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Alternative use of dredge material in the north east, north west, south east and south west marine plan areas (MMO1190)



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MMO1190: Alternative use of dredge material in the north east, north west, south east and south west marine plan areas

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Executive Summary

The Marine Management Organisation (MMO) is currently developing the north east, north west, south east and south west marine plan areas around the English coast. As there is a need for more dredged material to be re-used rather than disposed of at sea, used “alternatively”, there is a requirement for a national dataset to be developed to identify sites of potential alternative use and to associate these with suitable future dredging campaigns. To meet this need, the MMO is developing a strategic overview of where dredging occurs and where this resource is needed to support alternative use of the extracted material. The MMO commissioned Royal HaskoningDHV to develop this dataset for the North East, North West, South East and South West Marine Plans and to undertake a review of the data.

This study developed a Geographic Information System (GIS) dataset and maps to describe existing and future opportunities for alternative use of dredge material in the north east, north west, south east and south west marine plan areas. This was completed using the [MMO Public Register](#), a review of relevant literature and stakeholder consultation.

The GIS database is split into four datasets; historic and existing dredging, historic and existing alternative use, future dredging and future alternative use. This report contains the tabulated data from the database as well as a series of maps depicting dredging and alternative use in each of the marine plan areas. These data were reviewed and a need for more strategic oversight has been identified to more efficiently coordinate the re-use of dredged material instead of disposal at sea. Although there are several constraints, such as material suitability, there are clear opportunities for much greater re-use in all the marine plan areas reviewed.

The information delivered by this project contributes to the wider aspiration to use dredge materials alternatively while providing an evidence base to support plan policy that promotes integrated and sustainable management of the marine areas. When combined with similar studies on the other marine plan areas, the information collected may be used to help industry work with the environment, reducing their environmental impact and the cost of sourcing new material from elsewhere.

1. Introduction

Marine planning aims to support activities and improve integrated management to achieve sustainable development in the marine area. Marine planning should be supported by a robust evidence base that ensures that all sectors are managed fairly and proportionately to make the best use of available marine resources now and in the future.

The UK Marine Policy Statement (MPS) (HM Government, 2011) contains the high level marine objectives set by Defra (2009), providing a framework for decision-making to contribute to the achievement of sustainable development in the marine environment. The MPS facilitates the preparation of Marine Plans (such as those developed by the MMO) to ensure that marine resources are used in a sustainable way in line with the high level objectives.

One element of marine planning, and a desirable output from the developing marine plans, is how best to “alternatively”¹ use dredged materials from capital or maintenance dredging that would otherwise require disposal, usually through dumping in defined disposal areas at sea. The Waste Framework Directive waste hierarchy states that if prevention of the dredging is not possible, the options in the hierarchy in order of preference are preparing for use, recycling and other recovery. The MMO is developing a strategic overview of where dredging occurs and where this resource is needed to support alternative use of the extracted material. This process began with publication in 2014 of a strategic review of the beneficial use of dredged materials in the South Inshore and South Offshore marine plan areas (MMO, 2014).

This study aims to develop previous work further through Geographic Information System (GIS) data and maps to describe existing and future opportunities for alternative use of dredge material in the north east, north west, south east and south west marine plan areas. The information delivered by this project contributes to the wider aspiration to seek alternative uses for dredge materials while providing an evidence base to support plan policy that promotes integrated and sustainable management of the marine area. On a larger scale, and combined with similar studies on the other marine plan areas, the information collected may be used to ultimately help industry work with the environment, through the analysis of marine licences to suggest alternatives to disposal at sea, where opportunities are identified.

The objectives of this study are to:

1. Map existing:
 - a) sites of dredging activity in the north east, north west, south east and south west marine plan areas; and
 - b) sites where dredged material has been used alternatively, rather than deposited at sea.

¹ The term ‘alternative use’ is used throughout this report instead of ‘beneficial use’. This is because the potential uses of dredged material discussed in this report include construction materials and land-claim rather than for purely environmentally beneficial purposes (such as beach nourishment).

2. Map potential future:
 - a) sites of dredging activity; and
 - b) sites where the material could be used/is needed alternatively in the future.

This study focuses on environmental and engineering opportunities for use of dredged material.

This study focuses on environmental and engineering opportunities for use of dredged material. MMO recently completed a project to investigate the location, condition and features of significant sites for habitat restoration or creation around the UK coast (MMO, 2019). This study assesses further alternative uses in terms of (for example) beach nourishment, coastal defence, construction, sustainable relocation and land-claim. Together these projects represent a comprehensive assessment to aid the re-use for dredge material.

2. Approach

The identification and collation of data on existing and future opportunities for alternative use of dredge material was completed by a desk-based review followed by input into a GIS database.

2.1. Mapping Historic and Existing Sites

To map the existing sites of dredging activity and where dredged material has been re-used, digital spatial extent data provided by the MMO was imported into the GIS with associated metadata. Two separate datasets were provided by the MMO; one containing sites of historic and existing (ongoing/incomplete) dredging activities, and the other contained historic and existing alternative use sites. The data supplied was exclusively Marine Licences and Applications since 2011, split into point data, line data and polygonal data.

The data was checked visually, and a review of the tabulated data was completed to identify any anomalies. Anomalies included applications for licences which have not yet been granted, or licences which have been granted but for future work. These projects were transferred into the relevant 'future sites' datasets. Any projects labelled 'alternative use' which did not involve the re-use of dredged material were removed (this included several which were disposal licences, as well as aggregate licences).

The data provided by the MMO did not include details on material type and volume. Type and volume data were collated using the MMO public register for the sites where licences have not yet expired, and included as part of the metadata. These data were not obtained for those sites where licences have expired, as this was outside the scope of this study.

2.2. Mapping Future Sites

Data was gathered on potential future dredging and alternative use sites through desk-based assessment of key strategic documents and stakeholder engagement.

This has been informed by Shoreline Management Plans (SMPs), Beach Management Plans (BMPs), and industry documents such as Port Master Plans. Two main tasks were completed to compile the data; a desk-based review and stakeholder consultation.

2.2.1. Desk-based Review

Future Dredging

Potential future dredging opportunities were predominantly identified through a search of the MMO public register. This register provided details of sites which are still in the application stage and may be licensed soon. Further information on material type and volumes to be dredged was gathered through a review of application documents. Where this information was not available, 'not available' is stated in the tabulated data later in this report. These sites were added into the GIS database along with the respective MMO case references.

In addition, studies commissioned by The Crown Estate and the RSPB were reviewed to look for opportunities for using dredged material alternatively to meet several objectives such as consideration of potential navigational dredging requirements and potential for use of the resulting material (Ausden et al., 2018). Any projects additional to those described in the MMO public register were added to the GIS database along with the available metadata. A review of Port Master Plans for major ports and harbours was also completed, but their value in supporting the data collation was limited due to lack of detail in the four marine plan areas.

Future Alternative Use

Potential sites for alternative use of dredged material were identified using a combination of existing knowledge, a review of management plans, and the MMO public register. Areas of the coast which may make use of dredged material were identified using the policy adopted within each Policy Unit of the relevant SMPs. All the Policy Units which identified a potential opportunity for the re-use of dredged material were collated, including sites where the preferred management policy is Hold the Line involving beach nourishment. In addition, potential sites of sandscaping (large-scale beach nourishment) were identified and integrated into the dataset along with applications for alternative use on the MMO public register.

For each potential alternative use site, the purpose of the use was identified, as well as the type and volume of material required (where available). Purposes include (but are not limited to) flood risk, environmental services, amenity and coastal processes. The potential alternative use sites were defined in several ways:

- objectives of the alternative use;
- required material type;
- volume, frequency and timing; and
- need for alternative use.

2.2.2. Stakeholder Consultation

The data collated in the GIS database was presented to representatives of relevant organisations with an interest or ownership in the sites, for discussion of their

validity. These included industry, government departments, local authorities, and public bodies who have provided additional data and evidence they hold on the topic including:

- National Organisations:
 - Environment Agency;
 - RSPB;
 - The Crown Estate;
 - Natural England; and
 - Cefas.
- Regional/Local Organisations:
 - Scarborough Borough Council;
 - PD Ports;
 - Peel Ports;
 - Bristol Port Company; and
 - Falmouth Harbour.

Each representative was requested to review the database and provide a response to three questions:

1. Have we covered all existing and potential future dredging and beneficial use sites that you are aware of?
2. Are all relevant sites valid in your view?
3. Are there any additional existing or potential future dredging or beneficial use sites that you are aware of, that we have not captured? If yes, please provide as much detail as possible.

Responses were received from the following stakeholders:

- Natural England;
- Environment Agency;
- Peel Ports; and
- The Crown Estate.

The GIS and tabulated data were modified based on the stakeholder responses to create the final dataset of potential future sites for dredging and alternative use.

3. Alternative Use Techniques

Marine planning aims to support activities and improve integrated management to achieve sustainable development in the marine area. One aspect of this is the use of dredged materials from capital or maintenance dredging for alternative activities. Examples of alternative uses of dredged material described in this section include:

- beach nourishment,
- construction,
- flood defence,
- environmental enhancement (agriculture; horticulture; aquaculture),
- recreation

Examples of recycling include reprocessed sediment (e.g. making high-grade products, such as bricks or aggregates, from dredged material) and agriculture.

Table 3.1 describes examples of alternative uses of various types of dredged material, excluding habitat creation.

Table 3.1 Compatibility of materials with alternative use options

Material type	Alternative use
Cobbles	Beach nourishment; construction; flood defence
Gravel	Beach nourishment; recreation; construction
Sand	Beach nourishment; recreation; construction; flood defence; environmental enhancement (landscaping)
Silt	Agriculture; horticulture; aquaculture; construction
Clay	Agriculture; horticulture; aquaculture
Mixture	Any of above depending on composition

3.1. Beach Nourishment

Beach nourishment is the use of dredged material (primarily sand) to restore beaches that are eroding, and is a common coastal defence strategy around the UK. There are three main situations where beach nourishment may be used:

- where the beach is experiencing continued loss of sediment and there is a shortage of sediment supplied through longshore transport;
- where the beach is acting as a self-contained system, with little input or export, but redistribution of sediment is taking place; and
- to enhance the recreational value of the beach by widening it.

Through studies such as this, which aim to provide linkages between dredged material and potential alternative use areas, beach nourishment could become more common, and easier to accomplish.

3.2. Construction

Dredged material could be used to support industrial and/or commercial activities, such as brownfield redevelopment, raising the land height, levelling land and providing bank stabilisation. Dredged materials could also be used as construction materials. For example, gravels could be used in the creation of haul roads and temporary car parks and sands in concrete and cement. Another alternative uses of dredged material could be to cap solid waste landfills, or protect landfills, although these are less common uses.

3.3. Flood Defence

Offshore berms and bunds are suitable uses for dredged materials, depending on the intended function. Rock or clay could be used for the construction of stable berms to provide shelter to the coast by dampening incoming waves. Sand or shingle could be used to create feeder berms or sacrificial bunds, whereby the material is dispersed towards the shore by natural physical processes to provide a sediment supply to an eroding stretch of coast. Larger sized dredged materials (such as cobbles or rock) could be used to create rock gabions as flood and coastal defences where coastal erosion is an identified issue.

In addition, dredged materials could be placed behind (on the landward side) of existing flood defences where erosion may occur behind them. This may include stabilisation behind breached defences, or where dunes are eroding behind rock armour to provide additional sediment to slow the retreat.

3.4. Environmental Enhancement

Environmental enhancement can be achieved using a variety of methods, including habitat restoration and engineering methods such as beach nourishment and flood defence. Dredged material could also be used to replace eroded topsoil, elevate soil surfaces, or improve the characteristics of soils in the agriculture, horticulture and aquaculture industries.

One innovative method of environmental enhancement is sandscaping (Royal HaskoningDHV, 2015). A healthy beach is one of the most effective forms of coastal defence, providing the beach is not constrained in terms of sediment supply and has space to move naturally. This will become essential in the future as mitigation and adaptation to the effects of sea-level rise are required. One key distinguishing feature of sandscaping is its large scale, allowing the scheme to interact with natural processes and the system to function, develop and respond to hydraulic and geomorphological changes. It also aims to use natural processes to transport sediment to locations where it is needed and thus differs from beach replenishment.

The sandscaping concept has already been applied in The Netherlands as part of the ongoing 'Building with Nature' project. This project used 21.5 million cubic metres of sand to nourish parts of the Zuid-Holland coast. For this 'Zand Motor', the sand was placed in the shape of a hook and physical processes re-distributed it along the coast.

3.5. Recreation

Dredged material could be used as the foundation for parks and other recreational facilities and for features such as waterside parks, providing swimming, picnicking, camping and boating areas, boat-launching ramps, and fishing piers. Sand could also be used in the creation of large public sand pits and gravel could be suitable for coastal car parks. This could be especially beneficial for coastal car parks maintained by small parishes, which do not have the funding for materials to expand or enhance their car parks otherwise.

4. Historic and Existing Activity

4.1. Historic and Existing Dredging

The historic and licensed dredging activities within the north east, north west, south east and south west marine plan areas provided by the MMO are summarised in Table 4.1. Only projects which were listed with 'dredging' in the project type metadata were selected. These included those listed as 'other dredging', 'navigational dredging' and 'clean-up dredging'.

Table 4.1 Dredge campaign summary as supplied by the MMO

Marine Plan Area	Number of projects per dredging activity type			
	Capital	Maintenance	All other types	Total
North east	8	55	16	79
North west	4	32	29	65
South east	16	61	34	111
South west	5	15	28*	48

*This includes four licences for aggregate dredging

The dredging campaigns also include projects that have unexpired and recently granted licences. Hence, the totals include those dredge campaigns which have already taken place within the marine plan areas since 2011, or are licensed, so will soon be underway.

Where available, the types and volumes of material dredged were derived from the MMO public register for licences which have future end dates. The types and volumes of dredged material for campaigns which have ended were not included because they are no longer producing dredge material. All licensed dredging campaigns are listed by marine plan area in Table 4.2 (north east), Table 4.3 (north west), Table 4.4 (south east), and Table 4.5 (south west) (excluding aggregate dredging) and shown on Figures 4.1 to 4.4. Where one licence covers several adjacent sites (for example, several berths in a port or harbour), these have been grouped under that licence.

4.1.1. North east marine plan area

In the north east marine plan area, at least 42 dredging campaigns have been licensed since 2011 (Table 4.2 and Figure 4.1). According to those licences which have not yet expired, between 2011 and 2027 (the latest marine licence end date in this marine plan area), more than eight million cubic metres of material will have been dredged. These are predominantly annual maintenance dredging campaigns. Most of the dredged material was silt, with much smaller volumes of other sediment sizes. Licensed maintenance dredging in valid licences could result in approximately 420,000 cubic metres of material to be dredged annually until 2027.

