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 2023–2024

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Prepared by

wessex archaeology

Protocol background

This year, we're celebrating the 19th anniversary of the Protocol Implementation Service and this annual report covers the period from 1 October 2023 to 30 September 2024.

Origin and aim of the protocol

In the depths of the North Sea basin and the English Channel lies evidence of prehistoric people. This is because these areas of the North Sea were once dry land during the last Ice Age. The land consisted of a vast plain where prehistoric people hunted, gathered food and set up camp. The climate got warmer over time and as a result the larger ice cap covering Europe melted away and flooded the deep basin between Europe and England, creating the North Sea and the English Channel.

The archaeology of the seabed is not limited to Palaeolithic or early Mesolithic activity. After the emergence of the North Sea basin and English Channel, many activities took place in or around these bodies of water, from the small boats used during Neolithic crossings to bring agricultural techniques to the island, to the sailing ships used in the First Anglo-Dutch War, to aeroplanes that crashed during the two World Wars. Evidence of archaeological heritage of different time periods and their developments can be found at the bottom of the sea. Marine aggregate industry dredging works have the potential to uncover this evidence. To understand discoveries that may be made during marine aggregate industry dredging works, and to provide mitigation measures and protection, the Marine Aggregate Industry Archaeological Protocol or 'the Protocol' is in place.

Dredgers provide access to areas of the seabed otherwise difficult to explore. While marine geophysical survey techniques can indicate archaeological potential, and archaeological assessment can ensure that archaeological features on the seabed can be protected with exclusion zones, it is more difficult to identify features buried in the sediment, or those scattered across the surface. Without the reporting process, finds from dredged aggregate would most likely never have entered the archaeological record. The reporting procedure laid out in the Protocol is designed to allow users to follow an effective process of documenting and reporting finds.

The Protocol Implementation Team aim to identify and conduct research on the find before producing a short report and sharing the information with marine aggregate industry

staff and the named authorities. In an instance when the Team cannot identify the object, an in-house or external specialist will be contacted to ensure that the utmost is done to provide a background and relative age on the reported find, and to develop mitigation measures, if needed, to promote conservation and to provide protection for sites on the seabed.

Protocol in Practice

Prior to a licence being granted to dredge an area, an intensive investigation is undertaken to identify potential archaeological material on 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 regions. 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.

Wessex Archaeology drafted the Protocol[1] in 2005 on behalf of English Heritage (now Historic England) and the British Marine Aggregate Producers Association (BMAPA), following recommendations made in the *Marine Aggregate Dredging and the Historic Environment: Assessing, evaluating, mitigating and monitoring the archaeological effects of marine dredging* guidance note produced by English Heritage and BMAPA in 2003.[2] BMAPA member companies have 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 2009, The Crown Estate joined BMAPA to co-fund the Protocol Implementation Service, currently operated by Wessex Archaeology. When a find is encountered, it is reported through a Site Champion on the wharf or vessel to a Nominated Contact from the company owning the wharf or vessel who then alerts the Implementation Service.

Effectiveness of the Protocol

Since the inception of the Protocol over **2457** finds have been reported and the Protocol has been overwhelmingly successful. 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. Because 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.

1 bmapa.org/documents/fullreportingprotocol2005.pdf
2 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

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 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.

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 finds 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 35, printed in Autumn 2024 and all previous *Dredged Up* newsletters can be found online.[3]

- 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 via email.

- Raises Protocol awareness amongst third parties, such as geotechnical and environmental survey companies working on behalf of the marine aggregate industry.

3 www.wessexarch.co.uk/projects/marine/bmapa/dredged-up

Finds Awards

The 2022–2023 Finds Awards were made to the following wharf and vessels, published in Issue 34 of *Dredged Up*.

Best Attitude by a Wharf

In the 2022-2023 Finds Awards, we recognised the staff at **Brett's Flat House Quay** in Portsmouth! A total of 15 finds were reported in eight different reports. We would especially like to thank Ben Johnson, Nathan O'Sullivan, Paul Stevens and Kevin Ferguson Snr for reporting the finds. The finds consist of unexploded ordnance (UXO) material, a component of a ship's ordnance system and cannonballs. Further, some aircraft material has been found, including parts of an exhaust pipe and control rods.

Right: six of the eight pieces making up Brett_1067, some of which are likely to be aircraft components (not relatively scaled)

Best Attitude by a Vessel

Thank you to each vessel that has reported finds through the Protocol over the past reporting year. We congratulate **Cemex's *Britannia Beaver*** for winning the award for 2022–2023, after they reported 19 finds from Area 340 in the South Coast. One of the amazing finds was the bomb shackle from an American strategic bomber.

A special thanks goes to finders Dean Jackson, Robert Lockley, Paul Stevens and J. Dietzel for taking care of these finds and reporting them through the Protocol.

Below: Britannia_1074, a corroded and damaged B7 bomb shackle discovered in Licence Area 340

Best Find

The best find of the 2022–2023 reporting year went to **Britiannia_1073**, discovered by Dean Jackson and Robert Lockley. This find consists of a small, truncated gas cylinder approximately 250 mm long and 50 mm in diameter, with an overall length of 340 mm including the valve and gauge.

Pictures were sent to our external specialist Steve Vizard who identified **Brittannia_1073** as a pilot's emergency oxygen cylinder, better known as a 'bailout bottle'. For American bomber crews undertaking daytime raids, the chance of being shot down was uncomfortably high. It was therefore important that aircrew were provided with all the equipment they would need to give them the best chance of making it out of a disabled plane alive. The H1 oxygen cylinder contained around 124 bar of breathable gas and was part of the personal survival equipment carried by all USAAF aircrew. With the casualties that the USAAF Eighth Air Force were sustaining, this equipment was desperately needed. In the event an aircraft suffered catastrophic damage, the crew's only means of escape would be to jump out of their very likely already burning aircraft.

In theory, bailing out would be attempted after the pilot had safely lowered the plane to 15,000 feet. However, after taking enough damage to need to bail out, this was clearly not always possible. This could mean potentially bailing out of your bomber at 30,000 feet. At this height, the same as Mount Everest, there was less than a third of the oxygen at sea level and the air temperature would be around -45 degrees centigrade. Most bombers were not pressurised, so crewmen would connect breathing apparatus to ports in the airframe. When bailing, these would need to be disconnected and hooked up to the H1 bailout bottle. These would give around 10 minutes of breathing time. If this system failed, the crew were told to 'take a deep breath' before disconnecting from the plane's air supply and jumping. Freezing temperatures and a lack of oxygen could cause bailing crewmen to pass out during this desperate escape. The consequences could be disastrous for crewmen who needed to deploy their parachutes manually. The chances of being recovered if aircrew landed in the cold waters of the North Sea or English Channel were extremely slim. If a pilot could control the aircraft, they would attempt a water landing, known as ditching. The crew would deploy inflatable dinghies and could survive a few days with the provisions they had onboard.

Visits to wharves

Since the 2022–2023 annual report was published, there have been eight Protocol Awareness Visits. Contact has also been maintained through emails.

The 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 working 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 archaeology 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 to contain 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. Questions can be asked at any time during the training and an informal discussion is usually had at the end of the presentation. 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.

After an awareness visit, training certificates are emailed to the Site Champions to give to all wharf or vessel staff who receive the awareness training so that they may add them to their working portfolios.

Contact is maintained through regular emails, the Marine Aggregate Facebook page, the annual report and the *Dredged Up* newsletter 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[4] 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**.

Below: Protocol Awareness Visit at Cemex Northfleet Wharf

4 www.wessexarch.co.uk/projects/marine/bmapa/docs.html

Awareness visits at 1: Tarmac Medina Wharf; 2: Tarmac Burnley Wharf; 3: Cemex Brighton Wharf; and 4: Shoreham Wharf.

Dredged Up newsletter

In 2023–2024, two issues of the biannual *Dredged Up* newsletter were produced: Issue 34 and Issue 35.

Issue 34 was released in May 2024 and outlined some of the year's finds as well as publishing the winners of the annual Finds Awards. This issue featured an interesting case study about different types of ordnance found throughout the Protocol and the importance of these finds for the history of the UK.

Issue 35 was distributed in November 2024 and featured the latest 'Finds Round Up'. The awareness visits from 2024 were celebrated and the issue featured a case study about cannons, as cannonballs are often found and reported through the Protocol.

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 Facebook page and Wessex Archaeology's social media platforms, including Facebook and LinkedIn. The digital edition is also downloadable from Wessex Archaeology's website.[5]

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.

5 www.wessexarch.co.uk/our-work/marine-aggregate-industry-protocol-reporting-finds-archaeological-interest

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, using the preliminary record form, to the secure online console.[6] 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. Although reporting the material was previously undertaken by the Protocol Implementation Service, the Receiver of Wreck has streamlined their process and any finds should now be reported directly by the Nominated Contact to the Receiver of Wreck via their online form.[7] The Nominated Contact should then provide the Protocol Implementation Service with the Receiver of Wreck number, to ensure that finds can be identified using either unique ID in the future.

The Protocol Implementation Team investigates the find and may send photographs and information to external specialists for additional interpretation and then compile a report. Most of the reports are confined to 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 2023-2024 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	Marine Geology 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

6 net.wessexarch.co.uk/bmapa/login.aspx?ReturnUrl=%2fbmapa%2findex.aspx
7 www.gov.uk/report-wreck-material

Access

Conditions relating to archaeology are placed on the permissions for marine development (including marine aggregate extraction), 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 each find 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)

If considered wreck material, finds are also 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 also reported to the Receiver of Wreck along with the Ministry of Defence as it may relate to the *Protection of Military Remains Act* 1986.

All finds are reported to Historic England's National Marine Heritage Record, and will soon be accessible via an online portal, such as the ones for terrestrial finds.[8]

Finds can also be explored through the Protocol's StoryMap[9] which includes information about the Protocol, the Awareness Programme, dredged discoveries from 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.[10]

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.[11]

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.

Right: a selection of finds reported to the Protocol between 1 October 2023 to 30 September 2024, not relatively scaled

8 www.heritagegateway.org.uk
9 storymaps.arcgis.com/stories/2968f0b4062245ee815d04124bbd9368
10 www.facebook.com/marineaggregateindustryarchaeologicalprotocol/?ref=aymt_homepage_panel
11 www.wessexarch.co.uk/our-work/marine-aggregate-industry-protocol-reporting-finds-archaeological-interest

Artefact patterns and distribution

This year **107** finds have been reported. These have been added to a database of over 2457 finds reported since the launch of the scheme in 2005.

Through the use of a Geographical Information System (GIS; ArcGIS Pro 3.4.0), 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 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.

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 being sent to relevant organisations (aggregate companies that are licenced to work in those areas, local HERs, NHMR, 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 requested.

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, although animal bones have been reported this year both independently and in conjunction with the Operational Sampling project, mentioned on pages 14 and 15.

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.

Page 11: Location of 107 finds reported through the Protocol over the previous year.


500000
600000
700000
400000
300000
200000
100000
0
UNITED KINGDOM
LONDON
FRANCE
Heidelberg_1151
Heidelberg_1150
Hanson_1100
Cemex_1145
Hanson_1105
Hanson_1102
Hanson_1091
Cemex_1141
Cemex_1121
Hanson_1096
Cemex_1156
Cemex_1122
Cemex_1123
Cemex_1142
Cemex_1126
Cemex_1143
0
10 km
Tarmac_1152
Brett_1144
Cemex_1127
Britannia_1112
Brett_1128
Britannia_1110
Britannia_1107
Hanson_1093
Cemex_1140
Heidelberg_1132
Tarmac_1153
0
100 km
Made with Natural Earth. Free vector and raster map data @ naturalearthdata.com.
Number of finds within individual reports
1
2
3
4
5
7
9
10
Licence areas

Distribution of artefacts by dredging region

There are seven dredging regions around the English coast:

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

In 2023–2024, 24 reports came from the East Coast, 10 reports came from the East English Channel, 17 from the South Coast, and 1 from the Thames Estuary.

Four reports were from an unknown region as the finds were discovered on the magnet, crusher grid and material from a previous oversize stockpile.

No reports were received from cargoes dredged from the Humber, North West or South West regions.

2021 data: bmapa.org/documents/the-area-involved-24th-annual-report.pdf

2022 data: bmapa.org/documents/25th-Area-of-Seabed-Dredged-Report-2023.pdf

Region	Millions of tonnes of construction aggregate dredged		Number of finds reported through the Protocol	
	2021	2022	2022-2023	2023-2024
Humber	3.5	3.69	0	0
East Coast	3.3	3.60	12	73
East Coast or East English Channel	-	-	1	0
Thames Estuary	1.6	1.69	1	2
East English Channel	4.48	4.60	2	12
South Coast	3.99	3.65	25	20
South West	1.43	1.3	0	0
North West	0.26	0.22	0	0
Unknown	-	-	4	0
Terrestrial location	-	-	0	0
Totals			**47**	**107**

Distribution of artefacts by date and archaeological typology

Maritime artefacts

Several finds reported this year are believed to be maritime in nature, including multiple timber fragments, cannonballs and even a whale bone.

None of the marine finds were thought to be related to wreck sites. All of the finds 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 shell casing and a flare, were reported through the Protocol this year. It is always advised that wharf and vessel staff should ensure that company Health & Safety policies are followed before any ordnance is reported through the Protocol.

Aircraft

More than half the discoveries made this year related to aircraft. All aircraft material were reported to the Receiver of Wreck and the Ministry of Defence. Most of the finds consist of components from an aircraft, but a few other items relate to personal items from the pilot, for instance, **Britannia_1107**, a parachute buckle, seen below.

Distribution of archaeological artefacts

Archaeological typology	Number of finds	Number of reports	Date
Prehistoric finds	0	0	-
Maritime artefacts	28	25	Post medieval - modern
Ordnance and munitions	21	11	Modern
Aircraft material	58	22	Modern
Non-archaeological	0	0	-

Above: Britannia_1107, a parachute buckle

Reports in 2023-2024

During the 19th year of operation, Wessex Archaeology received 56 reports through the Protocol Implementation Service. These reports encompassed details of 107 separate finds. Further details of each discovery are shown below and included in the wharf reports appended to this report.

