

British Marine Aggregate Producers Association,  
Historic England and The Crown Estate

*Marine Aggregate Industry Protocol for the Reporting of  
Finds of Archaeological Interest*

# Annual Report to BMAPA 2024-2025

January 2026



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Prepared by





## Protocol background

**This year, we're celebrating the 20th anniversary of the Protocol Implementation Service and this annual report covers the period from 1 October 2024 to 30 September 2025.**

### Origin and aim of the Protocol

The offshore dredging industry provides around 20% of the aggregate needed for UK construction. While dredging areas are archaeologically assessed as part of the licensing process, there remains the potential for unexpected discoveries to be made by staff during operations.

Back in the late 20th century, the marine archaeological resource was not well understood, and there were gaps in our understanding about what was on the seabed and how it could be identified. The marine aggregate industry was keen to identify potential impacts from dredging, the significance of effects, and to develop mitigation to minimise impact.

In 2003, the British Marine Aggregate Producers Association (BMAPA) and English Heritage (now Historic England) asked Wessex Archaeology to produce guidance. The document that was produced, *Marine Aggregate Dredging and the Historic Environment: Assessing, evaluating, mitigating and monitoring the archaeological effects of marine aggregate dredging*<sup>1</sup>, was ground breaking, and it set out the importance of the marine historic environment, the regulatory framework (as it stood in 2003), methodologies for archaeological assessment, the possible effects of aggregate extraction on the historic environment, and mitigation measures. Crucially, those mitigation measures included recommendations for how to deal with unexpected discoveries – ones that were made after all other archaeological assessments had been undertaken – and that method was described as a Protocol.

Rather than have many different Protocols for each individual dredging project, BMAPA and English Heritage wanted a single, unified Protocol, applicable to all dredging areas, vessels and wharves, so that reported finds could be explored thematically as well as regionally.

<sup>1</sup> Wessex Archaeology. 2003. *Marine Aggregate Dredging and the Historic Environment*. [www.wessexarch.co.uk/sites/default/files/projects/BMAPA-Protocol/BMAPA-EH-Guidance-Note-April-2003.pdf](http://www.wessexarch.co.uk/sites/default/files/projects/BMAPA-Protocol/BMAPA-EH-Guidance-Note-April-2003.pdf)

Established in 2005 by BMAPA, Historic England and The Crown Estate, the *Protocol for reporting finds of archaeological interest*<sup>2</sup> provides clear guidance for aggregate staff to report finds to the Protocol Implementation Service run by Wessex Archaeology. The finds can then be investigated, with specialist support, helping protect significant sites and build understanding of our past.

BMAPA member companies adopted the Protocol voluntarily since 2006, though adherence to the Protocol is now regularly a formal condition of consent for new marine licences and licence renewals. In subsequent years, additional supporting guidance was developed, covering Palaeolithic and Mesolithic Archaeology on the Seabed<sup>3</sup> and how to report aircraft material.<sup>4</sup>

In 2024, additional guidance was produced for beach replenishment/nourishment and contract fill projects<sup>5</sup>, after a number of projects indicated that archaeological material had been found after work had been finished. Since aggregate is deposited directly on beaches and during fill projects, there isn't the opportunity for staff at wharves to make discoveries during processing, so additional mitigation measures are required to cover potential discoveries.

## Protocol in practice

Prior to a licence being granted to dredge an area, an intensive investigation is undertaken to identify potential archaeological material on and under the seabed. Using geophysical and geotechnical survey and analysis of available records from various archive sources, archaeologists identify known and suspected sites of archaeological interest within proposed aggregate extraction areas. The known sites are protected through Archaeological Exclusion Zones (AEZs) to ensure that no harm comes to them through dredging activities. Even after this level of investigation, unidentified sites and especially individual artefacts may still be found during dredging works or within dredged cargoes. In response to this, the Protocol was proposed to define a framework through which archaeological

material could be identified, reported, investigated, and crucially, protected. The Protocol ensures that any items of potential heritage importance recovered during aggregate dredging, whether encountered on the seabed, on a dredging vessel or, more commonly, at a wharf after a cargo is landed, can be properly reported, assessed, recorded, conserved and archived. In some instances, further mitigation or monitoring may be required.

## Effectiveness of the Protocol

Since its inception, over **2500** finds have been reported making the Protocol an overwhelming success. The marine aggregate industry has demonstrated that this is a cost-effective mitigation option for protecting cultural heritage that is both fragile and finite.

The Protocol Awareness Programme provides training for wharf and vessel staff to recognise, and report finds of archaeological interest discovered within cargoes without the need for an archaeologist to be present. As a consequence of the success of the Protocol, the model has been adapted and implemented for use in several other industries, and Wessex Archaeology continues to run scheme-specific protocols for other commercial development projects based on the marine aggregate industry model.

<sup>2</sup> [bmapa.org/documents/fullreportingprotocol2005.pdf](https://bmapa.org/documents/fullreportingprotocol2005.pdf)

<sup>3</sup> Wessex Archaeology. 2002. *Palaeolithic and Mesolithic Archaeology on the Sea-bed*. [www.wessexarch.co.uk/sites/default/files/projects/BMAPA-Protocol/mads2.pdf](http://www.wessexarch.co.uk/sites/default/files/projects/BMAPA-Protocol/mads2.pdf)

<sup>4</sup> Wessex Archaeology. 2008. *Annex to the Protocol Guidance on the use of the Protocol for Reporting Finds of Archaeological Interest in Relation to Aircraft Crash Sites at Sea*. [www.scribd.com/document/2174360/Annex-to-the-Protocol-Guidance-on-the-use-of-the-Protocol-for-Reporting-Finds-of-Archaeological-Interest-in-Relation-to-Aircraft-Crash-Sites-at-Sea](https://www.scribd.com/document/2174360/Annex-to-the-Protocol-Guidance-on-the-use-of-the-Protocol-for-Reporting-Finds-of-Archaeological-Interest-in-Relation-to-Aircraft-Crash-Sites-at-Sea).

<sup>5</sup> Wessex Archaeology. 2024. *Marine Archaeological Guidance. Beach Replenishment/Nourishment and Contract Fill Projects*. [www.wessexarch.co.uk/sites/default/files/field\\_file/MarineArchaeologicalGuidance\\_BeachReplenishment\\_0.pdf](http://www.wessexarch.co.uk/sites/default/files/field_file/MarineArchaeologicalGuidance_BeachReplenishment_0.pdf)

## Raising awareness

The Protocol Awareness Programme is funded by BMAPA and The Crown Estate and implemented by Wessex Archaeology. Members of the Protocol Implementation Team promote awareness of the Protocol and keep awareness materials up to date, as well as visiting several wharves and occasionally vessels each year to maintain a close relationship with the staff. Emails between the Implementation Team, Nominated Contacts, wharf managers and Site Champions are encouraged throughout the year to keep a consistent flow of communication. Through emails, phone calls and during the visits, questions can be answered and feedback is gathered so that we can further improve the delivery and content of the Protocol and associated Implementation Service and Awareness Programme.

### The Protocol Awareness Programme:

- Delivers in-person training by an archaeologist during awareness visits to wharves and vessels, providing industry staff with the confidence to identify several different types of archaeological materials through interactive presentation slides as well as understanding the process of reporting and conserving finds of archaeological interest discovered. The training demonstrates the different types of finds that can be encountered, dating from prehistory through to the modern period, by providing a collection of objects that have been previously reported for the wharf and vessel staff to handle;
- Produces the biannual *Dredged Up* newsletter which aims to publicise the Protocol and highlight recent finds and news. The newsletter is sent out to each Nominated Contact, wharf and vessel that implements the Protocol. The most recent issue, Issue 37, printed in Autumn 2025 and all previous *Dredged Up* newsletters can be found online;<sup>6</sup>
- Is available to support and train individual Site Champions to ensure that new and existing staff are familiar with the Protocol, either in person, over the telephone or on virtual calls, or via email; and
- Raises Protocol awareness amongst third parties, such as geotechnical and environmental survey companies working on behalf of the marine aggregate industry, and the general public during conferences and other events.

<sup>6</sup> [www.wessexarch.co.uk/marine-aggregate-industry-protocol-reporting-finds-archaeological-interest](http://www.wessexarch.co.uk/marine-aggregate-industry-protocol-reporting-finds-archaeological-interest)

An awareness visit to Greenhithe Wharf





An awareness visit to Rochester Wharf

## Visits to wharves

The awareness training sessions last around 30 minutes to minimise disruption to the work of the wharf and are often split into two or three sessions so that the wharf can continue operating with a rotation of staff. Each session is designed to be informal and involves an interactive presentation to identify different types of archaeological material, explain the different ways archaeological material can reach the seabed and what to do if it is found in the cargo landed at the wharf or discovered onboard a dredger. The reporting process is also discussed.

A member of the Implementation Team brings an array of archaeological finds previously reported through the Protocol that wharf and vessel staff can handle and discuss. The training also sets out guidelines on what to do if a find is suspected of containing asbestos or if marine invasive non-native species are encountered. The Implementation Team member also brings handouts, laminated scale sheets and branded photo scale cards. The handouts, photo scale cards and scale sheets are designed to be left at the wharf to enable the Site Champions to induct future new employees and so that current employees can refresh their memories. Questions can be asked at any time during the training and an informal discussion is usually had at the end of the presentation.

After an awareness visit, training certificates are emailed to the Site Champions to give to

all wharf or vessel staff who have received the awareness training so that they may add them to their working portfolios.

Contact is maintained through regular emails, the Marine Aggregate Industry Archaeological Protocol Facebook page, the annual report and the *Dredged Up* newsletters and, of course, through any reports made via the Protocol.

All archaeological awareness materials can be accessed through the Protocol pages on Wessex Archaeology's website<sup>7</sup> and are available in English, Dutch and French.

The Protocol Implementation Team firmly believe that these visits are key to the success of the scheme as it promotes enthusiasm, increases knowledge and resolves issues. As well as delivering the training, the visits allow Wessex Archaeology to maintain contact with wharves and vessels; keep the content fresh; boost interest in the Protocol; and promote it to both new and existing staff.

If you would like to arrange a Protocol Awareness Visit or would like to receive more advice on finds and finds reporting, please contact Wessex Archaeology via [protocol@wessexarch.co.uk](mailto:protocol@wessexarch.co.uk)

<sup>7</sup> [www.wessexarch.co.uk/marine-aggregate-industry-protocol-reporting-finds-archaeological-interest](http://www.wessexarch.co.uk/marine-aggregate-industry-protocol-reporting-finds-archaeological-interest)

## Dredged Up Newsletter

In 2024–2025, two issues of the biannual *Dredged Up* newsletter were produced: Issue 36 and Issue 37.

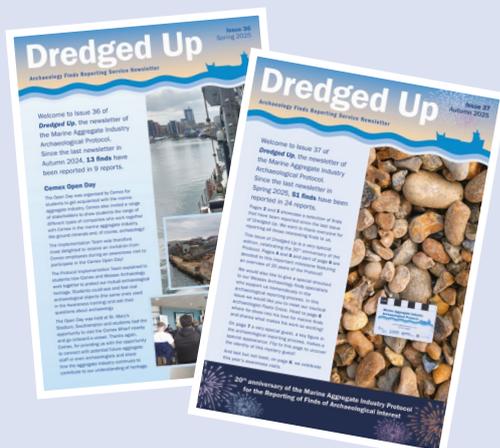
Issue 36 was released in May 2025 and outlined some of the year's finds as well as publishing the winners of the annual Finds Awards. This issue featured an insight into the Wessex Archaeology finds process and an interview with one of our specialists.

Issue 37 was distributed in November 2025 and featured the latest 'Finds Round Up'. In this issue we celebrated the 20th anniversary of the Protocol and featured an exclusive interview with the Receiver of Wreck, Stephen White.

The newsletters are distributed to every wharf, all vessels and BMAPA member companies as well as The Crown Estate, Historic England, the Receiver of Wreck and a variety of other organisations, individuals and the general public during conferences and events.

A wider audience is reached with the digital copy of the newsletter that is posted on the Marine Aggregate Industry Archaeological Protocol Facebook page and Wessex Archaeology's social media platforms, including Facebook and LinkedIn. Digital editions of all the newsletters are available to download from Wessex Archaeology's website.<sup>8</sup>

The newsletters reach a wide audience to promote the operation of the Protocol and provide a positive showcase for the industry's activities. They are also an important tool for raising and maintaining awareness and interest by publicising dredged finds and the dredging process.



<sup>8</sup> <https://wessexarchaeologylibrary.org/library/repository/search/Dredged%20Up/>



Above: Stephen White (left) with the Carentan Bell handover from Anthony Reed; and below: Stephen's favourite recent find, a hand grenade, Heidelberg\_1189

## Finds Awards

The 2023–2024 Finds Awards were made to the following wharf and vessels, published in Issue 36 of *Dredged Up*. The 2024-2025 Finds Awards will be based on this past year, and the Protocol finds reports collated in the appendix of this report.

### Best Find

The best find of the 2023-2024 reporting year went to **Heidelberg\_1132** (see image below) reported from Frindsbury Wharf. This find consists of a pair of cylinders. Both cylinders are the same size and type, with clearly visible markings embossed around the top of the cylinders by the valves. The cylinders were identified as being manufactured and used by the German Luftwaffe during the Second World War. The operating altitude of aircraft during the Second World War was such that oxygen was needed to be carried inside the aircraft so that the pilots could breathe. A single engine fighter aircraft could be equipped with a pair of cylinders like this, while larger multi-crew aircraft could need over a dozen.

Unfortunately, the generic and ubiquitous nature of these cylinders means it was not possible to connect these items to any one particular aircraft. The stamping around the neck of the cylinders relates to dates of manufacture and pressure testing. As these cylinders were found without any kind of rack or fittings it is unlikely that they come from a larger aircraft. The type of cylinder does suggest a date early in the Second World War, around 1940. Later cylinders were coated with a dark blue anodic finish, and then towards the end of the war they would change to a more bulbous shape.