Table 4.2 Historic and existing licensed dredging in the north east marine plan area

Dredging project	Applicant name	Licence expiry	Volumes		Material
			Total	Annual	
North east marine plan area					
Limited Maintenance Dredge - McNulty Quay	Port of Tyne Authority	30/06/2013			
Replacement Quay A.V. Dawson	A.V. Dawson Limited	21/03/2014			
Offshore Technology Park Dredge	Shepherd Offshore Services Limited	31/08/2014			
Offshore Group Newcastle/Enquest	Offshore Group Newcastle Limited	24/09/2014			
Scarborough Harbour Maintenance Dredging	Scarborough Borough Council	15/01/2015			
Completion of Replacement Quay Dredging	A.V. Dawson Limited	03/08/2015			
Offshore Technology Park Dredge	Shepherd Offshore Services Limited	14/09/2015			
Seaham Harbour Dredging	Seaham Harbour Dock Company	27/11/2015			
A&P Group- Dock Entrance Dredging Tyne	A&P Group Limited	05/01/2016			
Able Seaton Port and Seaton Channel	Able UK Limited	31/01/2016			
Dredging Material from around the Cleveland Potash Limited Outfall for Disposal	Cleveland Potash Limited	31/01/2016			
Swan Hunter - Dredging, Temporary Repository and Wet Dock Infill	North Tyneside Council	29/04/2016			
Able Middlesbrough Port Berth 1 and 2	Able UK Limited	14/05/2016			
Northern Link Walker Quay	Newcastle City Council	26/08/2016			
Maintenance Dredge at WD Close, Wallsend, Newcastle.	North Tyneside Council	11/09/2016			

Dredging project	Applicant name	Licence expiry	Volumes		Material
			Total	Annual	
Wheatcroft Long Sea Outfall Replacement	Yorkshire Water Services Limited	30/09/2016			
Amble Marina Dredge	Amble Marina Limited	30/11/2016			
Maintenance Dredge Licence - OGN Hadrian Yard, River Tyne	Offshore Group Newcastle Limited	19/12/2016			
Neptune Yard Capital Dredge	Shepherd Offshore Limited	31/12/2016			
Maintenance Dredge Licence - Simon Storage Ocean Berth, River Tyne	Inter Terminals Tyneside Limited	27/03/2017			
Maintenance Dredge Licence Hebburn - Quays and Dry Dock Entrance	A&P Tyne Limited	30/04/2017			
Small Scale Subsea Plough Trials	Engineering Technology Applications Limited	30/04/2017			
North Shields Ferry Landing Clearance Dredging	Southbay Civil Engineering Limited	30/06/2017			
Offshore Technology Park Dredge	Shepherd Offshore Services Limited	14/09/2017			
Warkworth Harbour North Side Sand Relocation	Mr. Simon Baxter	31/10/2017			
Howdon Yard, Willington Quay, Wallsend	Port of Tyne Public Limited Company	16/11/2017			
Maintenance Dredge Licence Cemex - Jarrow Quay, River Tyne	Cemex UK Marine Limited	27/11/2017			
Scarborough Harbour Maintenance Dredging	Scarborough Borough Council	15/01/2018			
Whitby Harbour Maintenance Dredging	Scarborough Borough Council	16/01/2018			
New Wear Bridge	Sunderland City Council	28/02/2018			
Tees Dock No.1 Quay	PD Teesport Limited	30/09/2018			
QEII Berth Development, Environment Statement, PD Teesport	PD Teesport Limited	31/12/2018			

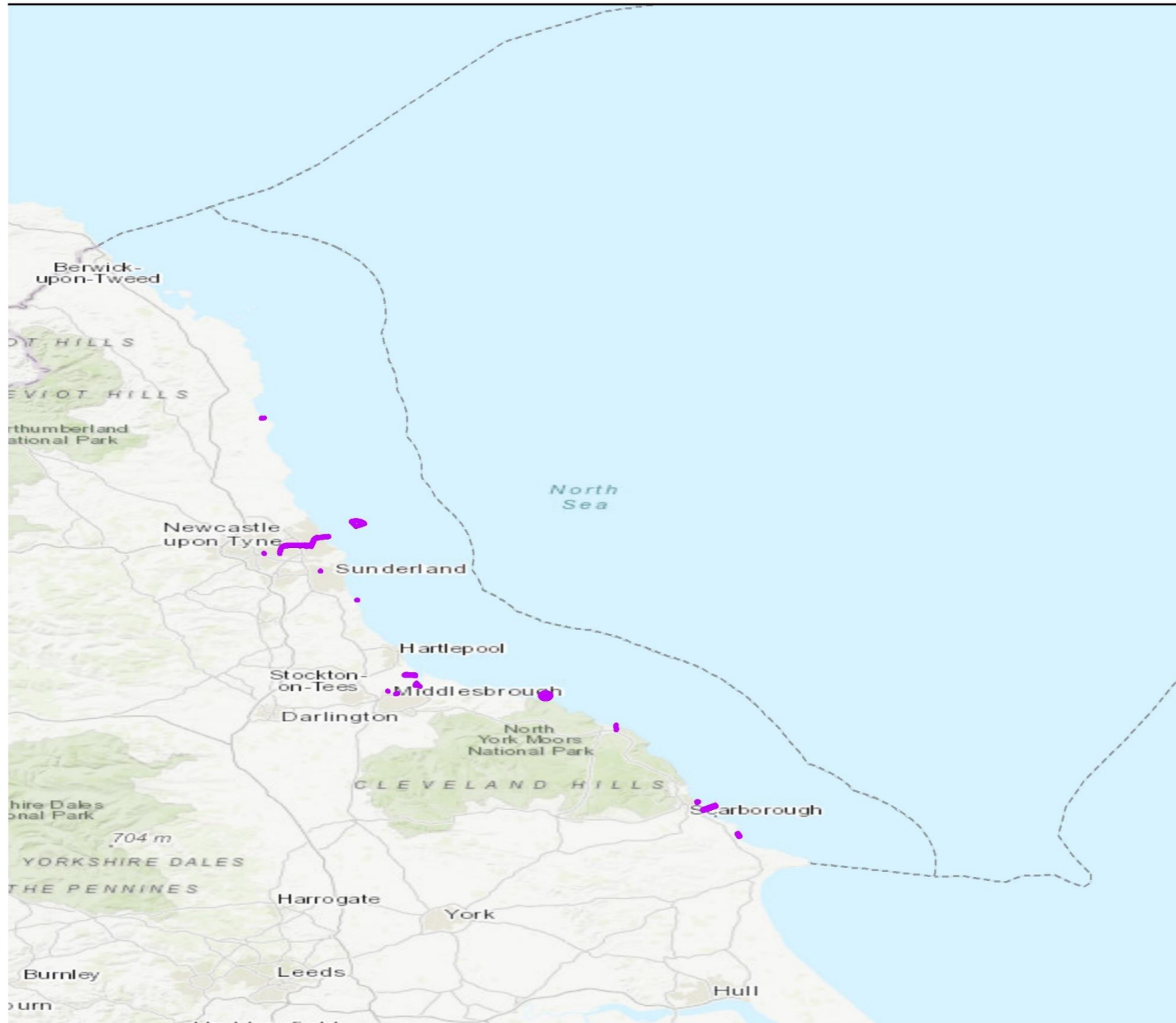
Dredging project	Applicant name	Licence expiry	Volumes		Material
			Total	Annual	
Maintenance Dredge Licence OGN Hadrian Yard, River Tyne	Smulders Projects UK Limited	23/04/2019			
RSQ Downriver Extension	Port of Tyne Authority	30/06/2019	148,000m ³	N/A	98,000m ³ silt, 50,000m ³ boulder clay (till)
Maintenance Dredge, Disposal at Sea and Removal of TBT, Neptune Quay	Shepherd Offshore Limited	30/06/2021	108,500m ³	21,500m ³	Silt
Tyne Maintenance Dredging	Port of Tyne Authority	31/12/2022	2,379,659m ³	Not available	2,127,028m ³ silt, 252,631m ³ sand
Able Seaton Port Berths, Holding Basin and Channel	Able UK Limited	01/03/2026	1,377,160m ³	N/A	630,000m ³ clay, 747,160m ³ silt
Maintenance Dredging around Cleveland Potash Outfalls - Boulby. For Disposal	Cleveland Potash Limited	19/04/2026	909,080m ³	90,908m ³	Silt
Maintenance Dredge Licence – Inter Terminals Tyneside Ocean Berth, River Tyne	Inter Terminals Tyneside Limited	12/03/2027	37,500m ³	3,750m ³	Silt
Dredging and Disposal of Dredged Material, A&P Tyne Frontage	A&P Tyne Limited	30/06/2027	650,000m ³	65,000m ³	Silt
Offshore Technology Park Dredging and Disposal	Shepherd Offshore Services Limited	10/10/2027	2,400,000m ³	240,000m ³	Silt
Jarrow Wharf - Disposal Application	Cemex UK Marine Limited	19/12/2027	150,000m ³	N/A	120,000m ³ silt, 15,000m ³ sand, 15,000m ³ gravel

Figure 4.1 Historic and existing licensed dredging in the north east marine plan area



Figure 4.1 | Historic and Existing Dredging Activity: North East Marine Plan Area

- Historic and Existing Dredging Activity
- Marine Plan Area



Date: 07-Jun-19
 Coordinate System: GCS ETRS 1989
 Datum: ETRS 1989
 Units: Degree



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4.1.2. North west marine plan area

Since 2011, at least 65 dredging campaigns have been licensed in the north west marine plan area (Table 4.3 and Figure 4.2). According to those licences which are still valid, between 2011 and 2037 (the latest marine licence end date for the north west marine plan area), a total of 6.6 million cubic metres of material will have been dredged. Silt constitutes most of the dredged material during this time, followed by sand. Licensed maintenance dredging in licences with future end dates could result in a further (over) 1.5 million cubic metres of material to be dredged per year until 2029, most of which will be silt.

Table 4.3 Historic and existing licensed dredging in the north west marine plan area

Dredging project	Applicant name	Licence expiry	Volumes		Material
			Total	Annual	
North west marine plan area					
Heysham North Bank	Mersey Docks and Harbour Company Limited	15/02/2013			
Liverpool Wastewater Treatment Works Outfall	United Utilities Water Public Limited Company	31/01/2014			
Silloth Docks Maintenance Dredge	Associated British Ports Holdings Limited	05/08/2015			
Renewal of Licence L/2011/00178/2	Mersey Docks and Harbour Company Limited	25/08/2015			
Dock Bridge (tidal Main Drain) Desilting Project	Environment Agency (Warrington)	17/09/2015			
Harrowside Outfall	United Utilities	30/10/2015			
Harrowside Long Sea Outfall - Maintenance Works	United Utilities Water Public Limited Company	31/12/2015			
Maintenance Dredging of Garston Approach Channel and Garston Docks	Associated British Ports Holdings Limited	28/01/2016			
Sankey Canal Lock Repairs	Halton Borough Council	17/03/2016			
Liverpool 2 and River Mersey Approach Channel Dredging	Mersey Docks and Harbour Company Limited	31/03/2016			
Port of Workington Maintenance Dredging	Port of Workington	30/06/2016			
Heysham 1 and 2	EDF Energy Nuclear Generation Limited	07/07/2016			
Port of Barrow Maintenance Dredging	Associated British Ports.	13/09/2016			
Dredging at Ormonde Pontoon, Ramsden Dock	Ormonde Energy Limited	31/10/2016			
Burbo Bank Extension Debris Clearance	Dong Energy Burbo Extension (UK) Limited	01/12/2016			

Dredging project	Applicant name	Licence expiry	Volumes		Material
			Total	Annual	
Clearance of Sea Water Intake at BAE Systems (Barrow-in-Furness)	BAE Systems Marine Limited	31/12/2016			
River Mersey Maintenance Dredge Licence Renewal	Mersey Docks and Harbour Company Limited	30/04/2017			
Maryport Harbour and Marina Maintenance Dredging	Maryport Harbour and Marina Limited	31/05/2017			
Heysham Harbour Maintenance Disposal Renewal	Heysham Port Limited	24/11/2017			
East Lytham	Bam Nuttall Limited	30/06/2018			
2017/18 Tidal Outfall Channel Desilt	Environment Agency	26/07/2018			
Anchorsholme Storm Water Outfall	United Utilities Water Public Limited Company	31/10/2018			
One-off Desilt of Broadfleet at Pilling	Mr. John Barton	20/03/2019			
Heysham 1 and 2 Dredging Activities	EDF Energy Nuclear Generation Limited	07/05/2019	225,000m ³	75,000m ³	15,000m ³ /year silt, 60,000m ³ /year sand
Port of Workington Maintenance Dredging 2016 -2018	Port of Workington	30/06/2019	637,191m ³	Not available	Silt
Clearance of Sea Water Intake at BAE Systems (Barrow-in-Furness)	BAE Systems Marine Limited	02/08/2019	5,550m ³	N/A	Silt
Port Meridian Deep Water Port Project	Port Meridian Energy Limited	31/10/2019	Not available	Not available	Not available
Maryport South Beach, Tidal Deposit Removals	Mr. Joseph Scott-Plummer	14/04/2021	60,000m ³	15,000m ³	Gravel
Royal National Lifeboat Institution Lifeboat Berth Fleetwood - Marine Licence for Maintenance Dredging	Royal National Lifeboat Institution Division South	03/09/2021	6,000m ³	Not available	Sand
Routine Marine Structure Maintenance Work	EDF Energy Nuclear Generation Limited	06/05/2023	2,630m ³	Not available	Silt

