Eastleigh BSAC "What Lies Beneath" Report 2013, The 'O' Wreck

November 25

2013

Year 1, report detailing EBSAC's investigations, survey and diving at WLB Site Number 11 – 19949.

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Summary

Investigating our wreck, designated number 11 – 19949, for the 'What Lies Beneath' (WLB) project has been an interesting task that has got many members of our club interested in not only diving a wreck site but also interested in finding out about the wreck's history; in that respect the WLB project has been very successful in our opinion.

Due to the wreck's depth and relative remoteness the objective of our investigations were to assess the general nature and extent of the wreck site and establish a general overview of the site layout. To this end we have carried out a side scan SONAR and magnetometer survey of the wreck site to ascertain its general layout and dimensions, dived and filmed the wreck site and also carried out some desk based wreck research. This report details our findings and conclusions from this year's (2013) investigations; we have also produced an accompanying wreck tour video.

1.0 The Team

The Team has had several changes since the club took on this project. The original project management team was made up of Paul Wilson, Mike Jackson, Adam Southwell and James Eustace; however, due to other commitments the planning, organisation and reporting fell to Andy Hermiston assisted by Karen Brown, Alex Theoharis, Rob Alexander and Pete Scott. We have visited the wreck site three times this year, firstly in April to carry out side-scan SONAR and magnetometer surveys and then twice in July to dive the wreck. This is the final report on our investigations during 2013 on Wreck Site 11-19949 also known as the "O" Wreck (which will become clear later in the report) together with a wreck tour video.

1.1 About the Author

I learned to dive in 1996 at a local dive shop, Andark, and then joined Eastleigh BSAC in 1999 as a sports diver and have progressed through to Advanced diver with the clubs training programme. I have been the club's boat officer for the past 3 years looking after our 2 RIBs and their equipment. I enjoy researching and investigating wreck sites and hence took on this project.

1.2 About Eastleigh BSAC

Formed more than forty years ago the club has a solid membership of 50+ divers of all levels. We meet at Fleming Park leisure centre on Tuesday evenings to carry out training in the pool and hold our meetings in the bar afterwards to discuss and plan diving trips. We have a very active dive programme, most of which is done from our two RIBs on the south coast but we also regularly use charter boats and have at least two week long holidays per year; this year we had a week in Scotland diving the Sound of Mull and also a week in the Scilly Isles. We also have regular foreign dive trips to the Red Sea and beyond. The club's website

can be found at www.eastleighsubaquaclub.co.uk and has more detailed information about the club and its activities.

2.0 Research Carried Out Before Diving the Site.

2.1 Shore Based Research

The wreck site is located to the south East of the Isle of Wight, its position being indicated by the tip of the pencil in Photo 1. It lies approximately 11 miles south of Chichester Harbour entrance and just to the east of a spoil ground. General water depths surrounding the wreck site are 30 metres, with a minimum depth of about 25 metres over the wreck itself.

Photo 1 Wreck Location.

Prior to surveying and diving the site we reviewed the Admiralty UKHO data on this wreck site. It was first recorded in the UKHO data base in 1976 and an extract from the data base is reproduced in Table 1 together with the “What Lies Beneath” designated wreck identification number.

Table 1, UKHO Wreck **Site Information.**

Wreck Identification No.	Latitude	Longitude	UKHO Summary of Wreck Details
11 - 19949	50°35'.215 N	000°54'.852 W	1.12.76 WK LOCATED BY MAGNETOMETER. LIES E/W, WITH BOWS TO THE EAST. THE STERN SECTION IS THE HIGHEST PART AT ABOUT 20FT. WK IS VERY OLD AND BROKEN UP. THE IMMEDIATE STERN IS BROKEN OFF AND TIPPED UP ON END. LOCATED 8.8.76 LEAST E/S DEPTH 21.6 IN GEN DEPTH 27-30MTRS. DCS3 HT 8MTRS. LENGTH 60MTRS. ORIENTATION 110/290DEGS. WK LIES ON SMALL RIDGE. HIGHEST POINTS AMIDSHIPS & AT WESTERN END. AS AN UNKNOWN COASTER. LIES E/W ON STARBOARD SIDE, STERN 20FT ABOVE BOTTOM. AS AN UNKNOWN COASTER. LIES E/W ON STARBOARD SIDE, STERN 20FT ABOVE BOTTOM. 17.1.96 LOCATED LENGTH 40MTRS, WIDTH 10MTRS. LIES 055/235 DEGS. STANDS 7MTRS HIGH BY E/S. ROV RUN SHOWED METAL WK BROKEN UP WITH DISPERSED WRECKAGE UP TO 30MTRS E OF THE MAIN STRUCTURE. 25.10.00 DIVED ON CONFIRMED AS BEING COASTER. PLATE FOUND MARKED: 'E DONKIN - NEWCASTLE-UPON-TYNE.' COVERED IN SHINGLE. PART UPSIDE DOWN. EXAM'D 31.7.03 SWEPT CLEAR 21.6, FOUL 21.9MTRS. LEAST E/S DEPTH 22.3 IN GEN DEPTH 26MTRS. NO SCOUR. LENGTH 40MTRS, WIDTH 10MTRS. DCS3 HT 4.8MTRS. LIES 110/290 DEGS. MODERATE MAGENTIC ANOMALY. WELL BROKEN UP.

What caught my eye was the information about a plate with the inscription “Donkin – Newcastle Upon Tyne”. For some reason the mention of the name “Donkin” stuck in my mind and after several hours of head scratching it turns out that I had spent several weeks on an ancient survey vessel that had had a large brass Donkin steering pump sat behind the ships wheel. A bit of internet research found details about the E. Donkin Company who were formed in 1879 and manufactured steering gear and capstans on the north bank of the Tyne. There appears to be quite a lot of information about the equipment they manufactured including orders, accounts etc. at the Tyne and Wear Archives service.

http://www.tyneandweararchives.org.uk/DServe2/dserve.exe?dsqIni=Dserve.ini&dsqApp=Archive&dsqDb=Catalog&dsqCmd=NaviTree.tcl&dsqField=RefNo&dsqItem=DS.DON#HERE

However, although the documents are referenced, much of the information contained within those documents is not online and because of the wealth of information, it was not considered cost effective to request the museum researchers to look through the records on our behalf. However, two members of the club who travel to that part of the world on a regular basis recently incorporated a visit to the museum to view the records. They reviewed the Donkin steering gear registers and using the following criteria, length, breadth, tonnage and ships with the letter “O” in the name they found 130 entries for vessels that could have been contenders for the “O” wreck; their report and findings are located in Appendix 1. It became evident that we needed more diagnostic information from the wreck site to narrow down the search for the wrecks true identity.

The presence of the name plate indicates that the wreck site has a maximum age of 1879 and the youngest 1976, when it was located by the UKHO. However, it was noted in the UKHO records that the wreck was “very old” so it is likely to have sunk pre-World War 2. This general age is also supported by its riveted construction seen during the dive.

We also consulted the Wrecksite.EU website for any additional information and essentially got the same results as those given above.

The Dive Sussex guide by Kendall McDonald states that the wreck is of a coaster lying on her port side and is badly broken up amidships and at the bows; the stern has broken off and is tilted upright and is the highest part of the wreck. The wreck lies on a small ridge with the boilers showing 2m above the seabed and the wreck is heavily silted.

Talking to long standing members of the club, Bob Durant and Pete Attwood it became clear that they had dived the wreck in the mid 1990’s. Pete Attwood’s dive log for 9/6/1995 records the fact that they dived a wreck south east of the Nab, the shot was placed at the stern of the wreck in 27.9m, the wreck was well broken up and much of the hull buried into the seabed. At the time of their dive visibility was about 3m compared to 8 to 10m on our recent dive. The boiler was intact but sunken into the seabed; the engine was not found and was presumably under plating. However, they did recover and declare to the receiver of wreck the brass letter “O” or zero, hence in the club the wreck has been referred to as the “O” wreck. They recall searching Richard Larn's book Ship Wrecks of Hampshire and in the index there were about 5 ships that had an O in the name, which were within 5 to 10 miles of the wreck site. From its size and the configuration of the wreckage they assessed it to be considerably less than 1000 GRT and more likely 500GRT.

Photo 2, Bob Durant displaying the letter “O” recovered from the wreck site in 1995.

2.1 Side Scan SONAR and Magnetometer Survey

On Sunday the 21st April 2013 Myself, Rob Alexander and Mike Jackson set out for the wreck site aboard Meon Surveyor to carry out a side-scan SONAR and magnetometer survey of the site. The side-scan data was collected using a Dowty Widescan side SONAR, the data being recorded and processed using Chesapeake Sonarwiz software and the magnetometer data using an Aquascan AX100.

Photo 3, Meon Surveyor.

Photo 4, Colleting sidescan SONAR and magnetometer data.

Sea conditions were a little rough, degrading the SONAR images slightly but we surveyed a rectangle 1100m by 550m centred on the wreck site, collecting ten lines of side-scan data at a nominal line spacing of 50m. The survey lines were orientated 082/262^{o}, which was approximately parallel to the main direction of tidal current in this area at the time of the survey. The main survey lines were run at a sonar slant range of 100m on both the port and starboard sonar channels and two lines were run in close proximity to the wreck site at a sonar slant range of 50m. The latter two lines were run to improve the definition of structures present within the wreck site.

The wreck lays on the edge of a sedimentary boundary which trends 108/288^{o}. The boundary is marked by a low profile ridge; to the north and east of the ridge the seabed has an acoustically mottled and blotchy appearance indicative of a rocky and cobble seabed, whilst to the south and west of the ridge the sea bed has an acoustically uniform, medium intensity, return indicative of a stable sand and gravelly seabed. In the south west there is another rock ridge trending in the same direction as that at the wreck site, Figure 1.

