



Marine
Management
Organisation

High Priority Non-Licensable Activities in MPAs (MMO1243)



INVESTORS
IN PEOPLE

Bronze



MMO1243: High Priority non-Licensable Activities in MPAs

September 2021



Report prepared by: ABPmer

Project funded by: Marine Management Organisation

Version	Author	Note
0.1	ND, ZP, DW	First draft
0.2	ND, ZP, DW	Amendments
1	CG	Approved

© Marine Management Organisation 2021

You may use and re-use the information featured on this publication (not including logos) free of charge in any format or medium, under the terms of the Open Government Licence. Visit www.nationalarchives.gov.uk/doc/open-government-licence/ to view the licence or write to:

Information Policy Team
The National Archives
Kew
London
TW9 4DU
Email: psi@nationalarchives.gsi.gov.uk

Information about this publication and further copies are available from:

Marine Management Organisation
Lancaster House
Hampshire Court
Newcastle upon Tyne
NE4 7YH

Tel: 0300 123 1032
Email: info@marinemanagement.org.uk
Website: www.gov.uk/mmo

Disclaimer

This report contributes to the Marine Management Organisation (MMO) evidence base which is a resource developed through a large range of research activity and methods carried out by both MMO and external experts.

The opinions expressed in this report do not necessarily reflect the views of MMO nor are they intended to indicate how MMO will act on a given set of facts or signify any preference for one research activity or method over another. MMO is not liable for the accuracy or completeness of the information contained nor is it responsible for any use of the content.

When referencing this publication, please cite as:

MMO (2021). High Priority Non-Licensable Activities in MPAs. A report produced for the Marine Management Organisation, MMO Project No: 1243 September 2021, 74pp

Contents

Abbreviations	1
Executive Summary	2
1. Introduction	3
1.1 Background	3
1.2 Aims and Objectives	5
2. Methodology	7
2.1 Overview	7
2.1.1 Creating combined existing data layers.....	8
2.1.2 Stakeholder Consultation	8
2.1.3 Limitations of the methodology	8
2.2 Existing Data Review	9
2.3 New Mooring Areas Data Product	10
2.3.1 Pilot phase.....	11
2.3.2 Mapping phase.....	14
2.4 Collated Activity Data Layers for Stakeholder Review	16
2.5 Development of the Data Viewer	16
3. Stakeholder Consultation.....	20
3.1 Stakeholder Survey Consultees.....	20
3.1.1 Phase 1	20
3.1.2 Phase 2	20
3.1.3 Phase 3	20
3.3 Analysis of Stakeholder Responses	21
3.4 Results of the Stakeholder Engagement	21
3.4.1 Phase 1	22
3.4.2 Phases 2 & 3.....	23
4. Final Activity Data Layers	29
4.1 Mooring Areas.....	30
4.2 Anchorage Areas	31
4.3 Powerboat or Sailing Boat: Launching & Recovery.....	32
4.4 Powerboat or Sailing Boat: Participation	33
4.5 Motorised Personal Watercraft	35
4.6 Non-motorised Personal Watercraft	35
4.7 Recreational SCUBA Diving.....	37
4.8 Project geodatabase.....	38
5. Recreational Activity Maps	39
5.1 Isles of Scilly	39
5.2 Falmouth	41
5.3 Plymouth	42
5.4 Torbay	43
5.5 Exe Estuary	44
5.6 Poole and Studland	45
5.7 The Solent.....	46
5.7 Thames Estuary.....	53

5.8 Alde-Ore and Butley Estuaries.....	56
5.9 The Wash and North Norfolk.....	57
5.10 Morecambe Bay	58
6. Conclusions and Recommendations	59
6.1 Data Gaps and Data Limitations	59
6.2 Recommendations	60
7. References.....	61
Annex 1 Consultees	62
Annex 2 Stakeholder Survey Invitation	67

Figures

Figure 1: Selected Marine Protected Areas	6
Figure 2: Overview of methodology	7
Figure 3: CCO aerial imagery showing mooring buoys	13
Figure 4: CCO aerial imagery showing swinging mooring impact areas	14
Figure 5: Bookmarks for stakeholder editor app	18
Figure 6: Pop-up information for contributing information	19
Figure 7: Pie chart showing the break-down of stakeholder responses	22
Figure 8: Bar chart showing the number of responses from all phases that provided data, per region	25
Figure 9: Bar chart showing the number of responses from all phases that provided data, per organisation type	26
Figure 10: Bar charts showing responses per organisation type for each region	26
Figure 11: Flow chart of overall method used to create the final data layers.....	29
Figure 12: Final activity data layers and MPAs within the Isles of Scilly region	40
Figure 13: Final activity data layers and MPAs within the Falmouth region	41
Figure 14: Final activity data layers and MPAs within the Plymouth region	42
Figure 15: Final activity data layers and MPAs within the Torbay region	43
Figure 16: Final activity data layers and MPAs within the Exe Estuary region	44
Figure 17: Final activity data layers and MPAs within the Poole and Studland region	45
Figure 18: Final activity data layers and MPAs within The Solent region, separated into areas	46
Figure 18a: Final activity data layers and MPAs within the West Solent area	47
Figure 18b: Final activity data layers and MPAs within the Mid Solent area.....	48
Figure 18c: Final activity data layers and MPAs within the East Solent area	49
Figure 18d: Final activity data layers and MPAs within the Southampton Water area	50
Figure 18e: Final activity data layers and MPAs within the River Test area	51
Figure 18f: Final activity data layers and MPAs within the Portsmouth and Chichester area	52

Figure 19: Final activity data layers and MPAs within the Thames Estuary region ...	53
Figure 19a: Final activity data layers within the Essex Estuaries SAC and Benfleet and Southend Marshes SPA	54
Figure 19b: Final activity data layers within the Margate and Long Sands SAC	55
Figure 20: Final activity data layers and MPAs within the Alde-Ore and Butley Estuaries region.....	56
Figure 21: Final activity data layers and MPAs within the Wash and North Norfolk region	57
Figure 22: Final activity data layers and MPAs within the Morecambe Bay region ...	58

Tables

Table 1: List of selected MPA sites.....	4
Table 2. Potential existing data sources published since 2015	9
Table 3: CCO aerial imagery coverage of MPA sites	11
Table 4: Area of moorings as a percentage of each MPA.....	15
Table 5: Summary of total stakeholder responses	22
Table 6: Data sources for mooring activity	30
Table 7: Data sources for anchorage activity	31
Table 8: Data sources for launching & recovery activity	32
Table 9: Data sources for boating participation activity	33
Table 10: Data sources for motorised personal watercraft activity	35
Table 11: Data sources for non-motorised personal watercraft activity	36
Table 12: Data sources for recreational SCUBA diving activity	37
Table A1: List of stakeholders contacted	62

Abbreviations

Abbreviation	Term
AIS	Automatic Identification System
API	Application Programming Interface
ArcGIS	Aeronautical Reconnaissance Coverage Geographic Information System
ArcGIS API	ArcGIS application programming interface
ArcGIS PRO	ArcGIS Professional
BSAC	British Sub-Aqua Club
CCO	Channel Coastal Observatory
COVID	Coronavirus disease
Defra	Department for Environment, Food & Rural Affairs
EMODNet	European Marine Observation and Data Network
EPUG	Exeter Port Users Group
Esri	Environmental Systems Research Institute
ETRS	European Terrestrial Reference System
GDPR	General Data Protection Regulation
GIS	Geographic Information System
HE	Historic England
HM	Her Majesty's
ID	Identifier
IEG	Impacts Evidence Group
IFCA	Inshore Fisheries and Conservation Authority
INSPIRE	Infrastructure for spatial information in Europe
MCA	Maritime and Coastguard Agency
MCZ	Marine Conservation Zone
MMO	Marine Management Organisation
MPA	Marine Protected Area
MXD	Map Exchange Document (ArcGIS project file)
NHRE	National Record of the Historic Environment
PDF	Portable Document Format
PWC	Personal watercraft
RIB	Rigid inflatable boat
RNLI	Royal National Lifeboat Institute
RYA	Royal Yachting Association
SAC	Special Area of Conservation
SCUBA	Self-contained underwater breathing apparatus
SPA	Special Protection Area
TCE	The Crown Estate
UK	United Kingdom
UKHO	United Kingdom Hydrographic Office
URLs	Uniform Resource Locators
Webmap	Web (online) mapping interactive display of geographic information that can be opened in browsers, on devices,
WGS	World Geodetic System

Executive Summary

Under the Marine and Coastal Access Act (2009) the MMO is obligated to further the conservation objectives of Marine Protected Areas (MPAs) in England. Where non-licensable activities occur within MPAs the MMO can manage activity through its byelaw-making powers and through marine planning policy. This report provides insights into the spatial distribution of a subset of marine non-licensable activities within specific MPAs across England. Marine non-licensable activities are those which do not require a marine licence and include a range of recreational activities from mooring and anchoring to boating and SCUBA diving.

The overarching aim of this project was to identify and collate all relevant existing spatial data (published since 2015) for each marine non-licensable activity, validate and support this data through the collection of stakeholder information, and apply transparent and validated methods to produce data that can be used to support the consideration of potential management measures at 32 selected MPAs.

A variety of different data sources were utilised to obtain spatial data for each marine non-licensable activity. Publicly available information (including maps of boating participation areas, moorings and anchorages), aerial imagery and other available datasets and sources were identified and used to create a cumulative layer of existing spatial data for each non-licensable activity.

A stakeholder consultation was then implemented, using an online data viewer (displaying the cumulative data layers) to validate the existing data and further develop the spatial extent of each non-licensable activity. Regions with the highest stakeholder input included The Solent and the Exe Estuary, with consultees also providing information on a national scale. Government organisations and ports and harbours contacts provided the most information of all the stakeholder types invited to take part.

Limited information was obtained on temporal or spatial intensity of the activities. Many stakeholders who responded did provide details about intensity for the areas which they edited, but these formed a small proportion of the mapped activity data layers. Final outputs are summarised in this report, and the 7 final marine non-licensable activity map data layers, which are available for public use, can be accessed via the Defra Data Services Platform (<https://environment.data.gov.uk/>) or from the MMO by request.

Due to the COVID-19 restrictions on having face to face meetings with stakeholders an online data viewer was used which proved to be a successful and efficient way to share existing data and edit new spatial data. The existing data covered all MPAs of interest and were generally found to accord well with stakeholder knowledge. Responses provided by stakeholders covered all non-licensable activities of interest within 19 out of the 32 MPAs considered in this study. Data generated by this methodology can also be a useful tool for highlighting gaps in organisational and regional input of information regarding marine non-licensable activities within MPAs.

1. Introduction

1.1 Background

The Marine Management Organisation (MMO) has an obligation under the Marine and Coastal Access Act (2009) to further the conservation objectives of Marine Protected Areas (MPAs), including using its byelaw making powers and marine planning policy to directly or indirectly manage non-licensable activities.

Marine non-licensable activities are those which do not require a marine licence and include a range of recreational activities from mooring and anchoring to boating and SCUBA diving. Marine non-licensable activities within MPAs are not well understood in terms of their intensity, both spatially and temporally, particularly in relation to protected features in MPAs. Protected features include species European and international conservation importance as well as characteristic habitats present in UK waters. This makes it challenging to consider whether these types of activities are having a detrimental impact on an MPA.

The MMO wishes to improve the understanding of the distribution and intensity of marine non-licensable activities (hereinafter referred to as “recreational activities”) and provide support to the identification of potential management measures for existing MPAs. Following on from previous recent studies ([MMO1163](#) (MMO, 2020), MMO1165 (IEG, 2020), [MMO1136](#) (MMO, 2019), C5784AD (Lee, 2018) and [ME6003](#) (Griffiths, et al., 2017)) this project seeks to narrow down which MPAs have features most at risk from recreational activities and may require MMO management. This will assist the MMO in its role in furthering the conservation objectives of MPAs.

There are currently 175 MPAs in UK non-devolved (MMO) waters; the MMO has identified 32 MPAs as having designated features potentially at risk from pressures caused by recreational activities (see Figure 1) grouped in 11 regions for this project. These MPAs include Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Marine Conservation Zones (MCZs). The MMO has also identified seven types of recreational activity as priority activities to focus on. These activity types are based on the [categories](#) used by Natural England in their provision of conservation advice for inshore MPAs. Recreational anchoring and mooring are the highest priority for attention; the remainder have also been identified, but at a lower priority:

- Powerboating or sailing with an engine: mooring and/or anchoring;
- Sailing without an engine: mooring and/or anchoring;
- Powerboating or sailing with an engine: launching and recovery, participation;
- Sailing without an engine: launching and recovery, participation;
- Non-motorised watercraft (e.g. kayaks, windsurfing, dinghies, paddleboards);
- Motorised personal watercraft (PWC) (e.g. jet skis); and
- Recreational SCUBA diving.

Motorised personal watercraft (PWC) were originally planned to be dealt with under the powerboating category, as the impacts from engine noise are similar to boats with engines, however, during the project it was decided that they should have their

own category since they are likely to have a different spatial and temporal footprint to powerboats.

The breakdown of recreational vessels between “powerboating or sailing with an engine” and “sailing without an engine”, although useful from an impact perspective, was considered to be difficult to achieve in this study based on the available data. For example, moorings and anchorages may be used by either types of vessels, and in the process of mooring and anchoring, sailing vessels are usually manoeuvred under engine. Launching sites may also be used by recreational vessels with or without an engine and when participating in boating activities, many open water areas will be used by both powerboats and sailing boats either under engine or under sail. Areas which are more likely to be used by sailing vessels under engine are within restricted areas, such as harbours and rivers and their approaches.

Table 1: List of selected MPA sites. Project regions are given as in Figure 1.

No.	MPA Name	No.	MPA Name
1	Alde, Ore and Butley Estuaries SAC (Alde, Ore and Butley Estuaries region)	17	North Norfolk Coast SAC (The Wash and North Norfolk region)
2	Bembridge MCZ (The Solent region)	18	North Norfolk Coast SPA (The Wash and North Norfolk region)
3	Benfleet and Southend Marshes SPA (Thames Estuary region)	19	Plymouth Sound and Estuaries SAC (Plymouth and Looe region)
4	Chichester and Langstone Harbours SPA (The Solent region)	20	Poole Harbour SPA (Poole and Studland region)
5	Essex Estuaries SAC (Thames Estuary region)	21	Solent and Southampton Water SPA (The Solent region)
6	Exe Estuary SPA (Exe estuary region)	22	Solent Maritime SAC (The Solent region)
7	Fal and Helford SAC (Falmouth region)	23	Studland Bay MCZ (Poole and Studland region)
8	Falmouth Bay to St Austell Bay SPA (Falmouth region)	24	Tamar Estuaries Complex SPA (Plymouth and Looe region)
9	Inner Dowsing, Race Bank and North Ridge SAC (The Wash and North Norfolk region)	25	Tamar Estuary Sites MCZ (Plymouth and Looe region)
10	Isles of Scilly Complex SAC (Isles of Scilly region)	26	The Manacles MCZ (Falmouth region)
11	Isles of Scilly Sites - Hanjague to Deep Ledge MCZ (Isles of Scilly region)	27	The Needles MCZ (The Solent region)
12	Isles of Scilly Sites - Men a Vaur to White Island MCZ (Isles of Scilly region)	28	The Swale Estuary MCZ (Thames Estuary region)
13	Isles of Scilly Sites - Peninnis to Dry Ledge MCZ (Isles of Scilly region)	29	The Wash and North Norfolk Coast SAC (The Wash and North Norfolk region)
14	Margate and Long Sands SAC (Thames Estuary region)	30	The Wash SPA (The Wash and North Norfolk region)
15	Morecambe Bay SAC (Morecombe region)	31	Torbay MCZ (Torbay region)
16	Morecambe Bay and Duddon Estuary SPA (Morecombe region)	32	Whitsand to Looe Bay MCZ (Plymouth and Looe region)

The final seven marine non-licensable activities considered in this study were amended as follows:

- Powerboating or sailing with/without an engine: mooring;
- Powerboating or sailing with/without an engine: anchoring;
- Powerboating or sailing with/without an engine: launching and recovery;
- Powerboating or sailing with/without an engine: participation;
- Non-motorised watercraft (e.g. kayaks, canoes windsurfing, dinghies, paddleboards, surfboards);
- Motorised personal watercraft (PWC) (e.g. jet skis); and
- Recreational SCUBA diving.

1.2 Aims and Objectives

The aim of the project was to provide data to underpin MPA site level assessments to ensure that the MMO can accurately assess impacts to MPAs and further their conservation objectives.

To achieve this, the main objectives of the study were to:

1. collate existing data on the distribution of the seven prioritised marine non-licensable activities in the 32 specified MPAs, published since 1 January 2015, and validate the findings through stakeholder consultation;
2. create and collate new data for the seven prioritised marine non-licensable activities in the 32 specified MPAs (desk exercise) including locations of permanent moorings within each site and carry out a stakeholder survey regarding levels of activity at each site; and
3. collate existing and new data into a GIS to develop new geospatial data layers of the marine non-licensable activities and produce activity maps for each MPA.

To provide this information this report is structured as follows:

[Section 2](#): Methodology – describes the existing data collation exercise and methodology for development and verification of the new recreational activity data layers.

[Section 3](#): Stakeholder Consultation – describes the process involved in carrying out the stakeholder consultation and summary and analysis of stakeholder responses.

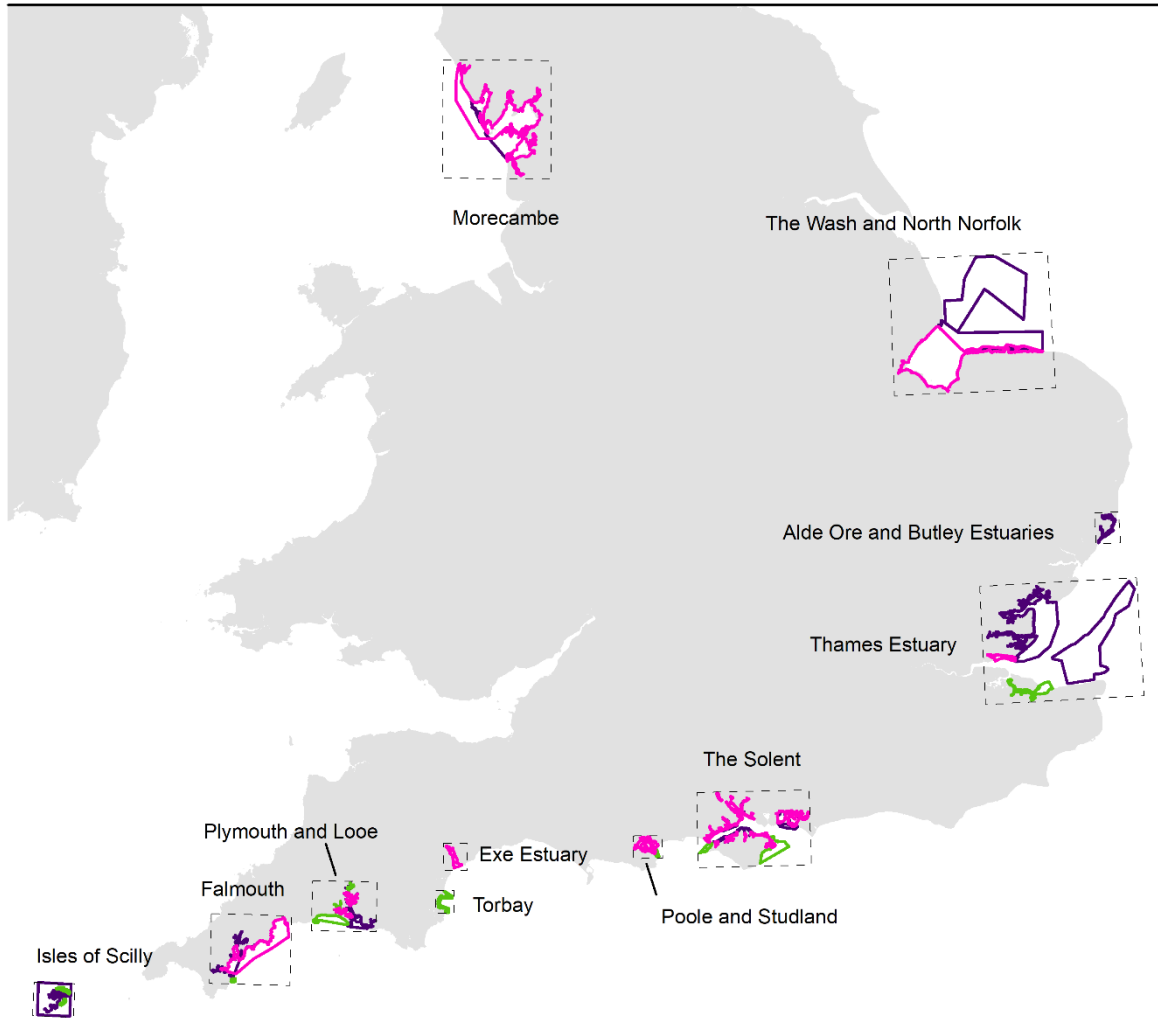
[Section 4](#): Final Activity Data Layers – describes the development of the final recreational activity data layers based on existing and new data sources.


[Section 5](#): Recreational Activity Maps – presents maps of the final recreational activity data layers for each region/MPA.

[Section 6](#): Conclusions and Recommendations – discusses the methods used in this study, data gaps and limitations and provides recommendations for future work.

Figure 1: Selected Marine Protected Areas

Regions and MPAs



<ul style="list-style-type: none"> Regions SPA MCZ SAC 	<p>Map outlining the 32 MPAs and corresponding regions.</p>	
---	---	---

Date of Publication: 19/04/2021
 Coordinate System: WGS 1984 UTM
 Zone 30N
 Projection: Transverse Mercator

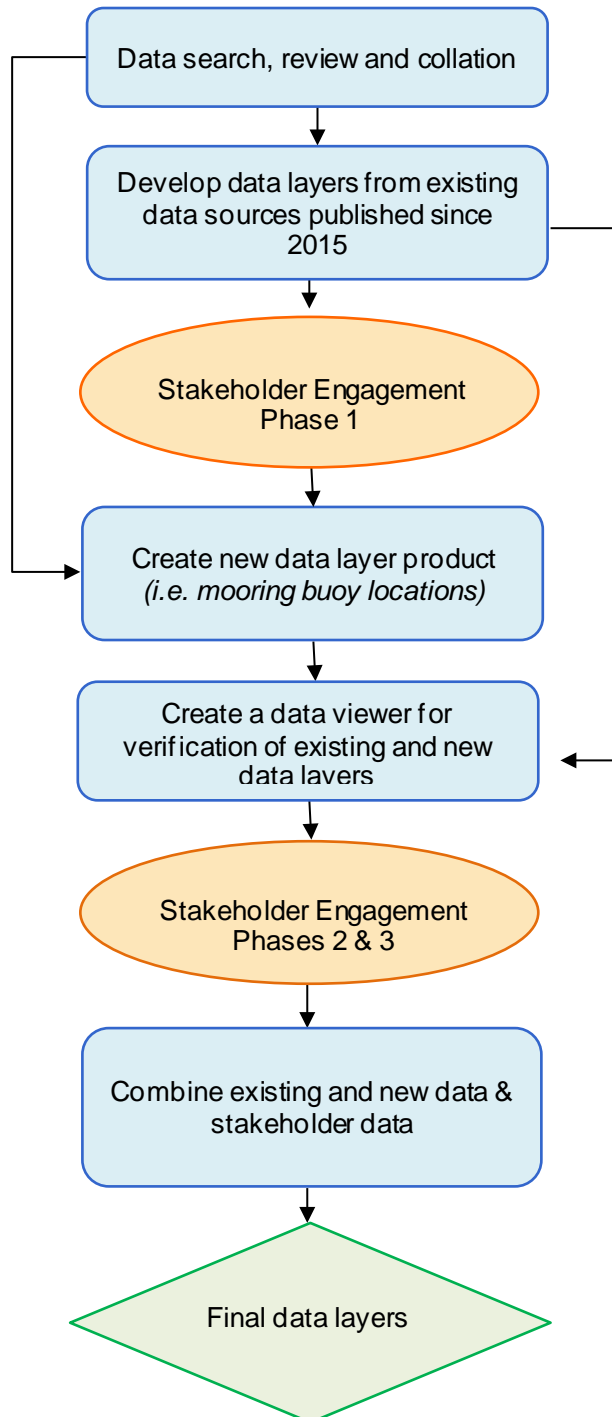
Not to be used for Navigation.
 © Natural England copyright. Contains Ordnance Survey data
 © Crown copyright and database right 2019.
 Contains public sector information
 licensed under the Open Government Licence v3.0.
 © ABPmer, All rights reserved, 2021.