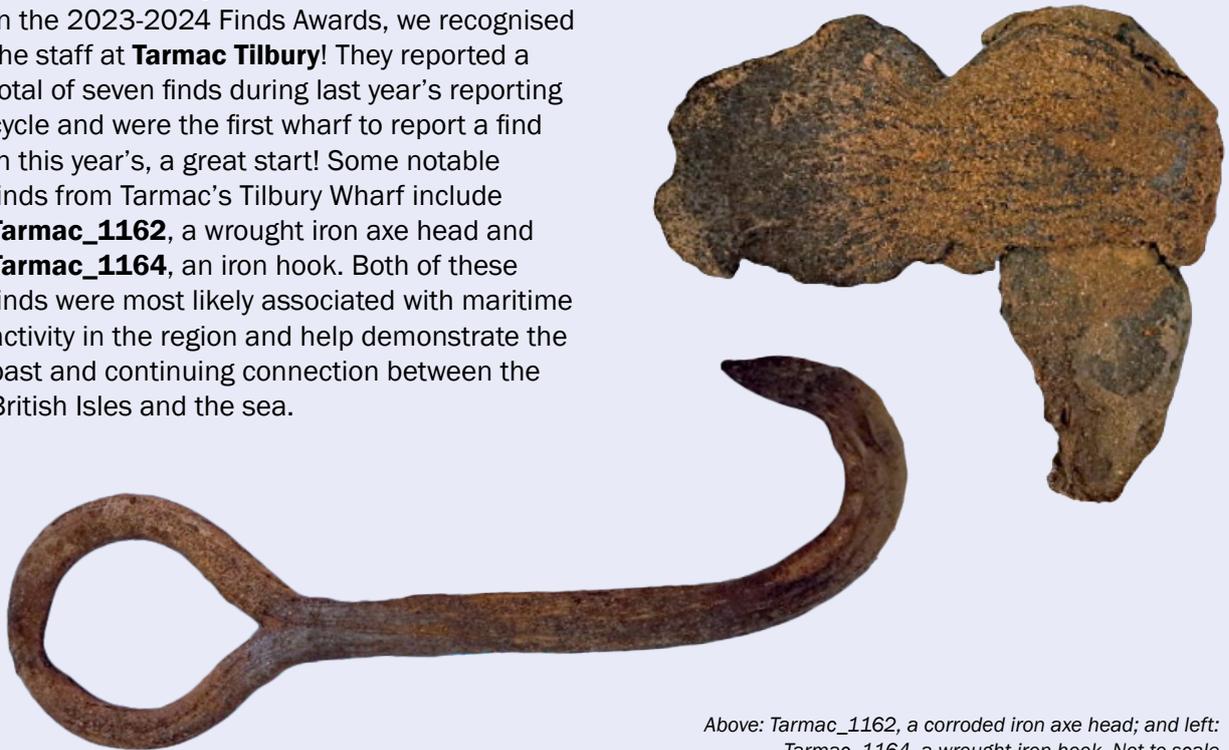
It is unsurprising that aircraft finds are among some of the most interesting that are recovered during marine aggregate dredging. Due to the Second World War, there are more aircraft wrecks in the waters around the UK than anywhere else in the world. Dredging crews and wharf staff should remain observant for any aircraft material that may be recovered in the future, as it helps us better understand a crucial period of our military past and better remember the sacrifices of those men and women who lived through it.

*Below: Early Second World War Luftwaffe oxygen bottles*



### Best Attitude by a Wharf

In the 2023-2024 Finds Awards, we recognised the staff at **Tarmac Tilbury**! They reported a total of seven finds during last year's reporting cycle and were the first wharf to report a find in this year's, a great start! Some notable finds from Tarmac's Tilbury Wharf include **Tarmac\_1162**, a wrought iron axe head and **Tarmac\_1164**, an iron hook. Both of these finds were most likely associated with maritime activity in the region and help demonstrate the past and continuing connection between the British Isles and the sea.



Above: Tarmac\_1162, a corroded iron axe head; and left: Tarmac\_1164, a wrought iron hook. Not to scale

### Best Attitude by a Vessel

This year we would like to congratulate the crew of Cemex's **Britannia Beaver**. For the second year in a row, they have gone above and beyond, reporting 13 finds during the 2023–2024 reporting year. A particularly nice find was **Britannia\_1107**, a parachute buckle. This find dates from the Second World War and is an extremely personal find. A functioning parachute was a vital piece of equipment to Allied airmen.

Below: Second World War parachute buckle



## Reporting process

Archaeological finds identified by wharf and vessel staff are reported through a Site Champion to the designated Nominated Contact of the company owning the wharf or vessel.

The process is designed so that the Nominated Contact uploads the images and information about the discovery to the secure online console, using the Preliminary Record Form.<sup>9</sup> The console alerts the Protocol Implementation Service operated by Wessex Archaeology and the find is added to the database.

In some instances, a Site Champion may prefer to report the material directly to the Protocol Implementation Team rather than going through the Nominated Contact. In any case, the Nominated Contact should be informed and will be included on any further correspondence between the Protocol Implementation Team and the finder.

If the find is classed as wreck material, it will need to be reported to the Receiver of Wreck under the *Merchant Shipping Act 1995* by the Nominated Contact via the Receiver’s online form.<sup>10</sup> The Nominated Contact should then provide the Protocol Implementation Service with the ID provided by the Receiver of Wreck, to ensure that finds can be identified using either the unique Protocol ID or Receiver of Wreck ID in the future.

The Protocol Implementation Team investigates the find and may send photographs and information to external specialists for additional interpretation, before compiling a report. Most of the reports are presented on an A4 page and will have an image of the object taken with a scale for reference.

The Protocol Implementation Team then communicates directly with the Nominated Contact and/or Site Champion regarding the archaeological importance of the discovery, its conservation and any storage recommendations.

The Nominated Contacts for each company during the 2024-2025 reporting year are detailed below.

BMAPA company	Nominated Contact	Position
Britannia Aggregates Ltd	Will Drake	General Manager Volker
CEMEX UK Marine Ltd	Samantha Ringwood Joe Holcroft	GIS & Licence Co-ordinator Resource Manager
DEME Building Materials Ltd	Christophe Matton Tom Janssens	Marine Resources Manager General Manager
Heidelberg Aggregates Marine Ltd	Amy Stewart Bryn Lockwood	Marine Geology Manager Marine Licence Manager
Isle of Wight Aggregates	Edward Skinner	Marine Resources Coordinator
Kendall Bros Ltd	Paul Stevens	Site Foreman
Tarmac Marine	Edward Skinner	Marine Resources Coordinator
Volker Dredging Ltd	Will Drake	General Manager

<sup>9</sup> <https://www.wessexarch.co.uk/preliminary-record-form-pdf>

<sup>10</sup> [www.gov.uk/report-wreck-material](http://www.gov.uk/report-wreck-material)

## Disseminating the results

Planning conditions relating to archaeology are placed on developments and dredging areas, which include a duty to publicise the results of archaeological investigations to the relevant bodies.

Once a find is reported to the Protocol Implementation Service, it is researched and compiled into a report. Details of the dredged finds are then disseminated to:

- The Site Champion who reported it
- The Nominated Contact
- Historic England
- BMAPA
- The Crown Estate
- The National Marine Heritage Record (NMHR), maintained by Historic England
- The appropriate local Historic Environment Record (HER)
- The Receiver of Wreck, if applicable
- The Ministry of Defence, if applicable

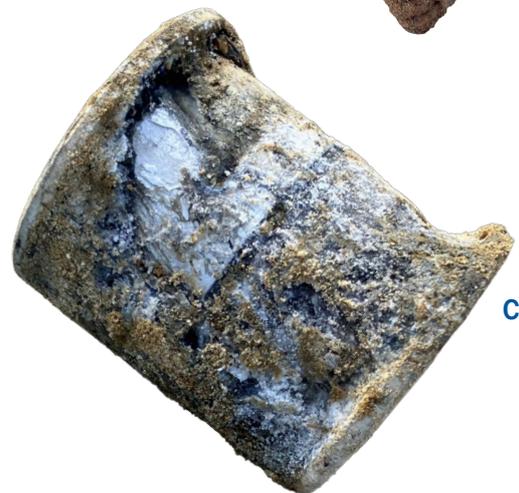
If considered wreck material, finds are reported to the Receiver of Wreck in compliance with the *Merchant Shipping Act 1995* and they receive a unique report number, commonly known as a droit. All aircraft material is reported to the Receiver of Wreck along with the Ministry of Defence as it may relate to the *Protection of Military Remains Act 1986*.

Finds can also be explored through the Protocol's StoryMap<sup>11</sup> which includes information about the Protocol, the Awareness Programme, dredged discoveries from Licence Area 240 and the wider Palaeo-Yare landscape, and Operational Sampling where tonnes of aggregate brought back to wharves are assessed by archaeologists for artefacts.

All finds, old and new, are also published on the Marine Aggregate Industry Archaeological Protocol Facebook page that was set up in March 2017.<sup>12</sup>

Each annual report also publishes all the individual reports for finds that were made during that reporting year (see the back pages of this report), and previous annual reports are all available to download.<sup>13</sup>

In addition, the discoveries and achievements of the staff involved with the Protocol are acknowledged through various publications produced by Wessex Archaeology, including the biannual *Dredged Up* newsletter, also available to download via the previous link.



Above, a selection of finds reported to the Protocol over the past year. A: Tarmac\_1214, an anchor fragment; B: Heidelberg\_1211, a cattle bone; and C: Cemex\_1175, a modern metal guide wheel. For more details see the back pages of this report.

<sup>11</sup> [storymaps.arcgis.com/stories/2968f0b4062245ee815d04124bbd9368](https://storymaps.arcgis.com/stories/2968f0b4062245ee815d04124bbd9368)

<sup>12</sup> [www.facebook.com/marineaggregateindustryarchaeologicalprotocol/?ref=aymt\\_homepage\\_panel](https://www.facebook.com/marineaggregateindustryarchaeologicalprotocol/?ref=aymt_homepage_panel)

<sup>13</sup> [www.wessexarch.co.uk/marine-aggregate-industry-protocol-reporting-finds-archaeological-interest](https://www.wessexarch.co.uk/marine-aggregate-industry-protocol-reporting-finds-archaeological-interest)

## Artefact patterns and distribution

This year **61** finds have been reported. These have been added to a database of over 2500 finds reported since the launch of the scheme in 2005.

Through the use of a Geographical Information System (GIS; ArcGIS Pro 3.4.5), patterns and trends such as artefact discovery location and concentration can be studied. During the reporting process, the Site Champions or Nominated Contacts are asked to give the licence area number where the object originated from, if known, as well as the dredging vessel's route known as a trackplot, in order to provide greater accuracy of the location of the discovery. This allows us to assess finds both within the licence area and on a regional basis, which is helpful when considering future licence applications within existing dredging regions. Patterns in artefact concentration can potentially identify sites of archaeological interest or debris fields or, alternatively, licence areas which are more likely to yield finds of archaeological interest in the future. When a large concentration is discovered from one area, it is useful to look back at previous years to compare what that particular licence area has yielded in the past.

Archaeological Exclusion Zones (AEZs) are also visible in the GIS map, which is useful when plotting finds, particularly those of archaeological importance, as they could be related to material within the AEZ. The GIS map is updated every time a new AEZ is implemented. This information is then sent to relevant organisations (aggregate companies that are licenced to work in those areas, local HERs, the NMHR, etc).

Archaeological material is not distributed evenly on the seabed. Some areas have a higher potential than others to contain material that entered the archaeological record either accidentally or deliberately. Some areas, such as the East Coast, are known to have had Palaeolithic activity when sea levels were much lower than the present day. Other areas are known to be post-Second World War dumping grounds, which have become apparent from artefact type and quantity in these areas.

We also know which licence areas tend to yield more munitions and should be approached with caution.

The kind of dredger used to dredge the seabed may also play a role in the quantity of archaeological material recovered. Contract vessels are larger and have a greater dredging capability, therefore they usually dredge deeper into the seabed. This may result in more material being discovered in the cargo which is why information of the delivering vessel is also requested when a discovery is reported.

The survival of artefacts will depend on the marine environment in which they lie. Most of the finds reported this year, as in previous years, are modern and made of metal, which is not unusual as this material tends to be more durable within a harsh underwater environment in comparison to finds made of organic materials. Finds such as bone and teeth from submerged prehistoric landscapes or wooden shipwrecks may be poorly preserved, unless they are buried beneath fine-grained sediments, which may account for the low percentage of finds reported of these materials.

For finds to be discovered, the high potential for loss or discard must coincide with a high potential for the preservation of archaeological materials.

Based on potential and survival, some licence areas will therefore contain more archaeological remains than others and may be associated with more specific time periods than others. Other factors, such as whether finds are discovered in isolation or grouped with similar items, also add to their context. In most cases, objects are reported as single, isolated finds, but we do occasionally receive reports of multiple items found in the same location - this year aircraft material and munitions are prime examples. The significance of a find can therefore depend on its location as much as the nature of the object itself.



## Distribution of artefacts by dredging region

There are seven dredging regions around the UK:

- Humber
- East Coast
- Thames Estuary
- East English Channel
- South Coast
- South West
- North West

In 2024-2025, 23 reports came from the East Coast, three reports came from the East English Channel and five from the South Coast.

One report was from an unknown region as the finds were discovered on the wharf's electromagnet and one report came from two mixed cargoes from either the Humber or the East Coast.

No (direct) reports were received from cargoes dredged from the Humber, Thames Estuary, North West or South West regions.

