

RESEARCH VESSEL SURVEY REPORT

RV CEFAS ENDEAVOUR
Survey: CEND 1722 Scallop UWTV

STAFF:

Name	Role
Karen Vanstaen	SIC
Ros McIntyre	SIC2
Andy Lawler	Watch lead
Dan Clarke	Shellfish scientist
Jess Harvey	Shellfish scientist
Bella Voak	Shellfish scientist
Bryan Goodsir-Thompson	Marine Ops Technician
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DURATION: 7 days (+2 days poor weather contingency): 1st Nov – 9th Nov

MOB Monday 31st Oct, Falmouth 2022 for planned sailing on am 01-Nov-22. Departure delayed due to poor weather and winch repair. Sailed from Falmouth on 03-Nov-2022 at 18:00 hrs. Demobbing in Portland at 22:00 on Wednesday 9th Nov 2022 was delayed to 06:30 on Thursday 10th Nov due to port schedule.

UPDATE 01/08 – This survey was planned as a combined survey with mNCEA, however their survey was rescheduled to 2023.

LOCATION: SW English coast, Channel, Eastern Channel and French waters. English Channel and approaches to the Bristol Channel

MOB: Falmouth, **DEMOB:** Portland

SURVEY AREA:

Candidate survey areas were situated in the English Channel and approaches to the Bristol Channel (ICES areas 7.d, 7.e and 7.f). These were deliberately spatially extensive to enable contingency for poor weather conditions, possible in November. Where stations occur in the French EEZ or within the IFCA or Crown Estates areas of jurisdiction, separate permissions were requested.

CEFAS ENDEAVOUR sailed on 3rd Nov from Falmouth and docked in Portland on 10th Nov. This survey involved 24-hour operations and the scientific staff worked 4 on 8 off rolling shifts with two Marine Operations engineers on 12h shift Duty.

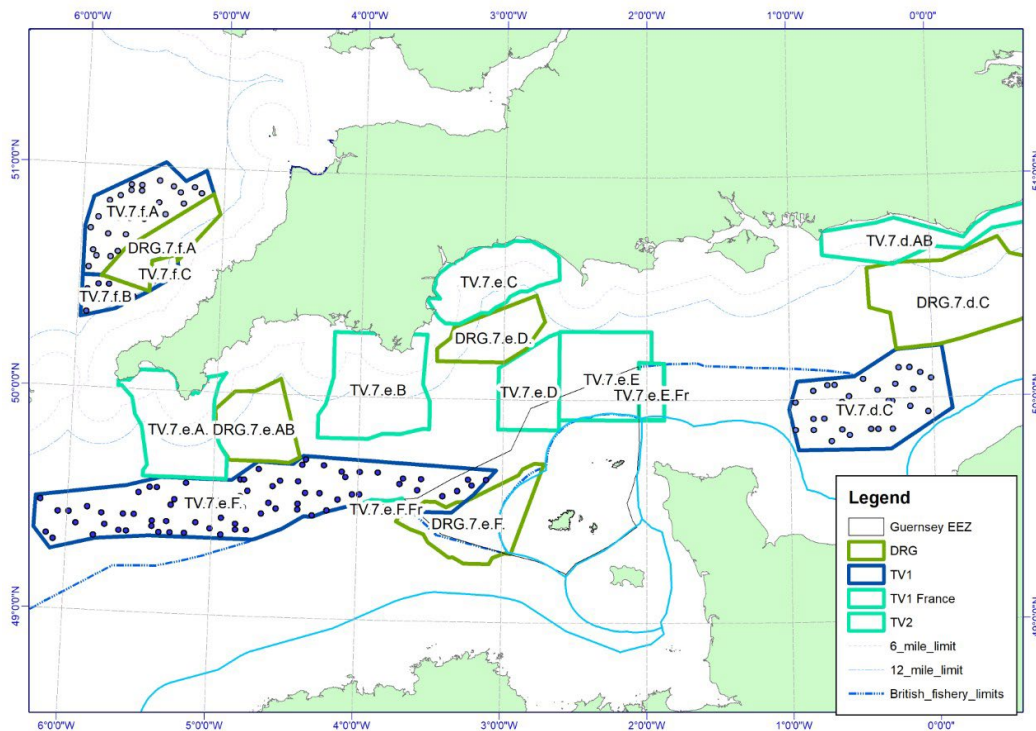


Figure 1. Candidate locations for underwater TV scallop survey beds 7.f.A, B, C, TV.7.e.F in Western English Channel and approaches to the Bristol Channel and TV.7.d.C. in Eastern English Channel.

