

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 2021-2022

February 2023



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Prepared by





## Protocol background

The Marine Aggregate Industry Archaeological Protocol (the Protocol) is in place to ensure the protection of submerged cultural heritage that may be discovered during marine aggregate industry dredging works.

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 surveys and analysis of available records from various 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 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 and archived. In some instances, further mitigation or monitoring may be required.

Wessex Archaeology drafted the Protocol in 2005 on behalf of English Heritage (now Historic England) and the British Marine Aggregate Producers Association (BMAPA).

BMAPA member companies have since adopted the scheme voluntarily since 2006, though adherence to the Protocol is becoming a formal condition of consent for new marine licences and licence renewals. The Crown Estate joined BMAPA in 2009 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 of the company that owns the wharf or vessel who alerts the Protocol Implementation Team.

The Protocol has been overwhelmingly successful, with over **2300** finds reported since its inception.

**This year we're celebrating the 17th anniversary of the Protocol Implementation Service and this annual report covers the period from 1 October 2021 to 30 September 2022.**

## Access

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

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

- the Site Champion that reported it;
- the Nominated Contact;
- Historic England;
- BMAPA;
- The Crown Estate;
- the National Marine Heritage Record (NMHR), formerly the National Record of the Historic Environment (NRHE); and
- 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 droit number. All aircraft material is reported to the Ministry of Defence as it may relate to the *Protection of Military Remains Act 1986*.

In the past, once the finds had been reported to the NRHE at Historic England, they were uploaded to a publicly accessible database, PastScape, but terrestrial finds have since been devolved to the local Historic Environment Records<sup>1</sup>. Historic England is currently developing a new dataset specifically for marine heritage, the National Marine Heritage Record, which, when up and running, will be accessible by an online portal.

All finds, old and new are also published on the Marine Aggregate Industry Archaeological Protocol Facebook page<sup>2</sup> that was set up in March 2017.

Each annual report also publishes all the individual reports for finds that were made during that reporting year, and they are all available to download<sup>3</sup>.

In addition, the discoveries and achievements of the staff involved with the Protocol are acknowledged through various publications produced by Wessex Archaeology, including the biannual *Dredged Up* newsletter, also available to download<sup>3</sup>.

1. [www.heritagegateway.org.uk/gateway](http://www.heritagegateway.org.uk/gateway)

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

3. [www.wessexarch.co.uk/our-work/marine-aggregate-industry-protocol-reporting-finds-archaeological-interest](http://www.wessexarch.co.uk/our-work/marine-aggregate-industry-protocol-reporting-finds-archaeological-interest)

## 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 a year to maintain a close relationship with the staff. To have consistency, it is often the same member of the team visiting the wharves where possible. Emails between the Implementation Team and the wharf managers, Nominated Contacts and Site Champions are encouraged throughout the year to keep a consistent flow of communication. Through emails, phone calls and during the visits, any 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, aiding industry staff to identify several different types of archaeological finds through interactive slides as well as the process of reporting and conserving finds of archaeological interest discovered on the wharf. The training also sets out guidelines on what to do if a find is suspected to contain asbestos (introduced in 2020) or if invasive marine species are encountered;
- has produced biosecurity awareness material (introduced in 2019, comprising a poster and booklet) and delivers basic training as an add on to the archaeological awareness training;
- demonstrates the different types of finds from a range of prehistoric and historic periods that can be encountered by providing a collection of finds that have been previously reported for the wharf 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 31, printed in Autumn 2022, and all previous *Dredged Up* newsletters, can be found online<sup>4</sup>;
- raises Protocol awareness amongst third parties, such as geotechnical and environmental survey companies working on behalf of the marine aggregate industry;
- 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;
- as of 2019, produces promotional material in the form of branded photo scale cards, mugs and pens delivered to each wharf and vessel enrolled in the scheme.

4. [www.wessexarch.co.uk/our-work/marine-aggregate-industry-protocol-reporting-finds-archaeological-interest](http://www.wessexarch.co.uk/our-work/marine-aggregate-industry-protocol-reporting-finds-archaeological-interest)



## Visits to wharves

Since the 2020–2021 annual report was published, there have been nine Protocol Awareness Visits made this year. 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 in to two or three sessions so that the wharf can continue working with a rotation of staff. Each session is designed to be informal and involve an interactive presentation to explain the different ways archaeology can reach the seabed and what to do if it is found in the cargo landed at the wharf.

The reporting process is also discussed (see page 4).

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. A member of the Implementation Team 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 usually takes place at the end of the presentation. The handouts 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.

Training certificates are sent out to the Site Champions to give to all wharf staff who receive the awareness training so that they may add them to their working portfolios. These are emailed to each Site Champion or wharf manager after a wharf has been visited. Additionally, a feedback form is also given to the attending wharf staff at the end of each visit (or emailed) to gather comments and suggestions so that we can continue to make improvements to Protocol Awareness and the way we deliver the training.

Contact is maintained through regular emails, the Facebook page, the annual report and the *Dredged Up* newsletter.

All archaeological awareness materials can be accessed through the Protocol pages on Wessex Archaeology's website<sup>5</sup> and are available in English, Dutch and French.

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

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

5. [www.wessexarch.co.uk/our-work/marine-aggregate-industry-protocol-reporting-finds-archaeological-interest](http://www.wessexarch.co.uk/our-work/marine-aggregate-industry-protocol-reporting-finds-archaeological-interest)



**Top:** Brad Johnson holding a cannon fragment discovered by Adrian Hatcher and himself at Clubbs Denton Wharf; **bottom:** Marcel De Koff holding a pickaxe.

## Reporting process

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

The Nominated Contact uploads the images and information about the discovery, using the preliminary form, to the secure online console<sup>6</sup>. In some cases, the Site Champion will report finds directly to the console rather than through the Nominated Contact. The console alerts the Protocol Implementation Service operated by Wessex Archaeology and the find is added to the database.

There have also been instances where a Site Champion of a wharf 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, a Report of Wreck and Salvage form will need to be completed. Previously, this was undertaken by the Protocol Implementation Team. However, the Receiver of Wreck has recently streamlined their processes, and any finds should now be reported by the Nominated Contact directly to the Receiver of Wreck via their online form<sup>7</sup>. The Nominated Contact should then provide the Protocol Implementation Service with the droit number, to ensure that finds can be identified using either unique ID in the future.

The Protocol Implementation Team investigates the find, and occasionally sends photographs and information to external specialists for additional information. The Protocol Implementation Team then produces a report. Most of the reports cover 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, and conservation and storage recommendations.

The Nominated Contacts for each company are detailed below.

BMAPA company	Nominated Contact	Position
Britannia Aggregates Ltd	Richard Fifield	Marine Resources Manager
CEMEX UK Marine Ltd	Samantha Ringwood	GIS & Licence Co-ordinator
DEME Building Materials Ltd	Christophe Matton	Marine Resources Manager
	Tom Janssens	General Manager
Hanson Aggregates Marine Ltd	Nigel Griffiths	Principal Resources Manager
	Bryn Lockwood	GIS and Resource Coordinator
Isle of Wight Aggregates	Edward Skinner	Marine Resources Coordinator
Kendall Bros Ltd	Paul Stevens	Managing Director
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](http://net.wessexarch.co.uk/bmapa/login.aspx?ReturnUrl=%2fbmapa%2findex.aspx)

7. [www.gov.uk/report-wreck-material](http://www.gov.uk/report-wreck-material)

## Protocol update

In 2021–2022, the Protocol celebrated its 17th year! During this year, 102 individual finds were reported through the Protocol (from 37 reports) including 10 cannonballs, munitions, aircraft parts, anchors and a teapot spout. These have been added to a database of over 2300 finds reported since the launch of the scheme in 2005.

Without the reporting process, finds from dredged aggregate would most likely never have entered the archaeological record, so dredgers allow us to access areas of the seabed otherwise physically unexplored. 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.

Future visits to the wharves to give the archaeological awareness training will be arranged for 2023 and it is hoped that representatives from Historic England and the Receiver of Wreck team will be able to come along on one of the visits.

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 numbers of 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.

In 2019–20, The Crown Estate commissioned Royal HaskoningDHV to undertake work to enhance the resolution of the existing British Geological Survey resource maps, with the aim of creating a High-Resolution Resource Inventory for marine aggregates, in the waters of England and Wales. The project identified a requirement for geophysical data recovery from a total of 1,300 line kilometres, targeting the upper portion of the seabed, across four key regions: the East English Channel; the Thames Estuary; the East Coast and the Humber. During the survey, the high-resolution bathymetry images revealed the wreck of a submarine located around 70 km off the coast of East Anglia. The wreck was identified as that of HMS E22. The discovery of the wreck and information about its history was featured in Issue 31 of *Dredged Up*. The Crown Estate are confident that the output of this project will assist marine planning capabilities and support decision-making in relation to the future deployment of a range of offshore assets. It will also add to society's



*A photograph of the conning tower of the E22 with members of her crew aboard, provided by the National Maritime Museum (Reference Number N24167: Laforey Collection).*

wider understanding of the seabed, helping a broad range of stakeholders including the government, regulators, industry and academia.

Through the implementation of the Protocol, 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 trains staff to recognise and report finds of archaeological interest discovered within cargoes without the need of an archaeologist being present. Because of the success of the Protocol, the model has been adapted and implemented for use in several other industries. Wessex Archaeology also continues to run scheme-specific protocols for other commercial development projects based on the marine aggregate industry model.

Further information about the Protocol and the Protocol Implementation Service is available online<sup>8</sup>.

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

## Training for the Implementation Team

During this year, members of the Implementation Team undertook additional e-learning refresher training in asbestos awareness.

8. [www.wessexarch.co.uk/our-work/marine-aggregate-industry-protocol-reporting-finds-archaeological-interest](http://www.wessexarch.co.uk/our-work/marine-aggregate-industry-protocol-reporting-finds-archaeological-interest)

## Dredged Up newsletter

In 2021–2022, two issues of the biannual *Dredged Up* newsletter were produced: Issue 30 and Issue 31.

Issue 30 was released in April 2022 and outlined some of the year’s finds as well as publishing the winners of the annual Finds Awards. This issue introduced the new Brett Newhaven wharf and the *Hanson Thames* vessel alongside a handy guide for dating pottery which might be encountered.

Issue 31 was distributed in November 2022 and featured an exciting piece about the discovery of the HMS E22 wreck. The article details how the wreck was discovered during geophysical survey to create a high-resolution marine aggregate resources map and outlines the history of the ill-fated submarine. This edition also shines a spotlight on particular finds reported through the Protocol including cannon fragments and numerous cannonballs.

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. This year *Dredged Up* was taken to the annual Nautical Archaeology Society’s conference, which was held in Dublin.

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<sup>9</sup>.

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

**Top right:** Coastal & Marine Archaeologist Amy Lammiman holding a copy of *Dredged Up* at the annual Nautical Archaeology Society conference;

**bottom right:** the latest issues of *Dredged Up*, available online!



9. [www.wessexarch.co.uk/our-work/marine-aggregate-industry-protocol-reporting-finds-archaeological-interest](http://www.wessexarch.co.uk/our-work/marine-aggregate-industry-protocol-reporting-finds-archaeological-interest)

## Finds Awards

The 2020–21 Finds Awards were made to the following wharf and vessels, published in Issue 30 of *Dredged Up*.

### Best Attitude by a Wharf

In the 2020-2021 reporting year, the winner of the best attitude by a wharf was **Hanson Greenhithe Wharf** who submitted 84 finds through six reports! These included munitions, wreck material, an ammunition clip, an inscribed metal plate, a fragment of an anchor and aircraft material. We would like to give our special thanks to Stuart King for reporting all the finds.



## Best Attitude by a Vessel

Thank you to each vessel that has reported finds through the Protocol over the past reporting year. For the 2020-2021 reporting year we congratulated Tarmac's **City of London** for winning this award, and especially the finders, Jack Tate and Stuart Willis.

Tarmac's *City of London* discovered two finds: a white ensign flag (Tarmac\_0978) and a Rolls-Royce engine part (Tarmac\_0988) which were both discovered in Licence Area 254 in the East Coast dredging region, approximately 10 km north-east of Great Yarmouth.

The flag (Tarmac\_0978) is the top left corner of a larger white ensign flag. The larger, whole flag would comprise a white flag with a red cross, like the St. George flag with the added addition of the Union Jack in the upper left corner. This find is believed to be relatively modern. Royal Navy ships and submarines wear the White Ensign at all times when underway on the surface. The logo of the Royal Navy features a waving White Ensign at the top. The White Ensign is also flown on shore establishments including all Royal Marines establishments as well as yachts of members of the Royal Yacht Squadron and by ships of Trinity House when escorting the reigning monarch. The White Ensign is worn at the mastheads when Royal Navy ships are dressed on special occasions, such as the monarch's birthday and may similarly be worn by foreign warships when in British waters, or when dressed in honour of a British holiday, or when firing a salute to British authorities. The Ensign was first introduced in the 15th century when it consisted of a Tudor ensign, the current version of the flag was developed in 1707. A red ensign is the official flag used for merchant vessels while the Blue Ensign indicates a ship commanded by an officer of the Royal Naval Reserve.



Tarmac\_0978, a rare white ensign flag

Tarmac\_0988 was reported as a "metal engine part that looks like a turbine from either a jet or steam engine", which measures over 610 mm.

The vessel also identified an "RR" that was thought to stand for Rolls-Royce. Dr Mark Pacey, Chief Project Engineer, and John Wagstaff at Rolls-Royce were kind enough to offer their views on the part. Their first thoughts on seeing the photos were that we have the remains of a bladed turbine disc from quite a small engine, which implies that it is probably from a military engine. Fortunately, the part numbers were still



Top: Tarmac\_0988, a metal engine part from a Rolls-Royce Avon engine;

Bottom: the 'RR' mark used to identify this piece.

clearly readable in the blade picture, so they were passed on to the configuration team, who confirmed that they are high pressure (HP) turbine blades from a Rolls-Royce Avon engine.

The Avon powered a wide range of military aircraft from its introduction in 1950, including the English Electric Canberra and Lightning, the Hawker Hunter and the Vickers Valiant, and also had two civil applications – the de Havilland Comet (the world's first jet powered civil airliner) and the Sud Aviation Caravelle. Rolls-Royce ceased production of the Avon aero-engine in 1974 and withdrew in-service support in 2006. However, an industrial variant of the Avon was also produced and is still available today, although Rolls-Royce sold its industrial gas turbine business to Siemens in 2016 and Siemens Energy are now responsible for current production. In total, it is believed that Avon production was in excess of 11,000 engines.

Dr Mark Pacey said that he had passed the details to the defence team and asked if they have any records showing why an Avon might have been in the sea near Great Yarmouth. However, it is quite likely that this was an industrial engine, in which case Rolls-Royce would not necessarily have a record of any loss. When the "BR" prefix was queried, he said that the part number has no particular significance and part numbers' series are randomly issued to the various Rolls-Royce design sites. These part numbers actually came from a series allocated to East Kilbride near Glasgow, which is where the design work would have been done.