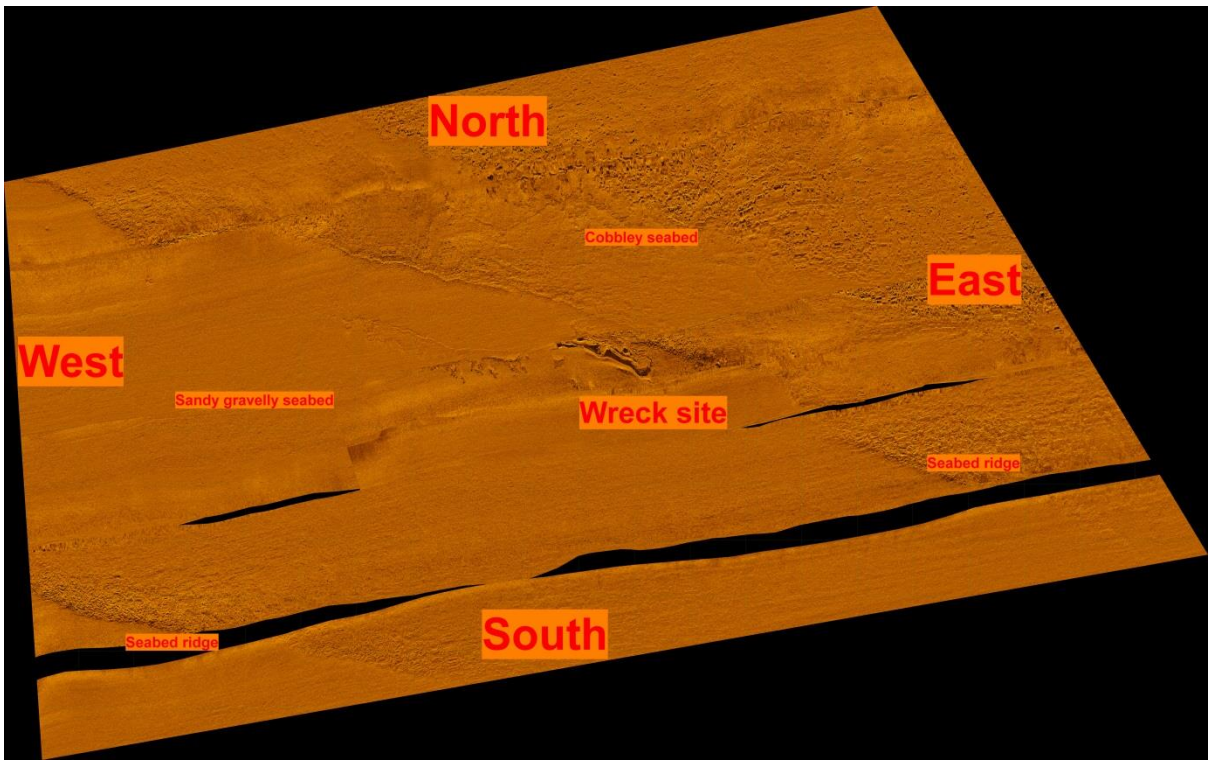


Figure 1, seabed in the vicinity of wreck site.

Superimposing the wreck site on the British Geological Survey’s Wight Offshore Solid Geology Map shows the wreck lying just to the south of a prominent geological feature (monocline) resulting in the north-east / south-west trending seabed ridges seen on the side scan SONAR records. The nature of the solid geology explains why the wreck has not sunk into the seabed.

The wreck lies in a general water depth of 31m at LWN and has a least depth of about 25m over the central section in the vicinity of the boilers. It makes a strong sonar contact and the site covers an area of approximately 60m by 13m, is orientated 110/290^{o} and is lying on a small mound in the sea bed. The wreck appears to be quite compact without an extensive debris field, although a few sand patches overlie the gravelly seabed in the lea of the wreck to the west, Figure 2.

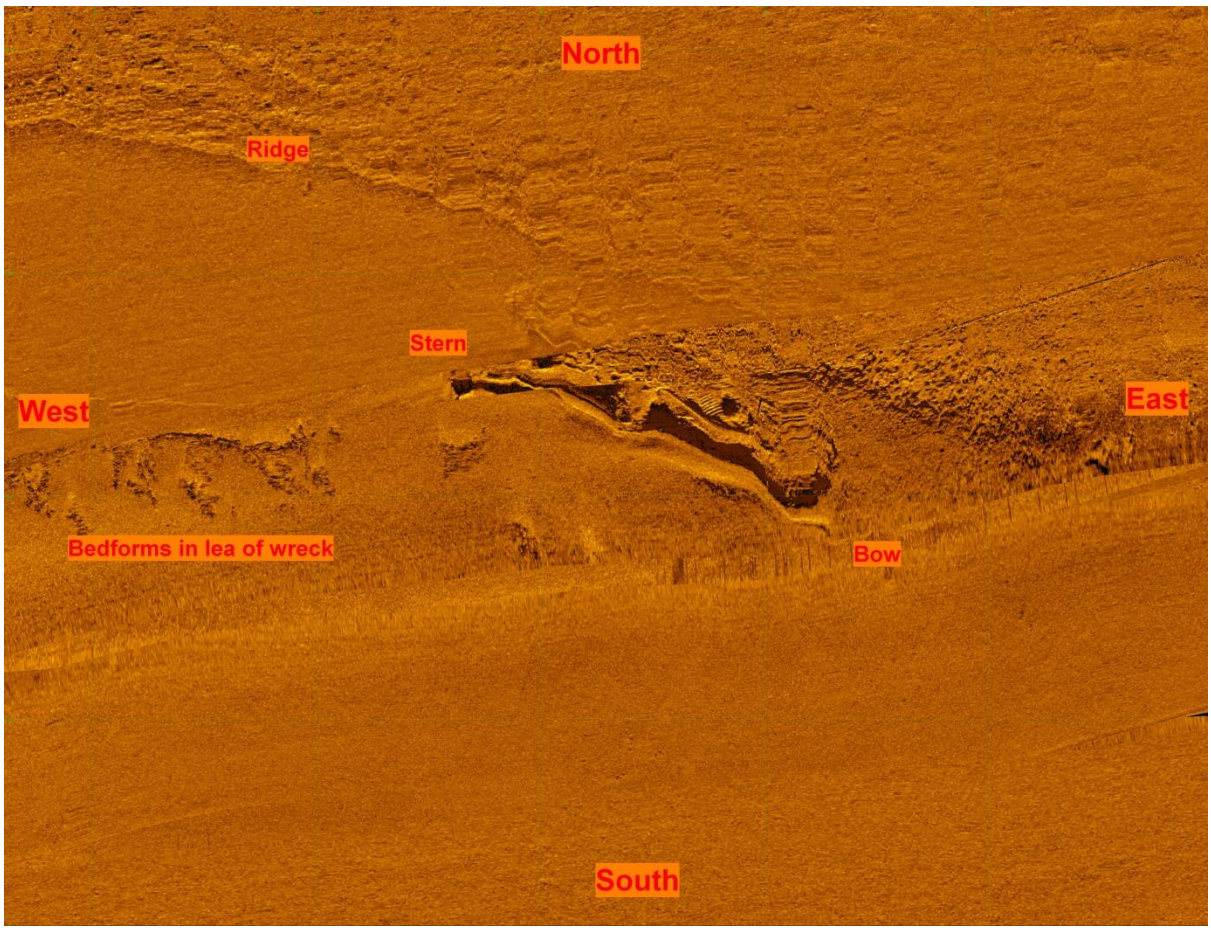


Figure 2, wreck site.

Within the wreck some internal structures can be seen, the most intriguing of these are:

- Mast or prop shaft,
- Winches.
- A collection of seven well defined linear reflectors covering an area 6m by 6m that may form part of a hatch cover, and
- The boilers which are amidships in the most intact section of the vessel.

These features can be seen in figure 3.

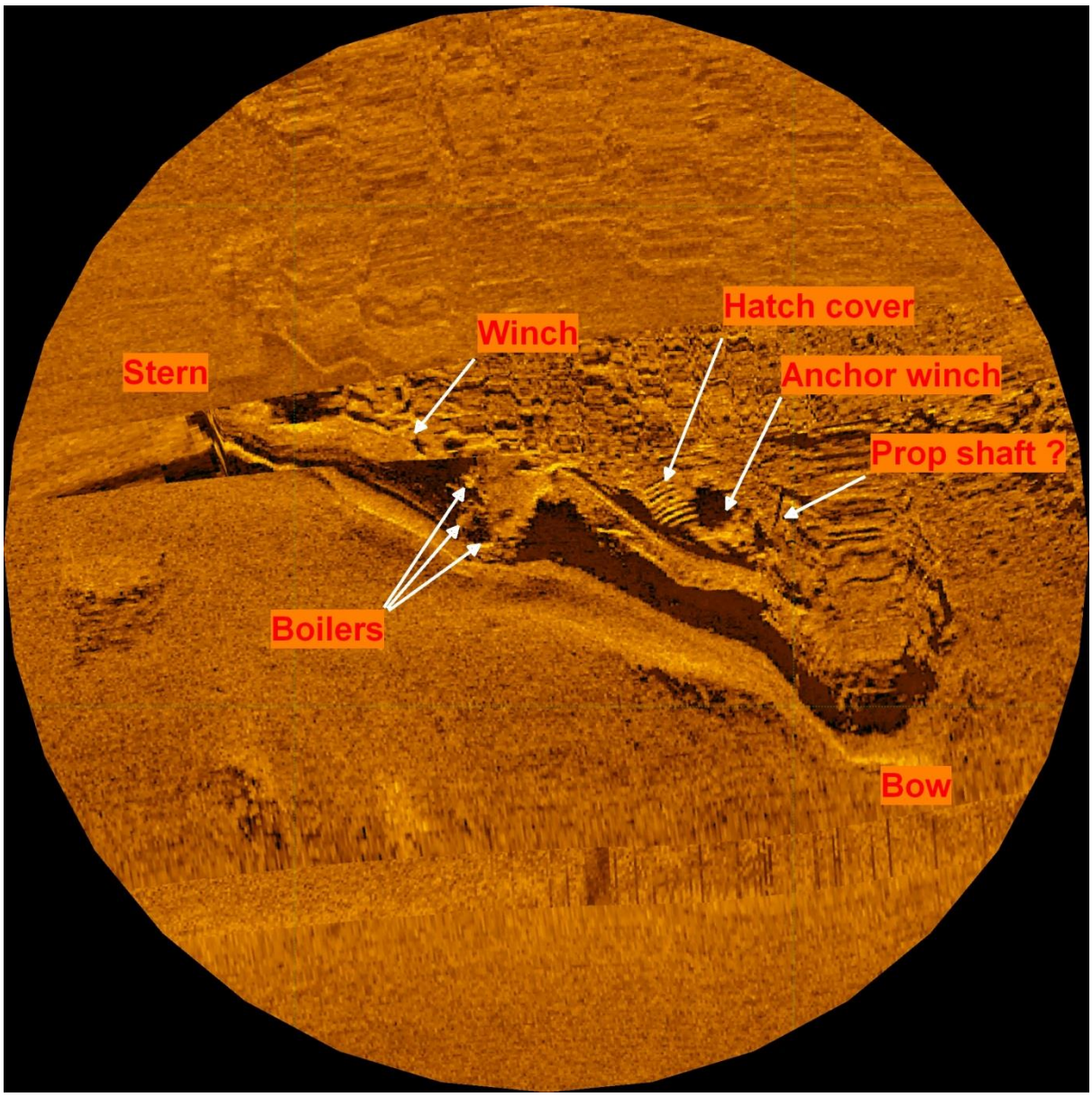


Figure 3, detailed sonar image of the wreck.