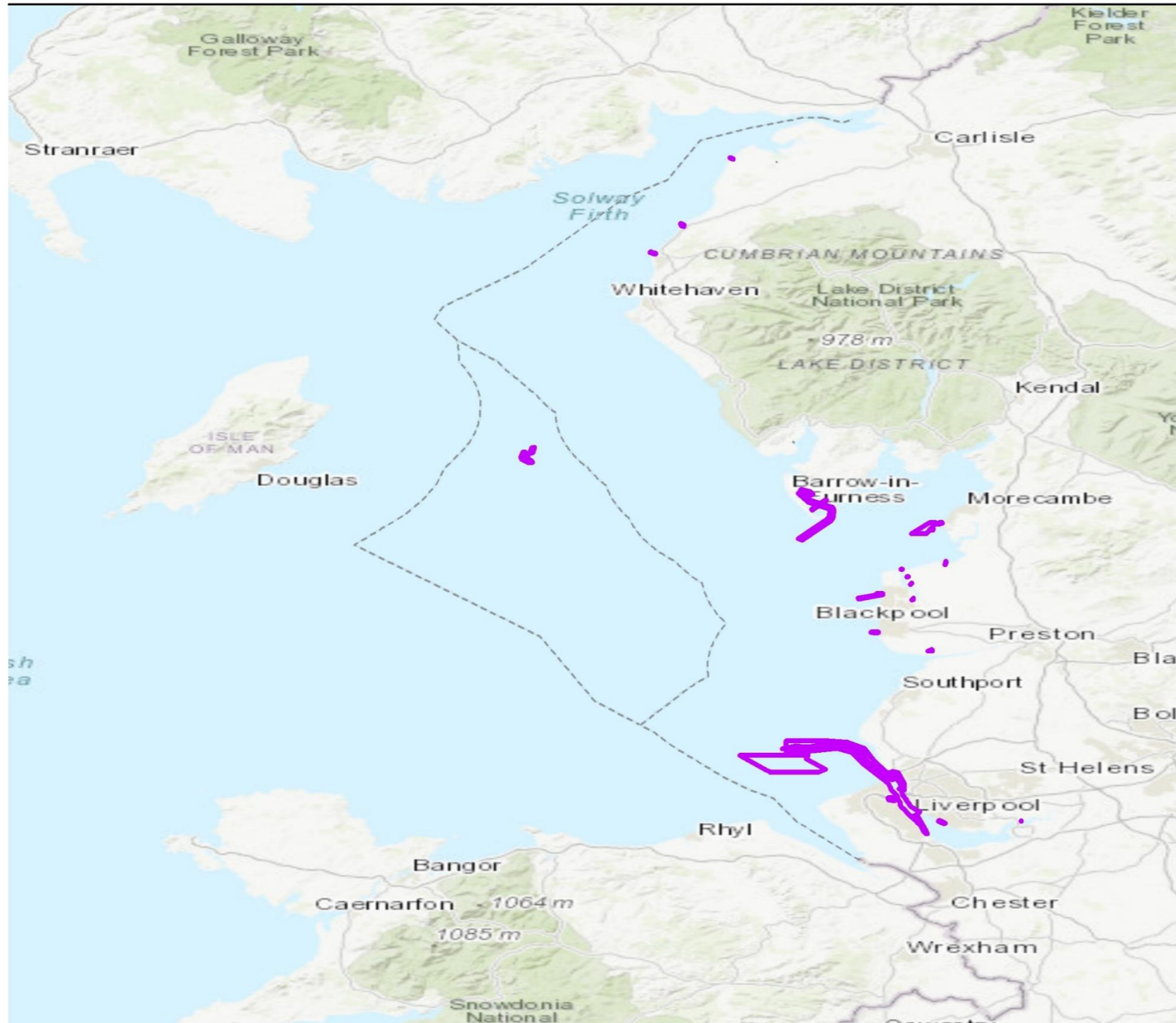
Dredging project	Applicant name	Licence expiry	Volumes		Material
			Total	Annual	
Maintenance Dredging and Disposal of Garston Approach Channel and Garston Docks	Associated British Ports Holdings Limited	06/10/2025	2,353,360m ³	235,336m ³	171,875m ³ /year sand, 63,461m ³ /year silt
Middleton Wastewater Treatment Works Long Sea Outfall Maintenance	United Utilities Water Public Limited Company	31/12/2025	600 tonnes	Not available	Sand
Port of Barrow Maintenance Dredging Disposal Licence.	Associated British Ports	12/09/2026	12,200,000m ³	1,220,000m ³	978,000m ³ /year silt, 230,000m ³ /year sand, 12,000m ³ /year gravel
Heysham Harbour and Approaches Maintenance Disposal Licence	Heysham Port Limited	20/12/2027	885,536m ³	Not available	650,478m ³ sand, 235,058m ³ silt
West of Duddon Sands Pontoon Dredging Marine Licence	Dong Energy West of Duddon Sands	15/03/2028	12,520m ³	Not available	Silt
Walney Extension Pontoon/Jetty Dredging and Disposal	Dong Energy Walney Extension (UK) Limited	06/02/2029	240,000m ³	24,000m ³	Silt
Ormonde Offshore Wind Farm O&M Marine Licence	Ormonde Energy Limited	31/12/2037	10,000m ³	Not available	Silt

Figure 4.2 Historic and existing licensed dredging in the north west marine plan area



Figure 4.2 | Historic and Existing Dredging Activity: North West Marine Plan Area

- Historic and Existing Dredging Activity
- Marine Plan Area



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4.1.3. South east marine plan area

The south east marine plan area has the highest number of historic and existing licensed dredging campaigns, with 82 licences granted since 2011 (according to the MMO database created for this project) (Table 4.4 and Figure 4.3). Twenty-nine of these have not yet expired, so have the potential to be used in future alternative use projects.

According to these licences, a total of more than 27 million cubic metres of material will have been dredged in the south east marine plan area by 2028 (two projects; Nemo Link and Garden Bridge, with end dates past 2100, have not been included in this calculation). Most of this material has been dredged as part of maintenance dredging campaigns taking place annually. Similar to the other marine plan areas, silt makes up most of the dredged material. Licensed capital dredge campaigns which haven't yet taken place constitute a further 273,560 cubic metres, with the Nemo Link and Garden Bridge projects adding a further 446,460 cubic metres, although it is unclear when this material is due to be dredged as these licences do not expire until 2115 and 2136, respectively.

Licensed maintenance dredging yet to take place could result in over six million cubic metres of material to be dredged per year until 2028. There are several licences that do not identify the yearly volume of material to be dredged, but specify that there are a number of campaigns to take place. As the yearly volumes are unavailable, the volume of material to be dredged per year in this marine plan area is likely to be higher.

Table 4.4 Historic and existing licensed dredging in the south east marine plan area

Dredging project	Applicant name	Licence expiry	Volumes		Material
			Total	Annual	
South east marine plan area					
Berthing Facility Bed Levelling, Trinity Buoy Wharf	Dragados-Sisk Joint Venture	31/03/2013			
Oikos Jetty No.1 Phase 2	Oikos Storage Limited	31/07/2013			
Crossrail	Dragados Sisk Joint Venture	19/08/2013			
Bradwell Nuclear Decommissioning Site Silt Removal from Culvert	Magnox Limited	31/07/2014			
Maintenance Dredge of Grain LNG Jetties 8 and 10 River Medway	National Grid Grain LNG Limited	31/10/2014			
Emergency Dredging Application at West India Dock London	Canal and River Trust	31/10/2014			
Thames Oilport removal of Silt from Fire Fighting Water Intake Chamber	Morzine Limited	31/12/2014			
Woolverstone Marina	Marina Developments Limited	20/01/2015			
Jurgens Jetty Annual Maintenance Dredge Emergency Licence	Pura Foods Limited	31/03/2015			
S-Jetty Dredging	Shell UK Oil Products Limited	31/03/2015			
Emergency Dredging Application at West India Dock	Canal and River Trust	30/05/2015			
Burnham Yacht Harbour Annual Maintenance Dredge	Burnham Yacht Harbour Marina Limited	30/06/2015			
ADM Erith Limited Capital dredge	Archer Daniels Midland Erith Limited	10/07/2015			
St. George Wharf Pier Dredging	St. George South London	01/09/2015			
Conservation Offshore Pile Foundation Approach Bridge C.RO Ports Purfleet	CDMR Purfleet Limited	30/09/2015			

Dredging project	Applicant name	Licence expiry	Volumes		Material
			Total	Annual	
Maintenance Dredging	National Grid Public Limited Company	30/09/2015			
Wallasea Island Wild Coast Project (Cell 1 Existing Sea Walls Breaching)	Bam Nuttall Limited	30/09/2015			
Embankment Dredging	London River Services Limited	27/11/2015			
Port of Ramsgate Maintenance Dredging	Port of Ramsgate	12/12/2015			
Berth 9 Quay Extension	Hutchison Ports (UK) Limited	23/12/2015			
Dredging Material Disposal at Maldon Saltings, TH062	Northumbrian Water Limited	31/12/2015			
Maintenance Dredging	Fox's Marina Ipswich Limited	13/01/2016			
215/009 - Dredging at Halls Wharf, Northfleet	Cemex UK	03/05/2016			
Maintenance Dredging Disposal - Dover Harbour Board	Dover Harbour Board	19/05/2016			
Thunderer Jetty Dredging	Stolthaven Dagenham Limited	21/05/2016			
OSL Jetty 1 Capital Dredge	Oikos Storage Limited	30/06/2016			
Tollesbury Marina Maintenance Dredging	Tollesbury Marina LLP	31/08/2016			
Royal National Lifeboat Institution Walmer - Low Impact Maintenance Works (Fast Track Licence)	Royal National Lifeboat Institution	15/10/2016			
Berth 1 WID Clearance Channel and Transit Approach	Oikos Storage Limited	07/01/2017			
Marina Dredging and Saltmarsh Feeding	Yacht Havens Limited	29/01/2017			
Plantation Wharf Wave Break	MSO Marine	10/02/2017			

Dredging project	Applicant name	Licence expiry	Volumes		Material
			Total	Annual	
Annual Maintenance Dredging and Disposal	Port of Sheerness Limited	28/02/2017			
White Mountain, Dagenham Maintenance Dredge	Armac Shipping Services Limited	01/05/2017			
Dagenham Jetty Upgrade for Cemex UK	Cemex UK	31/05/2017			
Enderby Wharf	Enderby Wharf Limited	31/08/2017			
Greenwich Pumping Station - Geotechnical Investigation Sampling Works at Deptford Creek	Jackie Roe	31/08/2017			
DLR5461: Removal of the River Wandle Half Tide Weir	Wandsworth Borough Council	21/09/2017			
Routine Dredging Custom House Gravesend Pontoon (Thames)	UK Border Force	02/12/2017			
NuStar Jetty 1 Capital Dredge, Grays, Thames	Nustar Corporation L.P.	31/01/2018			
Faversham Creek Basin Dredging	Faversham Creek Navigation Company CIC	31/03/2018			
Woods Quay- Savoy Pier Enhancements and Extension	Woods River Cruises Limited	26/06/2018			
Water Jetting System	C.Ro Ports London Limited	13/09/2018			
Woolverstone Marina - Pier Downstream (Capital Dredge)	Marina Developments Limited	30/11/2018			
Levington Saltmarsh Restoration and Beneficial Use of Dredgings Project 2013	Suffolk Yacht Harbour	19/12/2018			
Berths 6 and 7, Trinity Terminal, Port of Felixstowe	Hutchison Ports (UK) Limited	31/12/2018			
Wandsworth Riverside Quarter Pier Extension	Frasers Riverside Quarter Limited	31/12/2018			
Lot's Ait	Hither Green Developments Limited	22/02/2019			

Dredging project	Applicant name	Licence expiry	Volumes		Material
			Total	Annual	
Woolwich Ferry Life Extension	Bam Nuttall Limited	28/02/2019			
Hanson Purfleet Jetty Maintenance Dredging	Hanson Quarry Products Europe Limited	28/02/2019			
Robins Wharf, Northfleet	Armac Shipping Services Limited	04/03/2019			
Management of Shingle on the Landguard Frontage	Port of Felixstowe Limited	11/03/2019			
Peruvian Wharf - Capital Dredge Works for Berthing Pocket	Brett Aggregates Limited	31/03/2019			
OSL J1 Berth Approach Capital Dredge	Oikos Storage Limited	11/04/2019			
Maintenance Dredging Disposal - Dover Harbour Board	Dover Harbour Board	19/05/2019	15,000,000m ³	5,000,000m ³	Silt
Berth 9 Container Yard, Port of Felixstowe	Hutchison Ports (UK) Limited	01/08/2019	5,000m ³	N/A	Silt
Isle of Grain Maintenance Dredging	BP Oil UK Limited	07/09/2019	102,000m ³	21,500m ³	Silt
Thames Oilport Jetties 1 to 5	Vopak Services UK Limited	11/02/2020	20,000m ³	4,000m ³	1,000m ³ sand, 3,000m ³ silt
Ipswich Flood Defence Management Scheme - Tidal Barrier Works	Environment Agency	31/05/2020	12,700m ³	N/A	1,900m ³ sand, 2,400m ³ clay, 2,900m ³ gravel, 5,500m ³ silt
Dredging and Restoration of Brightlingsea Harbour	Brightlingsea Harbour Commissioners	05/02/2022	53,000m ³	N/A	Silt
Dredging of S-Jetty	Shell UK Oil Products Limited	30/07/2022	191,150m ³	38,230m ³	Silt
White Mountain, Dagenham Maintenance Dredge	Armac Shipping Services Limited	28/02/2023	2,500m ³	N/A	1,575m ³ clay, 700m ³ gravel, 225m ³ sand
Maintenance Dredging of Grain LNG Jetties 8 and 10	National Grid Grain LNG Limited	30/11/2023	65,700m ³	8,212.5m ³	Silt

Dredging project	Applicant name	Licence expiry	Volumes		Material
			Total	Annual	
Desilting of Sluice Exit South Hall Creek	William Cullen Farms	29/04/2024	360m ³	N/A	Silt/sand
Maintenance Dredging at the C.RO Ports Purfleet Berths	CDMR Purfleet Limited	31/08/2024	24,000 tonnes	Not available	Silt
Vopak Terminal London Berth Dredging	Vopak Terminal London B.V. Limited	31/08/2024	156,000m ³	Not available	Silt
Oikos No. 1 Jetty	Oikos Storage Limited	02/09/2024	2,000,000m ³	200,000m ³	Sand
Tate and Lyle Outer berth	Tate and Lyle Sugars Limited	07/09/2024	200,000m ³	N/A	Silt
Maintenance Dredging at Thames Oilport	Morzine Limited	14/09/2024	1,830,000m ³	Not available	1,525,671m ³ sand, 118,035m ³ silt, 186,294m ³ clay
Whitstable Harbour Dredging	Canterbury City Council	30/04/2025	36,000m ³	3,000m ³	Silt
Royal Docks Management Authority Dredging Works	Royal Docks Management Authority Limited	31/05/2025	36,000m ³	Not available	12,000m ³ silt, 12,000m ³ clay, 12,000m ³ sand
Burnham Yacht Harbour Annual Maintenance Dredge	Burnham Yacht Harbour Marina Limited	01/06/2025	117,500m ³	12,500m ³	Silt
Middleton Wharf Dredging	Riverside Resource Recovery Limited	30/09/2025	115,000m ³	11,500m ³	Silt
Woolverstone Marina Maintenance Dredge	Marina Developments Limited	21/10/2025	430,000m ³	43,000m ³	Silt
Dredging Application at West India Dock	Canal and River Trust	26/11/2025	300,000m ³	30,000m ³	30,000m ³ sand, 270,000m ³ silt
Jurgens Jetty Annual Maintenance Dredge	Pura Foods Limited	16/12/2025	120,000m ³	12,000m ³	Silt
Port of Ramsgate Maintenance Dredging	Port of Ramsgate	17/03/2026	1,023,000m ³	102,300m ³	96,000m ³ silt, 6,300m ³ sand
Essex Marina Removal of Silt Build Up	Essex Marina	08/12/2026	200,000m ³	20,000m ³	Silt
Tollesbury Marina Spring 2017	Tollesbury Marina LLP	08/03/2027	100,000m ³	10,000m ³	Silt