**2024 data:** [datocms-assets.com/136653/1746700986-mineral-summary-statistics-2025.pdf](https://datocms-assets.com/136653/1746700986-mineral-summary-statistics-2025.pdf)

**2023 data:** [datocms-assets.com/136653/1733131478-marine-aggregates-annual-review-2024.pdf](https://datocms-assets.com/136653/1733131478-marine-aggregates-annual-review-2024.pdf)

Region	Millions of tonnes of construction aggregate dredged		Number of finds reported through the Protocol	
	2023	2024	2023-2024	2024-2025
Humber	3.69	3.32	0	0
East Coast	3.60	3.10	73	50
East Coast or East English Channel	-	-	0	0
East Coast or Humber	-	-	0	1
Thames Estuary	1.69	1.39	2	0
East English Channel	4.60	3.81	12	4
South Coast	3.65	3.81	20	5
South West	1.3	1.28	0	0
North West	0.22	0.23	0	0
Unknown	-	-	0	1
Terrestrial location	-	-	0	0
<b>Totals</b>			<b>107</b>	<b>61</b>



## Distribution of Maritime artefacts by date and archaeological typology

### Ship-derived artefacts

Maritime artefacts relate to artefacts that are connected to human activities or life at sea, such as sailing, navigating or trading. Several finds reported this year are believed to be maritime in nature. Among them was a very rare find, a mariner's lantern (**Brett\_1171**, seen right).

None of the maritime artefacts derived from ships were thought to be directly related to a wreck site. The finds all appear to be isolated discoveries, which could have been lost overboard, purposely dumped at sea or have been moved along the seabed from wreck sites elsewhere.

### Ordnance and munitions

Several munitions, such as a grenade (**Heidelberg\_1189**) and a machine gun barrel (**Brett\_1180**), were reported through the Protocol this year.

It is always advised that wharf staff should ensure that company Health & Safety policies are followed before any ordnance or munitions are reported through the Protocol.

### Aircraft material

There were several aircraft fragments this year. All aircraft material were reported to the Receiver of Wreck and the Ministry of Defence.



Archaeological typology	Number of finds	Number of reports	Date
Prehistoric finds	3	3	Palaeolithic - modern
Maritime artefacts	7	4	post-medieval - modern
Ordnance and munitions	7	6	post-medieval - modern
Aircraft material	20	6	modern
Non-archaeological	24	14	early modern - modern

## Reports in 2024-2025

During the 20th year of operation, Wessex Archaeology received 33 reports through the Protocol Implementation Service. These reports encompassed details of 61 separate finds. Further details of each discovery are shown below and included in the Protocol finds reports appended to this report.

### Finds reported in 2024-2025

Report ID	Description	Licence Area	Region	Location of Discovery	Quantity
Cemex_1158	Cannon ball	458	East Sussex	Wharf	1
Tarmac_1170	Cannon ball	254	Norfolk	Wharf	1
Brett_1171	Mariners lantern	340	Isle of Wight	Wharf	1
Cemex_1172	Aircraft fragment	512	Norfolk	Wharf	1
Cemex_1173	Animal bone	512	Norfolk	Wharf	2
Cemex_1174	Rope fragment	512	Norfolk	Wharf	1
Cemex_1175	Roller wheel	512	Norfolk	Wharf	1
Heidelberg_1176	Animal bone	473/1	East Sussex	Wharf	1
Heidelberg_1177	Animal bone	473/1	East Sussex	Wharf	1
Heidelberg_1178	Wooden ship components	240	Norfolk	Wharf	4
Brett_1180	Machine gun barrel	340	Isle of Wight	Wharf	1
Cemex_1181	Aircraft fragments	512	Norfolk	Wharf	11
Cemex_1182	Aircraft component	512	Norfolk	Wharf	1
Cemex_1183	Aircraft electrical component	512	Norfolk	Wharf	1
Cemex_1184	UXO casings	512	Norfolk	Wharf	2
Cemex_1185	Wooden boat plank	512	Norfolk	Wharf	1
Tarmac_1186	Iron nail	500/3	Isle of Wight	Vessel	1
Brett_1188	Coupling	351	Isle of Wight	Vessel	1
Heidelberg_1189	Grenade	240	Norfolk	Wharf	1
Cemex_1190	Electric motor	340	Isle of Wight	Vessel	1
Tarmac_1191	Wooden find	254	Norfolk	Wharf	1
Heidelberg_1194	Iron	Unknown	Unknown	Wharf	1
Heidelberg_1195	.50 BMG casing	401/2	Norfolk	Wharf	1
Heidelberg_1196	Aircraft fragments	401/2	Norfolk	Wharf	2
Heidelberg_1197	Aluminium plaque	401/2	Norfolk	Wharf	1
Heidelberg_1198	Aircraft fragments	361B	Norfolk	Wharf	4
Cemex_1199	Metal object	1803	East Sussex	Vessel	1
Heidelberg_1206	Metal object	240	Norfolk	Wharf	1
Heidelberg_1207	Iron object	240	Norfolk	Wharf	1
Heidelberg_1208	Metal objects	240	Norfolk	Wharf	9
Heidelberg_1211	Cattle bone	240	Norfolk	Wharf	1
Heidelberg_1212	Aluminium fragment	240	Norfolk	Wharf	2
Tarmac_1214	Anchor fragment	430 or 493	Suffolk or East Riding of Yorkshire	Wharf	1

## Specialists

This year, like previous years, we have a team of amazing specialists aiding in the identification of archaeological finds from the Protocol.

Members of the Protocol Implementation Team do their best to identify and research each and every find, but sometimes additional help is needed, and both in-house experts at Wessex Archaeology and external specialists, companies and organisations are consulted. It's a great way to find out more information about objects, with regards to their identification, age and possible source. Since the implementation of the Protocol in 2005, the number of willing and valuable experts we consult has grown to include a range of fields.

The table below provides a list of the specialists who gave advice during the 2024–2025 reporting year. Specialists that we have contacted in the past but not during this operational year are still included in Wessex Archaeology's internal lists but have been omitted from the table below. We are extremely grateful to all the specialists who have assisted in the identification of Protocol finds over the last 20 years. That is why we added a special section to *Dredged Up* to introduce different specialists who aid the Protocol Implementation Team in their research.

*Below: Rachel Seager Smith (Wessex Archaeology) a finds specialist*

Expert	Advice given concerning	Institution/organisation/role
Stephanie Said	Martime artefacts	Wessex Archaeology
Paolo Croce	Martime artefacts	Wessex Archaeology
Graham Scott	Martime artefacts	Wessex Archaeology
Lorrain Higbee	Zooarchaeology	Wessex Archaeology
Rachel Seager Smith	Finds specialist	Wessex Archaeology
Phil Andrews	Technical specialist	Wessex Archaeology
Jonathan Ferguson	Ordnance	Royal Armouries Museum
Mark Khan	Ordnance	Command Post Media
Steve Vizard	Aircraft	Airframe Assemblies



## Liaison and accessibility

Details of each discovery have been sent to:

<b>Mark Russell</b>	British Marine Aggregate Producers Association
<b>Stuart Churchley</b>	Historic England, Marine Planning Archaeological Officer
<b>Yingying Yan</b>	Historic England, Marine Historic Environment Record Officer
<b>Neil Guiden</b>	Historic England, Data and Analysis Manager
<b>Serena Cant</b>	Historic England, Marine Information Officer
<b>Kathryn Miles</b>	Historic England, Historic Environment Record (HER) Manager
<b>Andrew Cameron</b>	The Crown Estate
<b>Nick Everington</b>	The Crown Estate
<b>Mark Wrigley</b>	The Crown Estate

The Protocol received a number of reports of artefacts which may relate to vessels considered to be wreck material and aircraft material, these reports were forwarded to the Receiver of Wreck (see chapter ‘wreck and aircraft material’ below). If, however, reported finds relate directly to unknown and uncharted wreck sites or aircraft crash sites, the reports need to be forwarded to the United Kingdom Hydrographic Office (UKHO). All finds in the 2024-2025 reporting year appear to be isolated finds and are therefore not forwarded to the UKHO office.

Information on each find has been forwarded to each county’s HER (Historic Environment Record) relevant to the location of the archaeological discovery. In the case of a discovery where the original location is known, this will be the HER closest to the dredging licence area. Discoveries made at wharves where the licence area is unknown are reported to the HER nearest to the wharf.

Further details of liaison and the dissemination of data to interested parties are included in the Protocol finds reports appended to this report.

## Wreck material

Details of discoveries regarded as wreck under the Merchant Shipping Act 1995 have been forwarded to the Receiver of Wreck Stephen White and Deputy Receiver of Wreck Andrea Bailey. In 2024-2025, the following reports were deemed to represent items of wreck, and the table includes the droit numbers assigned by the Receiver of Wreck:

Report ID	Droit number
Cemex_1158	173/24
Tarmac_1170	291/24
Brett_1171	308/24
Cemex_1172	307/24
Cemex_1174	307/24
Cemex_1175	307/24
Heidelberg_1178	313/24
Brett_1180	019/25
Cemex_1181	038/25-01
Cemex_1182	038/25-02
Cemex_1183	038/25-03
Cemex_1184	038/25-04
Cemex_1185	038/25-05
Tarmac_1186	058/25
Brett_1188	079/25-01
Heidelberg_1189	111/25
Cemex_1190	098/25
Tarmac_1191	109/25
Heidelberg_1194	118/25
Heidelberg_1195	126/25-01
Heidelberg_1196	126/25-02
Heidelberg_1197	126/25-03
Heidelberg_1198	161/25
Cemex_1199	203/25
Heidelberg_1206	188/25
Heidelberg_1207	189/25
Heidelberg_1208	187/25
Heidelberg_1212	263/25
Tarmac_1214	236/25-01

### Aircraft material

This year six reports have been related to aircraft (see appended Protocol finds reports for more details). Details of discoveries regarded as potential military aircraft have been forwarded to the Ministry of Defence.

Report ID	Description
Cemex_1172	Aircraft fragment
Cemex_1181	Aircraft fragments
Cemex_1182	Aircraft component
Cemex_1183	Aircraft component
Heidelberg_1196	Aircraft fragments
Heidelberg_1198	Aircraft fragments



*Heidelberg\_1196, discovered in material from Area 401/2 at Dagenham Wharf, comprising two aluminium aircraft fragments*



*Cemex\_1181, discovered in material from Area 512 at Northfleet Wharf, comprising eleven aluminium aircraft fragments. Not to scale.*

## Protocol updates 2024-2025

The number of reports each year and the ongoing success of the Protocol confirms that it is as relevant now as it was in 2005. The support of the marine aggregate industry has once again been substantial, with the continued high standard reporting of archaeological finds through the Protocol and the welcome that the Implementation Team have received during wharf visits.

Marine aggregates are an essential component of the UK building materials supply chain, and the anticipated scale and speed of marine development is leading to increasing competition for seabed space and environmental capacity.

### Awareness visits

This year two visits have been conducted to Heidelberg wharfs. Special thanks to Heidelberg Rochester and Heidelberg Greenhithe for the warm welcome and the keen interest of the staff. A special thanks also goes to the Nominated Contact from the Rochester Heidelberg Wharf who provided the Implementation Team with a well-preserved mammoth bone stored in its own bucket of water.

The awareness visits proved to be once again very valuable. Once the presentation has been given, the visits then provide the opportunity for staff, Nominated Contacts and Site Champions to discuss their discoveries with a member of the Protocol Implementation Team, and have any general questions regarding the Protocol including law and regulations answered. Future visits to the wharves to give the archaeological awareness training will be arranged for 2026 and it is hoped that Historic England and the Receiver of Wreck will be able to come along on one of the visits.

### Implementation team

This year we welcome a new member to our Protocol Implementation Team, Beccy Scott. She is a Principal Marine Geoarchaeologist and a Neanderthal stone tool specialist, and she is particularly interested in animal bones from the seabed. She is working on a number of projects investigating submerged landscapes around the UK.

### Dredged Up

Our Protocol Implementation Team works hard to investigate each find reported through the Protocol. But in archaeology you can't simply be an expert in everything, and we often seek advice from our in-house specialists at Wessex. To introduce and celebrate our experts we introduced a new section in *Dredged Up: The Wessex Archaeology Specialists!* In the upcoming *Dredged Up* issues, you will find exclusive interviews with our experts. Further information about the Protocol and the Protocol Implementation Service is available online: [www.wessexarch.co.uk/our-work/marine-aggregate-industry-protocol-reporting-finds-archaeological-interest](http://www.wessexarch.co.uk/our-work/marine-aggregate-industry-protocol-reporting-finds-archaeological-interest).

To contact the Protocol Implementation Service, email [protocol@wessexarch.co.uk](mailto:protocol@wessexarch.co.uk) or phone **01722 326 867**.



An awareness visit to Rochester Wharf

## Case study – Protocol 20th anniversary celebration!

The Protocol has been in effect for 20 years and during this time archaeological finds have been reported from far and wide. Each find provided important information such as location and material, which were diligently recorded by wharf and vessel staff and provided to the Protocol Implementation Team. The finds were then thoroughly researched by the Protocol Implementation Team at Wessex Archaeology and relevant internal and external specialists, which added extra information to enhance the finds database about archaeological period and find type. All this data combined shows us valuable information about patterns and spatial distribution which can even be used to pinpoint Palaeolandscapes or wreck sites.

In the Annual Report for Protocol year 2019-2020, 15 years of Protocol finds were celebrated and the total number of finds was presented. In this case study, we will build on that data by providing an overview of 20 years Protocol and take a closer look at data from the last five Protocol years.

### Summary of the first 15 years of the Protocol

As the Annual Report from 2019-2020 was published some time ago, this case study will begin with a very brief recap. The East Coast contained the most finds, followed by the South Coast and the East English Channel. The find category 'miscellaneous' contained the most reported finds overall.

Licence Areas 430, 360 and 240 reported the highest number of finds since the Protocol's inception in 2005.

### 20 years of Protocol - archaeological finds and reports

Over **2500** finds have been reported since the start of the Protocol. The number of finds reported per Protocol year has fluctuated over time, shown in **Figure 1**, with a peak in the first Protocol year following its initial implementation when wharves began reporting all their accumulated finds.

The number of finds reported each year depends on several factors: the lanes or areas licensed for dredging, Operational Sampling visits, the vigilance of staff in reporting finds, and the effectiveness of the Protocol outreach. Even the COVID-19 pandemic can be observed in the data, as restrictions on close human contact temporarily affected reporting and field operations.

