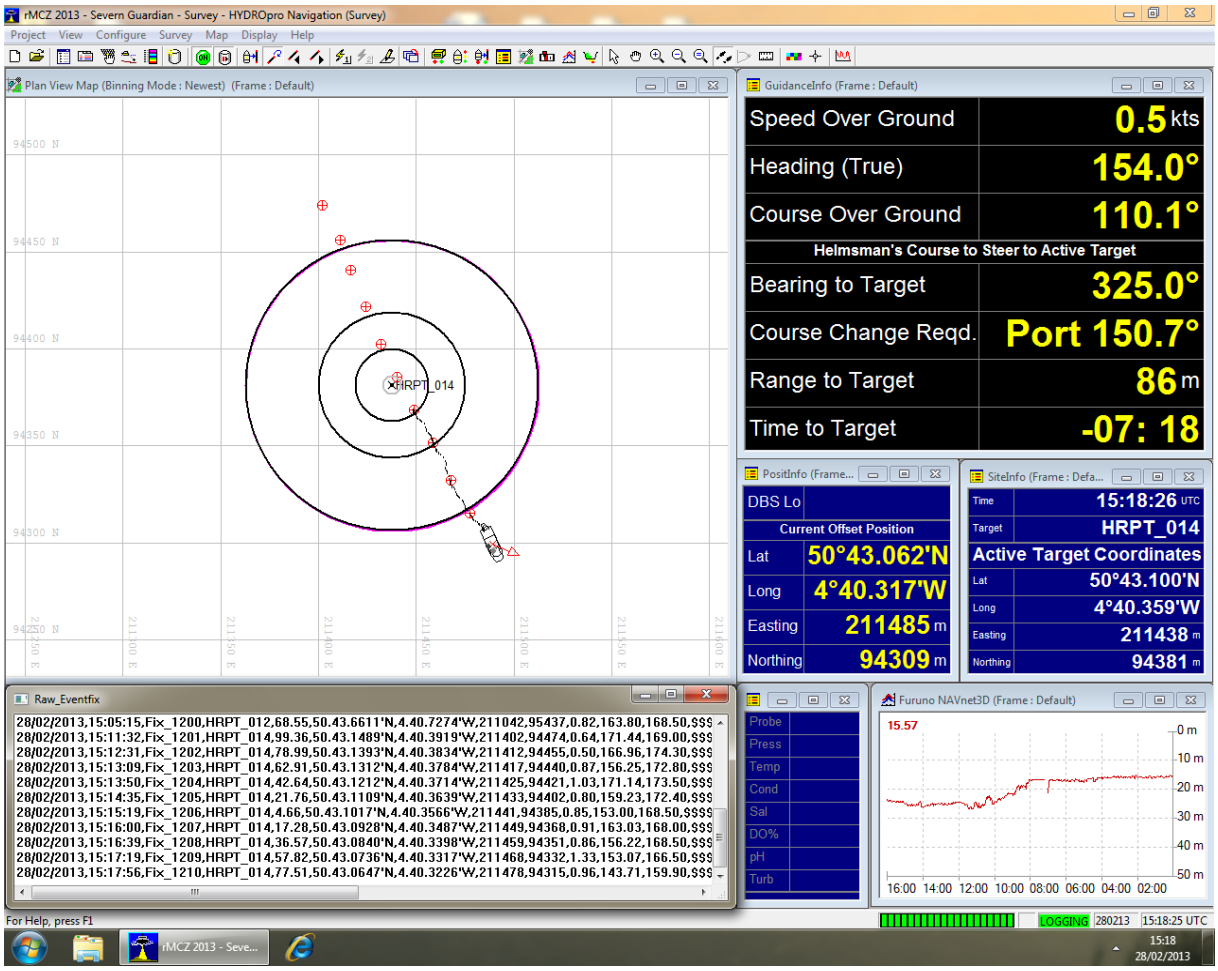
General Information
Length: 18.3 m
Beam: 6.3 m
Draft (baseline): 1.15 m
Draught (skegs): 1.65 m
Displacement (light ship): 22 T
Displacement (full load): 30 T
Service Speed: 16 knots
Maximum Speed: 18 knots

Main Equipment
Main Engines: 2 x Volvo D9-MH 261 bkW @ 2200 rpm. Twin Disc MGX-5075 integral vee-drive
Crew: 2
Scientific Officers: Up to 10
Accommodation: 3 x twin cabins and mess
Data network to share information around vessel
Wet lab/bench for processing water, sediment and ecology samples
Fridge/freezer for sample storage
Dry lab space for two computers and data processing
Large aft deck working area
A frame – 2 T SWL
Double Independent Drum Trawl Winch – 2 T SWL
Hydraulic crane

7.2 Survey Equipment

7.2.1 Navigation and Positioning

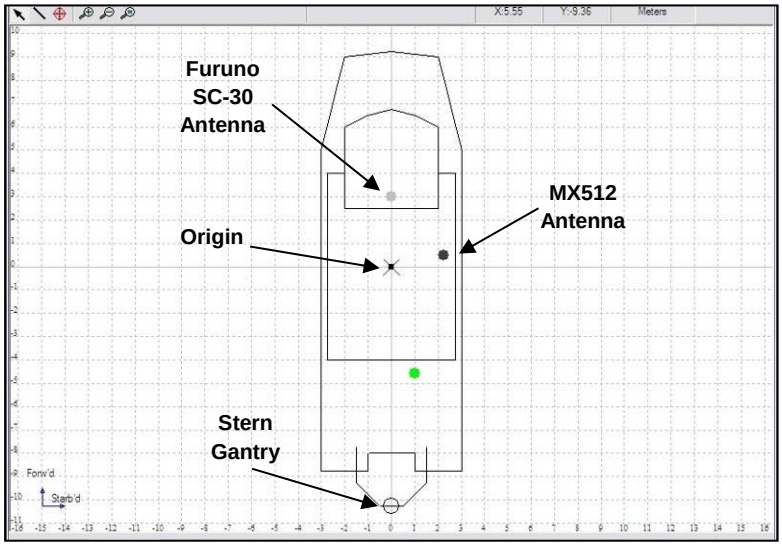
Trimble® HYDRO*pro*™ software is utilised for real-time navigation and survey data acquisition.



Trimble® HYDRO*pro*™ software screen grab displaying real-time navigation and survey data acquisition for a MCZ Drop Camera survey line.

Navigational and survey equipment offsets on the coastal survey vessel *Solent Guardian* and *Severn Guardian* (Environment Agency Estuarine and Coastal Monitoring & Assessment Service).

NMEA Device	Make/Model	Offset Name	Offset (m) X (Starb'd)	Y (Forw'd)	Z +ve (Up)
Gyrocompass	Simrad Robertson RGC50	n/a	-	-	-
Navigation Echosounder	Furuno DFF1, 525ST-MSD transducer	n/a	-	-	-
Survey Echosounder	Kongsberg EA400	n/a	-	-	-
Origin	n/a	Origin	0.0	0.0	0.0
Navigation GPS (Secondary)	Furuno SC-30 DGPS	Furuno SC-30 Antenna	0.0	3.0	0.0
Survey GPS (Primary)	SIMRAD MX512 DGPS	MX512 Antenna	2.25	0.5	0.0
n/a	n/a	Sediment Grab (Stern Gantry)	0.0	-10.25	0.0



Trimble® HYDROpro™ vessel editor screen showing survey equipment offsets from the origin (Environment Agency Estuarine and Coastal Monitoring & Assessment Service).

7.2.2 SeaSpyder Drop Camera System

STR
SUBSEA TECHNOLOGY & RENTALS

SEASPYDER DROP CAMERA SYSTEM


Surface Control Unit & Processor

The SeaSpyder Underwater Drop Camera System is part of a family of field proven camera systems manufactured by STR for the marine survey and environmental communities. The SeaSpyder is ideally suited for operation in shallow-medium water depths with the standard system having a working depth range of 500m. For applications demanding a deeper rating, a "telemetry" model is offered which operates over longer cable lengths for operation down to 1000m. Both models are fitted with a new generation digital SLR Camera offering high resolution digital stills and HD Video for the highest imagery detail. The high specification digital SLR Camera offers an impressive 18.0 mega pixels resolution and both manual and automatic focus for achieving the sharpest images. The captured digital stills are framed with the aid of dedicated real-time video and can be transferred to the topside 'on the fly' for rapid online review.

A 19" rack mount Surface Control Unit and powerful topside processor give full remote control of the camera via the easy to use SeaView GUI software. As standard, the purpose designed camera deployment frame is fitted with a subsea electronics and camera housing, high power underwater flash, an array of four high intensity LED lamps and dual scaling laser pointers to provide accurate imagery scaling. There is the option to install additional sensors with the availability of three user defined serial interfaces with optional power.

SYSTEM FEATURES

- Latest generation 18 Mega Pixels Digital SLR Camera
- Full remote control of camera functions including automatic and manual focus control
- 'On-the-fly' image download
- Real time HD Video
- High intensity LED Lamps
- Dual lasers for precise imagery scaling
- High speed digital telemetry link to camera and sensors
- Additional user defined RS232 ports and 24VDC power interfaces

SEASPYDER SHALLOW WATER CAMERA SYSTEM

SEASPYDER RACK MOUNT PROCESSOR

Hardware: Standard 19" Rack Mountable
Processor: Intel I5 3.1GHz Quad-Core
Memory: 4GB DDR3 RAM
Storage: 500GB hard drive
Interface: DVD-RW, 2 x 1 GigE, 6 x USB, 4 x RS232
Display: 2 x 22" LED HDMI Monitor
Power: 110/240 VAC, 50 Hz (900W)
Dimensions: 19" 3U rack mountable 550 mm (L) x 485 mm (W) x 132mm (H)

SEASPYDER SEAVIEW SOFTWARE

Key Features:

- Remote control of SeaSpyder Digital Stills Camera
- Digital stills and video capture
- "On-the-fly" image download
- External overlay functions
- Realtime composite video
- HD video capture
- Remote control of lights, scaling lasers and additional sensors

SEASPYDER SURFACE CONTROL UNIT

ELECTRICAL

Power Input: 85 – 264 VAC (47 – 63 Hz) ≈ 500 W max
Cable Power: +/- 48VDC Nominal (≈ 400W max.) with built in electrical leakage detector

SIGNAL INTERFACE

Cable Interface #1: High bandwidth VDSL2
Cable Interface #2: Differential Colour Composite Video with automatic cable length compensation

MECHANICAL

Dimensions: 19" 2U rack mountable 550 mm (L) 485 mm (W), 88 mm (H)

SEASPYDER SUBSEA ELECTRONICS

ELECTRICAL

Power Output: 24VDC Output (200 W Max Subsea Power)
Interface: 1 x SeaSpyder Camera & Underwater Flash
4 x 24VDC LED Lamps
2 x RS232 Ports with 24VDC
1 x RS232 Port with 12 VDC/ 24VDC
1 x Dual Scaling Lasers

MECHANICAL

Diameter: 200mm
Length: 409mm
Standard Housing: Hard Anodised Aluminium
Depth Rating: 500m

SEASPYDER 18 MEGA PIXELS UNDERWATER DIGITAL STILLS CAMERA

ELECTRICAL

Image Size: JPEG (720 x 480) to (5184 x 3456)
Image Size: RAW (5184 x 3456)
Video: Full HD (1920 x 1080)
ISO Sensitivity: Auto (100 – 6400), 100 – 12800
Sensor Type: 22.3 x 14.9mm CMOS
Aspect Ratio: 3:2
Shutter Speed: 30 – 1/4000 Sec
Interface: Ethernet

OPTICAL

Standard Lens: 10 – 24mm
Macro Mode: F/3.5 – 4.5
Zoom: Fixed
Focus: Manual & Automatic mode
Angle of View: ≈65° in water
Vertical View: ≈1m²@ 80cm in water

SEASPYDER COLOUR VIDEO CAMERA

ELECTRICAL

Image Resolution: 600 TV lines
Video Format: PAL Composite Colour Video
Sensitivity: 0.01 Lux
Sensor Type: 1/3 Sony Super HAD CCD
Frame Rate: 50 FPS
Video Output: ≈1.3Vpp into 75Ω

OPTICAL

Lens Type: 3.6 mm Wide Angle

SEASPYDER HIGH POWER CAMERA FLASH

ELECTRICAL

Control: TTL control via digital stills camera
Power Input: Power supply via stills camera

MECHANICAL

Diameter: 150mm
Length: 230mm
Weight in Air: 7.6kg
Weight in Water: 3.54kg
Standard Housing: Hard Anodised Aluminium
Depth Rating: 3000 m

SEASPYDER 20W LED LIGHT

ELECTRICAL

Lighting: LED Lamp
Luminous Flux: 1500Lm
Wavelength: Neutral White
Power Input: 24 VDC @ 1.1 A (Built in thermal protection)

MECHANICAL

Diameter: 70mm
Length: 110mm
Weight in Air: 1kg
Weight in Water: 0.58kg
Standard Housing: Hard Anodised Aluminium
Depth Rating: 3000m

SEASPYDER DUAL SCALING SUBSEA LASERS

ELECTRICAL

Power Input: 8 V – 30VDC; 60 m A @ 24VDC

LASER

Type: 2 X Class II Safety Classification (<1 milliwatt output)
Beam Shape: Elliptical (Approx 6 mm Red Dot output)
Beam Divergence: - 0.75mrad
Wavelength: 650nm
Temperature Range: -10°C to 40°C

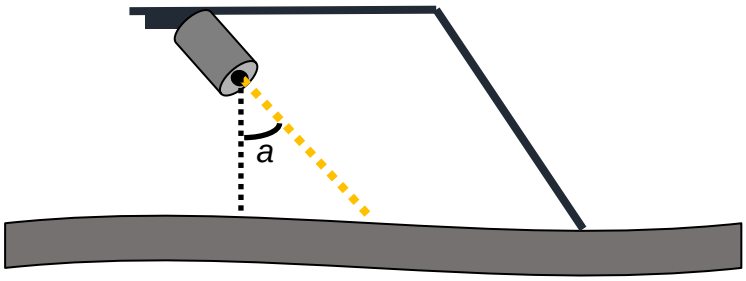
SEASPYDER DROP CAMERA FRAME

MECHANICAL

Length: 2.21m
Width: 1.43m
Height: 1.40m
Weight in Air: 125kg (Inc sensors)

7.2.3 Camera Setup

Manufacturer	Sonar Equipment Services
Model	**Sea Spyder Drop Camera**
Survey Vessel	**Severn Guardian**
Separate video/stills camera	Yes
Approximate video/stills camera line of sight angle (a)	45º
distance of video/stills camera above seabed	60 cm
Flash unit angle relative to the seabed (approx.)	45º
no. of lights (dimmable?)	4 x LED spotlights – non-dimmable
FOV scaling lasers distance apart	**O 20 cm O** **19 cm 19 cm** **O 19 cm O**
Comments: Comments taken from guidance Sea cable point of attachment – vulnerable. Unable to angle video/stills camera any further towards seabed on existing bracket.	



Camera settings	
Date	**21/08/2018**
Image quality	Large – normal 18 Megapixels
Flash setup	1/3rd (various adjustments made)
Shutter speed	1/80
Aperture size	F8.0
ISO setting	AUTO
White balance	AWB
Light metering mode	Evaluative/Multi-segment [(*)]
Focus	Quick mode, manual selection – centre point selected – click 'ON' and wait for camera to complete focus adjustment. 'ON' will deselect when complete.

