Date: 25/06/2012
Location: Helford Estuary
Vessel: MTS Xplorer
Sea State: Smooth
Wind: 11mph
High Tide: 11:05(UTC) 4.1m

Geophysical Benthic Habitat Mapping of the Helford Estuary

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Group 2

Investigation Aims: Carry out a habitat baseline survey to determine whether the artificial introduction of eelgrass to a newly exposed bed form was successful.

The Helford Estuary is significant since it holds the first marine conservation zone (MCZ), it was implemented as the many moorings in the estuary create scour marks removing the delicate *Zostera marina,* eelgrass that is home to two species of seahorse. In this MCZ moorings and other detrimental anthropogenic activities are not allowed. Dr Ken Collins, in a research project in 2014, seeded eelgrass in an area outside the MCZ, they removed moorings and planted the seedlings in this newly exposed part of the sandy benthos and the surrounding area.

Methods:

- Subsurface Dual Frequency Analogue Side Scan Sonar- mapped the seafloor along a single transect across the newly exposed moorings. The frequency was 100kHz (a lower resolution ensures identification of eelgrass),
- Video transects were taken across the side scanned area, footage of the SAC was also taken. Both of these have been used to identify species present and percentage cover of the eelgrass.
- Correlating the video transect with Side Scan Sonar as a ground truthing method.

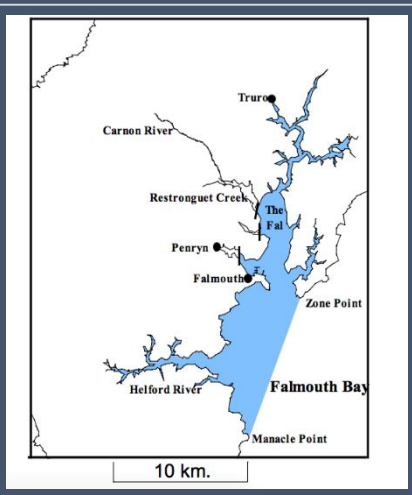

Figure 1, See Above, Helford Estuary, the areas the transect were taken in is represented by the white line.

Figure 2 The SAC area has been highlighted in blue on the map of the Falmouth Bay on the image to the left. (Langston et al, 2003)

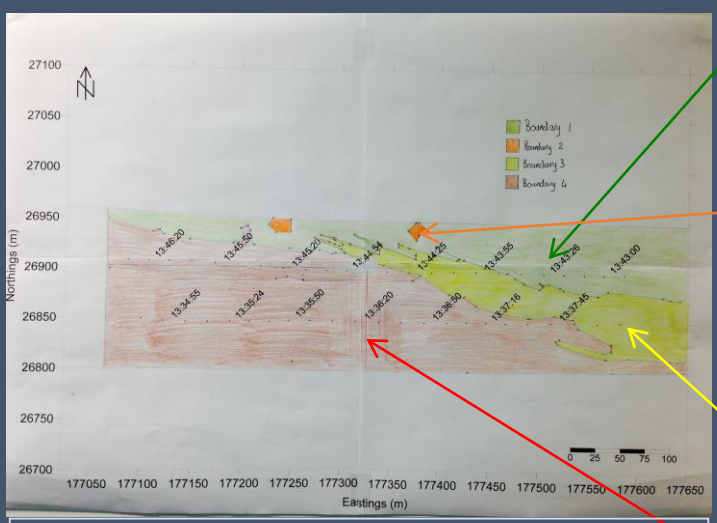

Figure 3 A Benthic Map constructed from data collected from the Helford estuary showing the boundaries between specific substrates.

Boundary 1
The green sections of the chart indicate areas containing eelgrass, frequently other species of macroalgae appear such as *Laminaria* species.

Boundary 2
The chart contains orange patches within the eelgrass beds-these patches are areas where there is little or no eelgrass growing. It may be that these patches are due to damage resulting from boats mooring in the area.

Boundary 3
The yellow sections of the chart comprise soft, sandy sediment with sporadic patches of large kelp growing

Boundary 4
These areas are composed of harder sediment with benthic algae and mollusc shells.

Figure 4: Eelgrass (*Zostera marina*) & common starfish (*Asterias rubens*) in Transect 1.

Figure 5 : *Laminaria digitata* & Eelgrass (*Zostera marina*) in Transect 2.

Figure 6: Flowering Eelgrass in Transect 2.

Conclusion:
The eelgrass transplant appears to have been successful, this is proven in the depiction of the side scan sonar from transect 1 (the newly exposed habitat) as Boundary 1 on the benthic map shows this as well as the presence of visible patches of eelgrass in the video footage. Ideally comparisons could be made to previous data from the area and the coordinates of the area where the eelgrass was transplanted should have been used to allow more specific analysis. For progression in the eelgrass' growth, future transects should be taken in this area.

Comparing the analyses of the video footage from transect 1 to transect 2 (the MCZ area) allows a comparison between a well-established eelgrass community and a newly introduced eelgrass community. There was found to be more seagrass present in the well-established community. There were not bare spaces in the established seagrass community, this means the bare sand could be residual effects from the removed moorings. This can be seen in the side scan sonar at Boundary 2 which is supported also by the video footage.

Reference: Langston, W.J., Chesman, N.C., Burt, G.R., Hawkins, S.J., Readman, J. and Worsfeild, P. 2003, 'Site Characterisation of the South West European Marine Sites- Fal and Helford cSAC', *Marine Biological Association Ocasssional Publication No. 8.*