Finds reported in 2023-2024

Report ID	Description	Licence Area	Region	Discovered on Wharf/Vessel	Quantity
Hanson_1091	Spent casings	401/2	Norfolk	Wharf	7
Hanson_1092	Leather sole	401/2	Norfolk	Wharf	1
Hanson_1093	Star shell	473/2	East Sussex	Vessel	1
Hanson_1096	Aircraft fragment	401 or 402B	Norfolk	Wharf	1
Hanson_1097	.50 BMG casing	401 or 402B	Norfolk	Wharf	1
Hanson_1098	Leather sole	401 or 402B	Norfolk	Wharf	1
Hanson_1100	Flare gun	240 or 401 or 402B	Norfolk	Wharf	1
Hanson_1102	Type 80 fuse	240	Norfolk	Wharf	1
Hanson_1103	Electrical fuse	240	Norfolk	Wharf	1
Hanson_1105	Wooden ship blocks	240	Norfolk	Wharf	1
Hanson_1106	Metal cap	240	Norfolk	Wharf	1
Britannia_1107	Parachute buckle	340	Isle of Wight	Wharf	1
Britannia_1108	Bomb shackle	340	Isle of Wight	Wharf	1
Britannia_1109	Engine component	340	Isle of Wight	Wharf	1
Britannia_1110	Aircraft component	340	Isle of Wight	Vessel	1
Britannia_1112	Aircraft fragment	340	Isle of Wight	Vessel	1
Britannia_1113	Aircraft component	340	Isle of Wight	Vessel	1
Britannia_1114	Metal box	340	Isle of Wight	Wharf	1
Britannia_1115	Engine components	340	Isle of Wight	Wharf	1
Cemex_1121, Cemex_1122, Cemex_1123	Aircraft fragments	512	Norfolk	Vessel	11
Brett_1124	AEP projectile	340	Isle of Wight	Wharf	1
Cemex_1126	Aircraft fragments	512	Norfolk	Vessel	9
Cemex_1127	Metal hatch	137	Isle of Wight	Vessel	1
Brett_1128	Cannonball	351	Isle of Wight	Wharf	1

Report ID	Description	Licence Area	Region	Discovered on Wharf/Vessel	Quantity
Brett_1129	Timber	351	Isle of Wight	Wharf	1
Cemex_1131	Pottery	512	Norfolk	Wharf	1
Heidelberg_1132	Oxygen cylinders	473/2	East Sussex	Wharf	2
Heidelberg_1134	Seafaring detritus	401/2	Norfolk	Wharf	3
Britannia_1135	Metal fragment	340	Isle of Wight	Wharf	1
Brett_1136	CO2 cylinder	340	Isle of Wight	Wharf	1
Brett_1137	Metal pipe	340	Isle of Wight	Vessel	1
Cemex_1138	Aircraft components	512	Norfolk	Wharf	5
Cemex_1140	Aircraft components	458	East Sussex	Wharf	2
Cemex_1141	Aircraft components	512	Norfolk	Wharf	4
Cemex_1142	Aircraft components	512	Norfolk	Wharf	10
Cemex_1143	UXO	458	Norfolk	Wharf	4
Brett_1144	Shell casing	508	Essex	Vessel	1
Cemex_1145	Aircraft fragment	511	Suffolk	Wharf	1
Cemex_1146	.50 BMG projectile	512	Norfolk	Wharf	1
Cemex_1147	Whale bone	407	West Sussex	Vessel	1
Heidelberg_1150	Aircraft fragment	240	Norfolk	Wharf	1
Heidelberg_1151	Wooden ship components	240	Norfolk	Wharf	2
Tarmac_1152	Iron anchor chain	509/3	Essex	Vessel	1
Tarmac_1153	Ship timber with iron spike	458	East Sussex	Wharf	1
Tarmac_1154	Metal part	458	East Sussex	Wharf	1
Tarmac_1155	Aircraft fragments	351 or 395	West Sussex	Wharf	3
Cemex_1156	UXO	512	Norfolk	Wharf	2
Heidelberg_1159	Wooden ship component	240	Norfolk	Wharf	1
Heidelberg_1160	Cow bone	240	Norfolk	Wharf	1
Britannia_1161	Metal pipe	351	Isle of Wight	Vessel	1
Tarmac_1162	Axe head	Various	East Sussex	Wharf	1
Tarmac_1163	Curved iron bar	Various	East Sussex	Wharf	1
Tarmac_1164	Iron hook	Various	East Sussex	Wharf	1
Tarmac_1165	Curved metal tube	Various	East Sussex	Wharf	1
Tarmac_1166	Metal bracket	Various	East Sussex	Wharf	1
Heidelberg_1169	Aircraft fragment	240	Norfolk	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 2023–2024 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 19 years.

Below: Paolo Croce, a specialist in maritime artefacts, works with other staff from Wessex Archaeology on the Dungeness Wreck at CEMEX's Denge Quarry

Expert	Advice given concerning	Institution/organisation/role
Stephanie Said	Maritime artefacts	Wessex Archaeology
Paolo Croce	Maritime artefacts	Wessex Archaeology
Graham Scott	Maritime artefacts	Wessex Archaeology
Lorrain Higbee	Zooarchaeology	Wessex Archaeology
Lorraine Mepham	Pottery, vessels and cutlery	Wessex Archaeology
Rachel Seager Smith	Finds specialist	Wessex Archaeology
Phil Andrews	Technical specialist	Wessex Archaeology
Katie Marsden	Pottery, metal	Wessex Archaeology
Bob Clarke	Metal specialist	Wessex Archaeology
Anthony Mansfield	Mechanics and engineering	Senior Naval Engineer
Jonathan Ferguson	Ordnance	Royal Armouries Museum
Richard Noyce	Ordnance	Royal Armouries
Steve Vizard	Aircraft	Airframe Assemblies
Ewen Cameron	Aircraft	Royal Airforce Museum

Liaison and accessibility

Details of each discovery have been sent to:

Mark Russell	British Marine Aggregate Producers Association
Stuart Churchley	Historic England, Marine Planning Archaeological Officer
Neil Guiden	Historic England, Data and Analysis Manager
Serena Cant	Historic England, Marine Information Officer
Tanja Watson	Historic England, Maritime Research Specialist
Andrew Cameron	The Crown Estate
Nick Everington	The Crown Estate
Mark Wrigley	The Crown Estate

Details of discoveries regarded as wreck under the *Merchant Shipping Act* 1995 have been forwarded to former Receiver of Wrecks, Graham Caldwell and Lydia Woolley and to the new Receiver of Wreck in 2024 Stephen White, and Deputy Receiver of Wrecks Andrea Bailey, Kate Rogers and Callum Thomas. In 2023–2024 the following reports were deemed to represent items of wreck, and the table includes the unique droit numbers assigned by the Receiver of Wreck:

Report ID	Droit number
Hanson_1091	126/23
Hanson_1092	127/23
Hanson_1093	128/23
Hanson_1096	140/23
Hanson_1097	140/23
Hanson_1098	140/23
Hanson_1100	143/23
Hanson_1102	136/23
Hanson_1103	136/23
Hanson_1105	139/23
Hanson_1106	139/23
Britannia_1107	024/24
Britannia_1108	025/24
Britannia_1109	026/24
Britannia_1110	027/24
Britannia_1112	029/24
Britannia_1113	030/24
Britannia_1114	031/24
Britannia_1115	032/24
Cemex_1121	012/24
Cemex_1122	012/24
Cemex_1123	012/24
Brett_1124	005/24
Cemex_1126	007/24
Cemex_1127	015/24
Brett_1128	033/24
Brett_1129	034/24
Cemex_1131	018/24
Heidelberg_1132	021/24
Heidelberg_1134	024/24
Brittania_1135	210/24
Brett_1136	044/24
Brett_1137	052/24
Cemex_1138	063/24
Cemex_1140	074/24
Cemex_1141	075/24
Cemex_1142	075/24
Cemex_1143	075/24
Brett_1144	080/24
Cemex_1145	084/24
Cemex_1146	087/24
Cemex_1147	N/A
Heidelberg_1150	089/24
Heidelberg_1151	089/24
Tarmac_1152	098/24
Tarmac_1153	151/24
Tarmac_1154	150/24
Tarmac_1155	152/24
Cemex_1156	118/24
Heidelberg_1159	182/24
Heidelberg_1160	182/24
Brittania_1161	201/24
Tarmac_1162	224/24
Tarmac_1163	224/24
Tarmac_1164	224/24
Tarmac_1165	226/24
Tarmac_1166	226/24
Heidelberg_1169	232/24

Wreck and aircraft material

This year twenty-two reports may have been related to aircraft (see appended Wharf Reports for more details):

- Hanson_1096
- Britannia_1107
- Britannia_1108
- Britannia_1109
- Britannia_1110
- Britannia_1112
- Britannia_1113
- Cemex_1121
- Cemex_1122
- Cemex_1123
- Cemex_1126
- Heidelberg_1132
- Brettannia_1135
- Brett_1136
- Cemex_1138
- Cemex_1140
- Cemex_1141
- Cemex_1142
- Cemex_1145
- Heidelberg_1150
- Tarmac_1155
- Heidelberg_1169

Although the Protocol received a number of reports of artefacts which may relate to vessels considered to be wreck and aircraft material, none of them were thought to directly relate to unknown and uncharted wreck sites or aircraft crash sites. Consequently, no reports were forwarded to the United Kingdom Hydrographic Office (UKHO) in the 2023–2024 reporting year.

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 wharf reports appended to this report.

Right: Aircraft parts discovered in the East Coast dredging region by Cemex staff on board Reimerswaal. Top: Cemex_1121 consists of five square and hollow tubes; middle: Cemex_1122 consists of eight different metal aircraft components, none of which have been identified; bottom: Cemex_1123 consists of an assemblage of 22 aircraft parts.

Protocol updates 2023-2024

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 reporting of significant archaeological finds maintained at a high standard through the Protocol and the welcome 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 eight visits have been conducted to Cemex wharfs and Tarmac wharfs. During the Tarmac visit to Shoreham Wharf Andrew Bellamy, Tarmac Marine's resources manager and geologist joined the wharf visit to explain the geological developments of the dredging areas. In addition, Site Champion Edward Skinner from Tarmac accompanied the site visits to show Tarmac's interest in reporting the finds through the Protocol. The additions of both Andrew and Edward made it an interesting awareness visit for the staff and shows Tarmac's dedication to the Protocol.

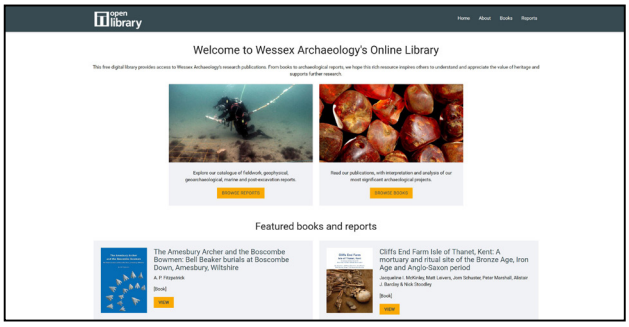
The awareness visits proved to be once again very valuable. The visits provide the opportunity for staff, Site Champions and members of the Protocol Team to discuss findings, questions and law and regulations with each other. Future visits to the wharves to give the archaeological awareness training will be arranged for 2025 and it is hoped that staff from Historic England and the Receiver of Wreck's office will be able to come along on one of the visits.

Implementation Team

This year we welcomed a new member to our Protocol Implementation Team. Dutch Maritime Archaeologist Kirsten Pollé joined the Wessex Archaeology Coastal & Marine Team in December 2023.

Janeway Platform

This year Wessex Archaeology released the Janeway platform. The Janeway platform includes over 40 years of archaeological research done by Wessex Archaeology, including previous *Dredged Up* magazines and previous Annual Reports. All new Annual Reports and *Dredged Up* magazines will be updated on this new platform from this year onwards. The platform can be found through this link: wessexarchaeologylibrary.org.



Wessex Archaeology's Janeway platform

Cemex Open Day

Interest in the Marine Aggregate Industry and archaeology can start at a young age, and therefore Cemex organised an Open Day for students to get acquainted with the Marine Aggregate Industry. Cemex also invited a range of stakeholders to show students all the different types of companies who worked together with Cemex in the Marine Aggregate industry, like ground minerals and archaeology. The Protocol Implementation Team was present during this day to teach students how Cemex and Wessex Archaeology work together to protect our archaeological heritage. Also, students could see and feel real archaeological objects (the same ones used in the awareness training) and ask their questions about archaeology. Thanks again to Cemex, for providing us with the opportunity to connect with potential future aggregate staff and share how the aggregate industry continues to contribute to our understanding of heritage.

Dutch Maritime Archaeologist Kirsten Pollé at the Cemex Open Day

Cemex Open Day

Keychains

Recently a new item has been produced to celebrate the Protocol, and to increase awareness. While sending out the newest version of *Dredged Up* in November the Protocol Implementation Team included key chains for trolley carts in the envelopes. These key chains contain a QR-Code with information about the Protocol and help spread awareness. If you didn't receive a keychain and would like one, please contact the Wessex Implementation Team on the protocol email (see below).

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.

To contact the Protocol Implementation Service, email **protocol@wessexarch.co.uk** or phone **01722 326 867**.

Case Study 1: Anchors, a ship's hope

Introduction

Anchors are often found during maritime works, for instance dredging and channel deepening works. Since 2005, around 17 anchors or parts of anchors have been reported through the Protocol. One of them, for example, was a modern stockpile anchor (**Tarmac_1056**) found in Area 430 in the East Coast dredging region (**Image A**, top right). Further, during Protocol year 2021-2022, **Cemex_1020**, a piece of a fishermen's or kedge anchor was found (**Image B**, middle right). All of the anchors were reported through the Protocol and were researched by the Protocol Implementation Team. The study of anchors is a very broad field, there are many different types of anchors in many different regions that vary and change over time. In this case study the history of anchors will briefly be explored. At the end of this article there is an interesting section for volunteers about documenting anchors.


A


B

Anchor study

Why study anchors? Anchors are essential for seafaring and they are a common find on shipwrecks (Votruba 2022, 338). Anchors are all around us (**Image C**, bottom right); anchors even appear in our folklore and in our daily language, often represented as a symbol of hope or stability. The study of anchors provides historians and maritime archaeologists a better insight into old navigation and seafaring techniques, as well as marine culture and economic and political history and archaeology (*ibid.*).

Early anchors

Since the first human maritime activity and certainly from the Bronze Age onwards, a rope tied to a stone was common practice for anchoring vessels. This technique is still used today, particularly for vessels anchoring near shorelines or in the eastern Mediterranean region (Curryer 1999, 7).


C

While the shape and size of anchors changed over time, one type or group of anchors has remained consistent: the killick. A killick is a simple anchor used by fisherman and seafarers in coastal regions worldwide (Curryer 1999, 22). The killick has various forms, for instance a piece of wood with two wooden flukes and a wooden stock tied to a piece of rope. Killicks were made from locally available material, making them

inexpensive and easy to produce (*ibid.*). However, as the components are organic, they are unlikely to survive in the archaeological record, unless conditions are optimal.

Over time, different materials, such as wood and lead, were used to produce a solid anchor until the iron and metal anchors took their place. Iron and metal anchors are more 'modern' types of anchors and they can be divided into two categories: stock anchors and stockless anchors (Nautical Archaeology Society 2018).

Stock anchors

Stock anchors date back to the 4th Century BC (Curryer 1999, 106) (see **Image D**). These anchors are named after their stock, typically placed at the upper end of the shank (*ibid*). This stock had a specific function. Most of the time the anchor lands on its stock and rests on its stock on the seafloor. When a vessel pulled on the rope or chain attached to the anchor, this movement, combined with the stock's design, forced the anchor to rotate. As a result, one of the arms of the anchor would face downward, digging its way into the seabed and therefore anchoring the ship in place (Votruba 2022).

In early times, the stock of the anchor consisted of wood and lead. Over time this changed to metal. These materials added weight to the stock of the anchor, forcing the anchor deeper into seabed but also increasing the holding power of the anchor (Curryer 1999, 106). The anchor itself changed as well, between around 1540 to 1600 the design of the arms changed from a curved-armed anchor to an English straight-armed anchor. The straight arm was easier to manufacture in a large size. Over a period of 200 years, this new form experienced minor changes (Curryer 1999, 41), which can make isolated anchors from this period difficult to date precisely.

Around 1800, anchors in England were largely forged in the Naval Dockyards. The used material was iron, often scrap iron, which was welded together. The iron was heated and beaten into shape with a hammer. Initially, this process was done by hand, but later, mechanical drop hammers were invented to speed up the process (Curryer 1999, 62). Components such as flukes and the anchor ring were forged separately and then welded into onto the anchor (Curryer 1999, 62-63).