2. Methodology

2.1 Overview

This section provides an outline of the steps taken in the development and verification of new recreational activity data layers, based on existing data sources, as summarised in the flow chart in Figure 2. The geoprocessing steps described below were carried out using ArcGIS v10.7 and ArcGIS Pro v2.6.

Figure 2: Overview of methodology



2.1.1 Creating combined existing data layers

Following the data search and collation task, methodologies were designed to combine the available data (where possible) into a new data layer for each activity. Input data layers (see Table 2) were merged (if polygon data) or buffered by a set distance and then merged (if point data) and clipped to the MPA boundaries. The outputs were saved ensuring that information on the data source was retained. These data layers were then simplified by dissolving before they were ready for verification by the stakeholders.

Limited information was available on the location of permanent mooring areas and anchorage areas within the MPAs and since these were the main priorities for this study, consideration was given to the development of new data products for these, based on existing data. Recent aerial imagery could be used to define permanent mooring areas, however, no additional datasets were found (within the time and budgetary limits of this study) to add to the existing data used in the creation of the new anchorage area dataset (see Section 2.3).

2.1.2 Stakeholder Consultation

The stakeholder consultation was carried out in two phases: the first phase focussed on obtaining information about mooring and anchorage areas in particular, from ports and harbour authorities situated within or near to the selected MPAs; the second phase involved a wider group of stakeholders, including government bodies, coastal fora and watersports organisations, who were asked to verify the collated data layers for each activity, as well as provide additional spatial and non-spatial data about the extent and intensity of the recreational activities within each region where the MPAs are located (see [Section 3](#)). The regions are shown in Figure 1.

Following the stakeholder engagement, information provided by the stakeholders was used to edit the collated activity data layers and the final output data layers were prepared for delivery as polygons in an ArcGIS geodatabase (see [Section 4](#)).

2.1.3 Limitations of the methodology

As well as mapping the extent of the recreational activities listed in Section 1.1, this study aimed to map the intensity (spatial and temporal) of the activities. Several approaches were considered to achieve this aim, including giving higher intensity scores where more dataset sources overlapped, using intensity scores from existing datasets, as well as gathering intensity information from stakeholders during the consultation exercise. However, these approaches were problematic as some of the activity datasets are based on generalised extents, which do not give information about intensity within an area, other datasets, particularly where points were converted to polygons, contained many overlapping data records which do not necessarily give a true reflection of intensity, and only a few data sources included intensity information. Although stakeholders were asked for information about intensity of activities, most did not provide any details. Where details about intensity were provided, they mainly focussed on temporal intensity (specifically high and low seasons) with this information mainly given as a general comment relating to overall usage of an area, although more specific information was provided for non-motorised

personal watercraft activities. This temporal information was carried across into the final data layers, however there is insufficient temporal and usage data to determine intensity for all data layers and in all regions.

The activity data layers, developed from merging the existing and new datasets with the stakeholder supplied data, were dependent on the quality of the input data and as such there will be associated limitations and gaps in the final data layer outputs. These are outlined in Sections 4 and 6.

2.2 Existing Data Review

Sourcing, collation and prioritisation of available spatial data published between 2015 and 2020 was carried out early in the study to develop the activity data layers and determine any data gaps. A thorough online search and review of available literature was carried out to identify any information and data sources, which may be useful to the project. The sources of evidence were also informed by the previous studies (noting that previous MMO, Natural England and Defra research projects have already undertaken similar tasks and produced spatial data outputs).

The sources of evidence which were collated for each priority activity are listed in Table 2. Any required processing of these data is detailed in [Section 4](#).

Table 2. Potential existing data sources published since 2015

Potential Data Sources	Recreational Activity
<ul style="list-style-type: none"> Defra C5784AD Recreational Mooring Areas (2018) The Crown Estate (TCE) Licensed mooring areas¹ Channel Coastal Observatory (CCO) Aerial imagery (2016 to 2019) 	Powerboating or sailing with/without an engine: mooring
<ul style="list-style-type: none"> Defra C5784AD Recreational Anchoring Areas (2018) Defra C5784AD Racing Anchoring Areas (2018) UK Hydrographic Office (UKHO) (S57 vector data) anchorage areas² UKHO (S57 vector data) anchorage points² 	Powerboating or sailing with/without an engine: anchoring
<ul style="list-style-type: none"> MMO 1136 Non-Licensable Activities (2019) MMO 1163 Slips (2020) Royal National Lifeboat Institution (RNLI) Stations (2020) Royal Yachting Association (RYA) Clubs & Training Centres (2016)³ RYA Marinas (2016)³ 	Powerboating or sailing with/without an engine: launching and recovery
<ul style="list-style-type: none"> MMO 1136 Non-Licensable Activities (2019) MMO 1163 Slips (2020) MMO 1163 Angling Areas (2020) RYA Clubs & Training Centres (2016)³ 	Powerboating or sailing with/without an engine: participation

<ul style="list-style-type: none"> • RYA Marinas (2016)³ • RYA General Boating Areas (2016) ³ • RYA Offshore Routes (2016)³ • RYA AIS Intensity (2016)³ • MMO/ABPmer AIS (Automatic Identification System) Recreational Vessel Transits and Density (2015 to 2017)⁴ • European Marine Observation and Data Network (EMODNet) Pleasure Craft and Sailing Vessel AIS Density (2017 to 2019)⁴ • RNLI Incidents (2020) • RNLI Returns of Service (2020) 	
<ul style="list-style-type: none"> • MMO 1136 Non-Licensable Activities (2019) • MMO 1163 Slips (2020) • RYA Clubs & Training Centres (2016)³ • RNLI Incidents (2020) • RNLI Returns of Service (2020) 	Non-motorised watercraft (e.g. kayaks, canoes windsurfing, dinghies, paddleboards, surfboards)
<ul style="list-style-type: none"> • MMO 1136 Non-Licensable Activities (2019) • MMO 1163 Slips (2020) • RNLI Incidents (2020) • RNLI Returns of Service (2020) 	Motorised personal watercraft (PWC) (e.g. jet skis)
<ul style="list-style-type: none"> • MMO 1136 Non-Licensable Activities (2019) • Finstrokes Dive Sites (2017) • UKHO INSPIRE Wrecks: points (2020)² • UKHO INSPIRE Wrecks: polygons (2020)² • Historic England (HE), National Record of the Historic Environment (NHRE), Maritime Coastguard Agency (MCA) Protected Wrecks Exclusion Zones (2009)⁵ • RNLI Incidents (2020) • RNLI Returns of Service (2020) 	Recreational SCUBA diving
<p>Notes:</p> <ol style="list-style-type: none"> 1. TCE's licensed mooring area data was requested from TCE but was not provided. 2. UKHO Admiralty chart S57 marine vector data was supplied to ABPmer under licence from Defra. 3. RYA's UK Coastal Atlas of Recreational Boating is provided under licence to ABPmer. 4. MMO AIS vessel transit data was selected for use in this study rather than AIS density gridded data. 5. HE, NHRE, MCA (2009) Protected wrecks data is included for completeness since these locations will not have changed since 2009. 	

It was hoped that freely available Strava data for non-motorised watercraft activities could also be included, however, when approached with a data request for this study Strava Metro was unfortunately only able to offer terrestrial data in the form of bike/pedestrian activities.

2.3 New Mooring Areas Data Product

As discussed in Section 2.1, there was little available data for mooring area locations, therefore, as this was a priority activity for consideration, the option of

digitising the mooring areas was considered, based on freely available aerial imagery supplied by the CCO to create a new data product for this study.

Requests for information from port and harbour authority contacts were also made to obtain geospatial information about moorings and anchorages and any other information relating to the other recreational activities within the areas of interest during phase 1 of the stakeholder engagement (see Section 3.1). Online searches were also conducted to identify any further data sources which may be useful.

Data was processed on a site-by-site basis or regional basis where more than one MPA site overlaps an area, following the successful completion of a pilot phase to test the methodology for digitising mooring buoys/areas.

2.3.1 Pilot phase

Following the data collation stage of the project, a pilot study was carried out to assess and agree the methodology for digitising mooring buoys/areas before applying it to the remainder of the sites. During the pilot phase, consideration was also given to the issue of intensity of activity, spatially and temporally, since the MMO is interested in comparing intensity across and between MPA sites.

CCO ortho-rectified aerial imagery (imagery that has undergone the process of removing the effects of camera tilt and topographic relief (terrain), leaving an accurate representation of the Earth's surface), which covers the coastal regions of England and most of the selected MPAs, was collated from 2019 to 2016. 8 sites had full CCO aerial imagery coverage; 22 sites had coverage of the nearshore area, where mooring areas tend to be located; and two sites had no coverage (Table 3). The aerial imagery was captured during the winter seasons at a high resolution of 0.1 m and can be used as a reference dataset to digitise mooring buoys (Figure 3). Using aerial imagery from the winter seasons is beneficial for identifying mooring buoys as there are less boats using temporary moorings.

Table 3: CCO aerial imagery coverage of MPA sites

No.	MPA Name	CCO aerial imagery coverage
1	Alde, Ore and Butley Estuaries SAC	Full coverage
2	Bembridge MCZ	Nearshore area only
3	Benfleet and Southend Marshes SPA	Full coverage
4	Chichester and Langstone Harbours SPA	Full coverage
5	Essex Estuaries SAC	Nearshore area only
6	Exe Estuary SPA	Full coverage
7	Fal and Helford SAC	Nearshore area only
8	Falmouth Bay to St Austell Bay SPA	Nearshore area only
9	Inner Dowsing, Race Bank and North Ridge SAC	None
10	Isles of Scilly Complex SAC	Nearshore area only
11	Isles of Scilly Sites - Hanjague to Deep Ledge MCZ	Nearshore area only
12	Isles of Scilly Sites - Men a Vaur to White Island MCZ	Nearshore area only
13	Isles of Scilly Sites - Peninnis to Dry Ledge MCZ	Nearshore area only

14	Margate and Long Sands SAC	None
15	Morecambe Bay SAC	Incomplete nearshore area
16	Morecambe Bay and Duddon Estuary SPA	Incomplete nearshore area
17	North Norfolk Coast SAC	Full coverage
18	North Norfolk Coast SPA	Full coverage
19	Plymouth Sound and Estuaries SAC	Full coverage
20	Poole Harbour SPA	Nearshore area only
21	Solent and Southampton Water SPA	Nearshore area only
22	Solent Maritime SAC	Nearshore area only
23	Studland Bay MCZ	Nearshore area only
24	Tamar Estuaries Complex SPA	Full coverage
25	Tamar Estuary Sites MCZ	Nearshore area only
26	The Manacles MCZ	Nearshore area only
27	The Needles MCZ	Nearshore area only
28	The Swale Estuary MCZ	Nearshore area only
29	The Wash and North Norfolk Coast SAC	Nearshore area only
30	The Wash SPA	Nearshore area only
31	Torbay MCZ	Nearshore area only
32	Whitsand to Looe Bay MCZ	Nearshore area only

Where CCO aerial imagery did not cover the MPA, the existence of mooring areas was checked using Esri's (Environmental Systems Research Institute) satellite and aerial imagery basemap available within ArcGIS, which has good enough resolution at 0.6 m to indicate mooring areas and is typically within 3-5 years of currency. The presence of mooring areas was also checked against Admiralty chart data using Navionics Chart Viewer online charts. No moorings were noted in areas outside of the CCO data coverage.

The option of automating the mapping process using image recognition software was tested, however, due to mooring buoys having different colours in different areas (white, red, pink or yellow) and the difficulty of distinguishing between buoys and boats or white wave tops, this option was not feasible within the scope of this study.

During the pilot phase, locations of mooring buoys were digitised within the Benfleet and Southend Marshes SPA using the CCO 2019 aerial imagery in ArcGIS. If it was unclear whether an object was a mooring buoy, previous years of CCO data were checked. Admiralty chart data was also checked (using Navionics Chart Viewer online data) to help clarify areas where buoys are used for navigation purposes rather than mooring. Mooring buoys were not always in the same place from year to year, therefore, mooring buoy locations for earlier years were also digitised.

Figure 3: CCO aerial imagery showing mooring buoys



After completing the mooring buoy digitisation, a mooring area polygon was created around the outer extent of the point dataset. Where buoys were laid out in lines, a polyline was created, along the line of buoys, rather than a polygon. The polygons and polylines were buffered by 20 m to cover the likely area affected by swinging boats and mooring buoy anchor chains. These affected areas could be clearly seen in some imagery (Figure 4). Finally, the buffer areas were clipped to the MPA boundaries.

The intensity of mooring buoy use could not be captured with the aerial imagery (since the data was a snapshot of moorings from one day in the winter season) however, the size of the digitised areas provide a good indication of the intensity of moorings: the larger the area the greater the number of moorings since buoys tend to be at a similar density/spacing between areas and between harbours/regions.

Figure 4: CCO aerial imagery showing swinging mooring impact areas



2.3.2 Mapping phase

Following the successful completion of the pilot phase, mooring areas in the remaining MPA sites were digitised using a similar method. However, to speed up the process, polygons were created around the mooring buoys using the CCO 2019 aerial imagery in the first instance, then checking against CCO 2018, 2017 and/or 2016 (where available) to ensure the digitised areas encompassed all mooring buoy locations in previous years. Therefore, individual mooring buoys were not digitised for all sites – only Benfleet and Southend Marshes SPA, part of Chichester and Langstone Harbours SPA and Studland Bay MCZ (at the request of the MMO) had point data of mooring buoy locations.

Where mooring buoys were located just outside the MPA boundary but within the 20 m buffer area, these were included in the digitised areas since the swing of the vessel could encroach into the MPA site.

The digitised areas within each region were buffered by 20 m, merged to create one mooring area polygon and then clipped to the MPA site boundaries to produce the

final digitised mooring areas data layer. The percentage of the seabed area in each MPA, which might be influenced by moored vessels, is shown in Table 4.

Table 4: Area of moorings as a percentage of each MPA

MPA Name	Area of moorings (km²)	Area of moorings as % of MPA site
Alde, Ore and Butley Estuaries SAC	0.64	3.9
Bembridge MCZ	0.30	0.4
Benfleet and Southend Marshes SPA	1.07	4.7
Chichester and Langstone Harbours SPA	5.56	9.6
Essex Estuaries SAC	3.22	0.7
Exe Estuary SPA	1.76	7.4
Fal and Helford SAC	4.97	7.8
Falmouth Bay to St Austell Bay SPA	2.23	0.9
Inner Dowsing, Race Bank and North Ridge SAC	0.0	0.0
Isles of Scilly Complex SAC	1.92	0.7
Isles of Scilly Sites - Men a Vaur to White Island MCZ	0.04	1.0
Isles of Scilly Sites - Peninnis to Dry Ledge MCZ	0.01	0.3
Margate and Long Sands SAC	0.0	0.0
Morecambe Bay SAC	0.86	0.1
Morecambe Bay and Duddon Estuary SPA	0.95	0.1
North Norfolk Coast SAC	0.04	0.1
North Norfolk Coast SPA	1.02	1.3
Plymouth sound & Estuaries SAC	3.02	4.7
Poole Harbour SPA	3.58	8.6
Solent and Southampton Water SPA	1.80	3.3
Solent Maritime SAC	8.02	7.1
Studland Bay MCZ	0.22	5.5
Tamar Estuaries Complex SPA	1.12	5.8
Tamar Estuary Sites MCZ	1.20	7.8
The Manacles MCZ	0.0	0.0
The Needles MCZ	0.0	0.0
The Swale Estuary MCZ	0.24	0.5
The Wash SPA	0.02	0.003
The Wash and North Norfolk Coast SAC	1.13	0.1
Torbay MCZ	0.0	0.0
Whitsand to Looe Bay MCZ	0.0	0.0

2.4 Collated Activity Data Layers for Stakeholder Review

Once the existing data review had been completed (Table 2), all relevant datasets were collated within suitable geodatabases and catalogued. The new data products were also catalogued and stored within geodatabases once digitising had been completed.

The aim of the next step was to create a new dataset per activity type by collating information from all relevant layers into a single data layer. To do this, the extent and level of detail of the collated data had to be understood, and rules created per layer based on the specific activity. Many of the existing data layers informed multiple activity datasets, but rules were developed to specify filters that must be applied to ensure that only relevant records within each dataset were used. For example, the RNLI incidents data layer informed multiple activity types, but for SCUBA diving the dataset was filtered to only include incidents that were recorded with a 'type' of 'SCUBA Diving'. This also ensured there wasn't any duplication of information.

Also, within the merging rules were some instances where data had to be manipulated, where it was of an unsuitable type. The most common instance of this was the abundance of point data that had to be converted to polygons to be able to create a single layer per activity type and to give a more accurate representation of the activity extent. To convert to polygons, the 'buffer' tool was used, with the buffer distance varying between the data source and activity type, for example, the 'Launching & Recovery' activity used point positions of launch sites and the 'SCUBA diving' activity used point positions for wreck sites, but these were buffered by a specific distance to encompass the total area that would likely be influenced by the activity (see [Section 4](#)).

Each input dataset was edited to include information on the data source, so that when they were merged, each record within the dataset could be traced back to the data source. This also helped with the refining of the data layers after stakeholder consultation.

Once an activity layer had been merged with all suitable datasets, the layer was 'dissolved' to create one record of multiple polygons per input data source. The dissolve tool works by aggregating separate polygons into a single polygon based on one or more attributes. This made the dataset more manageable for viewing and improved performance when sharing with stakeholders online. The activity data layers were added to an ArcGIS Pro project and uploaded as a feature service to ArcGIS Online.

2.5 Development of the Data Viewer

The restrictions with holding face-to-face workshops due to the COVID-19 pandemic meant that dealing with stakeholders remotely was the only option for this study. Therefore, to engage with stakeholders, the decision was taken to utilise web mapping technology the ArcGIS Online platform. This was decided for several reasons, but mainly:

- it allowed each stakeholder the opportunity to contribute information securely;
- it gave stakeholders the ability to review the information provided and edit activity data directly into a GIS format;
- it allowed each stakeholder to take their time over reviewing the existing data layers; and
- it made it more efficient when making any changes to the spatial data for review.

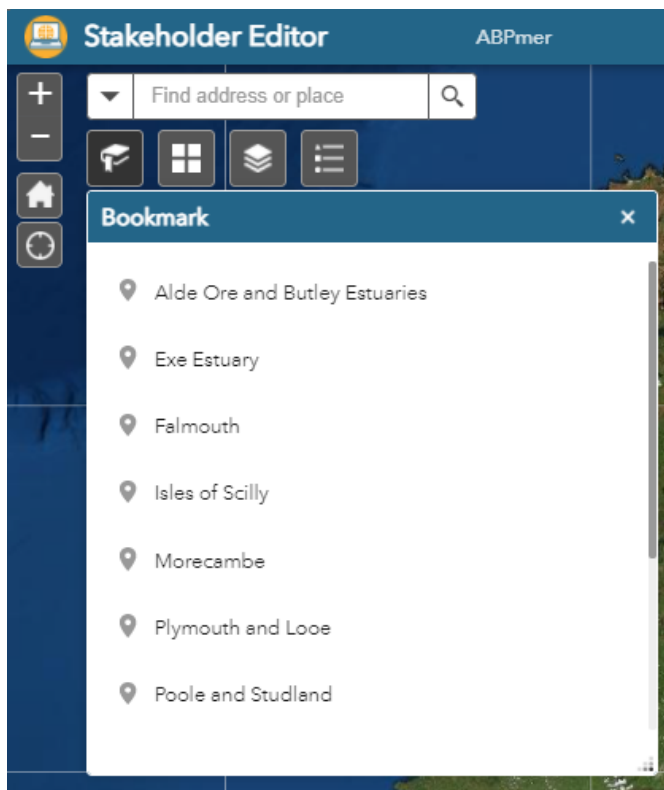
There were two main aims of using the webmap data viewers –

1. To review and comment on the existing activity data layers that had been collated and merged; and
2. To contribute information where an activity was not represented in the existing data layers, using local expert knowledge.

As noted in Section 2.4, the existing activity data layers were published as a feature service to ArcGIS Online and added to a webmap within the platform. Other layers were also published as feature services and used within the webmap to provide context and additional information to the stakeholders, including the locations and types of designated sites that are of interest and background chart data. Once all relevant data was included within the webmap, bookmarks were created to allow easy navigation to all regions of interest to the study, enabling easier contribution of information for stakeholders (Figure 5).

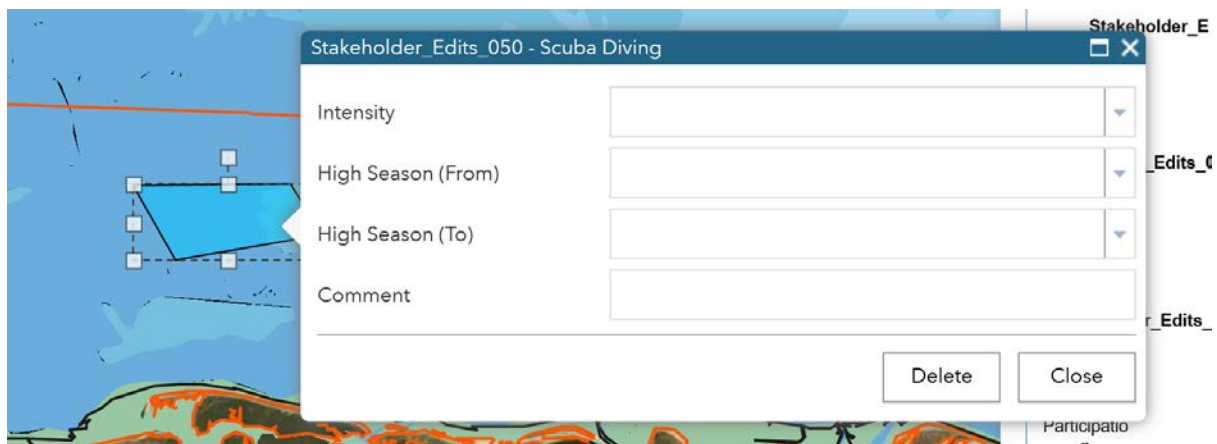
Blank data layers were created for each activity type, with relevant fields created for information that we wanted the stakeholders to populate and published to ArcGIS online. Fields within these datasets utilised set 'lists' of input information to minimise the effort required from the stakeholder and to ensure standardisation. The only field which was not populated with drop-down lists was a 'comment' field, that a stakeholder could use to give more detail on an area they were reviewing or editing. The blank feature service data layers were also added to the webmap and public editing of the datasets was enabled.

Figure 5: Bookmarks for stakeholder editor app



Once all data within the map had been configured with suitable colour palettes and pop-up information, the webmap was used within a 'web app'. This was essentially a 'wrapper' for the webmap that allowed tools and widgets to be added to interact with the data and make the experience more comfortable for the stakeholders. The most important tool that the app provided was the 'edit' tool, which opened by default and allowed a user to select an activity layer and draw a polygon in the map representing the activity. The shape would then provide a pop-up for the user to populate with information (Figure 6).

Figure 6: Pop-up information for contributing information



After the data viewer had been tested and agreed with the MMO, and a guidance document had been created on how to navigate the data viewer and use the tools (available from the MMO on request), the app and all of its components were duplicated 115 times to create a data viewer unique to each stakeholder. This created 115 unique URLs which were assigned to stakeholders using an anonymous ID, which were emailed to stakeholders along with the guidance document. The duplication process was carried out using the ArcGIS API for Python and Jupyter notebooks, to automate the process as much as possible.

Once the deadline for consultation had passed, the ArcGIS API for Python was used again to download all stakeholder edited data layers as file geodatabases containing their unique ID within the geodatabase name.