We also deployed a magnetometer over the site and a strong contact was observed coincident with the SONAR image of the wreck, further indicating the presence of an iron shipwreck.

3.0 The Logistics of Diving the 'O' Wreck

This wreck posed several challenges for our club to dive it on a regular basis, these included:

- The distance it lies offshore, the wreck is approximately 11 miles due south of Chichester harbour and 15 miles from Stokes Bay slipway, our preferred slipway as it can be used at all states of the tide, has a concrete slip, with ample parking and has shore side facilities.
- Cost, due to the distance offshore the amount of fuel the RIBs used made the cost of diving the wreck significantly greater for our team members than our regular dive sites.
- Water depth, the wreck lies on the seabed at 30m, which meant that the project was only open to sports divers, who had the necessary depth progression, and diving grades above sports, further restricting the pool of divers who were interested in this project.
- Water depth restricted the amount of bottom time the divers could spend on site and would have a significant impact upon what we could realistically hope to achieve.
- The number of opportunities to dive the wreck was very restricted due to an already very full diving program for 2013, the need to dive over a neap weekend, avoid plankton blooms, and that underwater visibility tends to be better to the east of the Isle of Wight in mid to late summer after a period favourable weather conditions.

4.0 Dive Planning

It became apparent early on in this project that we would not get many opportunities to dive the wreck site due to a combination of its relatively remote location offshore, its depth, tidal conditions and the availability of club members eligible to dive such a site. Hence, we were quite meticulous in our planning to get the maximum benefit from the dives that we did complete.

A review of Admiralty Chart 2037 shows the wreck site to be located to the south east of the main spoil dumping ground for the ports of Southampton and Portsmouth, so we were prepared for low visibility diving if required; torches, distance lines and good buddy discipline. However, when we dived the wreck the visibility was superb. The chart also shows that the wreck is just to the east of the Nab deep water approach channel for tankers and deep draft vessels entering Portsmouth or the Eastern Solent. If we had to recover divers in a hurry we implemented a diver recall system, this comprised a sealed hollow tube which when hit repeatedly in the water created a ringing sound that could be heard by the divers at a depth 30m when we tested the system. We also prepared karabiners with tags

attached to them that could be dropped down an SMB line to attract a diver’s attention; when we dived the wreck no other vessels were seen close to the dive site.

Having consulted the charts for hazards, confirming the wrecks position by remote sensing, chosen a suitable launch and recovery site for the club RIBs, and assembled a team of divers we settled on the weekend of the 20th and 21st of July. We planned two days of diving, team one would dive Saturday and locate the wreck, do an orientation dive, make observations and sketches and then brief team two on the wrecks layout so that team two could be allocated specific tasks, such as measuring the boilers, propeller etc.

5.0 The Dives

5.1 Dive 1

Unfortunately the sea conditions on Saturday were poor, with several team members succumbing to the "mal de mare" and finding the wreck by GPS and echo sounder proved too difficult under the conditions. Team 1 found a buoy close to the wreck site and with limited amount of slack water time remaining decided to dive on the buoy in the hope that it was either attached to the wreck or a string of lobster pots that would run close by the wreck. Unfortunately they dived the seabed close to the wreck, Team 1 comprised:

Team 1	
Name	**Diving Qualification**
Paul Wilson	Dive Leader NAS Part 1
Adam Southwell	Sports Diver
James Eustace	Sports Diver
Graeme Walters	Advanced Diver OWI
Andrew Jackson	PADI Rescue Diver
Lucie Mayal	PADI Rescue Diver

5.2 Dive 2

Team 2 had much better luck on Sunday, the sea conditions had calmed down considerably and with bright and sunny weather conditions a good days diving was anticipated by all. Team 2 comprised:

Team 2	
Name	**Diving Qualification**
Andy Hermiston	Advanced Diver
Rob Alexander	Advanced Diver
Pete Scott	Advanced Diver Assistant OWI
Karen Brown	Advanced Diver Assistant OWI
Jim Dalton	Sports Diver
Jacky Dalton	Boat Handler
Alex Theoharis	Sports Diver (gaining depth progression skills during this dive)
Andrew Jackson	PADI Rescue Diver

So with no wreck site orientation information to guide us Team 2's revised plan was to locate the wreck by echo sounder and magnetometer, shot the highest part of the wreck

and then carry out an orientation dive. Several team members were equipped with GoPro video cameras, which were to be switched on at the start of the dive and left on during the dive so that features could be related to each other and put in context. Other team members were to sketch their impression of the wreck site or take photos. The decision was taken at this stage not to survey the wreck in detail, i.e. a taped survey, due to the limited amount of bottom time available to us on an unknown site. Instead the objective for the day was to get an overall impression of the wreck and its general layout.

We consulted the charts and an electronic tidal atlas to predict the time of slack water, which we estimated would fall within the hours of 15:45 and 16:45 on Sunday the 21st and we noted that mid-slack was at 16:20, 5.5 hours after HW Portsmouth. We estimated that the slack water time, with currents of less than 0.3 knots, would last about 35 to 40 minutes. The relatively short and unknown duration of the slack tidal window was one of our main constraints, which we mitigated by having non-diving coxes to man the boats (Fortunately Pete was recovering from a broken leg!! and Jacky was happy to sit in the sun). This allowed the divers to spend the maximum amount of time on the wreck and not have to worry about sharing the slack and loose valuable bottom time.

The team turned up early to an empty car park at Stokes Bay to kit up and launch our two RIBs, everything was going like clockwork until about 10am when we noticed several marques being erected on the seafront and shortly afterwards the car park began to fill up. We had not factored in the local GAFIRS (Gosport & Fareham Inshore Rescue Service) fundraising day, so we had to launch the RIBs through a throng of people and various characters dressed up in Star Wars costumes milling around the slipway, we had fortunately factored in extra time to account for unforeseen events. After launching we had an uneventful trip out to the wreck site.

On arriving at the site we deployed the magnetometer and ran a search pattern around the position we had identified in April. Quickly we got a strong hit on the mag and a clear wreck profile on the echo sounder. Further investigation by echo sounder showed the least depth to be 24.8m with the surrounding seabed lying generally at 30m. Pete did an excellent job of shotting the wreck at its shallowest part, amidships and by the boilers.

Photo 5, Towing the magnetometer deployed from the Club’s RIB.

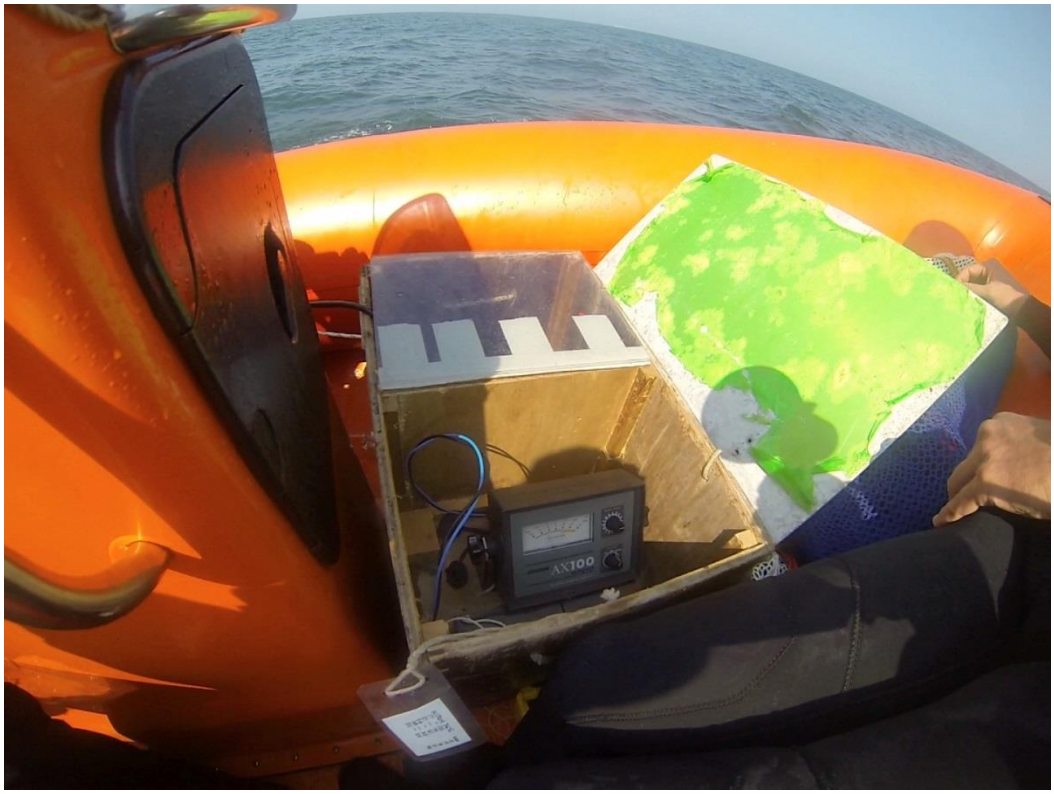
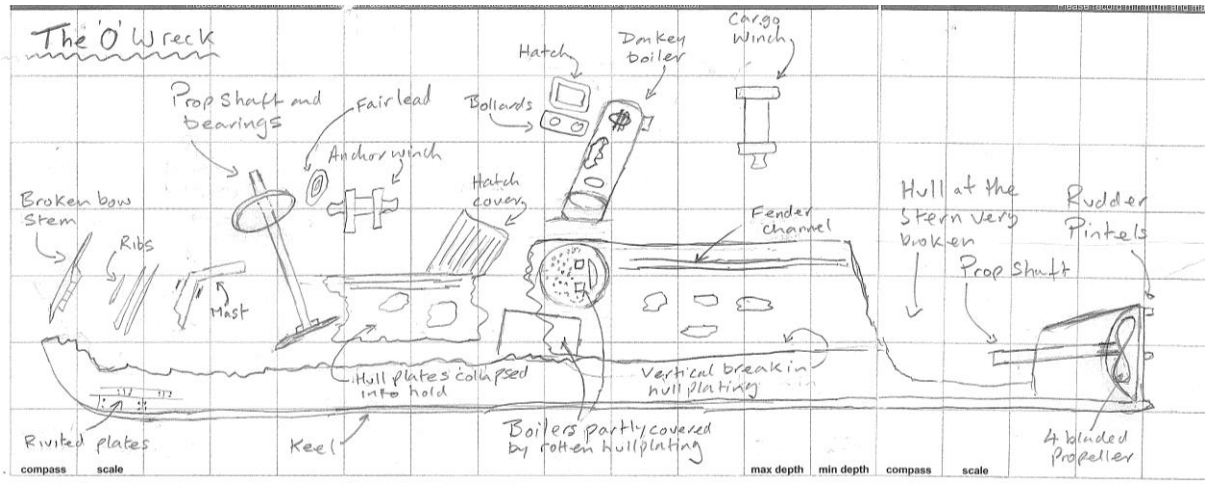


Photo 6, Magnetometer processor.