### Archaeological finds and reports by licence area

In the last 20 years of the Protocol, Licence Areas 240, 430 and 360 represent the three hot spots for archaeological discoveries, as shown in **Figure 2**. This partially aligns with the data from the 2019-2020 Annual Report, which identified Areas 240 and 430 as leading locations for archaeological finds.

Area 240 became well-known after a range of Palaeolithic artefacts, including handaxes, flakes, cores as well as remains of large fauna, were found at SBV Flushing Wharf in the Netherlands in February 2008 and reported through the Protocol. These finds were exceptionally well-preserved and provided evidence of a previously unknown and particularly rare area of early human activity.

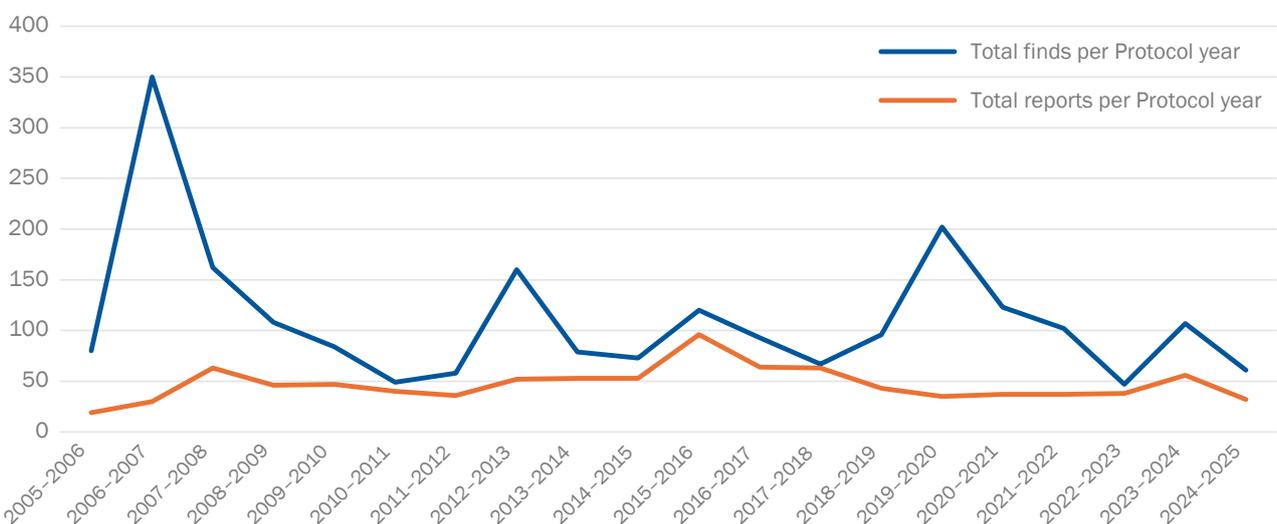


Figure 1 – Total number of finds and reports shown by Protocol year.

Over the years, additional Palaeolithic remains from Area 240, including further hand axes, worked flint tools and animal bones, were reported through the Protocol, sparking significant research into this area. As a result of these discoveries and studies, it is now recognised that there is a hotspot of Middle Palaeolithic (200,000 to 300,000 years ago) activity in Area 240, in a wider submerged prehistoric landscape. The evidence that has been recovered is therefore of great importance to the cultural understanding of prehistoric landscapes around the UK coastline.

More information about the significance of the discoveries from Licence Area 240, and from aggregate licences in the wider Palaeo-Yare region, along with details of more recent finds, can be found in a case study in the Annual Report from 2019-2020 as well as the Palaeo-Yare Five Year Review (Wessex Archaeology 2021<sup>14</sup>), and a recent journal article The Submerged Palaeo-Yare: New Middle Palaeolithic Archaeological Finds from the Southern North Sea (Shaw *et al.* 2023<sup>15</sup>).

In comparison, in Area 430, an assemblage of aircraft material was discovered in 2007, when wharf staff reported aircraft wreckage and a human bone. More information about this find can be accessed in a case study in the Annual Report from 2006-2007. Area 430 is also located very close to two famous 17th century naval battles: the Battle of Lowestoft and the Battle of Sole Bay. Some cannon balls found in this area are likely related to these Anglo-Dutch wars. In the 2007-2008 Annual Report a detailed case study can be found about the cannonballs from Licence Area 430 and their potential association to the Anglo-Dutch wars.

Interestingly, some of the finds dredged from Area 360 and reported through the Protocol relate to Palaeolithic bone material. In the first year of the Protocol (2005-2006) Cemex wharf staff reported a peat layer full of animal bone and struck flint.

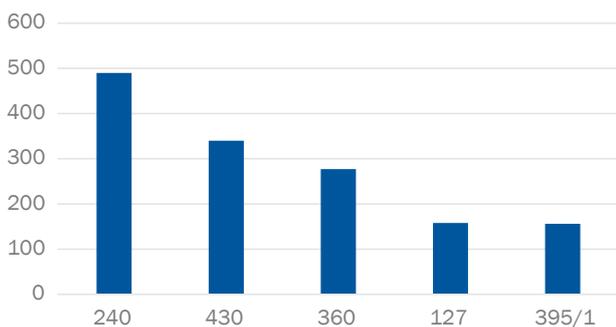


Figure 2 – Total number of finds by leading licence area

As can be seen in **Figure 3**, the largest number of reports were attributed to an unknown licence area. Although we try to determine provenance where possible, it sometimes happens that several cargoes are processed at the same time or material is found in an unknown oversize pile.

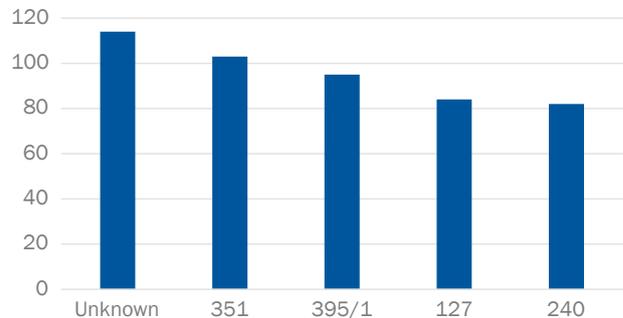


Figure 3 – Total number of reports shown by licence area

### Protocol 2020-2025 - total archaeological finds per dredging region

Let's dive deeper into the data from the last five years of the Protocol. In total, **440** finds were reported from 2020 to 2025. Most of these discoveries were made at the wharves within aggregate dredged from known licence areas, although some finds were found onboard the dredging vessels.

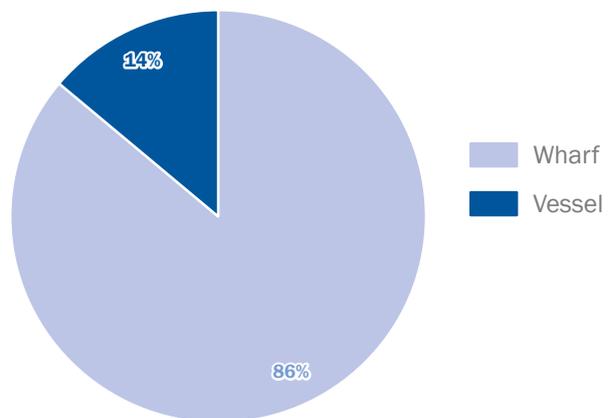


Figure 4 – Percentage of finds discovered at a wharf or on a vessel

14 Wessex Archaeology. 2021. Palaeo-Yare Catchment Monitoring: Interpretative Report. Five Year Review of Operational Sampling: January 2015 to December 2019. Salisbury report ref. 226020.03. [https://archaeologydataservice.ac.uk/archiveDS/archiveDownload?t=arch-425-1/dissemination/pdf/wessexar1-502396\\_118898.pdf](https://archaeologydataservice.ac.uk/archiveDS/archiveDownload?t=arch-425-1/dissemination/pdf/wessexar1-502396_118898.pdf)

15 Shaw *et al.* 2023. 'The Submerged Palaeo-Yare: New Middle Palaeolithic Archaeological Finds from the Southern North Sea', in Cambridge University Press, *Proceedings of the Prehistoric Society* 89, 273-297. Oxford: Cambridge University Press. <https://www.cambridge.org/core/journals/proceedings-of-the-prehistoric-society/article/abs/submerged-palaeoyare-new-middle-palaeolithic-archaeological-finds-from-the-southern-north-sea/8899E8585038DC719E16502433C53837>

Let's begin by taking a closer look at an overview of archaeological finds sorted by region. **Figures 5 to 10** present the finds recorded for each dredging region over the past five years. In all figures, the total number of finds is shown in relation to the material type.

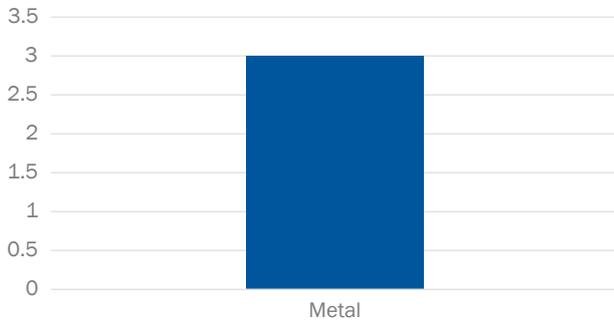


Figure 5 – Total number of finds shown by material type for the Humber

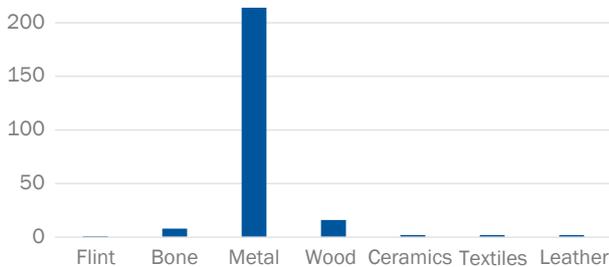


Figure 6 – Total number of finds shown by material type for the East Coast

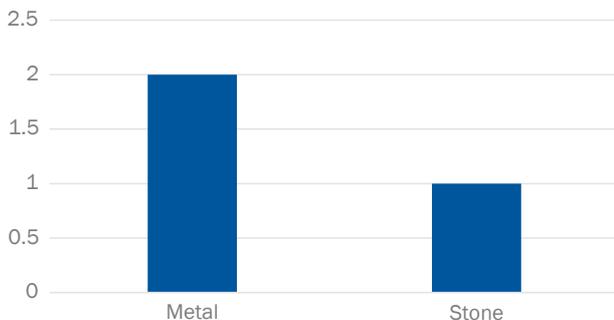


Figure 7 – Total number of finds shown by material type for the Thames Estuary

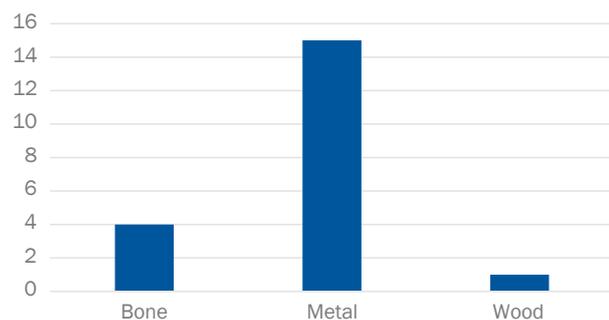


Figure 8 – Total number of finds shown by material type for the East English Channel

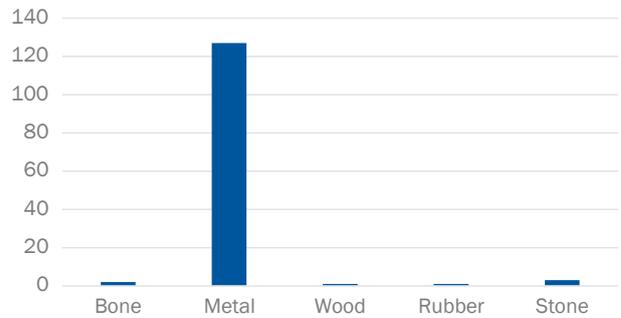


Figure 9 – Total number of finds shown by material type for the South Coast

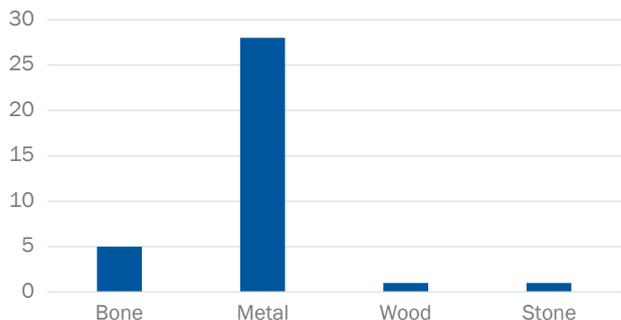


Figure 10 – Total number of finds shown by material type for Mixed/Unknown region

As shown in these figures, metal is the most frequently found material type, followed by bone and wood.

The region with the highest number of finds is the East Coast, followed by the South Coast. This aligns with the data from the 2019-2020 Annual Report. The North West and South West regions did not yield any finds in the past five years. These results differ from the 2019-2020 Annual Report, which recorded finds in both of these regions.

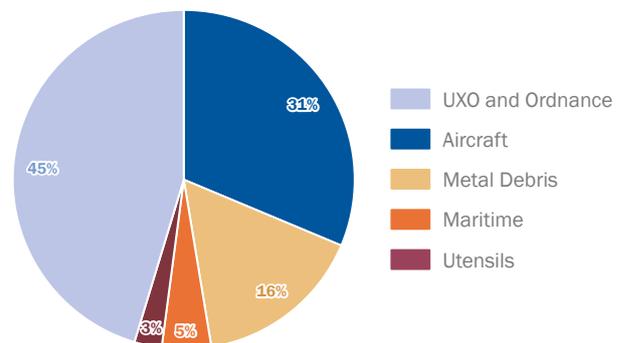


Figure 11 – Total number of metal finds shown by find category

**Protocol 2020-2025 – material types**

As stated previously, metal objects are found most often, with the majority discovered in the East Coast Region. However, metal is a very broad category. When we split these data into different find categories, unexploded ordnance (UXO) and ordnance emerge as the largest find group, followed by aircraft-related material (**Figure 11**).