## Best Find

The best find of this reporting year goes to **Tarmac\_0985**; a machine gun discovered from a mixed cargo deriving from Licence Area 509/3 in the Thames Estuary and Licence Area 460 in the East English Channel. Jamie Wallis discovered it at Greenwich Wharf.

This machine gun was reported in two parts and displayed several markings including a serial number “B194.466” that the wharf took excellent close-up photographs of. Images were sent to Graham Scott of Wessex Archaeology’s Coastal & Marine team who provisionally identified the gun as a Browning .303. Images were also sent to Jonathan Ferguson, Keeper of Firearms & Artillery at the Royal Armouries Museum, Leeds. He confirmed that this is a Browning .303 and the B prefix on the serial number denotes manufacture by Birmingham Small Arms Company (BSA). Through comparison of other guns, Jonathon estimated a date of 1941 for this machine gun. The barrel of the gun is a Mk. III while the breech casing is a Mk. II\*, and the only way to know whether this was built as a Mk. II and converted or not would be via the original production information.

As the gun is known to be from an aircraft, the images were sent to external aircraft specialist, Steve Vizard, in order to determine what kind of aircraft it may have originated from. He said that the mounting attachments would provide

evidence of type (the lug bracket with the two holes on the bottom of the gun body), but unfortunately they are missing. These were reasonably distinctive as to what aircraft the guns were fitted to, for example, static fixtures in a fighter wing as opposed to a gun turret in a bomber. And invariably this attachment bracketry would have part numbers denoting manufacturers. The standard Mk. II Browning was fitted in dozens of different types but was differentiated by the attachments used. The only other clue is the fluted end to the muzzle of the barrel, as opposed to the flash eliminator, that can sometimes denote between a fighter or bomber, but sadly is completely missing from this example.

As per the Firearms Act 1968, the machine gun was reported to the police as a Section 5 firearm<sup>10</sup> as withholding it would be an offence. Although the gun is in two pieces and not functioning, it is still viewed as a weapon because it could be used for parts. The police are now in possession of the find.

*“Excellent find! Also illustrates some of the risks involved in completing this important work. Many thanks Jamie. Just a quick thank you to all those that played their part in the effective delivery of the Protocol over this reporting year. I look forward to hearing about next year’s finds!”*

Stuart Churchley, Historic England



10. [www.legislation.gov.uk/ukpga/1968/27/contents](http://www.legislation.gov.uk/ukpga/1968/27/contents)

## Reports: Protocol

During the 17th year of operation, Wessex Archaeology received 37 reports through the Protocol Implementation Service. These reports encompassed details of 102 separate finds. Further details of each discovery are shown below and included in the wharf reports appended to this report.

### Finds reported in 2021–2022

Report ID	Description	Licence Area	Region	Wharf/ Vessel/ Quarry	No.
Brett_1012	Two cannonballs and a shell casing base	Unknown	Unknown	Wharf	3
Hanson_1013	Aircraft hydraulic unit	401/2	East Coast	Wharf	1
Brett_1014	Metal lock	351	South Coast	Wharf	1
Brett_1015	Stone weight	351 or 461	South or East Coast	Wharf	1
Clubbs_1016	Alloy tube	512	East Coast	Wharf	1
Brett_1017	Cannonball	351	South Coast	Wharf	1
Brett_1018	Munitions	351	South Coast	Wharf	2
Brett_1019	Aircraft parts (3) and munitions (43)	340	South Coast	Wharf	46
CEMEX_1020	Anchor	512	East Coast	Vessel	1
DEME_1021	Spout of teapot	478	East English Channel	Wharf	1
DEME_1022	Pickaxe	506	Humber	Wharf	1
Hanson_1023	Aircraft aileron hanger	460	East English Channel	Wharf	1
Clubbs_1024	Cannon muzzle	512 or 407	South or East Coast	Wharf	1
Clubbs_1025	Cannon fragments	512 or 407	South or East Coast	Wharf	2
Hanson_1026	Munition base, metal object and animal bone	361 or 460	East Coast	Vessel	3
CEMEX_1027	Spoon	137	South Coast	Wharf	1
CEMEX_1028	Aircraft engine	512	East Coast	Wharf	1
CEMEX_1029	Wooden shipwreck material	Denge Quarry	N/A	Quarry	1
Clubbs_1030	Mill stone	407	South Coast	Wharf	1
Clubbs_1031	Aircraft engine	407	South Coast	Wharf	1
Brett_1032	Aircraft fragments	340	South Coast	Wharf	11
Hanson_1033	Cannonball	401/2 or 461	East Coast or East English Channel	Wharf	1
Hanson_1034	Two munitions	401/2 or 461	East Coast or East English Channel	Wharf	2
Hanson_1035	Cannonball	461	East English Channel	Vessel	1
Hanson_1036	Cannonball and cone	361	East Coast	Vessel	2
Tarmac_1037	Porthole frame	351	South Coast	Wharf	1
DEME_1038	Large metal weight	506	Humber	Wharf	1
DEME_1039	Cow bone	478	East English Channel	Wharf	1
Tarmac_1040	Piece of metal	351	South Coast	Vessel	1
Hanson_1041	Wooden object	401/2	East Coast	Wharf	1
Hanson_1042	Part of a ship anchor	461	East English Channel	Wharf	1
Hanson_1043	Cannonball (3)	401/2	East Coast	Wharf	3
Hanson_1044	Munition	401/2	East Coast	Wharf	1
Brett_1045	Bar shot	351	South Coast	Wharf	1
Tarmac_1046	Metal anchor	351	South Coast	Wharf	1
Hanson_1047	Munition/star shell with parachute	461	East English Channel	Wharf	1
CEMEX_1048	Heating element with leather	401/2	East Coast	Wharf	1

## Specialists

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 2021–2022 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 17 years.

Expert	Advice given concerning	Institution/organisation/role
Euan McNeill	Maritime artefacts	Wessex Archaeology
Alistair Byford-Bates	Maritime artefacts	Wessex Archaeology
Graham Scott	Maritime artefacts	Wessex Archaeology
Paolo Croce	Maritime artefacts	Wessex Archaeology
Lorrain Higbee	Zooarchaeology	Wessex Archaeology
Lorraine Mepham	Pottery, vessels and cutlery	Wessex Archaeology
Phil Andrews	Technical specialist	Wessex Archaeology
Charles Trollope	Cannonballs	Historical Ordnance Expert
Anthony Mansfield	Mechanics and engineering	Senior Naval Engineer
Trevor Parker	Ordnance	Ordnance Society
Mark Khan	Ordnance	Fellows International
Steve Vizard	Aircraft	Airframe Assemblies

## Case Study 1: Anglo-Dutch Wars

Throughout the lifespan of the Protocol cannonballs have become common but still exciting finds. During the 2021–2022 year, 10 cannonballs were reported but there have been over 100 reported since the Protocol started in 2005. This high frequency is not surprising due to the extensive naval history of the country, with military activity having taken place along this stretch of coastline for hundreds of years. There are many different reasons why cannonballs end up on the seabed. They could have been fired during battle, in training exercises, or as part of salutes. Alternatively, they could have not been used at all and simply just lost overboard. If we find a high volume of cannonballs in a certain area this may be indicative of an area associated with naval warfare or even a previously unidentified wreck site! With sufficient images and measurements, the diameter, and weight of the finds, specialists in historical ordnance, such as Charles Trollope, can identify the calibre of the shot, and estimate the date and their country of origin. The combination of this information helps us to conclude how they may have ended up on the seabed. High frequency finds, especially with differing counties of origin, may indicate sites of conflict if they are from areas which we know naval battles took place. Through the Protocol, the identification of numerous cannonballs have made it possible to link many of these finds to the 17th century Anglo-Dutch Wars.

The Anglo-Dutch wars were a series of conflicts between the English and Dutch Republic that spanned over a century, beginning with the outbreak of the first war in 1652 and ending with the fourth episode in 1784. The first three wars stemmed from a period of intense European commercial and political rivalry in which England tried to end the Dutch domination of world trade and overseas colonies, whilst the last war arose from Dutch interference in the American Revolution. These battles were based entirely at sea and had a profound impact on the history of naval warfare and the development of the English Royal Navy. As these were struggles for commerce rather than territory, they played a significant role in determining control of trade routes across the sea. The last war consequently spelled the end of the Dutch republic's position as a world power.

Different licence areas have yielded a variety of cannonballs since the start of the Protocol in 2005, many of which have been linked to conflict with the Anglo-Dutch Wars. For example, two major battles of the Anglo-Dutch Wars are thought to have taken place near to what is today Area 430. These were the Battle of Lowestoft in 1665 (the first engagement of the Second Anglo-Dutch War) and the Battle of Sole Bay in 1672 (the first engagement of the Third Anglo-Dutch War). The cannonballs discovered

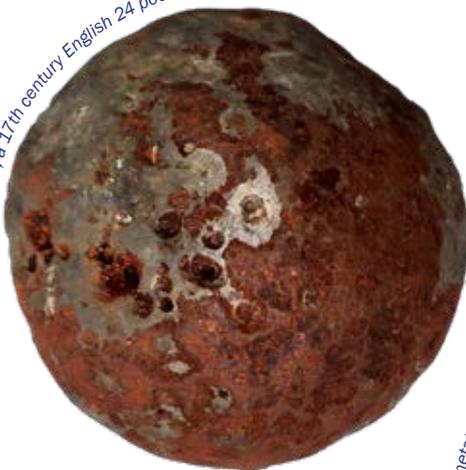
from Licence Area 430 and reported through the Protocol represent 6-pounder guns also known as sakers, 9-pounder guns, 12-pounder guns which were widely deployed on Third Rate vessels, and 18-pounder guns which were widely deployed on First and Second Rate vessels in the Battle of Lowestoft.

The numerous documentary sources of the battles give us a picture of what type of cannons were used and what damage they inflicted. We know that many vessels were lost throughout the battles, for example at the Battle of Lowestoft 20 Dutch and two English vessels were lost whilst at the Battle of Sole Bay, a further three Dutch and four English and French ships were lost. Finds such as cannonballs within these areas have the potential to pinpoint a previously unknown and uncharted shipwreck relating to a historic naval battle.

Wharf and vessel staff are encouraged to note the weight and diameter of the cannonballs on their discovery so that we are able to ascertain the calibre of the shot. We also ask that Nominated Contacts provide the vessel trackplot for the day in which such finds are discovered to enable us to note any patterns of distribution that may further aid the discovery of an unknown wreck site. It is of the utmost importance that any future finds of archaeological interest discovered in this dredging region are reported through the Protocol immediately, as they may relate to significant episodes of Britain's maritime history.

See the table on page 12 for a selection of some of the finds relating to the Anglo-Dutch wars.

Volker\_0984, a 17th century English 24 pounder shot



Hanson\_1033, an English 3-pounder cannonball from the 17th century



Hanson\_1043, three metal cannonballs of differing sizes



UMA\_0163, measuring 5 inches in diameter and weighing 10 lbs



LTM\_0305, measuring 110 mm in diameter and weighing 3 kg



Tarmac\_0361, a complete bar shot



LMT\_0495, measuring approximately 7 inches in diameter and weighing 20 lbs



Hanson\_0911, a large cast iron cannonball with a diameter of 200 mm



A collection of cannonballs reported through the Protocol, not shown to scale.

Find Number	Protocol Year	Area Found	Brief Description
Brett_0881	2017-2018	Unknown	A cast iron cannonball with a diameter of 180 mm. This size of solid shot would have been fired from a Demi Cannon. Ships featuring demi-cannons included HMS <i>Sovereign of the Seas</i> , HMS <i>Resolution</i> and HMS <i>James</i> , which fought in the Anglo-Dutch wars.
Brett_0897	2018-2019	461	Two cannonballs; the larger with a diameter of 170 mm and the smaller with a diameter of 110 mm. Based on 16th century British gun calibers, the larger of the two cannonballs could have been fired from a Demi Cannon. Ships featuring demi-cannons included HMS <i>Sovereign of the Seas</i> , HMS <i>Resolution</i> and HMS <i>James</i> , which fought in the Anglo-Dutch wars.
Hanson_0911	2018-2019	240	Large cast iron cannonball with a diameter of 200 mm, making it a 68-pounder. The only known battle in the area where the cannonball was found was the Battle of the Dogger Bank (5 August 1781, during the fourth Anglo-Dutch War). The Royal Navy ship <i>Princess Amelia</i> , which had a total 80 guns, might just have had two 68-Pounder Carronades mounted on board.
Hanson_1033	2021-2022	401/2 or 461	An English 3-pounder cannonball from the second half of the 17th century. The rough position of the find points to the Battle of Portland (18th to 20th February 1653), a brief engagement during the First Anglo-Dutch War.
Hanson_1043	2021-2022	401/2	Three metal cannonballs of differing sizes, which indicates that these cannonballs are of different nationalities. The smaller shot was identified as English, whilst the other two larger shots were too big to be English so must be Dutch or French. Based on the find location these finds could be possibly linked to the Battle of Lowestoft.
LTM_0495	2012-2013	430	A cannonball that measures approximately 7 inches in diameter and weighs about 20 lbs. This is incongruous as a cannonball of this size would normally have been fired by 42-pounder however this one is clearly lighter than expected. The only comparable example dredged from Area 430, UMA_045 reported in 2007-2008, also weighed less than could be expected for a cannonball of this size, coming in at only 36 lb.
LTM_0505	2013-2014	430	A cannonball that measures 110 mm in diameter and weighs 3 kg. This may have been fired by either a 9 or a 12- pounder cannon. These guns were typically made of cast iron or bronze and were notably used in the vicinity of the Licence Area by both sides during the Anglo-Dutch wars.
LTM_0578	2014-2015	447	One complete bar shot alongside two cannonballs. These could be Dutch or English examples, dredged from a Licence Area close to the site of the Battle of Kentish Knock (28 September 1652) during the first Anglo-Dutch War.
LTM_0593	2014-2015	430	A complete bar shot. The measurements of the find suggest that this bar shot dates from the mid-17th century onwards and is probably Dutch or English.
Tarmac_0361	2010-2011	430	A complete bar shot, the first discovered in the East Coast dredging region.
UMA_0091_a	2006-2007	430	This cannonball measures approximately 120 mm in diameter.
UMA_0100_a, UMA_0101_a, UMA_0102_a	2006-2007	430	Three cannonballs.
UMA_0129, UMA_0140, UMA_0141, UMA_0142, UMA_0145, UMA_0146, UMA_0161, UMA_0163_a	2007-2008	430	The smaller cannonballs of UMA_0142 and UMA_0146 measure 3.5 inches and 4 inches in diameter, representing a calibre suitable for a Saker. Two cannonballs (the larger of UMA_0146 and UMA_0161) are thought to have been fired by a 9-pounder, measuring 4.5 inches and weighing 8 lbs. UMA_0129 measures 4.75 inches in diameter and is thought to have been fired by a 12- pounder gun, a type of gun widely deployed in the Battle of Lowestoft on Third Rate vessels. UMA_0140, UMA_0141 and the larger of the two cannonballs in UMA_0142 were each reported to measure approximately 5 inches, representing a calibre suitable for an 18-pounder gun, a gun widely deployed on First and Second Rate vessels in the Battle of Lowestoft. UMA_0163 presents a dilemma, as its diameter of 5-inches suggests a weight of 18 lbs, but at 10 lbs it represents a weight usually fired by a Demi-culverin, a type of gun with a 4-inch diameter. UMA_0145 at 6.75 inches is the correct diameter to be fired by a 42-pounder gun although at 36 lb it is a little lighter than expected.
Volker_0984	2020-2021	461	A 17th century English 24-pounder shot with an intriguing lead coating that may have been added to make the shot larger. This may indicate that the shot had been enlarged to make it fit for the larger Dutch and French 24 pounder guns. How the cannonball came to be in the possession of the Dutch or French in the first instance is unknown, however it may have been used in combat on both sides!