Photo 7, Wreck trace as seen on the echosounder.

The buddy pairs then dived the wreck and were able to make maximum use of the slack time filming and recording the wreck, which we have collated to create a video wreck tour. One thing that really impressed me whilst diving the wreck was seeing a particular piece of wreckage, a 6m by 6m flat hatch cover or shell plating with strengthening ribs and being able to positively identify it as an artefact seen on the side-scan images we took back in April. The side-scan images were also useful in the dive briefing and gave us indications of where to look for the location of boilers, masts and winches etc.

At the end of the days diving, relaxing with a pint in the pub we discussed our dives and drew up a wreck site plan from our collective memories, Sketch 1.



Sketch 1, Sketch of the wreck site showing the location of major components. (The sketch shows the wreck lying on its starboard side but in fact the actual wreck lies on its port side.)

To say the least it was interesting to see how narcosis had affected some of the team member’s memory when comparing their impression of the site with the photos and GoPro video footage of the wreck. From video, photos and dive information we have collected we have created a video wreck tour for this site.

6.0 Site Description

The seabed by the bows consists of sands and gravels with shells and abundant cobbles; the seabed appeared to be stable as evidenced by the extensive marine flora, bryozoans being particularly evident, Photo 8. Adjacent to the keel, sands and shell had accumulated partly burying the port side of the hull and within the wreck sands and shell were present.

The wreck is lying on its portside; the keel is intact and can be followed from the turn of the bow, at the stem post, to the stern post by the rudder stock which encloses the propeller aperture. Foreword of the boilers, the hull has collapsed and has broken away from the keel revealing the internal frames within the keel section, Photo 9. The starboard hull has fallen into the hold and forms a low lying flat area devoid of many features; it has been displaced from the keel by about 1 to 2 meters. One interesting feature on the hull plating that can be traced along most of the wreck, at the former deck level, is a “U” shaped channel that may have contained wooden fendering, Photos 10 & 11 Deck fittings are also found scattered on the seabed beyond the hull plating at what would have been deck level.

Traversing from the bows towards the stern the first main deck feature seen is a mast. It is of riveted, hollow tube construction, has been broken off at its base and has a set of belaying pins approximately 1.5 metres above the break; a line of rivets can be seen in this area. The mast has been bent into a ninety degree bend just above the belaying pins, Photo 12.

The next feature is rather intriguing, which we have interpreted as part of the prop shaft and we believe that it has been dislodged by fishing or anchoring activity. It comprises of a sizable solid shaft that passes through a circular housing in which there appears to be a bolted flange, connecting two halves of the shaft together, and can be seen below the conger eel’s tail. The shaft continues through the circular housing for some distance, approximately 2.5 to 3.5 metres, and terminates at a bearing attached to a steel plate with ragged edges, suggesting it has been ripped from a bulkhead or similar, Photos 13 & 14.

The steam anchor winch, complete with warping drums, is lying upside down in the middle of the hold. Part of the supporting sub frame can be seen behind the steam piston, Photo 15 & 16. We concluded that it was the anchor winch due to the narrow drum length between the two gear wheels and fair lead seen adjacent to the winch. It was of similar size and construction to the anchor winch present on the SV Concha (formally known as the Ore wreck) off Littlehampton; which was investigated by Wessex Archaeology as part of an ASLF funded project “Wrecks on the seabed R2, Assessment, Evaluation and Recording”.

Part of a hatch cover can be seen just aft of the winch with the hull lying over a portion of the cover (note in the video it is shown before the winch due to the sequence in which the wreck was filmed), Photo 17. The hatch cover’s strengthening frames made an excellent acoustic target for the side scan SONAR and can be clearly identified in the sonar images.

The donkey boiler is lying on the seabed on the deck side of the wreck site close to the main boilers. It is lying on its side with the ash pit and furnace door visible at its base. The inside of the boiler can be seen through a hole in the boilers casing showing the construction of the furnace. Towards the top of the boiler’s casing an inspection hatch and steam relief valve are present, Photo 18. Just aft of the Donkey boiler are a hatch and a set of mooring bits.

It is interesting to note there are two main boilers which is unusual for a ship of this size. The port boiler is in its original orientation within the ship’s structure but the starboard boiler, which would have been parallel and on top of the port one when the ship came to rest on the seabed, appears to have broken free of its mounting to fall beside the port boiler resting on its stern end. Following this the unsupported starboard hull has broken and fallen across both boilers. Over the years the hull plating has corroded away leaving gaps between the ribs allowing the boiler features to be seen. A light hearted illustration of this theory is presented in the wreck tour video. An inspection hatch and steam valve can be seen on the port boiler, whilst the starboard boiler clearly shows the fire tubes, stays, furnace and ash pit. The internal surface of the furnace is corrugated, indicating it may be a Lancashire boiler and the furnace door can be found close by, Photo 19 & 20.

The hull at this point has been partly draped over the boilers and probably obscures access to the engine, although a narrow passage was found next to the boiler leading under the hull plating, Photo 21. Minimal diver penetration took place to establish the extent of this passage but due to additional gas and equipment required for wreck penetration this exploration was left for another dive.

The hull plating at the aft end of the wreck has broken away from the keel in a similar fashion to that seen in the forward section but has been displaced vertically downward revealing the internal frames, Photo 22.

Approximately halfway between the boilers and the stern of the wreck on the deck side is a steam cargo winch that can be distinguished from the anchor winch by its longer barrel length; one of the gear wheels has been broken off.

The stern of the wreck is interesting with part of the propeller shaft protruding into the inner space of the wreck through a bulkhead and bearing, Photo 23 & 24. The other side of the bulkhead there are a series of closely spaced frames supporting the stern tube and the propeller shaft can be seen in the deep ‘V’ hull profile at the very stern of the wreck.

From outside the wreck the stern tube and brass stern gland can be clearly seen protruding through the hull profile; attached to the propeller shaft is a four bladed iron propeller but two of the blades have been partially broken off, Photo 25, 26 & 27.

On the stern post there are the remains of pintails that would have held the rudder in place. Aft of this point there was a small amount of additional wreckage scattered around which could have been the rudder but was not investigated due to time limits and decompression penalties.

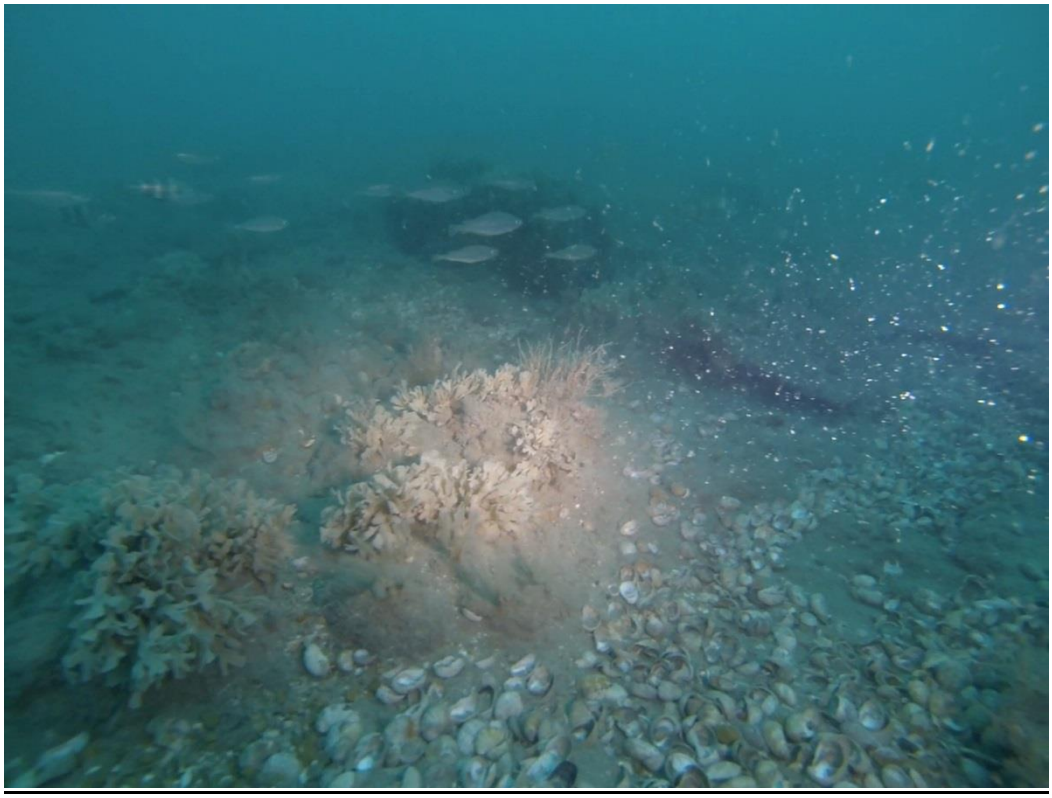


Photo 8, Seabed close to the wreck’s bow.