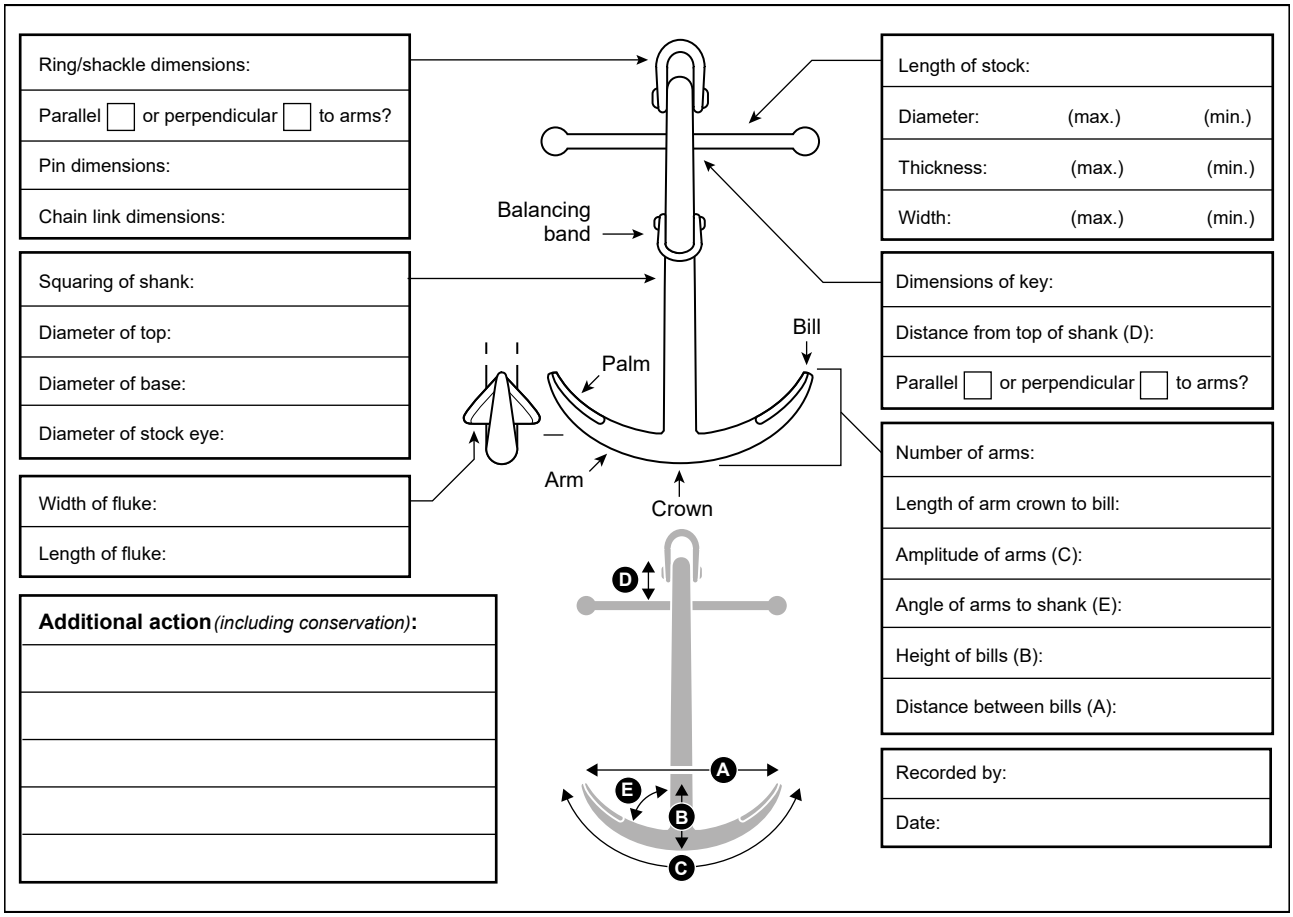


Image D: extract from recording sheet showing key measurements for stock anchors (Wessex Archaeology)

During this period, the Old Admiralty Longshank anchor was the primary type in use (Curryer 1999, 51) (for example, see **Image E**). However, the anchor had one major flaw: the arms tended to break off at the crown when a huge amount of stress was applied onto the anchor (Curryer 1999, 65). This weakness occurred because the hammers used around this time weren't able to remove the air bubbles from the iron, causing weak spots as the iron cooled down (Curryer 1999, 51).

During the 18th century, the quality of iron improved, and the invention of the steam hammer opened new possibilities for other anchor designers. A notable designer, Richard Pering, designed an anchor in 1813 with curved arms instead of straight arms (Cotsell 1856, 8; Curryer 1999, 73). The flukes and shanks of his anchor were smaller and shorter than those of the Admiralty Longshank anchor (Curryer 1999, 73 – 76). His new design paved the way for other anchor designers, including John Trotman and Wiliam Porter.

Around 1840-1841, Admiral Sir William Parker designed an 'evolved' version of Perings anchor. This anchor type is still in use today by smaller fishing crafts without hawse pipes. Parker's anchor was a fixed-arm anchor, manufacturable in various sizes. While its proportions were similar to the Admiralty Longshank anchor, the arms were gracefully curved, and the diameter of the iron forming the arms and the shank was elliptical. This allowed easier chafing of the ropes (Curryer 1999, 83-84).

Another notable anchor designer was Lieutenant Rodger. One of his most well-known designs was the patent small-palmed anchor, produced in 1832 (Cotsell 1856, 18-19). The palms or flukes had the shape of a heart, and the size of the flukes was reduced. Over time, however, the size of the flukes gradually increased to a point where they were similar in size to those of the Admiralty anchor (Cotsell 1856, 19).

*Image E: In protocol year 2007-2008 a very large Admirality Anchor was reported through the protocol (**Hanson_0125**)*

The stockless anchor

Around the 19th century, a drastic and revolutionary change in anchor designs occurred: the stockless anchor (see **Image F**, below). As the name suggests: these anchors lacked a stock (although early types had one for stability). The flukes of this anchor type were able to tilt. Over the years, several types of this anchor type were invented.

Around 1821, R.F. Hawkins developed an anchor that allowed both flukes to penetrate the ground at the same time (Cotsell 1856, 41; Curryer 1999, 112), enabling the anchor to dig its way into the seabed. This anchor type had many advantages: its holding power was equal to two anchors, it didn't damage the cable it was fitted with, and it broke the seafloor much easier (Cotswell 1859, 41). However, it had one disadvantage, it tended to fall over to the side. Although the anchor did have many advantages and was certainly a very radical change in anchor type and function, unfortunately, it was not accepted in the shipping industry (Curryer 1999, 114).

In the late 1800s, Lloyd's issued a sanction requiring all anchors to be produced by well-known names. This led to the development of Hall's stockless anchor in 1886. The head of this anchor design was attached with a pin, which was secured by the keeps in the head (Curryer 1999, 119). The anchor was very popular during its time. Other notable stockless anchor designs around the 19th century were created by Wasteney Smith and W.L. Byers.

Nineteenth and twentieth century

At the end of the 19th century, there was an increased demand for anchors with greater holding power, resulting in the introduction of High Holding Power (HPP) anchors. An anchor is considered a HPP anchor if it proves itself in three runs and in three different types of soil: sand, gravel and clay (Wärtsilä 2024, Curryer 1999, 29). HPP anchors provide twice the holding power of a 'normal' anchor with the same weight (Wärtsilä 2024).

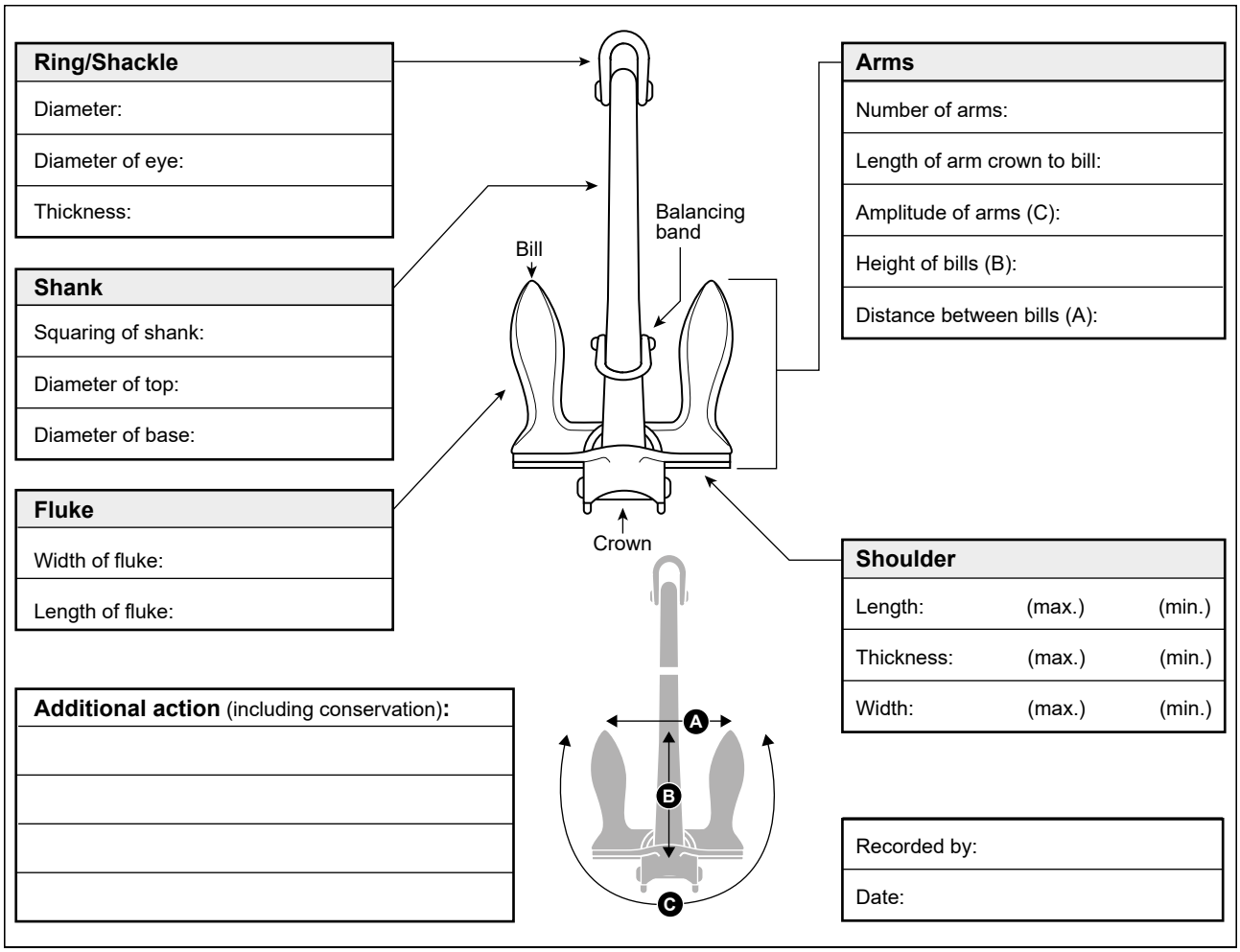


Image F: extract from recording sheet showing key measurements for stock anchors (Wessex Archaeology)

G

Around the 20th century, the vessels were increasing in size and created a demand for anchors with an even greater holding power. Therefore, the Admiralty conducted several tests on anchors to identify and develop the perfect anchor for mooring large vessels (Curryer 1999, 129). The results of the test showed that the area of the fluke, rather than the anchor's weight, determined its ability to embed itself in the seafloor. Additionally, the length of the chain aided the anchor to embed itself in the seafloor (Curryer 1999, 130) (for example, see **Image G**, a recently reported anchor chain **Tarmac_1152**). These results led to the development of anchors with an increased holding power and designs who incorporate features from different anchor types from the past, such as W.L. Byers (Curryer 1999, 132).

Upon making a discovery

It is highly likely that anchors will be discovered during dredging works. Even as a diver or fishermen you may discover an anchor during marine activities. When making a discovery, it is important to document as many features as possible, take measurements and photographs. Carefully clean the surface of the anchor as this may reveal markings on the metal.

To support you in your anchor recording and research the Nautical Archaeology Society launched the 'Big Anchor Project' in 2008. This project is a heritage recording initiative to encourage volunteers around the world to record physical anchors. On the project website, guidance and a recording form can be found; and for the digital minded volunteers a recording app can be installed on mobile devices. Furthermore, the website provides pictures and examples to compare your anchor to. Check out their website for more information: biganchorproject.com.

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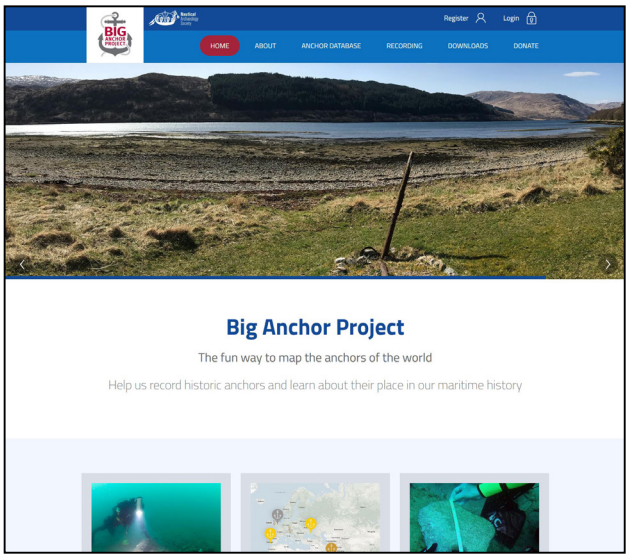


Discussion

Importance

Fifty-six reports were raised during the 2023-2024 reporting year, and this is eight more than the Protocol Implementation Service's expectation of around 50 reports a year. The reports comprised 107 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 types of 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. This year, 56 reports were made, 18 more than the 38 submitted in 2022-2023, and the total number of finds more than doubled in size, 107 finds this year in comparison to last year's 47. There are different reasons the number of finds reported through the Protocol fluctuates every year, depending on dredging locations and the presence of archaeologically interesting layers in the dredging areas.

One direct reason for the increase in finds this Protocol year might be due to the increase in awareness visits. Because of COVID-19 and the post-covid effects, visiting wharves for training was limited due to various health and safety reasons. This year the Implementation Team had the opportunity to visit the wharves again at full-strength, which might have led to an increase in overall awareness and therefore an increase in reporting finds.

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. Recently 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:

Regions with nil return

This year, there were no reports of finds among material dredged from Humber, North West or South West regions and English Channel region. There have been no reports from the North West region since the 2017–2018 Protocol year, and no reports from the South West region since the 2014–2015 Protocol year.

Images of finds

If possible, multiple images of a find should be taken to be included with reports as this can significantly aid the identification process. In particular images including scales of measurements, defining marks, stamps and the nose fuze and base of munitions can be very helpful (although this is not always possible especially with live munitions). Remember to follow company Health & Safety guidance and only take photos and measurements if safe to do so.

Area recognition

During the awareness visits and in the communication with the Nominated Contacts and Site Champions of the wharves the importance of the 'exact location' have been stressed. It is important for documentation process to know the exact license area for the find. When the licence area is known and the trackplot is attached, the Protocol Implementation Team can do their research more thoughtfully and keep track of potential aircraft crash sites or shipwrecks.

Even small finds are worth reporting

During the awareness visits, members of the Protocol Implementation Team noticed some confusion around the finds reporting process. The Marine Aggregate Facebook page, the awareness visits and sometimes the *Dredged Up* newsletters present only the most significant and most wonderful finds. This has led to the confusion that small and sometimes heavily damaged finds are not worthwhile reporting. However, the opposite is true, as the Protocol Implementation Team is happy with every find reported through the Protocol. Even objects that appear to be insignificant can hold a great deal of information.

Modern finds are worth reporting

During the awareness visits the Protocol Implementation Team receive questions about whether reporting modern (metal) finds is necessary. Modern finds, for instance, can be rusted objects or old ship pulleys. The Protocol Implementation Team is happy to receive these finds as well, as the Protocol is specifically designed for any type of archaeological find from any period. Even the modern finds contribute to our history and the understanding of our past.

Right: a selection of finds reported through the Protocol, not relatively scaled. Image A: Britannia_1113, an aircraft component; Image B: Cemex_1147, a section of whale bone; and Image C: Hanson_1092, a piece of shoe leather.