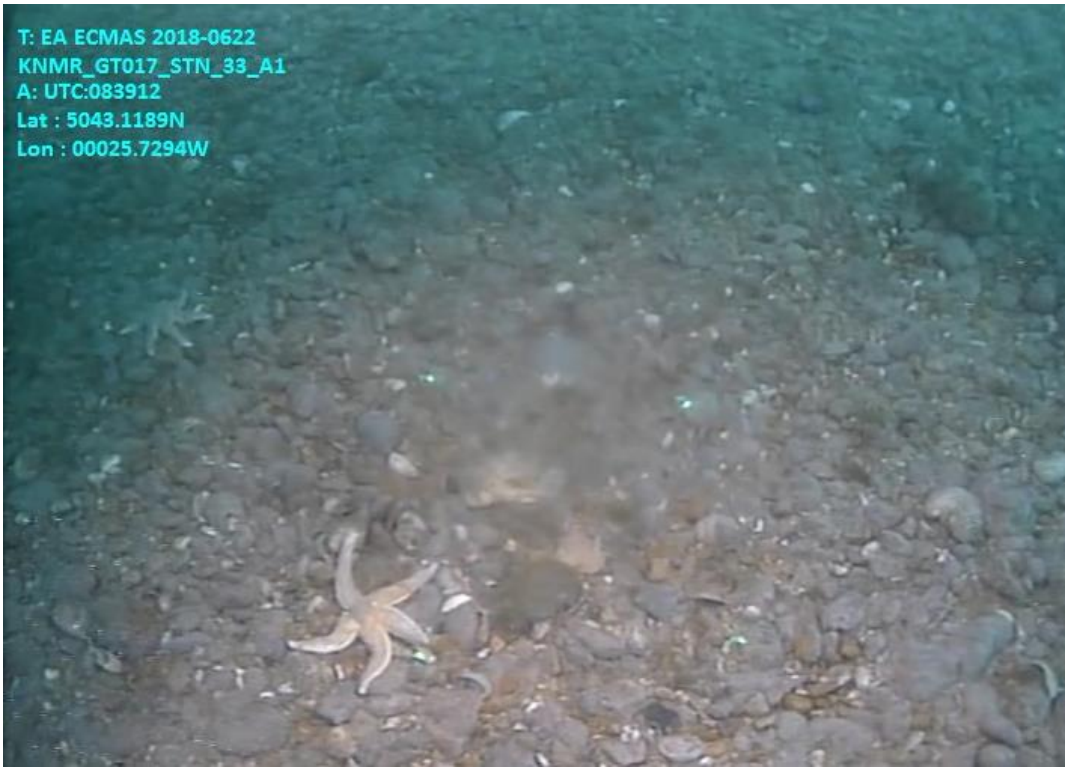
7.3 EA underwater video procedure_version 2.5 (STR Systems)

The procedure outlined below has developed through a series of discussions involving the Environment Agency, Cefas and Natural England. Due to the heterogeneous nature of the inshore coastal seabed habitat, strong tidal streams, various underwater hazards and no dynamic positioning system, a flexible approach is recommended for the underwater video camera deployment. The procedure must be used in accordance with the MESH 'recommended operating guidelines (ROG) for underwater video and photographic imaging techniques' (Coggan et al., 2007).

Important points to remember:

- Select stern gantry offset in Hydropro
- Synchronise all survey equipment (camera, laptops, etc.) with primary survey GPS time (UTC).
- Ensure the correct date, station code, STN number, time and position are displayed on the video overlay and clapperboard (if used).

Overlay Example:
EA ECMAS_2018-0622
KNMR_GT017_STN_33_A1 (annotate if station has been attempted on a previous occasion)
UTC: 083912 (real time feed from survey GPS)
Lat: 5043.1189N (real time feed from survey GPS – **uncorrected**)
Lon: 00025.7294W (real time feed from survey GPS – **uncorrected**)



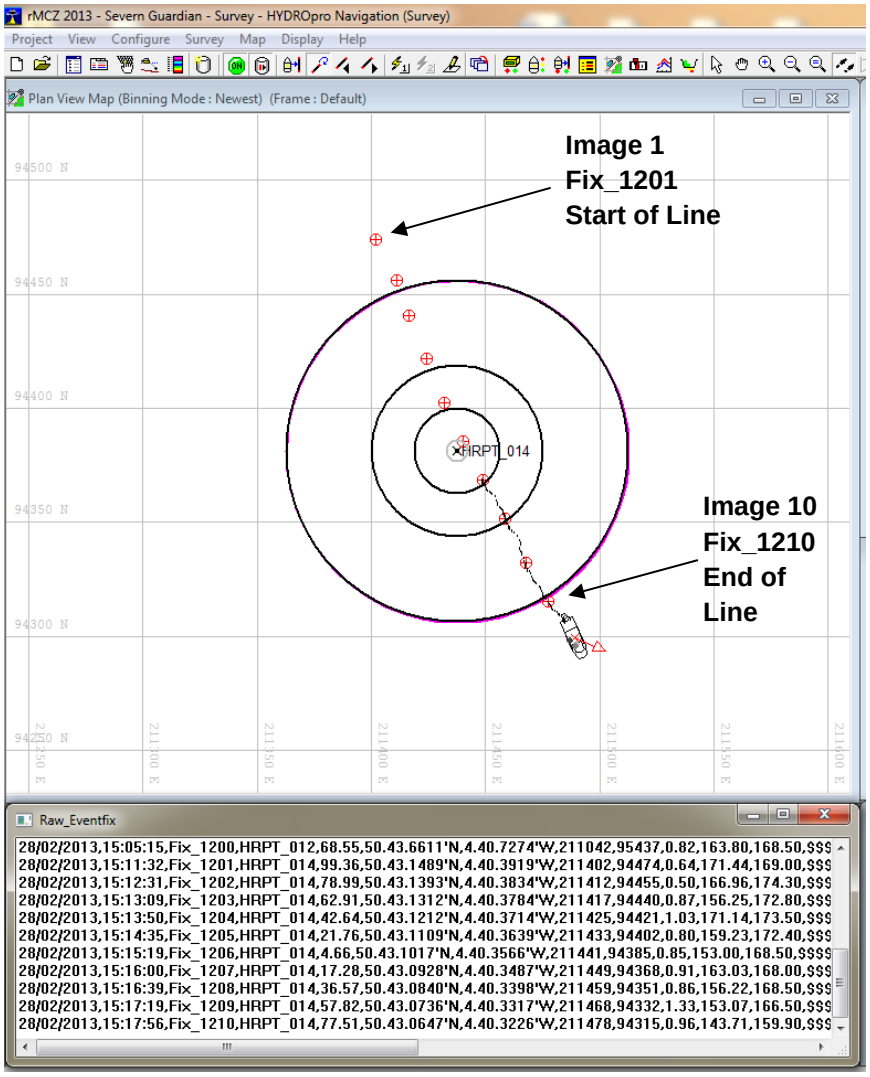
Clapperboard Example:

- Alter the stills prefix to the correct station code.

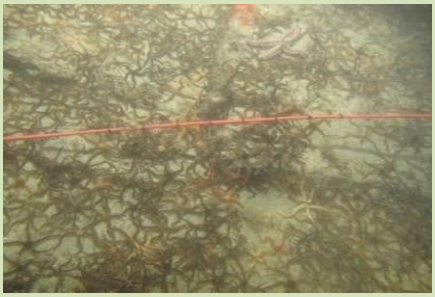
- The field of view scale bar/laser points should be set up/calibrated prior to the survey commencing. Laser pointers are ineffective in moderate/poor visibility conditions; a rope with a visible scale will be required as a replacement
- Set the image resolution to Large Normal (14.7 Megapixels, 18 sec upload time)
- Check the camera settings are appropriate for the conditions; the LED lights are on if required and ensure the video is recording throughout the deployment.

- If a Broadscale Habitat boundary is detected extend the deployment to gather as much information on habitat extent as possible.
- Take extra stills if habitat/species FOCI are observed – note these in the survey log.
- If possible, work a downhill seabed profile to avoid slack cable during deployment.
- Beware of sudden depth changes when surveying rocky areas.
- Abandon the station if survey conditions are hazardous.

Video Camera Type	Survey Conditions	Deployment
Drop Camera	Good visibility SOG <1.5 knots	*Deploy camera initially working across the Hydropro 75 m radius target area, as shown in the diagram below. Hover/rest camera above/on the seabed; take a still every 15 m. If tide/wind conditions do not allow a survey line to be followed across the bull ring, use the outer circle as a guide to ensure a distance of 150 m is covered (minimum) nearby.
	Poor visibility SOG >1.5 knots	Hover/rest camera above/on the seabed, take a still every 15 m. If the visibility is very poor, retrieve the equipment after taking 3-4 stills.



7.4 Underwater Visibility Scale

Example image	Scale	Definition
	Excellent	clear, sharp images - no suspended particulate matter
	Good	seabed features and epifauna clearly discernible
	Moderate	seabed features discernible - epifauna difficult to discern
	Poor	both seabed features and epifauna difficult to discern, low confidence in preliminary habitat assessment
	Very Poor	no seabed features or epifauna visible

7.5 MCZ Video logsheet

MCZ Video Logsheet (v1)

Station data

Contract Code: C5433 Vessel: Solent Guardian Date: 09/04/2016

MCZ Name: Mounts Bay Station Code: MNTB071

Nav-Log filename: SW 2016-0409 SL_log Sampling Gear: DC Water Depth: 10·5 m

Cable Out: _____ (metres). Speed Over Ground (SOG): 1·0 (knots)

Notes on Station:
(including any times & adjustments to Cable Out)

Position Reference Point: Stern gantry

Sample data

Digital Video Tape label: n/a

Filename on Hard-Drive: MNTB_2GDK70416_GT071_STN_1_A1_153751

No. of camera stills: 14 Stills folder name: GT071_STN_1

	GPS Time hh:mm		Fix No	Position in Lat/Long (WGS84)	DV tape counter Mins	Secs
Start of Video (SOV)	15	40	3862	50⁰ 06·3266′ N; 5⁰ 32·2924′ W	n/a	n/a
End of Video (EOV)	15	45	3875	50⁰ 06·3893′ N; 5⁰ 32·2093′ W	n/a	n/a

Visual / Video notes: (ground-type, terrain, visibility, species, FOCI, sketch of transect)

Broad-scale habitats observed

Infralittoral Rock ✓		Circalittoral Rock		Sediment habitats		Others	
high energy		high energy		subtidal mixed		macrophyte dominated sed's	✓
mod.energy		mod.energy		subtidal coarse			
low energy		low energy		subtidal mud		biogenic reef	
				subtidal sand	✓	deep-sea bed	

Completed by: K· Arnold Checked by: N· Godsell Entered by: K· Arnold

7.6 Pink Sea-Fan (*Eunicella verrucosa*) and Fragile Sponge and Anthozoan Communities DC Survey Guidance

The procedure outlined below has been developed through a series of discussions involving the Environment Agency, Cefas and Natural England. Due to the heterogeneous nature of the inshore coastal seabed habitat, strong tidal streams, various underwater hazards and lack of dynamic positioning system, a flexible approach is recommended.

The following guidance should be adhered to when undertaking monitoring of these features using the survey box method **only**.

Before Survey

- 300 m x 300 m survey boxes have been selected based on historical Pink Sea-Fan and Fragile Sponge and Anthozoan Community records. The co-ordinates of the four corners of these boxes will be provided to you prior to the start of survey.

- No co-ordinates for the camera tows have been provided prior for the survey, as the tow direction and location will depend on conditions at sea. Survey box co-ordinates should be uploaded to your navigation system (e.g. HydroPro) to aid camera tow placement.

- Deployment of the video / stills camera (including stills camera mounted on video frame) will comply with guidance developed by MESH: 'Recommended operating guidelines (ROG) for underwater video and photographic imaging techniques (http://webarchive.nationalarchives.gov.uk/20101014084033/http://www.searchmesh.net/Default.aspx?page=1739 and http://webarchive.nationalarchives.gov.uk/20101014084849/http://www.searchmesh.net/PDF/GMHM3_Video_ROG.pdf).

- Four (two pairs) of green scaling lasers should be used and the distance between each point measured before the survey. These details should be recorded on the 'camera equipment configuration' sheet.

- Deployment of the camera system and set up should also comply with EA underwater video procedure version 2.4 (STR Systems).

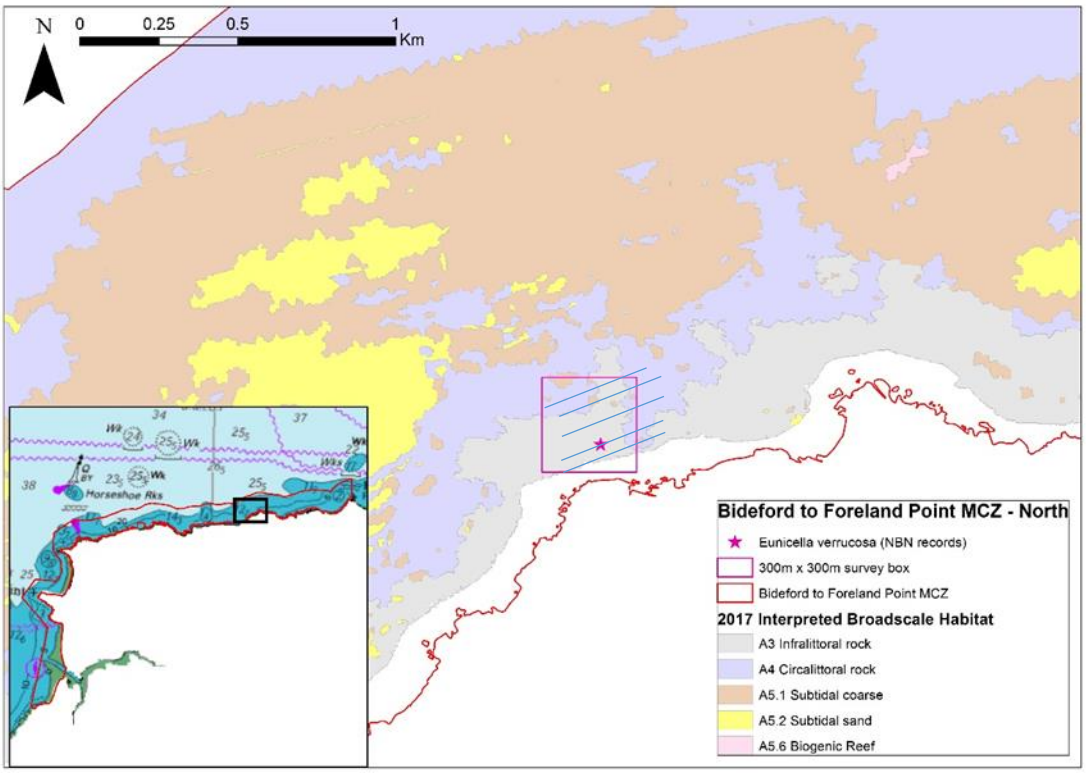
- For the purposes of MCZ naming conventions, each survey box is considered a station (GT number) and each tow a replicate (STN number). Therefore, one station should have five camera tow replicates. Follow Cefas guidance 'MPA work – File naming convention – all sample types. Version 2.1 (11 Jan 2013)'.

E.g. CBSL_2GDK70718_GT008_STN_038

Box number Tow number

During Survey

- 5 x randomly distributed video tows should be undertaken across the survey box, with a minimum tow length of 150 m (as per standard tow length) (see example below). Ideally, video tows should not cross each other.



- Position of MCZ features, human activities (e.g. fishing gear) or damage (e.g. broken Pink Sea-Fans) should be noted on the survey log and locations also recorded using the navigation software (Hpro 'fix').

- The Seaspyder camera should hover just above the seabed at a maximum height of 50 cm. The system should be towed at approximately 1 knot or less, up to maximum 1.5 knots speed over ground (SOG). The camera system should be deployed with the tail fin, buoy and line to facilitate towing.

The video/stills data are used for counts of colonies / individuals of Pink Sea-Fan so the slower and more stable the tow, the better the data quality.

- The video should be recording for the entire tow.

- Still images should also be taken every 5 seconds during the tow.

- One Idronaut reading for near seabed turbidity, O_2, temperature and salinity measurements should be taken within each survey box. Take care with deployment due to the presence of rocky reef and follow EA Idronaut deployment procedure. Contact your Team Leader if unsure on the correct Idronaut procedure.