Photo 9, Section of keel showing internal frames, seen from ‘inside’ the wreck.

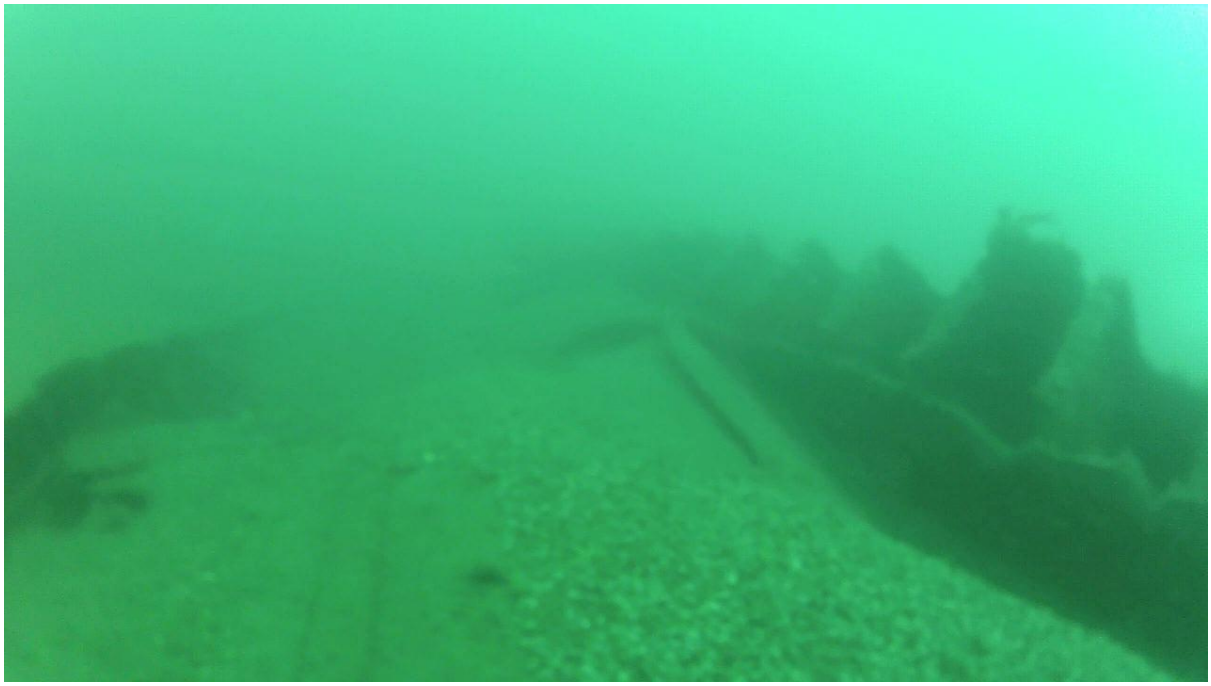


Photo 10, Shows the hull which has broken off from the keel and has been partly covered by sand and shells.

Photo 11, Hull section showing a channel appearing on the left of the photo and disappearing into the murk in the photo’s centre. It probably held wooden fendering as it was located close to the deck level.

Photo 12, Section of mast.

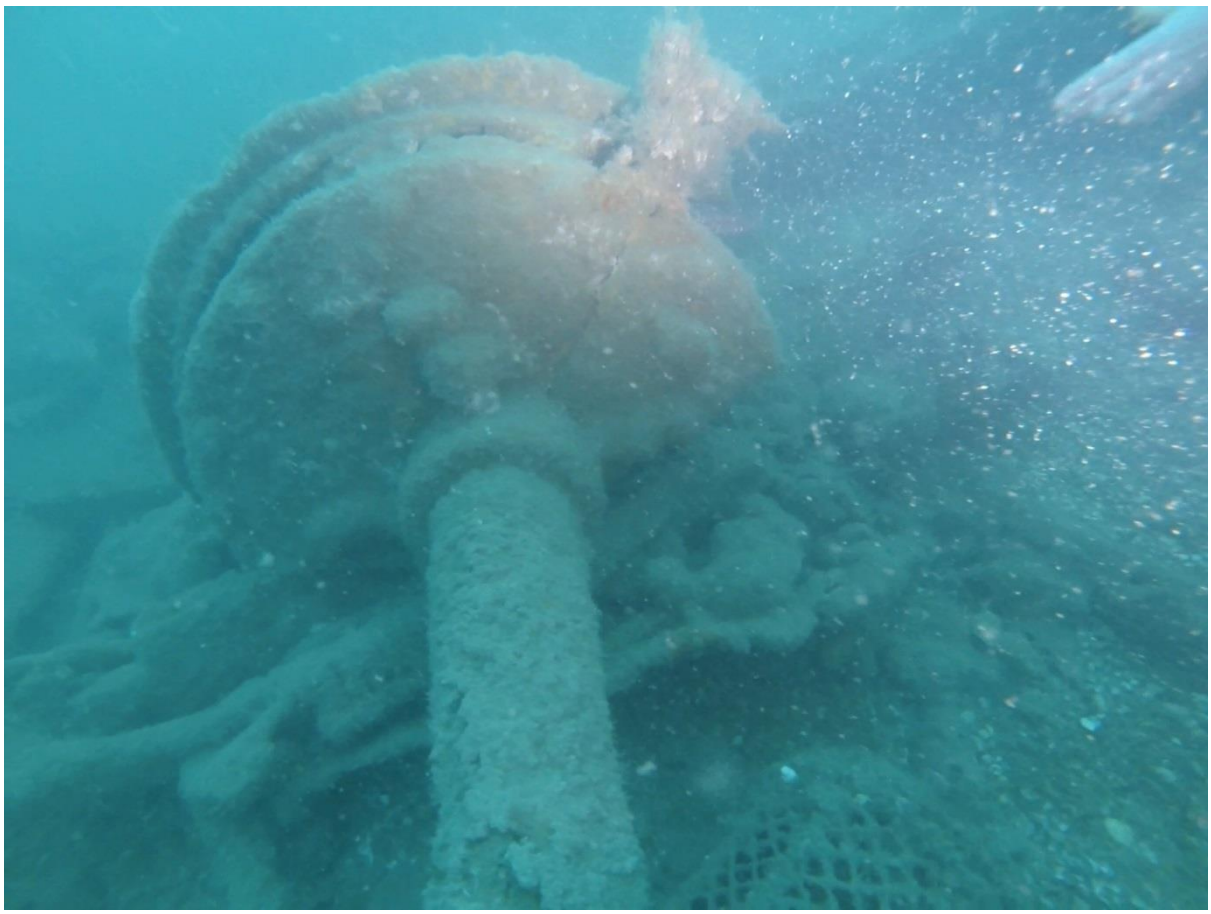


Photo 13, Displaced prop shaft and bearing assembly.

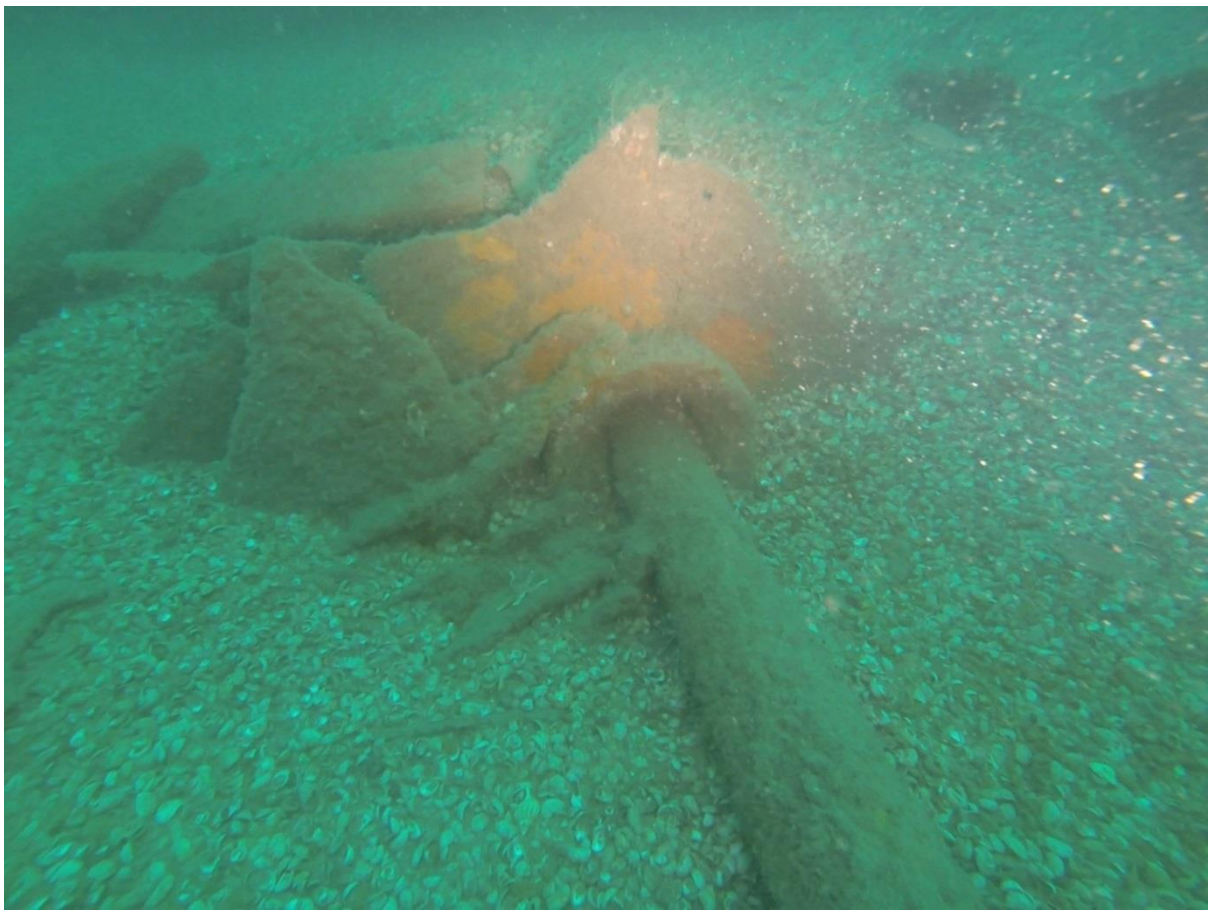


Photo 14, Opposite end of the displaced prop shaft seen in Photo 12. Note the ragged edges to the bulkhead housing a bearing.