Heidelberg_1159
a wooden ship component

Conclusion

The Marine Aggregate Industry Archaeological Protocol continues to be a relevant mitigation programme for offshore aggregate works. It also continues to be a model from which other industries draw inspiration as a framework for reporting 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. This is reiterated by the reports received this year from wharf and vessel staff and the contact that has been maintained with Nominated Contacts and Site Champions.

The application 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 fact that reports and images are uploaded to the website and on to social media platforms and that *Dredged Up* is handed out at engagement events has targeted a wider audience than just the aggregate industry.

The enthusiasm and diligence of wharf and vessel staff ensures the success of the Protocol. Everyone's support has ensured that the Protocol has become embedded in commercial processes, which in turn reduces the impact of dredging on underwater cultural heritage by making the archaeological record available for future generations. At the end of each wharf visit there are always discussions between a member of the Protocol Implementation Team and wharf/vessel staff, during which questions are raised and discussed, and ideas gathered on how to make the Protocol more relatable or easier to use. It is because of such informal discussions that the scale photocards, mugs and keychains were developed - ideas that became a reality and were greatly received by all the staff.

The Protocol Implementation Service Team would like to thank everyone who has helped to support the Protocol during the 2023–2024 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.

Protocol Finds

2023-2024

Hanson_1091: Spent Casings

These cartridge cases and unfired round were discovered in Licence Area 401/2B in the East Coast dredging region, approximately 23 km east-south-east of Great Yarmouth. Andrea Hamel and Paolo Croce discovered them at Dagenham Wharf during Operational Sampling.

Hanson_1091 is a collection of spent cartridge cases and a single unfired round. They represent a range of calibres and ammunition types. The head of several cases reveal identifying markings stamped into them. After photographs and basic recording was completed, the items were handed over to be disposed of by EOD.

Images of the casings were sent to Jonathon Fergason of the Royal Armouries at Leeds who was able to identify the finds. The contents of the bucket consist of a belted cannon cartridge case, which appears to be a 30mm ADEN aircraft cannon (Cold War vintage) cartridge case, then three .50 Browning Machine Gun rounds (headstamp shows Royal Laboratory, 1943 manufacture), and three German signal pistol cartridge cases – 1935 being the date again.

The signal pistol cases may have been fired by downed aircrew – as pistols used inside or mounted into aircraft would retain the cases inside the aircraft. The aircraft cannon case has fallen from a passing fighter/strike aircraft (Hunter, Harrier, etc). The unfired .50 BMG round has been discarded for some reason, possibly over the side of a ship or maybe for some reason from the air – for example a bomber turret with a stoppage might re-cock and eject live rounds.

It is unclear how these items found their way into the archaeological record. They represent two historical periods, the Second World War and the Cold War. In any case, they provide examples of how evidence of world changing events remains and can still be discovered on the seabed.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 126/23)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk

Hanson_1092: Piece of Shoe Leather

This piece of recycled show leather was discovered in Licence Area 401/2B in the East Coast dredging region, approximately 24 km south-east of Great Yarmouth. Andrea Hamel discovered it at Dagenham Wharf during Operational Sampling.

Hanson_1092 is a piece of leather sole which shows evidence of being cut and reshaped. The piece is 75 mm long and 50 mm wide and is 3 mm thick.

The find was brought back to Wessex Archaeology's Salisbury office for further assessment. After showing the find to a specialist, they were able to identify that the sole is from a shoe from around 1800. The round holes which are present on the outside of the piece are where wooden pegs were used to attach the sole to the main shoe.

It is unclear how this item entered into the archaeological record. Most likely the piece belonged to a crewmember onboard ship who discarded it over the side.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 127/23)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk

Hanson 1093: Star Shell

This piece of illumination ordnance was discovered in a cargo dredged from Licence Area 473/2 in the South Coast dredging region, approximately 30 km south of East Sussex. Stuart King discovered it onboard *Hanson Thames.*

The find is a fired piece of ordnance with a deployed parachute, likely an illumination round. The shell casing has a single driving band. The piece of ordnance was discovered onboard the vessel and disposed of as a piece of UXO, therefore no measurements or diameter are available in this case.

Richard Noyce, curator of artillery at Royal Armouries Fort Nelson was contacted regarding the find. Noyce was able to confirm that the find was an illumination round, often referred to as a 'Star Shell'. These were open-ended metal cannisters filled with a magnesium compound attached to a parachute by a swivel and wire support lines. They were used to provide illumination over a wide area.

It is unclear when and how this piece of ordnance came into the archaeological record. The North Sea and Britain's East Coast have seen considerable military activity, and it is likely this piece of ordnance was fired as a result of that activity, with the round sinking into the sea after being fired.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 128/23)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk.

Hanson_1096 Aircraft fragment

This fragment of an aircraft component was discovered in Licence Area 401/402 B in the East Coast dredging region, approximately 28 km south-east of Great Yarmouth. Adam Nightingale and Tony Scothern discovered it Dagenham Wharf during operational sampling.

The object appears to be a fragment of an aircraft component. It is aluminium, 180 mm long and 70 mm wide and around 10 mm think. There are six rivets evident running in a nonuniform line across the top of the find with between 10 mm and 20 mm spaces between each rivet.

Ewen Cameron from the Royal Air Force Museum was contacted regarding the find. Though he was able to confirm that the object was most likely a fragment from an aircraft component, the lack of diagnostic features present restricted his ability to classify the find. The find is likely to be from an aircraft produced post 1930, up until the present day.

It is unclear how this find found it's way into the archaeological record. It is not unusual for aircraft and aircraft fragments to be discovered. There was considerable aerial combat which took place over the east coast during the Second World War. It is therefore important that finds such as this be reported so as they can go along way in building up our understanding of aviation during this critical historical period.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 140/23)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk.

Hanson_1097: .50 BMG casing

This crushed .50 BMG casing was discovered in Licence Area 401/402B in the East Coast dredging region, approximately 28 km east-south-east of Great Yarmouth. Adam Nightingale and Tony Scothern discovered it at Dagenham Wharf during operational sample.

The object is cartridge case for a .50 BMG round. The casing has suffered considerable damage and appears to have been crushed. It is unclear if this occurred during the dredging process or though other means. The primer on the case does not appear to have been struck. The does not appear to be any legible markings present on the base of the case.

Jonathan Fergason of The Royal Armouries Leeds was contacted regarding the find. He was able to confirm that it was a .50 BMG case. .50 Browning Machine Gun rounds were introduced at the end of the First World War as an anti-tank round but as armour quickly became immune to this calibre of round the M2 .50 calibre Browning Machine Gun the round was designed for was rapidly repurposed as a heavy machine gun which was used on land, attached to vehicles, aircraft and naval vessels.

It is unclear how this casing found its way into the archaeological record. With the ubiquitous use of the weapon system and this round it may have been deposited at any point in the last hundred years. As the casing does not appear to be from a fired round, it may have been discarded while clearing a stoppage. The deformation evident on the case may be from this, though as mentioned this may have been the result of the dredging process.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 140/23)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk.

Hanson: 1098 Leather sole

This piece of leather sole was discovered in Licence Area 401/402 B in the East Coast dredging region, approximately 28 km east-south-east of Great Yarmouth. Adam Nightingale and Tony Scothern discovered it at Dagenham Wharf during operational sampling.

This find consists of a piece of leather which appears to be part of the sole of a shoe. At the largest points it is 170 mm long and 100 mm wide, and around 5 mm thick. None of the fixtures of the sole remain. However, there are squared holes visible which suggest wooden pegs.

Upon consultation with finds specialists at Wessex Archaeology, it was determined that the sole belonged to a shoe from the late Victorian period to early 20th century, around 1870 to 1920.

It is unclear how this object found its way into the archaeological record. Most likely it was either intentionally discarded or accidentally dropped by a passenger onboard a passing ship.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 140/23)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk.

Hanson_1100: Flare Gun

This German flare pistol was discovered in Licence Area 401/402B or 240, two cargos were being processed both from the East Coast dredging region, approximately 22 km east-south-east of Great Yarmouth. Troy Potter reported the find, discovered at Dagenham Wharf and reported as per protocol.

This object appears to be flare or signalling gun. These are used to fire pyrotechnical ammunition and while potentially dangerous are not in and of themselves weapons.

Jonathan Fergason from The Royal Armouries Leeds was consulted regarding the find and was able to identify it as German Model 26 Leuchtpistole. The model was adopted into service with the Reichswehr from 1926-1928 and would remain in service though to 1945 and beyond. Flare pistols such as this were utilized extensively for signalling and illumination. They fired 26.65 mm ammunition, with a wide variety of ammunition available depending on intended use.

While it is not certain how this object found its way into the archaeological record it is most likely that it was dropped by a passing Luftwaffe aircrew during the Second World War. Extensive aerial combat took place between the RAF and Luftwaffe over the east coast during the war, and this flare pistol may stand as evidence of that.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 143/23)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk.

Hanson_1102: Type 80 Fuse

This British artillery fuse was discovered in Licence Area 240 in the East Coast dredging region, approximately 15 km east of Norfolk. Adam Nightingale discovered it at Dagenham Wharf during an Operational Sampling visit.

Hanson_1102 appears to be a fuse for an artillery shell. The word 'SAFE' is identifiable. This suggests it is a British artillery fuse. The fuse also has visible numbers. It is made entirely out of solid brass. As a piece of UXO, it was handed into the Wharf for disposal by the EOD as per their UXO policy.

Richard Noyce of the Royal Armouries was contacted regarding the identification of this find. He was able to confirm it was a British Type 80 fuse. These were copies of the German Krupp design and produced under licence. They were produced in Britian by Vickers Armament, who paid Krupp royalties for this privilege throughout the First World War.

This is a 'time and percussion' fuse. Meaning it could be set to detonate on impact or after a certain distance controlled by the time setting on the fuse. This was particularly effective with shrapnel shells, where the time could be set so as to cause the shell to detonate above the enemy raining shrapnel down into defensive positions and enemy trenches.

It is unclear how this find entered into the archaeological record. Most likely, the fuse entered the sea as a result of being fired during training.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 136/23)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk

Hanson_1103: Electrical Fuse

This potential piece of UXO was discovered in Licence Area 401/2 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. Adam Nightingale discovered it Dagenham Wharf during an Operational Sampling visit.

Hanson_1103 appears to be a potential piece of UXO. It is a metal cylinder roughly 38 mm in diameter and 60 mm long. One end could be removed revealing a white powdery substance inside, with the metal pin roughly 40 mm long connected to the top.

Richard Noyce of The Royal Armouries was contacted in the hopes of identification of the find. Noyce suggested that the find may be an electrical fuse from a German aerial bomb from the Second World War.

These were anti-disturbance devices. If a bomb came to rest, any movement could disturb the sensitive trembler switches and fire the primer, detonating the main charge.

While Hanson_1103 is the same rough shape and size as these fuses, it does not directly match known examples. This may mean that it is a fuse from the later stages of the war, when Allied bombing destabilised German war production meaning at times a move away from set standards.

It is unclear how this object found its way into the archaeological record. If it is a piece of UXO, it was likely dropped off the East Coast by passing Luftwaffe aircraft.

The find was given to Wharf staff for disposal by EOD specialists.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 136/23)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk

Hanson_1105: Ships Block

This ship's block was discovered in Licence Area 240 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. Adam Nightingale and Andrea Hamel discovered it at Dagenham during an Operational Sampling visit.

This find appears to be ship's block. The block is roughly 150 mm long, 110 mm wide and 70 mm thick. Objects like these are designed to work in combination with other blocks to form a mechanical aid to lifting heavy weights. Devices like these have been in use for thousands of years. The level of deterioration of the block suggests that it has been exposed on the seabed for some time.

The sheave inside is just visible and Graham Scott from Wessex Archaeology was able to identify the material as *lignum vitae*, a dense hard wood from the Caribbean often used in rigging. While the lack of markings makes a definitive date impossible it is likely from the late 18th to 19th century. However, *lignum vitae* were still in use as late as the 1920s as it was considered to be three times as hard wearing as bronze or steel in specific applications. Scott was able to classify the find as an 8" ships block. The recesses cut into the shell of the block suggest it had a rope strop and was not iron bound.

It is unknown how this find entered into the archaeological record. Most likely the block came loose and was discarded over the side of a passing ship, or potentially could be part of a shipwreck.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 139/23)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk

Hanson_1106: Metal Cap

This metal cap was discovered in a cargo from Licence Area 240 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. Adam Nightingale and Andrea Hamel discovered it Dagenham wharf during an Operational Sampling visit.

This find appears to be a metal cap, possibly made of steel. It is a solid piece of machined metal, weighing 1082 g. It is 75 mm in diameter and 33 mm thick. There is a circular recess in the centre of the base which is 37 mm in diameter and 5 mm deep. There is a groove 4 mm wide running around the circumference of the object 8 mm up from the base. It is most likely a modern find and appears industrial in nature.

As there are no identifiable markings present on this item it has not been possible to positively identify the find. It is likely a component of a piece of industrial machinery. The groove running around the circumference of the cap suggests the presence of an o-ring. It may have been part of a hydraulic piston cap.

It is unknown how this object entered into the archaeological record. As its origin is unknown, given the modern appearance of the object it may have come from the dredging vessel itself.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 139/23)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk

Britannia_1107: Parachute Buckle

This parachute buckle was discovered in Licence Area 340 in the South Coast dredging region, approximately 12 km south-east of the Isle of Wight. Ben Johnson discovered it at Brett Aggregates Portsmouth wharf.

This find appears to be a parachute buckle used during the Second World War. The object is approximately 100 mm wide and 90 mm in length. In the centre of the object an oxidized screw is visible, and the object shows some rust stains on the edge.

Ewen Cameron from The Royal Airforce Museum was consulted regarding the find and was able to confirm that this find belongs to a British parachute harness. At the bottom of the object the words: T**O R**E**LE**ASE were found ('the bold letters were just about readable' according to Ewen Cameron). It is, however, possible that this object was used in an American aircraft. The United States Army Air Forces (USAAF) used many pieces of British equipment.

It is unclear how this object found its way into the archaeological record. Most likely it was discarded from a passing aircraft. However, there remains the possibility that the object entered the water while being worn by a crewman. It is also possible that the find could be from a previously unknown aircraft crash site.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 024/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Isle of Wight.

Britannia_1108: Bomb Shackle

This bomb shackle 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. Ben Johnson discovered it at Brett Aggregates Portsmouth.

This find appears to be a B7 bomb shackle. The same kind of object has been recovered from this area previously, such as Britannia_1074. This find was reported from the same cargo as finds Britannia_1107, Britannia_1109, Britannia_1110, Britannia_1112 and Britannia_1113. These finds are all confirmed to be related to aircraft.

Bomb shackles like Britannia_1074 and Britannia_1108 were fitted to B-17 Flying Fortress, B-24 Liberator and B-25 Mitchell bombers during the Second World War. These devices were used to store bomb loads during transit and to drop them safely onto targets when needed. They were essential pieces of equipment for the completion of an effective bombing run.

It is unclear how Britannia_1108 found its way onto the seabed. Due to the significant amount of activity which took place over the English Channel during the Second World War, it is most likely that the object was lost as a result of battle damage or is a part of a wrecked aircraft. Several finds have been recovered from Area 340 that help to build a picture of the aerial war during the Second World War. A more detailed examination of this fascinating period of history can be seen in the Annual Report 2022-2023, which will be available on the project website shortly (https://www.wessexarch.co.uk/our-work/marine-aggregate-industry-protocol-reporting-finds-archaeological-interest).

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 025/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Isle of Wight.

Britannia_1109: Engine Component

This engine component was discovered in Licence Area 340 in the South Coast dredging region, approximately 12 km south-east of the Isle of Wight. Ben Johnson discovered it aboard the *Britannia Beaver*.