3. Stakeholder Consultation

3.1 Stakeholder Survey Consultees

To supplement the existing spatial data layers described in Section 2, stakeholders were invited to provide further information/data on where, when and at what intensity the activities of interest occur. A list of stakeholders to consult was compiled in liaison with the MMO and included both national and regional organisations, government/local government, coastal forums, clubs and ports and harbour authorities. A list of consultees invited to engage with the study is shown in [Annex 1](#).

Stakeholder consultation was undertaken in 3 phases, with Phase 1 occurring before the creation of the GIS Online Spatial Data Viewer and Phases 2 and 3 occurring afterwards.

3.1.1 Phase 1

Port and harbour officials (including harbour offices, harbour masters and directors), for ports and harbours located within each region, were contacted via email to request any spatial data on anchorages and moorings for recreational vessels within their local areas.

3.1.2 Phase 2

National/regulatory stakeholders (including MPA and MMO Officers, governmental organisations and national water sports organisations) were contacted via email to request (primarily) any spatial data relating to the non-licensable activities of interest. They were also asked for temporal information relating to the activities as well as any non-spatial information (including comments relating to the activity). All Phase 2 contacts obtained in the initial search were contacted for information and were provided with a unique link to the ArcGIS Online Spatial Data Viewer within their email as well as a guidance document on how to use the viewer, which MPAs and activities were of interest to this study and a table in which to provide non-spatial information.

3.1.3 Phase 3

Regional stakeholders (including coastal forums, regional non-governmental organisations and wildlife charities, regional water sports organisations and clubs and ports and harbour officials) were then contacted via email to request any spatial, temporal and non-spatial data relating to the non-licensable activities of interest. Phase 3 contacts were contacted with the aim of obtaining more specific spatial information within each region. All Phase 3 contacts obtained in the initial search were contacted for information and were provided with a unique link to the ArcGIS Online Spatial Data Viewer within their email as well as a guidance document on how to use the viewer, what MPAs and activities were of interest to this study and a table in which to provide non-spatial information.

A total of 43 stakeholders were contacted during Phase 1 and 97 stakeholders were contacted during Phases 2 & 3. After all stakeholders had been contacted, two of the Phase 2 & 3 stakeholders forwarded the survey background and their link to the data viewer in an email blast, which led to additional contacts getting in touch and asking to participate. Similarly, both the MMO and ABPmer included details of the survey in blog posts on social media, which led to further stakeholders coming forward. This “snowball” effect took the total of Phase 2 & 3 contacts to 117, and the overall number to 160. Phase 1 contacts had 3 months to provide information, Phase 2 contacts had 3.5 weeks and Phase 3 contacts had 2.5 weeks. The email text sent to stakeholders can be found in [Annex 2](#).

3.3 Analysis of Stakeholder Responses

The number and type of stakeholder responses (e.g. spatial and non-spatial data) were analysed per region and organisation type. Spatial data provided by each stakeholder were downloaded into folders labelled with the stakeholder ID, within which the data were stored in an ArcGIS 10.7.1 geodatabase. All datasets contained their unique ID as an attribute and were combined into one feature class using the merge tool. An ArcGIS 10.7.1 Map Exchange Document (MXD) was then created specifically to display the new data and the layers were reviewed.

The reviewing process included investigating the spatial data and associated comments, before making edits to the existing data where necessary. For example, some polygons were created by stakeholders to outline an area that was incorrectly represented by the existing data; including anchorage/mooring areas in bird sanctuaries that are out of bounds to all craft all year. In these cases, the stakeholder created polygons and existing polygons were not taken further into the final data layers. The stakeholder spatial data were quality checked for any edits that were obviously added in error.

Non-spatial data provided by stakeholders was also investigated and used to make edits to existing data (where necessary). For example, where a stakeholder mentioned the occurrence of an activity (i.e. kayaking in the Exe Estuary or anchoring in the Solent) but did not provide spatial data, a new stakeholder polygon was created to capture this activity, if it had not already been captured by the existing data. Similarly, as with comments given in spatial data, comments given by stakeholders outside of the data viewer regarding the accuracy of existing data were also used to validate and amend the existing datasets where necessary. All non-spatial information (including general observations relating to non-licensable activities, evaluations of existing data and reports relevant to the study etc.) were then collated.

3.4 Results of the Stakeholder Engagement

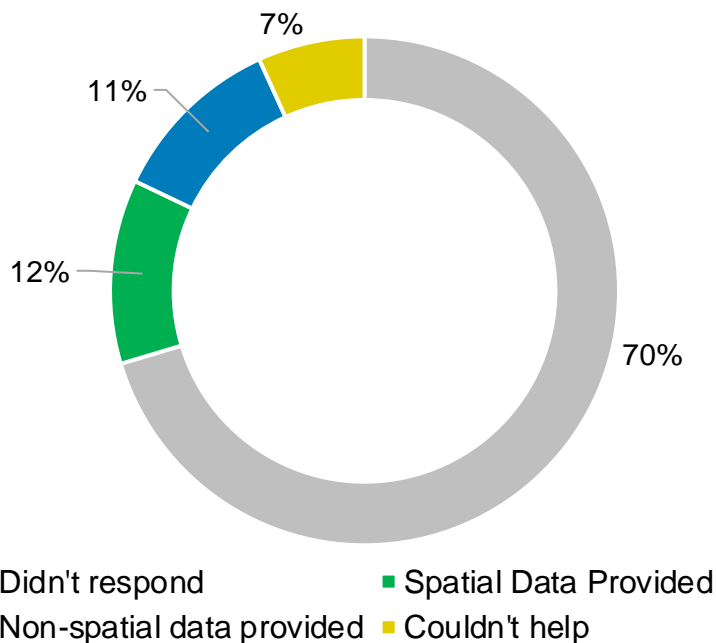
Of the 160 stakeholders contacted to take part in this study, a total of 48 stakeholder responses were gained; 8 from Phase 1 and 40 from Phases 2 & 3. The majority of responses were gained during Phases 2 & 3 (see Table 5). Some stakeholders chose to provide both spatial and non-spatial data, whilst others chose to provide

one type only. As such, the number of responses with data does not equal the number of stakeholders contacted. An overview of the responses gained through the stakeholder consultation can be seen in Figure 7.

Table 5: Summary of total stakeholder responses

	Phase 1	Phases 2 & 3	Total
Total responses with data	8	40	48
Total spatial data provided	3	16	19
Total non-spatial data provided	4	14	18
Total couldn't help	1	10	11
Total non-respondents	37	77	114

Figure 7: Pie chart showing the break-down of stakeholder responses



3.4.1 Phase 1

Of the 43 ports and harbours consultees contacted during Phase 1 to obtain specific anchorage and moorings data, a total of 8 responses were obtained; 3 including spatial data, 4 including non-spatial data and 1 unable to help.

The Solent region received the most responses, with contacts providing spatial data and non-spatial data. Spatial data obtained within this region included links to online maps of slipways, mooring areas and personal watercraft usage within the area, as well as the locations of moorings within Chichester Harbour. Non-spatial data obtained for this region included a number of PDF files showing precise locations of mooring and anchorage areas across The Solent Region (which were later digitised),

as well as non-spatial information regarding the usage of the Portsmouth and Chichester area by all non-licensable activities.

The Thames Estuary region also received both spatial and non-spatial data, which included specific mooring locations within the Medway, as well as an overview of the usage of the greater Thames area for a range of non-licensable activities.

The Exe Estuary region received non-spatial information including web links to mooring and anchorage locations within the region, as well as an overview of how the region is used for non-licensable activities.

3.4.2 Phases 2 & 3

Of 117 consultees contacted during Phases 2 & 3 of the survey, a total of 40 responses were obtained. 16 responses included the addition of spatial data to the data viewer, whilst 14 included the provision of non-spatial data (including reports relating to non-licensable activities and/or the MPAs of interest, comments on specific activities (high/low seasons etc) as well as comments on existing data in the viewer). 10 respondents wished to provide information but were unable to at the time of the consultation (see Table 5 and Figure 7).

Responses provided by stakeholders covered all non-licensable activities of interest within 11 of the 12 regions (19 out of 32 MPAs). The number of responses including spatial data provided per region did not necessarily equate to the volume of data added to the viewer; for example, the Isles of Scilly region received only one response containing spatial data, however this response provided a large amount of spatial data encompassing a range of non-licensable activities across the archipelago. Similarly, some non-spatial responses included reports that, while helpful, did not add any further information regarding the non-licensable activities, whilst others included documents and/or spreadsheets outlining the presence, intensity and temporal information relating to non-licensable activities within specific MPA areas. Several responses also provided spatial and non-spatial data within the regions but for areas outside of the MPA sites.

The most responses were received by Phase 2 contacts commenting on non-licensable activities on a “national” level, who had longer to respond to the consultation. Governmental and non-governmental organisations, as well as national water sports associations, provided both spatial and non-spatial information. Spatial data provided included mapped areas for recreational SCUBA diving, sailing participation areas and mooring locations within and across multiple regions. Non-spatial information included a summary document reviewing MPAs in which SCUBA diving activity occurs, as well as multiple reports assessing the environmental impacts of boat usage (including contamination, threats to wildlife, noise etc) on marine features.

The Solent region received the next-largest number of responses; with government organisations providing both spatial and non-spatial data and regional water sports clubs providing non-spatial information. Spatial data provided for the Solent included mapped areas for all non-licensable activities occurring within multiple MPAs in the region, whilst non-spatial data included comments on the validity of the existing data,

as well as the measures currently in place to control non-licensable activities within the area.

The Exe Estuary received both spatial and non-spatial information; with regional water sports clubs providing both types of responses, and individuals and ports and harbours contacts providing non-spatial information relating to the activities of interest. Spatial information provided for The Exe Estuary included the mapping of areas used for all non-licensable activities except for launching and recovery areas. Non-spatial information included comments relating to the validity of existing data, specifically pointing out protected features in the areas where activities do not occur.

The Falmouth region received both spatial and non-spatial data from Government organisations, whilst non-government organisations provided non-spatial information for the area. Spatial data provided for the Falmouth region included the mapping of launching and recovery areas, areas used for recreational SCUBA diving, mooring areas and areas utilised by non-motorised personal watercrafts. Non-spatial data included a list of water sports clubs and their corresponding non-licensable activities that occur within the region, as well as periods of high and low season for each club.

The Wash and North Norfolk region received spatial data from government and non-governmental organisations. Spatial data provided for this region included the mapping of areas utilised for recreational SCUBA diving, mooring areas, launching and recovery areas and areas used by motorised personal watercrafts. No non-spatial data were received.

The Torbay region received spatial data from ports and harbour authorities and regional water sports clubs. Spatial data included the mapping of areas used for recreational SCUBA diving activity as well as mooring areas. No non-spatial data were received for this region.

The Plymouth and Looe region received both spatial and non-spatial data from governmental organisations. . Spatial data provided for this region included the mapping of areas used for recreational SCUBA diving. Non-spatial information included a review of existing data within the Yealm river as well as comments relating to the intensity of multiple non-licensable activities.

The Isles of Scilly region received spatial data from a non-governmental organisation. Spatial data provided for the Isles of Scilly included the mapping of areas used for all non-licensable activities occurring throughout the archipelago. No non-spatial data were received for this region.

The Poole and Studland region received spatial data from non-governmental organisation, which included the mapping of areas used for recreational SCUBA diving, anchorages, moorings and launching and recovery sites. No non-spatial data were received for this region.

The Alde Ore and Butley Estuaries region received non-spatial information from a coastal forum. The response included information relating to the general usage of the area by non-motorised personal watercrafts as well as confirming the area is used by both sailing and motorised vessels.

The Thames Estuaries region received non-spatial data from a ports and harbours authority. The response included information relating to the type of vessel moorings present in the region, as well as an overview of the general usage of the area per non-licensable activity type.

The Morecambe region received no responses containing any information from any contacts.

A breakdown of the responses gained by region (for all phases) can be found in Figure 8, and a breakdown of responses gained by organisation type (for all phases) can be seen in Figure 9. Figure 10 shows a more in-depth breakdown of responses and includes the type of data provided by each organisation type within each region.

Figure 8: Bar chart showing the number of responses from all phases that provided data, per region

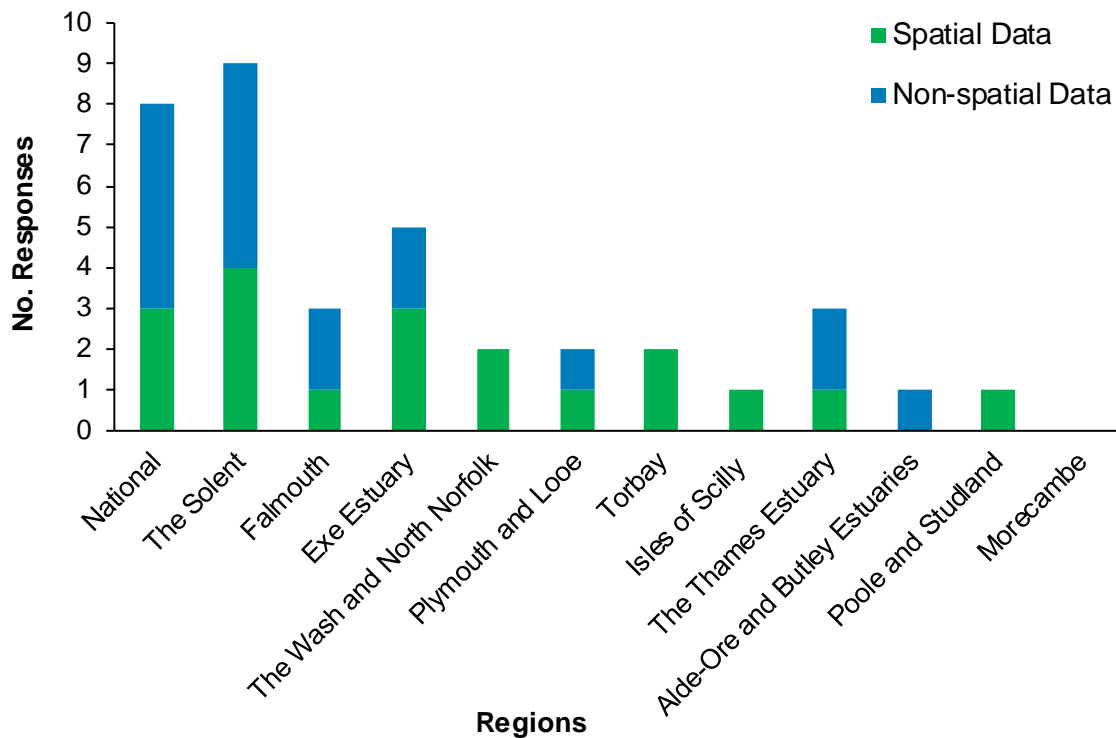


Figure 9: Bar chart showing the number of responses from all phases that provided data, per organisation type

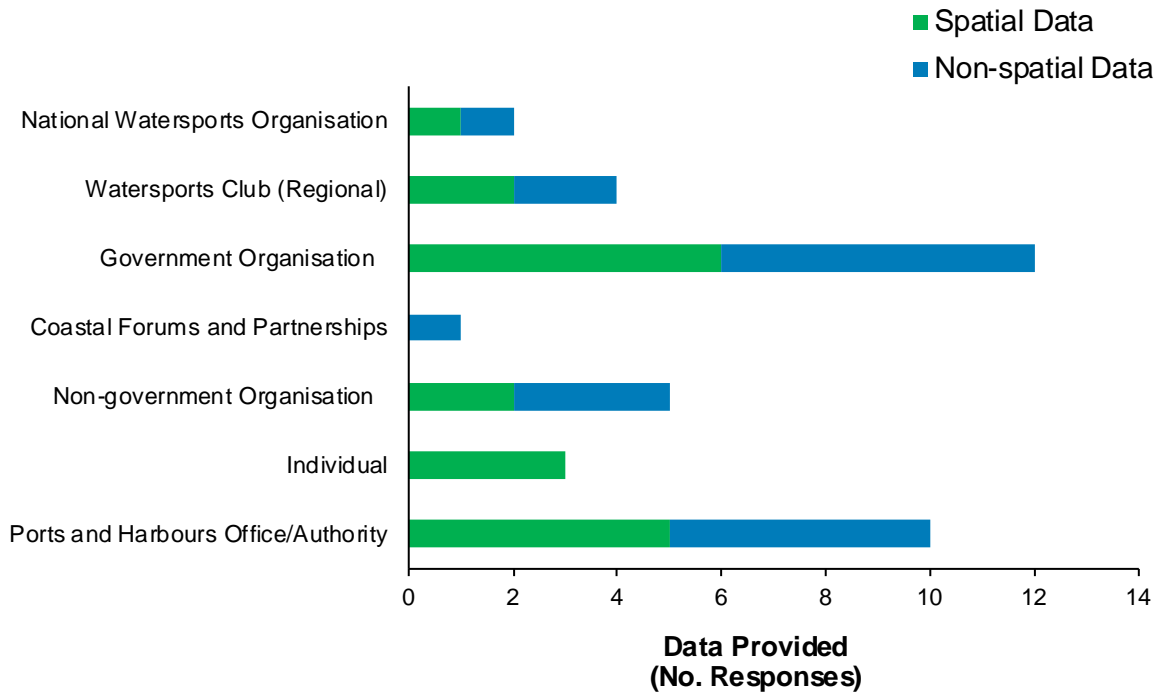
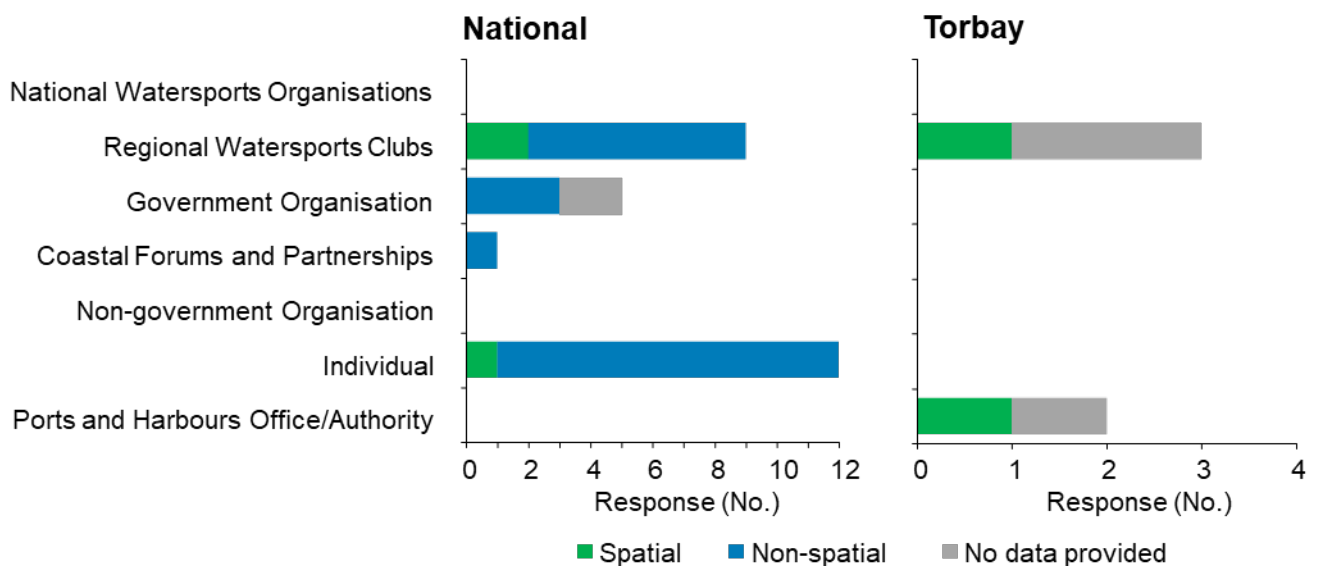
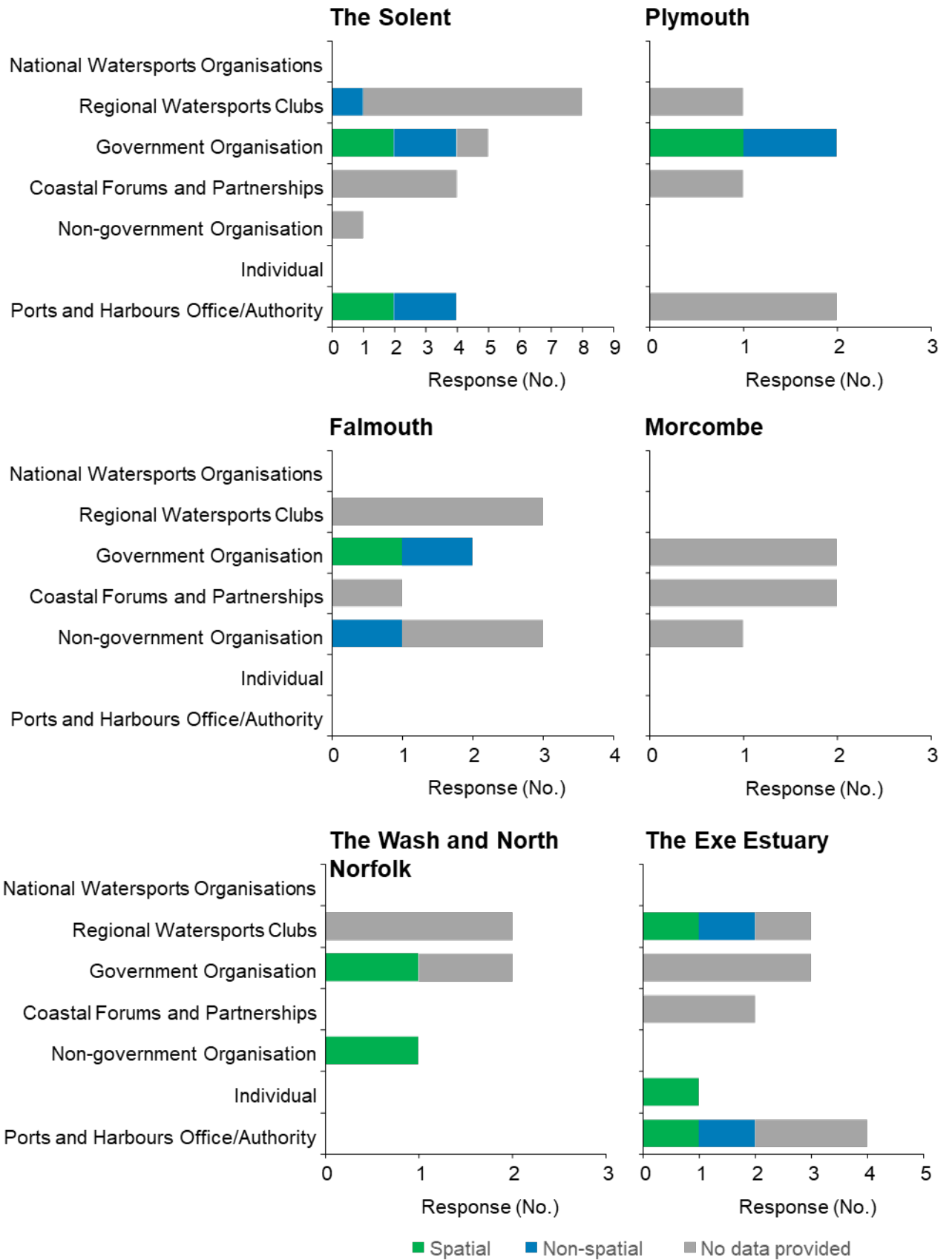
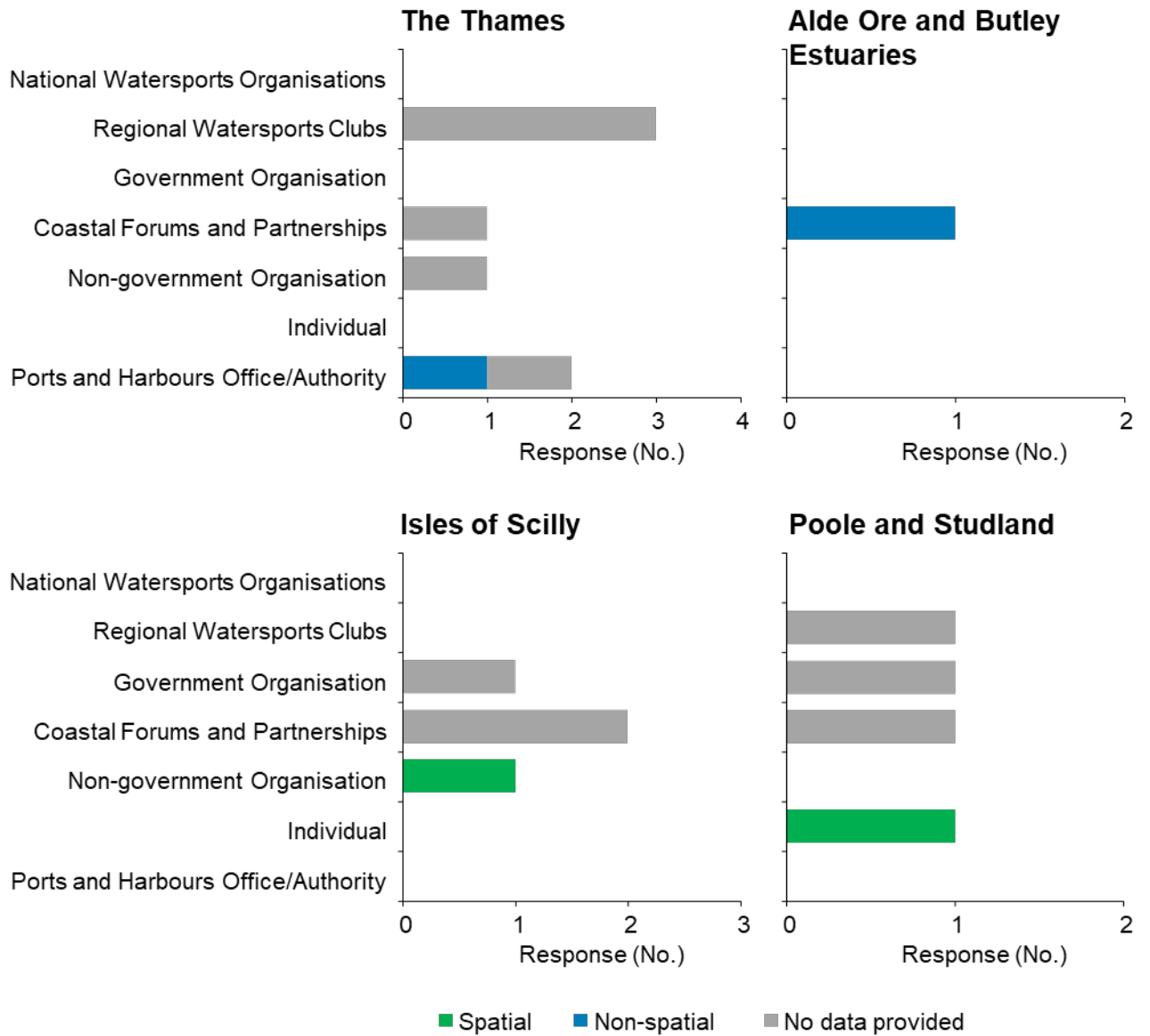