Photo 15, Steam anchor winch lying upside down.

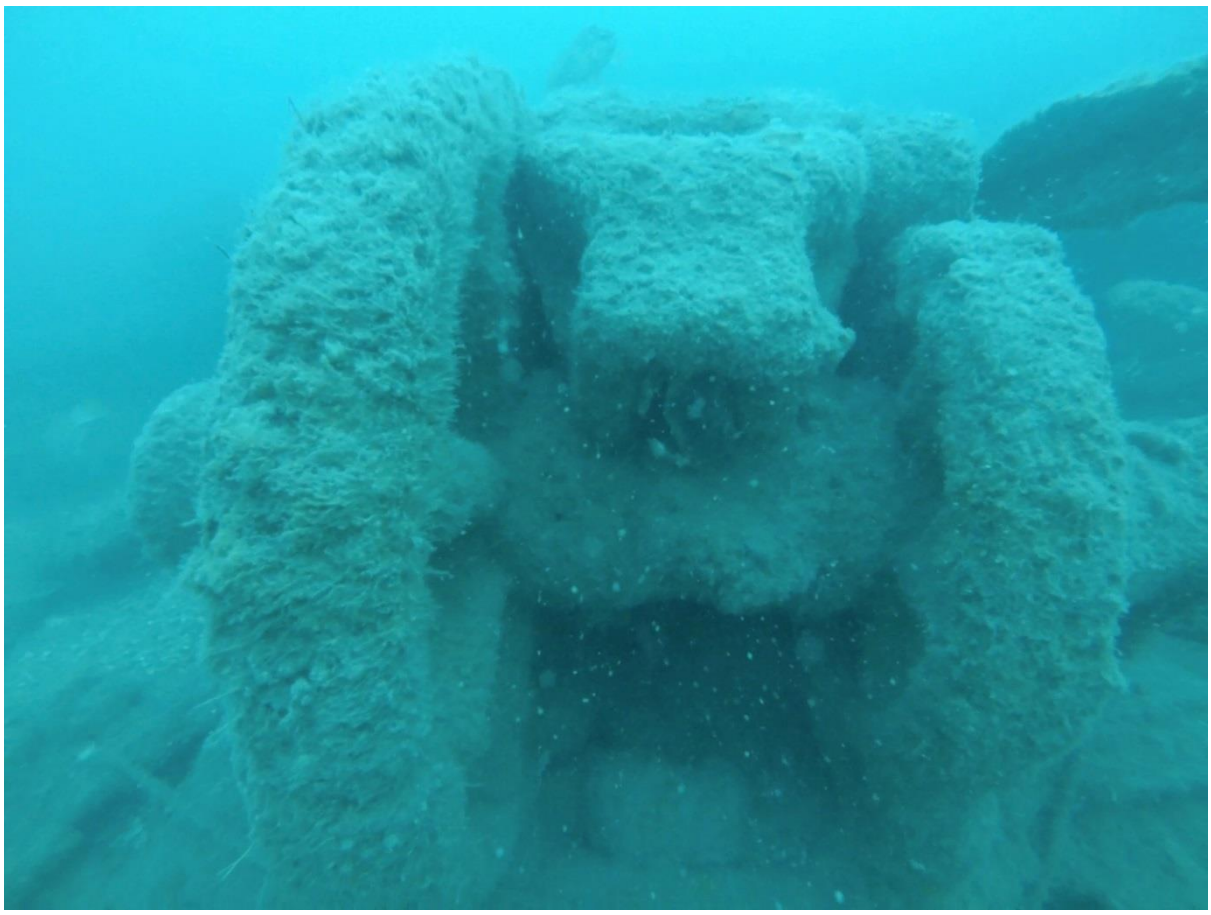


Photo 16, head on view of anchor winch and gear wheels.

Photo 17, Hatch cover seen so distinctively on the side scan SONAR records.

Photo 18, Top section of donkey boiler showing inspection hatch and steam valve.

Photo 19, Boiler lying on its aft end, with exposed fire tubes and overlain by the hull ribs.

Photo 20, Boiler showing ash pit, furnace door and fire tubes.

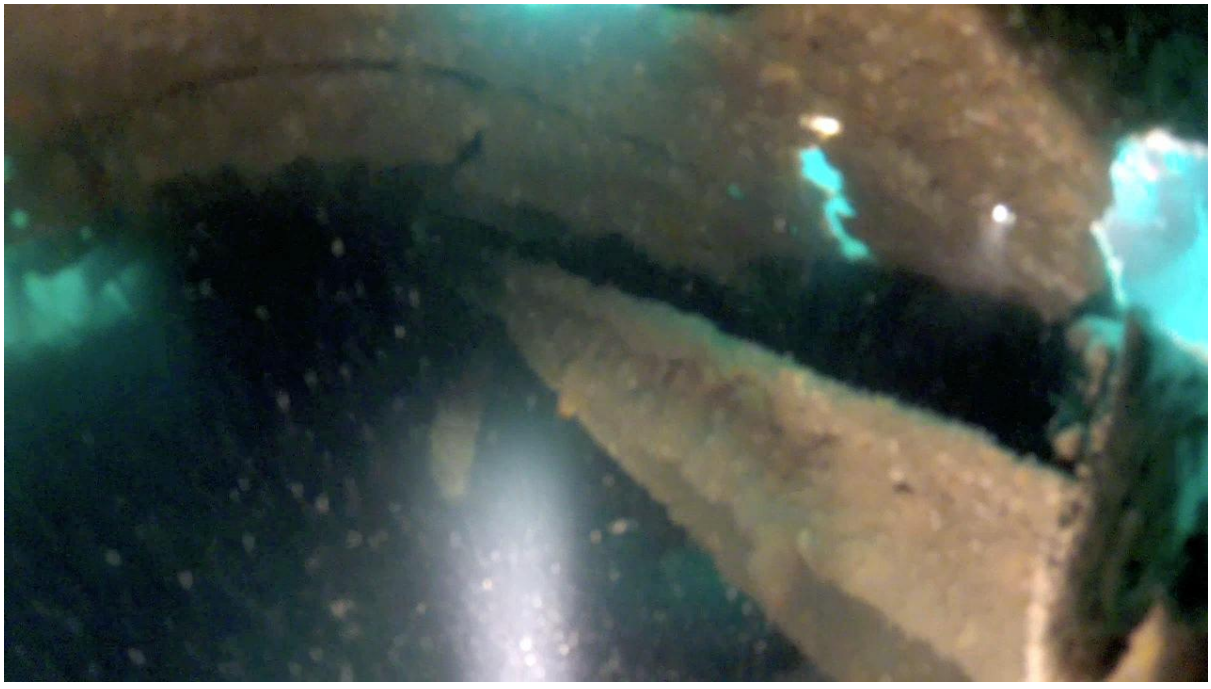


Photo 21, Tunnel under collapsed hull plating adjacent to the boilers which may give access to the engine.

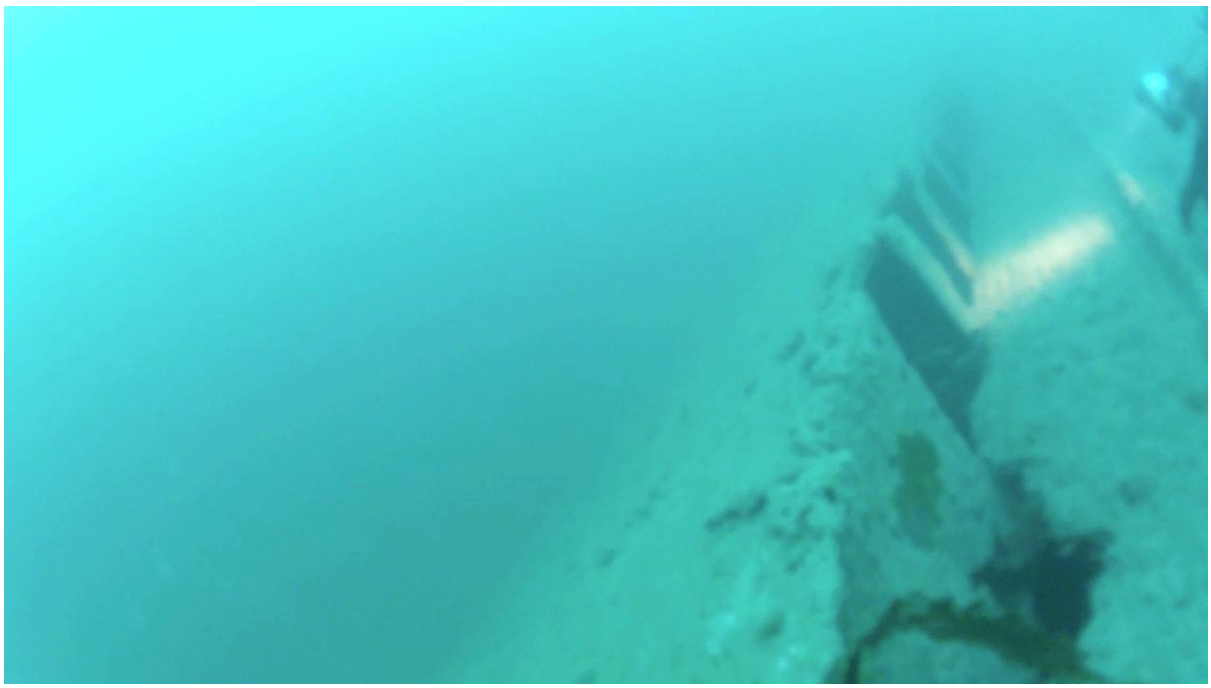


Photo 22, The hull can be seen broken away from the keel and displaced downwards at the aft end of the wreck.