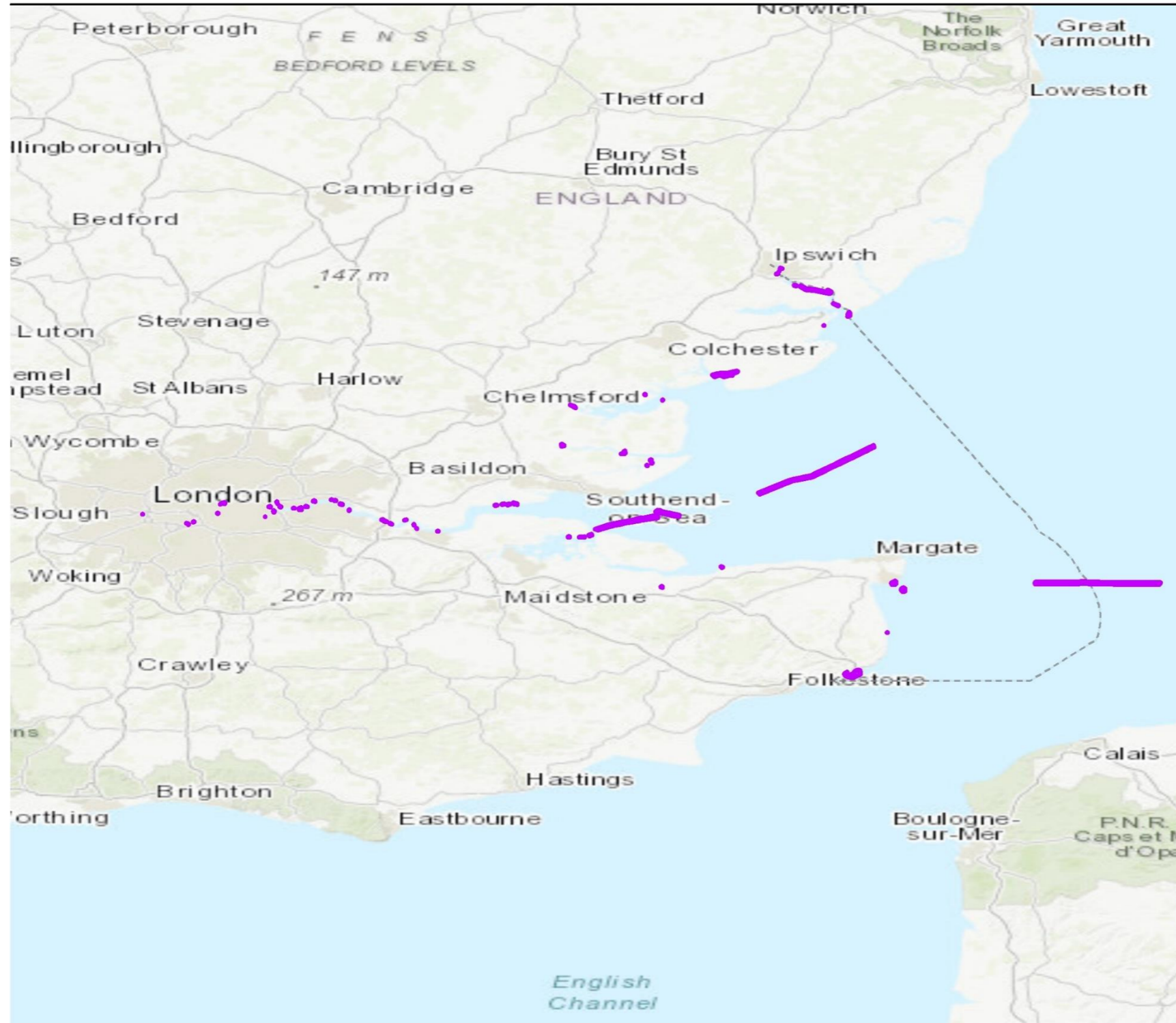
Dredging project	Applicant name	Licence expiry	Volumes		Material
			Total	Annual	
Thames Estuary Channel Management - Medium Term	Port of London Authority	06/02/2028	3,950,000m ³	395,000m ³	Sand
Medway Approach Channel Maintenance Licence	Port of Sheerness Limited	04/05/2028	1,170,000m ³	130,000m ³	Sand
Nemo Link - UK to Belgium Interconnector	National Grid Nemo Link Limited	31/12/2115	443,910m ³	N/A	Sand
The Garden Bridge	Garden Bridge Trust	01/03/2136	2,550m ³	N/A	Gravel

Figure 4.3 Historic and existing licensed dredging in the south east marine plan area



Figure 4.3 | Historic and Existing Dredging Activity: South East Marine Plan Area

- Historic and Existing Dredging Activity
- Marine Plan Area



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4.1.4. South west marine plan area

According to the MMO database created for this project, at least 35 dredging campaigns have been licensed in the south west marine plan area since 2011 (Table 4.5 and Figure 4.4). Twenty-four of these licences have expired. However, according to the 11 licences which are still valid, over 1,400,000 cubic metres of material will have been dredged in the south west marine plan area by 2028, with most of this as part of one-off dredging campaigns. This total does not consider the 283,000 cubic metres of material to be dredged by 2080 as part of the Hinkley Point C new nuclear build. Silt comprises approximately two thirds of the total material. Licensed maintenance dredging yet to take place could result in an additional 52,000 cubic metres of material to be dredged per year until 2025.

Table 4.5 Historic and existing licensed dredging in the south west marine plan area

Dredging project	Applicant name	Licence expiry	Volumes		Material
			Total	Annual	
South west marine plan area					
11 Dock Rehabilitation - Her Majesty's Naval Base Devonport	Westminster Dredging Company Limited	31/03/2013			
Port Pendennis Marina Dredging	Castlematter Limited	30/04/2013			
Millbay Enabling Works, Outer Basin Dredging	English Cities Fund	04/09/2013			
Dredging Adjacent Falmouth Petroleum Limited's Eastern Jetty	Falmouth Petroleum Limited	01/08/2014			
Stabilisation of pontoons, Zeta Berth, Instow, North Devon	Debut Services	30/09/2014			
Penzance Harbour Dredging	Cornwall Council	28/03/2015			
Searton Sea Wall Repairs	Mr. Simon Foster	30/04/2015			
Pendennis Wet Dock	Pendennis Shipyard Limited	29/05/2015			
Carnsew Sluicing Channel, Tunnels and Wall Repairs	Bowmer And Kirkland Limited	06/08/2015			
Corporation Wharf, Finnigan Road, Plymouth	Victoria Wharf Limited	28/02/2016			
Hinkley Point A - Clearance of Stormwater Outlet	Hinkley Point A	01/08/2016			
Royal National Lifeboat Institution Clovelly - Low Impact Maintenance Works (Fast Track Licence)	Royal National Lifeboat Institution	22/10/2016			
Maintenance Dredging at Her Majesty's Naval Base Devonport	Boskalis Westminster Limited	06/03/2017			
Minehead Harbour	Albert Stone	22/03/2017			
Maintenance Dredging at Her Majesty's Naval Base Devonport	Defence Infrastructure Organisation	31/03/2017			

Dredging project	Applicant name	Licence expiry	Volumes		Material
			Total	Annual	
Maintenance Dredging and Disposal in Bristol Harbour Area	Bristol Port Company Limited	13/07/2017			
Torpoint Yacht Marina Dredging	TMS Maritime Limited	18/08/2017			
Maintenance Dredging at Her Majesty's Naval Base Devonport	Defence Infrastructure Organisation	31/08/2018			
Blake Bridge	Somerset County Council	31/08/2018			
Restoration of Intertidal Habitat and Construction of New Quay Wall	Gweek Quay Limited	30/09/2018			
Clearing Accumulated Mud and Silt from the Slipway at Rolle Quay, Barnstaple, Devon	Barnstaple Pilot Gig Club CIO	17/10/2018			
Minehead Harbour Shingle Bank Removal	West Somerset District Council	31/01/2019			
Clearance of Slipway (MLA/2017/00302)	Cornwall Council	13/02/2019			
Clearance of Sand in Harbour to allow better use of Landing Steps on West Pier, St Ives	Cornwall Council - Harbour Office	10/04/2019			
Sea Sanctuary - Waterside Barge Mooring Project	Falmouth Divers Limited	20/06/2019	250m ³	N/A	100m ³ cobble, 150m ³ silt
Turnchapel Wharf - Capital Dredging	Turnchapel Wharf Limited	28/09/2020	6,400m ³	N/A	Silt
Plymouth Yacht Haven Maintenance Dredging	Plymouth Yacht Haven Limited	28/09/2020	59,900m ³	N/A	Silt
Yacht Haven Quay Maintenance Dredging	Yacht Haven Quay Limited	28/09/2020	8,000m ³	N/A	Silt
Her Majesty's Naval Base Devonport Plough dredging	Defence Infrastructure Organisation	07/02/2021	225,000m ³	N/A	Silt
Thanckes Oil Fuel Depot Loading Facility and Tank Farm Fire Fighting Upgrade	Defence Infrastructure Organisation	31/12/2021	37,000m ³	N/A	31,400m ³ silt, 5,600m ³ cobble
Fowey Harbour Maintenance Dredging	Fowey Harbour Commissioners	26/05/2024	491,909m ³	49,210m ³	5,000m ³ /year clay, 4,210m ³ /year

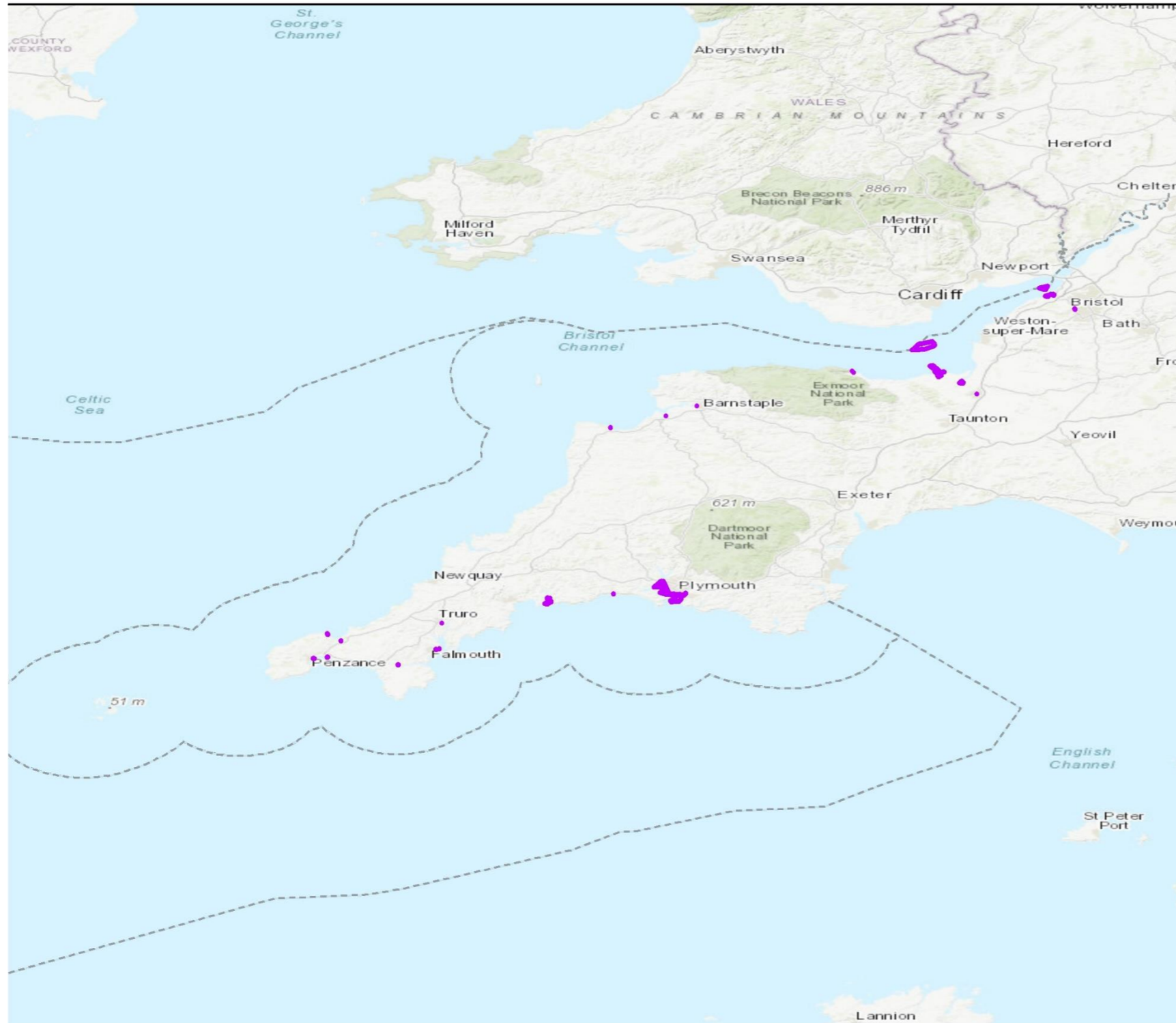
Dredging project	Applicant name	Licence expiry	Volumes		Material
			Total	Annual	
					sand, 40,000m ³ /year silt
Marazion Beach Maintenance and Landing Point Access	St Aubyn Estates	08/03/2025	18,750m ³	1,875m ³	Sand
Hinkley Point B Seawall Works	EDF Energy Nuclear Generation Limited	31/05/2025	16,649m ³	1,292m ³	1,142m ³ /year cobble, 150m ³ /year sand
Maintenance Dredging at Her Majesty's Naval Base Devonport	Defence Infrastructure Organisation	19/12/2028	550,000m ³	Not available	500,000m ³ silt, 50,000m ³ sand
Hinkley Point C Project: New Nuclear Development	EDF Energy Public Limited Company	31/12/2080	283,000m ³	N/A	218,600m ³ silt, 57,400m ³ clay, 5,600m ³ sand, 1,400m ³ gravel

Figure 4.4 Historic and existing licensed dredging in the south west marine plan area



Figure 4.4 | Historic and Existing Dredging Activity: South West Marine Plan Area

- Historic and Existing Dredging Activity
- Marine Plan Area



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4.2. Historic and Existing Alternative Use

Information on post-2011 licensed alternative use of dredged material was contained in the MMO database created for this project, under 'Alternative Use' and is summarised in

Table 4.6 and shown in Figure 4.5 and Figure 4.6. Nine MMO-licensed alternative use projects have been completed to date, two of which are on-going (annual alternative use projects yet to be completed). Six of these sites are within the south east marine plan area with three in the south west marine plan area. There were no licence records in the MMO data for alternative use in the north west or north east marine plan areas, although this does not rule out the possibility of small-scale alternative use carried out by local authorities, or alternative use within other larger-scale projects.