## Case Study 2: Aircraft Engines

Throughout the lifetime of the Protocol numerous fragments of aircraft have been reported. Up to this report, these finds relating to aircraft total over 500 individual objects. This year, five reports have been related to aircraft, with two of those reports, **Brett\_1019** and **Brett\_1032**, both containing numerous aircraft parts from the same licence area.

These aircraft components were all recovered from Licence Area 340 in the South Coast dredging region, approximately 8.5 km south-east of the Isle of Wight. Paul Russell and Conrad Stuckey discovered them at Newhaven Wharf. Brett\_1019 comprises three aircraft parts (one of which still had paint remaining, potentially in a camouflage pattern) and 43 munitions that were discovered in the same cargo. A few months later various aircraft parts (Brett\_1032) were discovered at the same wharf. The finds respectively alerted the wharf staff that they may have come across aircraft wreckage. Images were sent to external specialist Steve Vizard to help identify what aircrafts these may have come from.

For Brett\_1019 Steve said that the larger piece is an engine valve that looks to be from a radial engine type, and the ammunition is .50 calibre, therefore initially pointing towards an American aircraft. Apart from the Mustang which had an

inline engine (Merlin), most Second World War American aircraft used a radial engine and all American aircraft had .50 calibre Browning machine guns. He said that previous experience would lead him to believe that it's more likely to be a bomber than a fighter which could mean that if it were outbound, there could well be heavy ordnance in the area. However, most ditched their ammunition on the way back. Steve confirmed with a colleague that the engine valve is from a Wright Cyclone. This large radial engine was predominantly fitted to the American B17 Flying Fortress and this is further confirmed by the aluminium strut section appearing to be a wing rib brace from a B17.

The American B17 Flying Fortress is a four-engine heavy bomber developed in the 1930s for the United States Army Air Corps (USAAC). It proved efficient, enough to be used throughout the war. Legendary for its ability to sustain heavy damage in battle and bolstered by its nearly self-sufficient firepower, B17s were most often used for daytime raids over Germany, as well as to wreak havoc on enemy shipping in the Pacific, though to a lesser degree. Each aircraft had a crew of ten including: a Pilot, Co-Pilot, Bombardier, Navigator, Radio Operator, Flight Engineer, Ball Turret Gunner, Tail Gunner and two Waist Gunners.



**Brett\_1019: Image 1**, an aircraft component which appears to be a wing rib brace from a B17; **Image 2**, an aircraft component with paint still visible; **Image 3**, munitions discovered in the same cargo and therefore possibly relating to the same aircraft wreckage; and **Image 4**, an engine valve.

4.



Brett\_1032 was identified by Steve as parts from a BMW 801. This particular engine was fitted to three types of aircraft that operated over the UK. These being the Focke-Wulf 190 fighter, the Dornier 217 bomber and the Junkers 88.

The Focke-Wulf Fw 190 is a German single-seat, single-engine fighter aircraft designed in the late 1930s and widely used during the Second World War. Along with its well-known counterpart, the Messerschmitt Bf 109, the Fw 190 became the backbone of the Jagdwaffe (Fighter Force) of the Luftwaffe. The twin-row BMW 801 radial engine that powered most operational versions enabled the Fw 190 to lift larger loads than the Bf 109, allowing its use as a day fighter, fighter-bomber, ground-attack aircraft and to a lesser degree, night fighter. However, these aircrafts were not commonly used in this region.

**Above:** Various aircraft parts making up Brett\_1032

The Dornier Do 217 represented the refinement of German twin-engined bomber design, a progression from the earlier Do 17. From 1941, the Do 217 became the mainstay of the Luftwaffe's bomber arm in the West, equipping four Gruppen for operations over Britain. It carried out day and night attacks on British shipping, coastal targets, towns and industrial centres, both in formation and in lone attacks known to the German crews as 'Pirate' operations.

The Junkers Ju 88 is a German Second World War Luftwaffe twin-engined multirole combat aircraft. Junkers Aircraft and Motor Works (JFM) designed the plane in the mid-1930s as a so-called Schnellbomber ("fast bomber") that would be too fast for fighters of its era to intercept. Despite a protracted development, it became one of the Luftwaffe's most important aircraft. The assembly line ran constantly from 1936 to 1945 and more than 15,000 Ju 88s were built in dozens of variants. Today only two Ju 88s survive intact.



UMA\_0083, a Lku 4 gyro compass with German text visible

Further research was done on Area 340. It was found that there is an exclusion zone in place for an aircraft wreck, however that is for a Piper aircraft that lost power in both engines and ditched at sea on 29 July 1975. The pilot was not seriously injured in this incident (UKHO 19021) (Wessex Archaeology 2013). Therefore, the exclusion zone is not related to these finds.

A scoping study of aircraft crash sites at sea revealed that there are no recorded losses in the immediate area (Wessex Archaeology 2008). The closest record of a B17 was approximately 18.5 km west-south-west of where these discoveries were made. The record for that particular loss states that a Boeing B17 bomber, serial 42-31149 from 388th Heavy Bombardment Group stationed at Knettishall in Suffolk crashed into the sea some three miles off the coast of Niton on 30 December 1943. Of the crew of ten, only four Staff Sergeants J.E Mont (ball turret gunner), J. Payne (right waist gunner), W.L. Steele (left waist gunner) and F.C. Zagrovicj (tail gunner) survived.

The closest record of German aircraft wreckage is a 1944 wreck of a German Junkers Ju 188 which was shot down and crashed off Sandown 6 km north-west of where these finds were discovered. The aircraft was part of Squadron 5/KG2.



LTM\_0515, a propeller blade with bullet hole

Although not in the same licence area, similar finds of crashed aircrafts, especially of German aircraft, have been retrieved and reported to the Protocol. Finds reported in 2013 from Area 395/1, which also lies in the South Coast region by the Isle of Wight, suggested the presence of a dispersed aircraft wreck site in or around the licence area. The most diagnostic part of the assemblage was a propeller blade with a potential bullet hole (LTM\_0515, seen above). This type of duraluminium blade was fitted to the front of Junkers Ju 87 or

Stukas (although it was also used with other aircraft that flew with Jumo engines). A bullet hole would be plausible given the wartime circumstances that likely led to the loss of the aircraft.

In the Protocol year 2006-2007 almost 300 fragments of an aircraft were discovered in a cargo from Licence Area 430 and reported to the Protocol. More pieces were discovered over the several days it took to process the load and a human bone was also discovered the following day. Overall 87 items from the find (UMA\_0083) were thought to be potentially diagnostic so were cleaned, catalogued and photographed. This information allowed for the aircraft to be identified as German, and individual parts, such as engine components, indicate the aircraft is most likely to be a Ju 88.

Taken together, all of these finds remind us of the strong possibility that more than one aircraft lie in the region.

It would be presumed that these fragments wouldn't be too far away from the wreck site, however, depending on the amount of fishing and trawling that has taken place over the last 75 years, then the parts could be distributed over a large area. Also, there is the possibility of parts being dumped by fishing vessels, for instance fishermen may jettison such parts found in their nets in an area where they don't fish, so that they won't be netted again. Staff at the wharf have been told to be vigilant for any other aircraft material dredged from this licence area.

#### References:

[www.nationalww2museum.org/visit/museum-campus/us-freedom-pavilion/warbirds/b-17e-flying-fortress](http://www.nationalww2museum.org/visit/museum-campus/us-freedom-pavilion/warbirds/b-17e-flying-fortress) (accessed February 2022).

Wessex Archaeology 2008. *Aircraft Crash Sites at Sea A Scoping Study: Archaeological Desk-based Assessment*. ref. 66641.02.

Wessex Archaeology 2013. *Area 340 Marine Aggregate Extraction: Archaeological Assessment of 2012 Geophysical Data Archaeological Baseline Report*. ref. 87900.05.

## 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

**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 the former Receiver of Wrecks, Camilla Moore and Graham Caldwell. In 2021-2022 the following reports were deemed to represent items of wreck, and the table includes the droit numbers assigned by the Receiver of Wreck:

Report ID	Droit Number
Brett_1012	201/21
Hanson_1013	213/21
Clubbs_1016	009/22
Brett_1019	142/22
CEMEX_1020	012/22
DEME_1021	013/22
DEME_1022	014/22
Hanson_1023	018/22
Clubbs_1024	017/22
Clubbs_1025	020/22
Hanson_1026	019/22
CEMEX_1027	026/22
Clubbs_1030	025/22
Clubbs_1031	024/22
Brett_1032	142/22
Hanson_1033	096/22
Hanson_1034	093/22
Hanson_1035	094/22
Hanson_1036	095/22
Tarmac_1037	116/22
Hanson_1041	139/22
Hanson_1043	167/22
Hanson_1044	197/22
Brett_1045	234/22
Hanson_1047	210/22
CEMEX_1048	225/22

This year five reports may have been related to aircraft:

- **Hanson\_1013** is a hydraulic unit and was identified as being important due to the brass plate visible on the side of the object, etched with “CHASSIS”, “UP”, “DOWN” and “FLAPS” along with two arrows. It was identified as a hydraulic unit pertaining to the undercarriage (chassis) unit operation, and also the wing flaps.
- **CEMEX\_1028** and **Clubbs\_1031** are both fragments of aircraft engines. Interestingly one of the valves of Clubbs\_1031 is still able to be unscrewed to reveal the oil still inside the engine. They were respectively identified as being parts of large American radials which would have been fitted to several different types of aircraft. They were found in different areas and therefore unlikely to originate from the same aircraft, however, Steve Vizard suggested that they may both be parts of P47 Thunderbolts.
- **Brett\_1019** and **Brett\_1032** both comprised various aircraft components from the same licence area, 340. These finds are discussed in greater detail in **Case Study 2**.

Although the Protocol received a number of reports of artefacts which may relate to vessels considered to be wreck material, none of them were thought to directly relate to unknown and uncharted wreck sites. Consequently, no reports were forwarded to the UKHO in the 2021-2022 reporting year.

Information on each find has been forwarded to each county’s Historic Environment Record (HER) 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.



Conrad Stuckley holding aircraft parts of Brett\_1019

## Discussion

### Importance

37 individual reports were raised during the 2021–2022 reporting year, which is slightly less than the number of reports the previous year, and although less than the Protocol Implementation Service’s expectation of around 50 reports a year, the reports comprised 102 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 for all periods. The various archaeological material and the amount that is still reported re-iterates 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 Hanson, Tarmac, CEMEX, Clubbs Marine, Volker and DEME.

Wharf visits have returned with a flourish after a two year hiatus due to Covid-19.

### Timely reporting

The Receiver of Wreck must be notified of any wreck-related material within 28 days of it being removed from the seabed. Wreck-related finds include any 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 a Protocol, and this is why the Protocol Implementation Team urges all finds to be reported through the console as soon as they are found. There have been instances in the past when material was being kept together to be reported in one go or due to the busy nature of the job roles of the Nominated Contacts. The longer the items are kept without being reported, the more detail is lost. As of 2022 nominated contacts now notify the Receiver of Wrecks of any wreck-related finds through their online platform. A droit number will be generated which should be passed on to the Implementation team in a timely fashion. This will allow the team to follow up with additional information once the find is assessed and a Wharf Report is produced. Recently, the reporting of finds has been soon after the items are discovered which is a great improvement.

### 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, demonstrating 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:

- **Less use of the discoveries form.** There has been a decrease in the number of finds reported directly through the console, with images being emailed to the Protocol Implementation Team instead. This manner of reporting is more than acceptable; however, a discoveries form is needed so that the Team can upload the find on to the console with as much detail as possible. Details such as finder, date found, and originating Licence Area are all needed for this to be successful. If you do not have a copy of the discoveries form or have misplaced it, please email [protocol@wessexarch.co.uk](mailto:protocol@wessexarch.co.uk) and we will be happy to send you a digital copy.
- **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.
- **Companies with nil return.** It is unfortunate that no finds have been reported from Kendalls during the 2021–2022 reporting year. This is the second year running that no finds have been reported from this company.
- **Regions with nil return.** This year, there were no reports of finds among material dredged from the Thames Estuary, North West or South West regions. 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.
- **Unexpected reports.** This is the first year ever that a find has been reported from a terrestrial quarry! This discovery really highlighted the robustness of the Protocol, and the fact that wharf staff are so well trained in the reporting process that they carry their training over to new situations! A huge thank you to staff at CEMEX’s Denge Quarry (Romney Marsh, Kent) for their reporting of wooden shipwreck material. This find is still being archaeologically assessed, so keep your eyes peeled for updates early in 2023!

## Artefact patterns and distribution

Through the use of a Geographical Information System (GIS; ArcMap 10.8), 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 of the object, if known. This allows us to assess finds on a regional basis, which is helpful when considering future licence applications within existing dredging regions. Patterns in artefact concentration can potentially identify sites of archaeological interest or debris fields or, alternatively, licence areas which are more likely to yield finds of archaeological interest in the future. When a large concentration is discovered from one area, it is useful to look back at previous years to compare what that particular licence area has yielded in the past.

Archaeological Exclusion Zones (AEZs) are also visible within the GIS map, which is useful when plotting finds of a contentious nature, to note the distance of discovery from a previous AEZ as tides are able to move lighter objects from within these zones. The GIS map is updated every time a new AEZ is put into place.

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 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 it tends to be more durable within a harsh underwater environment in comparison to organic finds. Finds such as wood or bone and teeth from the submerged prehistoric landscapes or shipwrecks may be poorly preserved, unless they are buried beneath fine grained sediments, which may account for the low percentage of finds received of these materials, although animal bones have been reported this year both independently and in conjunction with operational sampling.

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 finds 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 being prime examples. The significance of a find can therefore depend on its location as much as the nature of object in itself.



## Distribution of artefacts by dredging region

There are seven dredging regions around the UK:

- Humber;
- East Coast;
- Thames Estuary;
- East English Channel;
- South Coast;
- South West; and
- North West.