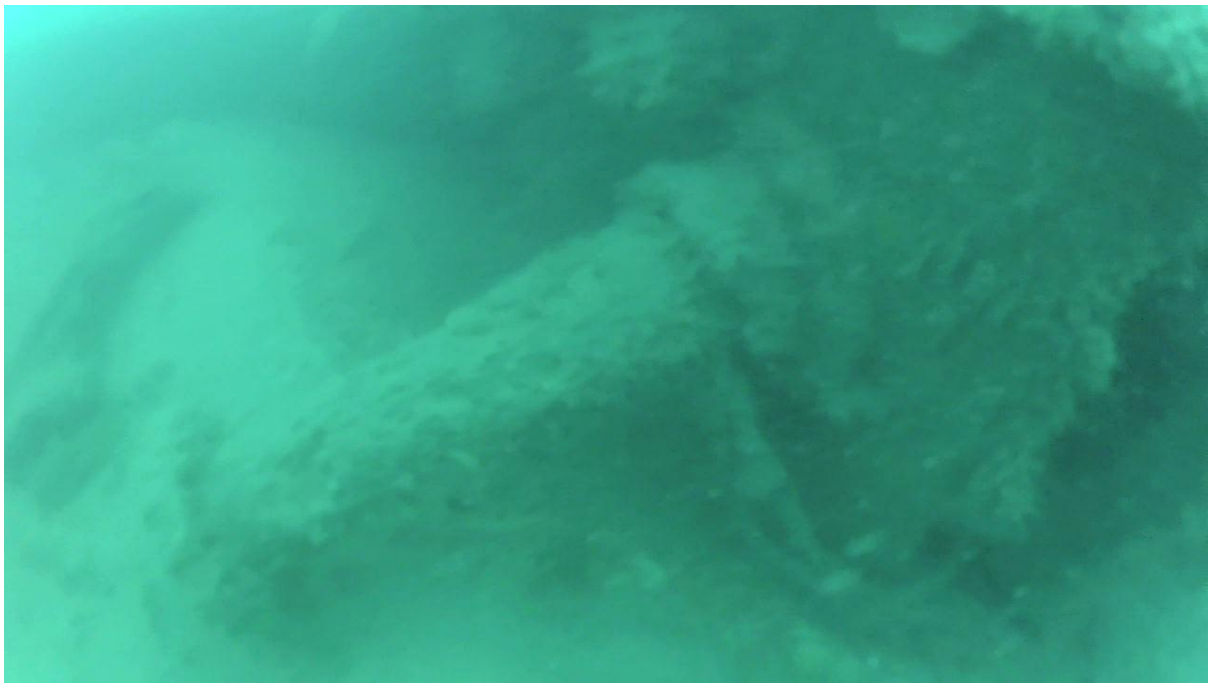


Photo 23, Prop Shaft seen passing through a bulkhead at the stern of the wreck

Photo 24, Close up of bearing seen in Photo 22.

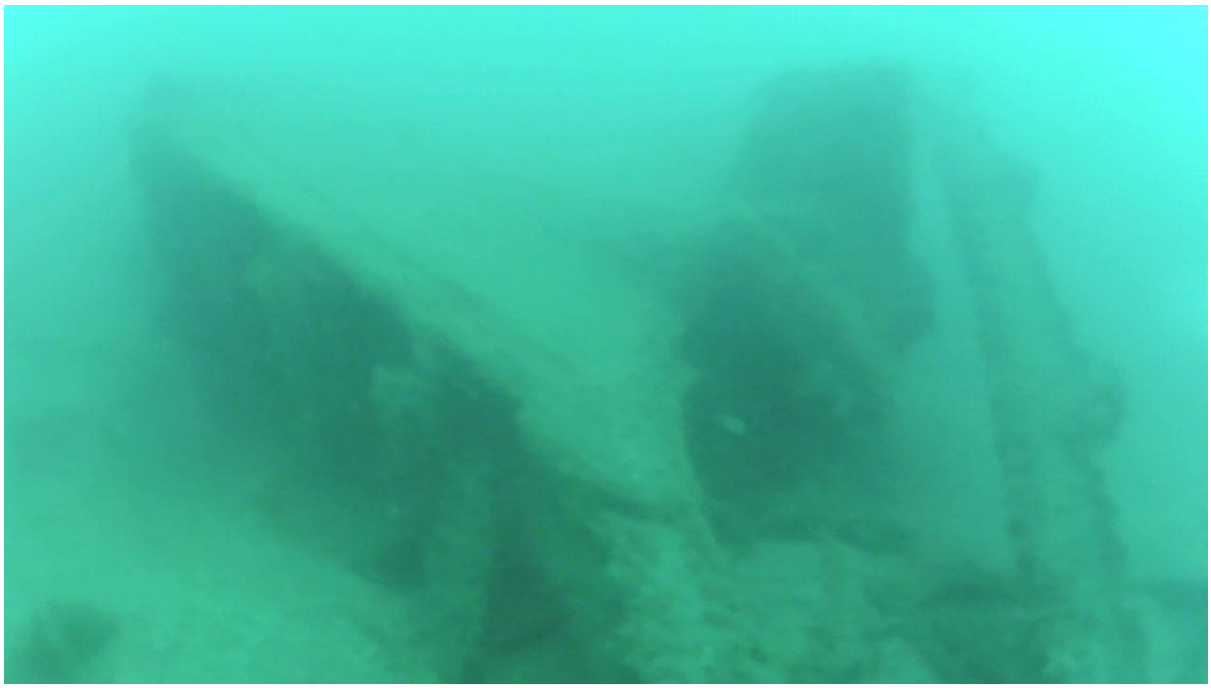


Photo 25, Shows the stern section in context, the first bulk head seen in the top left of the photo is the reverse side of the bulkhead shown in photos 22 &23. The prop shaft continues through a series of bulkheads emerging through the hull at the stern gland and is attached to a four bladed iron propeller. At least two of the blades have been broken off the other two are buried in the seabed. Behind the propeller the stern post can be seen with pintails for attaching the rudder, which we did not find.

Photo 26, Close up of pintails and rudder.

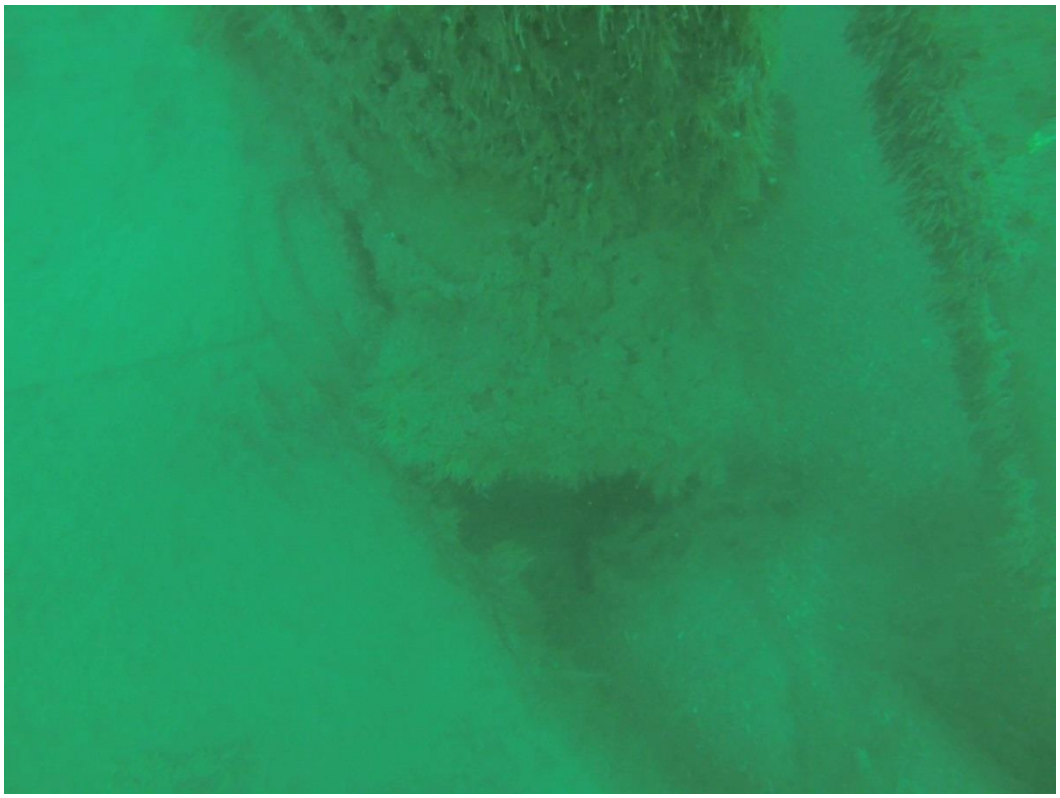


Photo 27, Close up of stern gland and broken propeller.

7.0 Conclusions

We felt the project was a worthwhile exercise in getting the club interested in surveying and researching a wreck site. Even though we only dived the actual site once we feel that we have amassed quite a lot of information on the site that we or other clubs can build upon in the future.

I’m not sure that we as a club would have the resources to carry out a full scale survey of this particular wreck site; establishing survey control points and using a co-ordinated taped survey to create a 3D visualisation of the wreck site using Site Recorder. Our reasoning is mainly due to the wreck’s depth, short tidal window for diving operations and remote location (for EBSAC).

However, we have decided to continue with this wreck project next year and our objectives are to:

- Obtain higher quality side-scan images to remotely map out the internal structure of the wreck site.
- Take measurements of the overall dimensions of the wreck.
- Take measurements of the frame spacing, boilers, prop shaft, propeller and other diagnostic features.
- Thoroughly search the bow and stern areas for any more brass letters.
- Search the winches and boilers for makers name plates and/or identification marks.
- Try and find the location of the engine, which is presumed to lie behind the boilers under the collapsed hull and superstructure.
- Look for evidence that made the vessel sink, which may help with dating the site. Any war damage would narrow down the time periods in which it sank.
- Try and locate and identify any cargo the vessel may have been carrying, which may help identify the type of vessel the wreck was.
- We have two more archive leads to follow up at Southampton Guildhall’s Maritime section of the reference library.
- Another potential source of information is from local newspapers.

In spending some time investigating this wreck we have raised a number of questions, they are:

- If we are correct in assessing the size of the vessel, why should such a small vessel have two boilers, plus a donkey boiler?
- Why has the propeller shaft ended up so close to the bow of the vessel?
- The wreck has been extensively broken up over the years, how do all the major components interrelate now? And where would they be expected to be prior to sinking?

We will need a good slice of luck to identify this vessel, but hopefully our objectives for next year will identify enough diagnostic features from the wreck site that will lead us to that goal.

We hope you enjoy our video wreck tour which can be found at www.youtube.com and search for the *The ‘O’ Wreck* by eastleighsubaquaclub.