Within the south east marine plan area, over 2.5 million tonnes² of material has been/will have been used for alternative use projects. Gravel makes up over half of this. The licence for the Port of Ramsgate dredging covers annual alternative use of dredged sand until 2026. Within this licence, there is 12,000 tonnes of sand estimated to be used annually between 2019 until its expiry in 2026.

A total of approximately 34,000 tonnes of material has/will have been used in alternative use projects within the south west marine plan area, with sand comprising most of the material. The Hinkley Point B Seawall Works involves annual deposition of material for alternative use. Under this licence, 15,680 dry tonnes (DT) of material will be used between 2019 and licence expiry in 2025.

Future planned and potential alternative use projects which are not yet licensed are discussed in Section 5.2.

² Some licences specify dry tonnes (DT) while others use simply 'tonnes' to describe weights of material. The terms used in the report reflect those on licences and other documents and, as such, overall quantities are given in tonnes where a combination of 'DT' and 'tonnes' have been used in licences within the marine plan area.



Table 4.6 Historic and existing alternative use projects in the south west and south east marine plan areas

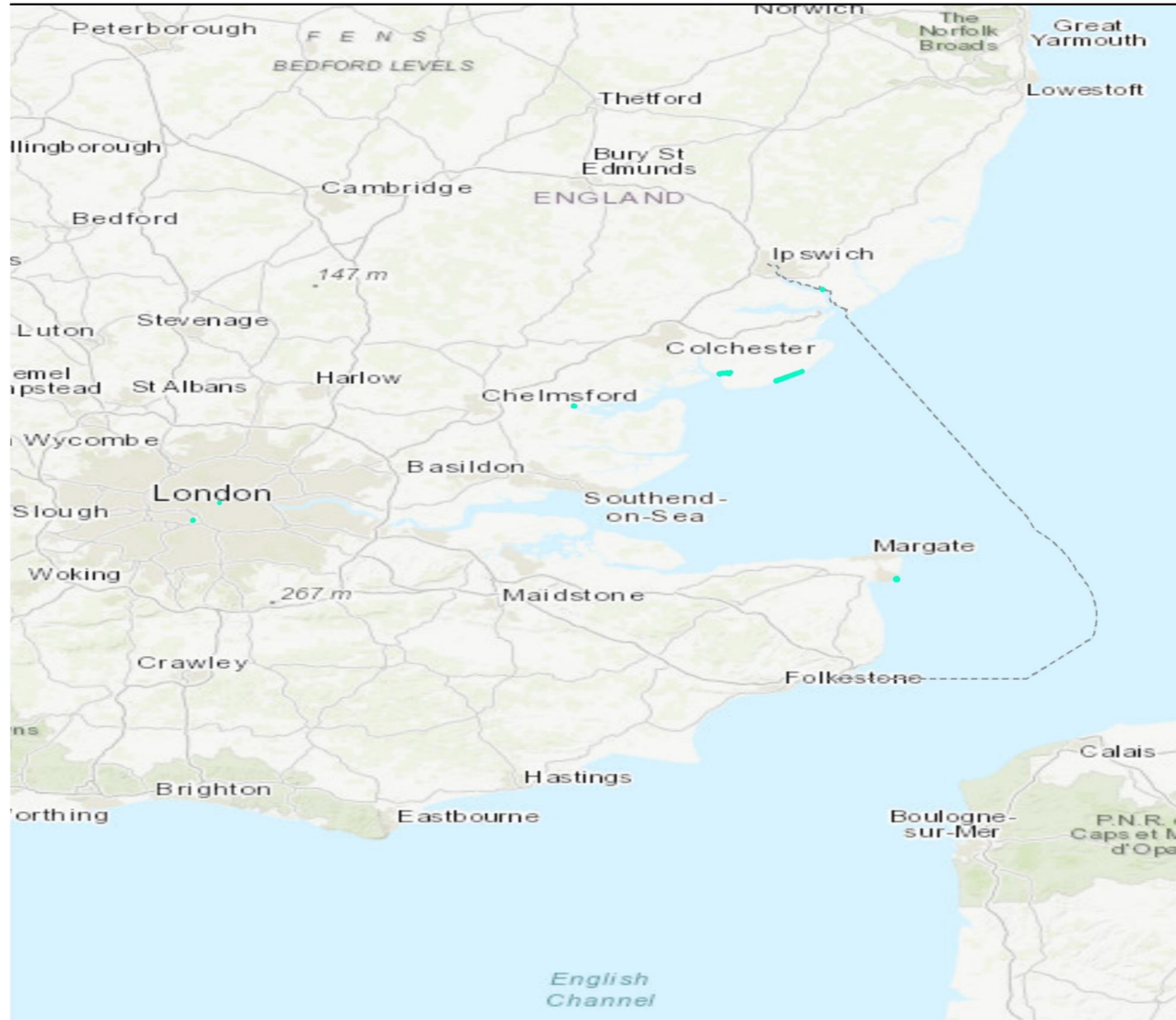
Project and use type	Applicant name	Licence expiry	Quantity	Material
South east marine plan area				
Embankment Dredging (Relocating Sediment from Mound to Adjacent Scour Hole)	London River Services Limited	27/11/2015	264 DT	Gravel
Dredging Material Disposal at Maldon Saltings, TH062 (Recharging Eroding Saltmarsh)	Northumbrian Water Limited	31/12/2015	9,750 tonnes	Silt
Clacton and Holland-on-Sea Sea Defences (Beach Nourishment to +3.5m OD)	Tendring District Council	28/10/2016	2,385,000 tonnes	1,431,000 tonnes gravel, 954,000 tonnes sand
Plantation Wharf Wave Break	MSO Marine	10/02/2017	390 DT	Gravel
Dredging and Restoration of Brightlingsea Harbour – various Restoration Sites	Brightlingsea Harbour Commissioners	05/02/2022	46,800 DT	Silt
Port of Ramsgate Maintenance Dredging (Beneficial use at Ramsgate Sands Foreshore)	Port of Ramsgate	17/03/2026	12,000 DT/year (120,000 DT total)	Sand
South west marine plan area				
Minehead Harbour	Albert Stone	22/03/2017	2,000 tonnes	Cobble
Restoration of Intertidal Habitat and Construction of New Quay Wall	Gweek Quay Limited	30/09/2018	3,200 DT	Gravel
Hinkley Point B Seawall Works (Removal of Material from Foreshore and Placement near Sea Wall to help Regrade Beach)	EDF Energy Nuclear Generation Limited	31/05/2025	2,240 DT/year (28,880 DT total)	2,000 DT/year sand, 240 DT/year cobble

Figure 4.5 Historic and existing licensed alternative use in the south east marine plan area



Figure 4.5 | Historic and Existing Alternative Use: South East Marine Plan Area

 Historic and Existing Alternative Use
 Marine Plan Area



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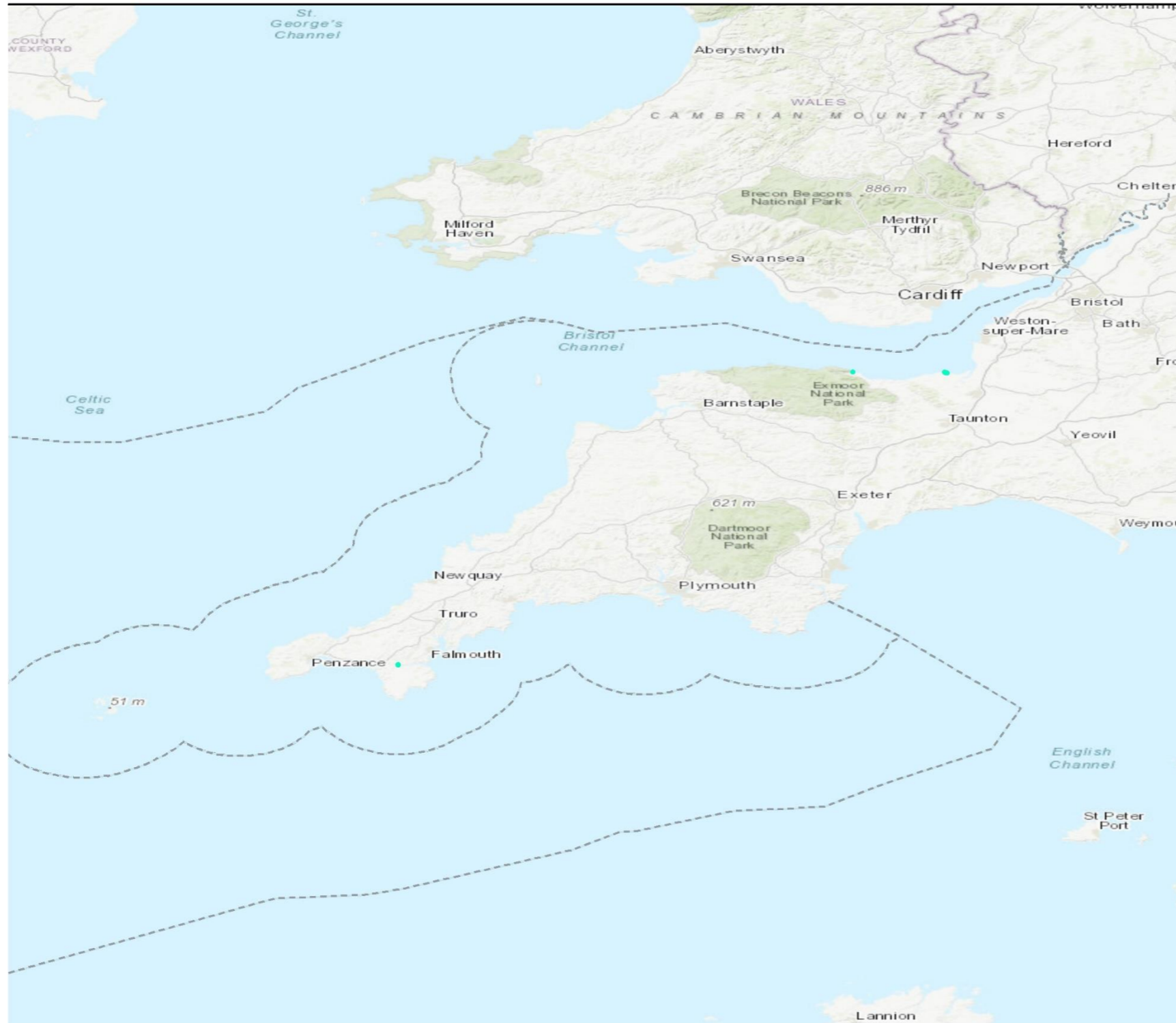
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Figure 4.6 Historic and existing licensed alternative use in the south west marine plan area



Figure 4.6 | Historic and Existing Alternative Use: South West Marine Plan Area

- Historic and Existing Alternative Use
- Marine Plan Area



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5. Potential Future Activity

5.1. Potential Future Dredging

The creation of the GIS database of potential future dredging activity was informed by three main sources:

- Campaigns on the MMO database which have not yet begun;
- Applications on the MMO public register which have not yet had a decision; and
- Applications on the MMO public register which have been licensed since the production of the MMO database.

Please note the inclusion of applications not yet granted a licence does not reflect on any pending decision making.

A small number of stakeholders identified future dredging campaigns in their responses to the stakeholder questionnaire. Those located in the four marine plan areas in scope of this project were added to the database. Port Master Plans in each of the marine plan areas were also reviewed. However, these had insufficient detail on potential future dredging and realised no useful information.

A summary of the total potential volumes for each marine plan area is provided in Table 5.1 and details on individual sites in Table 5.2 and Figure 5.1 (north east), Table 5.3 and Figure 5.2 (north west), Table 5.4 and Figure 5.3 (south east) and

Table 5.5 and Figure 5.4 (south west).

Table 5.1 Summary of potential future dredging volumes in each marine plan area

Marine Plan Area	Total volume	Material
North east	5,610,112m ³	378,000m ³ sand, 214,000m ³ boulder clay (till), 120,712m ³ silt, 58,000m ³ rock, 3,900m ³ clay, 4,800,000m ³ unknown
North west	286,560m ³	Mostly silt
South east	16,391,200m ³	389,000m ³ silt, 2,200m ³ coarse sediments, 16,000,000m ³ silt, sand and gravel
South west	551,583m ³ *	500,150m ³ silt, 50,000m ³ sand, 1,333m ³ mud, 100m ³ cobble

*Converted from tonnes using conversion rates provided in the HELCOM Guidelines for the Disposal of Dredged Material at Sea (Helsinki Commission, 2007)

The results indicate that over the next ten years, future planned maintenance dredging campaigns (of various intervals between individual dredging events, depending on the project) could potentially lead to over 1.1 million cubic metres of material being dredged across the four marine plan areas. Most of this would be dredged in the south west marine plan area. Capital and other one-off dredging campaigns could yield almost 900,000 cubic metres of material to be dredged across the four marine plan areas over the next ten years. The south east marine plan area has the highest number of planned future capital dredging campaigns. However,

most of the material to be dredged as one-off campaigns will be within the north east marine plan area.

