

Forgotten Wrecks of the First World War



LED BY IWM

June 2018

Sultan's Fighting Top Hamble River

Site Report

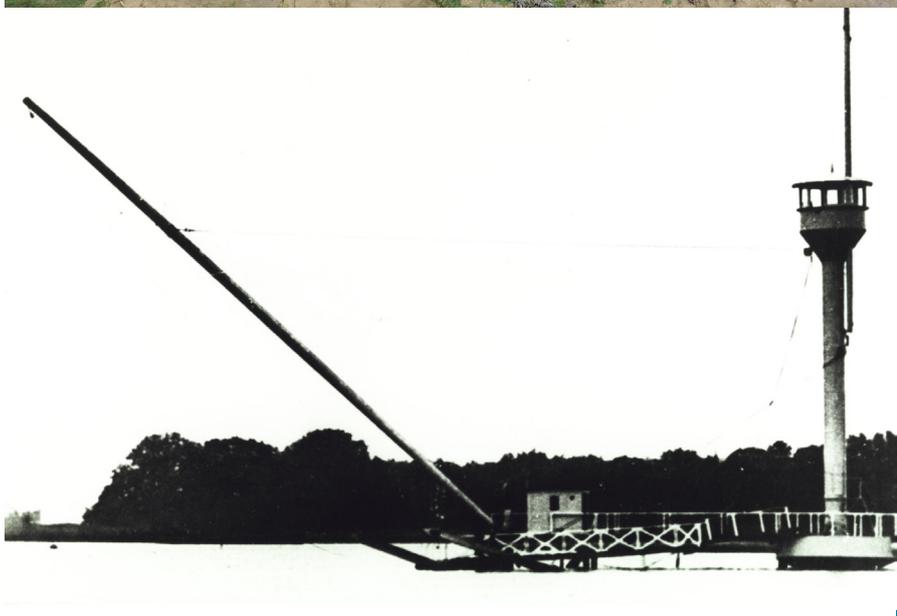


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i Acknowledgments

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ii Copyright Statement

This report has been produced by the MAT with the assistance of funding provided by the Heritage Lottery Fund through their Heritage Grants Programme. Unless otherwise stated all images are copyright of the MAT. If copyright is unknown, this is indicated in the caption.

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1 Project Background

Forgotten Wrecks of the First World War (FWFW) is a Heritage Lottery Funded project dedicated to raising the profile of a currently under-represented aspect of the First World War. While attention is often focused on the Western Front and major naval battles like Jutland, historic remains from the war lie, largely forgotten, in and around our seas, rivers and estuaries.

With over 1,000 wartime wrecks and hundreds of coastal sites along England's south coast alone, the conflict has left a rich heritage legacy and many associated stories of bravery and sacrifice. The underwater memorials represent the vestiges of a vital, yet little known, struggle that took place on a daily basis, just off our shores, while the coastal sites reflect the infrastructure to support the War at Sea and defend the country. The study and promotion of these archaeological sites presents a unique opportunity to better interpret them and improve physical and virtual access.

The project focuses on underwater and coastal sites from the Isle of Thanet in Kent, to beyond the Isles of Scilly, and over half way into the English Channel. The sites include merchant and naval ships, passenger, troop and hospital ships, U-boats, ports, wharfs, buildings and intertidal hulks. These sites, under water and on the foreshore, have been degrading and deteriorating due to natural and human processes for approximately 100 years and, as a result, are extremely fragile. In many cases, this project represents a final opportunity to record what remains on the seabed and foreshore before it is lost forever.

The project aims to characterise the nature and extent of the maritime First World War archaeological resource surviving on the south coast's seabed and around the coast. This will enable an understanding of the record of maritime activity created during the conflict and provide a window into some of the surviving sites. A representative sample of sites dating to the First World War along the south coast of England have been selected for more detailed study, analysis and interpretation.