- Good visibility is vital for video/still analysis. Do not undertake the survey if visibility is less than ‘moderate’

7.7 Video Survey Metadata

Date	Time UTC	Station Code	WGS84 Latitude DD.DDDDD	WGS84 Longitude DD.DDDDD	STN No.	Hpro fix no.	Fix Description	Still Label	Water depth (m)	SOG (kts)
Sampling Gear: SeaSpyder Drop Camera, FOV Scale: 4 x laser points arranged in an approx square 23 cm (left) x 19.5 cm (furthest from camera) x 19.5 cm (right) x 20 cm (closest to camera)										
21/08/2018	13:40:42	HRPT03	50°40.3557'N	4°48.5952'W	1	4438	SoL (Start of Line)	HRPT_2FGL50818_GT03_STN_1_A1_0001_134043.JPG	42.80	0.75
21/08/2018	13:41:07	HRPT03	50°40.3578'N	4°48.5898'W	1	4439		HRPT_2FGL50818_GT03_STN_1_A1_0002_134108.JPG	42.80	0.54
21/08/2018	13:41:23	HRPT03	50°40.3591'N	4°48.5848'W	1	4440		HRPT_2FGL50818_GT03_STN_1_A1_0003_134124.JPG	43.10	0.81
21/08/2018	13:41:43	HRPT03	50°40.3597'N	4°48.5781'W	1	4441		HRPT_2FGL50818_GT03_STN_1_A1_0004_134144.JPG	42.50	0.84
21/08/2018	13:42:03	HRPT03	50°40.3599'N	4°48.5708'W	1	4442		HRPT_2FGL50818_GT03_STN_1_A1_0005_134203.JPG	42.80	0.84
21/08/2018	13:42:31	HRPT03	50°40.3602'N	4°48.5606'W	1	4443		HRPT_2FGL50818_GT03_STN_1_A1_0006_134232.JPG	42.60	0.82
21/08/2018	13:42:42	HRPT03	50°40.3606'N	4°48.5563'W	1	4444		HRPT_2FGL50818_GT03_STN_1_A1_0007_134243.JPG	42.80	0.93
21/08/2018	13:43:01	HRPT03	50°40.3605'N	4°48.5472'W	1	4445		HRPT_2FGL50818_GT03_STN_1_A1_0008_134302.JPG	42.70	1.24
21/08/2018	13:43:27	HRPT03	50°40.3610'N	4°48.5375'W	1	4446		HRPT_2FGL50818_GT03_STN_1_A1_0009_134328.JPG	42.50	0.76
21/08/2018	13:43:51	HRPT03	50°40.3616'N	4°48.5293'W	1	4447		HRPT_2FGL50818_GT03_STN_1_A1_0010_134352.JPG	42.10	0.78
21/08/2018	13:44:19	HRPT03	50°40.3625'N	4°48.5217'W	1	4448		HRPT_2FGL50818_GT03_STN_1_A1_0011_134420.JPG	42.70	0.59
21/08/2018	13:44:39	HRPT03	50°40.3632'N	4°48.5145'W	1	4449		HRPT_2FGL50818_GT03_STN_1_A1_0012_134440.JPG	42.70	0.83
21/08/2018	13:45:08	HRPT03	50°40.3639'N	4°48.5054'W	1	4450		HRPT_2FGL50818_GT03_STN_1_A1_0013_134509.JPG	42.70	0.85
21/08/2018	13:45:29	HRPT03	50°40.3645'N	4°48.4988'W	1	4451		HRPT_2FGL50818_GT03_STN_1_A1_0014_134530.JPG	42.80	0.70
21/08/2018	13:45:58	HRPT03	50°40.3660'N	4°48.4920'W	1	4452		HRPT_2FGL50818_GT03_STN_1_A1_0015_134559.JPG	42.80	0.49
21/08/2018	13:46:15	HRPT03	50°40.3672'N	4°48.4882'W	1	4453	EoL (End of Line)	HRPT_2FGL50818_GT03_STN_1_A1_0016_134616.JPG	42.40	0.52
21/08/2018	13:59:07	HRPT04	50°40.5744'N	4°46.2899'W	2	4454	SoL	HRPT_2FGL50818_GT04_STN_2_A1_0017_135908.JPG	36.60	0.71
21/08/2018	13:59:52	HRPT04	50°40.5773'N	4°46.2822'W	2	4455		HRPT_2FGL50818_GT04_STN_2_A1_0018_135953.JPG	36.60	0.72
21/08/2018	14:00:17	HRPT04	50°40.5780'N	4°46.2721'W	2	4456		HRPT_2FGL50818_GT04_STN_2_A1_0019_140018.JPG	36.40	0.94
21/08/2018	14:00:33	HRPT04	50°40.5785'N	4°46.2660'W	2	4457		HRPT_2FGL50818_GT04_STN_2_A1_0020_140034.JPG	36.60	0.98
21/08/2018	14:01:11	HRPT04	50°40.5801'N	4°46.2513'W	2	4458		HRPT_2FGL50818_GT04_STN_2_A1_0021_140112.JPG	35.60	0.91
21/08/2018	14:01:20	HRPT04	50°40.5807'N	4°46.2480'W	2	4459		HRPT_2FGL50818_GT04_STN_2_A1_0022_140121.JPG	36.10	0.87
21/08/2018	14:01:40	HRPT04	50°40.5820'N	4°46.2408'W	2	4460		HRPT_2FGL50818_GT04_STN_2_A1_0023_140141.JPG	36.20	0.95
21/08/2018	14:02:00	HRPT04	50°40.5837'N	4°46.2347'W	2	4461		HRPT_2FGL50818_GT04_STN_2_A1_0024_140201.JPG	36.60	0.73
21/08/2018	14:02:32	HRPT04	50°40.5858'N	4°46.2233'W	2	4462		HRPT_2FGL50818_GT04_STN_2_A1_0025_140233.JPG	36.10	0.87
21/08/2018	14:02:45	HRPT04	50°40.5869'N	4°46.2186'W	2	4463		HRPT_2FGL50818_GT04_STN_2_A1_0026_140246.JPG	36.60	0.86
21/08/2018	14:03:09	HRPT04	50°40.5888'N	4°46.2095'W	2	4464		HRPT_2FGL50818_GT04_STN_2_A1_0027_140310.JPG	36.50	0.98

Date	Time UTC	Station Code	WGS84 Latitude DD.DDDDD	WGS84 Longitude DD.DDDDD	STN No.	Hpro fix no.	Fix Description	Still Label	Water depth (m)	SOG (kts)
21/08/2018	14:03:33	HRPT04	50°40.5907'N	4°46.2004'W	2	4465		HRPT_2FGL50818_GT04_STN_2_A1_0028_140333.JPG	36.20	0.83
21/08/2018	14:04:05	HRPT04	50°40.5936'N	4°46.1886'W	2	4466		HRPT_2FGL50818_GT04_STN_2_A1_0029_140406.JPG	36.40	1.04
21/08/2018	14:04:39	HRPT04	50°40.5958'N	4°46.1772'W	2	4467	EoL	HRPT_2FGL50818_GT04_STN_2_A1_0030_140440.JPG	36.30	0.64
21/08/2018	14:21:50	HRPT05	50°42.0748'N	4°43.5731'W	3	4468	SoL	HRPT_2FGL50818_GT05_STN_3_A1_0031_142151.JPG	37.70	0.69
21/08/2018	14:22:26	HRPT05	50°42.0768'N	4°43.5597'W	3	4469		HRPT_2FGL50818_GT05_STN_3_A1_0032_142227.JPG	37.60	0.84
21/08/2018	14:22:44	HRPT05	50°42.0777'N	4°43.5554'W	3	4470		HRPT_2FGL50818_GT05_STN_3_A1_0033_142245.JPG	37.20	0.63
21/08/2018	14:23:03	HRPT05	50°42.0791'N	4°43.5493'W	3	4471		HRPT_2FGL50818_GT05_STN_3_A1_0034_142304.JPG	36.80	0.80
21/08/2018	14:23:28	HRPT05	50°42.0811'N	4°43.5412'W	3	4472		HRPT_2FGL50818_GT05_STN_3_A1_0035_142329.JPG	36.40	0.78
21/08/2018	14:24:00	HRPT05	50°42.0827'N	4°43.5334'W	3	4473		HRPT_2FGL50818_GT05_STN_3_A1_0036_142401.JPG	36.10	0.51
21/08/2018	14:24:34	HRPT05	50°42.0849'N	4°43.5245'W	3	4474		HRPT_2FGL50818_GT05_STN_3_A1_0037_142435.JPG	36.50	0.72
21/08/2018	14:25:01	HRPT05	50°42.0871'N	4°43.5154'W	3	4475		HRPT_2FGL50818_GT05_STN_3_A1_0038_142502.JPG	36.40	0.95
21/08/2018	14:25:15	HRPT05	50°42.0885'N	4°43.5098'W	3	4476		HRPT_2FGL50818_GT05_STN_3_A1_0039_142515.JPG	37.10	0.91
21/08/2018	14:25:27	HRPT05	50°42.0900'N	4°43.5055'W	3	4477		HRPT_2FGL50818_GT05_STN_3_A1_0040_142528.JPG	37.50	0.89
21/08/2018	14:25:49	HRPT05	50°42.0926'N	4°43.4976'W	3	4478		HRPT_2FGL50818_GT05_STN_3_A1_0041_142550.JPG	37.20	0.86
21/08/2018	14:26:12	HRPT05	50°42.0947'N	4°43.4909'W	3	4479		HRPT_2FGL50818_GT05_STN_3_A1_0042_142613.JPG	36.80	0.66
21/08/2018	14:26:44	HRPT05	50°42.0985'N	4°43.4823'W	3	4480		HRPT_2FGL50818_GT05_STN_3_A1_0043_142645.JPG	36.60	0.71
21/08/2018	14:26:59	HRPT05	50°42.0999'N	4°43.4788'W	3	4481		HRPT_2FGL50818_GT05_STN_3_A1_0044_142700.JPG	36.80	0.59
21/08/2018	14:27:24	HRPT05	50°42.1032'N	4°43.4707'W	3	4482	EoL	HRPT_2FGL50818_GT05_STN_3_A1_0045_142725.JPG	36.60	0.94
21/08/2018	14:38:12	HRPT07	50°43.1268'N	4°41.9416'W	4	4483	SoL	HRPT_2FGL50818_GT07_STN_4_A1_0046_143813.JPG	30.60	0.75
21/08/2018	14:38:35	HRPT07	50°43.1302'N	4°41.9346'W	4	4484		HRPT_2FGL50818_GT07_STN_4_A1_0047_143836.JPG	30.60	0.87
21/08/2018	14:38:48	HRPT07	50°43.1317'N	4°41.9311'W	4	4485		HRPT_2FGL50818_GT07_STN_4_A1_0048_143849.JPG	29.70	0.72
21/08/2018	14:39:12	HRPT07	50°43.1357'N	4°41.9244'W	4	4486		HRPT_2FGL50818_GT07_STN_4_A1_0049_143912.JPG	30.50	1.06
21/08/2018	14:39:40	HRPT07	50°43.1394'N	4°41.9155'W	4	4487		HRPT_2FGL50818_GT07_STN_4_A1_0050_143941.JPG	31.10	0.89
21/08/2018	14:40:06	HRPT07	50°43.1428'N	4°41.9076'W	4	4488		HRPT_2FGL50818_GT07_STN_4_A1_0051_144007.JPG	30.80	0.82
21/08/2018	14:40:32	HRPT07	50°43.1458'N	4°41.8993'W	4	4489		HRPT_2FGL50818_GT07_STN_4_A1_0052_144033.JPG	30.10	0.94
21/08/2018	14:41:10	HRPT07	50°43.1501'N	4°41.8881'W	4	4490		HRPT_2FGL50818_GT07_STN_4_A1_0053_144111.JPG	30.50	0.91
21/08/2018	14:41:48	HRPT07	50°43.1536'N	4°41.8779'W	4	4491		HRPT_2FGL50818_GT07_STN_4_A1_0054_144149.JPG	30.40	0.49
21/08/2018	14:42:26	HRPT07	50°43.1571'N	4°41.8683'W	4	4492		HRPT_2FGL50818_GT07_STN_4_A1_0055_144226.JPG	29.90	0.74
21/08/2018	14:42:58	HRPT07	50°43.1613'N	4°41.8593'W	4	4493		HRPT_2FGL50818_GT07_STN_4_A1_0056_144259.JPG	29.00	0.72
21/08/2018	14:43:21	HRPT07	50°43.1637'N	4°41.8539'W	4	4494		HRPT_2FGL50818_GT07_STN_4_A1_0057_144322.JPG	29.50	0.75
21/08/2018	14:43:50	HRPT07	50°43.1673'N	4°41.8475'W	4	4495		HRPT_2FGL50818_GT07_STN_4_A1_0058_144351.JPG	28.50	0.62
21/08/2018	14:44:27	HRPT07	50°43.1723'N	4°41.8392'W	4	4496		HRPT_2FGL50818_GT07_STN_4_A1_0059_144428.JPG	28.60	0.94
21/08/2018	14:44:50	HRPT07	50°43.1772'N	4°41.8336'W	4	4497	EoL	HRPT_2FGL50818_GT07_STN_4_A1_0060_144451.JPG	29.00	1.06
21/08/2018	14:53:34	HRPT09	50°43.4058'N	4°42.8942'W	5	4498	SoL	HRPT_2FGL50818_GT09_STN_5_A1_0061_145335.JPG	40.70	0.37