AIMS:

Primary

1. Optimise and calibrate STR camera configuration and deployment for scallop UWTV survey
2. To conduct an underwater TV survey of *Pecten maximus* presence and density to estimate scallop abundance in selected un-dredged areas to compliment data collected as part of the wider scallop stock assessment in English Waters. (Priority 1 stations, Beds TV.7.f.A, TV.7.f.B, TV.7.f.C, TV.7.e.F and TV.7.d.C.)
3. To trial alternative camera platforms and deployment methods in selected areas testing video quality and frequency and quality of captured stills images as a potential candidate replacement for the main STR survey camera.

Secondary:

4. As time and weather permits additional survey areas described by existing dredge survey beds to survey with scallop dredges and mounted cameras to look at catch and size distribution.
5. Spatial underway sampling for nutrients and salinity for GiA03. This sampling will provide spatial winter nutrient concentrations which will contribute to the data for eutrophication assessments under OSPAR and the UK Marine Strategy.
6. Daily CALPS litter and water sampling.

NARRATIVE:

All scientific staff joined the vessel by Mon 31 Oct 18:00 h. Staff undertook COVID testing and confirmed negative results prior to travel to ship. Marine technical operations and contractors completed necessary works to set up camera systems on 31st Oct, 1st and 2nd Nov to ensure all equipment was operational prior to sailing. Sailing was delayed initially due to a severe SW gale and winch repairs. The vessel sailed from Falmouth at approx. 18:00 hrs Thursday 03 Nov, arriving at the first station position at the bottom of the eastern end of the French grid (Survey area TV7.d.C) at 1300 hrs on Fri 04 Nov.

During weather and winch repair downtime, scientific staff aged scallops collected during the September dredge survey in the Western Channel. These samples and microscopes were bought along as a contingency if poor weather delayed survey work. 16 scallop samples were measured and aged.

The STR SeaSpyder drop frame was used throughout the survey and was deployed with HD video and DSLR stills camera. Tow duration was twenty minutes at 0.4 knots speed over ground. HD video and HD photo images were recorded at each station.

Arrived at first survey station in the French EEZ and began surveying at 13:14 hrs. Seven drop camera deployments were completed in survey bed (TV.7.d.C) on 04 Nov, following safety and tool box talks. Sea state was moderate to rough but the deployment and recovery was successful. The frame was fitted with an outrigger bar to enable positioning of line lasers outside the protection of the frame but facilitating the area viewed by the camera to be clearly marked on the seabed. This was the first time this had been used and allowed for more accurate determination of the field of view and prevent counting of scallops outside of this. The stability in altitude of the drop frame and underwater footage surpassed expectations considering the weather conditions.

On 05th Nov we continued through the day working from West to East through the stations on the Eastern Channel bed TV.7.d.C. Fifteen underwater TV stations using drop camera were successful but weather stopped operations at 22:00hrs. Attempted to work different directions and wait for the tide to slacken, however no further deployments were possible that night. Completed CTD drops and water sampling for salinity, nutrients and plastics.

No safety issues or concerns raised, toolbox talks prior to drop camera operations and CTD to encompass changing weather conditions were carried out. Excellent safety awareness and communications between bridge, deck crews and scientists were observed.

On 06th Nov we continued to survey stations in TV.7.d.C. A further eight underwater TV stations were carried out before poor weather halted operations between 00:00 and 07:55 and after 18:00hrs. Further deployments were attempted at slack water but were not possible due to the wind strength and direction. Completed CTD drops and water sampling for salinity, nutrients and plastics. Toolbox talks undertaken prior to drop camera operations and CTD to highlight changing inclement weather conditions.

After weather/tide window opened at 09:44 h on 07th Nov we were able to complete the final station of underwater TV using drop camera for bed TV.7.d.C.

CTD drop and water sampling for salinity, nutrients and plastics completed.