With particular regard to coastal, rather than fully submerged archaeological remains, it has been noted in wider commentaries on England's coastal heritage (Murphy, 2014: 94) that there are relatively few surviving sites because of subsequent reuse and/or destruction during or following the Second World War. As a result, from the perspective of identifying coastal research priorities an emphasis has been placed (Murphy, 2014: 119) on the need to differentiate First World War sites from those of the Second World War. With all of this in mind, the following report addresses one of the coastal sites in use during the First World War.

This report collates information collected during the project, relating to one of the south coast's First World War intertidal sites, in this case the remains of the mast of HMS *Sultan* which was part of a boom defence, located near the entrance to Badnam Creek in the Hamble River (Figure 1). The following account provides a background to the history and geography of the site before outlining recent archaeological investigation undertaken through the FWFWW project. Triggered by close-up photographs taken recently by a drone, that work comprises desk-based research of local history publications and photographic archives, local council archives, and the internet.

2 Site Background and Context

2.1 Geographical Context

The site is located in the estuary of the River Hamble in Hampshire, north of the village of Hamble-le-Rice and close to Lincegrove Marsh on the western shore of the river (Figure 1). Badnam Creek, which rises approximately 3km NNW, enters the river just south of the site.

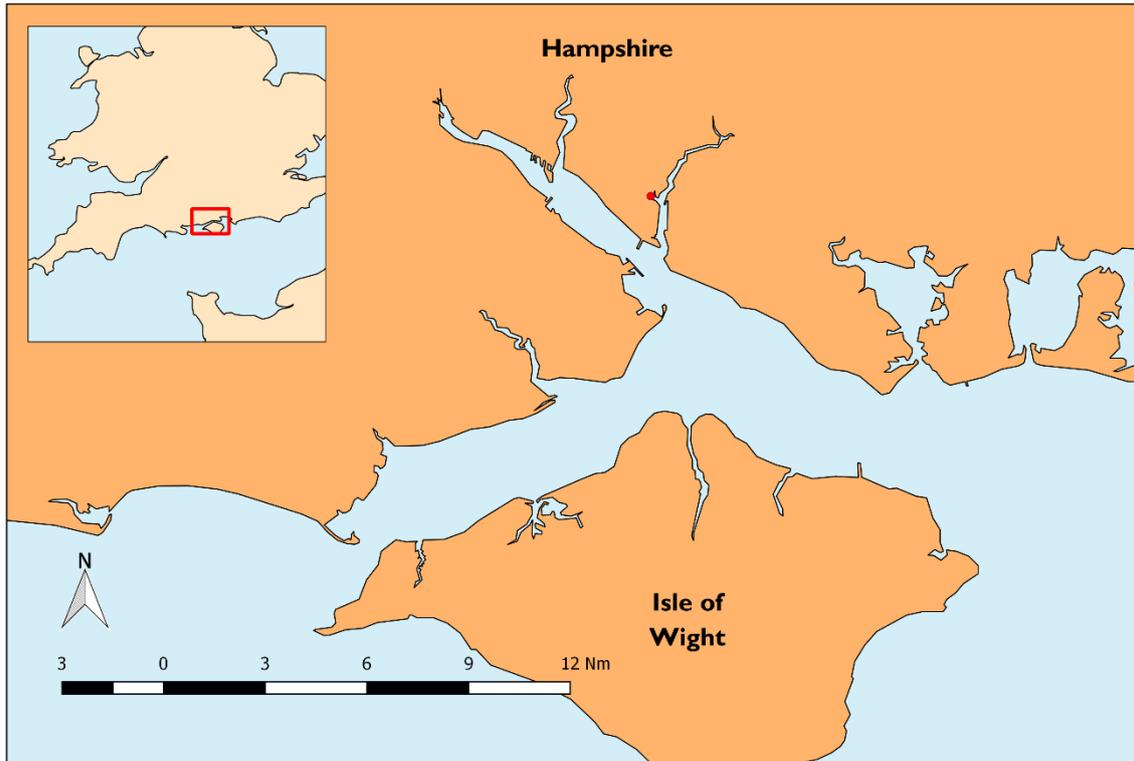


Figure 1: Location of Badnam Creek in relation to UK.