Most UXO and ordnance finds originate from Licence Area 340, while most aircraft-related finds come from Licence Area 512.

Licence Area 340, located east of the Isle of Wight reported several UXO and ordnance related finds. It is believed that this area was either used for training for the British military or as a dumping place for ordnance after the war. Some of the UXO and ordnance is aircraft-related, and these finds contribute to our understanding of the aerial battles fought in the Second World War around the Isle of Wight and south coast. These finds were studied in a case study in the Annual Report from 2022-2023.

The second-largest category consists of animal bone (**Figure 12**). Most remains represent Palaeolithic megafauna. This group mainly includes mammoth or woolly rhino bones, along with one deer specimen. The second-largest group comprises cattle bones, including several unidentified cattle-related specimens and a few identified as cow bones.

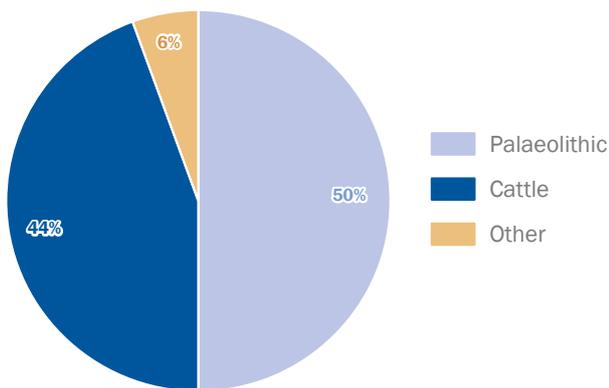


Figure 12 – Total number of animal bone discoveries, shown by animal type

Most Palaeolithic finds originated from Licence Area 240 and an unidentified or ‘unknown’ licence area. There is a hotspot of Palaeolithic activity in Area 240 and this continues to be reflected in the data from the last five years. The third-largest category consists of wooden artefacts (**Figure 13**). Most of these finds originate from Licence Area 240 and include a wooden ship block and several ship timbers.

Licence Area 240 is well-known for its prehistoric material, it is therefore quite interesting that this area has also produced some remarkable ship-related items. For instance, a wooden sheave that was used on Royal Navy warships in the 18th century. All wooden finds from Area 240

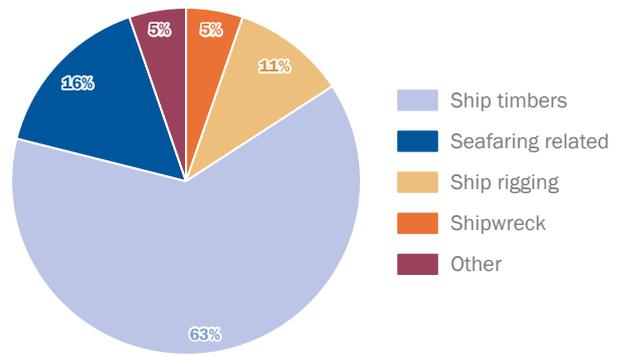


Figure 13 – Total number of wooden artefacts shown by find category

are isolated discoveries, and their distribution is not extensive enough to locate an unidentified wreck site. However, as more finds continue to be reported, it remains possible that a previously unidentified wreck site could be discovered.

It is quite remarkable that some highly sensitive finds, such as leather and textile, have been discovered. These material types are quite rare to come across as they are very fragile and tend to disintegrate quickly in the marine environment.

### Protocol 2020-2025 – Archaeological Periods

Modern finds, dating from 1901 to the present day, represent the largest category. All metal finds date from the modern period, making metal the largest material category within this period as well.

Most bone material originates from the Palaeolithic period, with a smaller portion dating to the modern period. Wooden finds primarily date from the post-medieval to the modern period. The three most frequently found material types correspond to the three most represented periods in **Figure 14**.

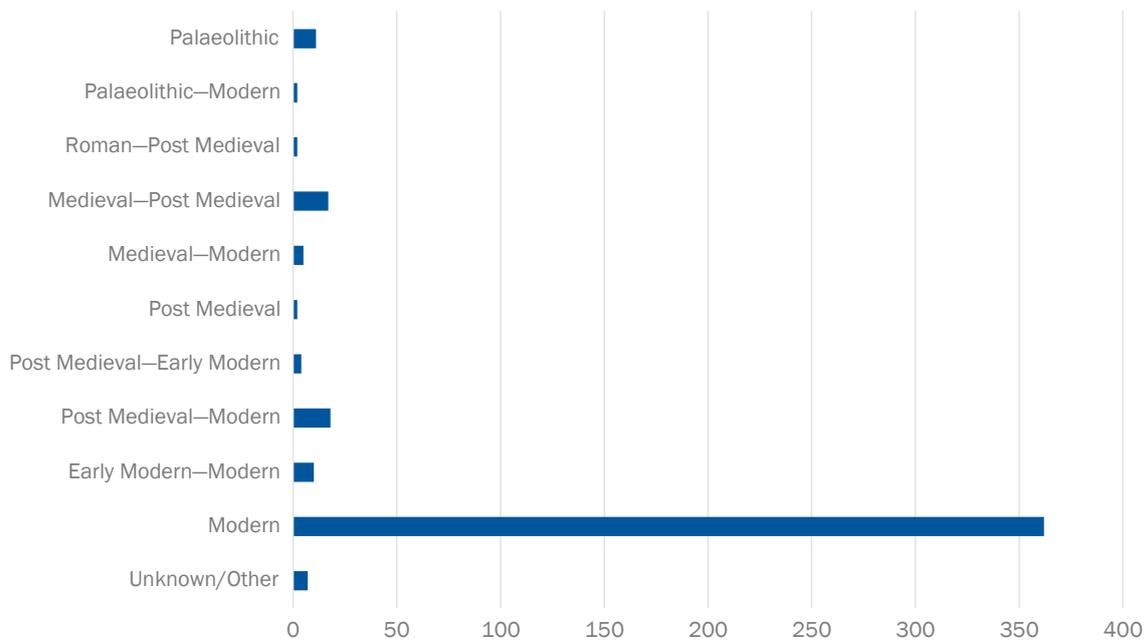
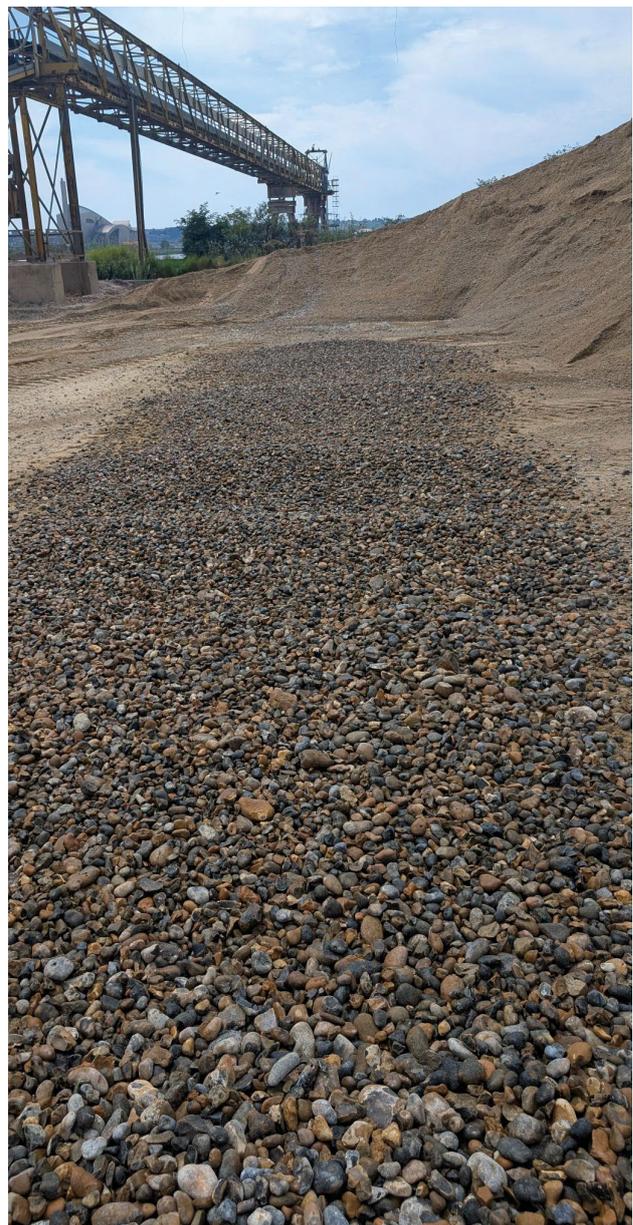


Figure 14 – Total number of finds shown by archaeological period

### 20 years of Protocol – Conclusion

Some amazing finds have been reported over the last 20 years. Several licence areas became well-known for their range and distribution of finds. For instance, some newly found Palaeolithic remains can be added to the study of Palaeolithic material from Licence Area 240. Licence Area 430 contains evidence of two 17th century Naval battles, while Licence Area 512 continues to add aircraft fragments to the finds database.

These discoveries increase opportunities to research England’s rich past, and without the Protocol, many of these finds would never have been shared more widely. Once again, this highlights the value of implementing the Protocol and the importance of the research associated with these archaeological finds. A well-deserved thanks goes to all wharf and vessel staff and Nominated Contacts for reporting these finds and aiding our understanding of the past!



## Discussion

### Importance

Thirty-three reports were raised during the 2024-2025 reporting year, and although less than the Protocol Implementation Service's expectation of around 50 reports a year, the reports comprised 61 individual finds.

The finds reported through the Protocol this year represent a diverse range of periods, emphasising that previous awareness training is successful in providing background information from all periods. The various archaeological material and the amount that is still reported reiterates the importance of the Protocol and demonstrates the wealth of archaeological material still on the seabed. Investigations into these finds expand our knowledge of the past and contribute to our understanding.

### Success

Reports were made this year from Heidelberg, Tarmac, Cemex and Britannia Aggregates Limited.

### Timely reporting

The Nominated Contact must notify the Receiver of Wreck of any wreck-related material within 28 days of it being recovered from the seabed. Wreck-related finds include any structural elements or artefacts that have come from a ship or aircraft. The reporting time limit is a legal requirement of the *Merchant Shipping Act 1995* that exists regardless of the presence of the Protocol, and this is why the Protocol Implementation Team urges all finds to be reported as soon as they are found. Once the find has been reported to the Receiver of Wreck, the Nominated Contact should forward the droit number to the Protocol Implementation Team so that we can keep our records updated. The Protocol Implementation Team will then liaise with the Receiver of Wreck regarding further research undertaken and with the positional details of the find. Since last Protocol year, the reporting of finds has occurred soon after the items were discovered, which is fantastic!



## Key issues

The Protocol has not been rewritten since its inception in 2005 and has only had minor addendums appended to it relating to the handling of specific finds, which demonstrates the robustness and effectiveness of the scheme. During each year of Protocol implementation, minor operational situations are recognised, and the Protocol Implementation Service develops and adapts to overcome these. This year the following points have been raised for discussion:

### Online Awareness visits

As is communicated in awareness visits and in our last *Dredged Up* from Autumn 2025, there are a number of ways we can provide awareness visits. Not only can we have a member of the Protocol Implementation Team visit a wharf or vessel, but in cases where a wharf has only one new starter, or a staff member wants to brush up on knowledge between visits, we're more than happy to do an individual awareness presentation over Teams. In this online awareness presentation we will discuss all the necessary information regarding what to look for, and for reporting and storing archaeological finds.



## Conclusion

At 20 years old – the Marine Aggregate Industry Archaeological Protocol continues to be a relevant part of archaeological mitigation for offshore aggregate works.

The Protocol also continues to be a model from which other industries draw inspiration as a framework for managing mitigation requirements and reporting unexpected archaeological material. It remains a successful and applicable template for preserving heritage on the seabed, for gaining understanding about the unexpected discoveries and for reaching audiences within the aggregate industry to improve their knowledge and understanding of archaeology.

The ongoing success of the Protocol is really based on the enthusiasm and diligence of wharf and vessel staff. Everyone's support has ensured that the Protocol has become embedded in commercial processes, which in turn reduces the impact of marine aggregate dredging on underwater cultural heritage by making the archaeological record available for future generations.

The implementation of the Protocol ensures that archaeological information is preserved through recording and timely reporting and is disseminated as widely as possible, so that everyone can enjoy and explore our underwater cultural heritage.

The Protocol Implementation Service Team would like to thank everyone who has helped to support the Protocol during the 2024–2025 reporting year.

### The future

Protocol Implementation continues to be run by Wessex Archaeology and finds are reported regularly. If you have any questions about finds reporting and the Protocol, please contact us via [protocol@wessexarch.co.uk](mailto:protocol@wessexarch.co.uk) or phone **01722 326 867**.



**Protocol Finds**  
**2024-2025**



## Cemex\_1158: Cannon Ball

This cannon ball was discovered in Licence Area 458 in the in the East English Channel dredging region, approximately 40 km south of Hastings. Dean Trowbridge discovered it at Dagenham Wharf.

This cannon ball appears to be made of iron, and measures approximately 140 x 140 mm or 120 x 120 mm. The cannon ball is rusted and corroded, and a part of it has been broken off.

Based on its measurements it is likely that the cannonball was fired by a demi-canon or 24 pounder, invented around the 17th century (Brinck, 2020). It is also possible the cannon ball was fired by a 12-pounder cannon. This type of cannon was used during the 17th to 19th century. However, it is unclear if the cannon ball was fired from a British ship without properly investigating the cannon it was fired from.

It is unclear how this cannon ball found its way into the archaeological record. There was considerable navy activity accompanied by several wars in the seas surrounding England, so it could relate to a battle. Another interpretation is that the cannon ball could belong to a nearby wreck site. In any case cannon balls are always a very valuable find to register through the Protocol.