Figure 10: Bar charts showing responses per organisation type for each region



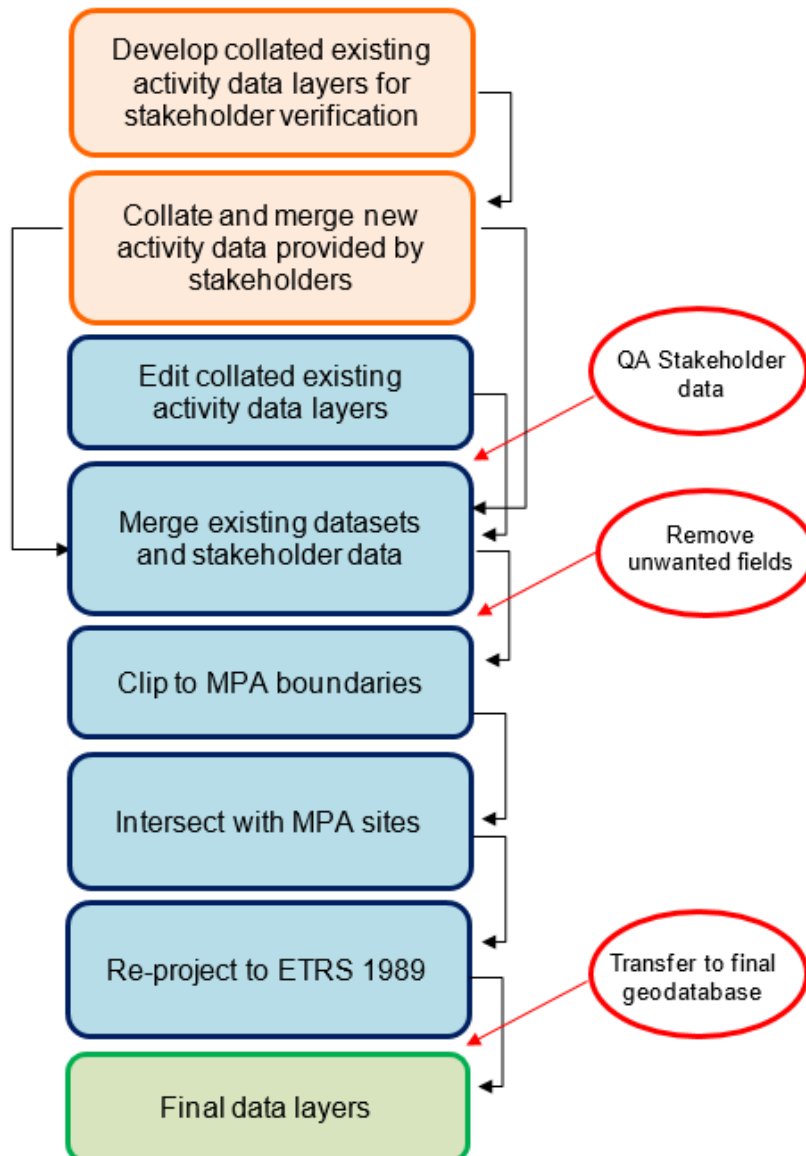




4. Final Activity Data Layers

The overall methodology used to create the final activity data layers is shown in the flow chart below (Figure 11). The collated existing and new data layers used in the stakeholder engagement were developed as described in [Section 2.4](#).

Figure 11: Flow chart of overall method used to create the final data layers



After the information from stakeholders had been checked and collated, edits were made to the collated existing activity data layers, as required. For example, the removal of a launching site within a bird sanctuary and the removal of a mooring area within the shipping channel. The spatial data provided by stakeholders and the collated existing activity data layers were then merged to develop the final activity data layers.

The attributes of the merged data layers were cleaned to remove unwanted fields and the data were clipped to the MPA boundaries. The data were then intersected (or spatially joined) to the MPA sites to include the MPA name and MPA type (i.e. SPA, SAC or MCZ) as an attribute within each activity data layer. The data layers were re-projected from WGS 1984 Web Mercator Auxiliary Sphere coordinate system to ETRS 1989 before exporting to the final geodatabase.

The following sections describe the final activity data layers including input data used to compile each layer, description of the data inputs, any geoprocessing steps required in the preparation of the input data prior to merging, any data limitations and a confidence assessment of each data input. The confidence assessment is based on the MMO confidence categories:

- 1 – Low confidence: the input data and processing method used may not provide the best estimate of the spatial extent of the activity;
- 2 – Moderate confidence: the input data is of good quality with published methodologies, but the processing method is based on an estimate of the spatial extent of the activity; and
- 3 – High confidence: the input data is of good quality with published methodologies and no/limited processing required.

4.1 Mooring Areas

The final data layer for activity type “powerboating or sailing with/without an engine: mooring” was:

- MMO1243_Powerboating_Sailing_Moorings_ETRS89

The data sources used in the final data layers are listed in Table 6 along with any processing steps required in the preparation of the input data prior to merging.

Table 6: Data sources for mooring activity

Input dataset	Description	Processing method prior to merging	Confidence assessment
CCO aerial imagery (2019 to 2016)	ABPmer digitised mooring buoy area polygons/points based on CCO aerial imagery	Digitised polygons of mooring buoy areas (see Section 2.3). No processing required.	3
Defra C5784AD Recreational Mooring Areas (2018)	Dataset of recreational mooring area polygons produced following a desk-based study	Remove duplicate areas.	3
Stakeholder Moorings Activity Data Layer (2021)	Stakeholder digitised polygons of mooring areas edited in the Data Viewer (see Section 2.5)	No processing required.	3

The moorings data layers had limited temporal information, but where details were provided, the high season ranged from February to November / April to October. Vessel type was generally unknown or both sailing and powerboating.

The size of the mooring areas reflects the intensity of moorings (i.e. the larger the area, the larger the number of moorings) since the density/spacing of buoys is similar within areas and for all harbours and regions.

4.2 Anchorage Areas

The final data layer for activity type “powerboating or sailing with/without an engine: anchorages” was:

- MMO1243_Powerboating_Sailing_Anchorages_ETRS89

The data sources used in the final data layers are listed in Table 7 along with any processing steps required in the preparation of the input data prior to merging.

Table 7: Data sources for anchorage activity

Input dataset	Description	Processing method prior to merging	Confidence assessment
UKHO (S57) anchorage areas (2020)	Anchorage area polygons from admiralty chart (S57) marine vector data	May include commercial vessel anchorages. Apply filter on Feature: • Anchorage area Simplify using ‘point remove’ algorithm with a 100 m tolerance.	3
UKHO (S57) anchorage points (2020)	Anchorage points from admiralty chart (S57) marine vector data	Apply filter on Feature: • Anchorage area Buffer points by 0.5 km.	2
Defra C5784AD Racing Anchorage Areas (2018)	Dataset of racing anchorage area polygons produced following a desk-based study	Remove duplicate areas	3
Defra C5784AD Recreational Anchorage Areas (2018)	Dataset of recreational anchorage area polygons produced following a desk-based study	Remove duplicate areas	3
Stakeholder Anchorages Activity Data Layer (2021)	Stakeholder digitised polygons of anchorage areas edited in the Data Viewer (see Section 2.5).	No processing required.	3

The anchorages data layers had limited temporal information, but where details were provided, the high season ranged from April to October. Vessel type was generally unknown or both sailing and powerboating.

Limited information about the intensity of use of anchorages was provided; these comments show that the number of vessels anchoring is highly dependent on the prevailing weather conditions.

The anchorage point data was assumed to indicate the location of an anchorage area with maximum extent of 500 m in either direction; therefore, the points were buffered by 500 m. This distance was based on the average length of anchorage areas located within the MPA sites selected from the UKHO S57 anchorage area dataset. This resulted in a lower confidence for these input data.

4.3 Powerboat or Sailing Boat: Launching & Recovery

The final data layer for activity type “powerboating or sailing with/without an engine: launching and recovery” was:

- MMO1243_Powerboating_Sailing_Launch_Recovery_ETRS89

The data sources used in the final data layers are listed in Table 8 along with any processing steps required in the preparation of the input data prior to merging.

Table 8: Data sources for launching & recovery activity

Input dataset	Description	Processing method prior to merging	Confidence assessment
MMO 1136 Non-Licensable Activities (2019)	Dataset of non-licensable activities polygons from MMO project 1136 following stakeholder consultation	Apply filter on Type: <ul style="list-style-type: none"> • Access; • access - Launch; • Access - Launch Site; • access - launch site 	3
MMO 1163 Slips (2020)	Dataset of point locations of slipways from MMO project 1163 following a desk-based study with stakeholder verification	Buffer points by 0.2 km.	2
RYA Clubs & Training Centres (2016)	Dataset of point locations of RYA affiliated sailing clubs	Buffer points by 0.2 km.	2
RYA Marinas (2016)	Dataset of point locations of RYA affiliated marinas	Buffer points by 0.2 km.	2
RNLI Stations (2020)	Dataset of point locations of RNLI Lifeboat stations	Buffer points by 0.2 km.	2
Stakeholder Launching Activity Data Layer (2021)	Stakeholder digitised polygons of launching areas edited in the Data Viewer (see Section 2.5).	No processing required.	3

The launching and recovery data layers had limited temporal information, but where details were provided, the high season ranged from April to September. Vessel type was generally unknown or powerboating.

Limited information about the intensity of use of launching and recovery sites was provided within the comments field.

The launching and recovery location point data was assumed to indicate activity areas with a maximum extent of 200 m in either direction; therefore, the points were buffered by 200 m. This distance was based on the maximum likely influence of this activity on the seabed either side and offshore of a slipway (for example, it takes into consideration boats being launched and recovered along a beach either side of a slipway). This resulted in a lower confidence for these input data.

4.4 Powerboat or Sailing Boat: Participation

The final data layer for activity type “powerboating or sailing with/without an engine: participation” was:

- MMO1243_Powerboating_Sailing_Participation_ETRS89

The data sources used in the final data layers are listed in Table 9 along with any processing steps required in the preparation of the input data prior to merging.

Table 9: Data sources for boating participation activity

Input dataset	Description	Processing method prior to merging	Confidence assessment
MMO 1136 Non-Licensable Activities (2019)	Dataset of non-licensable activities polygons from MMO project 1136 following stakeholder consultation	Apply filter on Type: <ul style="list-style-type: none"> • Access; • access - Launch; • Access - Launch Site; • access - launch site • Motor boating; • Motorsports; • Towed Water Sports; • Towed water sports', • 'Sailing' 	3
MMO 1163 Angling Areas (2020)	Dataset of angling area polygons from MMO project 1163 following a desk-based study	No processing required.	3
MMO 1163 Slips (2020)	Dataset of point locations of slipways from MMO project 1163 following a desk-based study with stakeholder verification	Buffer points by 5 km and 10 km to indicate general sailing/powerboating extents.	1
RYA General Boating Areas (2016)	Dataset of general boating participation area polygons	No processing required.	3
RYA Offshore Routes (2016)	Dataset of indicative offshore route polylines used by recreational vessels	Buffer polylines by 0.2 km. Dissolve to create one polygon covering the area of polylines	2
RYA Clubs & Training Centres (2016)	Dataset of point locations of RYA affiliated sailing clubs	Buffer points by 5 km and 10 km to indicate general sailing/powerboating extents.	2

RYA Marinas (2016)	Dataset of point locations of RYA affiliated marinas	Buffer points by 5 km and 10 km to indicate general sailing/powerboating extents.	2
RNLI Incidents (2020)	Dataset of point locations of incidents responded to by the RNLI by category	Apply filter on Activity: <ul style="list-style-type: none"> • Sailing • Angling from boat • Motorboating • Powered boat • Small craft – water skier Buffer points by 5 km and 10 km to indicate general sailing/powerboating extents.	2
RNLI Returns of Service (2020)	Dataset of point locations of RNLI returns of service	Apply filter on Activity: <ul style="list-style-type: none"> • Boating; • Coastal Cruising/Sailing; • Day Cruising/Sailing; • Sailing; • Motorboating. Buffer points by 5 km and 10 km to indicate general sailing/powerboating extents.	2
Stakeholder Boating Participation Activity Data Layer (2021)	Stakeholder digitised polygons of boating participation areas edited in the Data Viewer (see Section 2.5).	No processing required.	3

The boating participation data layers had limited temporal information, but where details were provided, the high season ranged from March to November and April to October.

Little information about the intensity of boating participation was provided within the comments field; two comments indicated that areas were most busy at weekends and in summer months in particular.

The boating participation point data was assumed to indicate activity areas with a maximum extent of 5 to 10 km in either direction for sailing and powerboating respectively; therefore, the points were buffered by 5 km and 10 km. This resulted in a lower confidence for these input data. A low confidence score was given to the buffered slipway data since it was unknown how suitable slips were for the launching and recovery of all types and sizes of power and sail boats.

Consideration was given to including the AIS based datasets: RYA AIS Intensity (2016); MMO/ABPmer AIS Recreational Vessel Transits and Density (2015 to 2017); and EMODNet Pleasure Craft and Sailing Vessel AIS Density (2017 to 2019). It was decided to exclude them, however, since the more precise nature of these datasets (and in particular, the ungridded AIS transit polyline data) would be lost once merged with the other more general boating polygons. The AIS Recreational Vessel Transits

data can be overlaid on top of the other data layers to get a better picture of recreational vessel transits.

4.5 Motorised Personal Watercraft

The final data layer for activity type “Motorised personal watercraft (PWC)” was:

- MMO1243_Motorised_Personal_Watercraft_ETRS89

The data sources used in the final data layers are listed in Table 10 along with any processing steps required in the preparation of the input data prior to merging.

Table 10: Data sources for motorised personal watercraft activity

Input dataset	Description	Processing method prior to merging	Confidence assessment
MMO 1136 Non-Licensable Activities (2019)	Dataset of non-licensable activities polygons from MMO project 1136 following stakeholder consultation	Apply filter on Type: <ul style="list-style-type: none"> • Jet skis 	3
MMO 1163 Slips (2020)	Dataset of point locations of slipways from MMO project 1163 following a desk-based study with stakeholder verification	Buffer points by 5 km.	2
RNLI Incidents (2020)	Dataset of point locations of incidents responded to by the RNLI by category	Apply filter on Activity: <ul style="list-style-type: none"> • Small craft – jet ski Buffer points by 5 km	2
RNLI Returns of Service (2020)	Dataset of point locations of RNLI returns of service	Apply filter on Activity: <ul style="list-style-type: none"> • Small craft – jet ski Buffer points by 5 km	2
Stakeholder Motorised PWC Activity Data Layer (2021)	Stakeholder digitised polygons of boating participation areas edited in the Data Viewer (see Section 2.5).	No processing required.	3

The motorised PWC data layers had limited temporal information, but where details were provided, the high season ranged from April or May to October.

Limited information about the intensity of motorised PWC activity was provided within the comments field.

The motorised PWC point data was assumed to indicate activity areas with a maximum extent of 5 km in either direction; therefore, the points were buffered by 5 km. This resulted in a lower confidence for these input data.

4.6 Non-motorised Personal Watercraft

The final data layer for activity type “Non-motorised personal watercraft (PWC)” was:

- MMO1243_Non_Motorised_Personal_Watercraft_ETRS89

The data sources used in the final data layers are listed in Table 11 along with any processing steps required in the preparation of the input data prior to merging.

Table 11: Data sources for non-motorised personal watercraft activity

Input dataset	Description	Processing method prior to merging	Confidence assessment
MMO 1136 Non-Licensable Activities (2019)	Dataset of non-licensable activities polygons from MMO project 1136 following stakeholder consultation	Apply filter on Type: <ul style="list-style-type: none"> • Board sports; • Paddle sports 	3
MMO 1163 Slips (2020)	Dataset of point locations of slipways from MMO project 1163 following a desk-based study with stakeholder verification	Buffer points by 5 km.	2
RYA Clubs & Training Centres (2016)	Dataset of point locations of RYA affiliated sailing clubs	Buffer points by 5 km.	2
RNLI Incidents (2020)	Dataset of point locations of incidents responded to by the RNLI by category	Apply filter on Activity: <ul style="list-style-type: none"> • Small craft Exclude: <ul style="list-style-type: none"> • Motorboating; • Jet skis Buffer points by 1 km.	2
RNLI Returns of Service (2020)	Dataset of point locations of RNLI returns of service	Apply filter on Activity: <ul style="list-style-type: none"> • Body boarding; • Canoeing; • Kayaking; • Kite surfing; • Manual craft activity; • Rowing • Stand up paddle boarding; • Surfing; • Windsurfing. Buffer points by 1 km.	2
Stakeholder Non-Motorised PWC Activity Data Layer (2021)	Stakeholder digitised polygons of boating participation areas edited in the Data Viewer (see Section 2.5).	No processing required.	3

The non-motorised PWC data layers had limited temporal information, but where details were provided, the high season ranged from April to September/October for most activities and all year round for kitesurfing/kiteboards in particular.

This activity data layer produced a variety of comments from stakeholders about the intensity of non-motorised PWC activities in different areas and their disturbance to birds.

The non-motorised PWC point data was assumed to indicate activity areas with a maximum extent of 5 km in either direction from slipways and RYA clubs (which are more likely to be associated with larger/manual craft activity such as rowing, canoeing and kayaking), and 1 km in either direction from other points; therefore, the points were buffered by 5 km and 1 km, respectively. This resulted in a lower confidence for these input data.

4.7 Recreational SCUBA Diving

The final data layer for activity type “Recreational SCUBA diving” was:

- MMO1243_Recreational_SCUBA_Diving_ETRS89

The data sources used in the final data layers are listed in Table 12 along with any processing steps required in the preparation of the input data prior to merging.

Table 12: Data sources for recreational SCUBA diving activity

Input dataset	Description	Processing method prior to merging	Confidence assessment
MMO 1136 Non-Licensable Activities (2019)	Dataset of non-licensable activities polygons from MMO project 1136 following stakeholder consultation	Apply filter on Type: <ul style="list-style-type: none"> • SCUBA diving. 	3
Finstrokes Dive Sites (2017)	Points of popular dive sites, taken from Finstrokes website	Buffer points by 0.5 km	3
UKHO INSPIRE Wrecks and Obstructions: polygons (2020)	Polygons of wrecks and obstructions from UKHO	Apply filter on Category: <ul style="list-style-type: none"> • Wreck Apply filter to include only named wrecks. (to remove obstructions and unnamed wrecks). Buffer points by 0.5 km	2
HE, NHRE, MCA Protected Wrecks Exclusion Zones (2009)	Protected wrecks exclusion zones	No processing required.	2
RNLI Incidents (2020)	Dataset of point locations of incidents responded to by the RNLI by category	Apply filter on Activity: <ul style="list-style-type: none"> • Small craft Exclude: <ul style="list-style-type: none"> • Motorboating; • Jet skis Buffer points by 0.5 km.	2
RNLI Returns of Service (2020)	Dataset of point locations of RNLI returns of service	Apply filter on Activity: <ul style="list-style-type: none"> • Leisure - Sub aqua diving; • Leisure Sub Aqua Diving; • Scuba Diving. Buffer points by 0.5 km.	2

Stakeholder SCUBA diving Activity Data Layer (2021)	Stakeholder digitised polygons of boating participation areas edited in the Data Viewer (see Section 2.5).	No processing required.	3
---	--	-------------------------	---

The recreational SCUBA diving data layers had limited temporal information, but where details were provided, the high season ranged from March/April to October.

Limited information about the intensity of recreational SCUBA diving activity was provided within the comments field.

The Recreational SCUBA diving point data was assumed to indicate activity areas with a maximum extent of 0.5 km in either direction; therefore, the points were buffered by 0.5 km. This resulted in a lower confidence for these input data.

4.8 Project geodatabase

The final activity data layers contained many overlapping records with differing data source attributes, therefore, a second set of activity data layers was produced containing a reduced number of records by dissolving the final merged data outputs described above.

The final project geodatabases with the undissolved and dissolved activity data layers contained the following attributes:

- Type: type of vessel (e.g. sailing boat, powerboat, kayak, windsurfing);
- High Season: Months of highest levels of activity (e.g. Apr to Sep);
- Data Source: Name and year of data source;
- Comments: Comments provided by stakeholders or useful information; extracted from data inputs;
- MPA Name; and
- MPA Type (i.e. SAC, SPA or MCZ).

For the dissolved activity data layers, the Data Source attribute contained 'concatenated' (i.e. linked together in a series) information about the all the data sources making up the data layer, whereas the undissolved activity data layers had separate records for each input data source.

The final step was to create INSPIRE compliant metadata for the activity feature classes in the geodatabases. INSPIRE is a European Commission-compliant metadata standard format outlined under [Article 5\(1\) of INSPIRE Directive 2007/2/EC](#).