Table 5.2 Potential future dredging sites in the north east marine plan area

Project title	Frequency	Volume	Material
Future dredging (application submitted but not yet licenced)			
Hartlepool Approach Channel	Once	650,000m ³	58,000m ³ rock, 214,000m ³ boulder clay (till), 378,000m ³ sand
Tyne Car Terminal Berth Reconfiguration	Once	98,112m ³	Silt
Dredge Area 1 - Existing Ash Barge Dock	Once	9,000m ³	Silt
Dredge Area 2A - Southern Extension	Once	53,000m ³	13,600m ³ silt, 3,900m ³ clay
Stakeholder identified future dredging (yet to submit licence application)			
Northern Gateway Container Terminal at PD Teesport	Unknown	4,800,000m ³	Unknown

Table 5.3 Potential future dredging sites in the north west marine plan area

Project title	Frequency	Volume	Material
Licensed future dredging			
Walney Extension Pontoon/Jetty Dredging and Disposal	Annually until 2029	24,000m ³ (annually)	Silt
Future dredging (application submitted but not yet licenced)			
Isle of Man Ferry Terminal	Once	46,560m ³	Silt/silty sand with some sandstone bedrock

Table 5.4 Potential future dredging sites in the south east marine plan area

Project title	Frequency	Volume	Material
Licensed future dredging			
White Mountain, Dagenham - Maintenance Dredge	Once	2,500m ³	1575m ³ clay, 700m ³ gravel, 225m ³ sand
Future dredging (application submitted but not yet licenced)			
Rochester Wharf Berth Dredge	Once	8,000m ³	Silt
Swan Lane Pier	Once	2,200m ³	Coarse sediments
Galloper O&M Facility, Harwich	Yearly	34,500m ³ (total)	Silt
Greenwich Development Outfall Zone D	Unknown	Unknown	Unknown
London Thamesport Maintenance Dredging Project	2018 - 2023	339,000m ³ (total)	Silt
Stakeholder identified future dredging (yet to submit licence application)			
Medway and Swale Estuary Maintenance Water Injection Dredging	Annually	5,000m ³	Silt

Harwich Haven	Once	16,000,000 m ³	Silt, sand and gravel
Although not dredging, a stakeholder identified that the Lower Thames Crossing has potential for further material to be available for alternative uses, due to tunnelling activity			



Table 5.5 Potential future dredging sites in the south west marine plan area

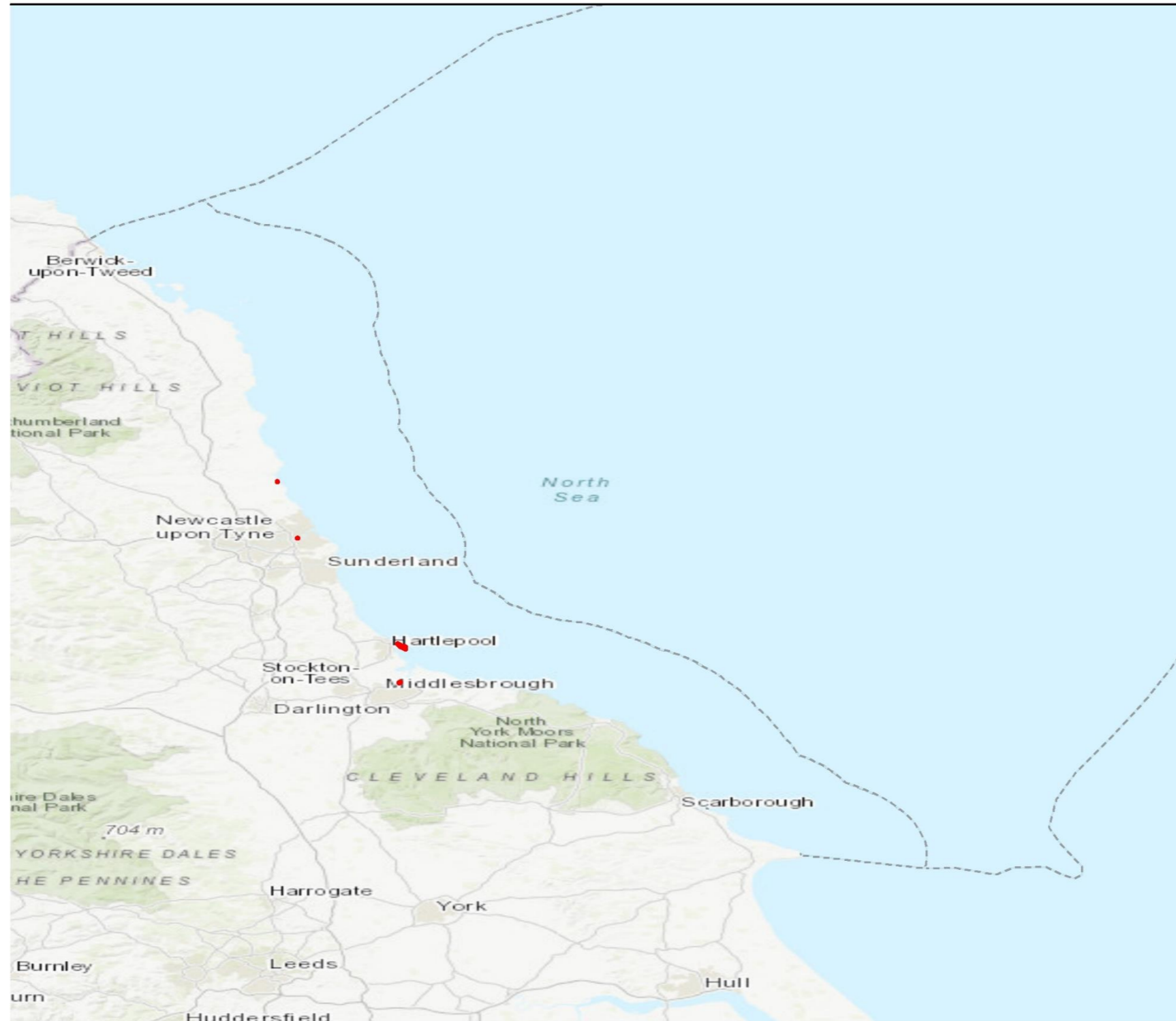
Project title	Frequency	Volume	Material
Licensed future dredging			
Maintenance Dredging at Her Majesty's Naval Base Devonport	Twice annually until 2028	550,000m ³ (total)	500,000m ³ silt, 50,000m ³ sand
Waterside Barge Mooring Project, Waterside Quay, Penryn	Once	250m ³	100m ³ cobble, 150m ³ silt
Slipway Clearance – Town Quay, Truro	Unknown	400 tonnes	Mud

Figure 5.1 Potential future dredging projects in the north east marine plan area



Figure 5.1 | Potential Future Dredging Projects: North East Marine Plan Area

-  Potential Future Dredging Projects
-  Marine Plan Area



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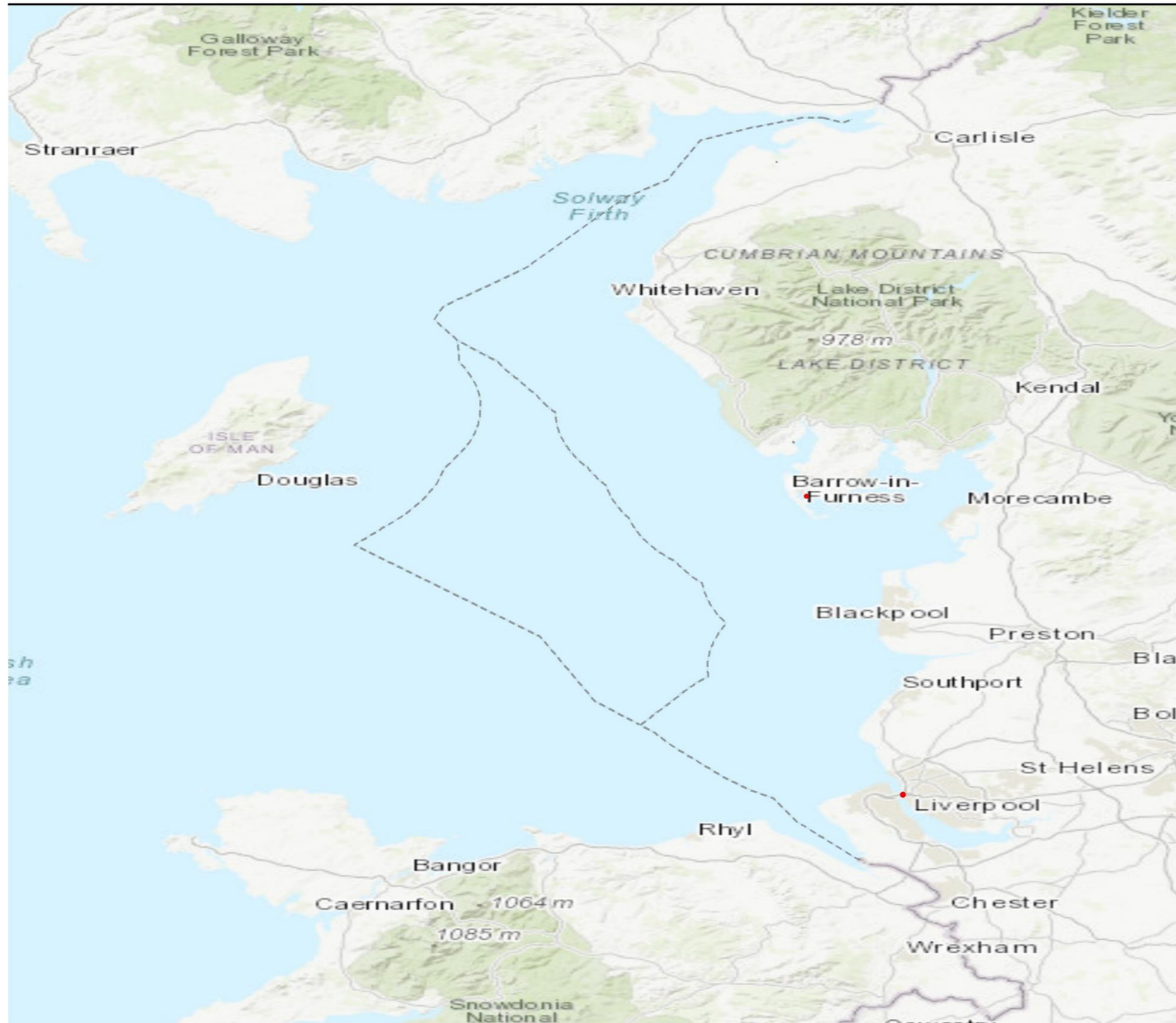
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Figure 5.2 Potential future dredging projects in the north west marine plan area



Figure 5.2 | Potential Future Dredging Projects: North West Marine Plan Area

- Potential Future Dredging Projects
- Marine Plan Area



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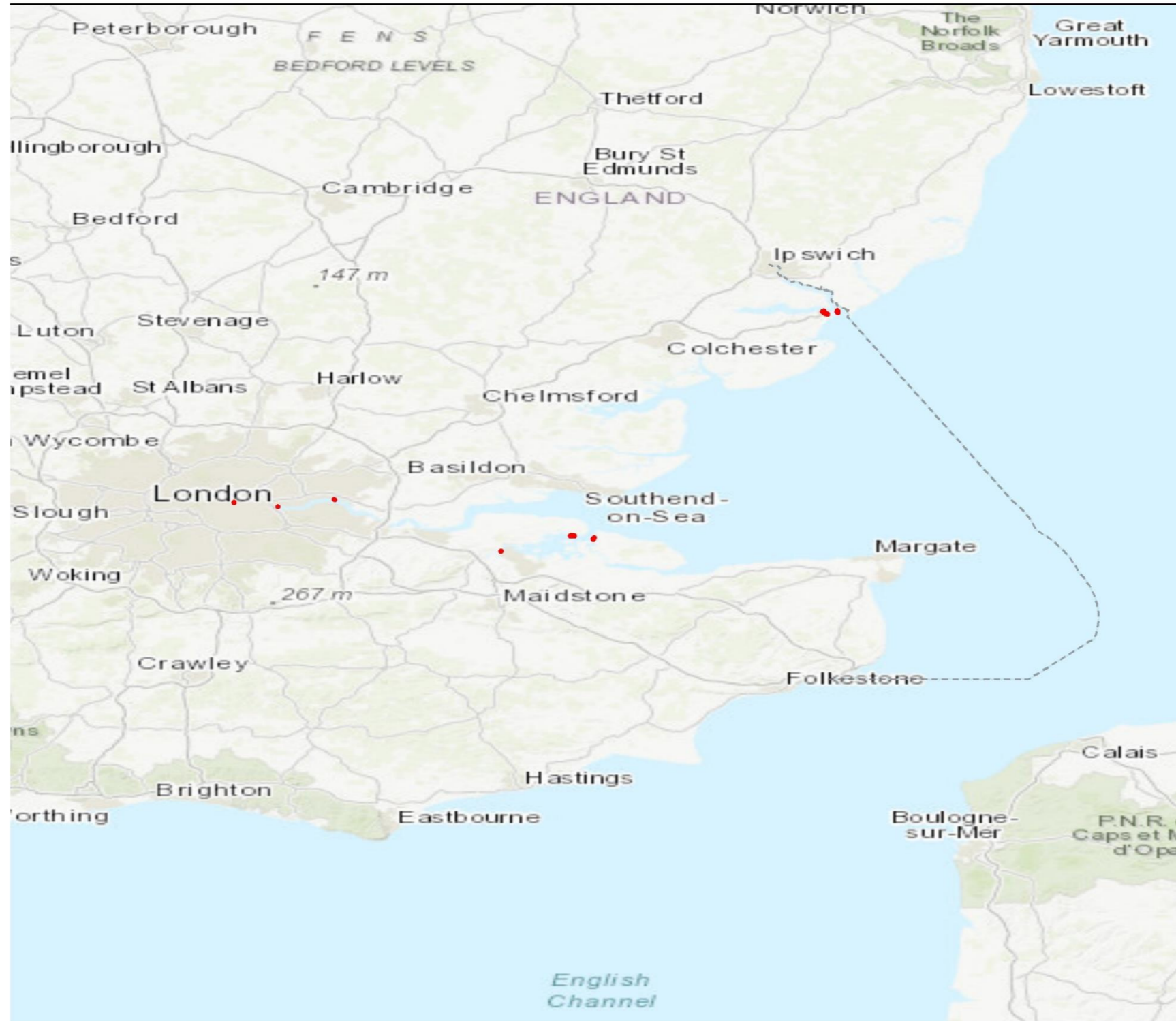
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Figure 5.3 Potential future dredging projects in the south east marine plan area



Figure 5.3 | Potential Future Dredging Projects: South East Marine Plan Area

- Potential Future Dredging Projects
- Marine Plan Area



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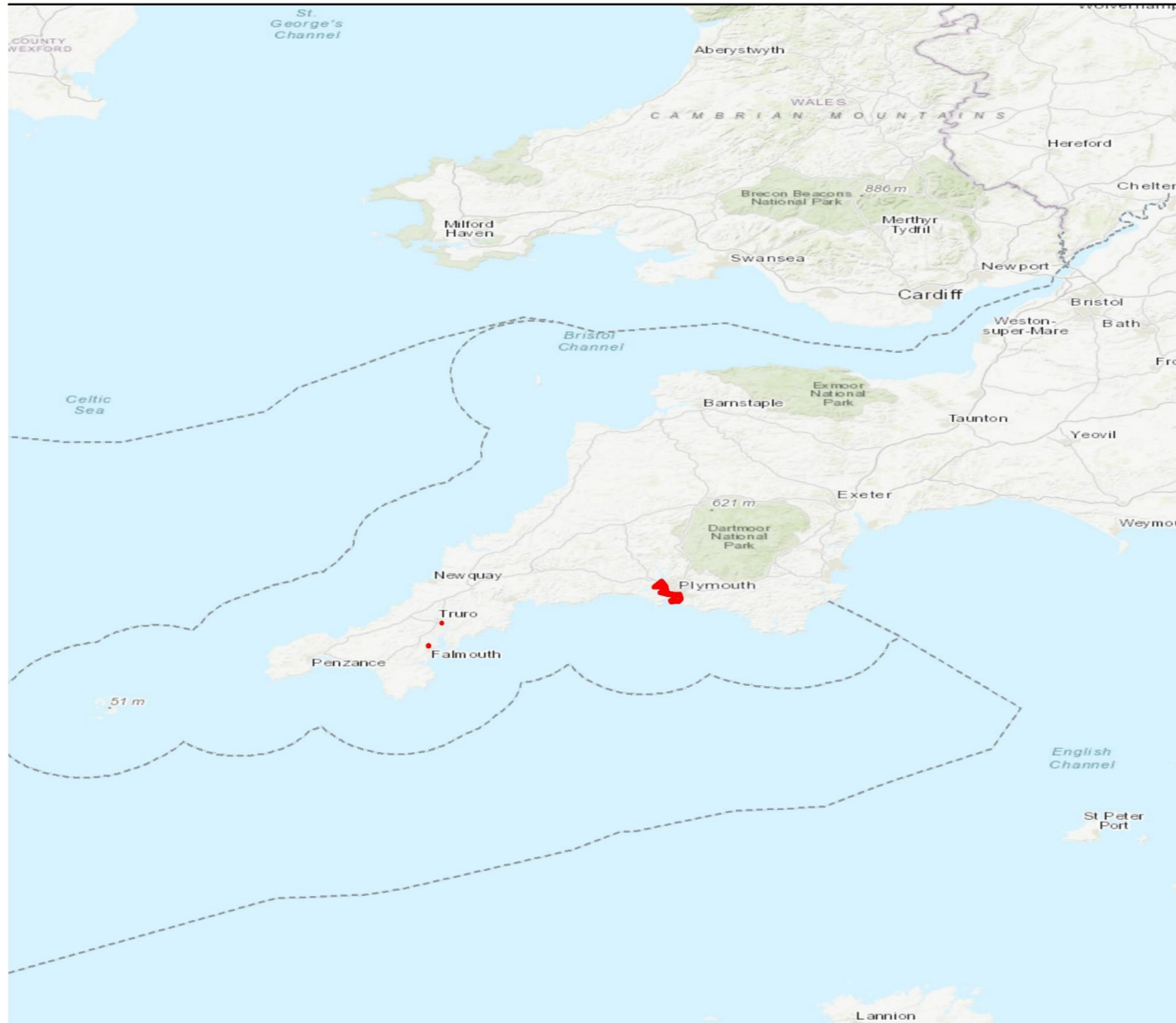
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Figure 5.4 Potential future dredging projects in the south west marine plan area