### References:

Brinck, N. 2020 *Guns of the Netherlands*. Amersfoort. Rijksdienst voor het cultureel erfgoed.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The MOD (if relevant)
- The Receiver of Wreck (Droit 173/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for East Sussex.



## Tarmac\_1170: Cannon Ball

This cannon ball was discovered in aggregate dredged from Licence Area 254 in the East Coast dredging region, approximately 12 km east of Great Yarmouth. Ted Kenney discovered it at Tilbury Wharf.

This cannon ball is made of cast iron with a diameter of 110 mm and weighing 1.309 kg. It is a solid shot with no sub-munition or internal charge. It has a sub angular shape, which is likely a result from being fired and the cannon ball making impact with the target.

Cannon balls or round shots are some of the earliest forms of projectiles fired from cannons. Cast-iron shots started to be used most widely during the 17th century onwards. Cannon balls were a long range and accurate weapon, fired with the use of a smooth bore cannon. In naval conflict their purpose was to batter the wooden hull of vessels.

This cannon ball likely ended up on the seabed in the east coast of England in the 17th-18th century. England were undergoing expansive naval pursuits, most notably the Anglo-Dutch Wars, that lasted over a hundred years. The Dutch had a large naval fleet and were maintaining a monopoly of trade in Asia and the Baltic, and conflicts between the two nations led to heavy naval and arterial bombardment between the coasts of England and Europe. These were important disputes in naval history due to the struggle to gain control of trade routes that affected commerce during this time.

There have been many cannonball finds in the East Coast dredging area, from the many naval skirmishes that are represented from the Anglo-Dutch Wars of the mid-17<sup>th</sup> century. Due to the location of these finds it is suggested that they could be a result of the Battle of Lowestoft 1665 (the first engagement of the Second Anglo-Dutch War) and Sole Bay 1672 (the first engagement of the Third Anglo-Dutch War).

In 2013, LTM\_0502, another cannonball dredged in Area 254, was discovered. Although these were both isolated finds, the two cannon balls are part of a wider context that may have been fired during a naval conflict or may even belong to a shipwreck.

A large cluster of cannonball finds in nearby license areas 430 and 296 (**UMA\_0129, UMA0140, UMA\_0141, UMA\_0142, UMA\_0145, UMA\_0146, UMA\_1061** and **UMA\_0163**) suggest two major battles would have taken place within this vicinity. By using the Protocol for finds such as these helps contribute and contextualise the naval history of this region.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 291/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk.

#



## Brett\_1171: Lantern

This lantern was discovered in aggregate dredged from Licence Area 340 in the South Coast dredging region, off the east coast of the Isle of Wight. Ben Johnson discovered the Lantern at Newhaven wharf.

The lantern appears to be one used for navigational purposes. It is evidenced by the ring on the top and the furrowed glass design. It measures 110x95 mm. Lanterns became maritime time law in the 1800s, suggesting this find could be from that period up until modern advancement in navigational signalling. Lanterns in the 19th and 20th centuries were made of brass, copper, iron, wrought iron and steel. Due to the level of rust on the find, it indicates that the likely material used was wrought iron or a cheaper level of steel.

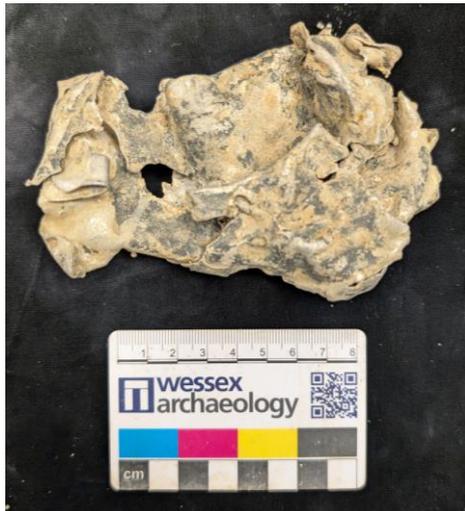
Due to its size and the round loop-hole on top, it was likely used as a lantern identifying port and starboard on a vessel. Lanterns for the port side were illuminated in red, whilst the starboard was green. This was important for vessel-shore communication, and position and orientation. This also applies to Port/Starboard navigational buoys.

Red and green are opposites on the colour wheel, making them ideal colours to indicate sides. Red glass was used for navigational lighting of ports and harbours, as it was easier to come by than green. Historically starboard is believed to be a Norse seafaring word, as they steered on the right side of the ship.

Traditional oil and kerosene burning lighting have been replaced by more modern and durable illumination with the help of electricity and the manufacture of popular lighting such as LED and solar. Different combinations and colours have advanced to display an array of mariner 'Road rules' for navigation and communication with other vessels and the shore.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 308/24-01)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for the Isle of Wight.



## Cemex\_1172: Aircraft Fragment

This fragment of aircraft material was discovered in aggregate dredged from Licence Area 512 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. Tony Scothern discovered it at Northfleet wharf during Operational Sampling.

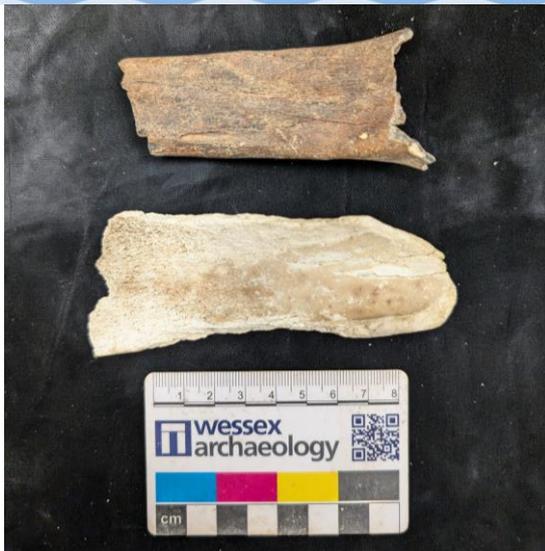
This find appears to be a crushed piece of aluminium. The find in its current condition is around 150 mm long and 70 mm wide. It is unclear how large this object might have been before being crushed.

Due to the poor preservation of the find it has not been possible to identify any kind of diagnostic marking or characteristics that might help in better identifying it. However, the most likely origin for this type of find is from an aircraft. Aluminium material is common in aircraft design to create strong but lightweight components.

It is unclear how this object found its way to the seabed. Given the damaged nature of the find which does not appear to be due to the dredging process, it mostly came from debris that fell from a damaged aircraft or from a wreck. Including this find, forty two aircraft components and fragments have been recovered from Licence Area 512.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The MOD
- The Receiver of Wreck (Droit 307/24-01)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk.



## Cemex\_1173: Animal Bones

These animal bones were discovered in aggregate dredged from Licence Area 512 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. Tony Scothern discovered them at Northfleet Wharf during Operational Sampling.

These two finds appear to be modern animal bone. Both bones are around the same size, 100 mm long and 40 mm wide.

Lorraine Higbee, a zooarchaeologist at Wessex Archaeology, assessed both bones. She was able to identify them as coming from modern cattle. They are proximal tibia shaft fragments, meaning they come from the lower leg of the animal.

It is unclear how these bones came to rest on the seabed. Livestock is regularly transported on vessels. This can both be to transport them for sale or as food for the crew. On long voyages some vessels would take live animals onboard with them, to ensure a ready supply of fresh meat and animal products like milk. This was very important for crew morale before the advent of refrigeration.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk.



## Cemex\_1174: Rope Fragment

This piece of rope was discovered in aggregate dredged from Licence Area 512 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. Tony Scothern discovered it at Northfleet Wharf during Operational Sampling.

This find appears to be a piece of modern rope. It is roughly 120 mm in length and around 10 mm thick. The fragment recovered is frayed at both ends. It is unclear if the rope was cut or broke under tension.

The find is an example of a laid rope, formed through separate strands which are twisted around themselves. The rope appears to be constructed of natural fibres. Hemp is the most common material used in ropes in Western Europe, particularly in a maritime context. While synthetic fibres have overtaken natural fibres in popularity, cordage made from natural materials is still very common. The orange staining on the rope fragment likely comes from iron rust, suggesting it has been in regular contact with that material.

It is unclear how this object came to rest on the seabed. Most likely the find was cut off from a large piece of rope and discarded over the side as waste.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 307/24-02)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk



## Cemex\_1175: Guide Wheel

This metal guide wheel was discovered in aggregate dredged from Licence Area 512 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. Tony Scothern discovered it at Northfleet Wharf during Operational Sampling.

This find appears to be a metallic cylinder with raised lips at both ends. Initially, the find was believed to be a potential piece of UXO, though this is now not believed to be the case. The cylinder is around 100 mm long and 60 mm in diameter. The raised lip extends around 10 mm from the main body of the cylinder and is around 3 mm thick. A groove appears to be present running around the centre of the cylinder. The groove is shallow, around 2 mm deep and 5 mm wide.

Finds specialists at Wessex Archaeology were contacted regarding the find. Phil Andrews suggests that this may be a guide wheel of some kind. It may have contained a belt or band as a component in a larger piece of machinery. It is likely a relatively modern find.

It is not clear how this object came to rest on the seabed. Potentially it was discarded as scrap over the side as components were replaced because of maintenance.

While in the end this find was not a piece of unexploded ordnance, care must always be taken. If there is ever any doubt, it is always best to assume you are dealing with live UXO and to operate accordingly.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 307/24-03)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk



These animal bones were discovered in Licence Area 473/1 in the East English Channel dredging region, approximately south of Eastbourne, Sussex. Lee Matthews discovered it at Frindsbury Wharf.

## Heidelberg\_1176/ 1177: Animal Bone

These fragments of animal bones were discovered by Lee Matthews on board *Hanson Thames*. They were recovered from aggregate dredged in License Area 473/1 which lies in the East English Channel region, south of Eastbourne, Sussex.

These fragments of bone are from a mammoth. The bone specialist at Wessex Archaeology, Lorrain Higbee, suggested that fragment **Heidelberg\_1177** could have been part of the pelvis (pelvis ilium) and as old as the Quaternary due to the level of mineralization. **Heidelberg\_1176** is a long bone shaft, specifically a femur shaft, but an unknown fragment, which is also heavily mineralised. Unfortunately, there is not enough detail on the bones to provide a clear statement due to the heavy mineralisation. Megafaunal remains may end up in a marine context after having been washed from terrestrial deposits by rivers or eroded from cliffs of beaches or simply been in areas that were dry land during the glacial periods in the Pleistocene and Holocene that have since been inundated by the sea.

During the geological epoch of the Pleistocene (2.6 million to 11,700 years BP), Earth went through extreme glacial and interglacial periods brought on by the Milankovitch Cycle; small changes to the Earth's orbit and axis, which lessens the effects of the Sun, resulting in cooler periods. This caused vast ice sheets to form, lowering sea levels by 300 m and exposing large areas of land, such as Doggerland, which connected Europe to Britain. Doggerland was an open and forested landscape with periods of wildlife, Neanderthal and human occupation before it was submerged yet again by the North Sea around 7000 BP. What land remained above the sea surface was affected by tsunamis and landslides due to the isostatic rebound (post-glacial rebound) of the Earth's crust, decompressing after the weight from the ice sheets.

Submerged prehistoric landscape deposits, studied by specialists contribute to our understanding of human movement and lack of available data (Gaffney *et al.* 2007, 1). The separation of the British Isles from the mainland is important in the studies of Palaeolithic and Mesolithic research (Walker *et al.* 2022, 66).

Finds discovered through the Protocol contribute to the archaeological record of submerged landscapes. Advancement in the marine prehistory of the channel has been aided with commercial activities such as offshore oil and gas, offshore renewables and marine aggregates. Remote sensing has contributed to the understanding of the physical geography of the late glacial and post glacial landscape, which experienced dynamic transition and inundation (Walker *et al.* 2022, 65, Gaffney *et al.* 2007, 4). The evidence of earlier megafauna bones and fragments in marine contexts is not uncommon. Megafaunal remains help to identify and understand Palaeolithic and Mesolithic human dispersal patterns, as early humans would follow food sources. Although there is no human material culture associated with these two finds, they still contribute to migration patterns of large mammals within the submerged landscape.

There have been no other megafaunal remains found in the East English Channel dredging reason, which suggests this may be an isolated find, or potentially washed in from another deposit.

#### References:

Gaffney, V., Thomson, K. and S. Fitch 2007. *Mapping Doggerland: The Mesolithic Landscapes of the Southern North Sea*. Archaeopress.

Walker, J., Gaffney, V., Harding R. and M. Muru 2022. 'The archaeological context of Doggerland during the final Palaeolithic and Mesolithic', in Gaffney, V. and S. Fitch (eds), *Europe's Lost Frontiers: Vol 1 Context and Methodology*, 63—88. London: Archaeopress.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Sussex



## Heidelberg\_1178: Wooden Ship Components

These wooden fragments were discovered in dredged cargo from Licence Area 240 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. Tony Scothern discovered them at Dagenham Wharf during the course of Operational Sampling.

This find comprises four wooden fragments which all show signs of working to a lesser or greater extent. The fragments vary in size. The largest piece is 270 mm long and 110 mm wide while the smallest is 220 mm long and 50 mm wide.

The larger three pieces all show evidence of treenail holes. The most intact treenail hole suggests a treenail of roughly 40 mm in diameter. The smaller piece has indentations which suggest it was fastened with nails leaving circular impressions.

These wooden components seem to show that they were parts of a larger manmade structure or object. As these finds were dredged several kilometres offshore, we can infer that these components did not come from dislodged harbour or shore-based infrastructure, but instead were once part of a vessel or craft. Dating fragmented timber finds can be difficult when they are out of context without using techniques such as dendrochronology. A cheaper and easier method is generally date them using fasteners which unfortunately in this case are not present. Therefore, dating must remain very general, with an origin date ranging from 100 to 500 years ago.