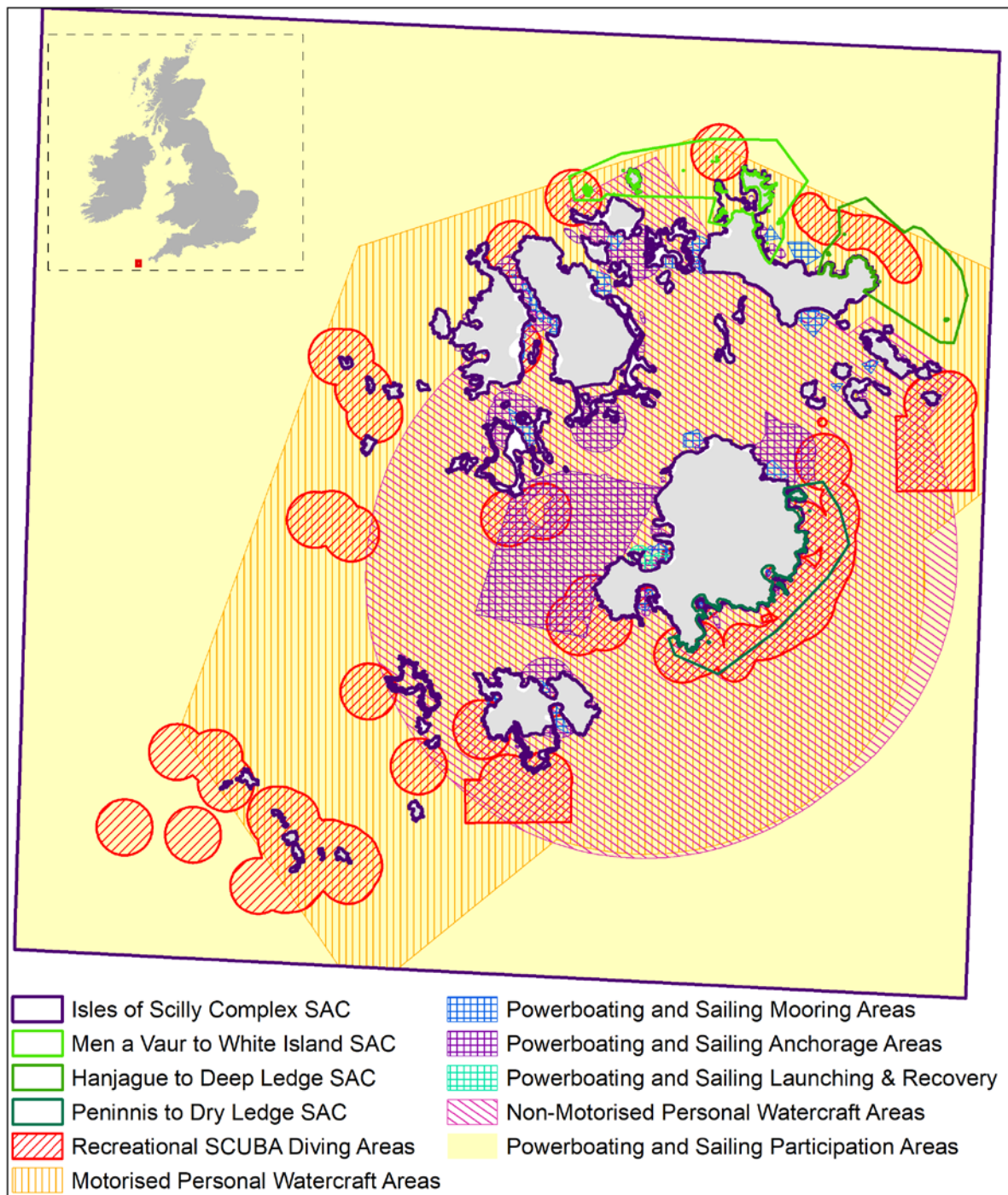
5. Recreational Activity Maps

This section provides a brief summary of the recreational activities considered in this study along with a figure displaying the final activity data layers and the MPAs in each region.

5.1 Isles of Scilly

Powerboating and sailing participation activities are widespread across all MPAs in this region. Motorised and non-motorised PWC activities occur closer inshore but within all the MPAs. Recreational SCUBA diving also occurs in all the MPAs but closer to the shore. Mooring, anchorage and launch and recovery activities occur mainly within the Isles of Scilly Complex SAC only.

Figure 12: Final activity data layers and MPAs within the Isles of Scilly region

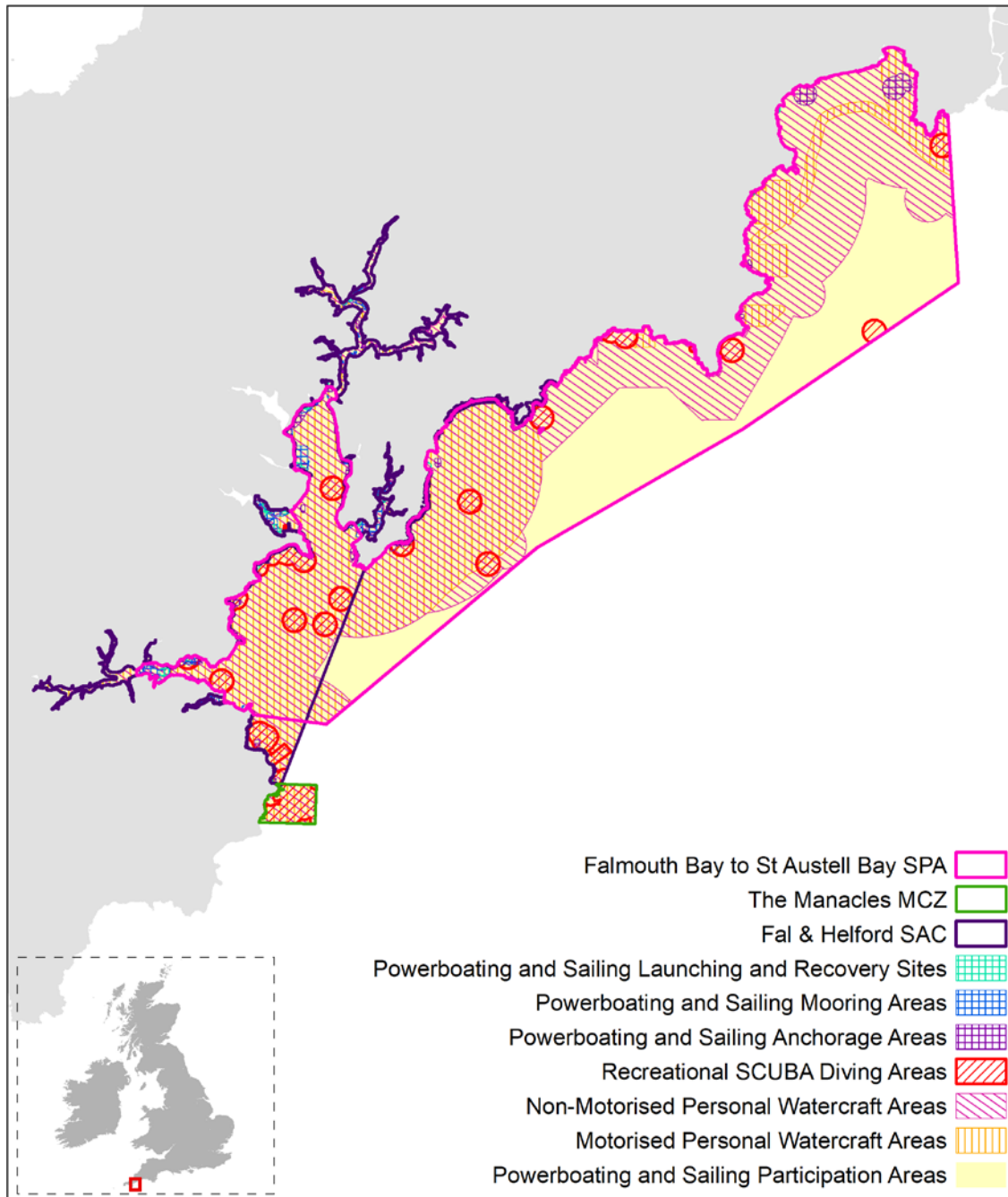


Contains public sector information licensed under the Open Government Licence v3.0 © Natural England copyright. Data derived under licence from RYA, 2016 ©, UKHO, 2021 © ABPmer, All rights reserved, 2021.

5.2 Falmouth

Powerboating and sailing participation activities are widespread across all MPAs in this region. Motorised and non-motorised PWC activities occur closer inshore but within all the MPAs. Recreational SCUBA diving also occurs in all the MPAs but in smaller areas. Mooring, anchorage and launch and recovery activities occur in specific locations close to the shore within the Falmouth Bay to St Austell Bay SPA and the Fal & Helford SAC only.

Figure 13: Final activity data layers and MPAs within the Falmouth region

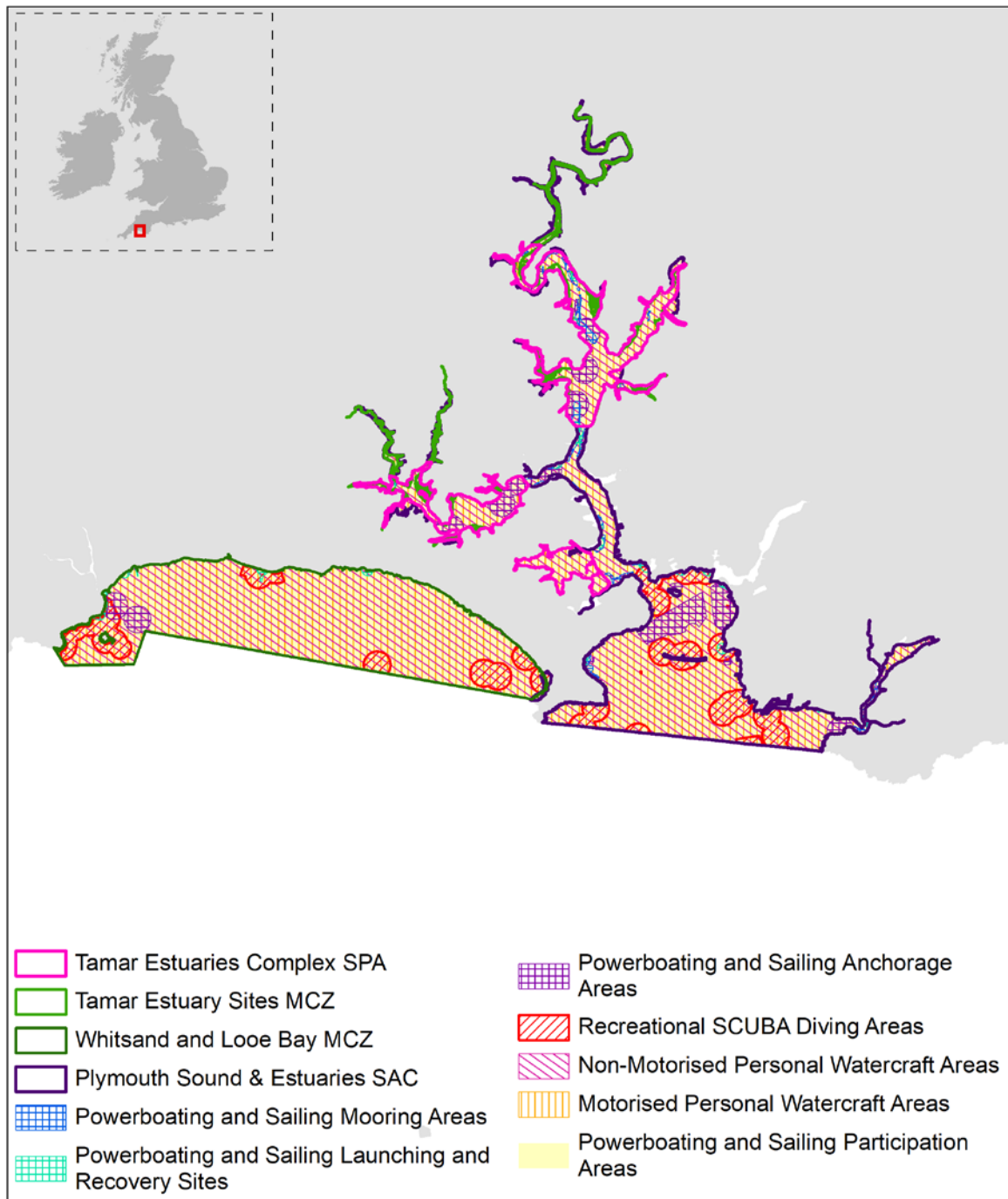


Contains public sector information licensed under the Open Government Licence v3.0 © Natural England copyright. Data derived under licence from RYA, 2016 ©, UKHO, 2021 © ABPmer, All rights reserved, 2021.

5.3 Plymouth

Powerboating and sailing participation and motorised and non-motorised PWC activities are widespread across all MPAs in this region. Recreational SCUBA diving occurs in smaller areas in the Plymouth Sound & Estuaries SAC and the Whitsand and Looe Bay MCZ. Mooring, anchorage and launch and recovery activities occur in specific locations close to the shore within all the MPAs in this region.

Figure 14: Final activity data layers and MPAs within the Plymouth region

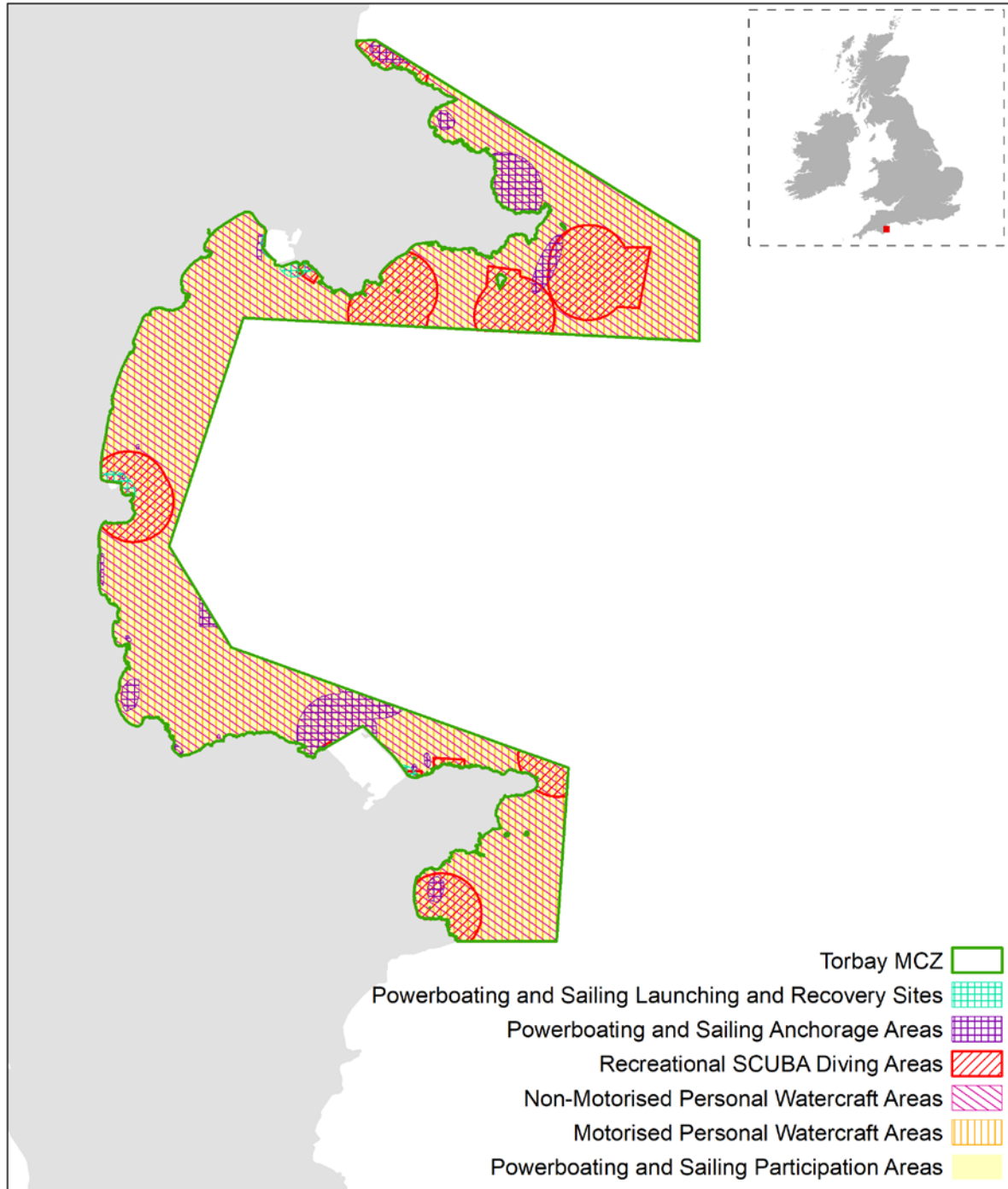


Contains public sector information licensed under the Open Government Licence v3.0 © Natural England copyright. Data derived under licence from RYA, 2016 ©, UKHO, 2021 © ABPmer, All rights reserved, 2021.

5.4 Torbay

Powerboating and sailing participation and motorised and non-motorised PWC activities are widespread across the whole of the Torbay MCZ. Recreational SCUBA diving and anchorage areas occur in smaller areas throughout the MCZ. Launch and recovery activities occur in specific locations close to the shore within the MCZ.

Figure 15: Final activity data layers and MPAs within the Torbay region

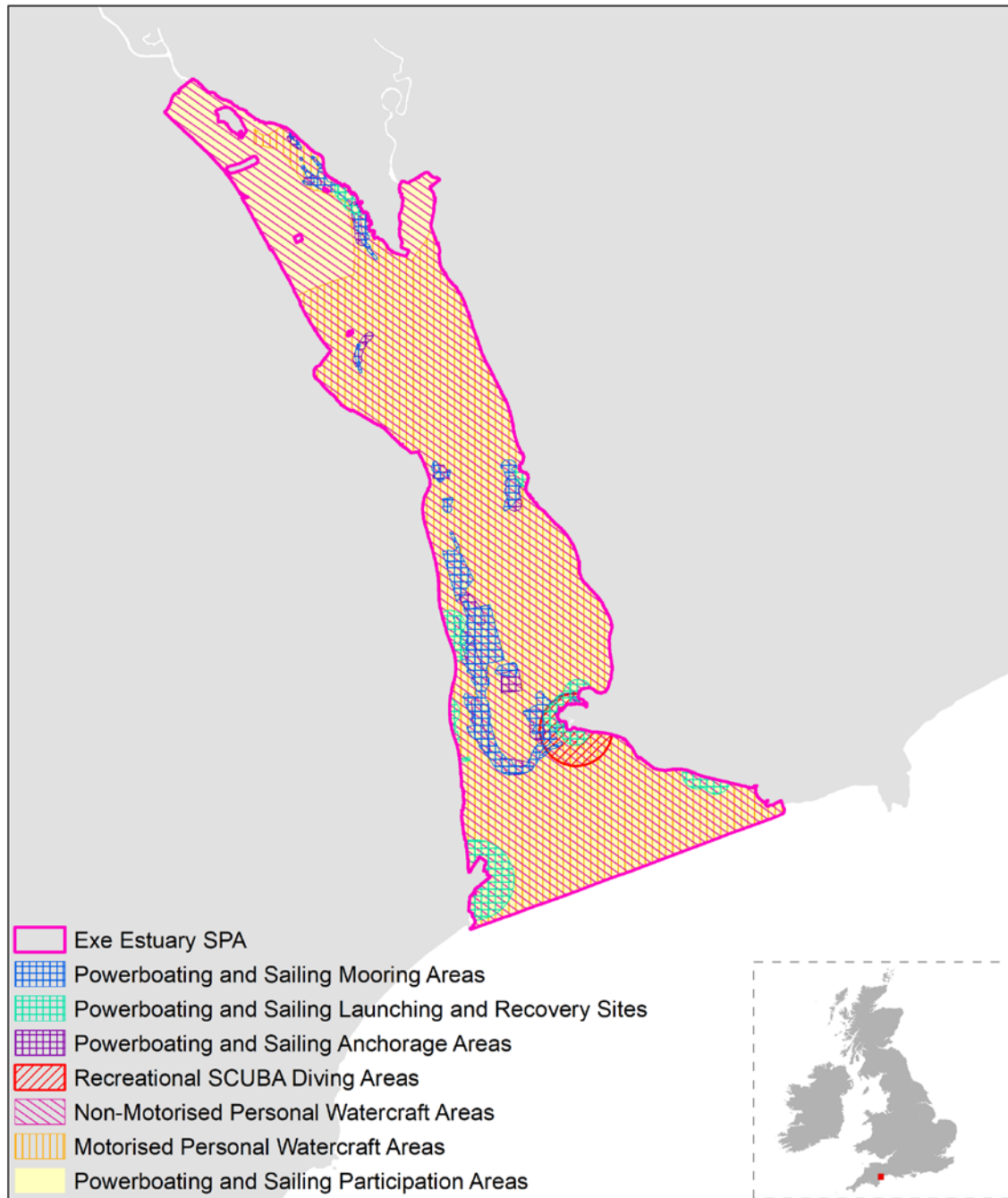


Contains public sector information licensed under the Open Government Licence v3.0 © Natural England copyright. Data derived under licence from RYA, 2016 ©, UKHO, 2021 © ABPmer, All rights reserved, 2021.

5.5 Exe Estuary

Powerboating and sailing participation and non-motorised PWC activities are widespread across the whole of the Exe Estuary SPA. Motorised PWC activities occur across the majority of the SPA, except for the northern-most areas. Recreational SCUBA diving occurs in an area near Exmouth Pier. Mooring, anchorage and launch and recovery activities also occur in specific locations within the estuary.

Figure 16: Final activity data layers and MPAs within the Exe Estuary region

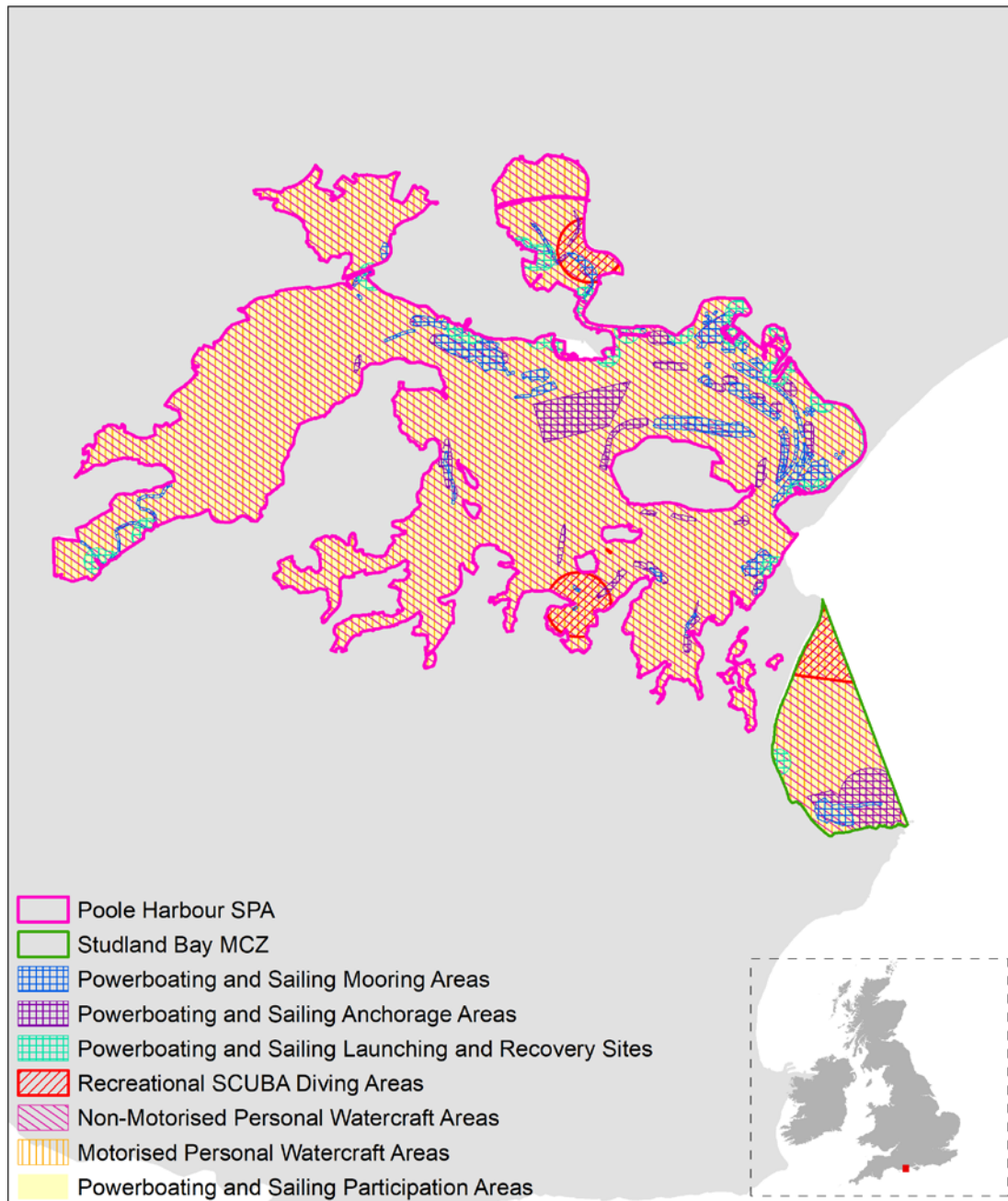


Contains public sector information licensed under the Open Government Licence v3.0 © Natural England copyright. Data derived under licence from RYA, 2016 ©, UKHO, 2021 © ABPmer, All rights reserved, 2021.