The find comprises a pair of metallic objects. One appears to be an engine component or mechanism, with visible gears. The other is a metal collar with four fixtures for attachment. The larger component has a circular disc roughly 180 mm in diameter and 50 mm deep above a smaller cylinder roughly 90 mm in width and 120 mm long. The metal collar is roughly 140 mm in diameter, with the surviving metal being around 5 mm thick. This find was reported from the same cargo as finds Britannia_1107, Britannia_1108, Britannia_1110, Britannia_1112 and Britannia_1113. These finds are all confirmed to be related to aircraft.

Ewen Cameron of the Royal Airforce Museum has identified this item as an engine driven generator. These pieces of equipment were used to provide electrical power to aircraft, derived from the energy generated by the aircraft's engine. It was not possible to determine exactly which aircraft the generator was from.

It is unclear how this object found its way onto the seabed. During the Second World War there was significant aerial combat over the Isle of Wight, as well as transit of bomber aircraft on their passage to targets in German occupied Europe. There have been several examples of aircraft components from the Second World War recovered in this area, this piece appears to be another example of that activity. It is also possible that unidentified aircraft material recovered in this area belongs to the wreck of a Piper PA-23 Apache, a twin piston engine private aircraft which ditched following engine failure in 1975.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 026/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Isle of Wight.

Britannia_1110: Aircraft Fragment

This aircraft fragment was discovered in Licence Area 340 in the South Coast dredging region, approximately 12 km south-east of the Isle of Wight. Ben Johnson discovered it aboard the *Britannia Beaver*.

The find comprises an aluminium aircraft fragment. It appears to be articulated suggesting some degree of movement. The find is made of two pieces of aluminium connected by cylindrical mounting point which is roughly 60 mm in diameter. The larger of the two pieces of aluminium is roughly 450 mm long and 110 mm wide, with a circular cut out roughly 70 mm in diameter. The second piece of aluminium is roughly 240 mm long and 60 mm wide. This find was reported from the same cargo as finds Britannia_1107, Britannia_1108, Britannia_1109, Britannia_1112 and Britannia_1113. These finds are all confirmed to be related to aircraft.

Ewen Cameron of the Royal Air Force Museum was able to confirm that it does appear to be a fragment from an aircraft component. However, he was not able to identify the find further.

It is unclear how this object found its way onto the seabed. During the Second World War there was significant aerial combat over the Isle of Wight, as well as transit of bomber aircraft on their passage to targets in German occupied Europe. There have been several examples of aircraft components from the Second World War recovered in this area, this piece appears to be another example of that activity. It is also possible that unidentified aircraft material recovered in this area belongs to the wreck of a Piper PA-23 Apache, a twin piston engine private aircraft which ditched following engine failure in 1975.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 027/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Isle of Wight.

Britannia_1112: Aircraft Fragment

This aircraft fragment was discovered in Licence Area 340 in the South Coast dredging region, approximately 12 km south-east of the Isle of Wight. Ben Johnson discovered it aboard the *Britannia Beaver*.

This find appears to be some kind of aircraft component. It is a spool, holding what appears to be a ribbon of fabric and some kind of wire or twine. A clip or clasp is visible, connected to the end of the wire or twine. The spool is roughly 60 mm in dimeter, wrapped in a ribbon of fabric which is around 10 mm wide. The spool is connected to a hexagonal piece around 20 mm wide and 60 mm long. This find was reported from the same cargo as finds Britannia_1107, Britannia_1108, Britannia_1109, Britannia_1110 and Britannia_1113. These finds are all confirmed to be related to aircraft.

Ewen Cameron of the Royal Air Force Museum was able to confirm that the find is likely an aircraft component. However, he was not able to offer any more concrete identification of the find.

It is unclear how this object found its way onto the seabed. During the Second World War there was significant aerial combat over the Isle of Wight, as well as transit of bomber aircraft on their passage to targets in German occupied Europe. There have been several examples of aircraft components from the Second World War recovered in this area, this piece appears to be another example of that activity. It is also possible that unidentified aircraft material recovered in this area belongs to the wreck of a Piper PA-23 Apache, a twin piston engine private aircraft which ditched following engine failure in 1975.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 029/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Isle of Wight.

Britannia_1113: Aircraft Component

This aircraft fragment was discovered in Licence Area 340 in the South Coast dredging region, approximately 12 km south-east of the Isle of Wight. Ben Johnson discovered it aboard the *Britannia Beaver*.

This find appears to be a fragment of an aircraft component. It is likely a piston of some kind, with a piston head, piston and return spring. The head of the piston is circular with a diameter of roughly 100 mm. There is a piece of coiled spring just below the head, this appears to only be partially intact. The entire piston is roughly 170 mm in length, with the cylindrical piston shaft below the head being roughly 20 mm in diameter. This find was reported from the same cargo as finds Britannia_1107, Britannia_1108, Britannia_1109, Britannia_1110 and Britannia_1112. These finds are all confirmed to be related to aircraft.

Ewen Cameron of the Royal Air Force Museum was able to confirm that the find is likely an aircraft component. However, he was not able to offer any more concrete identification of the find.

It is unclear how this object found its way onto the seabed. During the Second World War there was significant aerial combat over the Isle of Wight, as well as transit of bomber aircraft on their passage to targets in German occupied Europe. There have been several examples of aircraft components from the Second World War recovered in this area, this piece appears to be another example of that activity. It is also possible that unidentified aircraft material recovered in this area belongs to the wreck of a Piper PA-23 Apache, a twin piston engine private aircraft which ditched following engine failure in 1975.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 030/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Isle of Wight.

Britannia_1114: Metal Box

This metal box was discovered in an aggregate cargo from Licence Area 340 in the South Coast dredging region, approximately 12 km south-east of the Isle of Wight. Ben Johnson discovered it at Brett Aggregates Portsmouth, after the cargo was unloaded from *Britannia Beaver*.

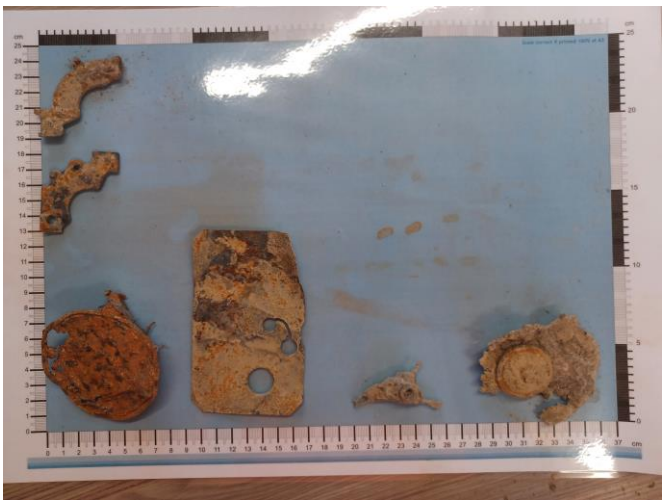
Britannia_1114 appears to be the remains of a metal box, approximately 250 mm long and 370 mm wide. The object is severely damaged and indented. The side of the box contains a grid-like pattern with small, punctuated holes. When it was recovered the box contained six different metallic objects. These have been recorded separately as find Britannia_1115.

As there are no readily identifiable diagnostic features to this find it has not been possible to definitively identify its origin. Most likely the find is a storage box from a vessel or aircraft. The holes could be to allow for water to naturally drain out aboard a vessel or to reduce weight on an aircraft. On consideration, it's probably more likely that this is a maritime find as opposed to being from an aircraft as it is made of steel and aluminium would be more common on aircraft.

It is unclear how this object found its way onto the seabed. In all probability, it was either lost over the side of a vessel or discarded. However, it can't be ruled out that it is a fragment of a wreck site. It is important to report items such as this even though they contain little diagnostic value. By tracking the location of these finds it may be possible to pinpoint the location of wreck sites and more significant finds.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 031/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Isle of Wight.



Britannia_1115: Machinery Components

These machinery components were discovered in an aggregate cargo dredged by *Britannia Beaver* in Licence Area 340 in the South Coast dredging region, approximately 12 km south-east of the Isle of Wight. Ben Johnson discovered them at Brett Aggregates Portsmouth.

Britannia_1115 comprises six machinery components. From top left to bottom right:

- Objects 1 and 2 are matching curved brackets or fittings. They are roughly 50 mm high, 20 mm wide.
- Object 3 is a circular cap or cover and is around 75 mm in diameter.
- Object 4 is a rectangular metal sheet roughly 120 mm long and 60 mm wide, with three holes punched through the sheet.
- Object 5 is a fragment of a component roughly 50 mm long and 10 mm wide.
- Object 6 is a fragment of a disc or gear and appears to have originally been circular. The surviving piece is roughly 80 mm by 70 mm.

These items were all found contained within a larger metallic box that has been recorded separately as find Britannia_1114.

It has not been possible to positively identify any of these items as they lack the necessary diagnostic features for this. Most likely they are pieces of machinery and spare parts that would be utilised in the maintenance of their parent vessel. Due to the lack of aluminium components, it is probable that these finds come from a maritime background instead of an aviation one.

It is unclear how these objects found their way onto the seabed. Most likely they were either discarded over the side of their parent vessel, however it is possible that they could be a component of a wreck site.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 032/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Isle of Wight.

Cemex_1121, Cemex_1122 and Cemex_1123: Aircraft Parts

These aircraft parts were discovered in Licence Area 512 in the East Coast dredging region, approximately 15 km east of Great Yarmouth, and were reported to the Protocol in three separate reports. Cemex staff discovered them on board *Reimerswaal*.

Cemex_1121 consists of five square and hollow tubes. The largest tube is 800 mm by 70 mm and the smallest 350 mm by 70 mm. The tubes show signs of severe damage, especially on the edges. This type of damage suggests that the material has been ripped off from the original structure by sheer force. Some tubes contain puncture holes. Some are a remnant of possible rivet holes, some are corrosion or damage marks.

Cemex_1122 consists of eight different metal aircraft components, none of which have been identified. The smallest component has a diameter of 70 mm by 20 mm and the largest component 100 mm by 110 mm. The material is very rusted, indicated by the brown surface colour.

Cemex_1123 consists of an assemblage of 22 aircraft parts. The biggest piece measures 120 mm by 80 mm and the smallest piece measures 40 mm by 30 mm. The objects are severely damaged, and some are crumpled up. Several objects have punctuated holes (likely for rivets), indicated by the regular intervals between the holes. Some holes are less regular and appear to be remnants of heavy corrosion.

Pictures of all the aircraft parts from the three reports were sent to Ewen Cameron from the Royal Airforce Museum. Unfortunately, these finds did not yield any specific diagnostic features to identify them. They only can be identified as aluminium (Cemex_1121 and Cemex_1123) and iron (Cemex_1122). However, Ewen was able to identify the square tube aircraft parts as presumably pre-Second World War design, but it is also possible the aircraft was still in use during the Second World War.

It is unclear how these finds found their way onto the seabed. It is possible they belong to a crashed airplane site. However small and unrecognizable, these parts are still of great importance, because they can be an indicator for hidden aircraft sites on the seafloor. Any further discoveries of potential aircraft material should be reported through the Protocol.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The MOD (if relevant)
- The Receiver of Wreck (Droit 012/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk.

Brett_1124: L60A1 AEP Projectile

This L60A1 AEP Projectile was discovered in Licence Area 340 in the South Coast dredging region, approximately 12 km south-east of the Isle of Wight. Lloyd Weedon discovered it Newhaven wharf.

The object appears to be a rubber less-lethal projectile. These are kinds of projectiles are used during riot or crowd control. The projectile is 37 mm wide and 130 mm long.

Jonathon Ferguson of The Royal Armouries in Leeds was able to confirm that the object was a L60A1 37 mm Attenuating Energy Projectile (AEP). These were in use by the British Army and police. They were brought into service in 2005 to supplement and eventually replace the L21A1 baton round. The AEP element of the round is a void present in the nose of the projectile. This allows for a round which will impact with equal mass but with a greater dispersion of force than earlier less-lethal projectiles. The purpose of this adaption is to reduce the risk of injury to the individual being fired upon.

These less-lethal projectiles were fired from purpose made L104A1 launcher. The 37 mm diameter is an intentional safety feature of the round, as 40 mm High Explosive (HE) and other more lethal ammunition cannot be accidentally loaded and discharged from this weapon system.

It is uncertain how this object came to be on the sea floor. The L60A1 round can be fired from any 37 mm launcher, including flare or signal guns.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 005/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Ilse of Wight.

Cemex_1126: Aircraft Remains

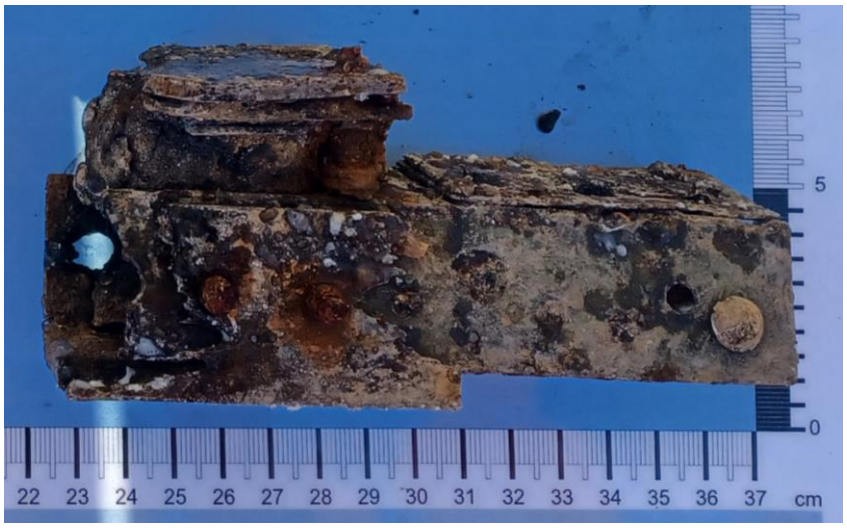
These aircraft remains were discovered in Licence Area 512 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. These finds were discovered on board *Sand Fulmar.*

Cemex_1126 consists of nine individual aircraft remains. They range in size but are all smaller than 300 mm². All but one item is metallic. Steve Vizard was contacted to aid in identifying the finds.

Owing to the badly fragmented nature of the finds and the lack of diagnostic data, such as part numbers, direct identification of each part was not possible. However, broad interpretation could be attempted. Seven objects appear to be engine components of some kind. These include: cast aluminium engine casing; head stud; shattered drive cogs; cam shaft drive and potentially heat and fire resistant fabric shielding.

Engine components:

The remaining two finds appear to be a gauge of some kind and a steel gun mount. The image of the gauge does not allow us to see the display meaning it is not possible to determine what the purpose of the gauge might be. Gun mounts were used to provide defensive armament to multi-engine aircraft such as bombers.

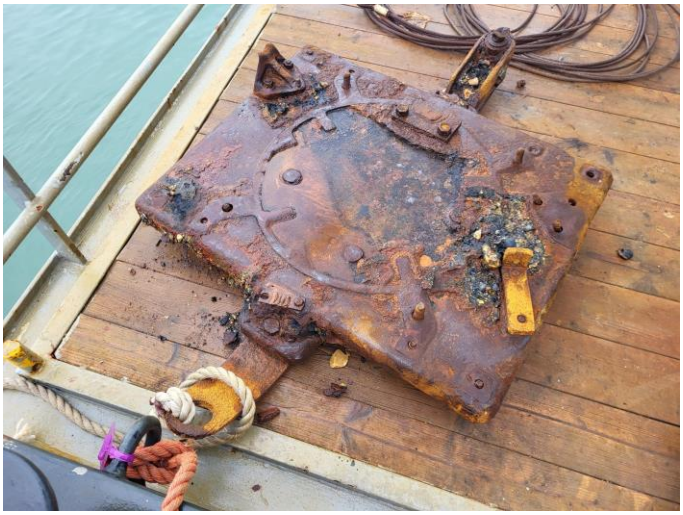


The engine components appear to be from a Merlin engine. The Rolls Royce Merlin is a Liquid-cooled V-12 four-stroke piston aero engine first produced in 1933. The engine became one of the most successful of the Second World War and was used in several aircraft such as the British Spitfire and the American P-51 Mustang. The Merlin was also used on multi-engine aircraft such as the Lancaster and Halifax and the wreck material here was likely from this type of aircraft.