Date	Time UTC	Station Code	WGS84 Latitude DD.DDDDD	WGS84 Longitude DD.DDDDD	STN No.	Hpro fix no.	Fix Description	Still Label	Water depth (m)	SOG (kts)
21/08/2018	14:53:56	HRPT09	50°43.4051'N	4°42.8868'W	5	4499		HRPT_2FGL50818_GT09_STN_5_A1_0062_145357.JPG	40.20	1.15
21/08/2018	14:54:19	HRPT09	50°43.4056'N	4°42.8781'W	5	4500		HRPT_2FGL50818_GT09_STN_5_A1_0063_145420.JPG	40.30	0.78
21/08/2018	14:54:38	HRPT09	50°43.4062'N	4°42.8708'W	5	4501		HRPT_2FGL50818_GT09_STN_5_A1_0064_145439.JPG	40.40	1.00
21/08/2018	14:55:01	HRPT09	50°43.4069'N	4°42.8637'W	5	4502		HRPT_2FGL50818_GT09_STN_5_A1_0065_145502.JPG	40.10	0.67
21/08/2018	14:55:22	HRPT09	50°43.4081'N	4°42.8559'W	5	4503		HRPT_2FGL50818_GT09_STN_5_A1_0066_145523.JPG	40.40	0.81
21/08/2018	14:55:44	HRPT09	50°43.4092'N	4°42.8475'W	5	4504		HRPT_2FGL50818_GT09_STN_5_A1_0067_145545.JPG	40.70	0.87
21/08/2018	14:56:12	HRPT09	50°43.4108'N	4°42.8385'W	5	4505		HRPT_2FGL50818_GT09_STN_5_A1_0068_145613.JPG	40.20	0.60
21/08/2018	14:56:34	HRPT09	50°43.4123'N	4°42.8300'W	5	4506		HRPT_2FGL50818_GT09_STN_5_A1_0069_145634.JPG	39.90	1.17
21/08/2018	14:56:58	HRPT09	50°43.4131'N	4°42.8207'W	5	4507		HRPT_2FGL50818_GT09_STN_5_A1_0070_145659.JPG	39.20	0.76
21/08/2018	14:57:23	HRPT09	50°43.4143'N	4°42.8106'W	5	4508		HRPT_2FGL50818_GT09_STN_5_A1_0071_145724.JPG	39.30	1.36
21/08/2018	14:57:43	HRPT09	50°43.4148'N	4°42.8008'W	5	4509		HRPT_2FGL50818_GT09_STN_5_A1_0072_145744.JPG	39.70	0.99
21/08/2018	14:58:19	HRPT09	50°43.4162'N	4°42.7875'W	5	4510		HRPT_2FGL50818_GT09_STN_5_A1_0073_145820.JPG	39.70	1.19
21/08/2018	14:58:40	HRPT09	50°43.4167'N	4°42.7799'W	5	4511		HRPT_2FGL50818_GT09_STN_5_A1_0074_145841.JPG	39.90	0.78
21/08/2018	14:58:56	HRPT09	50°43.4169'N	4°42.7748'W	5	4512	EoL	HRPT_2FGL50818_GT09_STN_5_A1_0075_145857.JPG	39.90	0.79
21/08/2018	15:24:35	HRPT10	50°44.6568'N	4°42.2570'W	6	4513	SoL	HRPT_2FGL50818_GT10_STN_6_A1_0076_152436.JPG	38.60	0.77
21/08/2018	15:25:02	HRPT10	50°44.6561'N	4°42.2480'W	6	4514		HRPT_2FGL50818_GT10_STN_6_A1_0077_152503.JPG	38.30	0.71
21/08/2018	15:25:23	HRPT10	50°44.6561'N	4°42.2413'W	6	4515		HRPT_2FGL50818_GT10_STN_6_A1_0078_152524.JPG	37.90	0.92
21/08/2018	15:25:43	HRPT10	50°44.6567'N	4°42.2337'W	6	4516		HRPT_2FGL50818_GT10_STN_6_A1_0079_152543.JPG	38.70	0.80
21/08/2018	15:25:57	HRPT10	50°44.6568'N	4°42.2295'W	6	4517		HRPT_2FGL50818_GT10_STN_6_A1_0080_152558.JPG	38.70	0.67
21/08/2018	15:26:27	HRPT10	50°44.6573'N	4°42.2187'W	6	4518		HRPT_2FGL50818_GT10_STN_6_A1_0081_152627.JPG	39.40	0.71
21/08/2018	15:26:33	HRPT10	50°44.6577'N	4°42.2170'W	6	4519		HRPT_2FGL50818_GT10_STN_6_A1_0082_152634.JPG	39.20	0.65
21/08/2018	15:27:05	HRPT10	50°44.6594'N	4°42.2039'W	6	4520		HRPT_2FGL50818_GT10_STN_6_A1_0083_152705.JPG	39.20	1.26
21/08/2018	15:27:15	HRPT10	50°44.6603'N	4°42.1999'W	6	4521		HRPT_2FGL50818_GT10_STN_6_A1_0084_152715.JPG	39.30	0.93
21/08/2018	15:27:32	HRPT10	50°44.6610'N	4°42.1946'W	6	4522		HRPT_2FGL50818_GT10_STN_6_A1_0085_152733.JPG	39.30	0.67
21/08/2018	15:28:03	HRPT10	50°44.6624'N	4°42.1861'W	6	4523		HRPT_2FGL50818_GT10_STN_6_A1_0086_152804.JPG	39.20	0.91
21/08/2018	15:28:43	HRPT10	50°44.6650'N	4°42.1738'W	6	4524		HRPT_2FGL50818_GT10_STN_6_A1_0087_152844.JPG	39.20	0.96
21/08/2018	15:29:07	HRPT10	50°44.6667'N	4°42.1656'W	6	4525		HRPT_2FGL50818_GT10_STN_6_A1_0088_152908.JPG	39.40	0.67
21/08/2018	15:29:42	HRPT10	50°44.6691'N	4°42.1540'W	6	4526		HRPT_2FGL50818_GT10_STN_6_A1_0089_152943.JPG	39.10	0.92
21/08/2018	15:30:22	HRPT10	50°44.6726'N	4°42.1395'W	6	4527		HRPT_2FGL50818_GT10_STN_6_A1_0090_153023.JPG	39.00	1.13
21/08/2018	15:30:49	HRPT10	50°44.6746'N	4°42.1312'W	6	4528		HRPT_2FGL50818_GT10_STN_6_A1_0091_153050.JPG	39.30	0.57
21/08/2018	15:31:02	HRPT10	50°44.6762'N	4°42.1260'W	6	4529	EoL	HRPT_2FGL50818_GT10_STN_6_A1_0092_153102.JPG	39.40	1.06
21/08/2018	15:42:03	HRPT13	50°45.9543'N	4°41.5638'W	7	4530	SoL	HRPT_2FGL50818_GT13_STN_7_A1_0093_154204.JPG	38.00	0.39
21/08/2018	15:42:27	HRPT13	50°45.9540'N	4°41.5569'W	7	4531		HRPT_2FGL50818_GT13_STN_7_A1_0094_154228.JPG	38.00	0.82
21/08/2018	15:42:55	HRPT13	50°45.9537'N	4°41.5447'W	7	4532		HRPT_2FGL50818_GT13_STN_7_A1_0095_154255.JPG	37.90	1.02

Date	Time UTC	Station Code	WGS84 Latitude DD.DDDDD	WGS84 Longitude DD.DDDDD	STN No.	Hpro fix no.	Fix Description	Still Label	Water depth (m)	SOG (kts)
21/08/2018	15:43:18	HRPT13	50°45.9536'N	4°41.5373'W	7	4533		HRPT_2FGL50818_GT13_STN_7_A1_0096_154319.JPG	38.90	0.70
21/08/2018	15:43:44	HRPT13	50°45.9535'N	4°41.5275'W	7	4534		HRPT_2FGL50818_GT13_STN_7_A1_0097_154345.JPG	38.30	0.69
21/08/2018	15:44:15	HRPT13	50°45.9532'N	4°41.5176'W	7	4535		HRPT_2FGL50818_GT13_STN_7_A1_0098_154416.JPG	38.10	0.69
21/08/2018	15:44:38	HRPT13	50°45.9535'N	4°41.5098'W	7	4536		HRPT_2FGL50818_GT13_STN_7_A1_0099_154439.JPG	38.10	0.74
21/08/2018	15:45:14	HRPT13	50°45.9548'N	4°41.4977'W	7	4537		HRPT_2FGL50818_GT13_STN_7_A1_0100_154515.JPG	38.00	0.84
21/08/2018	15:45:46	HRPT13	50°45.9568'N	4°41.4874'W	7	4538		HRPT_2FGL50818_GT13_STN_7_A1_0101_154547.JPG	37.80	0.68
21/08/2018	15:46:10	HRPT13	50°45.9581'N	4°41.4798'W	7	4539		HRPT_2FGL50818_GT13_STN_7_A1_0102_154611.JPG	37.50	0.82
21/08/2018	15:46:21	HRPT13	50°45.9588'N	4°41.4764'W	7	4540		HRPT_2FGL50818_GT13_STN_7_A1_0103_154622.JPG	37.60	0.73
21/08/2018	15:47:05	HRPT13	50°45.9620'N	4°41.4621'W	7	4541		HRPT_2FGL50818_GT13_STN_7_A1_0104_154706.JPG	37.70	0.90
21/08/2018	15:47:30	HRPT13	50°45.9645'N	4°41.4541'W	7	4542		HRPT_2FGL50818_GT13_STN_7_A1_0105_154730.JPG	37.90	0.72
21/08/2018	15:47:46	HRPT13	50°45.9662'N	4°41.4488'W	7	4543		HRPT_2FGL50818_GT13_STN_7_A1_0106_154747.JPG	38.50	0.99
21/08/2018	15:48:15	HRPT13	50°45.9694'N	4°41.4404'W	7	4544		HRPT_2FGL50818_GT13_STN_7_A1_0107_154816.JPG	38.50	0.60
21/08/2018	15:48:23	HRPT13	50°45.9701'N	4°41.4390'W	7	4545	EoL	HRPT_2FGL50818_GT13_STN_7_A1_0108_154824.JPG	38.60	0.52
21/08/2018	16:02:07	HRPT17	50°47.0024'N	4°43.1845'W	8	4546	SoL	HRPT_2FGL50818_GT17_STN_8_A1_0109_160208.JPG	39.60	0.54
21/08/2018	16:02:26	HRPT17	50°46.9990'N	4°43.1787'W	8	4547		HRPT_2FGL50818_GT17_STN_8_A1_0110_160227.JPG	39.90	1.30
21/08/2018	16:02:48	HRPT17	50°46.9964'N	4°43.1727'W	8	4548		HRPT_2FGL50818_GT17_STN_8_A1_0111_160249.JPG	39.60	0.52
21/08/2018	16:03:09	HRPT17	50°46.9951'N	4°43.1654'W	8	4549		HRPT_2FGL50818_GT17_STN_8_A1_0112_160310.JPG	39.40	0.94
21/08/2018	16:03:41	HRPT17	50°46.9939'N	4°43.1534'W	8	4550		HRPT_2FGL50818_GT17_STN_8_A1_0113_160342.JPG	39.40	0.76
21/08/2018	16:04:08	HRPT17	50°46.9929'N	4°43.1449'W	8	4551		HRPT_2FGL50818_GT17_STN_8_A1_0114_160409.JPG	40.00	0.78
21/08/2018	16:04:50	HRPT17	50°46.9920'N	4°43.1340'W	8	4552		HRPT_2FGL50818_GT17_STN_8_A1_0115_160450.JPG	39.90	0.57
21/08/2018	16:05:20	HRPT17	50°46.9930'N	4°43.1229'W	8	4553		HRPT_2FGL50818_GT17_STN_8_A1_0116_160521.JPG	39.80	0.99
21/08/2018	16:05:53	HRPT17	50°46.9952'N	4°43.1116'W	8	4554		HRPT_2FGL50818_GT17_STN_8_A1_0117_160554.JPG	39.70	0.61
21/08/2018	16:06:08	HRPT17	50°46.9957'N	4°43.1073'W	8	4555		HRPT_2FGL50818_GT17_STN_8_A1_0118_160609.JPG	40.10	0.80
21/08/2018	16:06:33	HRPT17	50°46.9979'N	4°43.0979'W	8	4556		HRPT_2FGL50818_GT17_STN_8_A1_0119_160634.JPG	40.00	1.03
21/08/2018	16:07:04	HRPT17	50°46.9999'N	4°43.0876'W	8	4557		HRPT_2FGL50818_GT17_STN_8_A1_0120_160705.JPG	40.00	0.94
21/08/2018	16:07:32	HRPT17	50°47.0022'N	4°43.0773'W	8	4558		HRPT_2FGL50818_GT17_STN_8_A1_0121_160732.JPG	40.00	0.97
21/08/2018	16:07:56	HRPT17	50°47.0037'N	4°43.0710'W	8	4559		HRPT_2FGL50818_GT17_STN_8_A1_0122_160757.JPG	40.00	0.68
21/08/2018	16:08:15	HRPT17	50°47.0050'N	4°43.0643'W	8	4560	EoL	HRPT_2FGL50818_GT17_STN_8_A1_0123_160816.JPG	39.80	0.85
21/08/2018	16:20:03	HRPT18	50°47.2513'N	4°40.8475'W	9	4561	SoL	HRPT_2FGL50818_GT18_STN_9_A1_0124_162004.JPG	37.50	0.66
21/08/2018	16:20:32	HRPT18	50°47.2479'N	4°40.8410'W	9	4562		HRPT_2FGL50818_GT18_STN_9_A1_0125_162033.JPG	37.50	0.68
21/08/2018	16:20:57	HRPT18	50°47.2446'N	4°40.8340'W	9	4563		HRPT_2FGL50818_GT18_STN_9_A1_0126_162058.JPG	37.10	0.86
21/08/2018	16:21:39	HRPT18	50°47.2402'N	4°40.8211'W	9	4564		HRPT_2FGL50818_GT18_STN_9_A1_0127_162140.JPG	36.20	0.73
21/08/2018	16:22:09	HRPT18	50°47.2371'N	4°40.8122'W	9	4565		HRPT_2FGL50818_GT18_STN_9_A1_0128_162210.JPG	36.60	0.78
21/08/2018	16:22:38	HRPT18	50°47.2356'N	4°40.8012'W	9	4566		HRPT_2FGL50818_GT18_STN_9_A1_0129_162239.JPG	36.20	1.06

Date	Time UTC	Station Code	WGS84 Latitude DD.DDDDD	WGS84 Longitude DD.DDDDD	STN No.	Hpro fix no.	Fix Description	Still Label	Water depth (m)	SOG (kts)
21/08/2018	16:23:07	HRPT18	50°47.2337'N	4°40.7906'W	9	4567		HRPT_2FGL50818_GT18_STN_9_A1_0130_162308.JPG	35.70	1.12
21/08/2018	16:23:50	HRPT18	50°47.2322'N	4°40.7750'W	9	4568		HRPT_2FGL50818_GT18_STN_9_A1_0131_162351.JPG	35.00	1.09
21/08/2018	16:24:18	HRPT18	50°47.2313'N	4°40.7660'W	9	4569		HRPT_2FGL50818_GT18_STN_9_A1_0132_162419.JPG	34.80	0.79
21/08/2018	16:25:07	HRPT18	50°47.2307'N	4°40.7488'W	9	4570		HRPT_2FGL50818_GT18_STN_9_A1_0133_162508.JPG	35.10	0.59
21/08/2018	16:25:20	HRPT18	50°47.2305'N	4°40.7451'W	9	4571		HRPT_2FGL50818_GT18_STN_9_A1_0134_162521.JPG	35.00	0.71
21/08/2018	16:25:33	HRPT18	50°47.2304'N	4°40.7399'W	9	4572		HRPT_2FGL50818_GT18_STN_9_A1_0135_162534.JPG	35.00	0.96
21/08/2018	16:25:56	HRPT18	50°47.2301'N	4°40.7331'W	9	4573	EoL	HRPT_2FGL50818_GT18_STN_9_A1_0136_162556.JPG	34.80	0.66
21/08/2018	16:45:02	HRPT22	50°47.9780'N	4°41.5606'W	10	4574	SoL	HRPT_2FGL50818_GT22_STN_10_A1_0137_164503.JPG	37.90	0.43
21/08/2018	16:45:33	HRPT22	50°47.9724'N	4°41.5567'W	10	4575		HRPT_2FGL50818_GT22_STN_10_A1_0138_164534.JPG	38.00	0.78
21/08/2018	16:46:01	HRPT22	50°47.9664'N	4°41.5525'W	10	4576		HRPT_2FGL50818_GT22_STN_10_A1_0139_164601.JPG	38.20	0.99
21/08/2018	16:46:29	HRPT22	50°47.9604'N	4°41.5477'W	10	4577		HRPT_2FGL50818_GT22_STN_10_A1_0140_164630.JPG	38.00	0.76
21/08/2018	16:46:57	HRPT22	50°47.9547'N	4°41.5434'W	10	4578		HRPT_2FGL50818_GT22_STN_10_A1_0141_164658.JPG	38.20	0.78
21/08/2018	16:47:16	HRPT22	50°47.9507'N	4°41.5403'W	10	4579		HRPT_2FGL50818_GT22_STN_10_A1_0142_164717.JPG	38.40	0.97
21/08/2018	16:47:42	HRPT22	50°47.9461'N	4°41.5358'W	10	4580		HRPT_2FGL50818_GT22_STN_10_A1_0143_164743.JPG	38.60	0.70
21/08/2018	16:48:10	HRPT22	50°47.9414'N	4°41.5311'W	10	4581		HRPT_2FGL50818_GT22_STN_10_A1_0144_164811.JPG	38.20	0.81
21/08/2018	16:48:40	HRPT22	50°47.9364'N	4°41.5244'W	10	4582		HRPT_2FGL50818_GT22_STN_10_A1_0145_164840.JPG	38.20	0.79
21/08/2018	16:49:07	HRPT22	50°47.9322'N	4°41.5192'W	10	4583		HRPT_2FGL50818_GT22_STN_10_A1_0146_164908.JPG	38.10	0.75
21/08/2018	16:49:41	HRPT22	50°47.9275'N	4°41.5123'W	10	4584		HRPT_2FGL50818_GT22_STN_10_A1_0147_164942.JPG	38.60	0.61
21/08/2018	16:50:21	HRPT22	50°47.9223'N	4°41.5022'W	10	4585		HRPT_2FGL50818_GT22_STN_10_A1_0148_165022.JPG	38.10	0.70
21/08/2018	16:50:57	HRPT22	50°47.9188'N	4°41.4953'W	10	4586	EoL	HRPT_2FGL50818_GT22_STN_10_A1_0149_165058.JPG	38.30	0.67
21/08/2018	17:02:19	HRPT24	50°48.3464'N	4°42.2514'W	11	4587	SoL	HRPT_2FGL50818_GT24_STN_11_A1_0150_170220.JPG	39.30	0.00
21/08/2018	17:02:46	HRPT24	50°48.3429'N	4°42.2493'W	11	4588		HRPT_2FGL50818_GT24_STN_11_A1_0151_170247.JPG	39.20	0.53
21/08/2018	17:03:13	HRPT24	50°48.3376'N	4°42.2458'W	11	4589		HRPT_2FGL50818_GT24_STN_11_A1_0152_170314.JPG	39.20	0.79
21/08/2018	17:03:40	HRPT24	50°48.3315'N	4°42.2422'W	11	4590		HRPT_2FGL50818_GT24_STN_11_A1_0153_170341.JPG	39.40	0.93
21/08/2018	17:04:06	HRPT24	50°48.3265'N	4°42.2404'W	11	4591		HRPT_2FGL50818_GT24_STN_11_A1_0154_170407.JPG	39.10	0.68
21/08/2018	17:04:47	HRPT24	50°48.3186'N	4°42.2367'W	11	4592		HRPT_2FGL50818_GT24_STN_11_A1_0155_170448.JPG	39.00	0.75
21/08/2018	17:05:13	HRPT24	50°48.3127'N	4°42.2353'W	11	4593		HRPT_2FGL50818_GT24_STN_11_A1_0156_170514.JPG	39.40	0.85
21/08/2018	17:05:56	HRPT24	50°48.3035'N	4°42.2321'W	11	4594		HRPT_2FGL50818_GT24_STN_11_A1_0157_170556.JPG	39.30	1.05
21/08/2018	17:06:23	HRPT24	50°48.2976'N	4°42.2302'W	11	4595		HRPT_2FGL50818_GT24_STN_11_A1_0158_170624.JPG	39.50	0.84
21/08/2018	17:06:50	HRPT24	50°48.2917'N	4°42.2285'W	11	4596		HRPT_2FGL50818_GT24_STN_11_A1_0159_170651.JPG	39.10	1.02
21/08/2018	17:07:18	HRPT24	50°48.2861'N	4°42.2269'W	11	4597		HRPT_2FGL50818_GT24_STN_11_A1_0160_170719.JPG	39.50	0.62
21/08/2018	17:07:44	HRPT24	50°48.2804'N	4°42.2258'W	11	4598		HRPT_2FGL50818_GT24_STN_11_A1_0161_170744.JPG	39.00	0.87
21/08/2018	17:08:16	HRPT24	50°48.2751'N	4°42.2238'W	11	4599	EoL	HRPT_2FGL50818_GT24_STN_11_A1_0162_170816.JPG	39.00	0.57
21/08/2018	18:00:19	HRPT27	50°49.2213'N	4°40.8655'W	12	4600	SoL	HRPT_2FGL50818_GT27_STN_12_A1_0163_180019.JPG	36.80	0.92