In 2021–2022, nine reports came from the East Coast with a further two possibly coming from the area as they originated

from a mixed cargo. Three reports may have come from either the East or South Coast region. A total of 12 reports came from the South Coast, two from the Humber region and six from the East English Channel.

One report came through with an unknown region as the finds came were discovered on the magnet, crusher grid and material from a previous oversize stockpile. No reports were received from cargoes dredged from the North West or South West regions.

**References:** [www.bmapa.org/documents/23rd-Area-of\\_Seabed-Dredged-Report-2021.pdf](http://www.bmapa.org/documents/23rd-Area-of_Seabed-Dredged-Report-2021.pdf)

Region	Millions of tonnes of construction aggregate dredged in 2021 (2020 quantity)	Number of finds reported in 2021–2022 (2020–2021 number)
Humber	3.5 (3.52)	2 (1)
East Coast	3.3 (2.87)	12 (98)
Thames Estuary	1.6 (1.35)	0 (0)
East English Channel	4.48 (4.07)	6 (2)
South Coast	3.99 (3.18)	68 (15)
South West	1.43 (1.27)	0 (0)
North West	0.26 (0.15)	0 (0)
Unknown	-	13 (7)
Terrestrial Location	-	1 (0)
Totals	-	102 (123)



## Distribution of artefacts by date and archaeological typology

### Palaeolithic finds

During the 2021–2022 reporting year, no finds were deemed to be Palaeolithic in date.

### Medieval artefacts

No medieval artefacts were confirmed this year, although some finds such as various cannonballs and a quern stone (Clubbs\_1030) may belong to this period.

### Maritime artefacts

Over half of the finds reported this year are believed to be maritime including multiple cannonballs, bar shots and anchors.

None of the marine finds were thought to be related to a wreck site. 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 were reported through the Protocol this year ranging from individual finds to an assemblage of 43 (Brett\_1019). Several types of munitions were reported including a range of cannonballs, of which a selection which may be linked to the Anglo-Dutch wars are discussed in

#### **Case Study 1.**

Ordnance reported include fragments of cannon. The muzzle (Clubbs\_1024) was found shortly before the cascabel, first reinforcement and second reinforcement (Clubbs\_1025) were reported. It is difficult to say whether these parts are one gun. It is thought that the two body pieces are the same gun and while all three pieces have the same diameter bore, the muzzle itself seems to be of a slightly wider diameter.

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

### Aircraft

Several discoveries were made relating to aircraft this year, including various engine fragments, a hydraulic unit and munitions. More can be read about two reports of substantial ensembles of aircraft parts in **Case Study 2**. Two of these finds were reported to the Ministry of Defence.



## 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 several engagement events has targeted a wider audience than just the aggregate industry. When work experience students visit the Coastal & Marine team, the work they do with us often revolves around the Protocol and the finds that have been reported.

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 staff, during which questions are asked and answered, and ideas gathered on how to make the Protocol more relatable or easier to use. It is because of such informal discussions that the mugs were developed - an idea that became a reality and which 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 2021–2022 reporting year.

## The future

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





## Brett\_1012: Two Cannonballs and Shell Base

These two cannonballs and munition base were discovered by Harry Knott, Tony Payne, George Lee-Aimes at Cliffe Wharf. The Licence Area they came from is unknown as they were discovered on the magnet, crusher grid and material from previous oversize stockpile.

These finds consist of one cannonball with a 100 mm diameter, one cannonball with a 130 mm diameter and a shell case base with a 160 mm diameter.

Images of both cannonballs were sent to Charles Trollope, an expert in historical ordnance, who said that the smaller cannonball is most likely an English six pounder. The larger one is too large to be an English 18 pounder but fits nicely as a French 16 pounder. He also said that French pounds are heavier than English, and that the French had at least three different weights for their pound!

Cannonballs are a common find around the coast of England as, with an extensive naval history, military training and battles have taken place along this coastline for hundreds of years. As the seabed location of the cannonballs is not known, it is not possible to say more.

The image of the munition base was sent to Trevor Parker, from the Ordnance Society and Mark Khan, UXO Research Manager at Fellows International. They both said that the diameter measurement comes out at just over 7 inches, which equates to the base diameter of a 6-inch British brass separate loading shell case. They also both commented that the cartridge has had a major trauma and seems to have exploded outside of its 6-inch gun. Mark added that he has seen similar with cartridges that have been subject to demolition on land and that sometimes demolition scrap from land sites were dumped at sea.

Trevor commented that the only uncertainty is the primer; this 6-inch case had a protruding primer which could be interchanged from a percussion fired to an electric fired version. These had a much smaller diameter than the flush fitted primers, but because of the corrosion of this item, he couldn't tell which type it had. The other problem is that there are faint signs of three holes round the primer hole itself, but these were used for a 'primer protector' which was only used with the flush type.



It is unknown whether this particular shell was fired from a gun on a vessel or on land. As it is unknown which gun it was fired from, it is unknown what date the munition is. As stated by Mark, the munition could have come from a demolition scrap yard that was dumped at sea or it could be as a result of military training or combat.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 201/21)
- The National Record of the Historic Environment
- The Historic Environment Record for Kent



## Hanson\_1013: Hydraulic Unit

This hydraulic unit was recovered from Licence Area Licence Area 401/2 in the East Coast region approximately 23 km east of Lowestoft. Stuart King discovered it at Greenhithe Wharf.

This find was discovered in an over-size bay and was identified as being important due to the brass plate visible on the side of the object, etched with "CHASSIS", "UP", "DOWN" and "FLAPS" along with two arrows.

Images were sent to Steve Vizard, an external aircraft specialist who said that the item is definitely an aircraft part and is a hydraulic unit pertaining to the undercarriage (chassis) unit operation, and also the wing flaps. Both systems are hydraulically controlled on many types of aircraft. He said that it is not anything vaguely modern in his opinion, and almost certainly something from the 1940s or 1950s.

Steve said that the chances are that it is a military aircraft, and British by the looks of it (as opposed to a wartime American aircraft). By the size of the unit, it seems to be from a larger type of aircraft, a bomber of some kind. He said that it is certainly not a single seat fighter. He also said that there would definitely be other part numbers on the item, and these numbers, plus inspection stamps, will identify the manufacturer, and therefore (we would hope) the aircraft type. Stuart at the wharf was later able to identify two further markings on the part - "AIR9500F" and "AIR9444", however no other stamps were visible. Therefore, it is unclear at this time what kind of aircraft this object related to.

As this item is related to an aircraft, it may be part of a site where an aircraft was ditched or lost. No other remains were encountered within the cargo, but staff should be vigilant for any further finds from this area and report them immediately.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The MOD
- The Receiver of Wreck (Droit 213/21)
- The National Record of the Historic Environment
- The Historic Environment Record for Norfolk



## Brett\_1017: Cannonball

This cannonball was discovered in Licence Area 351 in the South Coast dredging region, approximately 12 km south-east of the Isle of Wight. Lloyd Weedon discovered it at Newhaven Wharf.

This large stone cannonball was found on the feed hopper grill and was reported as having a circumference of 550 mm and weighs 19.883 kg (43.8 lbs).

Charles Trollope, an expert in historical ordnance, studied the images of the find. He said that this is quite an interesting cannonball. Converting the measurement seen on the photographs (260 mm) to imperial, it would result in a 10-inch ball but that the weight reading from the scales seems too high to match this. Charles came to the conclusion that this is a Perier stone shot, dating 16th to early 17th Century, almost certainly not English but potentially Spanish.

Perier cannons, also known in Spanish as Pedrero cannons, were third class guns that fired stone balls to break and sink ships and defend batteries from assault ([https://www.nps.gov/parkhistory/online\\_books/source/is3/is3c.htm](https://www.nps.gov/parkhistory/online_books/source/is3/is3c.htm) accessed February 2022). The Perier cannons were an early form of swivel gun used by the English, Spanish and Portuguese fleets. A bronze Perier canon from Portugal dated to 1627 is stated as having a barrel bore of 267 mm which is comparable with the size of this cannonball and may represent a similar gun to the one this was fired from (<https://collections.royalarmouries.org/object/rac-object-22460.html> accessed February 2022).

Charles said that the cannonball could conceivably be from one of the Spanish Armada ships as the Pedrero cannon is known to have been on this fleet of ships and as the find was dredged off the Isle of Wight.

“The third encounter between the English fleet and the Armada took place on 25 July/4 August in a position said to be 18 miles south of the Isle of Wight. A disabled Armada ship had fallen astern which the English then attacked. Spanish galleasses came to the rescue, upon which the English turned their fire. There was 'very sharp fight for the time' before the Spanish, in the words of Medina-Sidonia, saw 'the advantage was no longer with us'". ([https://www.heritagegateway.org.uk/Gateway/Results\\_Single.aspx?uid=5496302f-1db2-40fb-8480-d798a5bcd2be&resourceID=19191](https://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=5496302f-1db2-40fb-8480-d798a5bcd2be&resourceID=19191) accessed February 2022).



It is not possible to say whether it was fired during training, battle or perhaps just lost overboard, however, its connection to the location of significant historical battle at sea means it is an exciting find.

Information about this discovery has been forwarded to:

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



## CEMEX\_1020: Anchor

This anchor was discovered in Licence Area 512 in the East Coast dredging region, approximately 14.5 km east-north-east of Lowestoft. Wieslaw Krolkowski discovered it wedged in the screen towers on board the dredged *Sand Falcon*.

This anchor was reported as being approximately 400 mm in length with a crossbar at one end. One end tapers to a point while the other end is shorter and blunter indicating that it may possibly have broken off.

Images were sent to Senior Maritime Technical Specialist, Graham Scott, who concluded that the object was a small, very corroded small anchor missing part of both arms. The arms of the anchor are the curved pieces either side of the shank or body. The flukes are the wide pointed ends at the end of the arms of an anchor that grip the seabed when mooring. The stock of an anchor runs perpendicular to the shank, however, as this example is believed to be missing the upper part of its shank, it cannot be confirmed whether a stock was present when it was in use. He said that it is probably quite old, although we don't know how bad a time it's had since it was lost.

For the most part, wrought iron anchors stopped being produced around the mid-1800s in favour of cast iron and steel. Based on the size and material, it is thought that this anchor is a kedge anchor or "fisherman's anchor" used for kedging (moving a boat by hauling in a light anchor) and temporary mooring.

Anchors are important symbols of the maritime world and are common artefacts found on the seafloor. There are a number of reasons why an anchor may end up on the seabed such as being lost during a storm, being fouled, as part of a shipwreck event or lost due to broken chains or ropes. Whatever the reason they came to be there anchors are important to record and can tell us a great deal about the history of an area, where an anchorage was located, areas of danger to ships and the location of shipwrecks.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 012/22)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Suffolk



## Clubbs\_1016: Alloy Tube

This alloy tube was discovered in Licence Area 512 in the East Coast dredging region, approximately 14.5 km east-north-east of Lowestoft. Tom McKenna discovered it at Clubbs Marine Wharf.

This alloy tube was reported from the wharf as suspected aircraft material due to the material and rivet holes. The object measures approximately 280 mm in length and has a diameter of 90 mm.

Images were sent to external aircraft specialist Steve Vizard who said that alloy was (and is) used in many other applications, not just aircraft. He said that it is highly unlikely that this item originated from an aircraft as it doesn't resemble any type of structure, or system part, that he's ever seen.

Images of the object were then sent to Anthony Mansfield, a senior naval engineer, who said that it looks like some kind of aircraft pitot tube arrangement, or at least the outer casing of one. The only problem is the size, as it is about four times the size of a regular aircraft pitot tube.

He said that his next guess would be part of a liquid's mixing device used to inject a dosing liquid into a main flow (main flow through the centre, dosing liquid along the flutes and through the holes to the centre flow). A dosing pump is a small, positive displacement pump. It is designed to pump a very precise flow rate of a chemical or substance into either a water, steam or gas flow. A dosing pump will deliver this precise flow rate of chemical or other product by a number of different methods, but it generally involves drawing a measured amount into a chamber and then injecting this volume of chemical into the pipe or tank being dosed. Dosing pumps are used in a variety of applications from agriculture, industry, and manufacturing to medicine.

As it is unclear what this object is, it is unknown how it entered the marine environment. It could be as a result of material being dumped at sea.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 009/22)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Suffolk



## DEME\_1021: Spout

This spout was discovered in Licence Area 506 in the Humber dredging region, approximately 150 km east-south-east of Bridlington. M. de Clercq discovered it at DBM Vlissingen wharf from material delivered by *Victor Horta*.

This spout measures 115 mm by 40 mm at its base and appears to have come off a teapot. The material is metallic and shows signs of rust as a result of being in salt water.

Images were sent to Wessex Archaeology's Senior Archives Manager, Lorraine Mephram, who said it is difficult to say much about it, but it looks as though it may be enamelled. She said it is similar to those rather utilitarian enamelled teapots from the late 19th and 20th centuries. She said that it would appear that it's no older than 19th-century.

Enamel cookware began in the 1760s in Germany with the idea of finding a safe, convenient coating. Over the next few decades enamel-coated metal came into use for domestic pots, pans, basins, as well as for street signs, medical equipment and more (<http://www.oldandinteresting.com/enamelware-history.aspx> accessed April 2022).

Enamelware was originally marketed in the 19th century as a safe alternative to toxic materials found in kitchen products. Early products were usually white. Britain produced white enamelware with a dark blue rim while Swedish products were cream-colored trimmed in green (<https://delishably.com/cooking-equipment/Enamelware-Vintage-Collectible-and-Popular-Modern-Retro> accessed April 2022). Later production included patterns which may be visible on this spout.

It is unknown whether this item was broken when it entered the marine environment. However, it is likely, as if a teapot had broken during a voyage, it would have been thrown overboard.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 013/22)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for East Riding of Yorkshire



## Clubbs\_1030: Possible Quern Stone

This possible quern stone was discovered in Licence Area 407 in the South Coast dredging region, approximately 15 km south-east of the Isle of Wight. Kevin Cruickshank discovered it at Clubbs Denton Wharf.

This find was reported by the wharf as a mill stone weighing approximately 1.5 kg and with an approximate diameter of 240 mm.

Images were sent to Wessex Archaeology Technical Specialist Phil Andrews and Senior Archives Manager, Lorraine Mephram and both agreed that it is too small to be a millstone, perhaps even a bit small for a quern stone, though the funnelling of the central hole on one side might be suggestive of this being the upper stone of a pair. However, the other side doesn't look flat/smooth enough to be a quern stone, and the stone appears to be limestone which would be an unlikely material choice due to it being a softer stone.

On the funnelled side are three (likely originally four) little recesses which appear genuine, and one possibility is that it is a grindstone (though limestone would again be an unlikely choice). They said that it could perhaps be a rotary grindstone mounted in a frame. If so, Lorraine found a possible medieval parallel from Exeter.

They asked to see photos of the edge of the stone that the wharf kindly provided. Once reviewed, they said it looks much less likely to be a grindstone as there is no flat grinding edge and we may be going back to it being a quern. It is odd, especially with those four recesses/lugs around the edge. They called it an interesting and slightly enigmatic find!