We then commenced dredging on five underwater TV stations using 4 Newhaven dredges deployed from the starboard side to compare camera and dredge efficiencies and size distributions. Poor weather with strong winds and currents hampered operations throughout the day. However the crew of Endeavour are to be commended on attempts to find weather and operational windows to work safely.

Thirty drop camera station deployments and ten dredge tows were completed in survey bed (TV.7.d.C) in French waters in the Eastern English Channel by 00:00 hrs on the 8th Nov. The vessel sailed for survey area C (TV.7.e.C) in Lyme Bay, Western Channel.

Transit from TV.7.d.C. to TV.7.e.C. was expected to take eight hours, however high seas, gale force winds and tide slowed progress and arrival at site was over 22h later.

During the passage scientific crew continued to recount video footage obtained earlier.

The vessel commenced operations in survey bed TV.7.e.C. in Lyme Bay at 06:00 carrying out 12 drop frame deployments prior to completion of operations and preparations to return to port. Attempts to deploy the ROTV and sledge were abandoned due to weather conditions and the poor underwater visibility created by the recent gales. The vessel docked in Portland at 06:30 on 09 Nov 22.

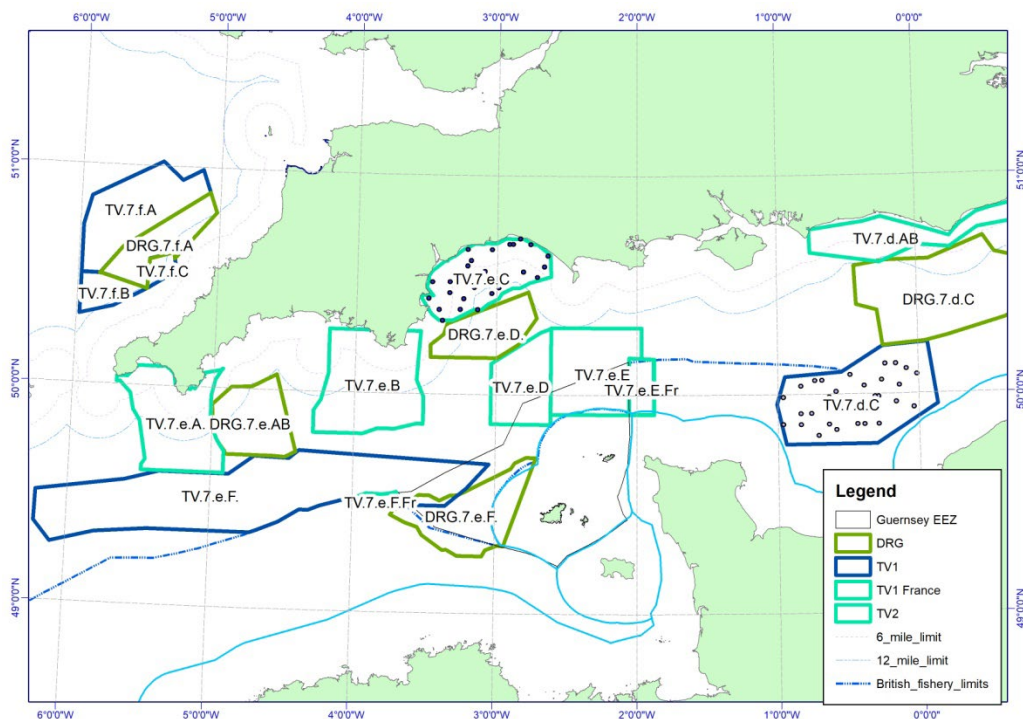


Figure 2. Underwater TV scallop beds surveyed TV.7.e.C.(part) in Lyme Bay and TV.7.d.C. in Eastern English Channel.