Date	Time UTC	Station Code	WGS84 Latitude DD.DDDDD	WGS84 Longitude DD.DDDDD	STN No.	Hpro fix no.	Fix Description	Still Label	Water depth (m)	SOG (kts)
21/08/2018	18:00:45	HRPT27	50°49.2167'N	4°40.8605'W	12	4601		HRPT_2FGL50818_GT27_STN_12_A1_0164_180046.JPG	36.60	0.70
21/08/2018	18:01:14	HRPT27	50°49.2119'N	4°40.8570'W	12	4602		HRPT_2FGL50818_GT27_STN_12_A1_0165_180114.JPG	37.20	0.76
21/08/2018	18:01:41	HRPT27	50°49.2062'N	4°40.8539'W	12	4603		HRPT_2FGL50818_GT27_STN_12_A1_0166_180142.JPG	36.70	0.80
21/08/2018	18:02:10	HRPT27	50°49.1997'N	4°40.8503'W	12	4604		HRPT_2FGL50818_GT27_STN_12_A1_0167_180211.JPG	36.80	0.93
21/08/2018	18:02:29	HRPT27	50°49.1957'N	4°40.8486'W	12	4605		HRPT_2FGL50818_GT27_STN_12_A1_0168_180230.JPG	36.70	0.70
21/08/2018	18:03:03	HRPT27	50°49.1874'N	4°40.8455'W	12	4606		HRPT_2FGL50818_GT27_STN_12_A1_0169_180304.JPG	37.20	1.18
21/08/2018	18:03:34	HRPT27	50°49.1799'N	4°40.8417'W	12	4607		HRPT_2FGL50818_GT27_STN_12_A1_0170_180335.JPG	36.80	0.69
21/08/2018	18:04:00	HRPT27	50°49.1760'N	4°40.8404'W	12	4608		HRPT_2FGL50818_GT27_STN_12_A1_0171_180401.JPG	37.30	0.60
21/08/2018	18:04:36	HRPT27	50°49.1676'N	4°40.8348'W	12	4609		HRPT_2FGL50818_GT27_STN_12_A1_0172_180437.JPG	37.10	0.78
21/08/2018	18:04:55	HRPT27	50°49.1644'N	4°40.8340'W	12	4610		HRPT_2FGL50818_GT27_STN_12_A1_0173_180456.JPG	37.00	0.61
21/08/2018	18:05:03	HRPT27	50°49.1629'N	4°40.8336'W	12	4611		HRPT_2FGL50818_GT27_STN_12_A1_0174_180504.JPG	36.90	0.69
21/08/2018	18:05:25	HRPT27	50°49.1566'N	4°40.8288'W	12	4612		HRPT_2FGL50818_GT27_STN_12_A1_0175_180526.JPG	37.00	1.03
21/08/2018	18:05:47	HRPT27	50°49.1523'N	4°40.8270'W	12	4613	EoL	HRPT_2FGL50818_GT27_STN_12_A1_0176_180548.JPG	36.50	0.62
21/08/2018	18:17:22	HRPT30	50°50.0539'N	4°39.8959'W	13	4614	SoL	HRPT_2FGL50818_GT30_STN_13_A1_0177_181723.JPG	36.20	0.47
21/08/2018	18:18:14	HRPT30	50°50.0441'N	4°39.8899'W	13	4615		HRPT_2FGL50818_GT30_STN_13_A1_0178_181815.JPG	35.80	0.73
21/08/2018	18:18:28	HRPT30	50°50.0419'N	4°39.8891'W	13	4616		HRPT_2FGL50818_GT30_STN_13_A1_0179_181829.JPG	35.70	0.56
21/08/2018	18:18:55	HRPT30	50°50.0380'N	4°39.8868'W	13	4617		HRPT_2FGL50818_GT30_STN_13_A1_0180_181856.JPG	36.50	0.73
21/08/2018	18:19:18	HRPT30	50°50.0329'N	4°39.8837'W	13	4618		HRPT_2FGL50818_GT30_STN_13_A1_0181_181918.JPG	36.00	0.76
21/08/2018	18:19:52	HRPT30	50°50.0250'N	4°39.8800'W	13	4619		HRPT_2FGL50818_GT30_STN_13_A1_0182_181953.JPG	35.60	0.93
21/08/2018	18:20:25	HRPT30	50°50.0164'N	4°39.8756'W	13	4620		HRPT_2FGL50818_GT30_STN_13_A1_0183_182026.JPG	35.40	0.98
21/08/2018	18:20:39	HRPT30	50°50.0130'N	4°39.8745'W	13	4621		HRPT_2FGL50818_GT30_STN_13_A1_0184_182040.JPG	35.10	0.90
21/08/2018	18:21:05	HRPT30	50°50.0064'N	4°39.8714'W	13	4622		HRPT_2FGL50818_GT30_STN_13_A1_0185_182106.JPG	35.40	0.85
21/08/2018	18:21:32	HRPT30	50°50.0011'N	4°39.8694'W	13	4623		HRPT_2FGL50818_GT30_STN_13_A1_0186_182133.JPG	35.10	0.73
21/08/2018	18:21:53	HRPT30	50°49.9967'N	4°39.8666'W	13	4624		HRPT_2FGL50818_GT30_STN_13_A1_0187_182154.JPG	35.00	1.00
21/08/2018	18:22:17	HRPT30	50°49.9917'N	4°39.8646'W	13	4625		HRPT_2FGL50818_GT30_STN_13_A1_0188_182218.JPG	35.40	0.67
21/08/2018	18:22:41	HRPT30	50°49.9872'N	4°39.8622'W	13	4626		HRPT_2FGL50818_GT30_STN_13_A1_0189_182242.JPG	35.40	0.93
21/08/2018	18:23:03	HRPT30	50°49.9818'N	4°39.8599'W	13	4627	EoL	HRPT_2FGL50818_GT30_STN_13_A1_0190_182304.JPG	35.40	1.01
21/08/2018	18:36:05	HRPT29	50°49.9882'N	4°42.1951'W	14	4628	SoL	HRPT_2FGL50818_GT29_STN_14_A1_0191_183606.JPG	37.50	0.32
21/08/2018	18:36:31	HRPT29	50°49.9841'N	4°42.1937'W	14	4629		HRPT_2FGL50818_GT29_STN_14_A1_0192_183631.JPG	37.50	0.68
21/08/2018	18:37:07	HRPT29	50°49.9768'N	4°42.1904'W	14	4630		HRPT_2FGL50818_GT29_STN_14_A1_0193_183708.JPG	38.40	0.84
21/08/2018	18:37:17	HRPT29	50°49.9744'N	4°42.1897'W	14	4631		HRPT_2FGL50818_GT29_STN_14_A1_0194_183718.JPG	37.50	0.88
21/08/2018	18:37:46	HRPT29	50°49.9683'N	4°42.1875'W	14	4632		HRPT_2FGL50818_GT29_STN_14_A1_0195_183747.JPG	37.10	0.77
21/08/2018	18:37:59	HRPT29	50°49.9660'N	4°42.1862'W	14	4633		HRPT_2FGL50818_GT29_STN_14_A1_0196_183800.JPG	37.40	0.69
21/08/2018	18:38:12	HRPT29	50°49.9635'N	4°42.1851'W	14	4634		HRPT_2FGL50818_GT29_STN_14_A1_0197_183813.JPG	37.60	0.69

Date	Time UTC	Station Code	WGS84 Latitude DD.DDDDD	WGS84 Longitude DD.DDDDD	STN No.	Hpro fix no.	Fix Description	Still Label	Water depth (m)	SOG (kts)
21/08/2018	18:38:39	HRPT29	50°49.9583'N	4°42.1826'W	14	4635		HRPT_2FGL50818_GT29_STN_14_A1_0198_183839.JPG	37.50	0.71
21/08/2018	18:39:03	HRPT29	50°49.9540'N	4°42.1813'W	14	4636		HRPT_2FGL50818_GT29_STN_14_A1_0199_183904.JPG	37.50	0.60
21/08/2018	18:39:29	HRPT29	50°49.9491'N	4°42.1791'W	14	4637		HRPT_2FGL50818_GT29_STN_14_A1_0200_183930.JPG	37.30	0.71
21/08/2018	18:39:44	HRPT29	50°49.9467'N	4°42.1774'W	14	4638		HRPT_2FGL50818_GT29_STN_14_A1_0201_183944.JPG	37.50	0.61
21/08/2018	18:40:09	HRPT29	50°49.9420'N	4°42.1746'W	14	4639		HRPT_2FGL50818_GT29_STN_14_A1_0202_184010.JPG	37.80	0.60
21/08/2018	18:40:33	HRPT29	50°49.9375'N	4°42.1721'W	14	4640		HRPT_2FGL50818_GT29_STN_14_A1_0203_184033.JPG	37.60	0.85
21/08/2018	18:40:59	HRPT29	50°49.9324'N	4°42.1685'W	14	4641		HRPT_2FGL50818_GT29_STN_14_A1_0204_184059.JPG	37.50	0.93
21/08/2018	18:41:22	HRPT29	50°49.9276'N	4°42.1652'W	14	4642		HRPT_2FGL50818_GT29_STN_14_A1_0205_184123.JPG	37.50	0.98
21/08/2018	18:41:51	HRPT29	50°49.9218'N	4°42.1600'W	14	4643		HRPT_2FGL50818_GT29_STN_14_A1_0206_184152.JPG	37.80	0.89
21/08/2018	18:42:06	HRPT29	50°49.9191'N	4°42.1576'W	14	4644	EoL	HRPT_2FGL50818_GT29_STN_14_A1_0207_184207.JPG	37.30	0.80
21/08/2018	18:52:19	HRPT28	50°49.2018'N	4°43.6271'W	15	4645	SoL	HRPT_2FGL50818_GT28_STN_15_A1_0208_185220.JPG	39.50	0.96
21/08/2018	18:52:43	HRPT28	50°49.1968'N	4°43.6273'W	15	4646		HRPT_2FGL50818_GT28_STN_15_A1_0209_185244.JPG	38.90	0.68
21/08/2018	18:53:10	HRPT28	50°49.1905'N	4°43.6261'W	15	4647		HRPT_2FGL50818_GT28_STN_15_A1_0210_185311.JPG	40.40	0.83
21/08/2018	18:53:24	HRPT28	50°49.1879'N	4°43.6262'W	15	4648		HRPT_2FGL50818_GT28_STN_15_A1_0211_185325.JPG	39.80	0.69
21/08/2018	18:53:52	HRPT28	50°49.1821'N	4°43.6246'W	15	4649		HRPT_2FGL50818_GT28_STN_15_A1_0212_185353.JPG	39.00	0.77
21/08/2018	18:54:15	HRPT28	50°49.1765'N	4°43.6237'W	15	4650		HRPT_2FGL50818_GT28_STN_15_A1_0213_185416.JPG	39.10	0.97
21/08/2018	18:54:33	HRPT28	50°49.1727'N	4°43.6236'W	15	4651		HRPT_2FGL50818_GT28_STN_15_A1_0214_185434.JPG	38.80	0.72
21/08/2018	18:54:43	HRPT28	50°49.1708'N	4°43.6234'W	15	4652		HRPT_2FGL50818_GT28_STN_15_A1_0215_185443.JPG	38.80	0.69
21/08/2018	18:54:54	HRPT28	50°49.1687'N	4°43.6230'W	15	4653		HRPT_2FGL50818_GT28_STN_15_A1_0216_185455.JPG	39.00	0.69
21/08/2018	18:55:28	HRPT28	50°49.1621'N	4°43.6227'W	15	4654		HRPT_2FGL50818_GT28_STN_15_A1_0217_185529.JPG	39.20	0.52
21/08/2018	18:55:53	HRPT28	50°49.1577'N	4°43.6218'W	15	4655		HRPT_2FGL50818_GT28_STN_15_A1_0218_185554.JPG	39.20	0.83
21/08/2018	18:56:18	HRPT28	50°49.1524'N	4°43.6213'W	15	4656		HRPT_2FGL50818_GT28_STN_15_A1_0219_185618.JPG	39.70	0.90
21/08/2018	18:56:42	HRPT28	50°49.1462'N	4°43.6206'W	15	4657		HRPT_2FGL50818_GT28_STN_15_A1_0220_185643.JPG	39.40	0.93
21/08/2018	18:57:03	HRPT28	50°49.1418'N	4°43.6205'W	15	4658		HRPT_2FGL50818_GT28_STN_15_A1_0221_185703.JPG	39.50	0.80
21/08/2018	18:57:28	HRPT28	50°49.1360'N	4°43.6192'W	15	4659		HRPT_2FGL50818_GT28_STN_15_A1_0222_185729.JPG	39.20	0.97
21/08/2018	18:57:53	HRPT28	50°49.1305'N	4°43.6178'W	15	4660		HRPT_2FGL50818_GT28_STN_15_A1_0223_185754.JPG	39.80	0.86
21/08/2018	18:58:18	HRPT28	50°49.1244'N	4°43.6169'W	15	4661	EoL	HRPT_2FGL50818_GT28_STN_15_A1_0224_185819.JPG	39.40	0.85
21/08/2018	19:10:42	HRPT31	50°50.0056'N	4°44.8578'W	16	4662	SoL	HRPT_2FGL50818_GT31_STN_16_A1_0225_191043.JPG	41.10	0.33
21/08/2018	19:11:04	HRPT31	50°50.0017'N	4°44.8566'W	16	4663		HRPT_2FGL50818_GT31_STN_16_A1_0226_191105.JPG	41.50	0.85
21/08/2018	19:11:12	HRPT31	50°50.0001'N	4°44.8562'W	16	4664		HRPT_2FGL50818_GT31_STN_16_A1_0227_191113.JPG	41.40	0.73
21/08/2018	19:11:23	HRPT31	50°49.9981'N	4°44.8554'W	16	4665		HRPT_2FGL50818_GT31_STN_16_A1_0228_191124.JPG	40.60	0.68
21/08/2018	19:11:47	HRPT31	50°49.9915'N	4°44.8544'W	16	4666		HRPT_2FGL50818_GT31_STN_16_A1_0229_191148.JPG	41.00	0.98
21/08/2018	19:12:16	HRPT31	50°49.9860'N	4°44.8533'W	16	4667		HRPT_2FGL50818_GT31_STN_16_A1_0230_191216.JPG	41.20	0.57
21/08/2018	19:12:56	HRPT31	50°49.9773'N	4°44.8507'W	16	4668		HRPT_2FGL50818_GT31_STN_16_A1_0231_191256.JPG	40.80	1.58