It is not clear how these finds came to rest on the seabed. Most likely, they are the consequence of aircraft loss resulting from equipment failure or enemy fire during the Second World War. By remaining vigilant to this material, the Marine Aggregate Industry can continue to help shed light on this vital part of British and world history.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The MOD
- The Receiver of Wreck (Droit 007/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk.



Cemex_1127: Metal Baseplate

This metal baseplate was discovered during dredging in Licence Area 137 in the South Coast dredging region, approximately 12 km west of the Isle of Wight. Stuart Kidd found the item aboard the *Cemex Go Innovation.*

The object is a metal baseplate, rectangular in shape measuring 700 mm by 900 mm. There are multiple fixtures and brackets attached to the item, and there appears to be further attachment points remaining beneath the main plate.

Anthony Mansfield was contacted regarding the find and was able to identify it as a baseplate for mounting some sort of mechanism. As there is a circular indentation in the baseplate it can be inferred that the mechanism was able to swing. The weight and size of the baseplate suggests it was used to mount a fairly substantial piece of machinery. It is likely that the baseplate comes from the civilian or commercial sector as the bright yellow warning paint still visible would be unlikely aboard a military vessel.

It is unclear how this object found its way into the archaeological record. Most likely the baseplate was discarded overboard, possibly when the machinery it mounted became obsolete or became damaged beyond the crew's ability to make repairs.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 015/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Isle of Wight.

Brett_1128: Cannon Ball

This cannon ball was discovered in Licence Area 351 in the South Coast dredging region, approximately 12 km east of the Isle of Wight. Ben Johnson found the object at Flathouse Quay Wharf.

This item appears to be an iron cannon ball, around 120 mm in diameter. This suggests it is a 12-pounder ball. It is a solid shot, with no sub-munition or internal charge. Around one third of the ball has been broken off. This may have been the result of movement on the seabed but could equally be the result of being fired during an action.

12-pounder cannon were a ubiquitous sight both on land and at sea during the 17th, 18th and early 19th centuries. The were considered a medium calibre weapon and were very versatile. They could make up the bulk of armament of a frigate or equip the top decks of a ship of the line. They were also considered to be the heaviest practical field artillery pieces for use by the Army.

It is unknown how this object found its way onto the seabed. There was considerable naval activity within the English Channel and this find may have been lost as a result of that.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Isle of Wight.

Brett_1129: Timber

This piece of timber was discovered in Licence Area 351 in the South Coast dredging region, approximately 12 km east of the Isle of Wight. Ben Johnson found the object on wharf Flathouse Quay.

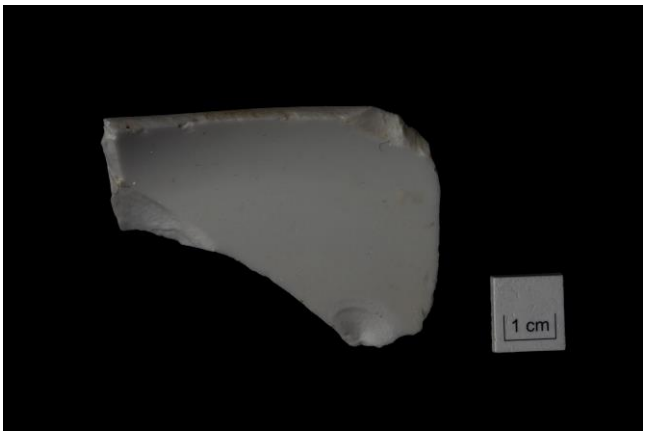
This piece of timber was discovered during dredging off the Isle of Wight. The piece has a slight curve and is roughly 500 mm in length. There do not appear to be any fastenings or evidence of fastenings present. At least one end of the piece shows signs of it being squared off.

While this piece of timber may have come from a small boat or be the product of some other human activity, there is very little that can be seen on the object as evidence for this. The current poor state of preservation of the object makes a detailed identification difficult.

It is unknown how this object found its way onto the seabed. The English Channel has seen substantial maritime activity throughout recorded history and there is the potential that this piece is an example of that.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Isle of Wight.



Cemex_1131: Pottery Sherd

This piece of pottery was discovered in a cargo from Licence Area 512 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. Kirsten Pollé discovered it during an operational sampling walkover at Cemex Northfleet Wharf.

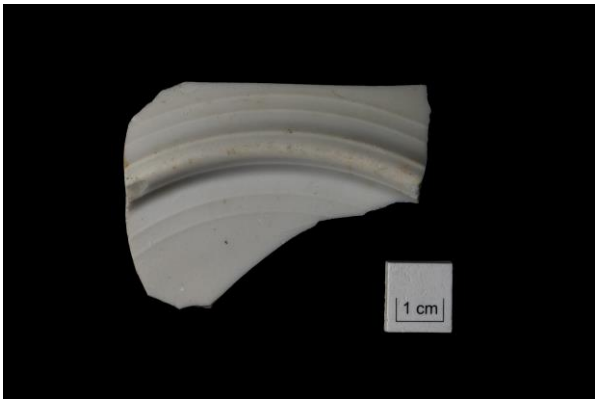
Cemex_1131 is a white pottery fragment. It measures 65 mm by 50 mm and the object is severely damaged on the edges.

The piece of pottery was shown to Racheal Segar Smith, Senior Finds Manager at Wessex Archaeology, and she was able to identify it as table ware. This particular piece is a fragment from a plate or bowl. It is glazed on both sides, and this is a trademark of this type of pottery.

It is unclear when and how this piece of pottery came into the archaeological record. It may have been tossed overboard from a ship as a way of discharging rubbish, or it could have fallen overboard. The piece of pottery may also have been flushed in from another archaeological site.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 018/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk.



Heidelberg_1132: Oxygen Cylinders

These German oxygen cylinders were discovered in a cargo from Licence Area 473 in the South Coast dredging region, approximately 30 km south of East Sussex. Tom Shenton discovered it Frindsbury Wharf.

These finds appear to be a pair of oxygen bottles. They are both of the same size and type. A valve is present on both cylinders as well as markings embossed into the metal at the top of both bottles. From the markings they are two litre cylinders.

Steve Vizard was contacted regarding the finds, and he was able to confirm that they are a pair of oxygen bottles which were fitted to all Luftwaffe aircraft during the Second World War. While the bottles are too generic an item to match to a specific aircraft, single seat aircraft such as fighters would be equipped with a pair of bottles, while larger bombers could carry over a dozen. Vizard was further able to date the finds to early war, likely 1940.

There are two aircraft losses recorded for this area, one of them German. This was a Junkers 88, a twin-engine medium bomber. An aircraft of this size would have been equipped with several cylinders like that found, most being fitted into racks holding multiple bottles positioned throughout the aircraft. As these cylinders are not contained in any kind of mounting system, it is unlikely that they are from this aircraft.

While we do not know for certain how these cylinders came to rest on the seabed, it is likely as a result of the combat which took place in the skies surrounding the United Kingdom during the Second World War. That these finds were recovered suggests further material may well be present in the area. These finds are further evidence of the struggles and sacrifices that helped shape our world.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The MOD
- The Receiver of Wreck (Droit 021/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for East Sussex.

Heidelberg_1134: Seafaring Detritus

These finds comprise a treenail, a piece of coal and a wooden fishing float. They were discovered with aggregate dredged from Licence Area 401/2 in the East Coast dredging region, approximately 28 km south-east of Great Yarmouth. Adam Nightingale discovered them at Dagenham Wharf during Operational Sampling.

These three finds show a series of different activities taking place in the maritime landscape of the early modern and modern era.

The first find is a potential treenail. It is 38 mm wide and 180 mm long. Treenails are wooden pegs that were often employed in ship construction. They were used on craft of all sizes.

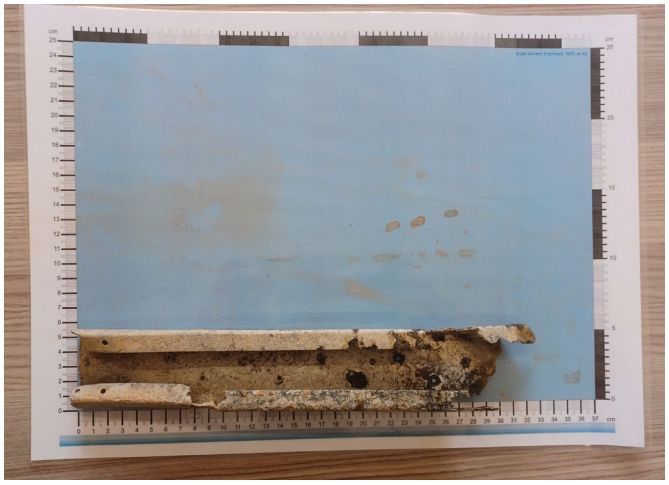
Second is a piece of coal. Coal was carried by vessels for several purposes. As the Industrial Revolution steadily grew in scale so did the demand and need to feed the factory fires, with a thriving collier industry evolving to meet these needs. Coal could be used onboard ship, either as fuel for galley fires, or as fuel for steam engines which would become more and more common throughout the 19th century.

Lastly there is a wooden fishing float. Only a fragment has survived. The piece is roughly 50 mm wide, 30 mm deep, with a centrally placed hole about 8 mm wide. Floats such as this were as common a sight as more modern plastic or rubber varieties are today.

It is unknown how these items found their way to the seabed. However, they offer a glimpse into the range of activities and industries that operated in and around the waters of the British Isles.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 042/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk.



Britannia_1135: Metal Fragment

This metal fragment was discovered in Licence Area 340 in the South Coast dredging region, approximately 12 km south-east of the Isle of Wight. Nathan O'Sullivan discovered it at Flathouse Quay Wharf

Britannia_1135 is an unknown metal fragment and measures approximately 335 mm by 55 mm. The find contains little, alternating puncture holes and the object is corroded. One end of the object seems to be broken off or damaged.

As the object resembles potential aircraft material, pictures were sent to aircraft specialist Steve Vizard from Airframe Assemblies. The find did not yield enough diagnostic features to identify it to a certain type of plane or plane part. Moreover, Steve is not entirely convinced that the find is indeed aircraft material. The object does not have enough holes for the number of rivets expected in airplane parts and the serial number on the part is abnormal for historic or wartime airplanes.

Therefore, if the find is an aircraft fragment, the style and number of stamps indicate a modern or a recent airplane fragment, certainly not a wartime or historic plane. It could instead be maritime related, and the part might belong to a vessel.

It is unclear how this find found its way onto the seabed. The metal part could be washed away by the sea from shore. However, it could also be broken off from a metal wreck or 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 210/24)
- The MOD
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Isle of Wight.

Brett_1136: CO_2 Cylinder

This gas cylinder was discovered in Licence Area 340 in the South Coast dredging region, approximately 12 km south-east of the Isle of Wight. Antonio Williams discovered it Newhaven Wharf.

This find appears to be a compressed gas cylinder, roughly 160 mm in length and 40 mm wide, with a threaded valve and rounded base. The body of the cylinder has eroded with a small hole appearing at the base. The cylinder appears to have been slightly crushed.

The size of the cylinder suggests that it is too large to be a single use capsule and too small to be used to contain breathable air. It is possible that the find is an 88 g CO_2 cylinder. These cylinders are used to recharge smaller refillable CO_2 capsules and are often used with airguns or for use in soda syphons.

It is unclear how this object came to be on the seabed. It is likely that the cylinder was used until empty and then tossed over the side.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 044/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Isle of Wight.

Brett_1137: Metal Pipe

This metal pipe was discovered in Licence Area 340 in the South Coast dredging region, approximately 12 km south-east of the Isle of Wight. Dean Jackson discovered it on board *Britannia Beaver*.

This find appears to be a section of metal piping with a metal collar showing evidence of multiple rivet holes. The pipe is roughly 300 mm in diameter will the casing being around 5 mm thick. The find displays moderate corrosion from the marine environment.

Specialists at Wessex Archaeology were contacted to try and identify this find. However, as no markings are evident it is not possible to be more specific than to say that the piece is most likely a component from a piece of maritime industrial machinery. The find resembles other pieces of iron piping such as Hanson_0234. Flanged piping like this is a fairly common site about twentieth century vessels.

It is unclear how this object found its way to the seabed. The find was most likely discarded over the side of the vessel which carried it, or it could be associated with areas debris that were dumped offshore after the Second World War.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 052/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Isle of Wight.

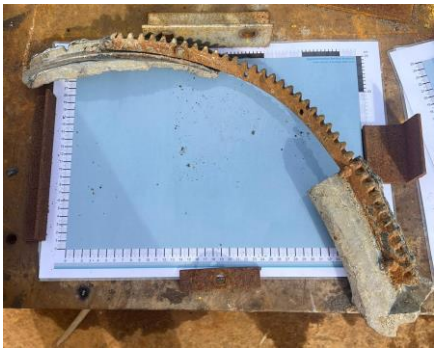
Cemex_1138: Aircraft Components

These five aircraft components were discovered in Licence Area 512 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. Jon Suckling discovered them at Cemex Northfleet Wharf.

This is a collection of five potential aircraft components found at the wharf following dredging. Images of the finds have been assessed by Steve Vizard, an aircraft specialist who was able to identify them.

Find a: A fragment of metallic tubing around 90 mm long and 30 mm wide. Find **a** does not appear to be an aircraft component and has no readily visible markings which could aid in an accurate identification.

Find b: This find is part of a control mechanism which had the capacity to swivel when attached to control rods or wires. A fragment of what could be a control rod is visible still connected to one side.



Find c: This was a part of a revolving gun turret. Ball turrets were often added to the dorsal and ventral sections of a bomber's airframe to give a wider field of fire and reduce blind spots. The serrated teeth of the find allowed the turret to rotate.

Find d: This is a fragment of aluminium airframe, roughly 200 mm long and 60 mm wide with attached bracket.

Find e: The final component is the remains of an engine generator. The outer shell is missing but the internal components are still visible. These components used the engine to create electricity for the aircraft.

Steve Vizard suggested that the four aircraft components came from a British Vickers Wellington bomber. This was a twin-engine medium bomber produced from 1936 to 1945, making the Wellington the only British bomber to remain in frontline service throughout the Second World War.

The Vickers Wellington was originally produced as a long-range daytime fighter, though during the war it quickly became apparent that the aircraft lacked the defensive armament to combat more modern fighters, leading to the Wellington being the first RAF bomber to be lost in the Second World War. As part of a general shift in RAF bomber strategy the Wellington would be converted to a nighttime bomber. As the war progressed, the utility and survivability of the aircraft would result in its adaption to a myriad of roles over the course of the war.

One particular characteristic of the Wellington was the geodetic structure of its airframe. This was formed through interconnecting over 1,600 duralumin W beams to form a honeycombed structure onto which the hull and components of the aircraft was mounted. While complex and difficult to repair, this structure gave the Wellington remarkable survivability, with significant redundant strength inherent within the superstructure of the airframe.

It is unclear how these finds found their way onto the seabed. Most likely, they are the result of a damaged aircraft or potentially a debris scatter from a downed aircraft. Due to the Second World War, there are more aircraft wrecks around the British Isles than anywhere else in the world. Therefore, it should be expected that material of this kind be found during marine aggregate dredging operations. These finds help show the sacrifices made by airmen during the Second World War, and it is a privilege to help preserve and share their story.

Any further discoveries of potential aircraft material should continue to be reported through the Protocol.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- MOD
- The Crown Estate
- The Receiver of Wreck (Droit 063/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk.