It is unclear how this object made its way to a marine environment. Quern stones were used for grinding grain into flour on land. It could be that when this stone reached the end of its working life, that it was used as a ballast stone on an older vessel.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 025/22)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for the Isle of Wight



## Clubbs\_1031: Aircraft Engine

This aircraft engine was discovered in Licence Area 407 in the South Coast dredging region, approximately 15 km south-east of the Isle of Wight. Tony McKenna discovered it at Clubbs Denton Wharf.

This find was correctly identified by the wharf as part of radial aircraft engine. The object measures 240 mm by 200 mm and weighs approximately 1.25 kg. One of the valves is still able to be unscrewed to reveal the oil inside the engine.

Images were sent to external aircraft specialist Steve Vizard who said that it is a part of a large American radial engine used on aircraft such as the P47 Thunderbolt and B24 Mitchell. He also said that the valve body appears to be from a Pratt & Whitney R2800 which is consistent with the P47 Thunderbolt.

The Republic P-47 Thunderbolt is a Second World War era fighter aircraft produced by the American aerospace company Republic Aviation from 1941 through 1945. The Thunderbolt was effective as a short-to medium-range escort fighter in high-altitude air-to-air combat and ground attack in both the European and Pacific theatres with its primary armament comprising eight .50-caliber machine guns.

He said that when parts have been sealed by bolts and plugs, and there's been no ingress of soil or water, it is common to find engines still with oil in them. On various land sites over the years, engines have been found full of oil having been buried 20 foot underground for 80 years.

Research was undertaken on known aircraft loss locations in relation to the area. None were within the Licence Area and those closest (over 7 km away) were either British or German in origin. It is therefore unknown how this aircraft engine came to be on the seabed, but it is assumed it has originated from an aircraft wreckage that was lost during the Second World War either through ditching or during combat and may have been transported as a result of fishing and trawling.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The MOD
- The Receiver of Wreck (Droit 024/22)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Isle of Wight



## CEMEX\_1027: Spoon

This spoon was discovered in Licence Area 137 in the South Coast dredging region, approximately 6.5 km south-west of the Isle of Wight. M Nichols discovered it at Shoreham Wharf.

This metal spoon measures approximately 200 mm in length and 60 mm at its widest point. The maker's stamp "John Round & Son Ltd" is visible on the reverse of the handle with no other stamps to be seen. The bowl of the spoon has sustained damage, whether before entering the marine environment, whilst on the seabed or through the dredging process is unknown.

Research on the stamp on this spoon revealed that it was made in Sheffield as was a lot of cutlery during the 19th century. The company was established by John Round in Sheffield in 1847 as a small workshop attached to his house in Tudor Street. The business proved successful and the firm, in partnership with his son Edwin, went under the title of John Round & Son Ltd. from 1874. An additional factory was opened at Arundel Plate Works, Sheffield, with various showrooms operating in London and Montreal (<https://www.silvercollection.it/ENGLAJOHNROUND.html> accessed April 2022).

As the company progressed over the years, the stamp on the cutlery they produced changed too. Based on the wording of this stamp containing the word "Ltd", this spoon dates to between 1874 and 1962. The company that made it also produced silver cutlery but as this one is not hallmarked; it is not silver. It is possibly a base white metal such as nickel silver.

How this object entered the maritime environment is unknown. It may be from an unknown wreck, but more likely it was lost or thrown overboard during everyday shipboard operations. Some theories are that cutlery were thrown overboard on a return journey to avoid washing them up!

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 026/22)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Isle of Wight



## CEMEX\_1028: Aircraft Engine

This aircraft engine was discovered in Licence Area 512 in the East Coast dredging region, approximately 14.5 km east-north-east of Lowestoft. David Bennett discovered it at Northfleet Wharf.

This find was reported as fragment of aircraft engine and measures approximately 250 mm by 220 mm.

Images were sent to external aircraft specialist, Steve Vizard, who said that it is a part of a cylinder head from a Pratt & Whitney engine, which was a large American radial fitted to several different types of aircraft, but predominantly the B25 Mitchell and P47 Thunderbolt.

The Republic P-47 Thunderbolt is a Second World War-era fighter aircraft produced by the American aerospace company Republic Aviation from 1941 through 1945. The Thunderbolt was effective as a short- to medium-range escort fighter in high-altitude air-to-air combat and ground attack in both the European and Pacific theatres. Its primary armament was eight .50-caliber machine guns.

The North American B-25 Mitchell was a twin-engine bomber that became standard equipment for the Allied air forces in the Second World War. It became the most heavily armed airplane in the world, was used for high- and low-level bombing, strafing, photoreconnaissance, submarine patrol, and even as a fighter. Some versions carried 75 mm cannon, machine guns and added firepower of 13 .50-caliber guns in the conventional bombardier's compartment. One version carried eight .50-caliber guns in the nose in an arrangement that provided 14 forward-firing guns.

Steve said that the location of dredging may possibly be an indicator, but the bombers were escorted by fighters so it would be guess work. Research was undertaken on known and recorded aircraft loss locations in relation to the area. Five had an approximate location in the south-east of the Licence Area but were all of German origin. Those closest known wrecks (over 4 km away) were either British or German in origin. It is therefore unknown how this aircraft engine came to be on the seabed, but it is assumed it has originated from an aircraft wreckage that was lost during the Second World War either through ditching or during combat, and then may have been carried as a result of fishing and trawling.



Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The MOD
- The Receiver of Wreck
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Suffolk



## Brett\_1018: Munitions

These munitions were discovered in Licence Area 351 in the South Coast dredging region, approximately 12 km south-east of the Isle of Wight. Luke Payne discovered them on the magnet at Cliffe Wharf.

These two munitions were reported as a “blind item measuring 16 inches by 4 inches (406 mm x 102 mm) with a practice fuse at the tip and therefore likely full of pitch or sand, from experience practice plugs are used on live ordnance and a hollow inert item measuring 9 inches by 2.5 inches (228.6 mm x 63.5 mm) with the fuse/plug missing from the rear”.

Images of the munitions were sent to Trevor Parker, from the Ordnance Society and Mark Khan, UXO Research Manager at Fellows International. Trevor said that the only information he can give is that the large brass flat base plug with a square central hole is to replace the base fuse which would be there for a live head. Going by the dimensions, the plug was to replace a No. 12 fuse (which was introduced in 1895 and finally made obsolete, many 'Marks' later in 1955). The plug is either a "Plug, Base, Shell, No. 2" or a "Plug, Base, Shell, No. 5".

Mark said that the larger munition looks to be a 4" Naval or coastal artillery practice projectile. There were a number of different types of these, but this one is of type that was loaded separately from the cartridge case (it is possible to see there is no crimp below the driving band). It has a practice fuse fitted, but he agreed with the wharf that it is better to be safe than sorry. High Explosive filled shells were on occasion known to be fired plugged (i.e., without a fuse).

Neither expert could comment on the smaller shell due to the limits of the photograph.

It is unknown whether these particular shells were fired from a gun on a vessel or on land. Based on the date Trevor gave of the plug, one of the munitions may relate to either World War and could be as a result of military training or combat in the area.

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\_1015: Stone Object

This stone object was discovered in a mixed cargo from Licence Area 351 in the South Coast dredging region and Licence Area 461 in the East English Channel. George Lee-Amies discovered it at Cliffe Wharf.

This object was reported by the wharf as small stone with a perfect hole in its centre that doesn't look naturally formed.

Archaeologist Phil Maier saw the images and said that fishing weights/sinkers or depth sounding weights in maritime contexts have a really distinct shape. It could be that this stone was used as a sinker however it could be that the hole was created by a bivalve mollusc boring into the stone and therefore it is a piddock stone. Piddocks are a strange group of clam-like shellfish that burrow into soft rocks such as clay and sandstone. The creature is able to bore a hole into a rock by locking on with a sucker-like foot and then twisting its shell to drill. Occasionally, the piddock bores through the entire stone and leaves a perfect hole, similar to this one.

Marine Archaeologist Alistair Byford-Bates suggested that the stone is a "glain neidr" or adder stone. Adder stones were thought to possess magical abilities such as protection against eye diseases or evil charms, preventing nightmares, curing whooping cough, the ability to see through fairy or witch disguised and trapped, if looked at through the middle of the hole, and of recovery from snakebite. The Glain Neidr or Maen Magi of Welsh folklore is also closely connected to Druidism (<https://vamzzz.com/blog/adder-stone/> accessed March 2022). Also known as Hagstones, they are thought to be a powerful amulet which protects the wearer and brings good luck (<https://nautibynaturedesigns.com/collections/hagstone-jewellery> accessed March 2022).

It is thought that this stone is too small and the wrong shape to be a fishing weight but could be an adder stone, worn for protection and washed from a terrestrial context, or a naturally occurring piddock stone.

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 Kent



## Brett\_1014: Metal Lock

This metal lock was discovered in Licence Area 351 in the South Coast dredging region, approximately 12 km south-east of the Isle of Wight. Tony Payne discovered it at Cliffe Wharf.

This object was reported as a possible hatch locking mechanism as it has some kind of handle which turns. The object measures approximately 240 mm by 190 mm and the outer edges have several rivet holes indicating that it was once attached to a larger piece.

Images of the object were sent to Anthony Mansfield, a senior naval engineer, who said that it does resemble a hatch locking mechanism. He said that it does have similarities to a container twist lock but the loose collar with the rivet holes is definitely pre-container days.

Images were also shown to marine archaeologist Grant Bettinson who said that it looks like the top of a storage tank. He said that it is a release valve for an unidentified system. The valve has been reinforced around its base suggesting it belongs to some kind of pressurised storage system.

A pressurised storage system is designed for storing volatile liquids such as gasoline and liquefied petroleum gases, which generate high internal pressures. A pressure storage tank is commonly spherical. Other types include spheroidal or hemispherical tanks. Some pressure storage tanks can support several hundred pounds per square inch of internal pressure. A pressure storage tank is also called a pressure-type tank.

The likelihood is that the object was somehow damaged and was purposely discarded overboard during everyday shipping operations. Alternatively, it may have been accidentally lost overboard or be indicative of a debris field.

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 the Isle of Wight

## Brett\_1019: Aircraft Components

These aircraft components were discovered in Licence Area 340 in the South Coast dredging region, approximately 8.5 km south-east of the Isle of Wight. Paul Russell and Conrad Stuckey discovered them at Newhaven Wharf.



These aircraft parts (3) and munitions (43) were discovered in the same cargo, alerting the wharf staff that they may have come across aircraft wreckage. The wharf highlighted at the time of reporting that there is still paint remaining on one of the parts potentially in a camouflage colour/pattern.

Images were sent to external specialist Steve Vizard who said that the larger piece is an engine valve that looks to be from a radial engine type, and the ammunition is .50 calibre, therefore initially pointing towards an American aircraft. Apart from the Mustang which had an inline engine (Merlin), most Second World War American aircraft used a radial engine and all American aircraft had .50 calibre Browning machine guns. He said that previous experience would lead him to believe that it's more likely to be a bomber than a fighter which could mean that if it were outbound, there could well be heavy ordnance in the area. However, most ditched their ammunition on the way back.

Steve confirmed with a colleague that the engine valve is from a Wright Cyclone. This large radial engine was predominantly fitted to the American B17 Flying Fortress and this is further confirmed by the aluminium strut section appearing to be a wing rib brace from a B17.

The American B17 Flying Fortress is a four-engine heavy bomber developed in the 1930s for the United States Army Air Corps (USAAC). It proved efficient, enough to



where it was used in every theatre of the war. Legendary for its ability to sustain heavy damage in battle and bolstered by its nearly self-sufficient firepower, B-17s were most often used for daytime raids over Germany, as well as to wreak havoc on enemy shipping in the Pacific, though to a lesser degree. Each aircraft had a crew of 10 including: a Pilot, Co-Pilot, Bombardier, Navigator, Radio Operator, Flight Engineer, Ball Turret Gunner, Tail Gunner and two Waist Gunners (<https://www.nationalww2museum.org/visit/museum-campus/us-freedom-pavilion/warbirds/b-17e-flying-fortress> accessed February 2022).

Steve was also asked what the likelihood was of an entire aircraft wreck being on the seabed in this area. He said that it would be presumed that these parts wouldn't be too far away from the wreck site, however, depending on the amount of fishing and trawling that has taken place over the last 75 years, then the parts could be distributed over a large area. Also, there is the possibility of parts being dumped by fishing vessels, for instance fishermen may jettison such parts found in their nets in an area where they don't fish, just to get rid of the parts, so that they won't be netted again. Staff at the wharf have been told to be vigilant for any other aircraft material dredged from this licence area.

Further research was done on Area 340. It was found that there is an exclusion zone in place for an aircraft wreck, however that is for a Piper aircraft that lost power in both engines and ditched at sea on 29 July 1975 (UKHO 19021) and therefore not related to these finds. The pilot was not seriously injured (Wessex Archaeology 2013).

An aircraft crash site location report revealed that there are no recorded losses in the immediate area (Wessex Archaeology 2008). The closest record of a B-17 was approximately 18.5 km west-south-west of where these discoveries were made. The record for that particular loss states that a Boeing B-17 bomber, serial 42-31149 from 388th Heavy Bombardment Group stationed at Knettishall in Suffolk crashed into the sea some three miles off the coast of Niton on 30 December 1943. Of the crew of 10, only 4 Staff Sergeants J.E Mont (ball turret gunner), J. Payne (right waist gunner), W.L. Steele (left waist gunner) and F.C. Zagrovicj (tail gunner) survived.

It cannot be confirmed whether these finds are related to this site.

#### References

- Wessex Archaeology 2008 *Aircraft Crash Sites at Sea A Scoping Study Archaeological Desk-based Assessment* Reference 66641.02
- Wessex Archaeology 2013 *Area 340 Marine Aggregate Extraction Archaeological Assessment of 2012 Geophysical Data Archaeological Baseline Report* Reference 87900.05

Information about this discovery has been forwarded to:

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



## DEME\_1022: Pickaxe Head

This pickaxe head was discovered in Licence Area 478 in the East English Channel dredging region, approximately 43 km south of Newhaven. Marcel De Koff discovered it at DBM Vlissingen wharf.

This item was correctly identified by wharf staff as a pickaxe head, measuring 360 mm by 75 mm at its widest point. The lamination of the metal indicates that the head is made from wrought iron rather than cast like other examples and the remains of the wooden handle is evident where it has broken off from the shaft.

This tool, known as a pick or pickaxe, has been in use since prehistoric times albeit with the earliest picks made from the tines of deer antlers, not iron. The sharp spike, which on modern picks is counterweighted by either a second pick or a chisel, can be used to break up hard ground surfaces, remove tree roots or, in medieval England, used as a weapon.