Date	Time UTC	Station Code	WGS84 Latitude DD.DDDDD	WGS84 Longitude DD.DDDDD	STN No.	Hpro fix no.	Fix Description	Still Label	Water depth (m)	SOG (kts)
21/08/2018	19:13:29	HRPT31	50°49.9679'N	4°44.8486'W	16	4669		HRPT_2FGL50818_GT31_STN_16_A1_0232_191330.JPG	41.10	0.72
21/08/2018	19:14:15	HRPT31	50°49.9588'N	4°44.8477'W	16	4670		HRPT_2FGL50818_GT31_STN_16_A1_0233_191416.JPG	41.20	1.16
21/08/2018	19:14:29	HRPT31	50°49.9553'N	4°44.8476'W	16	4671		HRPT_2FGL50818_GT31_STN_16_A1_0234_191429.JPG	41.40	0.87
21/08/2018	19:14:58	HRPT31	50°49.9476'N	4°44.8476'W	16	4672		HRPT_2FGL50818_GT31_STN_16_A1_0235_191459.JPG	41.20	1.24
21/08/2018	19:15:15	HRPT31	50°49.9432'N	4°44.8479'W	16	4673		HRPT_2FGL50818_GT31_STN_16_A1_0236_191516.JPG	41.20	0.84
21/08/2018	19:15:41	HRPT31	50°49.9372'N	4°44.8478'W	16	4674		HRPT_2FGL50818_GT31_STN_16_A1_0237_191542.JPG	41.00	1.01
21/08/2018	19:16:02	HRPT31	50°49.9325'N	4°44.8472'W	16	4675		HRPT_2FGL50818_GT31_STN_16_A1_0238_191603.JPG	40.90	0.69
21/08/2018	19:16:24	HRPT31	50°49.9280'N	4°44.8468'W	16	4676	EoL	HRPT_2FGL50818_GT31_STN_16_A1_0239_191624.JPG	40.90	0.97
21/08/2018	19:27:34	HRPT26	50°49.0622'N	4°46.4555'W	17	4677	SoL	HRPT_2FGL50818_GT26_STN_17_A1_0240_192735.JPG	43.90	0.43
21/08/2018	19:28:05	HRPT26	50°49.0562'N	4°46.4541'W	17	4678		HRPT_2FGL50818_GT26_STN_17_A1_0241_192806.JPG	44.20	0.82
21/08/2018	19:28:33	HRPT26	50°49.0510'N	4°46.4532'W	17	4679		HRPT_2FGL50818_GT26_STN_17_A1_0242_192834.JPG	44.00	0.57
21/08/2018	19:29:01	HRPT26	50°49.0452'N	4°46.4519'W	17	4680		HRPT_2FGL50818_GT26_STN_17_A1_0243_192902.JPG	44.40	0.66
21/08/2018	19:29:26	HRPT26	50°49.0401'N	4°46.4525'W	17	4681		HRPT_2FGL50818_GT26_STN_17_A1_0244_192926.JPG	43.70	0.70
21/08/2018	19:29:52	HRPT26	50°49.0331'N	4°46.4521'W	17	4682		HRPT_2FGL50818_GT26_STN_17_A1_0245_192952.JPG	43.80	1.04
21/08/2018	19:30:17	HRPT26	50°49.0272'N	4°46.4530'W	17	4683		HRPT_2FGL50818_GT26_STN_17_A1_0246_193018.JPG	43.70	0.78
21/08/2018	19:30:50	HRPT26	50°49.0203'N	4°46.4515'W	17	4684		HRPT_2FGL50818_GT26_STN_17_A1_0247_193050.JPG	43.60	0.81
21/08/2018	19:31:18	HRPT26	50°49.0143'N	4°46.4513'W	17	4685		HRPT_2FGL50818_GT26_STN_17_A1_0248_193118.JPG	44.00	0.68
21/08/2018	19:31:48	HRPT26	50°49.0071'N	4°46.4505'W	17	4686		HRPT_2FGL50818_GT26_STN_17_A1_0249_193149.JPG	44.00	0.84
21/08/2018	19:32:05	HRPT26	50°49.0039'N	4°46.4496'W	17	4687		HRPT_2FGL50818_GT26_STN_17_A1_0250_193206.JPG	43.70	0.66
21/08/2018	19:32:20	HRPT26	50°48.9976'N	4°46.4489'W	17	4688		HRPT_2FGL50818_GT26_STN_17_A1_0251_193220.JPG	44.20	1.59
21/08/2018	19:32:45	HRPT26	50°48.9900'N	4°46.4491'W	17	4689		HRPT_2FGL50818_GT26_STN_17_A1_0252_193246.JPG	43.70	0.89
21/08/2018	19:33:08	HRPT26	50°48.9858'N	4°46.4491'W	17	4690	EoL	HRPT_2FGL50818_GT26_STN_17_A1_0253_193308.JPG	43.50	0.56
21/08/2018	19:47:27	HRPT32	50°50.0248'N	4°47.1597'W	18	4691	SoL	HRPT_2FGL50818_GT32_STN_18_A1_0254_194728.JPG	45.70	1.30
21/08/2018	19:47:58	HRPT32	50°50.0171'N	4°47.1571'W	18	4692		HRPT_2FGL50818_GT32_STN_18_A1_0255_194758.JPG	45.30	0.93
21/08/2018	19:48:38	HRPT32	50°50.0102'N	4°47.1547'W	18	4693		HRPT_2FGL50818_GT32_STN_18_A1_0256_194839.JPG	44.30	0.41
21/08/2018	19:49:07	HRPT32	50°50.0020'N	4°47.1521'W	18	4694		HRPT_2FGL50818_GT32_STN_18_A1_0257_194908.JPG	45.10	1.16
21/08/2018	19:49:36	HRPT32	50°49.9964'N	4°47.1495'W	18	4695		HRPT_2FGL50818_GT32_STN_18_A1_0258_194936.JPG	45.00	0.85
21/08/2018	19:49:59	HRPT32	50°49.9910'N	4°47.1471'W	18	4696		HRPT_2FGL50818_GT32_STN_18_A1_0259_195000.JPG	45.30	0.89
21/08/2018	19:50:24	HRPT32	50°49.9854'N	4°47.1450'W	18	4697		HRPT_2FGL50818_GT32_STN_18_A1_0260_195025.JPG	45.30	0.73
21/08/2018	19:50:52	HRPT32	50°49.9770'N	4°47.1438'W	18	4698		HRPT_2FGL50818_GT32_STN_18_A1_0261_195053.JPG	45.20	1.24
21/08/2018	19:51:16	HRPT32	50°49.9718'N	4°47.1423'W	18	4699		HRPT_2FGL50818_GT32_STN_18_A1_0262_195116.JPG	44.90	0.73
21/08/2018	19:51:28	HRPT32	50°49.9697'N	4°47.1421'W	18	4700		HRPT_2FGL50818_GT32_STN_18_A1_0263_195129.JPG	45.20	0.54
21/08/2018	19:51:52	HRPT32	50°49.9641'N	4°47.1407'W	18	4701		HRPT_2FGL50818_GT32_STN_18_A1_0264_195152.JPG	45.20	0.89
21/08/2018	19:52:16	HRPT32	50°49.9594'N	4°47.1390'W	18	4702		HRPT_2FGL50818_GT32_STN_18_A1_0265_195217.JPG	45.20	0.67

Date	Time UTC	Station Code	WGS84 Latitude DD.DDDDD	WGS84 Longitude DD.DDDDD	STN No.	Hpro fix no.	Fix Description	Still Label	Water depth (m)	SOG (kts)
21/08/2018	19:52:38	HRPT32	50°49.9542'N	4°47.1380'W	18	4703		HRPT_2FGL50818_GT32_STN_18_A1_0266_195239.JPG	45.30	1.04
21/08/2018	19:53:01	HRPT32	50°49.9489'N	4°47.1365'W	18	4704		HRPT_2FGL50818_GT32_STN_18_A1_0267_195302.JPG	44.80	0.73
21/08/2018	19:53:28	HRPT32	50°49.9399'N	4°47.1355'W	18	4705	EoL	HRPT_2FGL50818_GT32_STN_18_A1_0268_195328.JPG	45.00	1.16
21/08/2018	20:08:42	HRPT33	50°50.0269'N	4°50.0236'W	19	4706	SoL	HRPT_2FGL50818_GT33_STN_19_A1_0269_200843.JPG	50.60	0.18
21/08/2018	20:09:13	HRPT33	50°50.0203'N	4°50.0217'W	19	4707		HRPT_2FGL50818_GT33_STN_19_A1_0270_200913.JPG	50.50	1.02
21/08/2018	20:09:38	HRPT33	50°50.0141'N	4°50.0205'W	19	4708		HRPT_2FGL50818_GT33_STN_19_A1_0271_200939.JPG	50.30	0.89
21/08/2018	20:10:05	HRPT33	50°50.0079'N	4°50.0183'W	19	4709		HRPT_2FGL50818_GT33_STN_19_A1_0272_201005.JPG	50.40	0.92
21/08/2018	20:10:33	HRPT33	50°50.0029'N	4°50.0151'W	19	4710		HRPT_2FGL50818_GT33_STN_19_A1_0273_201033.JPG	50.30	0.58
21/08/2018	20:11:00	HRPT33	50°49.9960'N	4°50.0123'W	19	4711		HRPT_2FGL50818_GT33_STN_19_A1_0274_201101.JPG	50.00	1.01
21/08/2018	20:11:18	HRPT33	50°49.9918'N	4°50.0114'W	19	4712		HRPT_2FGL50818_GT33_STN_19_A1_0275_201118.JPG	50.60	0.72
21/08/2018	20:11:43	HRPT33	50°49.9871'N	4°50.0094'W	19	4713		HRPT_2FGL50818_GT33_STN_19_A1_0276_201143.JPG	50.10	0.72
21/08/2018	20:12:08	HRPT33	50°49.9822'N	4°50.0070'W	19	4714		HRPT_2FGL50818_GT33_STN_19_A1_0277_201209.JPG	50.40	0.70
21/08/2018	20:12:33	HRPT33	50°49.9766'N	4°50.0053'W	19	4715		HRPT_2FGL50818_GT33_STN_19_A1_0278_201234.JPG	50.60	0.90
21/08/2018	20:13:01	HRPT33	50°49.9707'N	4°50.0039'W	19	4716		HRPT_2FGL50818_GT33_STN_19_A1_0279_201302.JPG	50.10	0.69
21/08/2018	20:13:26	HRPT33	50°49.9658'N	4°50.0023'W	19	4717		HRPT_2FGL50818_GT33_STN_19_A1_0280_201327.JPG	50.60	0.65
21/08/2018	20:13:51	HRPT33	50°49.9603'N	4°50.0006'W	19	4718		HRPT_2FGL50818_GT33_STN_19_A1_0281_201352.JPG	50.40	0.85
21/08/2018	20:14:11	HRPT33	50°49.9552'N	4°49.9989'W	19	4719	EoL	HRPT_2FGL50818_GT33_STN_19_A1_0282_201412.JPG	50.40	1.02
21/08/2018	20:27:07	HRPT25	50°48.9893'N	4°48.8928'W	20	4720	SoL	HRPT_2FGL50818_GT25_STN_20_A1_0283_202707.JPG	48.80	0.23
21/08/2018	20:27:40	HRPT25	50°48.9847'N	4°48.8883'W	20	4721		HRPT_2FGL50818_GT25_STN_20_A1_0284_202740.JPG	49.00	1.06
21/08/2018	20:27:53	HRPT25	50°48.9820'N	4°48.8861'W	20	4722		HRPT_2FGL50818_GT25_STN_20_A1_0285_202754.JPG	48.80	0.83
21/08/2018	20:28:17	HRPT25	50°48.9780'N	4°48.8844'W	20	4723		HRPT_2FGL50818_GT25_STN_20_A1_0286_202818.JPG	49.10	0.55
21/08/2018	20:28:39	HRPT25	50°48.9740'N	4°48.8829'W	20	4724		HRPT_2FGL50818_GT25_STN_20_A1_0287_202839.JPG	49.00	0.67
21/08/2018	20:29:04	HRPT25	50°48.9689'N	4°48.8802'W	20	4725		HRPT_2FGL50818_GT25_STN_20_A1_0288_202905.JPG	49.10	0.73
21/08/2018	20:29:38	HRPT25	50°48.9638'N	4°48.8769'W	20	4726		HRPT_2FGL50818_GT25_STN_20_A1_0289_202939.JPG	49.00	0.66
21/08/2018	20:29:50	HRPT25	50°48.9614'N	4°48.8759'W	20	4727		HRPT_2FGL50818_GT25_STN_20_A1_0290_202951.JPG	49.10	0.77
21/08/2018	20:30:19	HRPT25	50°48.9552'N	4°48.8719'W	20	4728		HRPT_2FGL50818_GT25_STN_20_A1_0291_203020.JPG	49.20	0.85
21/08/2018	20:30:33	HRPT25	50°48.9523'N	4°48.8707'W	20	4729		HRPT_2FGL50818_GT25_STN_20_A1_0292_203034.JPG	49.10	0.77
21/08/2018	20:31:06	HRPT25	50°48.9454'N	4°48.8665'W	20	4730		HRPT_2FGL50818_GT25_STN_20_A1_0293_203106.JPG	49.00	0.64
21/08/2018	20:31:39	HRPT25	50°48.9399'N	4°48.8630'W	20	4731		HRPT_2FGL50818_GT25_STN_20_A1_0294_203140.JPG	49.10	0.60
21/08/2018	20:32:06	HRPT25	50°48.9351'N	4°48.8603'W	20	4732		HRPT_2FGL50818_GT25_STN_20_A1_0295_203207.JPG	48.80	0.69
21/08/2018	20:32:33	HRPT25	50°48.9289'N	4°48.8548'W	20	4733		HRPT_2FGL50818_GT25_STN_20_A1_0296_203234.JPG	49.70	0.97
21/08/2018	20:32:58	HRPT25	50°48.9246'N	4°48.8521'W	20	4734		HRPT_2FGL50818_GT25_STN_20_A1_0297_203258.JPG	49.50	0.66
21/08/2018	20:33:15	HRPT25	50°48.9209'N	4°48.8498'W	20	4735		HRPT_2FGL50818_GT25_STN_20_A1_0298_203316.JPG	49.60	0.67
21/08/2018	20:33:39	HRPT25	50°48.9156'N	4°48.8465'W	20	4736	EoL	HRPT_2FGL50818_GT25_STN_20_A1_0299_203340.JPG	49.50	1.06