Cemex_1140: Aircraft Component

These fragments of aircraft components were discovered in Licence Area 458 in the East English Channel dredging region, approximately 39 km south of Hastings. Wharf staff discovered them at the Angerstein Wharf.

This find comprises two separate components that appear to have come from an aircraft. One is made of aluminium while the other appears to be made of steel. The steel component is a relatively flat piece roughly 160 mm long by 80 mm wide, with several holes across its surface with some surviving rivets and a small patch of aluminium showing where the component connected to the rest of the aircraft. The aluminium piece is a section of frame roughly 200 mm long and 60 mm wide with steel pieces rivetted to both sides.

Steve Vizard and Ewen Cameron were contacted regarding the find. They were able to confirm that the pieces were aircraft fragments, though with such small objects positive identification of the original aircraft was not possible. The square nature of the frame suggests a pre-war design, though this method of aircraft frame construction was in use until the 1950s. The Luftwaffe utilized steel doublers to strengthen components, suggesting that these may have originated from a German designed aircraft.

It is unknown how these finds found their way onto the seabed. Most likely they come from a damaged or downed aircraft lost as a result of action during the Second World War. There are more aircraft wrecks surrounding the British Isles than anywhere else in the world. Several aircraft components have been recovered from Area 458, such as Cemex_0853 and LTM_0619. Finds such as this should be anticipated by dredging crews who should be familiar enough with this kind of find to recognise this material. Accurate reporting of finds can help to track patterns in the material and potentially lead to the discovery of wrecks.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The MOD
- The Receiver of Wreck (Droit 074/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for East Sussex.

Cemex_1141: Aircraft Components

These aircraft components were discovered in Licence Area 512 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. They were discovered at Northfleet Wharf.

A collection of four aircraft components were discovered at Northfleet Wharf and handed to archaeologists who arrived on site to conduct an operational monitoring visit. These finds have been shared with specialists to determine their origin and to tell us more about their story.

The first finds (A and B) appear to be parts from radial engines. Find A is valve and rocker gear, it is roughly 200 mm by 200 mm in size. Most likely this component comes from a Pratt & Whitney 'Wasp' series of engine. This was a large family of engines used in a variety of aircraft designs from the 1930s and 40s. Find B is a smaller section of engine attached to a piece of serrated steel guide. The piece is roughly 120 mm by 300 mm. It is not possible to say for sure which aircraft an engine such as this might been fitted to without further evidence. One reason for the difficulty in determining exactly which aircraft these components relate to is the commonality of this type of engine during the Second World War. Variants of the design would be employed by all the major powers of the Second World War.

Radial engines operate by arranging cylinders in a star pattern around a central crankshaft. The pistons are connected to the crankshaft via a ring placed on the shaft, with a single piston connecting directly to the crankshaft acting as a 'master rod'. The pistons then fire in an every-other-piston sequence converting multiple linear forces into rotational energy used to turn the propeller.

Find C is a section of airframe, a flat aluminium sheet, roughly 170 mm by 120 mm. There are several uniform holes evident with a single iron bolt still evident in one. A pair of rivets are also visible. This piece is most likely part of joint plate or a fixture.

The final find may not be aircraft related, but was found in the same cargo. It is substantially heavier, made predominantly of steel instead of aluminium, though this does not in itself rule it out as an aircraft component. The find is roughly circular, 200 mm in diameter. There is a central connecting point mounted to the larger steel disc. It is possible that this is a component from a weapon system mount, though this is unlikely.

There have been several aircraft finds from Area 512, including Cemex_1028. These finds directly relate to other finds such as Cemex_1121, Cemex_1122 and Cemex_1123. It is important to have as precise location data as possible for finds such as this so that we are able to connect the dots and begin to look for patterns.

It is unclear how these finds came to be on the seabed. Most likely these finds come from just a small part of a larger debris scatter caused by a downed aircraft. Aircraft crash sites like this are common in the waters around the UK and point to the sacrifices made by airmen during the Second World War. Staff working on cargoes from Area 512 should continue to be vigilant for further discoveries of aircraft material, as it may be possible to pinpoint a previously unknown wreck site.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The MOD
- The Receiver of Wreck (Droit 075/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk.

Cemex_1142: Aircraft Fragments

These aircraft fragments were discovered in aggregate dredged from Licence Area 512 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. Adam Nightingale and Tony Scothern found them at Northfleet Wharf during Operational Monitoring.

This collection of ten aircraft fragments was discovered during a round of Operational Sampling. They are all fairly small, the largest overall being around 120 mm by 100 mm with the longest airframe fragment is 350 mm long and 20 mm wide. They are all made of aluminium. There are rivets and attachment points visible on several pieces.

Steve Vizard was contacted regarding these finds and confirmed that they come from an aircraft. As there is nothing diagnostically significant about any of the fragments it was not possible to connect any one fragment to a particular aircraft. However, he was able to say that they all appear to be from the airframe of the aircraft, as opposed to engine or system components.

It is not clear how these finds found their way onto the seabed. Most likely they fell from a damaged aircraft or possibly form a small part of the debris scatter created by a crashed aircraft. Even small fragments such as these should be reported as tracking the locations of these smaller finds can help determine the possible location of larger wreck sites.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The MOD
- The Receiver of Wreck (Droit 075/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk

Cemex_1143: UXO

These pieces of UXO were discovered in aggregate dredged from Licence Area 458 in the East English Channel dredging region, approximately 40 km south of Hastings. Adam Nightingale and Tony Scothern discovered them during Operational Monitoring at Northfleet Wharf.

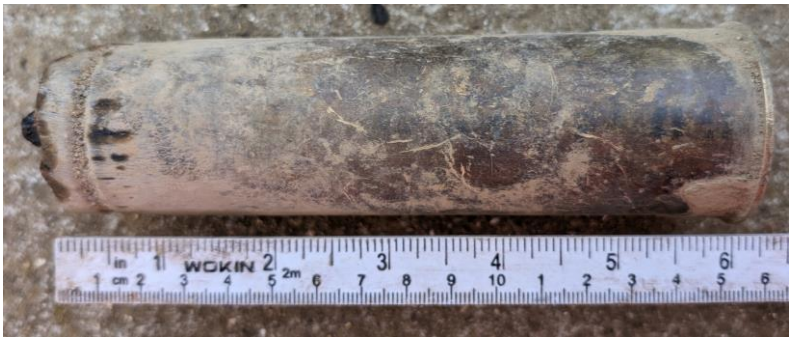
These four finds comprise two small arms cases, a larger 40 mm shell casing and a fragment of driving band or obturating ring.

Richard Noyce of the Royal Armouries Leeds was contacted in order to positively identify the UXO.

The small arms casings (in the images above) were both identified as .50 BMG rounds. These were extremely common and have been in use for over 100 years. In addition, the Browning Machine Guns that used these rounds were mounted to both naval vessels and aircraft. Of the two small arms cases, one appeared to be unfired, this can be seen from the fact that there is no evidence of primer being struck.

Driving bands (such as the fragment of one in the photo on the right) are soft pieces of metal wrapped around a projectile. The soft material will ‘obturate’ under pressure, forming a seal maximising the force exerted by the propellant gases. The grooves on this fragment indicate that it was fired.

The larger casing was identified as a British 2 pounder (pdr), Ordnance, Q.F. 2 Pr Mk I-V. The date '1944' is visibly stamped into the base of the case. Designed to make use of the vast stocks of 2 pdr ammunition left over from the First World War, the Q.F 2Pr was an anti-aircraft weapon used by the Royal Navy. Known as the 'pom-pom' gun from the sound it made while being fired.



The 'Q.F.' stood for quick firing, with a single auto-cannon being capable of firing around 200 rounds a minute. The weapons were often utilised in multi-barrelled arrangements, with up to eight weapons being mounted together. While the United States Navy considered adopting the weapon system, the fact the ammunition had a cordite propellant charge made the ammunition too difficult to produce. However, the weapons would be adopted by many Commonwealth nations, including Canada, Australia and New Zealand.

The ammunition itself would see continuous innovation over the years in order to maintain it's effectiveness into the Second World War. There were several different kinds of ammunition which could be used, including Common Pointed Shell; Nose Fuzed Shell; HE Shell; Armour Piercing and Night Tracer. After the end of the Second World War, the weapon would begin to be phased out, replaced by the more effective Bofors design.

It is unclear how these pieces of UXO found their way onto the seabed. Most likely they were fired either in anger during the Second World War or expended during training.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 075/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for East Sussex.

Brett_1144: Shell Casing

This shell casing was discovered in Licence Area 508 in the Thames Estuary dredging region, approximately 28 km south-east of Kent. Dean Jackson discovered it on board *Britannia Beaver.*

This find appears to be a shell casing. The casing has a diameter at the base of 70 mm and an overall length of approximately 130 mm.

Images of the find were shared with Richard Noyce, curator of artillery at The Royal Armouries Museum. He suspected that the casing belonged to a 40 mm Bofors shell. It is important to note that the calibre of a round is almost always based on the size of the projectile, which is invariably smaller than that of the base of the casing.

The Bofors 40 mm Automatic Gun was a series of anti-aircraft weapons designed by Sweden and used by a number of nations. The weapons entered service in the 1930s, with the L/60 variants being the most common. The weapons were commonly mounted to naval vessels, though ground-based use was also possible. The weapons were fed manually by loading in four round clips, which somewhat limited the weapons rate of fire to around 100 rounds a minute.

These weapons remained in use on naval vessels until the 1990s, where they began to be replaced by the multi-barrelled 20 mm and 30 mm phalanx CIWS systems. The United States Airforce retained their use onboard AC-130 gunships, with the weapons finally being retired in 2020.

While it is unclear how this find found its way to the seabed, the most likely cause is that it was fired from a vessel either as part of training or in anger during the Second World War.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 080/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Kent

Cemex_1145: Aircraft Fragment

This aircraft fragment was discovered in aggregate from Licence Area 511, in the East Coast dredging region, approximately 11 km north-east of Lowestoft. Adam Nightingale discovered it during Operational Monitoring at Cemex Dagenham Wharf.

This find appears to be a fragment of aluminium airframe. The find is 140 mm long and 55 mm wide. There is evidence of holes from rivets along the side of the fragment. There is also fragmentary evidence for green paint present. This suggests the find may have come from an Allied aircraft, though this is far from certain.

As this single find has little diagnostic value it is not possible to identify which aircraft this fragment originally belonged to.

While it is not clear how this find found its way onto the seabed, there is a high likelihood that it comes from the period around the Second World War. Aerial combat during this period resulted in more aircraft wrecks around UK waters than anywhere else on Earth, so aircraft finds such as this should be expected and always reported. Tracking the position of aircraft material such as this can help locate larger areas of wreckage.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The MOD
- The Receiver of Wreck (Droit 084/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Suffolk

Cemex_1146: .50 BMG Projectile

This .50 BMG projectile was discovered in aggregate from Licence Area 512 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. Wharf staff discovered it at Northfleet Wharf.

This find appears to be the projectile from a .50 BMG round. It is unclear if this was a ball round or if it contained any kind of charge.

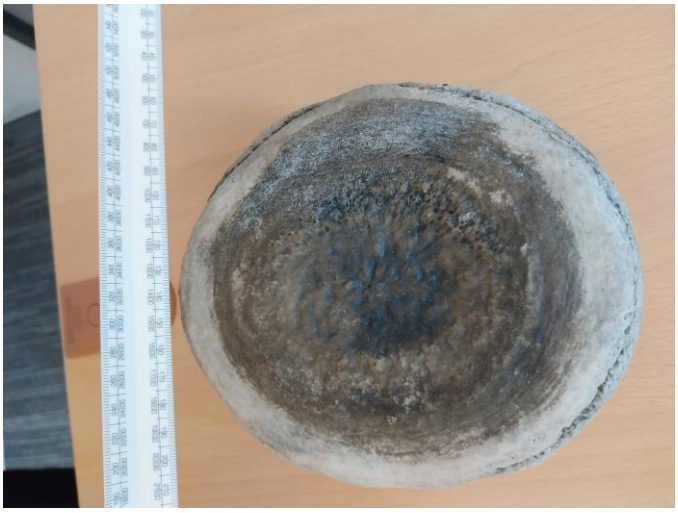
The .50 BMG (Browning Machine Gun) round was originally designed during the First World War. It was developed in conjunction with what would become the M2 HB Browning Machine Gun as an anti-armour weapon. Prototypes were completed by November 1918 and therefore did not see service. By the Second World War, the weapon had reached maturity but was unable to defeat the modern armour of tanks. However, it was still a capable weapon against light vehicles, aircraft and dismounted infantry and saw use across all theatres of the Second World War.

Having proved its effectiveness, the .50 BMG round would be adopted as a NATO standard munition and would be adopted by numerous nations. The round was ballistically extremely capable and large enough to contain a charge or explosive while remaining small enough for a high fire rate and large ammunition capacity when paired with vehicle mounted weapons systems. The weapons system is now over 100 years old and remains in front line service.

While we cannot be certain how this projectile found its way to the seabed, most likely it was fired either during training or in combat during the Second World War. 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 Receiver of Wreck (Droit 087/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk.



Cemex_1147: Whale Bone

This whale bone was discovered in Licence Area 407 in the South Coast dredging region, approximately 15 km south-east of the Isle of Wight. Filip Gorka-Niwinski discovered it on board *Cemex Go Innovation.*

This find appears to be section of whale bone. The piece is roughly 150 mm in diameter and 75 mm thick.

Lorraine Higbee from Wessex Archaeology was contacted regarding the find and was able to confirm that it was a Cetacea vertebra. Cetacea are a group of marine mammals which include whales, dolphins and porpoises. These animals are characterised by their exclusively marine habitat, air-breathing respiratory system and high intelligence.

This piece of whale bone does appear to have any man-made marks. However, using whale bone as an artistic material has been very common in the past, this is known as scrimshaw. Scrimshaw is an artistic form practiced usually by whalers who engraved images into the byproducts of the whaling industry such as whale bone and teeth.

It is not clear how this find found its way onto the seabed, most likely it was an entirely natural process. It is important that whale bone is reported through the archaeological protocol as examples of scrimshaw art when discovered offer a unique insight into the minds of the past mariners.

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 Isle of Wight.

Heidelberg_1150: Aircraft fragment

This aircraft fragment 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 Monitoring.

This find appears to be a fragment of airframe. It is made of aluminium. The find is approximately 400 mm long and 40 mm wide. The piece is crushed and is bent almost double in the middle. It is unclear how or when this damage occurred, either during the loss of the aircraft, action on the seabed or during the dredging process.

There are no clear diagnostic features present on this find, meaning it is not possible to make an accurate identification of which aircraft the find may have originated from. Aircraft wrecks are more common in the waters around the United Kingdom than in any other region on earth as a consequence of the Second World War. Including this find, a total of 54 finds relating to aircraft have been recovered through the archaeological protocol in 2024 so far.

While it is not possible to be certain how this fragment came to be on the seabed, it was most likely either a piece of damaged aircraft lost in flight or one small part of a larger wreck site. Given the quantity of aircraft material recovered, it is important to gain as accurate positional data on these finds as possible. This can increase the chances of finding wreck sites, including the possibility of recovering and returning home the remains of the pilots who flew them.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The MOD
- The Receiver of Wreck (Droit 089/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk

Heidelberg_1151: Ship components

These wooden ship components were discovered in aggregate from Licence Area 240 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. Adam Nightingale discovered them at Dagenham Wharf during Operational Monitoring.

These two finds appear to be fragmentary remains from wooden vessels. The first is most likely a treenail. It is approximately 205 mm long and 35 mm wide. It is roughly cylindrical and while one end has been shorn off the other appears to have been purposely planed off. The second find is most likely a reinforcing rib form a small vessel. The piece is roughly 250 mm long, 30 mm high and 10 mm wide. It is rectangular in cross section though with rounded edges. There is a notable bend to the piece, creating an L shape.