5.6 Poole and Studland

Powerboating and sailing participation and motorised and non-motorised PWC activities are widespread across both MPAs in this region. Recreational SCUBA diving occurs in smaller areas within both MPAs. Mooring and anchorage activities occur throughout the Poole Harbour SPA and in the southern part of Studland Bay MCZ. Launch and recovery activities occur in specific locations close to the shore within both MPAs in this region.

Figure 17: Final activity data layers and MPAs within the Poole and Studland region

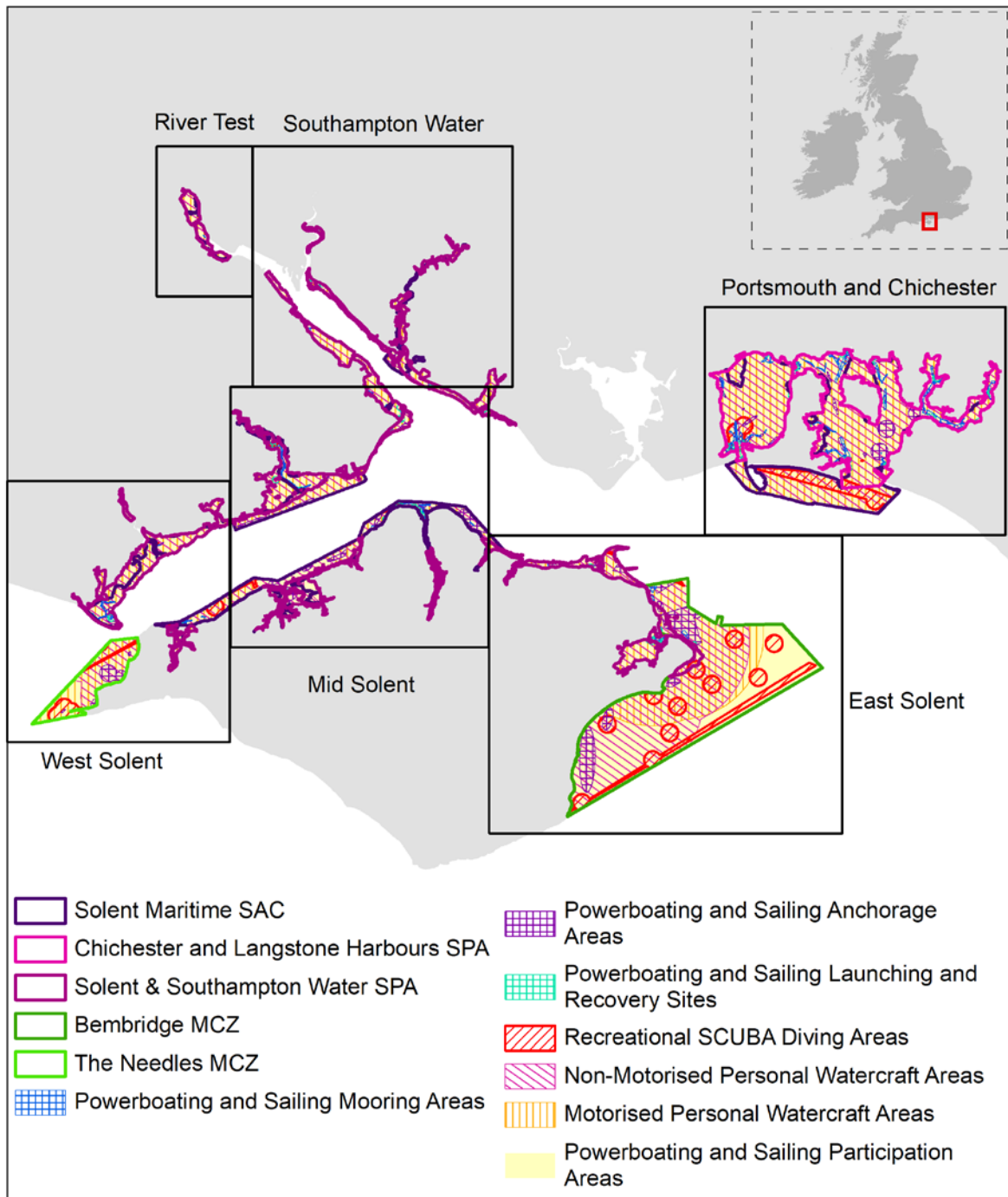


Contains public sector information licensed under the Open Government Licence v3.0 © Natural England copyright. Data derived under licence from RYA, 2016 ©, UKHO, 2021 © ABPmer, All rights reserved, 2021.

5.7 The Solent

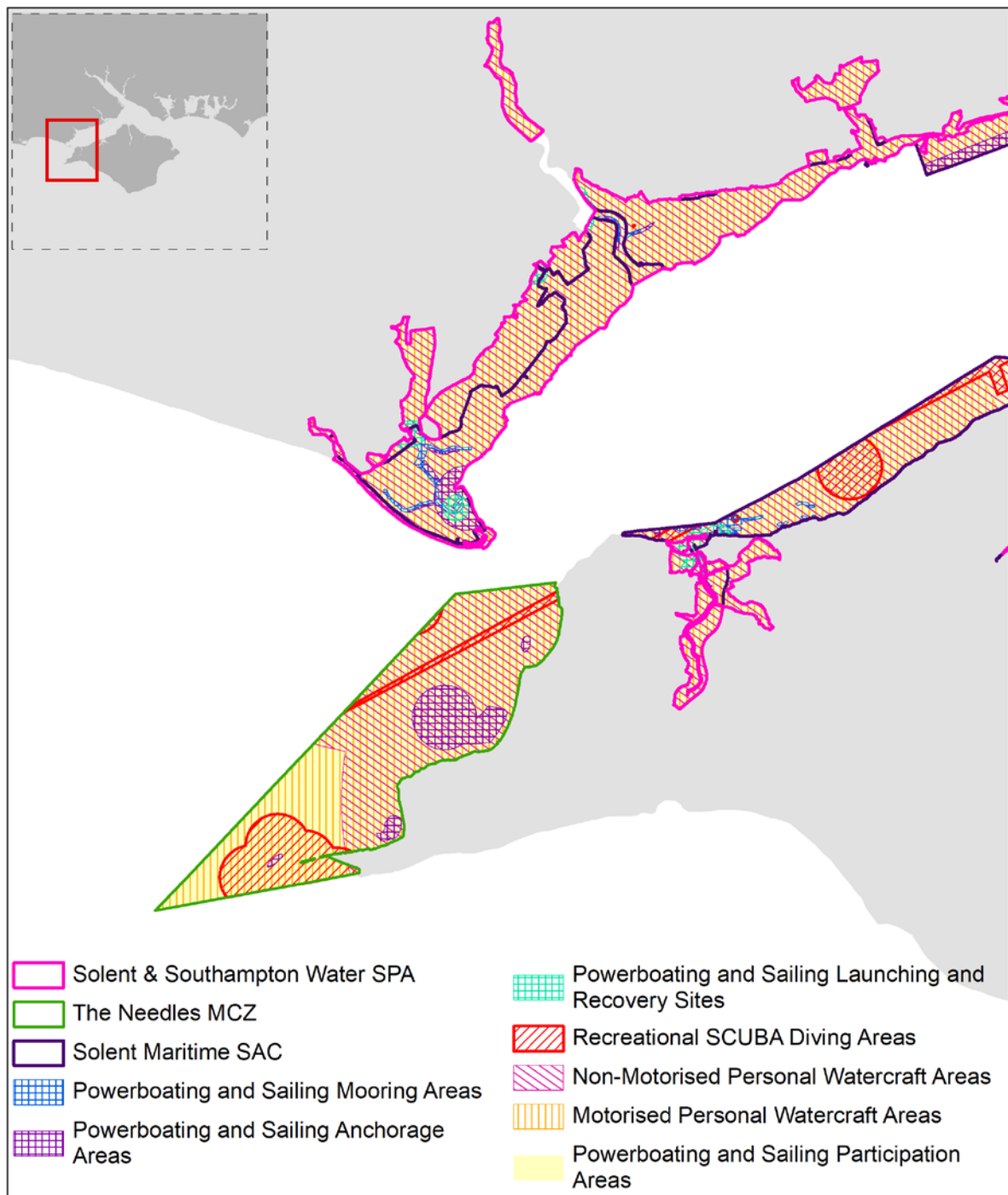
Powerboating and sailing participation and motorised and non-motorised PWC activities are widespread across all MPAs in this region. Recreational SCUBA diving occurs in smaller areas within the Solent and off of Chichester Harbour. Mooring, anchorage and launch and recovery activities occur within all MPAs in this region.

Figure 18: Final activity data layers and MPAs within The Solent region, separated into areas



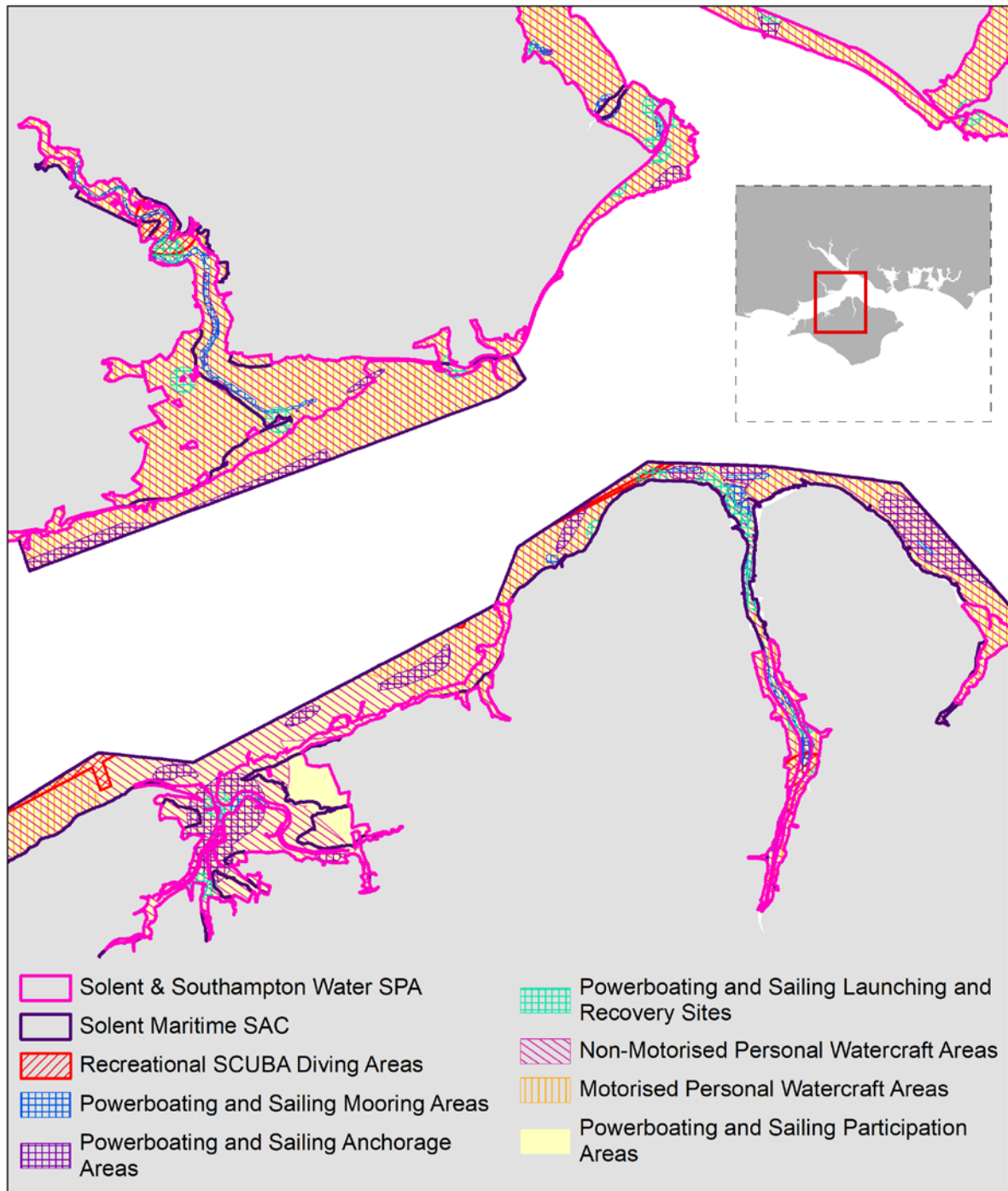
Contains public sector information licensed under the Open Government Licence v3.0 © Natural England copyright. Data derived under licence from RYA, 2016 ©, UKHO, 2021 © ABPmer, All rights reserved, 2021.

Figure 18a: Final activity data layers and MPAs within the West Solent area



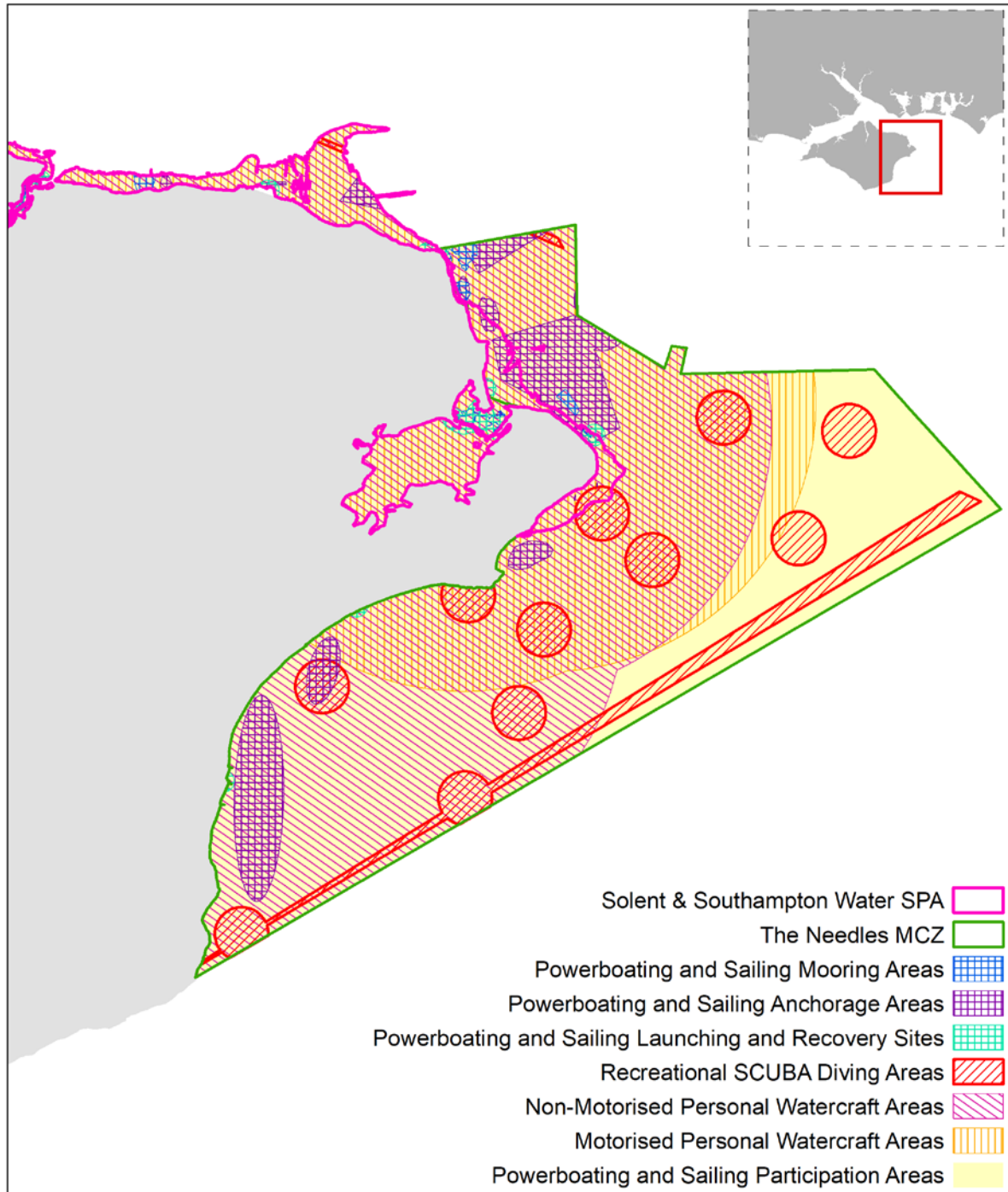
Contains public sector information licensed under the Open Government Licence v3.0 © Natural England copyright. Data derived under licence from RYA, 2016 ©, UKHO, 2021 © ABPmer, All rights reserved, 2021.

Figure 18b: Final activity data layers and MPAs within the Mid Solent area



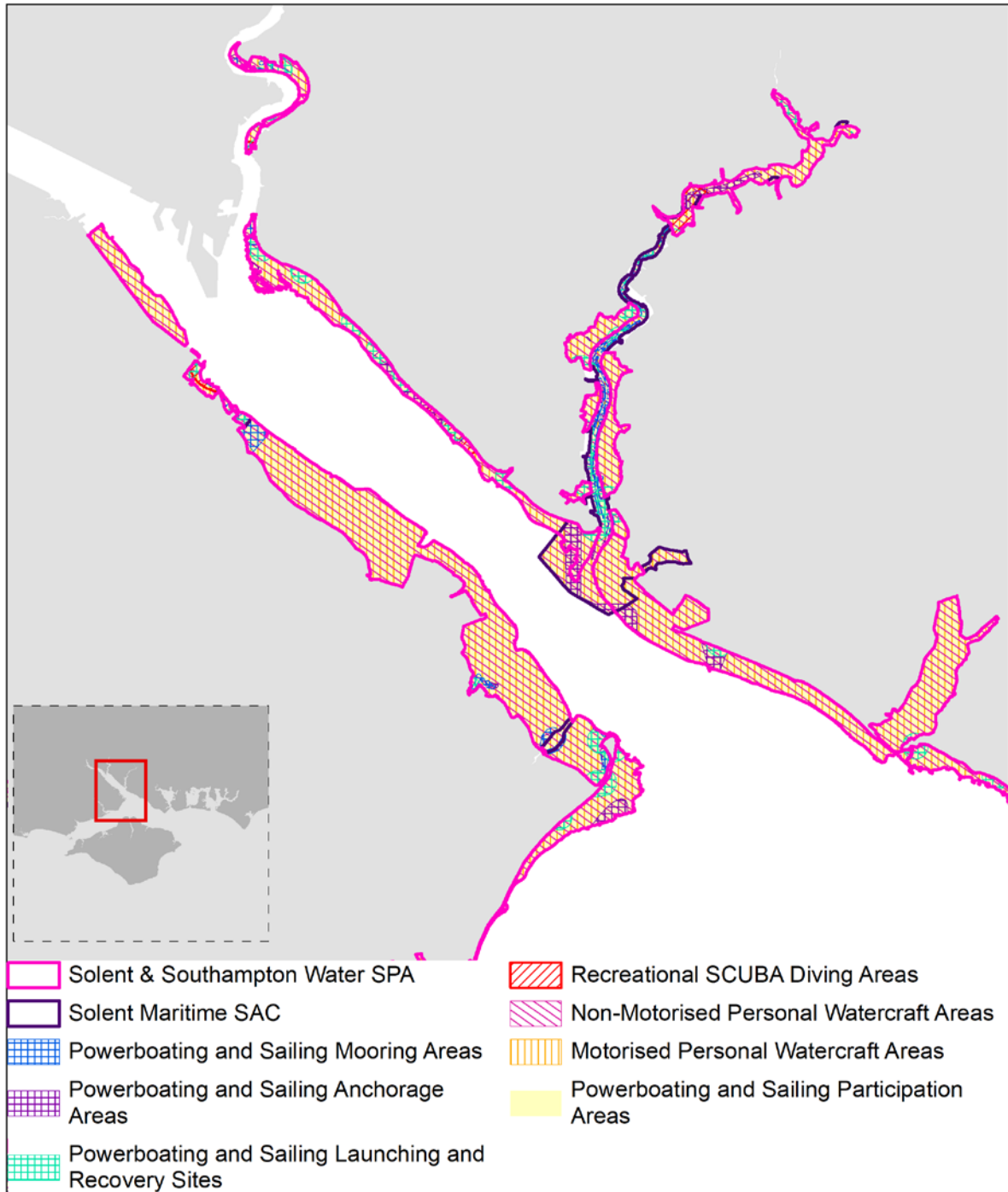
Contains public sector information licensed under the Open Government Licence v3.0 © Natural England copyright. Data derived under licence from RYA, 2016 ©, UKHO, 2021 © ABPmer, All rights reserved, 2021.

Figure 18c: Final activity data layers and MPAs within the East Solent area



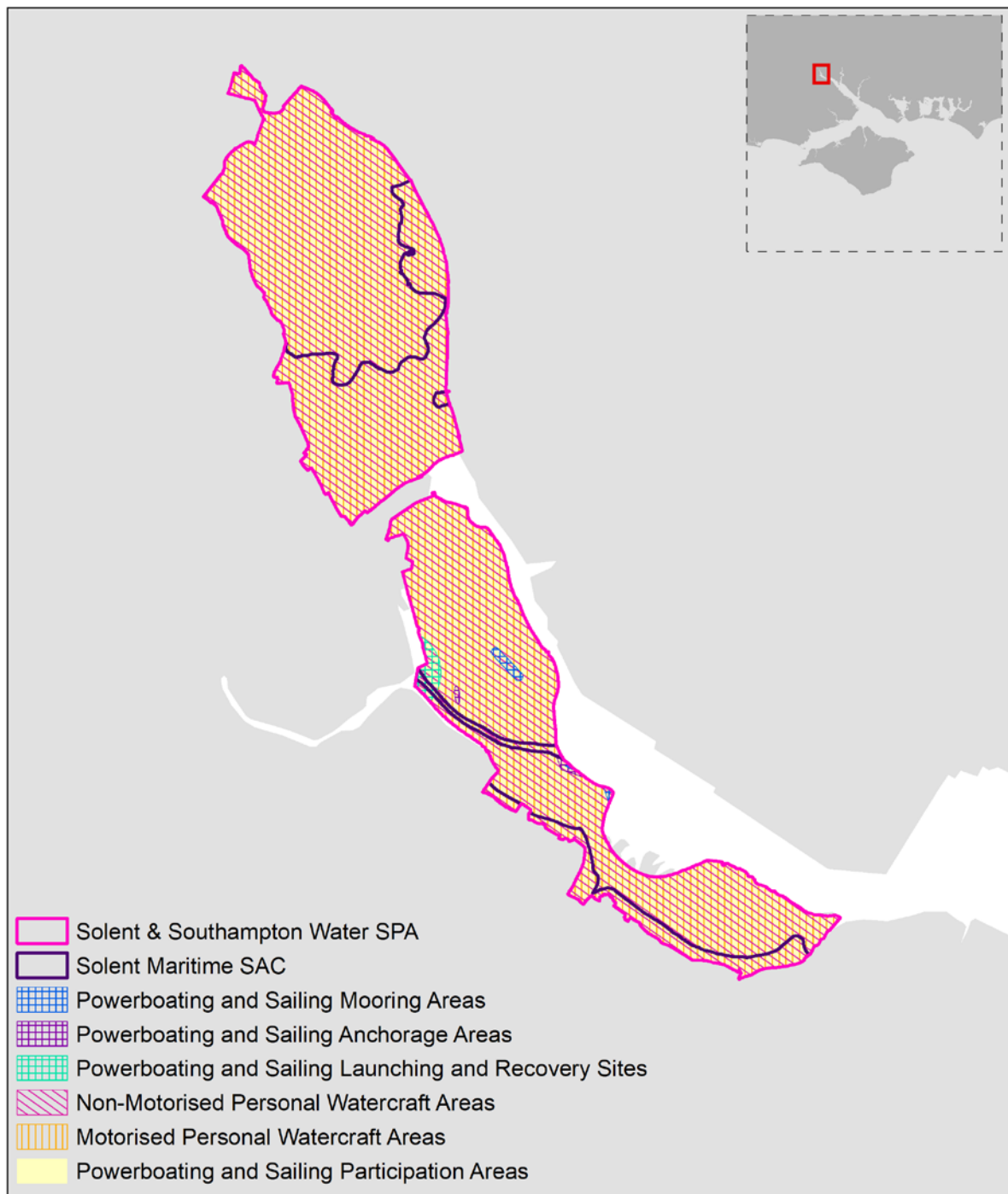
Contains public sector information licensed under the Open Government Licence v3.0 © Natural England copyright. Data derived under licence from RYA, 2016 ©, UKHO, 2021 © ABPmer, All rights reserved, 2021.