RESULTS:

1. Calibration tests of laser sizing were performed allowing increased confidence in determining the field of view. Further development using pixel measuring software will be completed post-survey in the lab to allow measurement of scallops.
2. 0.4 knots with the tide was found to be a good compromise between providing maximum ground coverage and retaining visibility of scallops. This deployment specification was used throughout. Higher speeds meant video quality was compromised.
3. Increased frequency of stills images allowed for improved validation of the video images.
4. Three new line lasers, two mounted externally to the drop frame, allowed for a defined field of view to be visible on the video images, preventing counting scallops outside the observed area. The vertically mounted lasers marked a consistently sized box on the seabed regardless of the changing altitude of the camera system and improving the accuracy of scallop density estimates.
5. This was the first time the un-dredged bed TV.7.e.C in the French EEZ was surveyed (to note grateful reception of French permissions to undertake this survey). Some stations within the bed provided density estimates from UWTV of up to 15/100m². Subsequent fishing on this station yielded a catch of 43 scallops in a 5 min tow (4 standard Newhaven dredges) at 2-3 knots providing a density of 17/100m² (5.1/100m² dredge efficiency adjusted). Comparison of the dredge catches will be cross referenced with video observations and image recordings on return to the lab.
6. HD video and numerous photo images were recorded during 20-minute transects at 42 stations. A 20-minute transect at 0.4 knots equates to an observed area of approximately 250m². Provisional scallop densities in the un-dredged beds of TV.7.e.C. were typically zero. Only the eastern and southern region of the bed were surveyed due to time constraints imposed by the weather conditions. Substrate in those areas surveyed in TV.7.e.C was predominantly muddy silt which is not typical scallop habitat.
7. Biomass estimates from this survey can be used in the wider scallop stock assessment project.

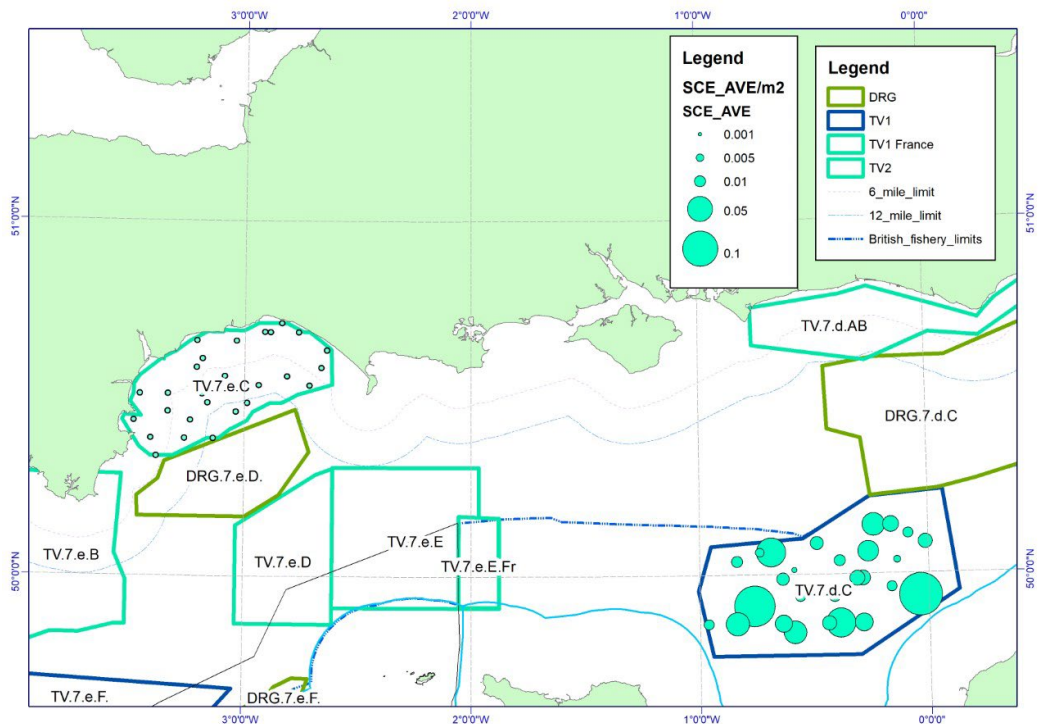


Figure 3. Provisional *Pecten maximus* density estimates (numbers per m² underwater TV survey in scallop survey beds TV.7.d.C. in French waters Eastern Channel and TV.7.e.C. in Western English Channel.

Karen Vanstaen
 Scientist In Charge
 09-Nov-2022

SEEN IN DRAFT

Master
 Senior Fishing Mate
 Mar Ops