Before the developments of modern steel making, wrought iron was the most commonly used form of malleable iron. This means that unlike cast iron, wrought iron is not as brittle. Wrought iron has a lower carbon content, which makes it harder and stronger, yet easier to weld. At its peak, wrought iron was used in the manufacturing of nearly everything, all over the world. Because mild steel is cheaper and easier to mass produce, the raw material wrought iron gradually disappeared, until the last ironworks ceased production in the 1970s.

Due to this example being made from wrought iron, it is likely to date 19th century.

Whilst this pickaxe may have been transported by, or lost from, a sea-going vessel, they are not commonly used on boats as they are predominantly agricultural, building or mining tools. Alternatively, this find may have been deposited at sea with a spread of rubble.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 014/22)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for East Sussex

## Hanson\_1026: Various Finds



These finds were discovered in aggregate dredged from the East Coast dredging region, either in Licence Area 361, approximately 26 km east of Great Yarmouth, or in Licence Area 401, approximately 26 km south-east of Great Yarmouth. M. Morley discovered them on board *Arco Avon*.

These items were recorded as:

- a round metal object, 80 mm in diameter with six equally spaced holes around it, possibly indicating the bottom of an ordnance shell;
- a metal object, with a rounded top and a metal loop protruding from the top measuring 140 mm by 60 mm by 50 mm, suspected to be a weight of some sort; and
- a third metal fragment measuring 70 mm by 160 mm.

The image of the munition base was sent to Trevor Parker, from the Ordnance Society, and Mark Khan, UXO Research Manager at Fellows International. Trevor said that it does look as if the base has been exposed to extreme heat (or an explosion) while Mark said that it looks like the baseplate of a Naval Shell as it has all the right attributes and is about the right size. Naval vessels used illuminating rounds where a flare on the end of a parachute were ejected from the base to provide very powerful illumination at night. He said that the Navy classified these as 'Star Shell' and fired them in copious numbers so it could very well be associated with one of these. This may have come to the seabed through training purposes or as a means of passing signals.

The second item has not yet been identified, but specialists agreed with the vessel staff that it could be a weight, or a component associated with rigging gear. This may have been transported, or lost from, a sea-going vessel, or deposited at sea with a spread of rubble.

Images of the third piece were sent to Wessex Archaeology's animal bone specialist, Lorrain Higbee, as it was suspected to be mineralised animal bone rather than metal due to the honeycomb effect visible on its surface and the fact that it was reported as a heavy object. Lorrain confirmed that it is mineralised animal bone from a large mammal but was not able to give a further identification.



Mineralised bones from woolly mammoth and rhinoceros are relatively common finds in the East Coast dredging region from when the area was dry land before the ice sheets melted at the end of the last ice age, making the seabed. Therefore, the bone could have remained there from that period.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 019/22)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk

## Cemex\_1029: Ship Timbers

These ship timbers were discovered at the Denge Quarry on the Denge Marsh, at 50° 56.213N, 0° 57.957E. The Denge forms part of the area known as the Romney Marsh in Kent. The timbers were reported by the Site Manager Michael Hinson.

During dredging operations at Cemex's Denge Quarry near Lydd-on-Sea, on the Romney Marshes, in Kent, a number of substantial ship's timbers, including at least four large sections of hull were recovered by the 'backhoe' dredger that operates at the quarry. The timbers were recovered from approximately 4-6 m below the water level of the quarry. An archaeological exclusion zone has been put in place around the location of the finds, as it is believed that further material is present. More information will be available in the next protocol year.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Historic Environment Record for Kent
- Kent County Council Archaeologists





## Hanson\_1023: Aileron Hanger

This aileron hanger was discovered in Licence Area 460 in the East English Channel dredging region, approximately 14 km south of Hastings. Tom Shenton discovered it at Frindsbury Wharf.

This find was reported as a small piece of aluminium, believe to be an aircraft part due to the light alloy material and the presence of rivets.

Images were sent to external specialist Steve Vizard who confirmed that it is an aircraft part. He identified it as an aileron hanger, which is basically an arm that the aileron (a wing flight control surface) attaches to and is operated from. He said that the slightly yellow anodising suggests a German aircraft, and it is the right size to belong to a bomber, possibly a Junkers 88 or perhaps a Dornier 17 which are both examples of twin-engine Second World War bombers. He also said that there should be some forging marks on the component giving a part number. Additional photographs were supplied by the wharf, but they didn't show the part numbers that were assumed to be there and so the part is being sent to Steve's workshop on the Isle of Wight to be cleaned and conserved to enable a positive identification. Steve will then send it back to the wharf for retention.

Steve did mention that this would probably have been detached from a section of wing out there somewhere, so there might well be more wreckage in the vicinity, however, depending on the amount of fishing and trawling that has taken place over the last 75 years, the parts could be distributed over a large area. Also, there is the possibility of parts being dumped by fishing vessels, for instance fishermen may jettison such parts found in their nets in an area where they don't fish, just to get rid of the parts, and so they won't be netted again.

Staff at the wharf have been told to be vigilant for any other aircraft material dredged from this licence area.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The MOD
- The Receiver of Wreck (Droit 018/22)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for East Sussex



## Clubbs\_1024: Cannon Muzzle

This cannon muzzle was discovered in Licence Area 512 in the East Coast dredging region, approximately 14.5 km east-north-east of Lowestoft or from Licence Area 407 in the South Coast dredging region, approximately 15 km south-east of the Isle of Wight. Brad Johnson discovered it at Clubbs Denton Wharf.

This item was correctly identified by the staff at the wharf as a cannon muzzle. It measures approximately 180 mm by 90 mm and the bore has a diameter of 35 mm.

Images were sent to Senior Maritime Technical Specialist Graham Scott who said that this is a heavily corroded muzzle fragment from a cast iron smoothbore muzzle loading gun, with a pronounced flare and a muzzle ring/astragal. From the scale next to one of the photos it may be a 1-2 pounder and therefore possibly a swivel gun. Although cast iron swivels existed before, they did not become very common until after 1700. Graham said that this find is therefore probably post-1700 and most probably English because they produced and exported them in very large numbers.

Images were also sent to Charles Trollope, an expert in historical ordnance, who said that the design of the swell is English. Measuring the bore and the length of the neck to muzzle and multiplying by the standard English design measurements the answer, in quite tidy figures, is as follows. The gun was a 1 pounder of 2 foot cast in the 17th century. Charles said that he can find these in the 17th century Barbados records of English guns but none produced in 18th century English/B of O records where the Half Pounder swivel became the standard.

The term swivel gun refers to a small cannon, mounted on a swivelling stand or fork which allows a very wide arc of movement. Swivel guns are among the smallest types of cannon, typically measuring less than 1 m in length and with a bore diameter of up to 35 mm. They can fire a variety of ammunition but were generally used to fire grapeshot and similar types of small diameter shot. Most swivel guns were muzzleloaders. They were aimed through the use of a wooden handle, somewhat similar in shape to a baseball bat, attached to the breech of the weapon.

The small size of swivel guns enabled them to be used by a wide variety of vessels, including those too small to accommodate larger cannons, serving as short-range anti-personnel ordnance. They were not ship-sinking weapons, due to their small calibre and short range, but could do considerable damage to those caught in their line of fire.

Due to their relatively small size, swivel guns were highly portable and could be moved around the deck of a ship quite easily (much more easily than other types of cannon). They could be mounted on the deck railings of a ship, which provided the gunner with a reasonably steady platform from which to fire. Their portability enabled them to be installed wherever they were most needed; whereas larger cannon were useless if they were on the wrong side of the ship, swivel guns could be carried across the deck to face the enemy.

It is not uncommon to find a broken off muzzle as they become extremely hot when fired and can break off if they strike anything whilst recoiling (there is a similar example of a muzzle fragment which may have occurred when a poorly controlled recoil resulted in the muzzle hitting the gunport lintel). As this is thought to relate to an 18th or early 19th century wreck, research was undertaken in order to identify matching wrecks in the possible originating areas of 512 and 407 by looking at archaeological assessment reports.

Within the 407 Licence Area 1 km buffer, are the remains of the wreck of *Faith*, a British cargo vessel, located 10 miles SE of St. Catherine's Point which foundered in 1855 on her delivery voyage, en route from London to Istanbul carrying a general cargo (Wessex Archaeology 2013a).

Within the 512 Licence Area, lies a wreck, which is possibly that of the *Mascota*, formerly *Torquay*, built in 1890 and owned by Marina Mercante (Argentina). The vessel was captured by a German torpedo boat and destroyed on 29th March 1917 and now lies at a depth of 28 meters (Wessex Archaeology 2013b).

Within the 512 Licence Area 1 km buffer lie the possible remains of the wreck of a British cargo vessel *Abeona* which foundered after a collision in 1883. The vessel was constructed of iron and powered by steam (Wessex Archaeology 2013b).

Whilst it cannot be ruled out that the muzzle originated from one of these wrecks (possibly being carried as ballast), it is likely that the gun would have originated from an earlier vessel. Another possibility could be the loss of a vessel carrying scrap. The fragment may also have been carried from another location via fishing nets or it may originate from an unknown wreck in the area that is previously unknown. Staff should be vigilant for other finds from the same areas.

#### References

Wessex Archaeology 2013a *Area 407 Marine Aggregate Extraction Archaeological Assessment* Reference 87680.02

Wessex Archaeology 2013b *Areas 511/512/513: Technical Report & Impact Assessment Offshore Desk-Based Archaeological Assessment* Reference 86240.04

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 017/22)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Suffolk and the Isle of Wight



## Clubbs\_1025: Cannon Fragments

These cannon fragments were discovered in aggregate dredged from either Licence Area 512 in the East Coast dredging region, approximately 14.5 km east-north-east of Lowestoft, or Licence Area 407 in the South Coast dredging region, approximately 15 km south-east of the Isle of Wight. Adrian Hatcher discovered them at Clubbs Denton Wharf.

These parts of a gun including cascabel, first reinforcement and second reinforcement were reported shortly after a muzzle was found (Clubbs\_1024).

Images were sent to Senior Maritime Technical Specialist Graham Scott who noted that the very worn first reinforce ring is visible. This suggests that the object has not lost very much metal from the reinforce end of the chase. He said that he would expect the circumference there to be greater than the circumference of the chase end of the muzzle fragment (Clubbs\_1024) if they are parts of the same gun.

He said that he would be cautious about saying it's the same gun until all of the pieces have been examined and measured and it has been possible to work out how much depth of metal has been lost on the chase end of the chase/reinforce fragment. He also noted that it is strange that the gun is in three pieces. It is unlikely that a dredger could cause this damage and questioned why salvagers would bother breaking it into three if its scrap and it is a strange explosion if it's an accident. He suggested it could be fire damage but was unsure.

Once measurements were taken at the wharf, he said it is probably a ½ pounder, which means it's likely to be a swivel gun and probably post-1700 because that is from approximately when they started to become commonplace. He said it is most likely English because we produced and exported them in very large numbers and they were used on both warships and merchant ships of all sizes. There is no sign of a tiller and due to it being very corroded, there are no signs of any marks or stamps/broad arrow.

The gun is believed to have been around 2 feet in length. It is difficult to say whether these parts and the muzzle fragment (Clubbs\_1024) are one gun. It is thought that the two body pieces are the same gun and while all three pieces have the same diameter bore, the muzzle itself seems to be of a slightly wider diameter although this could be due to corrosion on the other parts.



The wall thickness of the two body pieces where they would connect are consistent at 27 mm and they do match up relatively well. The wall thickness of the muzzle is slightly less but this may be because it tapers. The section of the body that would connect to the muzzle is very corroded and has lost a lot of thickness. If it was in better condition, it may be more comparable to the muzzle fragment although the direction of the break may indicate that it belongs to the same gun.

As this is thought to relate to an 18th or early 19th century wreck, research was undertaken in order to identify matching wrecks in the possible originating areas of 512 and 407 by looking at archaeological assessment reports.

Within the 407 Licence Area 1 km buffer, are the remains of the wreck of *Faith*, a British cargo vessel, located 10 miles SE of St. Catherine's Point which foundered in 1855 on her delivery voyage, en route from London to Istanbul carrying a general cargo (Wessex Archaeology 2013a).

Within the 512 Licence Area, lies a wreck, which is possibly that of the *Mascota*, formerly Torquay, built in 1890 and owned by Marina Mercante (Argentina). The vessel was captured by a German torpedo boat and destroyed on 29th March 1917 and now lies at a depth of 28 meters (Wessex Archaeology 2013b).

Within the 512 Licence Area 1 km buffer lie the possible remains of the wreck of a British cargo vessel *Abeona* which foundered after a collision in 1883. The vessel was constructed of iron and powered by steam (Wessex Archaeology 2013b).

Whilst it cannot be ruled out that the gun originated from one of these wrecks, it is likely that the gun would have originated from an earlier vessel, and with a lack of documentation to show what these vessels carried in terms of armament, it cannot be confirmed. The fragment may also have been carried from another location via fishing nets or it may originate from an unknown wreck in the area that is previously unknown. Staff should be vigilant for other finds from the same areas.

#### References

Wessex Archaeology 2013a *Area 407 Marine Aggregate Extraction Archaeological Assessment* Reference 87680.02

Wessex Archaeology 2013b *Area 407 Areas 511/512/513: Technical Report & Impact Assessment Offshore Desk-Based Archaeological Assessment* Reference 86240.04

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 020/22)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Suffolk and the Isle of Wight

## Brett\_1032: Aircraft Parts



These aircraft components were discovered in aggregate from Licence Area 340 in the South Coast dredging region, approximately 8.5 km south-east of the Isle of Wight. Conrad Stuckey discovered them at Newhaven Wharf.

These various aircraft parts including an engine fragment were discovered in the same cargo, alerting the wharf staff that they may have come across aircraft wreckage.

Images were sent to external specialist Steve Vizard who said that as far as he can tell, these parts are from a BMW 801. This particular engine was fitted to three types of aircraft that operated over the UK. This being the Focke-Wulf 190 fighter (although not particularly common over here), the Dornier 217 bomber and the Junkers 88.

The Focke-Wulf Fw 190 is a German single-seat, single-engine fighter aircraft designed in the late 1930s and widely used during the Second World War. Along with its well-known counterpart, the Messerschmitt Bf 109, the Fw 190 became the backbone of the Jagdwaffe (Fighter Force) of the Luftwaffe. The twin-row BMW 801 radial engine that powered most operational versions enabled the Fw 190 to lift larger loads than the Bf 109, allowing its use as a day fighter, fighter-bomber, ground-attack aircraft and to a lesser degree, night fighter.

The Dornier Do 217 represented the refinement of German twin-engined bomber design, a progression from the earlier Do 17. From 1941, the Do 217 became the mainstay of the Luftwaffe's bomber arm in the West, equipping four Gruppen for operations over Britain. It carried out day and night attacks on British shipping, coastal targets, towns and industrial centres, both in formation and in lone attacks known to the German crews as 'Pirate' operations.