The two pieces are likely from very different vessels. Treenails were a common fastening used throughout the post-medieval and early modern era and could be found on vessels of all sizes. The scale of this treenail suggests a moderate to large scale vessel. On the other hand, the size of the rib suggests a much smaller vessel. Clinker built vessels were often reinforced by ribs placed inside the hull running perpendicular to the planking.

It is unclear how these finds came to be on the seabed. They could have been damaged components that were discarded over the side or potentially elements from wreck sites. Accurately identifying the position of finds such as this is important in helping to track down and positively identify wreck sites. These wreck sites can tell us a great deal about the United Kingdom's maritime past and the exploitation of the waters surrounding it.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 089/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk.

Tarmac_1152: Anchor Chain

This anchor chain was discovered in Licence Area 509/3 in the Thames Estuary dredging region, 27 km south-east of the Essex coast. Aaron Faulkner discovered it on board *City of London*.

This find appears to be a wrought iron anchor chain. The links are around 75 mm in width and 125 mm in length. There are also studs evident in several links, though some are now missing.

Wrought iron studded chains such as this were common in the nineteenth and early twentieth century. As studs are present, the chain cannot predate 1819 when this innovation was introduced. The introduction of iron chains came as the size of vessels increased making hemp anchor cables insufficient. Hemp cables could also rot in tropical conditions becoming a health hazard for the crew.

While it is unclear how this chain came to be on the seabed, it was most likely lost or discarded over the side of a vessel.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 098/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Essex.

Tarmac_1153: Ship Timber

This ship timber was discovered in aggregate dredged from Licence Area 458 in the East English Channel dredging region, approximately 40 km south of Hastings. Ian Massey discovered it at Tilbury Wharf.

This find appears to be a ship timber with an iron spike in it. The wooden part is approximately 180 mm long. The wood is punctuated by an iron spike, approximately 260 mm long. The iron spike is severely oxidized.

The first indication of ironwork in wooden ships dates back to 1670. Iron was used in the ship *Royal James,* built in Portsmouth (Goodwin 1997). The transition from wooden elements to iron or metal elements was slow. Shipbuilders did not yet see the value of iron in shipbuilding and preferred to hold on to their old ways (Goodwin 1997). The introduction of steam engines and the increasing expense of importing wood sped up the process of using iron and metal in ships a bit. However, around 1830, iron ships were still rare (Historic England 2012). It wasn't until the 19th century that iron and metal were used on a large scale, and many iron and metal ships were built.

Before the use of iron spikes, ship timbers were fastened with the use of wooden nails or pegs. Wood soaked up water and by doing this it expanded in size, which helped keep the nail or peg in place, and therefore fastening the underlying timber(s) with it.

The object Tarmac_1153 is an isolated find, however, timber pieces with interesting shapes or with evidence of fastening techniques (iron bolts or wooden treenails) should always be reported through the Protocol. These types of finds could indicate the presence of a previously undiscovered wooden shipwreck.

References:

Goodwin, P. 1997. 'The Influence of Iron in Ship Construction: 1660 to 1830'. https://maritime.org/conf/conf-goodwin.php (accessed 21/06/2024).

Historic England. 2012. 'Ships and Boats: 1840-1950'. https://historicengland.org.uk/images-books/publications/iha-ships-boats-1840-1950/heag133-ships-and-boats-1840-1950-iha/ (accessed 24/06/2024).

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 151/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for East Sussex.

Tarmac_1154: Metal Part

This metal part was discovered in aggregate dredged from Licence Area 458 in the East English Channel dredging region, approximately 40 km south of Hastings. Ian Massey discovered it at Tilbury Wharf.

Find Tarmac_1154 appears to be a metal object. It is oxidated, quite heavy and measures approximately 270 x 70 mm. On the left side, the object has a narrower, roughly square end (30 mm in width). The edge appears to have broken off from a larger piece of metal or possibly a structure. The right side has a rounded and slightly pointy form.

Wessex Archaeology metal specialist Bob Clarke and Wessex Archaeology's find specialist Katie Marsdon inspected the object. It appears to be a metal part from a ship or from a terrestrial agriculture structure. The metal was probably attached to a moving machinery component with an unknown purpose. It was not possible to identify the exact nature of this object because it lacks the necessary diagnostic features for this.

The object is likely to be fairly modern, estimated around the 20th/21st century. It appears that the object has only been exposed on the seabed for a relatively short amount of time, as indicated by the relatively small amount of surface corrosion.

It is unclear how this object found its way onto the seabed. It could be broken off from a metal wreck or, most likely, discarded over the side from a passing vessel. Or, if it derives from a terrestrial agricultural use, it could have derived from debris dumped at sea.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 150/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for East Sussex.

Tarmac_1155: Aircraft Parts

These three aircraft parts were discovered in either Licence Area 351 or 395 in the South Coast dredging region, both located approximately 13 km east of the Isle of Wight. Steve Vince discovered these objects at Tarmac's Shoreham Wharf.

These parts were discovered at Tarmac's Brighton Wharf by Steve Vince. The collection consists of three parts. The large part (in the bottom of the picture) is approximately 300 mm long before it bends upright for a further 300 mm of compressed metal. The metal is light and grey, potentially aluminium. The two small pieces (at the top of the picture) appear to have numerous puncture holes.

Pictures of the aircraft remains were sent to aircraft specialist Ewen Cameron of the Royal Airforce Museum. Ewen indicated that these parts do not have enough diagnostic features to identify them.

It is unclear how these finds found their way onto the seabed. It is possible they belong to a crashed airplane site, or the material fell off a crashing plane. However, these small parts are still of great importance because they can be an indicator for currently unknown aircraft sites on the seafloor.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Ministry of Defence
- The Receiver of Wreck (Droit 152/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for the Isle of Wight.

Cemex_1156: UXO

These pieces of UXO were discovered in material dredged from Licence Area 512 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. Adam Nightingale discovered them during Operational monitoring at Northfleet Wharf.

These two finds consist of two spent casings. The larger of the two is roughly 150 mm long with a case head 45 mm in diameter. The other casing is around 90 mm long with a case head diameter of approximately 20 mm. Both casings show corrosion consistent with exposure to the marine environment.

Richard Noyce of the Royal Armouries Leeds identified the casings as coming from a 2 pdr round for the larger casing and a 20 mm Oerlikon round for the smaller casing. The 2 pdr QF cannon and the 20 mm Oerlikon were both used by the Royal Navy during the Second World War, primarily as anti-aircraft weapons. The quick firing (QF) 2 pdr gun was introduced as a way of making use of the large stocks of 2 pdr shells remaining from the First World War and would be known colloquially as the 'pom-pom' gun. The 20 mm Oerlikon was originally designed in Germany during the close of the First World War but would be produced under licence in a variety of variations by all major powers during the Second World War. Both weapon systems would remain in service throughout the war, though they would steadily be replaced by the 40 mm Bofors Automatic Gun in Allied service.

It is unclear how these finds found their way onto the seabed. It is probable that they were fired from a Royal Navy vessel during the Second World War either during training or in action. While unexploded ordnance may have archaeological value, it is important that all UXO is treated with caution. UXO should be handled with care and dealt with per the standard procedures either onboard the dredging vessel or at the wharf.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 118/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk.

Heidelberg_1159: Wooden Ship Component

This wooden ship component was discovered in aggregate dredged from Licence Area 240 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. Tony Scothern discovered it during an Operational Sampling visit at Dagenham Wharf.

Heidelberg_1159 is presumably a ship component. The find is approximately 380 mm long, 140 mm wide and 20 mm thick. The wooden component contains three square nail holes and is heavily damaged on both sides.

Paolo Croce of Wessex Archaeology identified this find as probably a wooden ship component. The find yields evidence of a seafaring past, as evidenced by the square wooden nail holes on the top of the wooden board. The distance between the nail holes matches the distance of ship planking. The nail holes only appear on the top side of the wooden component indicating that the wooden component was presumably fastened at the very end of the hull planking or quickly attached to a side of the ship. The wood type of is unknown, however the quality is outstanding. The grains on the wood are well visible, but no evidence of tool- or cutmarks has been found.

The object Heidelberg_1159 is an isolated find, however, timber pieces with interesting shapes or with evidence of fastening techniques (nail holes or treenails) should always be reported through the Protocol. These types of finds could indicate the presence of a previously undiscovered wooden shipwreck.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 182/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk

Heidelberg_1160: Cow Bone

This cow bone was discovered in aggregate dredged from Licence Area 240 in the East Coast dredging region, approximately 12 km south-east of Great Yarmouth. Kirsten Pollé discovered it during an Operational Sampling visit at Dagenham Wharf.

Heidelberg_1160 appears to be a piece of bone. It measures approximately 75 mm long and has a width of 70 mm. The bottom and top part of the bone appear to have been cut off.

Lorrain Higbee, bone specialist from Wessex Archaeology, identified the bone as a metatarsal. The bone is probably coming from a cow and dated from the modern period (21st Century). In humans, the metatarsal bones are the group of five bones in the midfoot, located between toes and the heal/ankle, but in cows, the metatarsal is the modified long bone in its hind limbs.

It is unclear how this find found its way to the seabed, most likely the bone has been washed away by the sea from shore. However it is also possible that the bone could have been carried as provisions and discarded over the side of a passing vessel.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 182/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk.

Britannia_1161: Metal Pipe

This metal pipe was discovered in Licence Area 351 in the South Coast dredging region, approximately 12 km south-east of Ilse of Wight. J Dietzel discovered it onboard the vessel *Britannia Beaver*.

Britannia_1161 appears to be a metal pipe. It is oxidated but not heavily concreted. The pipe appears to be made of steel and is approximately 600 mm in length with a diameter of 50 mm. The pipe is crushed and slightly bent at the midpoint.

While there is nothing especially diagnostic about this find, it most likely is a piece of scaffolding or other similar item. As the pipe is made of steel and not aluminium it is unlikely to have come from an aircraft.

It is unclear how this find found its way onto the seabed. It was most likely discarded over the side of a passing vessel.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 201/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Isle of Wight.

Tarmac_1162: Axe

This axe was discovered following processing of mixed cargos from dredging in the East Coast and Outer Thames Estuary areas. Ian Massey discovered it Tilbury Wharf.

This find appears to be an iron axe head with a small section of the shaft remaining. The iron head is heavily corroded. The axe head is approximately 165 mm long and 75 mm wide. Around 140 mm of shaft remains, and it appears it was approximately 50 mm in diameter.

While heavily corroded, the axe head appears to be a broadhead axe with a double bevel. Tools like this were used extensively both on shore and onboard ship for basic carpentry and ship repairs. Due to the poor preservation of the iron, there are no maker's marks or other identifying features visible on the find making dating difficult, but likely given its condition and that it appears to be made of wrought iron, it is likely pre nineteenth century.

Katie Marsden, a finds specialist with Wessex Archaeology was contacted regarding this find. Unfortunately, due to the poor preservation of the find there were no diagnostic markings such as makers marks that could be identified.

It is not clear how this axe found its way on the seabed. Most likely, this was a ship's carpenter's tool which was either discarded or lost over the side.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 224/24-03)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Essex

Tarmac_1163: Iron Bar

This iron bar was discovered following processing of mixed cargos from dredging in the East Coast and Outer Thames Estuary areas. Ian Massey discovered it Tilbury Wharf.

This find appears to be an iron bar or strap, with two rivets or other fastenings evident on one end. The piece of iron is approximately 540 mm long, 40 mm wide and 10 mm thick. The heads of the rivets are roughly 15 mm in diameter.

Katie Marsden, a finds specialist with Wessex Archaeology, was contacted regarding the find. Unfortunately, as no diagnostic features were seen it was not possible to assign any firm identification of the find. The find does not appear to be very heavily corroded, suggesting it is a modern find, or was well buried in the sediment.

It is unknown how this find came to rest on the seabed. The find was once likely a brace or reinforcement on a vessel that broke off 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 224/24-02)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Essex.

Tarmac_1164: Iron Hook

This iron hook was discovered following processing of mixed cargos from dredging in the East Coast and Outer Thames Estuary areas. Ian Massey discovered it Tilbury Wharf.

This find appears to be an iron hook. The hook is approximately 330 mm long, 20 mm wide and 10 mm thick. The eye of the hook is around 100 mm in diameter and is completely circular. The hook appears to be made from wrought iron and is moderately corroded.

Katie Marsden, a finds specialist at Wessex Archaeology, was contacted regarding the find. Unfortunately, as there are no diagnostic elements which are visible a firm identification of the find was not possible. Considering the environment in which the hook was found it is probable that it came from vessel. Wrought iron was still commonly used into the 20th century and this hook likely originates from that period.

It is unknown how this object came to rest on the seabed. As there is no obvious damage to the hook it is likely that this isolated find was accidentally lost over the side. Reporting isolated finds such as this is important as they can form patterns which may result in the discovery of larger and more significant finds such as wrecks.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 224/24-01)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Essex.

Tarmac_1165: Metal Object

This metal object was discovered following processing of mixed cargos from the East English Channel and the East Coast Dredging regions. Ian Massey discovered it at Tilbury Wharf.

Tarmac_1165 appears to be a metal object. The find is bent, and parts of the object are missing due to corrosion of the metal. What remains of the find is an object approximately 260 mm long and 7 mm wide.

Pictures of this find were sent to finds specialists Katie Marsden and Rachel Seager Smith. They were unable to identify the find due to the lack of any diagnostic features. The metal of the object seemed lead, but from the photographs, they weren't certain.

Sometimes finds will remain a mystery and their origin or purpose are unknown. Archaeologists record all the important information of these finds (length, width, etc.), to enable others to potentially identify this object in the future.

It is unclear how this find found its way onto the seabed. The metal object could be washed away by the sea from shore. However, it could also be broken off from a metal wreck or 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 226/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for East Sussex.

Tarmac_1166: Metal Object

This metal object was discovered following processing of mixed cargos from the East English Channel and the East Coast Dredging regions. Ian Massey discovered it at Tilbury Wharf.

Tarmac_1166 appears to be a roughly L-shaped metal object. The object is 371 mm long, with the shorter 'L' side 220 mm long, and both ends of the brackets are approximately 30 mm wide. The object is curved and reinforced in the curve with an extra layer of metal. The object is heavily corroded, resulting in the brownish colour.

Pictures of this find were sent to finds specialists Katie Marsden and Rachel Seager Smith. They were unable to identify the find due to the lack of any diagnostic features. The find is dated as a modern find and the material of the object seemed to be iron.

Sometimes finds will remain a mystery and their origin or purpose are unknown. Archaeologists record all the important information of these finds (length, width, etc.), to enable others to potentially identify this object in the future.

It is unclear how this find found its way onto the seabed. The metal object could be washed away by the sea from shore. However, it could also be broken off from a metal wreck or 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 226/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for East Sussex.

Heidelberg_1169: Aircraft Fragment

This possible aircraft fragment was discovered following dredging in 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 a round of Operational Sampling.

This find is a piece of deformed aluminium. There is a noticeable bend to the metal that appears uniform so is likely intentional. The piece is only fragmentary, with significant abrasion and wear evident over the entire surface of the find. On the inside surface of the curve a dark pigment, either very dark blue or black is evident. The fragment is approximately 160 mm long and 25 mm wide.

Ewen Cameron of the Royal Air Force Museum was contacted regarding the find. While it is very possible that this find originated from an aircraft, the poor condition of the find means that this cannot be said with certainty.

It is unsure how this find came to rest on the seabed. Aircraft finds are very common in the waters surrounding the United Kingdom because of the First and Second World Wars. It is important that small and apparently uninteresting finds such as this are reported as while they themselves may not tell us a great deal they may help us identify patterns and areas of potential interest.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The MOD
- The Receiver of Wreck (Droit 232/24)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk.

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