Date	Time UTC	Station Code	WGS84 Latitude DD.DDDDD	WGS84 Longitude DD.DDDDD	STN No.	Hpro fix no.	Fix Description	Still Label	Water depth (m)	SOG (kts)
21/08/2018	20:46:49	HRPT19	50°47.5078'N	4°48.4803'W	21	4737	SoL	HRPT_2FGL50818_GT19_STN_21_A1_0300_204650.JPG	47.00	0.00
21/08/2018	20:47:26	HRPT19	50°47.5038'N	4°48.4764'W	21	4738		HRPT_2FGL50818_GT19_STN_21_A1_0301_204727.JPG	47.50	0.89
21/08/2018	20:48:00	HRPT19	50°47.4967'N	4°48.4733'W	21	4739		HRPT_2FGL50818_GT19_STN_21_A1_0302_204801.JPG	47.90	0.74
21/08/2018	20:48:47	HRPT19	50°47.4865'N	4°48.4715'W	21	4740		HRPT_2FGL50818_GT19_STN_21_A1_0303_204848.JPG	47.40	0.99
21/08/2018	20:49:10	HRPT19	50°47.4811'N	4°48.4707'W	21	4741		HRPT_2FGL50818_GT19_STN_21_A1_0304_204911.JPG	47.70	0.73
21/08/2018	20:49:36	HRPT19	50°47.4752'N	4°48.4695'W	21	4742		HRPT_2FGL50818_GT19_STN_21_A1_0305_204937.JPG	47.60	0.92
21/08/2018	20:49:53	HRPT19	50°47.4719'N	4°48.4692'W	21	4743		HRPT_2FGL50818_GT19_STN_21_A1_0306_204953.JPG	47.20	0.64
21/08/2018	20:50:22	HRPT19	50°47.4659'N	4°48.4682'W	21	4744		HRPT_2FGL50818_GT19_STN_21_A1_0307_205022.JPG	47.30	0.78
21/08/2018	20:50:49	HRPT19	50°47.4613'N	4°48.4668'W	21	4745		HRPT_2FGL50818_GT19_STN_21_A1_0308_205050.JPG	47.50	0.66
21/08/2018	20:51:16	HRPT19	50°47.4539'N	4°48.4675'W	21	4746		HRPT_2FGL50818_GT19_STN_21_A1_0309_205117.JPG	47.40	1.16
21/08/2018	20:51:42	HRPT19	50°47.4487'N	4°48.4677'W	21	4747		HRPT_2FGL50818_GT19_STN_21_A1_0310_205143.JPG	47.60	0.57
21/08/2018	20:52:09	HRPT19	50°47.4433'N	4°48.4673'W	21	4748		HRPT_2FGL50818_GT19_STN_21_A1_0311_205209.JPG	47.60	0.69
21/08/2018	20:52:32	HRPT19	50°47.4377'N	4°48.4680'W	21	4749		HRPT_2FGL50818_GT19_STN_21_A1_0312_205233.JPG	47.60	0.69
21/08/2018	20:52:57	HRPT19	50°47.4322'N	4°48.4672'W	21	4750	EoL	HRPT_2FGL50818_GT19_STN_21_A1_0313_205258.JPG	47.50	0.78
21/08/2018	21:04:33	HRPT21	50°47.7234'N	4°50.2007'W	22	4751	SoL	HRPT_2FGL50818_GT21_STN_22_A1_0314_210433.JPG	50.70	0.73
21/08/2018	21:04:58	HRPT21	50°47.7173'N	4°50.2002'W	22	4752		HRPT_2FGL50818_GT21_STN_22_A1_0315_210458.JPG	50.60	1.12
21/08/2018	21:05:19	HRPT21	50°47.7125'N	4°50.2006'W	22	4753		HRPT_2FGL50818_GT21_STN_22_A1_0316_210520.JPG	50.70	0.76
21/08/2018	21:05:52	HRPT21	50°47.7041'N	4°50.2021'W	22	4754		HRPT_2FGL50818_GT21_STN_22_A1_0317_210552.JPG	50.60	0.76
21/08/2018	21:06:13	HRPT21	50°47.6962'N	4°50.2043'W	22	4755		HRPT_2FGL50818_GT21_STN_22_A1_0318_210614.JPG	50.70	1.55
21/08/2018	21:06:34	HRPT21	50°47.6886'N	4°50.2077'W	22	4756		HRPT_2FGL50818_GT21_STN_22_A1_0319_210635.JPG	50.80	1.38
21/08/2018	21:06:55	HRPT21	50°47.6831'N	4°50.2091'W	22	4757		HRPT_2FGL50818_GT21_STN_22_A1_0320_210656.JPG	50.80	0.87
21/08/2018	21:07:33	HRPT21	50°47.6759'N	4°50.2078'W	22	4758		HRPT_2FGL50818_GT21_STN_22_A1_0321_210734.JPG	50.80	0.55
21/08/2018	21:08:01	HRPT21	50°47.6687'N	4°50.2084'W	22	4759		HRPT_2FGL50818_GT21_STN_22_A1_0322_210801.JPG	50.60	0.76
21/08/2018	21:08:20	HRPT21	50°47.6647'N	4°50.2085'W	22	4760		HRPT_2FGL50818_GT21_STN_22_A1_0323_210821.JPG	50.60	0.87
21/08/2018	21:08:44	HRPT21	50°47.6578'N	4°50.2089'W	22	4761		HRPT_2FGL50818_GT21_STN_22_A1_0324_210844.JPG	50.70	0.84
21/08/2018	21:09:06	HRPT21	50°47.6522'N	4°50.2097'W	22	4762		HRPT_2FGL50818_GT21_STN_22_A1_0325_210906.JPG	50.90	1.29
21/08/2018	21:09:30	HRPT21	50°47.6468'N	4°50.2106'W	22	4763	EoL	HRPT_2FGL50818_GT21_STN_22_A1_0326_210930.JPG	50.60	0.68
22/08/2018	15:46:06	HRPT34	50°53.1997'N	4°35.7430'W	23	4764	SOL	No image	28.60	0.73
22/08/2018	15:46:40	HRPT34	50°53.2047'N	4°35.7319'W	23	4765		No image	27.70	1.30
22/08/2018	15:47:08	HRPT34	50°53.2075'N	4°35.7215'W	23	4766		No image	28.60	0.69
22/08/2018	15:47:21	HRPT34	50°53.2087'N	4°35.7141'W	23	4767		No image	28.70	1.38
22/08/2018	15:47:55	HRPT34	50°53.2121'N	4°35.7025'W	23	4768		No image	27.90	0.86
22/08/2018	15:48:09	HRPT34	50°53.2136'N	4°35.6978'W	23	4769		No image	28.00	0.85
22/08/2018	15:48:36	HRPT34	50°53.2149'N	4°35.6879'W	23	4770		No image	27.10	0.87

Date	Time UTC	Station Code	WGS84 Latitude DD.DDDDD	WGS84 Longitude DD.DDDDD	STN No.	Hpro fix no.	Fix Description	Still Label	Water depth (m)	SOG (kts)
22/08/2018	15:49:00	HRPT34	50°53.2176'N	4°35.6801'W	23	4771		No image	27.20	0.90
22/08/2018	15:49:23	HRPT34	50°53.2198'N	4°35.6726'W	23	4772		No image	27.50	0.86
22/08/2018	15:49:47	HRPT34	50°53.2232'N	4°35.6652'W	23	4773		No image	27.30	1.01
22/08/2018	15:50:13	HRPT34	50°53.2255'N	4°35.6540'W	23	4774		No image	27.50	0.94
22/08/2018	15:50:39	HRPT34	50°53.2289'N	4°35.6455'W	23	4775		No image	27.70	0.82
22/08/2018	15:50:56	HRPT34	50°53.2310'N	4°35.6410'W	23	4776		No image	27.60	0.84
22/08/2018	15:51:43	HRPT34	50°53.2347'N	4°35.6261'W	23	4777	EOL	No image	27.20	0.90

7.8 Grab Survey Metadata

Date	Time UTC	Station Code	WGS84 Latitude DD.DDDDD	WGS84 Longitude DD.DDDDD	STN no.	Hpro fix no.	Water depth (m)	Sediment vol. (litres) calculated	Sediment use
Sampling gear = Mini-Hamon grab, sieve mesh = 1 mm									
26/02/2019	10:27	HRPT22	50.76920	-4.76389	24	Fix_4713	46.70	4.2	Biota + PSA
26/02/2019	10:59	HRPT28	50.79289	-4.75835	25	Fix_4714	46.27	-	Discarded
26/02/2019	11:05	HRPT28	50.79307	-4.75845	25	Fix_4715	46.89	4.0	Biota + PSA
26/02/2019	11:20	HRPT27	50.79331	-4.73214	26	Fix_4716	42.12	-	Empty
26/02/2019	11:27	HRPT27	50.79322	-4.73194	26	Fix_4717	42.40	-	Empty
26/02/2019	11:32	HRPT27	50.79338	-4.73214	26	Fix_4718	42.84	-	Empty
26/02/2019	11:54	HRPT30	50.80997	-4.66136	27	Fix_4719	38.42	-	Empty
26/02/2019	12:03	HRPT30	50.81004	-4.66122	27	Fix_4720	38.93	2.0	Biota + PSA
26/02/2019	12:09	HRPT30	50.80992	-4.66119	27	Fix_4721	39.99	-	Discarded
26/02/2019	12:26	HRPT38	50.83318	-4.68402	28	Fix_4722	40.15	-	Empty
26/02/2019	12:32	HRPT38	50.83289	-4.68377	28	Fix_4723	39.45	-	Discarded
26/02/2019	12:36	HRPT38	50.83315	-4.68382	28	Fix_4724	39.67	-	Empty
26/02/2019	12:50	HRPT35	50.81799	-4.70993	29	Fix_4725	40.65	-	Empty
26/02/2019	12:55	HRPT35	50.81804	-4.70983	29	Fix_4726	41.18	-	Empty
26/02/2019	13:00	HRPT35	50.81810	-4.70969	29	Fix_4727	40.52	-	Empty
26/02/2019	13:14	HRPT37	50.83182	-4.74016	30	Fix_4728	43.32	6.5	Biota + PSA
26/02/2019	13:28	HRPT33	50.81642	-4.75379	31	Fix_4729	44.82	-	Empty
26/02/2019	13:34	HRPT33	50.81631	-4.75338	31	Fix_4730	44.39	-	Discarded

Date	Time UTC	Station Code	WGS84 Latitude DD.DDDDD	WGS84 Longitude DD.DDDDD	STN no.	Hpro fix no.	Water depth (m)	Sediment vol. (litres) calculated	Sediment use
26/02/2019	13:39	HRPT33	50.81628	-4.75347	31	Fix_4731	44.63	-	Empty
26/02/2019	13:55	HRPT32C	50.81500	-4.79664	32	Fix_4732	49.36	-	Empty
26/02/2019	14:01	HRPT32C	50.81508	-4.79608	32	Fix_4733	48.50	-	Discarded
26/02/2019	14:06	HRPT32C	50.81494	-4.79613	32	Fix_4734	49.42	0.5	PSA
26/02/2019	14:22	HRPT39	50.83324	-4.80845	33	Fix_4735	49.90	-	Empty
26/02/2019	14:27	HRPT39	50.83326	-4.80808	33	Fix_4736	50.04	3.5	Biota + PSA
26/02/2019	14:46	HRPT34	50.81454	-4.83789	34	Fix_4737	51.55	3.3	Biota + PSA
26/02/2019	15:04	HRPT26	50.79107	-4.81761	35	Fix_4738	49.73	3.4	Biota + PSA
26/02/2019	15:21	HRPT24	50.76850	-4.83542	36	Fix_4739	49.39	-	Empty
26/02/2019	15:26	HRPT24	50.76833	-4.83513	36	Fix_4740	50.18	2.0	Discarded
26/02/2019	15:31	HRPT24	50.76839	-4.83493	36	Fix_4741	49.59	0.6	Discarded
26/02/2019	15:47	HRPT21	50.76808	-4.79293	37	Fix_4742	44.10	-	Empty
26/02/2019	15:51	HRPT21	50.76810	-4.79283	37	Fix_4743	43.47	-	Empty
26/02/2019	15:56	HRPT21	50.76792	-4.79285	37	Fix_4744	43.22	-	Empty
26/02/2019	16:10	HRPT16	50.74473	-4.81151	38	Fix_4745	46.01	-	Empty
26/02/2019	16:15	HRPT16	50.74478	-4.81159	38	Fix_4746	44.98	-	Empty
26/02/2019	16:19	HRPT16	50.74472	-4.81170	38	Fix_4747	45.20	2.5	Discarded
26/02/2019	16:35	HRPT15	50.74516	-4.76967	39	Fix_4748	41.11	-	Empty
26/02/2019	16:40	HRPT15	50.74511	-4.76923	39	Fix_4749	40.85	2.8	Biota + PSA
26/02/2019	16:47	HRPT15	50.74524	-4.76963	39	Fix_4750	40.45	0.5	Discarded
26/02/2019	17:06	HRPT13	50.74509	-4.72762	40	Fix_4751	37.60	-	Empty
26/02/2019	17:10	HRPT13	50.74502	-4.72754	40	Fix_4752	38.15	-	Empty
26/02/2019	17:15	HRPT13	50.74502	-4.72761	40	Fix_4753	37.97	-	Empty
26/02/2019	17:29	HRPT10	50.72327	-4.73404	41	Fix_4754	38.34	-	Empty
26/02/2019	17:33	HRPT10	50.72332	-4.73381	41	Fix_4755	38.49	-	Discarded
26/02/2019	17:37	HRPT10	50.72332	-4.73427	41	Fix_4756	38.03	-	Discarded
26/02/2019	17:56	HRPT4C	50.69854	-4.76779	42	Fix_4757	39.36	2.0	Biota + PSA
26/02/2019	18:01	HRPT4C	50.69836	-4.76782	42	Fix_4758	40.58	1.2	Discarded
26/02/2019	18:05	HRPT4C	50.69848	-4.76752	42	Fix_4759	40.92	0.5	Discarded
26/02/2019	18:22	HRPT6	50.69844	-4.81022	43	Fix_4760	41.89	-	Empty
26/02/2019	18:27	HRPT6	50.69825	-4.81028	43	Fix_4761	43.62	4.0	Biota + PSA
27/02/2019	09:07	HRPT2C	50.67429	-4.83166	44	Fix_4762	45.64	1.0	PSA
27/02/2019	09:18	HRPT2C	50.67431	-4.83162	44	Fix_4763	45.66	1.0	Discarded
27/02/2019	09:23	HRPT2C	50.67430	-4.83121	44	Fix_4764	46.42	0.8	Discarded
27/02/2019	09:42	HRPT1	50.67516	-4.78771	45	Fix_4765	42.83	-	Discarded