Appendix 1

Tyne & Wear Archives Visit Report 25h October 2013

The following extract from the Admiralty UKHO data for this site is:

25.10.00 DIVED ON CONFIRMED AS BEING COASTER. PLATE FOUND MARKED: 'E DONKIN - NEWCASTLE-UPON-TYNE.'

This prompted two members of the team, Pete Scott and Karen Brown (plus Karen’s parents), to visit the Tyne & Wear Archives. The aim was to find out more about the Donkin Company and maybe a route to positively identifying the ‘O’ wreck.

The Tyne & Wear Archives are part of the Discovery Museum in Newcastle upon Tyne. Held there are various historical records from the surrounding areas of Newcastle, Gateshead, Sunderland and Tyneside. An Internet search had revealed that these records included those of the Donkin and Company Limited for the years 1879 to 1977. The Donkin records consist of:

Steering gear registers
Publicity leaflets and advertisements
Photographs
A scale drawing of electric hydraulic steering gear

Of immediate interest was the Steering gear registers as it was hoped they would contain details of each vessel for which Donkin had manufactured. Naively we hoped that we would simply read through the registers noting the few ships that matched the details we had of the ‘O’ wreck. These details included:

A steam ship
Probably small coaster
2 Main boilers 1 donkey boiler
Built before 1974 but probably before 1939
Name containing at least one letter ‘O’
Ship length between 50 – 200 feet
Weight less than 1000 GRT but probably a lot less

There are four registers available covering the years of 1879 to 1932 with a total of 6057 orders.

Register 1 Order numbers 1 – 1595 Date 10 April 1879 - 1905
Register 2 Order numbers 1596 – 3064 Date 1905 - 1913
Register 3 Order numbers 3065 - 4561 Date 1913 - 1920
Register 4 Order numbers 4562 – 6057 Date 1920 - 1932

No member of the team had ever conducted this kind of ‘hand-on’ records research and we really did not know what to expect. The rationale was that even if we did not find anything useful for this project it would present a valuable and interesting learning experience and remain a resource for future projects.

On arrival we made our requests for the registers and went for lunch while they were retrieved. We assumed that we would be provided with some microfiche and a reader but on return we were presented with the first of four original approximately A3 sized hand written and bound books.

It was fascinating though challenging to be reading the actual hand written records that were over 130 years old. The handwriting was small neat copperplate styled, and in places, very difficult to read particularly foreign company and unfamiliar place names. Unfortunately we soon discovered that our objective would prove to be too ambitious on this visit due to the limited wreck details and manpower we had.

Firstly for the first 8 years Donkin recorded only the name of the ship for which they were manufacturing steering gear. Clearly they were much more interested in recording the details of their machinery than the ship that it would be fitted. In retrospect it was not at all surprising. This meant that the only criterion of use was that the ship name contained the letter ‘O’. Unsurprisingly this proved to match nearly every ship so we decided to pass over the initial part of the register until Donkin began to record additional ship details.

When Donkin started to add ship details they were minimal and sporadic. Details at most included

Date
Ship name
Ship builder
Tonnage (unspecified type)
Length and beam

During the afternoon the four of us working in two teams made our way through register 1 and 2. During the afternoon each team covered approximately half a register. This resulted in a list of 100 candidate ships (included in the report as an appendix). Extrapolating forward, we estimate that there are approximately 500 candidate ships in total. We believe that four teams of two working for one day would be required to thoroughly cover all four registers.

In conclusion it was a very worthwhile exercise in terms of the experience gained. In order to complete the task more manpower and a full day visit would be required. This would still produce a very large list of candidate ships that could be later reduced with additional clues from the site. Preferably more details need to be gleamed from the site before another visit is planned. Details that would considerable reduce the candidate list include:

Site measured ship dimensions
Additional brass letters from the ship's name
Ship builder's name
Narrowing of ship's sinking date
Narrowing of ship's manufacturing date
Ship type that would narrow down possible tonnage range

date or year	Steamer name	Shipbuilder	Length (ft)	ton	Notes
12/10/1879	Cordova	Tyne Iron Shipbuilding co			
26/10/1879	Canton	Wigham Richardson			
10/04/1879	Lord Collingwood	Tyne Iron Shipbuilding co			Lost
27/05/1879	Lord Nelson	Tyne Iron Shipbuilding co			Lost
03/07/1897	Argosy	Pearse & co Stockton			
06/09/1879	Lord Derby	Cole Brothers Willington Quay on Tyne			
06/09/1879	Lord Geofrey	Tyne Iron Shipbuilding co			Lost
1880	Storm Queen	Swan Hunter			
03/07/1879	Morzocco ex Gleadave	Palmers J&S Co			skipped to March 1888
13/09/1889	Viceroy	Wood Skinner co		950 – 1000	
06/05/1890	Sarah Joliffe	J Redhead and Co		289	
1890	Cornhill	R Stephenson & Co Hebburn			
	Kirkheaton	Hodgson & blyth	170.6	495	
May1892	Richmond	John Stewart & Sons	157	350	
May1892	Leona	old	201	572	
March 1892	Otterbourne	James Lang	204	962	
	Skeffington	Wood Skinner & co	206	940	
	John Wilson	Bergen Mekaniske Verksted	205	805	Norway
March 1893	Holmside	Wood Skinner & co	206	842	
	Sir Robert Peel	B Craggs & Son	145	376	
	Columbia	Bergen Mekaniske	206	825	

		Verksted			
	George Seally	Bergen Mekaniske Verksted	211	851	
	Prudhoe Castle		211	813	
	Vostock	Hawthorn Leslie	210	754	
	Rose	Wood Skinner & co	200	871	
	Ballochbuie	Mills & knight	190	659	
	Hollmann	H Koch Schiffswerft Lubeck	121	250	
	Wearmouth	The Strand ?? Co	211	982	
	Gotha	?? Rostock	120	800	
	Condor	Bergen Mekaniske Verksted	185	650	
	Corea	Earls Shipbuilding	210	776	
	Porto	Howald ?? kiel	175	709	
	Colombra	H Hall & co Aberdeen	190	709	
24/05/1895	Nordsee	?? Lur	135	365	
Oct 1895	Victoria	Bergen Mekaniske Verksted	215	965	
	Rio	Bergen Mekaniske Verksted	190	720	
Jan 1896	Damerod		171	570	
Feb 1896	Barcellos	A Rodgers & co	170	398	
	Goog	Hawthorn Leslie	210	794	
	Greenwood	Mercantile Dry Dock	232	928	
	Blencowe	Old Boat (Jarrow)	165	519	
	Kronos	Sunderland Shipbuilders	190	925	
Dec 1896	Polius	Hawthorn Leslie	225	976	
	Equator		225	976	
	Tropic		225	976	
	Briton	Sunderland Shipbuilders	206	790	
July '1896	Douglas	Old Boat (Jarrow)	211	741	
Feb 1897	Saxonia	Riecke	196	245	Tug boat
	Ravensworth	Old Boat (Jarrow)	195	801	
	Stamfordham	Wood Skinner & co	210	921	
	loughbrow	old Boat	190	691	
	Salvo	J T Eltringham	120		
1898	Longbenton	Blythe shipbuilding	210	925	upto page 84 Oct 1900 Register 1
29/07/1905	Gorliat	South America ss co	110		Hamburg

	Eastwood	Palmers & Bros Co	243	942	
	Samson	Schiffswerft und	110		
	Goliath	Sir W G R W & Co ltd	155	498	
13/12/1905	Argus now Northdale	J Fullerton & co	185	704	
	Lorne or Lorue	H C Stitchen, Hamburg	73.9X 19		
	Glassack now Komet	J Duthie & Son co	183	664	
	Sasco	Sunderland Shipbuilders	190	654	
1907	Liam o Dee	Murdoch & Murray	170	516	
	Constance	W J Yarwood	110		
	Rosetta	John Duthhie sons & co ltd	124		
	Gro	Akers Tuck Verk	199	760	Denmark ?
	Knottigley now Lulonga	John Crown & Co	195	824	
	Jsbjorn	Fevigo Jesus	170	570	
	protector	J P Rennoldson & son	110	199	
	Tocantins	Murdoch & Murray	180	659	
	Imperado	Murdoch & Murray	150	402	
	Doris	John Duthie sons & co (Torry)	126	239	
	SAO Pedro	Schiffswerft und meschinenfabrick(Hamburg)	85	125	
'oct 1907	Deux Freres now Silverthorn	Wood Skinner & co	115	440	
	Alison	W J Yarwood	119		
	Titmouse	John Thornycroft & Co	75	72	
	La Flandre now Kentish Coast	Dunndee Shipbuilding Co	185	506	
	Peterborough	R Craggs & Sons	183	617	
	Muscat now Oiekast	Bergen Mekaniske Verksted	171		
	Seelotse	Schiffswerft und meschinenfabrick	102	150	
	Hampshire now Yewmont	J Crown & Sons	195	833	
	Bob	Nylands Verksted	175	678	
1908	Tromo	Nylands Verksted	175	694	

	Lady Londonderry	SP Austin Ltd	200	808	
	Loryenae and Lokmun	Cantiere navale triestino	200		
	Flostero	Nylands Verksted	175	688	
	Braeside now Falmouth Castle	J Crown & Sons	141	406	
	Foca	Camell Laird	87	94	
	hyounghla	Armstrong & Whiworth co ltd	160		
	Julie Lyn now Gusten now Kolsdal	Dundee SB & Co Ltd	175	690	
	Vettor Pisane	Stabilimento technico	130		
	Don Fedirico	Fergusen Bros	167	481	
	Gaviota	Cammell Laird & Co	87	94	
	Balleria now Sir John R Wright + Concha +Ola Cuervo	Cammell Laird & Co	87	94	Buenos Ayres
	Stewards Court	SP Austin Ltd	200	813	
	Champion	A W Robertson & Co	89	116	
	LOH ER No1 and No 2	Cox and Co	82	174	NE Railway Co
	La Loire	Earles S B and Eng Co	174	604	
	Axholme	cammell Laird & Co	125		
	Stadion	nylands Verksted	154	519	
	Haker now Gowrie	Cochrane & Sons	178	670	
	Woodmere	Blythe shipbuilding	185	680	
	Graceful now Devon coast now Devon Brook	William Harkness & sons	195	785	
	Steersman now Lowick now Darimoir	Wood Skinner & co	170	562	