The Junkers Ju 88 is a German Second World War Luftwaffe twin-engined multirole combat aircraft. Junkers Aircraft and Motor Works (JFM) designed the plane in the mid-1930s as a so-called Schnellbomber ("fast bomber") that would be too fast for fighters of its era to intercept. Despite a protracted development, it became one of the Luftwaffe's most important aircraft. The assembly line ran constantly from 1936 to 1945 and more than 15,000 Ju 88s were built in dozens of variants.

It is presumed that these parts wouldn't be too far away from the wreck site, however, sometimes aircraft break up on entry to the water and scatter over a wide area. Additionally, depending on the amount of fishing and trawling that has taken place over the last 75 years, then the parts could be distributed over a large area. Also, there is the possibility of parts being dumped by fishing vessels, for instance fishermen may jettison such parts found in their nets in an area where they don't fish, just to get rid of them, and so they won't be netted again. Staff at the wharf have been told to be vigilant for any other aircraft material dredged from this licence area.

Further research was done on Area 340. It was found that there is an exclusion zone in place for an aircraft wreck, however that is for a Piper aircraft that lost power in both engines and ditched at sea on 29 July 1975 (UKHO 19021) and therefore not related to these finds (Wessex Archaeology 2013).

An aircraft crash site location report revealed that there are no recorded losses in the immediate area (Wessex Archaeology 2008). The closest record of German aircraft wreckage is a 1944 wreck of a German Junkers Ju188 which was shot down and crashed off Sandown 6 km north-west of where these finds were discovered. The aircraft was part of Squadron 5/KG2.

The Ju 188 was designed to be fitted with either the 1,750 PS (1,290 kW; 1,730 hp) Jumo 213A or 1,700 PS (1,250 kW; 1,680 hp) BMW 801 G-2 engines without any changes to the airframe, with the exclusion of the re-design for Jumo-powered examples.

It cannot be confirmed whether these finds are related to this site.

#### References

Wessex Archaeology 2008 *Aircraft Crash Sites at Sea A Scoping Study Archaeological Desk-based Assessment* Reference 66641.02

Wessex Archaeology 2013 *Area 340 Marine Aggregate Extraction Archaeological Assessment of 2012 Geophysical Data Archaeological Baseline Report* Reference 87900.05

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The MOD
- The Receiver of Wreck (142/22)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Isle of Wight



## Hanson\_1034: Two Munititions

These munititions were discovered in Licence Area 401/2 in the East Coast dredging region or in Licence Area 461 in the East English Channel dredging region. Stuart King discovered them at Greenhithe Wharf.

Both munititions measure approximately 400 mm in length and 80 mm in diameter and marks on the driving bands indicate that both were fired. One still had the brass nose cap in place while the other did not. Both items were taken away by the EOD and were not exploded on site.

Images of the munition base was sent to Trevor Parker, from the Ordnance Society, and Mark Khan, UXO Research Manager at Fellows International. Mark Khan stated that the measurement of 80 mm equates roughly to 3" which was a common calibre/mounting on British warships. The projectile in image 2 has grooves indicating it was fixed round – i.e., the groove is where a cartridge case was crimped on to the projectile.

Trevor Parker said the object in image 2 is the most difficult to identify, as the nose has no markings visible, though it is either a practice shell with a flat nose plug, or a 'live' explosive shell (smoke, HE, illuminating) where the nose fuze has either been broken off or cut off. There is no way to determine which and it may even be something completely different.

The munition in image 1 is also not easy to identify. It is a fired shell from a 'fixed' round, and not a 'separate-loading' shell. Further images of the nose or base would be required to make a more specific identification.

The approximate diameter of 80 mm is one that covers a wide range of calibre guns, both British and European, making identification difficult.

A number of fired munititions have been found in the past in Licence Area 401/2 and staff should be vigilant for any other finds.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 093/22)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for East Sussex and Norfolk

## DEME\_1039: Bone



This animal bone was discovered in Licence Area 478 in the East English Channel dredging region, approximately 12 km south-east of Great Yarmouth. Gerard Kegel discovered it at DBM Wharf in Vlissingen, Netherlands.

This animal bone measures 300 mm long and 70 mm wide and has no signs of butchery.

Images of the piece were sent to Wessex Archaeology's animal bone specialist, Lorrain Higbee, who said that it is definitely the right radius of a bovine i.e., cattle. The radius is one of the two bones that make up the forearm alongside the ulna.

In mammals each epiphysis (the end of long bones) is initially separate to the diaphysis (main shaft section of the bone). As an animal matures these parts of bone will fuse together, with each epiphysis having its own predetermined age of fusion. The timing of this fusion is well known for humans, domestic mammals, and some wild animals (such as reindeer, deer, brown bears for example). Therefore, bones with unfused or fusing epiphyses can be used to estimate age-at-death. The distal epiphysis (the end of the bone which connects to the wrist) is unfused in this case. The epiphyseal fusion of this element in cattle is usually between 42-48 months old, therefore this indicates that the animal was still a juvenile.

The bone is largely intact indicating that it has been relatively undisturbed since it was deposited on the seabed. The remains of animal bones may end up in marine contexts having been washed from terrestrial deposits by rivers or eroded from cliffs or beaches. Alternatively, it may be the result of animals being carried on vessels to be consumed on board before the bones were discarded overboard. Beef seems to have been the staple diet of many ships but was more often than not transported in preserved form, which has been found in many shipwrecks. This includes the *Mary Rose*, in which excavations of the wreck recovered eight casks containing over 2,000 butchered cattle bones.

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 East Riding of Yorkshire



## Hanson\_1033: Cannonball

This cannonball was discovered in Licence Area 401/2 in the East Coast dredging region or in Licence Area 461 in the East English Channel dredging region. Stuart King discovered it at Greenhithe Wharf.

This cannonball is made of cast iron, has a diameter of 70 mm and it is likely to weigh around 1.4 kg. The original surface is only partially preserved.

Cannonballs, or round shot, are one of the earliest forms of projectiles fired from cannons. Round shot was made in early times from dressed stone and from iron by the late 15th century until the 19th century.

Images of the cannonball were sent to Charles Trollope, an expert in historical ordnance, who confirmed that this is a 3-pounder ball. Charles noted the large flat area from when it was cast, which indicates it will be from the second half of the 17th century and probably English. Casting technique was upgraded soon after 1700.

Cast-iron cannonballs initially appeared in Europe in the first half of the fifteenth century and are a relatively common occurrence in the waters around the UK as the country has an extensive naval history, with battles and training exercises taking place all around the coast for hundreds of years.

The way this cannonball ended on the seabed is not known. It could have been accidentally lost overboard or fired from a gun. Guns were fired not only during Naval engagements but also when arriving or leaving harbour or when saluting another vessel. The rough position of the find points to the Battle of Portland (18th to 20th February 1653), a brief naval battle between the Dutch and the English. The battle resulted in the loss of eight Dutch ships out of 70, two English warships out of 80, and the capture of 50 Dutch merchant ships. This battle was a part of the Anglo-Dutch Wars, 17th and 18th-century naval conflicts between England and the Dutch Republic. The wars stemmed from commercial rivalry and ended in the establishment of English naval might.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 096/22)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk and East Sussex



## Hanson\_1036: Cannonball and Possible Sounding Weight

These finds were discovered in Licence Area 361, approximately 24 km east of Southwold. Lance Allen discovered it on board *Arco Avon*.

This round metal object is from some form of ordnance and has a hole to the centre but not passing through the entire object. The conical object is made of stone and has an indentation on the bottom and one slightly flattened face.

Images of the finds were sent to Charles Trollope, an expert in historical ordnance, who said that the round object is the ball end of a bar shot, not a grenade. He noted the casting flat which is not at the hole as it would have been if this was a grenade. Bar shots are a type of cannon projectile formed of cannonballs, or half-balls, joined by a solid bar. He thought it appears to be a 3- to 4-pounder size and to date to the 17th century. Bar shot was used at close range to slash through the rigging and sails of an enemy ship. The weight on either end of the bar would cause it to partially rotate after it was fired out of a cannon, inflicting maximum damage on sails and rigging.

Euan McNeil of the Coastal & Marine team at Wessex Archaeology suggested the conical object looked like a sounding weight, used to measure the depth of a body of water, but missing the attachment point. The depression at the bottom is likely for tallow in order to check seabed type by examining sediment which stuck to the animal fat. Alistair Byford-Bates, also from of the Coastal & Marine team suggested it appears to be made of ironstone but as there is no oxidisation, this is unclear.

It is possible the shot was fired, causing the ball end to break off from the bar shot but this is not certain though its condition indicates that it has been undisturbed since its deposition. The sounding weight may have snapped loose during use or fallen overboard.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 095/22)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Suffolk



## Hanson\_1035: Cannonball

This cannonball was discovered in Licence Area 461 in the East English Channel dredging region, approximately 49 km south of Eastbourne. Lance Allen discovered it on board *Arco Avon*.

This object is a large cannonball measuring over 150 mm in diameter. It has suffered minor corrosion but remains intact.

Images of the cannonball were sent to Charles Trollope, an expert in historical ordnance, who said that this is a nice example of a 68-pounder shot and must be English as neither the Dutch nor French used shots this large. The state of the ball shows that this was almost certainly cast direct from the furnace. The 68-pounder shot was made for the carronade cannons, which made their first appearance with the Royal Navy in 1778. These cannons were developed in order to attack the ever more heavily armoured ships of the line and have been described by historian John Talbott as “a bulldog of a naval gun: short, squat, ugly, and extremely effective at close range.” (Talbot 2013).

HMS *Victory* carried two 68-pounder carronades at the Battle of Trafalgar in 1805. At a five-yard range, a single shot fired by the *Victory* tore through the stern of the French flagship *Bucentaure*. Within a split second, the shot would travel the entire length of the Frenchman’s gun decks shredding everything in their path, killing or wounding half of the *Bucentaure*’s 800 crew. Fittingly, the nickname for one of the two carronades that fired the devastating volley was “the Smasher.”

Cannonballs are a common find due to the long and extensive history of the United Kingdom. It is not possible to say whether it was fired during training, battle or perhaps just lost overboard

### References

Talbott, J. E. (2013). *The Pen and Ink Sailor: Charles Middleton and the King's Navy, 1778-1813*. London: Routledge.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 094/02)
- The Historic England’s National Marine Heritage Record
- The Historic Environment Record for East Sussex



## Hanson\_1043: Cannonballs

These cannonballs were discovered in Licence Area 401/2 in the East Coast region approximately 23 km east of Lowestoft. They were discovered at Greenhithe wharf.

These three metal cannonballs were reported together. No measurements were given besides the ruler for scale in the image. The shot on the left is slightly smaller than the other two shots on the right.

Charles Trollope, an expert in historical ordnance, was sent the image of the finds to identify. He decided that all three are 12-pounder shots. However, the differing size indicates that these cannonballs are of different nationalities. The smaller shot was identified as English, whilst the other two larger shots were too big to be English so must be Dutch or French.

The 12-pounder cannons that would fire these types of shots were used on land and at sea. Unlike their land-based cousins, such weapons were considered light by naval standards. They formed the main armament of smaller frigates and were used on the upper decks of larger vessels, where their relatively lighter weight would not be a problem.

Based on the find location these finds could be possibly linked to the Battle of Lowestoft. This naval battle took place on 3 June 1665, during the Second Anglo-Dutch War. This war was a series of conflicts between the English and Dutch Republic, partly for control over the seas and trade routes, where England tried to end the Dutch domination of world trade during a period of intense European commercial and political rivalry. The battle of Lowestoft featured a fleet of more than a hundred ships of the United Provinces commanded by Lieutenant-Admiral Jacob van Wassenaer. Lord Obdam attacked an English fleet of equal size commanded by James, Duke of York forty miles east of the port of Lowestoft in Suffolk. The battle resulted in only one English warship being captured in comparison to the three Dutch warships sunk, five destroyed, and nine captured. This was a substantial English victory, however despite losses the bulk of the Dutch fleet escaped the battle, depriving England of the chance of ending the war quickly with a single decisive victory. After initial early English successes, the war ultimately ended in a Dutch victory.



Other objects related to the Anglo-Dutch Wars have been reported through the Protocol, including other examples of cannonballs. For example, Charles also identified Hanson\_1033 as a smaller 3-pounder ball which, based on the casting technique and rough position of the find, was linked to the Battle of Portland. This naval conflict took place in 1653 and was a part of the first Anglo-Dutch wars. Although this war ended in English victory, the ongoing tensions between the English would lead to several more wars between these two nations in the following decades.

Cannonballs are a common find around the coast of England as, with an extensive naval history, military training and battles have taken place along this stretch of coastline for hundreds of years. It is not possible to say whether it was fired during training, battle or perhaps just lost overboard but finds like these with differing counties of origin may indicate sites of conflict.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 167/22)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk



## Hanson\_1047: Munition

This munition was discovered in Licence Area 461 in the East English Channel dredging region, approximately 49 km south of Eastbourne. Tom Shenton discovered it at Frindsbury Wharf.

This UXO was reported by the staff to the EOD to be blown up. Afterwards, the safe shell was returned to the wharf with a new split. Staff reported the shell as containing a parachute in the backend and some marking on the exterior. From this they identified the find as a 4-inch star shell.

Images of the find were sent to ordnance specialists Trevor Parker and Mark Khan. Both agreed with wharf staff's identification of the find as a star shell. Trevor wasn't sure about the calibre though, as it might be a slightly more recent example of a 4.5-inch star shell rather than a 4-inch.

Not all artillery shells are designed to be destructive, and could be designed to carry objects, create smoke screens, or in this case offer illumination. The star shell carries a very bright flare that is attached to a parachute. At the peak of its arc of flight a small charge 'kicks' the flare out of the shell, which slowly descends whilst lighting up an area beneath and around it. Typically, the flares would burn for about 60 seconds. This could be used to illuminate a battlefield or as a means of passing signals between groups. These flares were sometimes multi-coloured with different colours serving to pass along a pre-given signal and were sometimes sent up without parachutes.

These flares were used at sea, although radar has mainly replaced them. This find may originate from a wreck or may have been lost overboard.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 210/22)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for East Sussex



## Tarmac\_1037: Porthole Frame

This porthole frame was discovered in Licence Area 351 in the South Coast dredging region, approximately 12 km south-east of the Isle of Wight. Chris Margetts discovered it at the Isle of White Aggregates wharf.

This metal object was correctly described by wharf staff as part of a brass porthole frame. It is approximately 500 mm long.

Portholes have been used for centuries to allow light and ventilation to enter the lower levels of vessels that would have been notoriously dark and damp and in some cases, as a means of seeing out of a submersible.

Portholes are generally crafted from glass secured within a metal frame that is then bolted to the vessel and are watertight. In addition, many portholes also have metal storm covers that can be securely fastened against the window when necessary. The popular metals that are used to create the frame of the portholes are bronze, brass, steel, iron, or aluminium. Bronze and brass are most commonly used, as they are favoured for their resistance to saltwater corrosion.