Date	Time UTC	Station Code	WGS84 Latitude DD.DDDDD	WGS84 Longitude DD.DDDDD	STN no.	Hpro fix no.	Water depth (m)	Sediment vol. (litres) calculated	Sediment use
27/02/2019	09:47	HRPT1	50.67522	-4.78793	45	Fix_4766	43.29	-	Discarded
27/02/2019	09:53	HRPT1	50.67512	-4.78781	45	Fix_4767	41.98	-	Discarded
27/02/2019	10:09	HRPT3	50.68294	-4.73719	46	Fix_4768	22.02	2.8	Discarded
27/02/2019	10:14	HPRT3	50.68303	-4.73742	46	Fix_4769	23.33	3.2	Biota + PSA
27/02/2019	10:30	HPRT5	50.70033	-4.71118	47	Fix_4770	32.00	0.6	Discarded
27/02/2019	10:34	HPRT5	50.70032	-4.71139	47	Fix_4771	32.55	0.8	PSA
27/02/2019	10:38	HPRT5	50.70042	-4.71137	47	Fix_4772	32.34	-	Discarded
27/02/2019	10:55	HPRT7	50.72403	-4.67698	48	Fix_4773	27.92	1.2	Discarded
27/02/2019	10:59	HPRT7	50.72407	-4.67732	48	Fix_4774	27.77	-	Discarded
27/02/2019	11:02	HPRT7	50.72407	-4.67707	48	Fix_4775	27.68	2.0	PSA
27/02/2019	11:14	HPRT11	50.73418	-4.65930	49	Fix_4776	16.26	4.0	Biota + PSA
27/02/2019	11:29	HRPT12	50.74291	-4.64719	50	Fix_4777	17.13	-	Empty
27/02/2019	11:31	HRPT12	50.74294	-4.64715	50	Fix_4778	18.23	-	Empty
27/02/2019	11:33	HRPT12	50.74298	-4.64698	50	Fix_4779	17.67	-	Empty
27/02/2019	11:48	HRPT14	50.74695	-4.68542	51	Fix_4780	37.19	-	Empty
27/02/2019	11:52	HRPT14	50.74660	-4.68543	51	Fix_4781	37.07	0.3	PSA
27/02/2019	11:57	HRPT14	50.74685	-4.68544	51	Fix_4782	38.89	-	Discarded
27/02/2019	12:23	HRPT19C	50.76988	-4.70760	52	Fix_4783	40.65	-	Empty
27/02/2019	12:32	HRPT19C	50.76975	-4.70739	52	Fix_4784	39.39	-	Discarded
27/02/2019	12:36	HRPT19C	50.76980	-4.70753	52	Fix_4785	39.56	-	Empty
27/02/2019	12:54	HRPT23	50.77200	-4.66741	53	Fix_4786	37.80	-	Discarded
27/02/2019	12:59	HRPT23	50.77205	-4.66744	53	Fix_4787	37.02	-	Discarded
27/02/2019	13:04	HRPT23	50.77189	-4.66729	53	Fix_4788	37.83	-	Empty
27/02/2019	13:24	HRPT17	50.76081	-4.62162	54	Fix_4789	15.89	-	Empty
27/02/2019	13:30	HRPT17	50.76094	-4.62191	54	Fix_4790	16.74	-	Misfire
27/02/2019	13:31	HRPT17	50.76089	-4.62214	54	Fix_4791	16.76	-	Empty
27/02/2019	13:35	HRPT17	50.76088	-4.62176	54	Fix_4792	17.25	-	Empty
27/02/2019	13:47	HRPT18	50.76690	-4.60872	55	Fix_4793	15.98	-	Empty
27/02/2019	13:50	HRPT18	50.76696	-4.60892	55	Fix_4794	16.11	-	Empty
27/02/2019	13:52	HRPT18	50.76707	-4.60872	55	Fix_4795	15.22	-	Empty
27/02/2019	14:03	HRPT20	50.77261	-4.58849	56	Fix_4796	13.32	5.5	Biota + PSA
27/02/2019	14:20	HRPT25	50.78406	-4.57241	57	Fix_4797	10.38	2.2	Discarded
27/02/2019	14:26	HRPT25	50.78405	-4.57237	57	Fix_4798	10.24	3.3	Biota + PSA
27/02/2019	14:41	HRPT29	50.79733	-4.57060	58	Fix_4799	12.73	1.8	Discarded
27/02/2019	14:44	HRPT29	50.79738	-4.57069	58	Fix_4800	12.10	2.1	Discarded

Date	Time UTC	Station Code	WGS84 Latitude DD.DDDDD	WGS84 Longitude DD.DDDDD	STN no.	Hpro fix no.	Water depth (m)	Sediment vol. (litres) calculated	Sediment use
27/02/2019	14:48	HRPT29	50.79744	-4.57054	58	Fix_4801	12.33	2.7	Biota + PSA
27/02/2019	15:02	HRPT31	50.81276	-4.56716	59	Fix_4802	12.17	2.5	-
27/02/2019	15:08	HRPT31	50.81277	-4.56720	59	Fix_4803	11.97	2.6	-
27/02/2019	15:11	HRPT31	50.81288	-4.56701	59	Fix_4804	11.33	3.2	Biota + PSA
27/02/2019	15:25	HRPT36	50.82473	-4.56606	60	Fix_4805	11.49	3.4	Biota + PSA
27/02/2019	15:40	HRPT40	50.84406	-4.56546	61	Fix_4806	9.30	4.4	Biota + PSA
27/02/2019	15:57	HRPT41	50.86194	-4.56839	62	Fix_4807	12.83	3.5	Biota + PSA
27/02/2019	16:10	HRPT42	50.87473	-4.56996	63	Fix_4808	14.31	4.4	Biota + PSA
27/02/2019	16:23	HRPT43	50.88324	-4.57357	64	Fix_4809	16.34	3.2	Biota + PSA
27/02/2019	16:37	HRPT45	50.89080	-4.57188	65	Fix_4810	11.92	3.6	Biota + PSA
27/02/2019	17:59	HRPT9	50.72207	-4.78988	66	Fix_4811	41.78	2.2	Biota + PSA
27/02/2019	18:03	HRPT9	50.72204	-4.78941	66	Fix_4812	41.68	-	Empty
27/02/2019	18:07	HRPT9	50.72207	-4.78954	66	Fix_4813	41.97	-	Empty
27/02/2019	18:23	HRPT8	50.72083	-4.83275	67	Fix_4814	44.38	1.2	PSA
27/02/2019	18:28	HRPT8	50.72066	-4.83202	67	Fix_4815	45.74	-	Empty
27/02/2019	18:32	HRPT8	50.72091	-4.83215	67	Fix_4816	46.17	-	Empty
20/03/2019	08:32	HRPT_44	50.88873	-4.59288	68	Fix_5563	25.75	-	Discarded
20/03/2019	08:38	HRPT_44	50.88881	-4.59329	68	Fix_5564	24.78	-	Empty
20/03/2019	08:41	HRPT_44	50.88882	-4.59339	68	Fix_5565	25.11	-	Misfire
20/03/2019	08:44	HRPT_44	50.88883	-4.59331	68	Fix_5566	25.16	-	Empty
20/03/2019	08:53	HRPT_47	50.89913	-4.57389	69	Fix_5567	13.57	-	Empty
20/03/2019	08:55	HRPT_47	50.89912	-4.57380	69	Fix_5568	13.03	-	Empty
20/03/2019	08:58	HRPT_47	50.89917	-4.57393	69	Fix_5569	12.31	-	Discarded
20/03/2019	09:07	HRPT_48	50.90119	-4.59141	70	Fix_5570	24.46	-	Discarded
20/03/2019	09:11	HRPT_48	50.90152	-4.59111	70	Fix_5571	25.36	-	Empty
20/03/2019	09:13	HRPT_48	50.90121	-4.59129	70	Fix_5572	24.78	-	Discarded
20/03/2019	09:24	HRPT_52	50.92016	-4.58423	71	Fix_5573	21.33	-	Empty
20/03/2019	09:26	HRPT_52	50.91999	-4.58434	71	Fix_5574	21.91	-	Empty
20/03/2019	09:28	HRPT_52	50.92009	-4.58461	71	Fix_5575	22.33	-	Empty
20/03/2019	09:39	HRPT_53	50.93224	-4.55545	72	Fix_5576	7.99	3.2	Biota + PSA
20/03/2019	09:53	HRPT_55	50.93321	-4.57748	73	Fix_5577	21.73	-	Discarded
20/03/2019	09:56	HRPT_55	50.93320	-4.57732	73	Fix_5578	22.47	-	Discarded
20/03/2019	09:58	HRPT_55	50.93330	-4.57733	73	Fix_5579	21.90	-	Empty
20/03/2019	10:06	HRPT_57	50.94490	-4.58598	74	Fix_5580	26.75	-	Discarded
20/03/2019	10:10	HRPT_57	50.94481	-4.58602	74	Fix_5581	25.06	-	Empty

Date	Time UTC	Station Code	WGS84 Latitude DD.DDDDD	WGS84 Longitude DD.DDDDD	STN no.	Hpro fix no.	Water depth (m)	Sediment vol. (litres) calculated	Sediment use
20/03/2019	10:12	HRPT_57	50.94476	-4.58577	74	Fix_5582	24.94	-	Empty
20/03/2019	10:22	HRPT_58	50.94775	-4.55099	75	Fix_5583	7.54	-	Empty
20/03/2019	10:25	HRPT_58	50.94768	-4.55093	75	Fix_5584	7.62	-	Discarded
20/03/2019	10:27	HRPT_58	50.94769	-4.55093	75	Fix_5585	7.11	5.1	Biota + PSA
20/03/2019	10:39	HRPT_59	50.95383	-4.56723	76	Fix_5586	16.51	-	Misfire
20/03/2019	10:41	HRPT_59	50.95374	-4.56721	76	Fix_5587	17.91	-	Discarded
20/03/2019	10:43	HRPT_59	50.95370	-4.56751	76	Fix_5588	18.87	-	Empty
20/03/2019	10:45	HRPT_59	50.95364	-4.56731	76	Fix_5589	17.48	-	Empty
20/03/2019	10:54	HRPT_61	50.96078	-4.54587	77	Fix_5590	8.62	2.5	Discarded
20/03/2019	10:57	HRPT_61	50.96071	-4.54598	77	Fix_5591	9.29	2.9	Discarded
20/03/2019	11:00	HRPT_61	50.96052	-4.54575	77	Fix_5592	8.76	3.1	Biota + PSA
20/03/2019	11:11	HRPT_63	50.96871	-4.54203	78	Fix_5593	7.55	3.3	Biota + PSA
20/03/2019	11:19	HRPT_65	50.97671	-4.54916	79	Fix_5594	14.78	-	Empty
20/03/2019	11:22	HRPT_65	50.97670	-4.54943	79	Fix_5595	15.25	-	Empty
20/03/2019	11:25	HRPT_65	50.97689	-4.54926	79	Fix_5596	15.12	-	Empty
20/03/2019	11:30	HRPT_67	50.98550	-4.53981	80	Fix_5597	9.04	4.0	Biota + PSA
20/03/2019	12:13	HRPT_69	50.99452	-4.54989	81	Fix_5598	15.98	-	Empty
20/03/2019	12:16	HRPT_69	50.99446	-4.54996	81	Fix_5599	15.77	-	Empty
20/03/2019	12:18	HRPT_69	50.99442	-4.54998	81	Fix_5600	15.31	-	Empty
20/03/2019	12:49	HRPT_66	50.98412	-4.56191	82	Fix_5601	23.84	-	Discarded
20/03/2019	12:52	HRPT_66	50.98407	-4.56175	82	Fix_5602	23.76	-	Empty
20/03/2019	12:55	HRPT_66	50.98420	-4.56178	82	Fix_5603	23.48	5.1	Biota + PSA
20/03/2019	13:07	HRPT_64	50.97654	-4.57202	83	Fix_5604	27.53	-	Discarded
20/03/2019	13:10	HRPT_64	50.97643	-4.57172	83	Fix_5605	26.73	-	Empty
20/03/2019	13:12	HRPT_64	50.97640	-4.57195	83	Fix_5606	26.76	-	Empty
20/03/2019	13:15	HRPT_64	50.97639	-4.57199	83	Fix_5607	27.12	-	Empty
20/03/2019	13:25	HRPT_62	50.96507	-4.56062	84	Fix_5608	21.82	-	Empty
20/03/2019	13:28	HRPT_62	50.96491	-4.56063	84	Fix_5609	21.90	-	Empty
20/03/2019	13:31	HRPT_62	50.96495	-4.56063	84	Fix_5610	21.19	-	Empty
20/03/2019	13:46	HRPT_60	50.95361	-4.59893	85	Fix_5611	33.50	-	Discarded
20/03/2019	13:49	HRPT_60	50.95357	-4.59912	85	Fix_5612	33.04	-	Discarded
20/03/2019	13:52	HRPT_60	50.95364	-4.59920	85	Fix_5613	33.38	-	Discarded
20/03/2019	14:01	HRPT_56	50.94400	-4.60887	86	Fix_5614	34.71	-	Empty
20/03/2019	14:04	HRPT_56	50.94398	-4.60922	86	Fix_5615	34.33	-	Empty
20/03/2019	14:07	HRPT_56	50.94404	-4.60904	86	Fix_5616	34.57	-	Empty

Date	Time UTC	Station Code	WGS84 Latitude DD.DDDDD	WGS84 Longitude DD.DDDDD	STN no.	Hpro fix no.	Water depth (m)	Sediment vol. (litres) calculated	Sediment use
20/03/2019	14:14	HRPT_54	50.93592	-4.59804	87	Fix_5617	32.54	-	Discarded
20/03/2019	14:16	HRPT_54	50.93604	-4.59834	87	Fix_5618	33.39	-	Empty
20/03/2019	14:19	HRPT_54	50.93581	-4.59805	87	Fix_5619	33.20	-	Empty
21/03/2019	08:38	HRPT46	50.89238	-4.61066	88	Fix_5621	29.85	-	Discarded
21/03/2019	08:41	HRPT46	50.89242	-4.61076	88	Fix_5622	29.76	-	Discarded
21/03/2019	08:45	HRPT46	50.89251	-4.61062	88	Fix_5623	28.12	-	Discarded
21/03/2019	08:54	HRPT49	50.90657	-4.60933	89	Fix_5624	30.08	-	Empty
21/03/2019	08:56	HRPT49	50.90660	-4.60933	89	Fix_5625	30.74	-	Empty
21/03/2019	08:59	HRPT49	50.90661	-4.60912	89	Fix_5626	30.44	-	Empty
21/03/2019	09:05	HRPT50	50.91406	-4.60315	90	Fix_5627	29.58	-	Empty
21/03/2019	09:08	HRPT50	50.91400	-4.60338	90	Fix_5628	30.23	-	Discarded
21/03/2019	09:10	HRPT50	50.91404	-4.60307	90	Fix_5629	29.00	-	Empty
21/03/2019	09:17	HRPT51	50.92146	-4.61036	91	Fix_5630	31.24	-	Empty
21/03/2019	09:19	HRPT51	50.92154	-4.61074	91	Fix_5631	32.63	-	Empty
21/03/2019	09:23	HRPT51	50.92158	-4.61089	91	Fix_5632	32.66	-	Empty
21/03/2019	09:56	HRPT68	50.99295	-4.57173	92	Fix_5633	24.89	-	Empty
21/03/2019	09:58	HRPT68	50.99308	-4.57204	92	Fix_5634	25.17	-	Empty
21/03/2019	10:00	HRPT68	50.99310	-4.57207	92	Fix_5635	24.75	3.5	Biota + PSA
21/03/2019	10:14	HRPT71	51.00344	-4.55925	93	Fix_5636	20.04	-	Empty
21/03/2019	10:17	HRPT71	51.00341	-4.55943	93	Fix_5637	20.56	-	Empty
21/03/2019	10:19	HRPT71	51.00339	-4.55950	93	Fix_5638	20.39	-	Empty
21/03/2019	10:27	HRPT70	51.00380	-4.53773	94	Fix_5639	6.82	2.9	Discarded
21/03/2019	10:30	HRPT70	51.00380	-4.53780	94	Fix_5640	7.18	4.1	Biota + PSA
21/03/2019	10:39	HRPT72	51.01288	-4.54941	95	Fix_5641	16.65	-	Discarded
21/03/2019	10:42	HRPT72	51.01307	-4.54953	95	Fix_5642	17.64	-	Empty
21/03/2019	10:44	HRPT72	51.01302	-4.54957	95	Fix_5643	16.75	-	Empty
21/03/2019	10:54	HRPT73	51.01263	-4.57152	96	Fix_5644	29.04	3.8	Biota + PSA
21/03/2019	11:03	HRPT74	51.01841	-4.56376	97	Fix_5645	23.45	4.0	Biota + PSA
21/03/2019	11:15	HRPT75	51.01931	-4.53431	98	Fix_5646	12.05	-	Misfire
21/03/2019	11:16	HRPT75	51.01946	-4.53423	98	Fix_5647	12.50	-	Empty
21/03/2019	11:18	HRPT75	51.01938	-4.53431	98	Fix_5648	12.05	-	Empty
21/03/2019	11:20	HRPT75	51.01962	-4.53426	98	Fix_5649	12.80	-	Discarded

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