It is not possible to tell how these finds came to rest on the seabed. The waters around the British Isles have seen significant maritime exploitation and use. There are thousands of known wrecks around Britain and the debris of the use of the marine environment is even more common. Finds like this point toward our historical connection to the ocean, and how it has shaped our use of it today.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 313/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk



## Brett\_1180: Machine Gun Barrel

This machine gun barrel was discovered in aggregate dredged from Licence Area 340 in the South Coast dredging region, approximately 12 km south-east of the Isle of Wight. Conrad Stuckey discovered it at Newhaven Wharf.

This find appears to be the barrel of a firearm, most likely a machine gun. The barrel is around 1 m in length and is around 40 mm at its widest point. The barrel visibly tapers away from the bore, widening again towards the muzzle. There is a rectangular mounting piece still connected to the barrel around the bore. This block is roughly 200 mm long and 50 mm wide. The barrel passes through a circular hole at one end of the block with around 100 mm of barrel penetrating the block.

Jonathon Ferguson, keeper of firearms and artillery at The Royal Armouries Museum was contacted regarding the find and was able to identify the find as the barrel of a Browning AN/M2 .50BMG machine gun. These were extremely common armaments used throughout the USAAF during the Second World War. The base Browning M2 machine gun remains in use in a variety of forms in a number of militaries to this day.

As an aircraft mounted weapon during the Second World War the Browning M2 proved more effective than the rifle calibre machine guns used by some militaries such as the RAF during the early war. However, as aircraft technology continued to advance most Airforce's moved to heavier cannon armament.

It is not clear how this find came to rest on the seabed. It is probable that the barrel came away from an aircraft due to damage, possibly as one part of a debris scatter or wreck. Finds such as this are important to log, as they can be clues to locating aircraft wreck sites which may well contain the remains of those that flew them.

Finds such as this machine gun part are covered by the Firearms Act 1968 and is important that they are treated as such and reported to the relevant authorities.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 19/25)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Isle of Wight



## Cemex\_1181: Aircraft Fragments

These aircraft fragments were discovered during operational sampling of cargo from Licence Area 512 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. Adam Nightingale discovered them at Northfleet wharf.

These finds comprise eleven aluminium fragments. There are rivets visible on several pieces and one piece which appears once to have been a flexible joint. There is green paint still present on multiple examples. They are most likely aircraft fragments.

Images of the finds were sent to Steve Vizard for identification. He was able to confirm that they are aircraft fragments, comprising various airframe sections. While fragmentary pieces such as this are difficult to positively identify, the fragments are most likely from a British aircraft from the Second World War.

These fragments of aluminium airframe were found in the same cargo as a piece of possible aircraft fuel tank Cemex\_1182 and aircraft electronics Cemex\_1183. 41 other aircraft finds have been reported originating from Licence Area 512. There are no known aircraft losses within the Licence Area. However, given the amount of aircraft material being recovered, there is the chance that a previously undiscovered wreck site is present. Vessel and wharf staff should remain vigilant so as to properly locate and track material which may indicate the location of a potentially significant site.

It is unclear how these finds came to rest on the seabed. Aircraft material is very common in British waters as a consequence of the Second World War and this material could possibly have been lost from an aircraft due to battle damage or be part of a debris scatter. Reporting finds such as this is important despite their small size and apparent unimportance as tracking these finds can help locate and identify larger aircraft wreck sites.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The MOD
- The Receiver of Wreck (Droit 038/25-01)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk



## Cemex\_1182: Aircraft Component

This possible aircraft component was discovered during operational monitoring of cargo from Licence Area 512 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. Adam Nightingale discovered it Northfleet wharf.

This find is a subcircular piece of steel roughly 100 mm in diameter with a raised section around 35 mm on one side. A piece of rubber tube 18 mm in diameter juts out from the flatter side and a rubber skirt that once contained a glass object from the shards visible inside is present on the raised side.

Steve Vizard was contacted regarding the find as potentially being related to aircraft. This find was recovered with other aircraft material Cemex\_1181 and Cemex\_1183. Without markings or stampings, it is difficult to be certain, but the component could be part of a fuel or oil tank, functioning as a drain or vent.

It is unclear how this find came to rest on the seabed. Aircraft material is very common in British waters as a consequence of the Second World War and this material could possibly have been lost from an aircraft due to battle damage or be part of a debris scatter. During this round of sampling, a number of other aircraft components were found, including Cemex\_1181 and Cemex\_1183.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The MOD
- The Receiver of Wreck (Droit 038/25-02)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk



## Cemex\_1183: Aircraft Component

This aircraft component was discovered during operational monitoring of cargo from Licence Area 512 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. Adam Nightingale discovered it at Northfleet wharf.

This find appears to be made of coiled wire. The wire is coiled into two roughly square coils that were once wrapped in tape. Each coil is around 50 mm across. The wire is about 1 mm thick. The wire making up the coils has no covering beyond the tape wrapping around the coil, while the connecting wires between the coils and beyond has what appears to be a thin fabric covering.

Steve Vizard was contacted regarding the find as it potentially relates to aircraft, due to other discoveries in the same cargo (Cemex\_1181 and potentially Cemex\_1182). Electrical wiring and components like this are a common part of aircraft power systems and are often recovered connected with other aircraft material.

It is unclear how this object came to rest on the seabed. A large number of aircraft wrecks are present in British waters following the Second World War. This find is likely connected to this, having fallen from a damaged aircraft or being part of a large debris scatter.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The MOD
- The Receiver of Wreck (Droit 038/25-03)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk



## Cemex\_1184: UXO Casings

These casings were discovered during operational monitoring of cargo taken from Licence Area 512 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. Adam Nightingale discovered them at Northfleet wharf.

This find comprises two shell cases. The first and larger casing has a struck primer suggesting it has been fired. The other smaller casing has an unstruck primer meaning it has not been fired. Both cases are around 100 mm in length, with one being around 20 mm wide at the case head, with the other being around 15 mm wide. On the smaller case, there is a clear 'DM' and a likely '43' stamping evident on the case head. The larger casing appears to have the remains of green pigment on the casing body.

Jonathan Ferguson, Keeper of Firearms and Artillery at the Royal Armouries Museum in Leeds, was contacted regarding these casings. He was able to confirm that they are a spent 20 mm Oerlikon casing and an unfired .50 BMG casing.

The .50 BMG casing came from the Des Moines Iowa Army Ammunition Plant (IAAAP) and was manufactured in 1943. The IAAAP was first established in 1940, with production starting in 1941. They produced a variety of ammunition during the Second World War, including .50 BMG. The plant would be closed down in 1945 with the end of the war but would reopen in 1949 to support the Korean War. In 1975, control of the plant would pass to the United States Army as a strategic resource.

This 20 mm Oerlikon casing is somewhat unusual as it shows evidence of being painted green. Green paint is sometimes used to designate the presence of high explosives, though this normally would appear on the projectile rather than the casing. With some research we were able to ascertain that green painted casings were produced, especially on steel cases. This was used as a protective coating to avoid wear and rust on the round which may cause a stoppage to the weapon system. 20 mm Oerlikon cannons were a common sight on Naval vessels even after the Second World War, normally being employed as an anti-aircraft armament. They remained in this role until more modern jet fighters and missile weapons became too fast to be effectively engaged with these weapons. The green paint present on this casing was most likely present to protect the round from the corrosive effects of salt water.

It is unclear how these finds found their way onto the seabed. Both calibres and weapon systems have been used extensively and by multiple nations military powers throughout the Second World War and beyond. The .50 BMG casing, with its 1943 production date was likely lost during the Second World War. As the casing was not fired, it may have been ejected from a weapon in order to make it safe or, more likely given its location off the East Coast, ejected to clear a stoppage. As the 20 mm Oerlikon has remained in service with some nations to the present day, without a manufacture's date stamp it is difficult to discern when it may have been lost. The .50 BMG casing is a good example of the importance of looking at finds for stamp marks, dates, serial numbers, and other text which can help us identify finds and ascertain their provenience.

**As with all UXO, finds of this nature must be treated with caution. Always follow wharf guidelines when UXO is found.**

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 038/25-4)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk.



## Cemex\_1185: Wooden Plank

This fragment of planking was discovered during operational monitoring of cargo taken from Licence Area 512 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. Adam Nightingale discovered it at Northfleet wharf.

This find appears to be a fragment of wooden plank. It is roughly 180 mm long, 65 mm wide and 25 mm thick. There are no fastenings evident.

While this item has clearly been worked, there are no diagnostic or otherwise identifying features present on the find. This makes it difficult to determine the age and provenance of the find. It is clearly a wooden plank, but could be from shore infrastructure, a fragment of wooden boat, or have been discarded from a larger vessel.

It is unclear how this find came to rest on the seabed. Most likely this wooden fragment was discarded from a passing vessel.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 038/25-05)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk.

## Tarmac\_1186: Iron Nail

This iron nail was discovered in Licence Area 500/3 in the South Coast dredging region, approximately 14 km south-west of Isle of Wight. Jon-Paul Jerromes discovered it at Burnley Wharf.



This find appears to be a small, cylindrical iron nail, roughly 160 mm in length and 15 mm in width. The nail is the same thickness transitioning to a point around 20 mm long. The fibrous and flaking nature of the nail suggests it is wrought iron. Corrosion is equally present across the nail's surface.

Graham Scott, a technical specialist with Wessex Archaeology, was contacted regarding the find. He was able to confirm that the find is a wrought iron hand made fastening. It appears to be a type of fastening referred to as a 'dump'. These were often used to secure hull and deck planking to wooden vessels.

The term 'dump' is an English term used to describe a short bolt, with a long, flattened point and a rounded cross section. The term first appears in 1794 in *Rigging and Seamanship*, and was common throughout the nineteenth century. Dumps were used in conjunction to wooden treenails to secure planking. It was believed that the different materials used in metal and wooden fasteners would compliment each other by responding to the different stresses put onto the ships structure.

It is unclear how this find came to rest on the seabed. It may have once been part of a large wreck site or potentially have been dropped over the side during the course of maintenance and repairs. It is unlikely that a nail such as this would have been intentionally discarded, as metal items such as this would have been valuable.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 058/25)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Isle of Wight.



## Brett\_1188: Iron Coupling

This coupling was discovered in aggregate dredged from Licence Area 351 dredging region, located 19 km off the east coast off the Isle of Wight. It was found on board *Britannia Beaver* by Greg Rhind.

The find appears to be a cast iron pipe or shaft coupling with a rubber seal and a height of 180 mm and 170 mm at the widest point with visible rusting.

Materials used for manufacturing couplings for vessels and marine infrastructure were predominantly cast iron or steel. The device was used to connect two shafts or pipes together for transmitting fluid and gases. They were readily used in the 19th and 20th centuries during the widespread use of iron hulled ships during the shift from wooden vessels, which required different connections and mechanics. Due to the rubber seal, it is possible this coupling could be as old as the late 19th century but is more likely to be mid-20th century to modern.

As this is an isolated find it is likely that this is not a find from a shipwreck but may be a result of jettisoned or dumped goods.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 079/25-01)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Isle of Wight and West Sussex



## Heidelberg\_1189: Grenade

This grenade was discovered in marine aggregate dredged from Licence Area 240 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. Stuart King discovered it at Greenhithe wharf.

This grenade was discovered on the electromagnet at Greenhithe wharf. As grenades are extremely dangerous to handle, this grenade has not been handled. Pictures of the grenade were sent to specialists. Unexploded ordnance (UXO) pose a significant risk as degradation of the device and moving the UXO could potentially detonate the device.

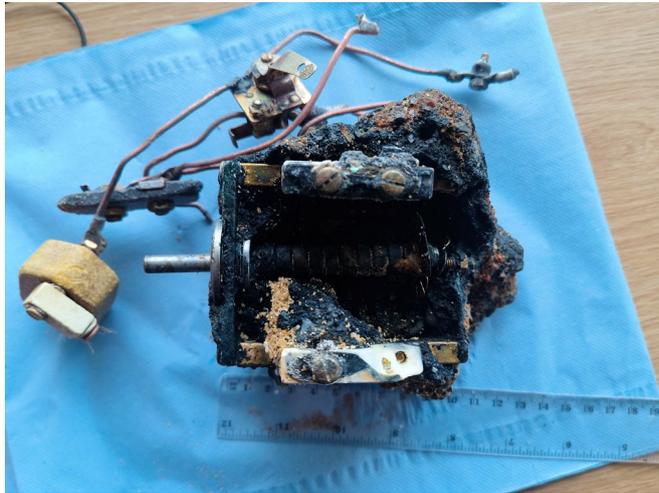
Jonathan Ferguson from the Royal Armouries Museum and Mark Khan owner of Command Post Media, identified this grenade as a British Mills hand grenade. Mark classified it as a type Mills 36 grenade. According to Mark: 'they were in use from the First World War through the 1970's. These types of grenades were issued on RN ships. One of their purposes was to signal submarines when exercising with surface ships. The detonation of the grenade would be heard inside the submerged submarine'.

From the picture, Mark identified that the striker lever (a safety device) is in place and that the grenade has a base plug fitted. The base plug was required to be removed (unscrewed) to allow the detonator to be inserted. After the insertion of the detonator the base plug was screwed back in.

It is unclear how this grenade found its way into the archaeological record. Most ordnance found in British waters relates to the First or Second World War. The grenade was most likely fired in combat or training. As the projectile possibly contained an explosive charge it was handed in to EOD for subsequent safe disposal. It is important for all staff who may encounter UXO to remain cautious and to follow all relevant H&S procedures.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The MOD (if relevant)
- The Receiver of Wreck (Droit 111/25)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk.



## Cemex\_1190: Electrical Component

This electrical component was discovered during dredging operations in Licence Area 340 in the South Coast dredging region, approximately 8 km south-east of Isle of Wight. Marcin Hoffa discovered it onboard *Cemex Go Innovation*.

This find appears to be an electrical component of some kind. A main component is connected to some wiring with smaller switches and connectors. The main component is around 120 mm. There does not appear to be any markings or writing on any part of the find.