Figure 5.4 | Potential Future Dredging Projects: South West Marine Plan Area

- Potential Future Dredging Projects
- Marine Plan Area



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5.2. Potential Future Alternative Use

The GIS of sites for future alternative use of dredged material was sourced from a review of Shoreline Management Plan policies in each marine plan area, planned alternative use on the MMO database (licensed but not undertaken, or applications submitted but no decision made), and a review of potential sandscaping sites identified by Royal HaskoningDHV (2015). Data obtained through the stakeholder survey was also added to this dataset, excluding any sites submitted which are not in the four marine plan areas. Section 2.2.2 contains a list of the stakeholders contacted for the survey, as well as a list of those who responded. Contacts include local authorities, port companies, and national stakeholders.

Summaries of the potential future alternative use sites for each marine plan area are provided in Table 5.6 and Figure 5.5 (north east),

Table 5.7 and Figure 5.6 (north west),

Table 5.8 and Figure 5.7 (south east) and

Table 5.9 and Figure 5.8 (south west).

Table 5.6 Potential future alternative use in the north east marine plan area

Site	Type of Use	Material
Areas identified from Shoreline Management Plans		
Newbiggin Bay	Artificially drawing forward the shoreline	Sand
North Bay Promenade and Clarence Garden frontage, Scalby Ness	Beach nourishment	Sand
Potential sandscaping sites (Royal HaskoningDHV, 2015)		
Withernsea	Sandscaping	Sand
Application submitted (MMO database)		
Warkworth Harbour North Side Sand Relocation (Licence Extension)	Sand relocation	10,500 DT Sand
Stakeholder survey responses		
Northern Gateway Container Terminal at PD Teesport	Land-claim and raising height of land	1,900,000m ³ Unknown

Table 5.7 Potential future alternative use in the north west marine plan area

Site	Type of Use	Material
Potential sandscaping sites (Royal HaskoningDHV, 2015)		
Ainsdale, Formby, Crosby	Sandscaping	Sand
Lytham	Sandscaping	Sand
Stakeholder survey responses		
Mid River Disposal Site in Liverpool, Peel Ports	Disposal site with environmental benefits	300,000m ³ silt annually

	such as upstream saltmarsh recharge	
Joint Crown Estate and Peel Ports Investigations into Island Creation in Liverpool Bay	Potential island creation in Liverpool Bay using dredge material to create habitat	Sand

Table 5.8 Potential future alternative use in the south east marine plan area

Project Title	Type of Use	Material
Areas identified from Shoreline Management Plans		
Management Unit B - Hamford Water	Foreshore nourishment	Sand/shingle
Bradwell-on-Sea	Beach nourishment	Sand
Garrison Point to Minster	Beach nourishment	Mixed sand and gravel
Whitstable Harbour (east) to Swalecliffe	Beach nourishment	Mixed sand and gravel
Reculver Towers to Minnis Bay	Beach nourishment	Mixed sand and gravel

Table 5.9 Potential future alternative use in the south west marine plan area

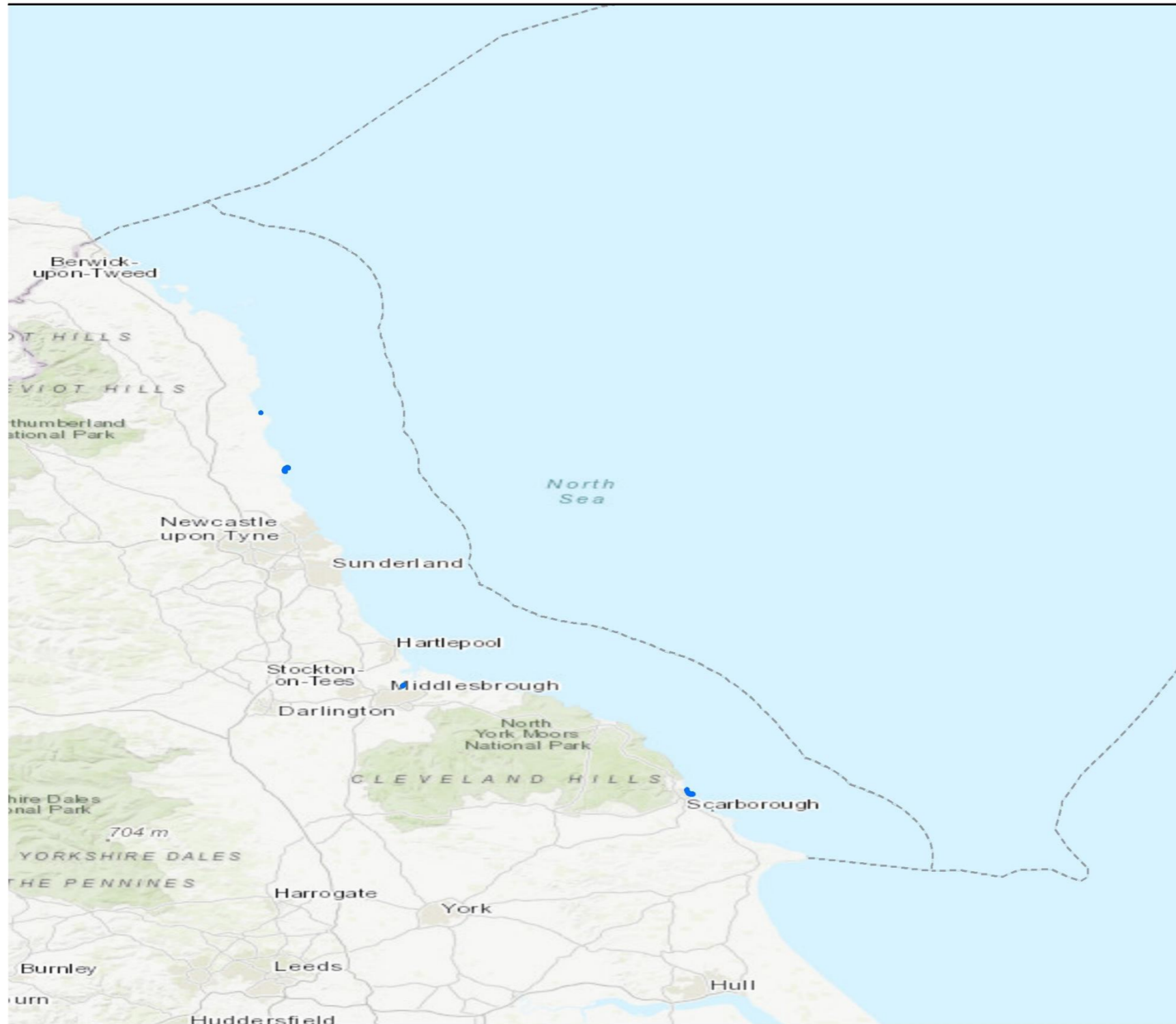
Project Title	Type of Use	Material
Areas identified from Shoreline Management Plans		
Redcliff Point to Preston Beach	Beach nourishment at Preston Beach	Sand
Preston Beach (Rock Groyne) to Portland Harbour (North Breakwater)	Future nourishment to counter coastal squeeze	Unknown - likely sand
West Bay	Beach nourishment	Unknown - likely sand
Sidmouth	Maintenance of existing defences, including beach management activities and beach nourishment	Unknown - likely sand
Orcombe Rocks to Exmouth Spit	Beach nourishment	Unknown - likely sand
Langstone Rock to Holcombe	Beach nourishment options	Unknown - likely sand
Holcombe to Teignmouth (The Point)	Beach nourishment	Unknown - likely sand
Crow Point and Crow Neck	Beach replenishment	Unknown – estuarine location
The Warren (Minehead Golf Course)	Beach replenishment to support other management measures	Unknown
Potential sandscaping sites (Royal HaskoningDHV, 2015)		
Penzance	Sandscaping	Sand
Application submitted (MMO database)		
Riverbank Reinforcement with Dredged Spoil from Slipway (Town Quay, Truro)	Flood protection	400 tonnes mud

Figure 5.5 Potential future alternative use in the north east marine plan area



Figure 5.5 | Potential Future Alternative Use: North East Marine Plan Area

- Potential Future Alternative Use
- Marine Plan Area



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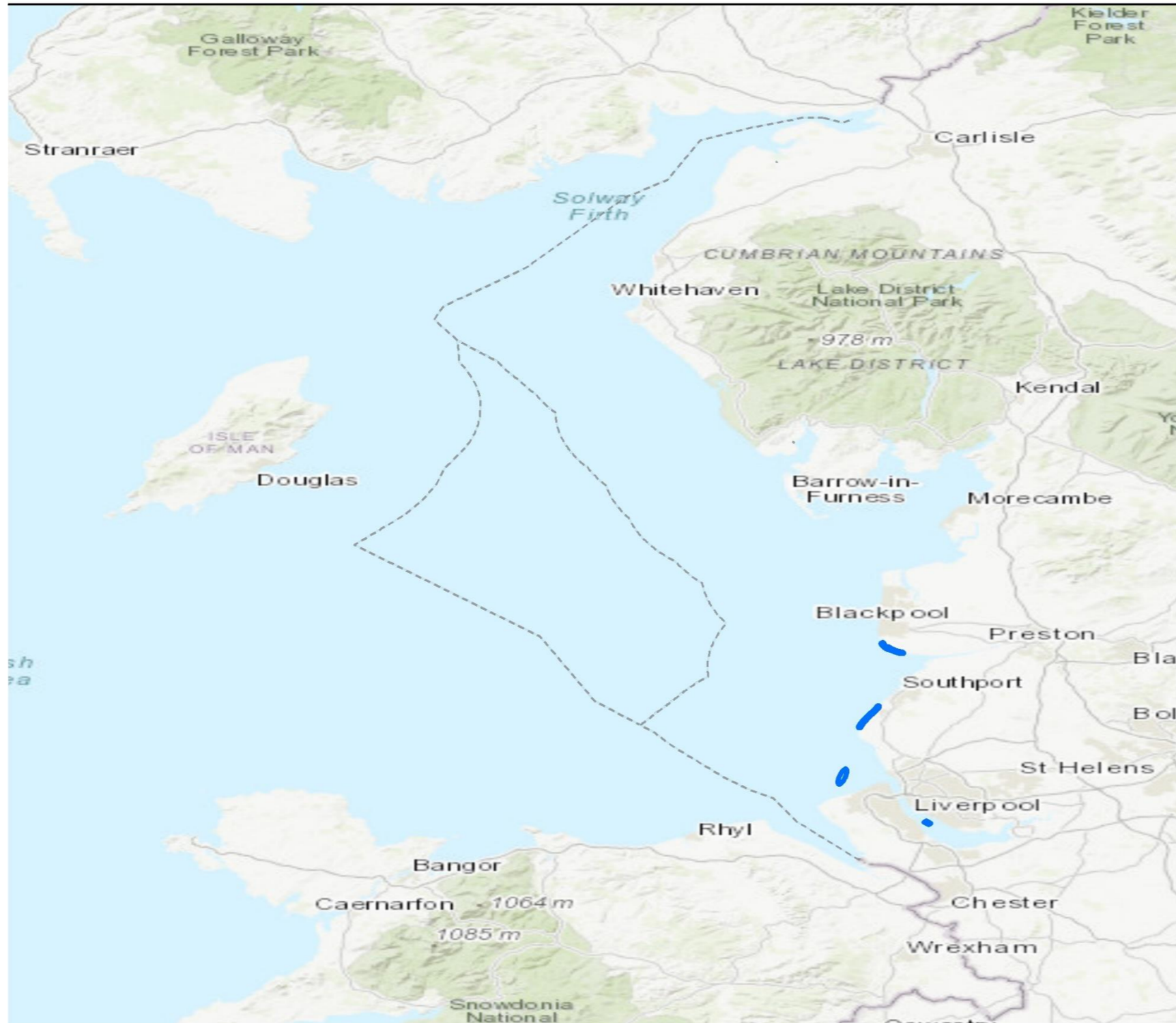
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Figure 5.6 Potential future alternative use in the north west marine plan area



