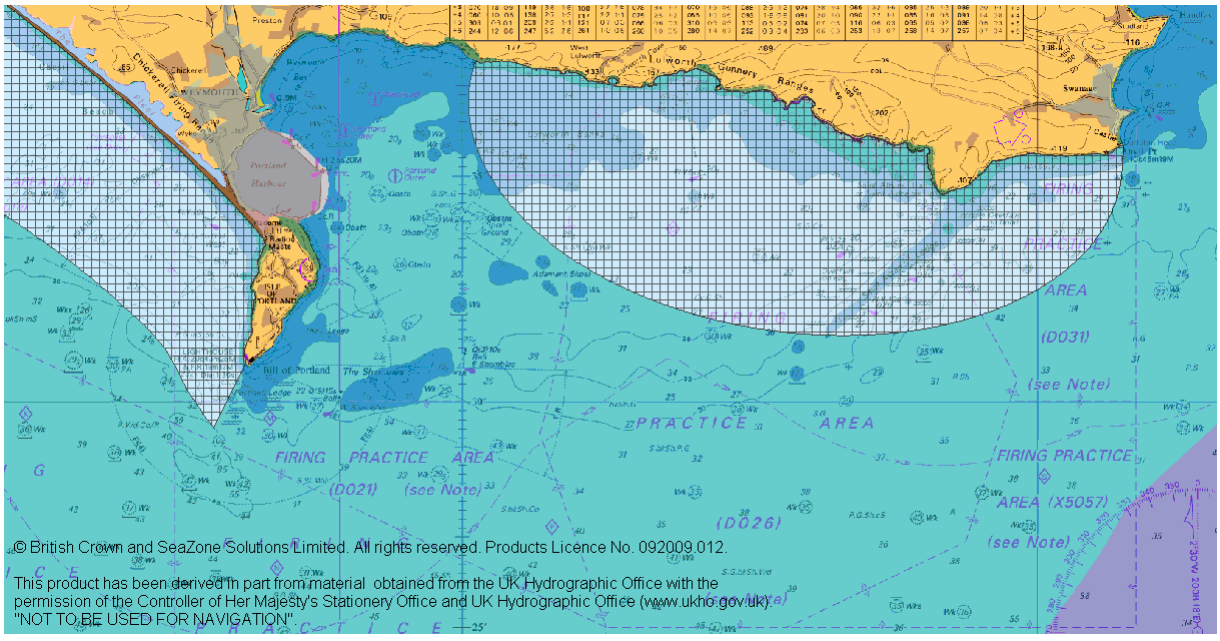
Appendix 9. Constraints Mapping Methods

Constraints Mapping

The MapInfo Professional GIS was used to undertake the constraints mapping component of the project. To support the efficient running of multiple iterations of the constraints maps a MapBasic program was written to automate the process. Central to this was a control file. This is an Excel spreadsheet which lists the "rules" used for the constraints mapping. Each rule can be defined by a number of parameters.

- Rule type – Query , buffer or wait (omit from the analysis)
- Input dataset name
- Query
- Buffer distance (m)
- Output dataset name

The outcome is a MapInfo dataset that shows areas which are NOT suitable for the particular activity such as aquaculture. A query selects a subset of features based on some criterion. An example would be the rule that says "New aquaculture schemes should not be located within the seascape areas defined as coastal waters". The figure below shows all of the seascape types. The result of the query, (coastal waters) is shown with the cross-hatch pattern.



Buffers are distance bands around features. A buffer-based rule might be "New aquaculture schemes should not be located within 100 metres of buoys". The figure below shows both the buoys dataset and the corresponding buffered areas.