Figure 18d: Final activity data layers and MPAs within the Southampton Water area



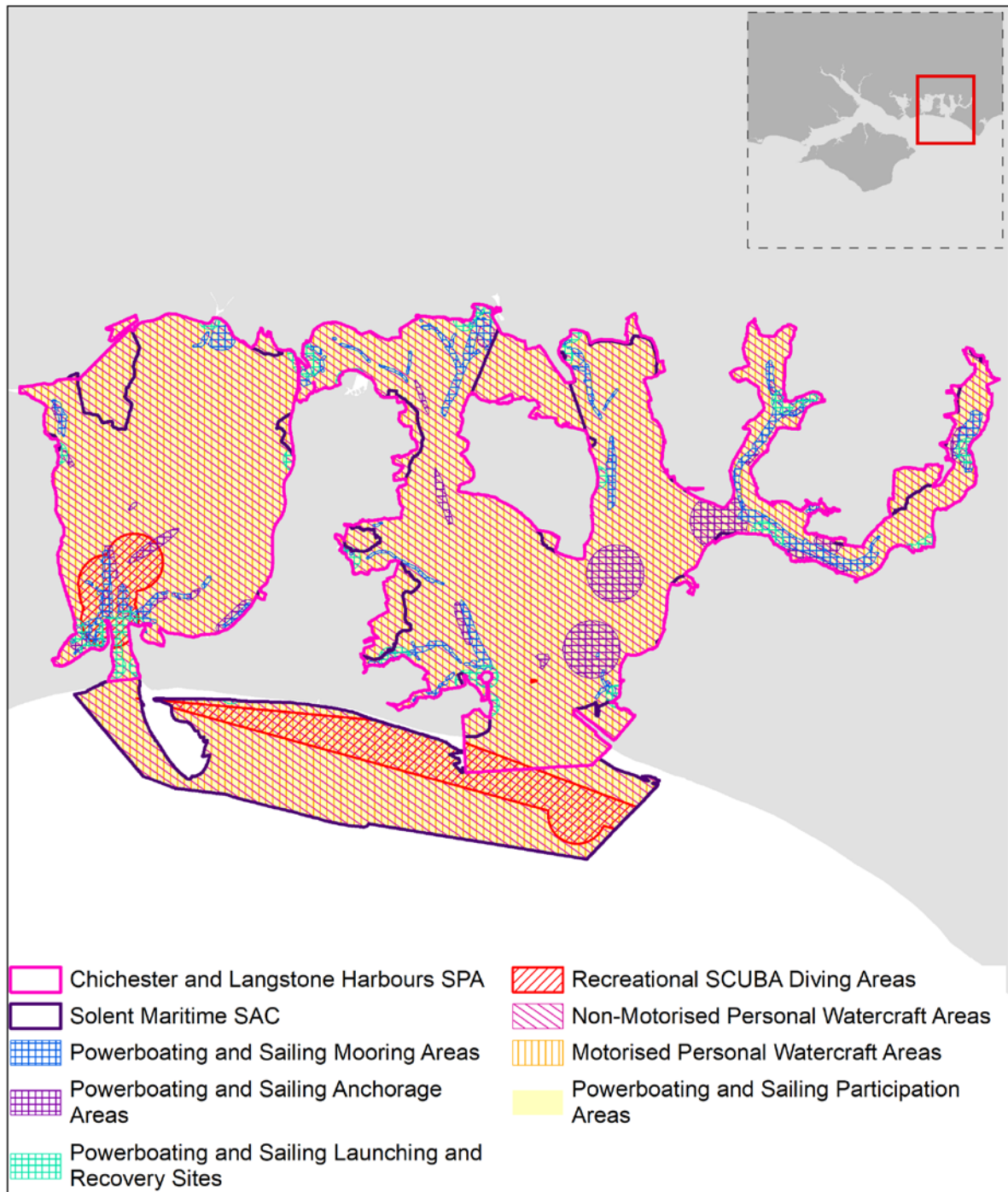
Contains public sector information licensed under the Open Government Licence v3.0 © Natural England copyright. Data derived under licence from RYA, 2016 ©, UKHO, 2021 © ABPmer, All rights reserved, 2021.

Figure 18e: Final activity data layers and MPAs within the River Test area



Contains public sector information licensed under the Open Government Licence v3.0 © Natural England copyright. Data derived under licence from RYA, 2016 ©, UKHO, 2021 © ABPmer, All rights reserved, 2021.

Figure 18f: Final activity data layers and MPAs within the Portsmouth and Chichester area

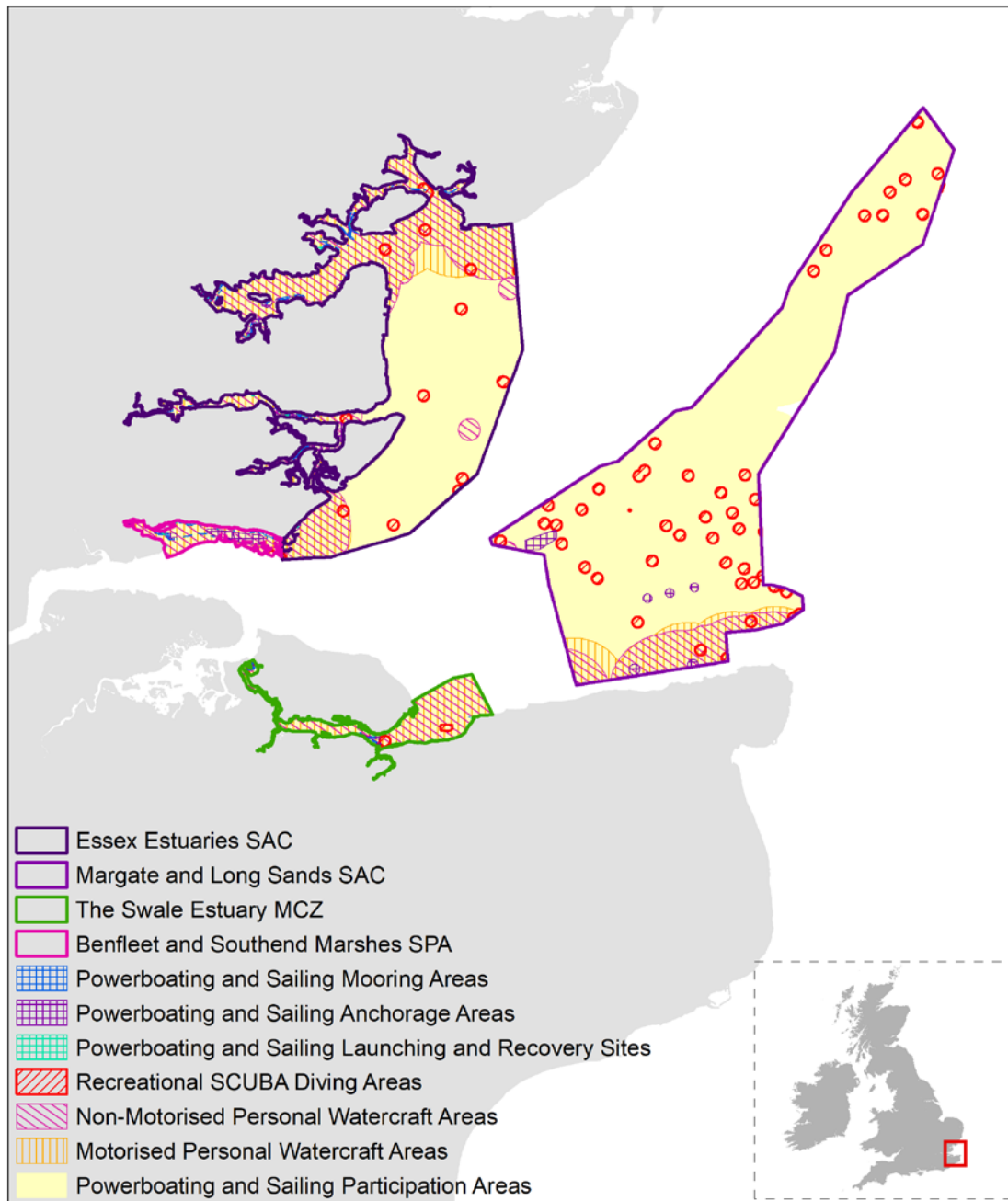


Contains public sector information licensed under the Open Government Licence v3.0 © Natural England copyright. Data derived under licence from RYA, 2016 ©, UKHO, 2021 © ABPmer, All rights reserved, 2021.

5.7 Thames Estuary

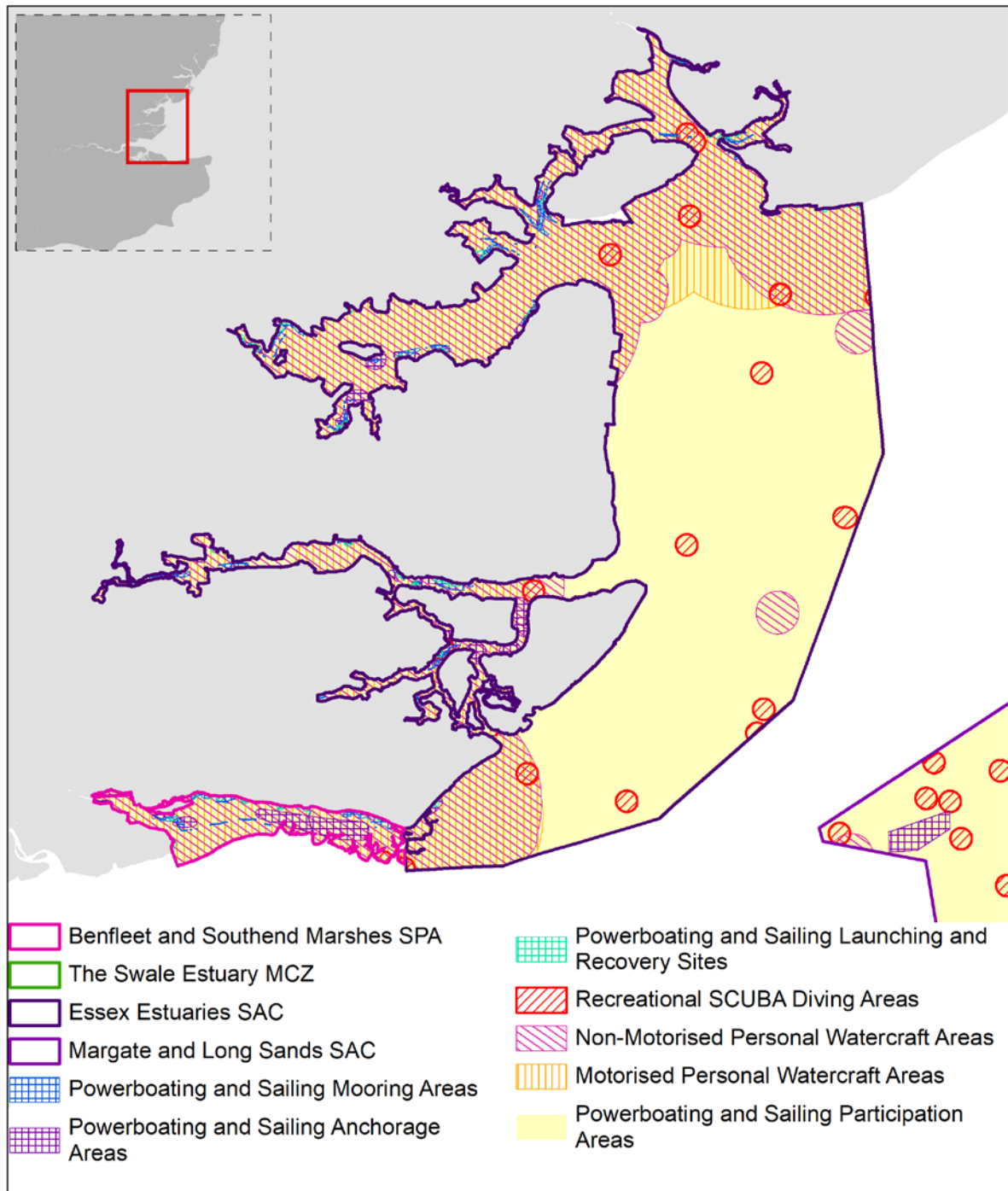
Powerboating and sailing participation are widespread across all MPAs in this region. Motorised and non-motorised PWC activities occur across the inshore areas of all the MPAs. Recreational SCUBA diving occurs in small areas within the Essex Estuaries SAC, Margate and Long Sands SAC and The Swale Estuary MCZ. Mooring, anchorage and launch and recovery activities occur within all MPAs in this region.

Figure 19: Final activity data layers and MPAs within the Thames Estuary region



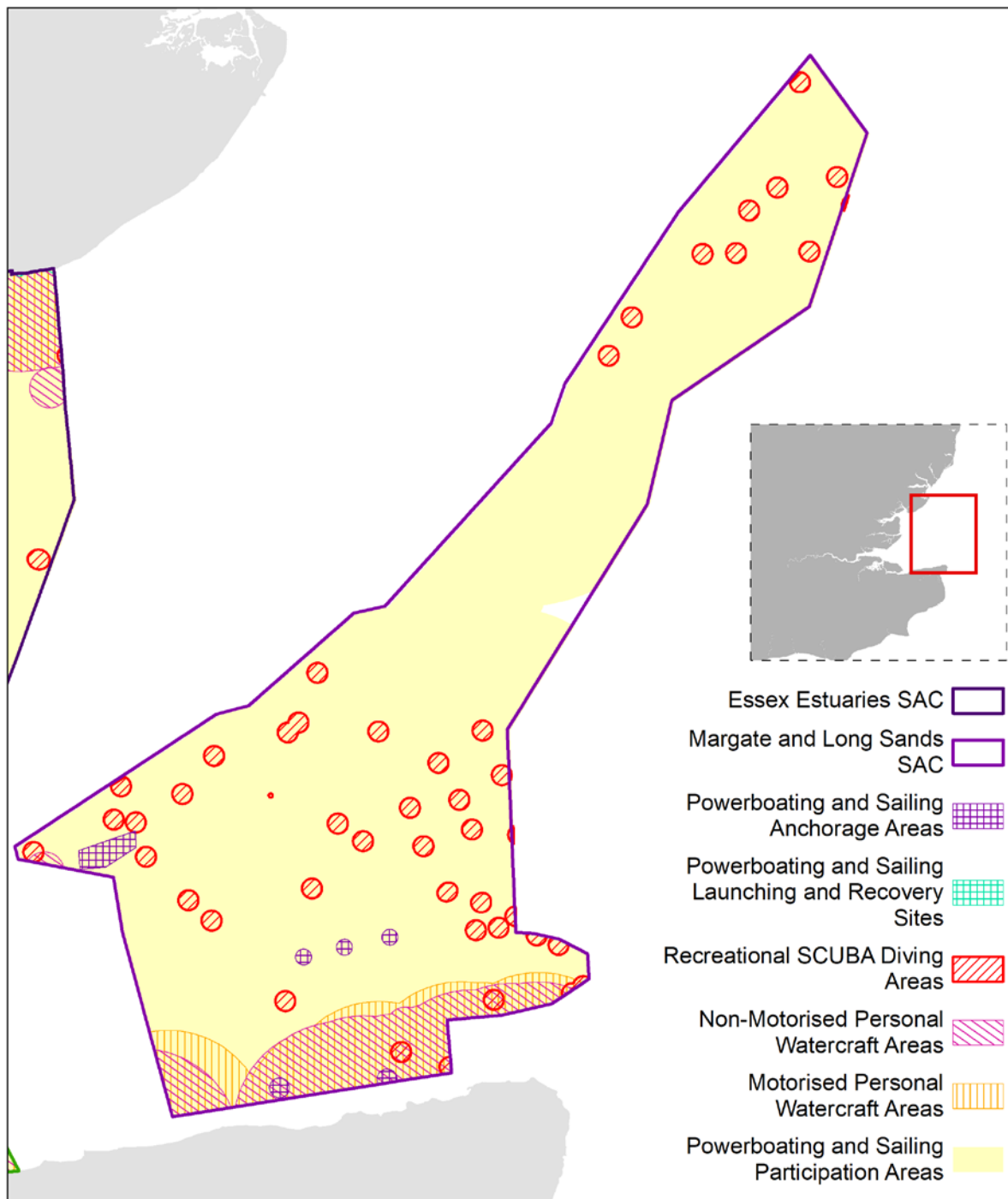
Contains public sector information licensed under the Open Government Licence v3.0 © Natural England copyright. Data derived under licence from RYA, 2016 ©, UKHO, 2021 © ABPmer, All rights reserved, 2021.

Figure 19a: Final activity data layers within the Essex Estuaries SAC and Benfleet and Southend Marshes SPA



Contains public sector information licensed under the Open Government Licence v3.0 © Natural England copyright. Data derived under licence from RYA, 2016 ©, UKHO, 2021 © ABPmer, All rights reserved, 2021.

Figure 19b: Final activity data layers within the Margate and Long Sands SAC

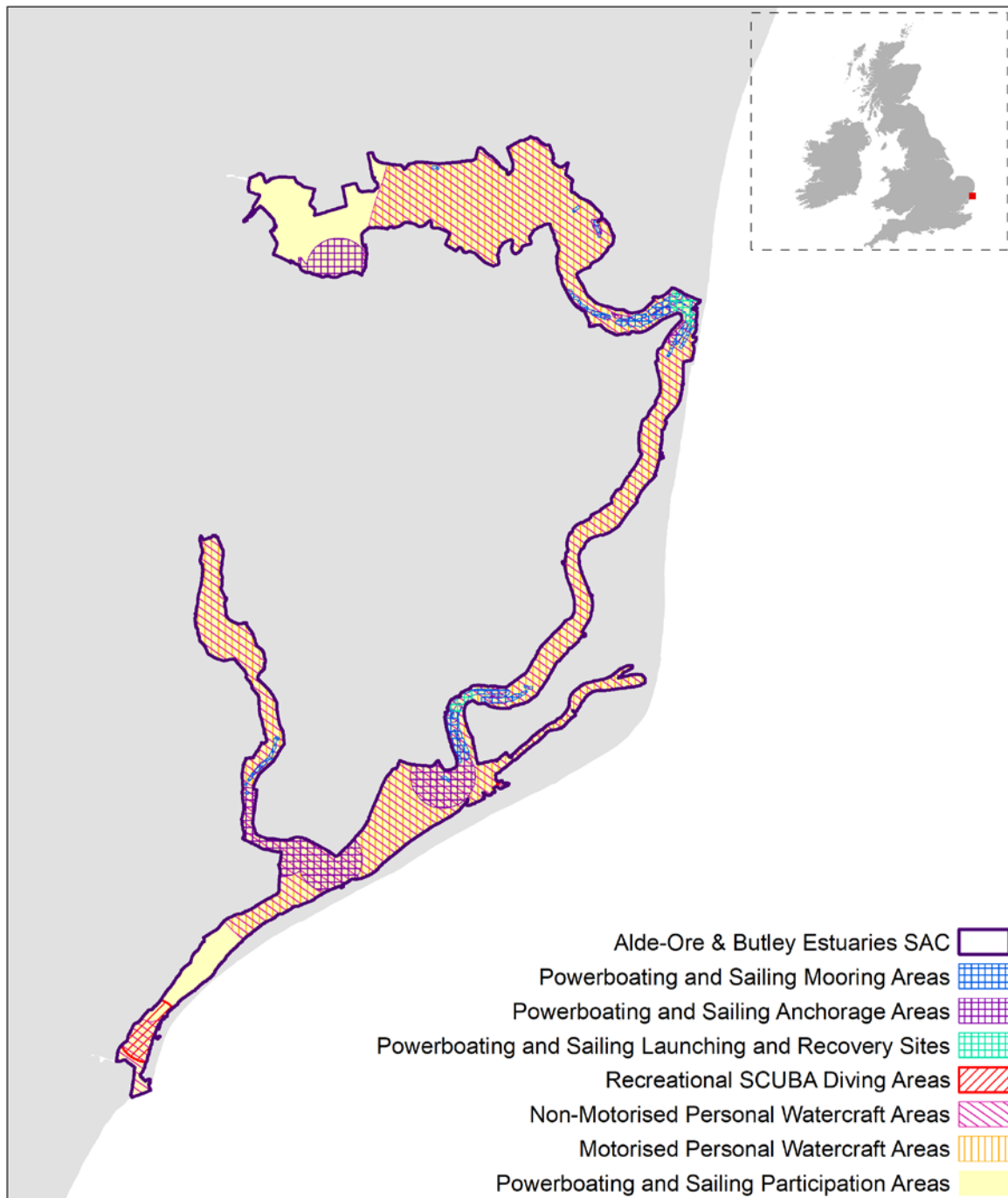


Contains public sector information licensed under the Open Government Licence v3.0 © Natural England copyright. Data derived under licence from RYA, 2016 ©, UKHO, 2021 © ABPmer, All rights reserved, 2021.

5.8 Alde-Ore and Butley Estuaries

Powerboating and sailing participation and motorised and non-motorised PWC activities are widespread across the Alde-Ore & Butley Estuaries SAC. Mooring, anchorage and launch and recovery activities also occur throughout the SAC. Recreational SCUBA diving occurs in a small area in the south of the SAC.