Initially, it was believed that the find could be a piece of aircraft material. Aircraft material is very common in the south and east coast of Britain as a consequence of the Second World War. However, aircraft specialists such as Steve Vizard who reviewed images of the find did not believe it matched any aircraft component they were familiar with.

An accurate age of the find is difficult to determine due to the lack of diagnostic features. However, the amount of concretion present on the find and the apparent lack of plastic parts suggest the find is from the first half of the 20th century. It is unclear how this find came to be on the seabed. As the original function of the component is still undetermined it is possible that it is a component from a piece of vessel machinery that was discarded due to maintenance.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 098/25)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Isle of Wight.



## Tarmac\_1191: Wooden Find

This wooden find was discovered in aggregate dredged from Licence Area 254 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. Ian Massy discovered it at Tilbury Wharf.

This cylindrical wooden find measures approximately 270 x 60 mm. The find appears to be in excellent condition, and not eroded or affected by saltwater or marine borers suggesting it only recently came to rest on the seafloor. The side of the object has holes suggesting it was attached to something.

This find could have a number of interpretations. For example, it could be a wooden roller. Alternatively, it could be a handle or part of a wooden pole for a tool, such as a boat hook or, if from a terrestrial context, a gardening tool.

It is unclear how this find found its way onto the seabed. The wooden object could be washed away by the sea from shore. However, it could also have been discarded over the side from a passing vessel.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 109/25)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk



## Heidelberg\_1194: Iron

This iron was discovered in material dredged from the East Coast. It was discovered by staff at Dagenham Wharf while inspecting the magnet. It is unclear exactly which Licence Area the find originated from.

This find appears to be an iron. The find is around 150 mm long and 100 mm wide at the widest point. It has a handle which is placed centrally on top. The handle is damaged and slightly crushed, it appears to have once been wrapped or had another material used to make a comfortable hand hold, but this is now missing. There is a socket for an electric cable present at the back of the iron, just under the handle.

Rachel Seager Smith, a finds specialist with Wessex Archaeology assessed the find, determining it to be an electric iron from the mid twentieth century. Using heat as a way of smoothing fabric has been in use since the 1st century BC in China. The concept was introduced to Europe through trade in the 12th century AD. Eventually, purpose built flat irons were produced for the purpose. The first electric iron was produced in the United States in 1882 which offered greater safety and convenience, but only in places with working electricity.

It is unclear how this find found its way onto the seabed. Most likely the iron broke onboard a vessel and was discarded over the side.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 118/25)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Suffolk.



## Heidelberg\_1195: .50 BMG Casing

This casing was discovered during operational monitoring of cargo taken from Licence Area 401/2 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. Adam Nightingale discovered it at Dagenham Wharf.

This find appears to be a spent casing. The primer has been struck suggesting it is a fired casing. No marks remain visible on the case head, though three points show where the primer was crimped in place.

The .50 calibre Browning Machine Gun and the round that was designed to be fired with it have now been continually in service for over 100 years, with no sign that this is likely to change. While the level of preservation of the casing suggests this particular casing is fairly old, or at least had been exposed on the seabed for some time, as there are no visible case markings it is not possible to determine a date of manufacture.

It is unclear how this casing found its way onto the seabed. It could have been fired from an aircraft or naval vessel, either in anger or as part of training. It is important to report UXO such as this as concentrations of finds may help locate large sites such as military aircraft wrecks, or highlight areas with higher levels of maritime warfare.

**As with all UXO, finds of this nature must be treated with caution. Always follow wharf guidelines when UXO is found.**

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 126/25-01)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk.



## Heidelberg\_1196: Aircraft Fragments

These aircraft fragments were discovered during operational monitoring of cargo taken from Licence Area 401/2 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. Adam Nightingale discovered them at Dagenham Wharf.

This find comprises two fragmentary pieces of aluminium. The first is piece of tubing, around 130 mm long and 25 mm in diameter. The second is a piece of aluminium sheet roughly 120 mm long, 2 mm thick and 20 mm wide at the widest point. There are no markings visible on either fragment.

These pieces are most likely examples of aircraft fragments. Aerial combat was extremely prevalent off the east coast during the Second World War, as this was the base of the USAAFs Eighth Airforce.

It is unclear how these finds found their way onto the seabed. Most likely these aircraft fragments either fell away from aircraft as a result of battle damage or have moved away from a larger wreck or debris site. Tracking these smaller, innocuous finds can help us locate these larger wreck sites.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The MOD
- The Receiver of Wreck (Droit 126/25-02)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk.



## Heidelberg\_1197: Plaque

This plaque was discovered during operation monitoring of cargo taken from Licence Area 401/2 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. Adam Nightingale discovered it at Dagenham Wharf.

This find is an aluminium oval roughly 180 mm long and 150 mm wide. The oval is 4 mm thick. There are four screw or other fixture holes evident though these have been damaged to various degrees. The most intact hole is 6 mm wide, with all four holes appearing to be equally sized. There is no writing or other markings visible on the find.

It is unclear exactly what this metal plaque is or what its original purpose was. Initially it was suspected that the find may have been a sacrificial anode used on ships, but these are made of zinc while the find appears to be aluminium. The find may have had a mechanical purpose, though the relatively soft and light weight nature of aluminium limits where this may have been. One example of a possible use could be as an aircraft component, where aluminium is commonly used for its strength and light weight.

It is unclear how this find came to rest on the seabed. Without a clearer idea of the objects purpose it is difficult to speculate on how it may have been lost. There is clear damage on the find, indicating the find may have come from a wreck or been discarded over the side after it was replaced following routine maintenance.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 126/25-03)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk.



## Heidelberg\_1198: Aircraft Fragments

The aluminium fragments were discovered during Operational Sampling of cargo dredged from Licence Area 361 in the East Coast dredging region, approximately 25 km south-east of Great Yarmouth. Adam Nightingale discovered them at Dagenham Wharf.

This find comprises four pieces of fragmented aluminium sheet, all roughly the same size. They are around 160 mm long, 100 mm wide and around 2 mm thick. All four pieces are jagged fragments and show a similar level of preservation.

While there is nothing necessarily diagnostic about any of these fragments, the most likely origin for these finds is from an aircraft wreck. Material such as this is very common debris from aircraft. However, this is the first time potential aircraft wreckage has been recovered from Area 361. There are no known aircraft wrecks with Area 361.

It is unclear how these fragments came to be on the seabed. Aircraft material is very common in the waters around the United Kingdom as a consequence of the Second World War. Reporting and mapping scattered finds such as these can help locate large and potentially significant aircraft wreck sites.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The MOD
- The Receiver of Wreck (Droit 161/25)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Suffolk.



## Cemex\_1199: Unknown Object

This metallic fragment was discovered in material dredged from Licence Area 1803 in the East English Channel dredging region, approximately 40 km south of Hastings. Filip Gorka-Niwinski discovered it on board *Cemex Go Innovation*.

This find appears to be a piece of metallic debris, with one end encased in concretion. The piece is roughly 180 mm in length and 50 mm in width. The exposed metal is jagged with signs of corrosion. The metal appears relatively thin at around 2 mm thick.

The find lacks clear diagnostic features so it is not possible to determine the origin of the find or its original purpose. Most likely this is a fragment of a larger item.

It is not possible to determine how this find came to rest on the seabed. Potentially the find was discarded over the side following maintenance.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 203/25)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for East Sussex.



## Heidelberg\_1206: Metal Object

This metal object was discovered in aggregate dredged in Licence Area 240 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. S. King discovered it at Greenhithe wharf.

The find appears to be a metal object. It measures 210 x 210 mm. The find is folded and cracked. The side of the object contains nails or rivets. In the middle of the object, a small round hole is visible.

Steve Vizard was contacted regarding the possibility that the finds could be aircraft related. The object contains holes and rivets, similar to aircraft related finds. However, as Steve pointed out, the object appears to be made out of brass or zinc and would therefore not be (directly) aircraft related. Unfortunately, the object lacks sufficient diagnostic features to identify any relation to aircraft material.

It is difficult to identify the precise origin and nature of the object as it folded and damaged in a considerable way. It is, however, possible that the object was part of an unidentified metal structure. In the construction industry rivets were used as fastening techniques as well.

It is unclear how this object came to rest on the seabed. It is possible this find belongs to a wider debris field from a wreck or another related metal construction, as these objects were in the same area as Heidelberg\_1207 and Heidelberg\_1208. Both are unidentified metal objects. The object could also have been tossed over the side of a passing vessel or washed away from shore.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 188/25)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk



## Heidelberg\_1207: Iron Object

This iron object was discovered in aggregate dredged from Licence Area 240 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. Stuart King discovered it at Greenhithe Wharf.

This find appears to be an iron object. It is heavily corroded, with pieces broken off. The metal object measures roughly 150 mm by 110 mm.

Sometimes a mysterious object with numerous possible interpretations is dredged up. For example, this find could be a heavily corroded cannon ball, but its shape and size suggest otherwise. Alternatively, it could be a piece of iron ore. Iron ore was used to extract iron, which in turn was used to forge weapons and tools. When the first humans master this technique, it replaced the use of bronze. Normally, iron ores contain other materials, such as rock, attached to it. This could be worn off over time, leaving the core intact. A more logical explanation for this find is an unidentified iron object. The heavy corrosion has made it difficult to recognise any diagnostic features, which obscures the true nature of the object.

It is unclear how this find found its way onto the seabed. It could be washed away by the sea from shore. However, it could also have been discarded over the side from a passing vessel.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The MOD (if relevant)
- The Receiver of Wreck (Droit 186/25)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk



## Heidelberg\_1208: Metal Objects

These metal objects were discovered in aggregate dredged from Licence Area 240 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. S. King discovered them at Greenhithe wharf.

These nine finds appear to be metal objects of various sizes. The objects are all around 30 mm wide and 10 mm thick, ranging from 50 mm to 200 mm in length. The objects are fragmented and appear to have been ripped off with considerable force from their original structure, as indicated by the ripped and fragmented edges of the objects.

Steve Vizard was contacted regarding the possibility that the finds could be aircraft related, as the objects have holes pierced at regular intervals, similar to aircraft related finds. However, Steve could not confirm whether these objects belong to an aircraft. Although, the objects have the appearance of being aircraft related, they are far too thick to be simply part of an airframe structure.

Unfortunately, the objects lack further sufficient diagnostic features and are too fragmented to determine their precise nature or origin. It is, however, possible that these objects were part of an unidentified metal structure. Similar pieces of metal have been used in metal shipwrecks or other metal constructions.

It is unclear how these objects came to rest on the seabed. It is possible these finds belong to a wider debris field of a wreck or another related metal construction, as these finds were found in the same area Heidelberg\_1206 and Heidelberg\_1207. Both are unidentified metal objects.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 187/25)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk



## Heidelberg\_1211: Cattle Bone

This cattle bone was discovered in cargo dredged from Licence Area 240 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. Danny Oostland discovered it at K3DEME Amsterdam.

This find appears to be a modern animal bone.

The find was assessed by Lorraine Higbee, zooarchaeologist at Wessex Archaeology. She was able to identify the find as being a vertebra coming from modern cattle.

It is unclear how this bone found its way to the seabed. Butchery is often performed on larger vessels with larger crews, or on smaller vessels undertaking long journeys. This modern bone is most likely a consequence of that practice.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk.



## Heidelberg\_1212: Aluminium Bar

This aluminium bar was discovered in aggregate dredged from Licence Area 240 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. Adam Nightingale discovered it at Dagenham Wharf during Operational Sampling.

This find is a small aluminium bar, measuring roughly 380 mm by 60 mm and severely corroded. The full length and width of the find appeared to have been preserved; however, some parts are missing due to corrosion processes on the seafloor.

Pictures were sent to Ewen Cameron from the Royal Air Force Museum. Ewen indicated that he can't discount it being from an aircraft and it shares features he would expect it to have, if it was indeed part of an airplane. Pictures were also sent to Steve Vizard from Airframe Assemblies. He indicated that if it was aircraft related it would normally show signs of attachment holes somewhere, either a rivet or bolt. The lack of these obvious features suggests it does not belong to any general aircraft structure or engine part.

In conclusion, it is hard to pinpoint the origin and function of this find. Since it is made of aluminium it could be related to an aircraft component, but experts found no clear diagnostic features to confirm this. As a result, its precise identification remains uncertain.

It is unclear how this find came to rest on the seabed. It is possible this find belongs to a wider debris field from a shipwreck or another related metal construction. If it is an aircraft fragment it could be the result of aerial combat which took place during the Second World War. Alternatively, it could have been part of an object used on board a ship, and then jettisoned over the side when no longer useful.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The MOD (if relevant)
- The Receiver of Wreck (Droit 263/25)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk.



## Tarmac\_1214: Anchor fragment

This anchor fragment was discovered in Licence Area 430 or 493 in the East Coast or Humber dredging region. Ian Massey discovered it at Tilbury Wharf.

This find appears to be a ferrous anchor fragment. The shank (central part) measures approximately 190 long and 23 mm thick. Original external ring diameter estimated to be c. 130 mm, with a section diameter of c. 11 mm. The attached ring is broken and slightly bent. The object is heavily corroded with significant loss of metal.

Graham Scott, technical specialist at Wessex Archaeology, was contacted regarding the find. He indicated the object as a small ferrous bar fragment with a captive ring. According to Graham it appears to be the head of the shank of a small common/fisherman's-type anchor. The shank has a rectangular section with a swelling possibly indicating the position of a missing stock. The ring has been pulled open, possibly splitting at the weld and therefore probably lost in use. Undated but likely to be 19-20th century, and no earlier than post medieval.

It is unclear how this object came to rest on the seabed. The seas surround the United Kingdom have been used for maritime activities for centuries. The find appears to be an isolated find for now, but wharf staff should remain vigilant, as any further uncovered anchor or ship-related material may indicate a potential wreck site.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 236/25-01)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Suffolk or East Riding of Yorkshire

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[www.wessexarch.co.uk/projects/marine/bmapa/index.html](http://www.wessexarch.co.uk/projects/marine/bmapa/index.html)



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