Portholes range in size with diameters from several inches to more than two feet and can weight several pounds to over 100 pounds. Much of the porthole's weight comes from its glass which, on ships, can be as much as two inches thick. The simple round design, heavy-duty material and rugged construction of the porthole allows it to achieve its different purposes, withstanding the pressure of storm waves crashing against it without sacrificing the integrity of the ship's hull.

This frame fragment may have come from a wreck site, may have been carried by fishing nets, may have been salvaged, or may have been discarded as scrap. As it is an isolated find, we cannot be sure.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 116/22)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for the Isle of Wight



## Brett\_1045: Bar Shot

This bar shot was discovered in Licence Area 351 in the South Coast dredging region, approximately 12 km south-east of the Isle of Wight. Lloyd Weedon discovered it at Newhaven wharf.

This metal shot has a hole drilled into it. The cannonball measured approximately 120 mm in diameter and no weight was given.

Charles Trollope, an expert in historical ordnance, was sent the images of the find. Based on the measurement of the find, Charles identified that this find was intended for a 24-pounder gun and is one end of a bar shot.

A bar shot is a type of cannon projectile which consists of two sub-calibre balls connected by a wrought iron bar. Bar shots were used at close range in naval warfare to shoot masts, cut the shrouds and any other rigging in order to immobilize a target ship. The weight on either end of the bar would cause the whole thing to partially rotate after it was fired out of a cannon, inflicting maximum damage on sails and rigging. Such attacks could prove devastating. However, the military usefulness of bar shots died out as wooden sail-powered ships were replaced with armoured steam ships which did not rely on sails and masts for propulsion. Without these elements, the bar shot had nothing to serve as proper targets.

Bar shot can be constructed in a variety of ways, but four distinct types have been recovered from the wreck of *Queen Anne's Revenge*, the infamous ship of Edward Teach aka Blackbeard. This includes 35 fragmented and complete examples of bar shot with whole shots, hemi-spherical shots, and hammer shaped heads. An example of an expanding bar shot (consisting of two linked bars with hammer heads on either end), was also recovered. This shot would be loaded collapsed into a cannon but spread out to almost three feet when fired. Attacks using these shots could prove devastating, especially at sea, when a successful volley could force sailors to choose between starving whilst stranded at sea or surrendering to the pirate crew. <https://www.garonline.org/conservation/artifacts/arms-and-armament/bar-shot>

Shots like these are relatively common finds due to the long and extensive naval history of the United Kingdom. Over the last hundred years, countless naval activities and conflicts have taken place along the coast. Observing the state of the shot helps



in identifying whether or not it was fired. Bar shots will usually break on impact, and it is unusual to find complete fired shots without damage. As this shot is broken it could be an indication that it was used, however we cannot be absolutely certain that this find was fired during battle or perhaps just lost overboard. It is unlikely that this type of weapon would be shot during training exercises unlike other cannonballs.

Numerous examples of bar shot have also been reported through the Protocol before. For example, LTM\_0578 consisted of one complete bar shot alongside two balls, similar to this find in having no bar attached but a hole where the bar would have been. The Licence Area from which these were dredged (447 in the Outer Thames Estuary) is close to the site of the Battle of Kentish Knock which took place on 28 September 1652. The Battle of Kentish Knock, named after the shoal over which it took place occurred during the first Anglo-Dutch War which lasted from 1652-1654. Records of the event attest that 'Thousands of great shot passed from one to the other', and an English source claims that three Dutch vessels were sunk. It is likely that these bar shots are a relic of that battle, giving a very specific date for their deposition at sea.

Tarmac\_0902 was identified as one half of a Dutch bar shot with the remains of the iron bar protruding from the ball. This find was found in License Area 460, approximately 14 km south of Hastings and was therefore linked to the Battle of Beachy Head. This battle occurred in 1690 and was fought along the coast from Beachy Head to Hastings. The Battle of Beachy Head was a naval engagement fought during the Nine Years' War between the French and a coalition of the English, Dutch Republic, Spain, Savoy and the Holy Roman Empire. The Dutch lost nine ships while their English allies also lost one. The French did not lose a single vessel and control of the English Channel temporarily fell into French hands. It is therefore highly likely that that bar shot came to be on the seabed as a direct result of naval conflict.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 234/22)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for the Isle of Wight



## Hanson\_1042: Part of Ship Anchor

This part of a ship anchor was discovered in Licence Area 461 in the East English Channel dredging region, approximately 26 km east of Great Yarmouth. Barry Gould discovered it at Frindsbury wharf.

This metal object was reported as part of a ship anchor by wharf staff. It is about 460 mm in length and was described as very heavy in the initial report.

Staff of the Coastal & Marine team at Wessex Archaeology were consulted over what this object could be. Marine archaeologist Alistair Byford-Bates and Coastal & Marine project manager Euan McNeill both agreed with wharf staff that this was highly likely to be part of a ship's anchor. Both also noted that it looked to be made out of wrought iron. Before the developments of modern steel making, wrought iron was the most commonly used form of malleable iron. This means that unlike cast iron, wrought iron is not as brittle. Wrought iron has a lower carbon content, which makes it harder and stronger, yet easier to weld. At its peak, wrought iron was used in the manufacturing of nearly everything, all over the world. Because mild steel is cheaper and easier to mass produce, wrought iron gradually disappeared, until the last ironworks ceased production in the 1970s. For the most part, wrought iron anchors stopped being produced around the mid-1800s in favour of cast iron and steel, so if this is part of an anchor this may help us date it. Furthermore, Euan noted the lack of flutes (the wide pointed ends at the end of the arms of an anchor that grip the seabed when mooring) which may further aid in dating this anchor.

Alternatively, Alistair added that if it isn't from an anchor, it may be part of a pickaxe. An example of a wrought iron pickaxe has been reported through the protocol recently; DEME\_1022 was found in License area 478, not very far from license area 461.

As we cannot be fully sure what this object is there are many different reasons for how it could have become part of the archaeological record. Pickaxes are not commonly used on boats as they are predominantly agricultural, building or mining tools, however it may have been transported by, or lost from, a sea-going vessel. Anchors are much more common artefacts found on the seafloor. There are a number of reasons why an anchor may end up on the seabed such as being lost during part of a shipwreck event, being fouled or lost due to broken chains or ropes. Anchors are important to record and can tell us a great deal about the history of an area, where an anchorage was located, areas of danger to ships and the location of



shipwrecks.

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 East Sussex



## CEMEX\_1048: Heating Element

This metal find was discovered in Licence Area 401/2 in the East Coast region approximately 23 km east of Lowestoft. M Pettitt and M Nichols discovered it at Shoreham wharf.

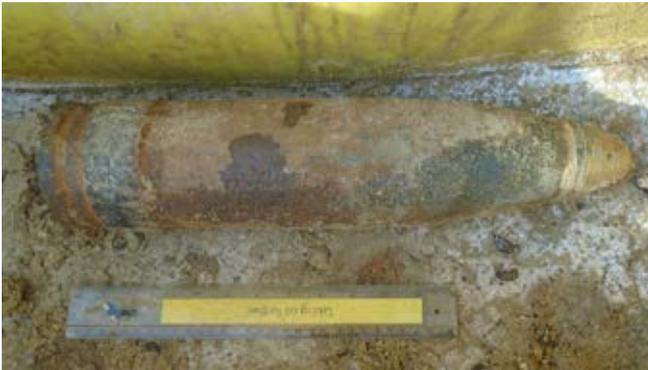
This metal object was described by staff as some type of heating element with leather wrapped around it. It measured approximately 370 mm combined.

Images of the find were sent to Anthony Mansfield, a senior naval engineer. He didn't immediately recognise the find but suggested that it may be a very old, and thus relatively big, temperature sensor. The threaded fitting at one end, the wires at the other and the insulation (which may be leather as described by wharf staff or may be compacted felt) would fit into this category. Anthony also suggested that it could be a heater with those features, however heaters usually allow a fluid to flow through and this find doesn't seem to allow that. From the general construction Anthony suggested that it was manufactured during the 1950s. Although he couldn't be certain whether this element came from land, air, or sea he noted that marine is probably the most likely origin for this find. He described this as a nice find and certainly something to puzzle over!

As we cannot be completely sure where this find originated from, we cannot say for sure how it arrived in the archaeological record. The find may have been damaged and purposely discarded overboard during everyday shipping operations or accidentally lost overboard. It may alternatively be indicative of terrestrial debris dumped off shore or have been lost from a wreck site.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 225/22)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk



## Hanson\_1044: Munition

This munition was discovered in Licence Area 401/2 in the East Coast region approximately 23 km east of Lowestoft. Stuart King discovered it at Greenhithe Wharf. This find was disposed of by the EOD.

This large munition measures approximately 450 mm in length but the diameter is unknown. The main casing was empty, however it still had timed fuze head which was live and had a date on head of 1940. As this munition was still live, the fuzed head was blown on site by EOD.

The image of the munition was sent to specialists Trevor Parker, from the Ordnance Society, and Mark Khan, a UXO specialist. Trevor tried to gauge the diameter of the find from the rule beside the projectile in the image, and estimated it's about 3.5" to 5", however corrosion may affect this. From this, Trevor suggested that the munition could be a No. 220 which is a time fuze for the 25-pounder smoke base eject (3.45" diameter); or a 60-pounder smoke base eject (5" diameter).

Mark commented that this is almost certainly a high explosive shell fitted with a time fuze and that staff were really lucky in relation to bringing this aboard as the fuze is also designed to function on impact.

The No. 220 fuze has a domed top which is not quite confirmed by the single picture. If possible multiple images of a find can be taken, and this can significantly aid the identification process. In particular images including scales of measurements, 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 H&S guidance and only take photos and measurements if safe to do so.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 197/22)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk



## Tarmac\_1040: Unidentified Steel Plate

This unidentified find was discovered in Licence Area 351 in the South Coast dredging region, approximately 12 km south-east of the Isle of Wight. Ian Harrison, Second Mate reported its discovery on board the *City of Winchester*.

The object appears to be an unevenly cut narrow length of steel plate, with seven gas cut, or unevenly punched, holes through it. It has been folded in half with one hole appearing to have been torn out and the end truncated. The opposite end appears to have been twisted away and truncated, possibly where it was further folded over, possibly from a wider section of steel plate. A short section at the fold in the steel is also missing. All the surfaces have been subject to relatively even corrosion, with no evidence of recent fractures or damage visible.

Due to the lack of identifying marks and the crude uneven nature of the holes cut in it, this object is thought to be a discarded piece of scrap steel, with no apparent indication as to its original use or origin. It has been suggested that it was a rubbing strake or strip on a ship, or the sacrificial blade on a loading shovel, but this can only be viewed as supposition in the circumstances.

As with identifying the object, its route into the marine environment can only be based on conjecture, the most obvious being that it was discarded from the deck of a vessel once no longer required or used as a weight and lost. Less likely is that it forms part of a larger object and has been torn away at some point in the past, prior to its recovery by the *City of Winchester*.



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 the Isle of Wight and Hampshire



## DEME\_1038: Metal Object

This iron object was discovered in Licence Area 506 in the Humber dredging region, approximately 100 km north-east of Cromer. Gerard Kegel discovered it at DBM Wharf in Vlissingen, Netherlands.

This large object is made of iron or steel, has a diameter of 250 mm and weighs 50 to 60 kg.

Euan McNeil and Paolo Croce of the Wessex Archaeology Coastal & Marine team agree that based on the shape it appeared to be an iron buoy, possibly a fishing buoy. However, the heavy weight of the object suggests that it must be something else.

Euan also added that it could possibly be the end of a chain shot; a type of cannon projectile which consists of two sub-calibre balls chained together. They were used in naval warfare to shoot masts, cut the shrouds and any other rigging in order to immobilize a target ship. The military usefulness of chain shot died out as wooden sail-powered ships were replaced with armoured steam ships as they do not have sails and riggings to serve as proper targets. However, chain shots were relatively small, and therefore the size and weight of this object makes it unlikely to be chain shot.

Due to its large size and heavy weight, this object could well be some kind of weight for commercial or industrial use. However, its specific use has not been determined at this time.

There is no visible damage to the object beyond the corrosion caused from being in sea water. It is likely that the object was lost while in use, or possibly discarded overboard when it was no longer of use.

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 Norfolk



## Tarmac\_1046: Anchor

This metal anchor was discovered in Licence Area 351 in the South Coast dredging region, approximately 12 km south-east of the Isle of Wight. Lee Brackstone discovered it at Burnley Wharf, Southampton.

This find was reported by wharf staff as an old iron anchor, perhaps originating from a small dinghy. It measures approximately 550 mm in length, however it is broken in the middle of the shank.

Staff within the Coastal & Marine team at Wessex Archaeology were consulted about this find. Senior marine archaeologist Alistair Byford-Bates noted the hole for a bent stock and forelock below the ring. This and the relatively small size of the anchor led to him identifying it as possibly being from a small inshore fishing boat. He also identified the material of the anchor as wrought iron. Before the developments of modern steel making, wrought iron was the most commonly used form of malleable iron. This means that unlike cast iron, wrought iron is not as brittle. Wrought iron has a lower carbon content, which makes it harder and stronger, yet easier to weld. At its peak, wrought iron was used in the manufacturing of nearly everything, all over the world. Because mild steel is cheaper and easier to mass produce, wrought iron gradually disappeared, until the last ironworks ceased production in the 1970s. For the most part, wrought iron anchors stopped being produced around the mid-1800s in favour of cast iron and steel, so as this anchor is wrought iron this helps us date it before the 20th century.

Anchors are important symbols of the maritime world and are common artefacts found on the seafloor, and we have had several anchors reported in the Protocol. There are a number of reasons why an anchor may end up on the seabed such as being lost during a storm, being fouled, as part of a shipwreck event or lost due to broken chains or ropes. Whatever the reason they came to be there, anchors are important to record and can tell us a great deal about the history of an area, where an anchorage was located, areas of danger to ships and the location of shipwrecks.

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 the Isle of Wight



## Hanson\_1041: Wooden Object

This wooden object was discovered in Licence Area 401/2 in the East Coast region approximately 23 km east of Lowestoft. Stuart King discovered it at Greenhithe Wharf.

This round wooden object was reported by wharf staff. It is approximately 190 mm in diameter and has a hole going all the way through the object.

The image was sent to the Coastal & Marine Team at Wessex Archaeology. Senior marine archaeologist Alistair Byford-Bates suggested that this object might be a 'truck' as in a truck and parrel. Also known as parral beads, parallel beads, parrell beads, bullseyes or doughnuts these objects are elements of sailing rigging that allow rope to pass through the middle, giving line anti-chaffing properties, to allow a sail or yard to be attached to a mast and slide up and down smoothly. Alistair also suggested that it alternatively may be some form of rope protector or running block from a ship. Wooden elements of ship's rigging have been reported through the protocol many times, including pulleys, blocks and sheaves.

There may be several different reasons for this object ending up in the archaeological record, for example it may have been lost over the side of a vessel or may have originated from a wreck.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 139/22)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk



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



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