Figure 20: Final activity data layers and MPAs within the Alde-Ore and Butley Estuaries region

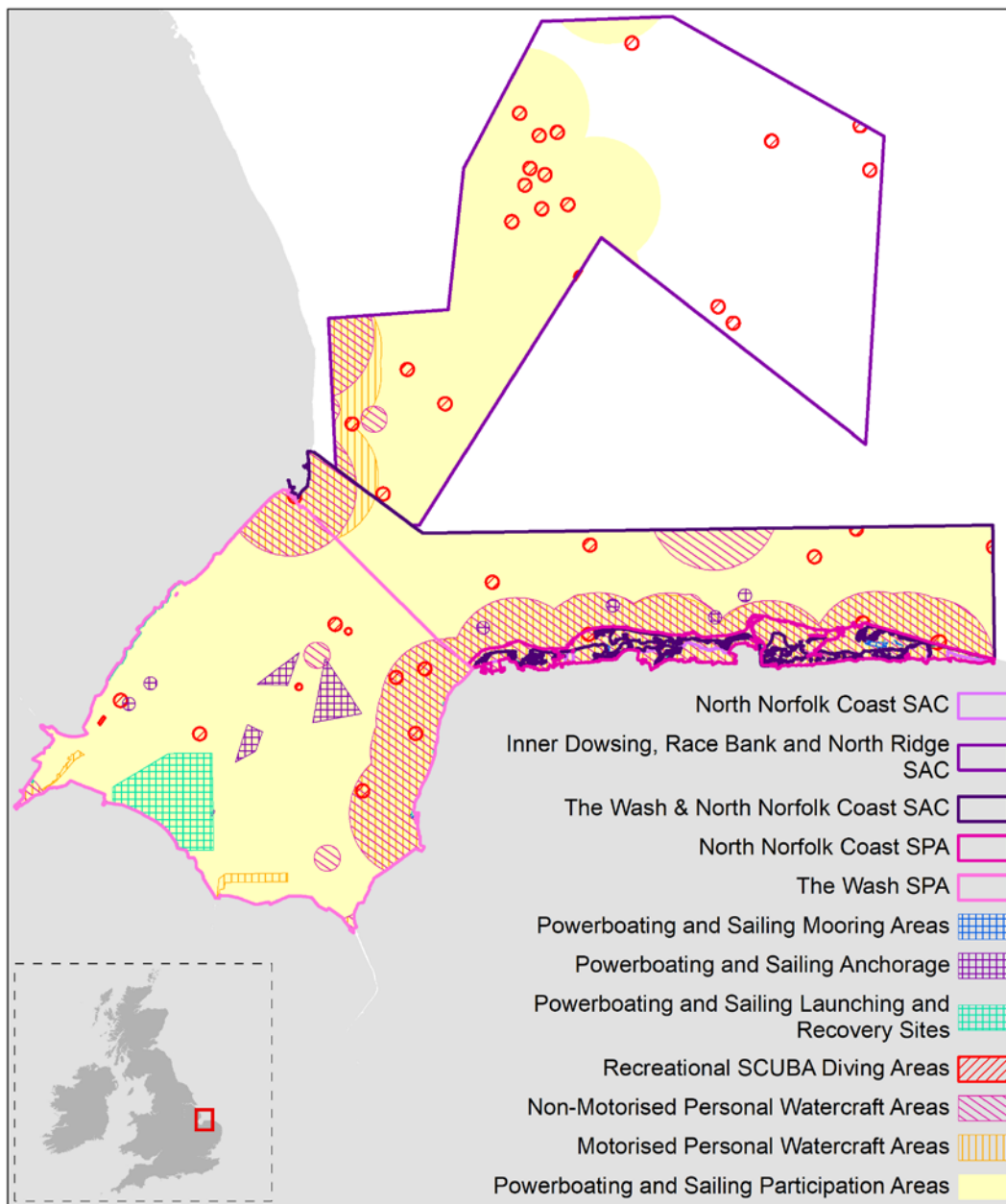


Contains public sector information licensed under the Open Government Licence v3.0 © Natural England copyright. Data derived under licence from RYA, 2016 ©, UKHO, 2021 © ABPmer, All rights reserved, 2021.

5.9 The Wash and North Norfolk

Powerboating and sailing participation are widespread across all inshore MPAs in this region and the western part of the Inner Dowsing, Race Bank and North Ridge SAC. Motorised and non-motorised PWC activities occur mainly along the North Norfolk coast and eastern and northern parts of The Wash. Recreational SCUBA diving occurs in small areas within all MPAs. Mooring, anchorage and launch and recovery activities occur within the MPAs along the North Norfolk Coast and The Wash SPAs.

Figure 21: Final activity data layers and MPAs within the Wash and North Norfolk region

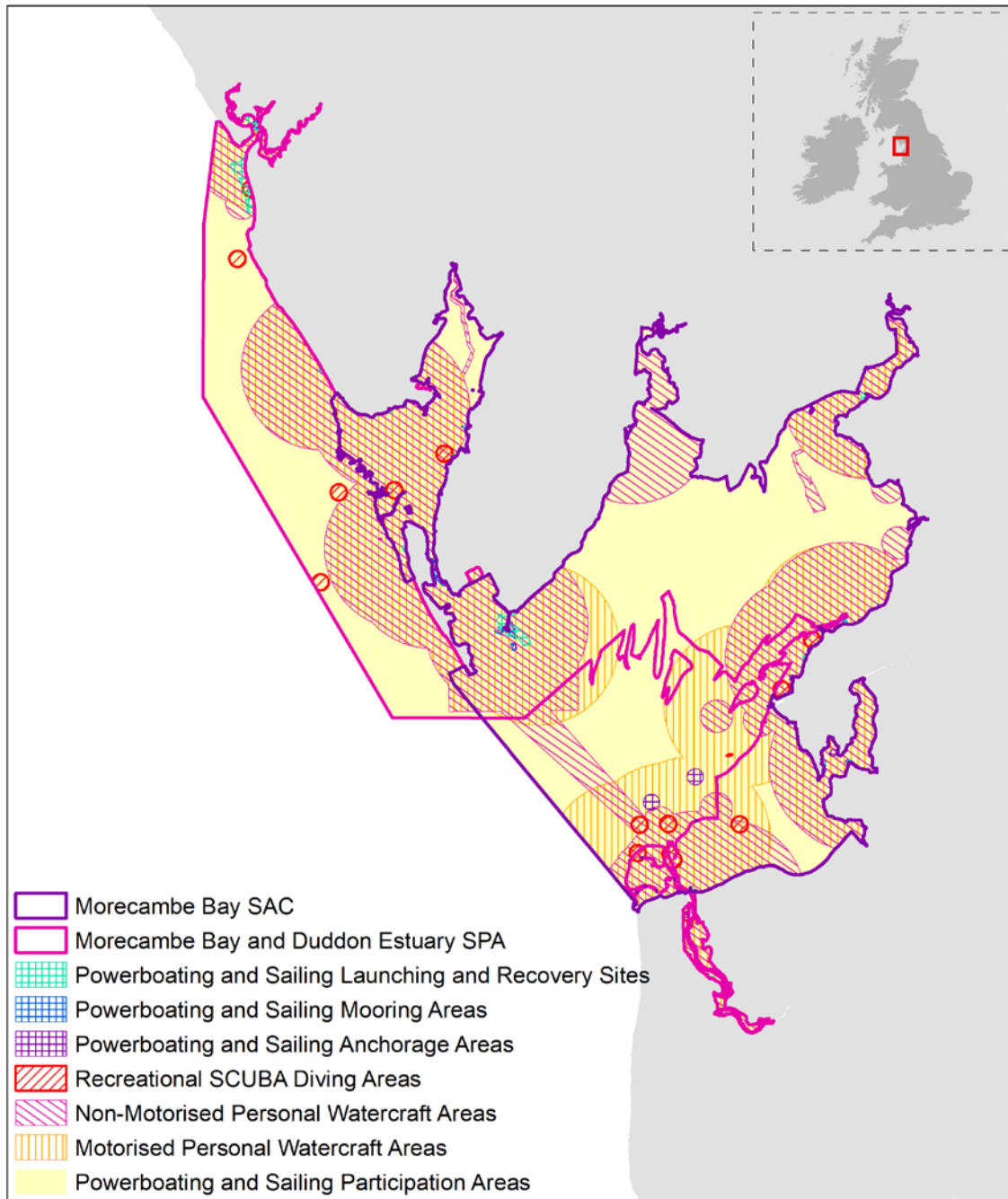


Contains public sector information licensed under the Open Government Licence v3.0 © Natural England copyright. Data derived under licence from RYA, 2016 ©, UKHO, 2021 © ABPmer, All rights reserved, 2021.

5.10 Morecambe Bay

Powerboating and sailing participation are widespread across both MPAs in this region. Motorised and non-motorised PWC activities occur across the inshore areas of both MPAs. Recreational SCUBA diving occurs in small areas within both MPAs. Mooring, anchorage and launch and recovery activities also occur within both MPAs in this region.

Figure 22: Final activity data layers and MPAs within the Morecambe Bay region



Contains public sector information licensed under the Open Government Licence v3.0 © Natural England copyright. Data derived under licence from RYA, 2016 ©, UKHO, 2021 © ABPmer, All rights reserved, 2021.

6. Conclusions and Recommendations

Many of the previous studies held stakeholder workshops to obtain high quality data. As this was not an option due to the COVID-19 pandemic throughout the duration of this project, a remote survey approach was required. It is likely that this did not generate as much richness of data as a face-to-face workshop. The use of an online data viewer for stakeholder engagement required stakeholders to work remotely by themselves and did not allow for discussion between participants.

One of the limitations of the use of an online data viewer is that it required a moderate level of knowledge and experience using webmaps and guidance was needed to help those less experienced in using GIS software. Whilst a guidance document was provided to all stakeholder consultees explaining how to use the data viewer, it became apparent that some consultees struggled with the process and/or did not read the guidance document, which led to incorrect edits being made, as well as no edits being created. It is also possible that those less confident with online methodologies were wary of using the data viewer and decided not to participate.

However, the use of the online data viewer did have many merits:

- it allowed each stakeholder the opportunity to contribute information securely;
- it gave stakeholders the ability to review the information provided and edit activity data directly into a GIS format;
- it allowed each stakeholder to take their time over reviewing the existing data layers; and
- it made the process more efficient when making any changes to the spatial data for review.

6.1 Data Gaps and Data Limitations

Contact details were “mined” using organisation websites, and it was found that a number of these email addresses were no longer in use. (This could however be partly due to the COVID-19 pandemic; with many people working from home or on furlough it is possible that general organisational emails were not being monitored, which was the case for at least two contacts). Also, contact details for some individuals in organisations, likely to have relevant information pertaining to this study, were not available publicly; they later contacted ABPmer to take part in the survey.

Not many regional or national water sports clubs took part in the consultation, therefore, the presence/intensity of the recreational activities is likely to have been under-reported.

There was a varied response with spatial and/or non-spatial information from different regions with one region (Morecambe) providing no responses at all.

Point data, which was used to provide information for many of the activities, required conversion from a single point location to an area of activity. This was achieved by

applying buffers at set distances for each activity, based on assumptions about the likely distance the activity may cover. These assumptions may not necessarily reflect the true extent of the activities and, in fact, the activity may not actually occur at all from that point. For example, the use of all slipways as inputs to the “powerboating or sailing with/without an engine: launching and recovery” activity data layer, without knowledge of their suitability for launching and recovery of these types of vessels may have exaggerated the extent of this activity. Similarly, the use of all named wrecks as inputs to the recreational SCUBA diving activity data layer may have resulted in areas being included that are not actual dive sites.

Limited information was obtained on temporal or spatial intensity. Many stakeholders who responded did provide details about intensity for the areas which they edited, but these formed a small proportion of the mapped activity data layers.

6.2 Recommendations

Since obtaining relevant contact details has been made difficult by the General Data Protection Regulation (GDPR) introduced in May 2018, contact details obtained within the company for use in other projects (but that would be relevant to this consultation) were not able to be shared with the project team for use in this project. Therefore, consultees within this project have been asked if they would like to be contacted for further surveys involving non-licensable activities in MPAs and where positive responses were received, their details have been recorded. This is a useful recommendation for other stakeholder engagement projects in the future.

Although the online data viewer proved to be a successful and efficient way to share existing data and edit new spatial data, more time and guidance for stakeholders to use the viewer may help to produce more and better responses.

Digital data mining techniques, for example analysing Flickr photographs for some of the different recreational activities as a proxy for location/intensity of activities or use of Strava or Garmin data may become more effective in the future. However, these may have other limitations such as limited user group, issues around the use of personal data as well as user error (for example, incorrect activities may be logged, or the start/end of an activity may not be logged correctly). The option of automating the mapping of activities, such as mooring buoy locations or anchorages, using image recognition software may be possible with enough time to allow for the machine learning requirements. New datasets may also become available for use in the future, such as the RYA's [SafeTrx app](#) which monitors recreational boat users, particularly dinghy cruisers, PWC users, RIB users, canoers, kayakers, wind and kite surfers and smaller boat users and allows users the ability to inform HM Coastguard of voyage plans and dynamic location in the event of distress.

To fully understand the extent and intensity of activities, focussed local stakeholder workshops and/or field surveys would be required. Ground-truthing of data where an MPA is considered to be impacted by a non-licensable recreational activity may also be required. However, it is recognised that such data collection is time consuming and expensive.

7. References

Griffiths, C.A., Langmead, O.A., Readman, J.A.J., Tillin, H.M. 2017 Anchoring and Mooring Impacts in English and Welsh Marine Protected Areas: Reviewing sensitivity, activity, risk and management. [A report to Defra Impacts Evidence Group](#).

IEG (2020). Recreational Anchoring and Mooring in Marine Protected Areas and the Potential of Eco-Moorings for Mitigation of Impacts. A report produced by MarineSpace for the Marine Management Organisation on behalf of the Marine Biodiversity Impacts Evidence Group, MMO Project No: 1165, March 2020

Lee, J. (2018). Recreational anchoring and mooring in Marine Protected Areas (MPAs): Activity data collection, Defra (final draft submitted but not published).

MMO (2019) Non-licensable Activity Impacts on Marine Protected Areas. Marine Management Organisation, [MMO Project No: 1136](#), November 2019, 118pp

MMO (2020) Mapping recreational sea anglers in English waters. Marine Management Organisation, [MMO Project No: 1163](#), February 2020, 129pp.

Natural England (2017) Managing marine recreational activities: a review of evidence. Natural England, [NECR Project No: 242](#), November 2017, 38pp.

Annex 1 Consultees

The Table A1 identifies the groups contacted directly as part of this study.

Table A1: List of stakeholders contacted

Activity Type	Groups or organisations contacted
Phase 1 Stakeholders – Ports and Harbours	
Powerboat and/or Sailing moorings; Powerboat and/or Sailing anchorages	Barrow-in-Furness
	Bembridge
	Blakeney
	Boston
	Brancaster Staithe
	Brightlingsea
	Brixham
	Burnham-on-Crouch
	Cattewater
	Charlestown
	Chichester
	Cowes
	Exeter
	Exmouth
	Falmouth
	Faversham
	Fawley Marine Terminal
	Fishbourne
	Fleetwood
	Fowey
	Glasson Dock
	Gorran Haven
	Hamble
	Herne Bay
	Heysham
	Hughtown (St. Mary's)
	King's Lynn
	Knott End
	Lancaster
	Leigh-on-Sea
Looe	
Lymington	
Maldon	
Margate	
Mevagissey	
Millbay Docks	
Millom	
Orford	

	Paignton
Powerboat and/or Sailing moorings; Powerboat and/or Sailing anchorages.	Par
	Plymouth
	Polperro
	Poole
	Porthoustock
	Portscatho
	Portsmouth
	Queenborough
	Rochford
	Rochford (Wallasea)
	Sheerness
	Southampton
	St Mawes
	Sutton Bridge
	Sutton Harbour
	Swanage
	Thamesport
	Torquay
	Truro
	Ventnor
Wells-next-the-Sea	
Whitstable	
Wivenhoe	
Yarmouth	
Phase 2 Stakeholders	
All Activities	Natural England
All Activities	MMO Officers
All Activities	MPA Officers
All Activities	British Marine
All Activities	Hovercraft Club of Great Britain
All Activities	Historic England
All Activities	National Trust
All Activities	Morecambe Bay Partnership
All Activities	Duddon Estuary Partnership
All Activities	The Alde and Ore Estuary Partnership
All Activities	Cornwall & Isles of Scilly Local Nature Partnership
All Activities	Fowey Estuary Partnership (UNDER Fowey Harbour Commissioners)

All Activities	Estuary and Coastal Partnerships and Forums; Exe Estuary Management Partnership
All Activities	Devon Maritime Forum
All Activities	Dorset Coast Forum
All Activities	Thames Estuary Partnership
All Activities	Coastal Partners
All Activities	Solent Forum
All Activities	Isle of Wight Estuaries Project
All Activities	Chichester Harbour Conservancy
All Activities	ABPmer
All Activities	Recreation Mitigation Coordinator Poole Harbour SPA
All Activities	Birds Aware Solent
Motorised personal watercraft	Personal Watercraft Partnership
Non-motorised personal watercraft	Surfing England;
Non-motorised personal watercraft	British Canoeing;
Non-motorised personal watercraft	British Stand Up Paddle Association;
Non-motorised personal watercraft	British Kite Sports;
Powerboat and/or Sailing participation; Powerboat and/or Sailing moorings; Powerboat and/or Sailing anchorages; Powerboat and/or Sailing launching and recovery	Royal Yachting Association (RYA);
Recreational SCUBA diving	British Sub-Aqua Club (BSAC);
Phase 3 Stakeholders	
All Activities	National Trust
All Activities	Cornwall Marine and Coastal Code Group
All Activities	Isles of Scilly County Council
All Activities	Isles of Scilly Wildlife Trust
All Activities	Cornwall Wildlife Trust
All Activities	Cornwall Seal Group Research Trust
All Activities	Plymouth's Coastal Community Team; Plymouth City Council
All Activities	Tamar Estuaries Consultative Forum
All Activities	Plymouth Council

All Activities	Cornwall IFCA
All Activities	Duchy of Cornwall
All Activities	East Devon County Council
All Activities	Exeter City Council
All Activities	Torbay Harbour Office
All Activities	National Trust
All Activities	Hamble Estuary Partnership
All Activities	Environment Agency
All Activities	Marine Conservation Society
All Activities	Exmouth Water Users group
All Activities	A frequent "user" of MPAs on the south coast.
All Activities	Exeter Port Users Group (EPUG)
All Activities	Environment Agency
Motorised personal watercraft	Jet-ski Safaris
Non-motorised personal watercraft	Louth and District Model Aero Club
Non-motorised personal watercraft	Falmouth Surf Lifesaving Club
Non-motorised personal watercraft	Kernow Kitesurfing
Non-motorised personal watercraft	Exmouth Beach Rescue Club
Non-motorised personal watercraft	Exe Kiteboarders
Non-motorised personal watercraft	Torbay Sea School
Non-motorised personal watercraft	Sea Kayak Torbay
Non-motorised personal watercraft	Torbay Surf Lifesaving
Non-motorised personal watercraft	Essex Kite Club
Non-motorised personal watercraft	Christchurch Lifesaving Club
Non-motorised personal watercraft	Hurst Kite Club
Non-motorised personal watercraft	Isle of Wight surf club
Non-motorised personal watercraft	Fluid Adventures Ltd
Non-motorised personal watercraft	24-7 Boardsports
Powerboat and/or Sailing participation; Powerboat and/or Sailing moorings; Powerboat and/or Sailing anchorages; Powerboat and/or Sailing launching and recovery	Square Sail Ventures Limited
Powerboat and/or Sailing participation; Powerboat and/or Sailing moorings; Powerboat and/or Sailing anchorages;	Royal Western Yacht Club

Powerboat and/or Sailing launching and recovery	
Powerboat and/or Sailing participation; Powerboat and/or Sailing moorings; Powerboat and/or Sailing anchorages; Powerboat and/or Sailing launching and recovery	Thames Sailing Barge Association
Powerboat and/or Sailing participation; Powerboat and/or Sailing moorings; Powerboat and/or Sailing anchorages; Powerboat and/or Sailing launching and recovery	Island Sailing Club
Powerboat and/or Sailing participation; Powerboat and/or Sailing moorings; Powerboat and/or Sailing anchorages; Powerboat and/or Sailing launching and recovery	Royal Victoria Yacht Club
Powerboat and/or Sailing participation; Powerboat and/or Sailing moorings; Powerboat and/or Sailing anchorages; Powerboat and/or Sailing launching and recovery	United Kingdom Sailing Academy
Powerboat and/or Sailing participation; Powerboat and/or Sailing moorings; Powerboat and/or Sailing anchorages; Powerboat and/or Sailing launching and recovery	Royal Solent Yacht Club
Powerboat and/or Sailing participation; Powerboat and/or Sailing moorings; Powerboat and/or Sailing anchorages; Powerboat and/or Sailing launching and recovery	South Coast Group
Powerboat and/or Sailing participation; Powerboat and/or Sailing moorings; Powerboat and/or Sailing anchorages;	Professional Boatman's Association

Powerboat and/or Sailing launching and recovery	
Recreational SCUBA diving	Lowestoft Sub Aqua Club
Recreational SCUBA diving	Diving club member

Annex 2 Stakeholder Survey Invitation

High Priority Non-Licensable Activities in MPAs – Call for Evidence

Do you have information on where marine recreational activities occur within your region? If so, we would like to hear from you.

ABPmer, on behalf of the Marine Management Organisation (MMO), has been commissioned to collate and present information on non-licensable marine recreational activities (for example recreational boating and watersports) which occur within 32 Marine Protected Areas (MPAs) around the English coast. The overall goal of this study is to maintain sustainable usage of MPAs and forms part of the MMO's work to provide data that underpins MPA site level assessment, in order to accurately assess impacts to MPAs and further conservation objectives. The information will be used by the MMO to support further engagement with stakeholders and regulators.

This survey invites you to review and contribute to a study designed to collate spatial data layers showing regions across the English coast where marine non-licensable activities occur. The MMO have identified several types of non-licensable activities to focus on for this project. We are interested in any data and stakeholder views relating to the location, intensity and/or timing (seasonality) of the following activities:

- Moorings used by powerboats or sailing vessels (with or without engine);
- Anchorages used by powerboats or sailing vessels (with or without engine);
- Launching and Recovery sites for powerboats or sailing vessels (with or without engine) including popular non-slipway launch sites;
- Powerboat participation areas;
- Sailing boat (sailing vessels under sail or engine) participation areas
- Non-motorised Personal Watercraft (e.g. kayaks, canoes, sailing dinghies, paddleboards, windsurfing, surfing, bodyboards) usage areas;
- Motorised Personal Watercraft (e.g. jet skis) usage areas; and
- SCUBA Diving sites.

The link provided below will enable you to view and annotate spatial data layers showing the distribution of the marine non-licensable recreational activities. The data can be viewed by region and presents existing publicly available data outlining where the above activities take place. We would be grateful if you could view the data for the region(s)/MPA(s) that are most relevant to you (e.g. in the area that you work, or your members undertake the activities) and consider the following 4 questions:

- Does the existing data provide a reasonable representation of where activities occur within the region/MPA(s)?
- Does the intensity of activities vary throughout the year? If so, when are the busiest months?
- Are there additional key areas or 'hotspots' where specific activities occur that are not currently shown in the maps?
- Do you know any other key stakeholders that may have additional information regarding these activities and would appreciate being sent this data viewer?

The Spatial Data Review document attached lists the regions and MPAs of interest and provides instructions on how to use the data viewer. As general comments cannot be made within the data viewer, unless you choose to create an area for an activity, the attached document also includes a table which can be used to send us information about the distribution or timing of activities in a non-spatial format. Please note that any annotations you make to the maps within the data viewer will automatically be saved to the data viewer hosted on ABPmer's secure server.

Please note that the link to the data viewer below is specific to you. When you open the data viewer you will be able to annotate the maps with additional information regarding where activities occur. **IF YOU FORWARD THE LINK TO OTHER PEOPLE, THEY WILL BE ABLE TO SEE ANY ANOTATIONS YOU HAVE MADE. HENCE WE STRONGLY ADVISE THAT YOU DO NOT FORWARD THE LINK TO ANYONE EXTERNAL TO YOUR ORGANISATION.** You are welcome to pass the contact details of the project manager (Nicola Dewey; ndewey@abpmer.co.uk) to any other stakeholders who can contact us and request a survey link.

Please open the below link in Google Chrome or Microsoft Edge. Due to the large volume of data held within the data viewer, it may take 1-2 minutes to properly load up.

[Link to data viewer]

Please submit your responses by the 1st March 2021.

What we will do with your responses

Participation in the survey is voluntary. Any information you supply that is included in the final outputs (spatial data layers and report provided to the MMO), will be aggregated and anonymised (i.e. not be attributable to you). The survey does not ask for information that will identify you personally. The survey is hosted by ABPmer; click [here](#) to view our privacy policy. Your responses will be analysed solely in line with the objectives of the study and will not be used for any other purpose. The results of the survey will contribute to a report which will be available on the MMO's website [\[here\]](#) in due course.