Figure 5.6 | Potential Future Alternative Use: North West Marine Plan Area

- Potential Future Alternative Use
- Marine Plan Area



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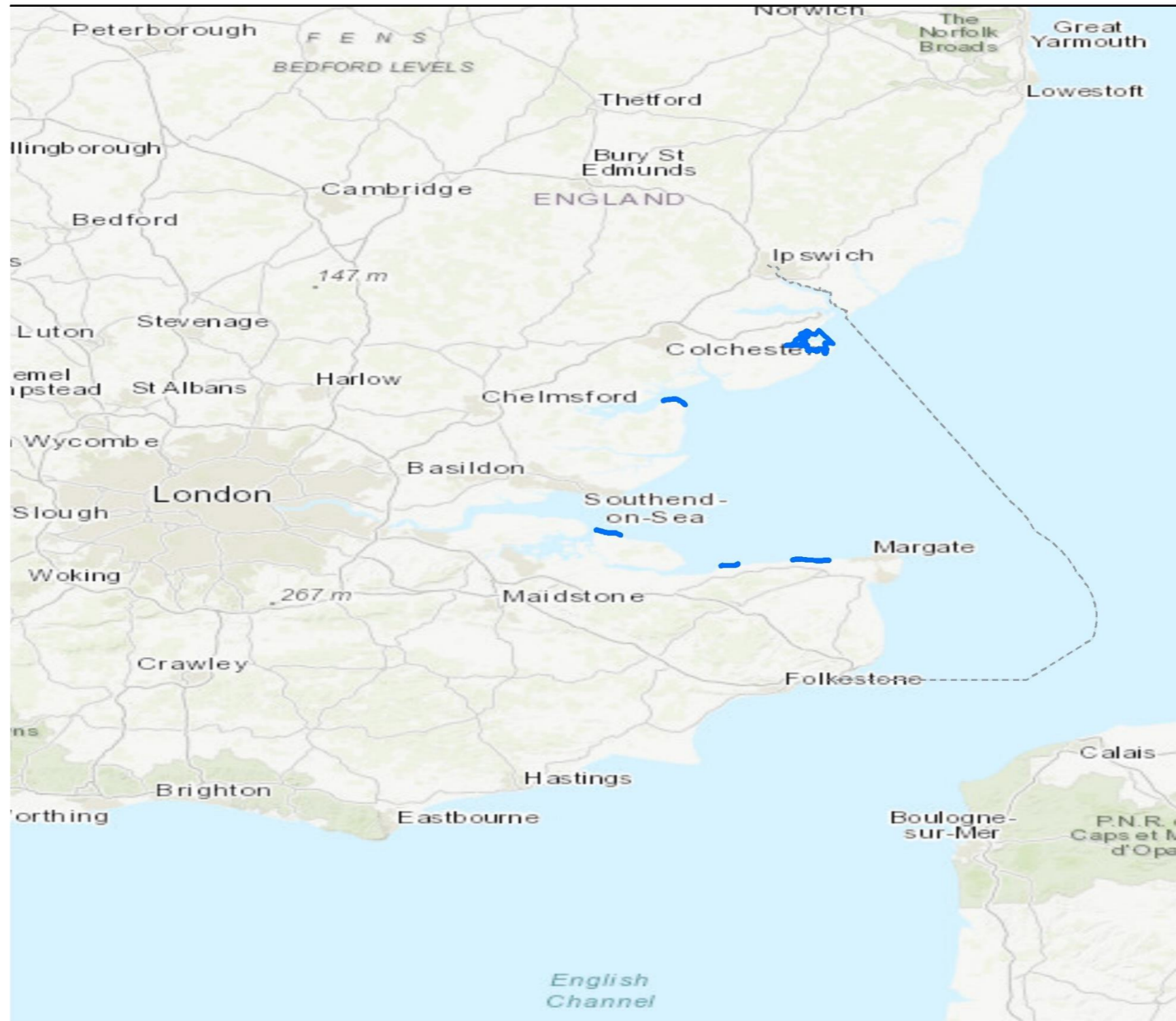
Figure 5.7 Potential future alternative use in the south east marine plan area



Figure 5.7 | Potential Future Alternative Use: South East Marine Plan Area

Potential Future Alternative Use

Marine Plan Area



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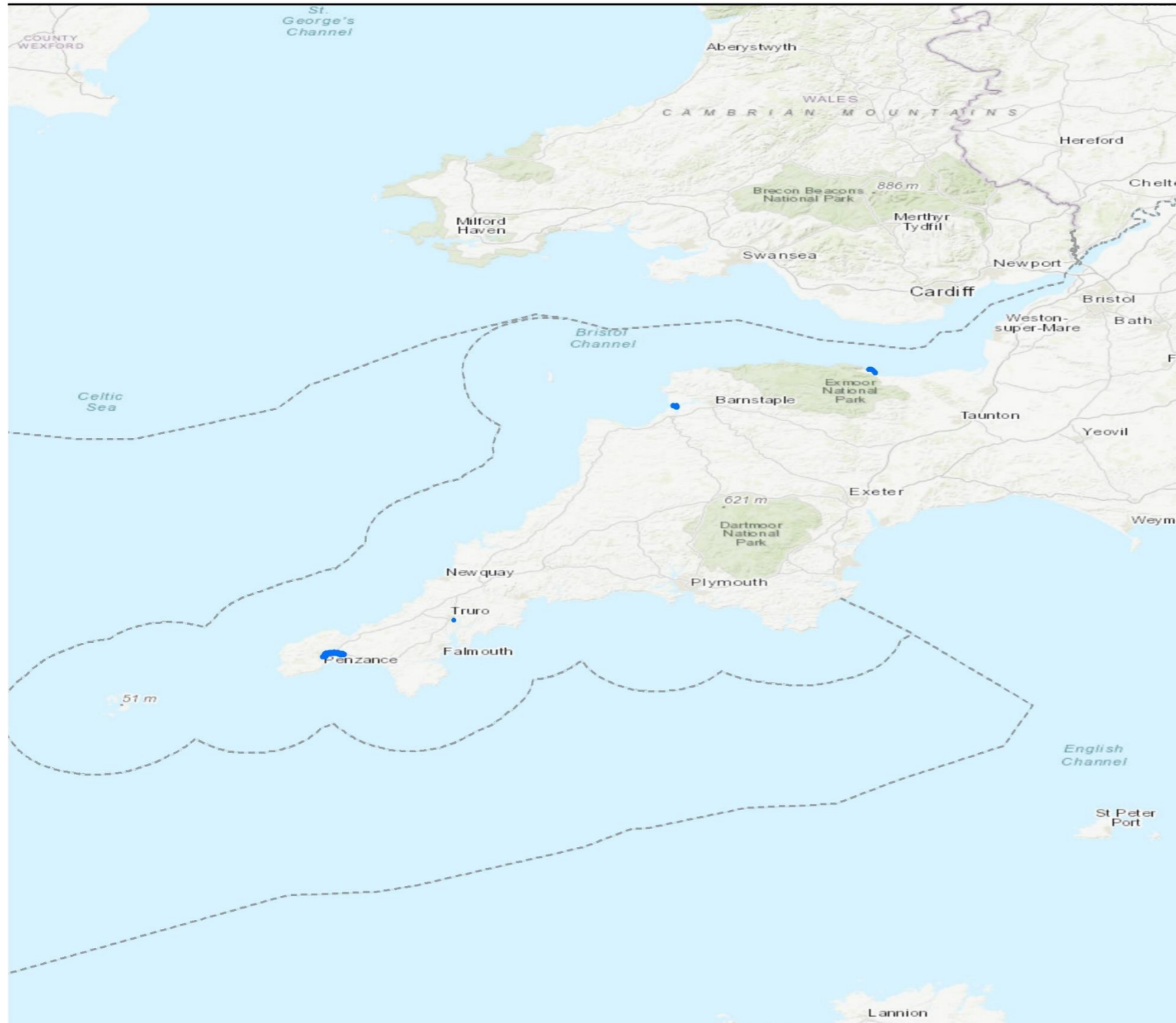
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Figure 5.8 Potential future alternative use in the south west marine plan area



Figure 5.8 | Potential Future Alternative Use: South West Marine Plan Area

- Potential Future Alternative Use
- Marine Plan Area



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Sites identified from the SMPs in each marine plan area are those for which the short-term policy involves beach nourishment (mainly those with Hold the Line as the preferred shoreline management strategy). Medium-term beach nourishment policies were not included in this dataset, as medium-term in the SMPs is defined as extending to 25 years, which is beyond most of the dredge campaigns identified in this study.

There are currently only two licence applications on the MMO database for future alternative use. These are in the north east marine plan area (10,500 tonnes of sand) and the south west marine plan area (400 tonnes of mud).

Three of the licensed alternative use sites identified in

Table 4.6, are anticipated to continue for several years or have not yet begun. Taking these into account, over 16,000 tonnes of material may be utilised in the south west marine plan area over the next seven years, comprised of annual deposition of 2,000 DT of sand and 240 DT of cobble and an additional 400 tonnes of mud for a site not yet licensed. The south east marine plan area has the highest number of both dredging and alternative use sites and is estimated to require up to 46,800 tonnes of silt by 2022 and 96,000 tonnes of sand by 2026 (involving annual foreshore deposition of 12,000 tonnes). At least 10,500 tonnes of sand will potentially be required for alternative use in the north east marine plan area, if a licence is granted for the Warkworth Harbour sand relocation scheme, and the Northern Gateway Container Terminal is likely to require almost two million cubic metres of material for land-claim, though the composition is yet unknown. These quantities do not include those which are unknown.

The majority of identified alternative use sites would require sand. However, as these only include sites within the marine plan area boundaries (i.e. coastal schemes), there could be a potential for other types of alternative use both onshore and within bordering marine plan areas. These could include construction materials in any new port developments or industrial activities near to any locations where suitable material is to be dredged.

6. Uncertainty

There are some limitations with the data collected and, as such, caution should be taken in interpretation and planning. The three main uncertainties are material quantities, timing of schemes and completeness.

6.1. Material Quantities

As all volumes of sediment provided in this report are licensed or predicted volumes, and not actual dredged volumes, it is likely that the actual quantities that will be dredged will be less than those quoted. There may be constraints at some sites regarding the availability of certain materials. For example, cobbles and gravel are not common dredged materials, and silt is less widely used except for habitat restoration projects. However, there is a huge volume of material that continues to be disposed at sea, which could have alternative uses beyond those identified through the literature reviews (such as construction materials).

Not all the material which is dredged may be suitable for re-use, due to constraints such as contamination issues, and errors in grading. However, due to the potentially large oversupply from planned dredging campaigns relative to volumes required for planned alternative use projects there is still a clear scope to increase the number of alternative use projects in all four marine plan areas and to be selective in material reused

6.2. Timing of Schemes

Strategic planning would need to be in place in order to accommodate timings, but if done effectively, coastal projects could take place with a smaller impact to the

environment as well as at a lower cost. This is especially important in areas where the local authority manages the coastal defences and amenities, with little funding. If a nearby project were to involve the dredging of material suitable for (for example) coastal car parks, recreational facilities or to reinforce sea walls, this material could be brought to shore and utilised, removing the need for at-sea disposal. This could then have knock-on effects, resulting in reduced need for the sourcing of new materials, thus reducing any time and cost constraints for projects which could make use of dredged materials.

6.3. Completeness

Although steps were taken to ensure that the dredging datasets are as complete as possible, several dredging projects may be missing, if classed as a different project type in the MMO database. Where these sites were not selected during the compiling of the alternative use dataset (in which the 'Alternative use' dataset was reviewed for anomalies) or noted by stakeholders in response to the questionnaire, they were not included in the GIS database. There are a number of reasons for the classification of these projects as anything other than 'dredging'. These include where a harbour authority is a competent authority and so only requires a dredge disposal licence, or where navigational dredging is not the main activity in the project (e.g. aggregate dredging). Where competent authorities do not require a dredge licence, there could be additional alternative use opportunities where dredging is planned.

7. Summary

7.1. North east marine plan area

Four future (not yet licensed) dredging campaigns were identified in the north east marine plan area, in addition to the licensed dredging campaigns which are not yet complete. Future dredging campaigns are estimated to yield over 5.6 million cubic metres of material. In addition, licensed maintenance dredging which is due to continue to take place annually may contribute 420,000 cubic metres of material per year, comprised mainly of silt.

All but one of the identified potential future alternative use projects in the north east marine plan area would require sand, with one planned project requiring 10,500 DT. The Northern Gateway Container Terminal would require a further 1.9 million cubic metres of material (composition unknown at this time). Using the HELCOM conversion factors (Helsinki Commission, 2007), future (unlicensed) dredging campaigns are estimated to yield over half a million cubic metres of sand. Like the north west marine plan area (below), there is scope for additional alternative use due to the volumes of material anticipated to be dredged in both current licensed and future dredging campaigns.

7.2. North west marine plan area

In the north west marine plan area, calculations have shown that future (not yet licensed) dredging campaigns could yield around 286,560 cubic metres of material.

Licensed ongoing dredging campaigns are estimated to yield up to 1.5 million cubic metres of material per year over the next ten years, 400,000 cubic metres of which is sand. Additional material available from one-off dredging campaigns which may not yet have taken place could result in a total volume of approximately 6.6 million cubic metres. This estimate assumes that the annual dredged volumes licensed will be the actual volumes dredged.

No historic or existing alternative use projects were identified in the north west marine plan area. There were two alternative use opportunities identified in this marine plan area, both identified by Royal HaskoningDHV (2015) as 'high potential' future sandscaping sites. A further two sites of alternative use were identified through the stakeholder responses, one of which requires 300,000 cubic metres of silt annually. Although most of the volumes required for future alternative use in this area are not known, the volume of sand and silt estimated to be dredged annually over the next ten years would be enough to satisfy needs as well as provide opportunities for further alternative use.

7.3. South east marine plan area

The south east marine plan area has the highest number of historic and existing licensed dredging campaigns as well as the highest number of future planned dredging campaigns. The total anticipated dredging volume estimated for future sites is more than 16 million cubic metres, the majority of which is likely to be silt. The total annual dredge volume within the maintenance dredge licences not yet expired is six million cubic metres. Most of this material is anticipated to be silt, although 700,000 cubic metres would be sand (over one million DT).

The south east marine plan area also has the highest number of historic and existing alternative use projects, including two which have licences with future expiry dates. These licences are for the alternative use of 46,800 DT of silt (used for restoration works) by 2022, and 12,000 DT of sand deposited annually at the Ramsgate Sands Foreshore until 2026.

Several stretches of coast were identified from the SMPs as being potential beach nourishment sites in the south east marine plan area. These locations are likely to require sand. Although the total volume of material quoted in the licences is unlikely to be the actual material dredged, licensed maintenance activities alone are estimated to involve dredging of over one million tonnes per year of sand.

7.4. South west marine plan area

In the south west marine plan area, it is estimated that about 550,000 cubic metres of material could be dredged by the future dredging campaigns identified. This is comprised of 500,000 cubic metres of silt and 50,000 cubic metres of sand. In addition, approximately 52,000 cubic metres of material would be dredged annually as part of current licensed maintenance dredging campaigns (this does not include non-maintenance dredging which has already been licensed and may not have taken place).

Of the historic and existing alternative use projects identified in the south west marine plan area, one licence (Hinkley Point B Seawall Works) has a future expiry date. Within this licence, 2,000 DT of sand and 240 DT of cobble annually is to be used alternatively until 2025.

Eleven future alternative use opportunities have been identified in the south west marine plan area, nine of which are stretches of coast which have been identified as suitable for beach nourishment within the SMPs, one high potential sandscaping site and one application for the use of 400 tonnes of mud in a flood protection scheme. All but the flood defence scheme would require sand, though it is unclear what volumes of sand would be required.

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