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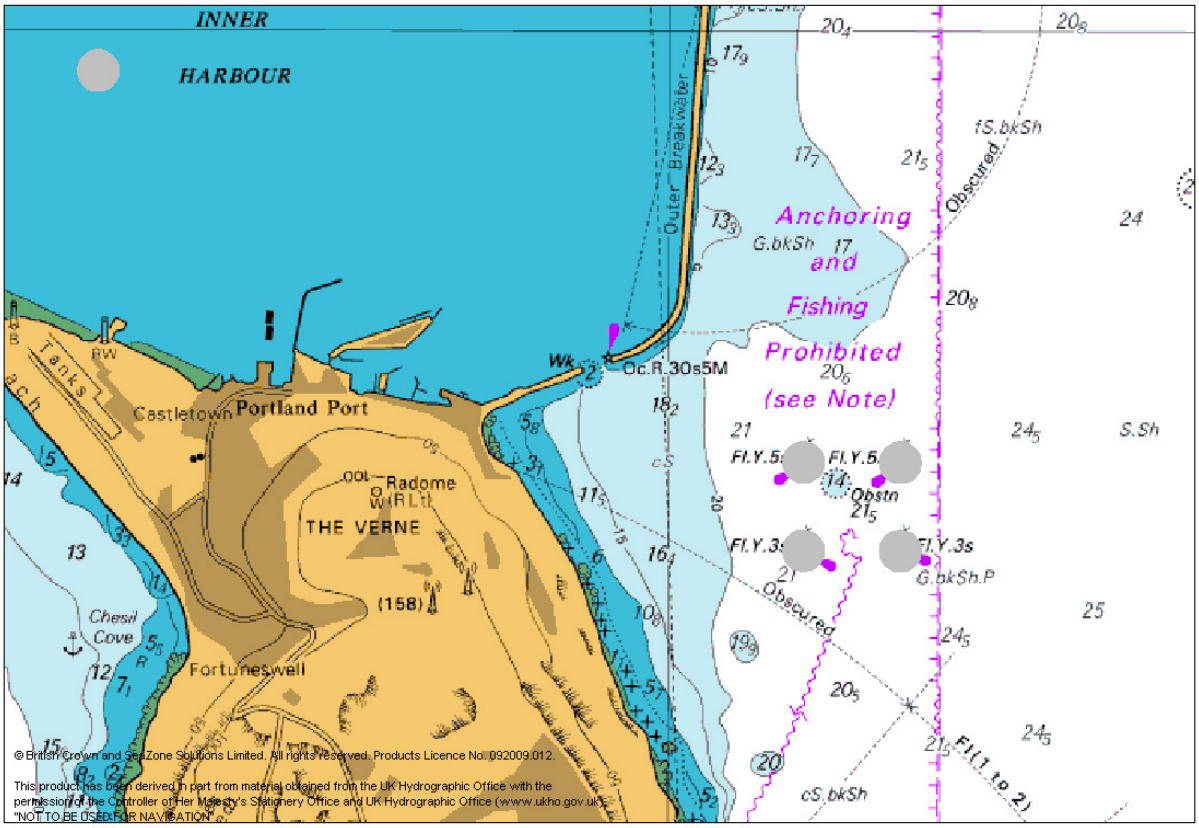

The resulting output datasets are displayed on top of each other within the GIS. This shows clearly areas which are and are not suitable for the particular activity. It was then possible to "draw" revised areas on-screen which might group several smaller suitable areas together.

A number of iterations were run where certain rules were included or omitted, buffer widths and queries were changed.

Constraints Mapping Data and Rules

The below table lists the datasets which were used within the final iteration.

Information	Rule Type	Rule
Seascape	QUERY	Avoid - Coastal waters
Degaussing range & other military infrastructure	BUFFER	500m buffer
Wrecks	BUFFER	100m buffer
Fishing effort	QUERY	Avoid highest density
Marinas	BUFFER	1km buffer

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Ports	BUFFER	1km buffer
Residential areas	BUFFER	1km buffer
MoD ranges	QUERY	Within
Beacons	BUFFER	100m buffer
Buoys	BUFFER	100m buffer
Signal stations	BUFFER	1km buffer
Lights	BUFFER	100m buffer
Outfalls	BUFFER	1km buffer
Recreation areas and bathing areas	BUFFER	1km buffer
Bathing Water points	BUFFER	1km buffer
Wreck to reef	BUFFER	500m buffer
Most used shipping routes	BUFFER	500m buffer
Anchorages	BUFFER	500m buffer
Bad weather anchorage	BUFFER	500m buffer
Proposed bad weather anchorage	BUFFER	500m buffer
Berths	BUFFER	500m buffer
Submarine cables	BUFFER	500m buffer
Pipelines	BUFFER	500m buffer
Cable areas	BUFFER	500m buffer
Portland Gas	BUFFER	500m buffer
Water depth mussels and scallops	QUERY	≥10m, ≤50m
Water intake	BUFFER	100m buffer
Yachting routes	BUFFER	500m buffer

Results

The figure below shows the areas that the constraints mapping exercise has shown as not suitable for aquaculture (grey) in addition to the “drawn” areas. Whilst there is a region to the south-east of the Marine Plan area which looks suitable for aquaculture development, it was felt that the operational distance to shore to service the site made it un-viable.

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