The sediment regime in the area of the site is well described within a study by the *Standing Conference on Problems Associated with the Coastline (SCOPAC)*. 2.3 Coastal Erosion / E2 / Inter-tidal Mudflat Erosion. Environmental and wildlife issues are addressed in the Eastleigh Borough Council's "Action for the Solent Coast & Hamble Estuary Priority Area". This can be found at: <https://www.eastleigh.gov.uk/media/60579/wildSolent.pdf>

The location of the HMS *Sultan* mast that is the subject of this report is SU 48558 08369; X (Easting): 448558; Y (Northing): 108369; Lat.: 50.872789; Long.: -1.3112649, between the low- and high-water marks (Figure 2). The feature being a metal, cement-filled structure that protrudes from the riverbed (Figure 3).



Figure 2: Aerial view of site (Channel Coastal Observatory 2016)



Figure 3: The remaining section of fighting top/mast in 2016

2.2 Site History

English Heritage indicates that in the late 19th century there was a boom defence from Calshot Castle to a battery south-east of the mouth of the Hamble at Chilling, near the present-day 'Solent Breezes' site on the opposite shore (English Heritage 2014). This defence line was supported from 1908 by a base near Badnam Creek in the River Hamble, which originally comprised a number of redundant hulks at anchor, and later included a landing stage accessed via a jetty from the shore, the end of which was secured with a mast from a Victorian battleship, sunk into the mud.

All that remains of the Badnam Creek base are some traces of the jetty and the lower part of the mast, which is clearly visible from either bank of the river, and on satellite imagery websites. The diameter

of the structure is approximately 4.8 metres. It is marked on current maritime charts as an 'Obstruction'. At the time of writing, there is no entry for the Badnam Creek mast in Historic England's PastScape database, though Monument No. 1371073 (MAT reference HAM005), large timber posts in an inlet, may be associated with the jetty.

In the years before the First World War, a number of redundant vessels were moored in the area for use as a boom-defence, initially in Southampton Water near Netley. In the event of an invasion, these vessels were to be towed out and moored in a line across the mouth of Southampton Water.

The Boom Defence unit had been established in the 1890s – the Harbour Board minutes record a request for moorings for five ships off Netley in July 1896, and later that year there are references to *"the dolphins about to be constructed at Calshot"* and *"Defence works at Calshot now in progress"*. The dolphins were permanent structures between which the boom defence vessels would be moored when deployed.

Since 1898, the Boom Defence unit had been commanded by Captain Mansfield Smith Cumming (henceforth referred to as 'M-C'), who went on to found the Secret Service Bureau (SSB), which later became MI6 (Secret Intelligence Service). A keen yachtsman, M-C requested of the Harbour Board in September 1905, yacht moorings off the mouth of Badnam Creek, within the Hamble estuary, for use during the winter; in summer the yachts would be kept at the end of the line of Defence Ships off Netley. In April 1907, the Southampton Harbour Board (SHB) made no objection to a request from the Captain of Portsmouth Dockyard to moor two of the Boom Defence ships just above Badnam Creek (ADM 179/130). In June the same year, permission was given by the SHB for a Landing Stage (also referred to as a Landing Jetty) at the site, after a visit by a sub-committee who deemed that it would be out of the way of navigation. By December 1907, two of the vessels had been moved from Netley into the Hamble (Harbour Master's letters and ADM 179/130), and all the men berthed in the largest.

The future of this method of boom defence was under review by 1906 (see **Section 4.3**), but work continued on the Badnam site. M-C's report in January 1908 (ADM 179/130) details how the Admiralty had leased a 30-acre plot near the Badnam Creek base. The 1909 25-inch OS map shows the only nearby plot of that size to be south of Badnam Copse, east and north of Satchell Lane (Figure 4).

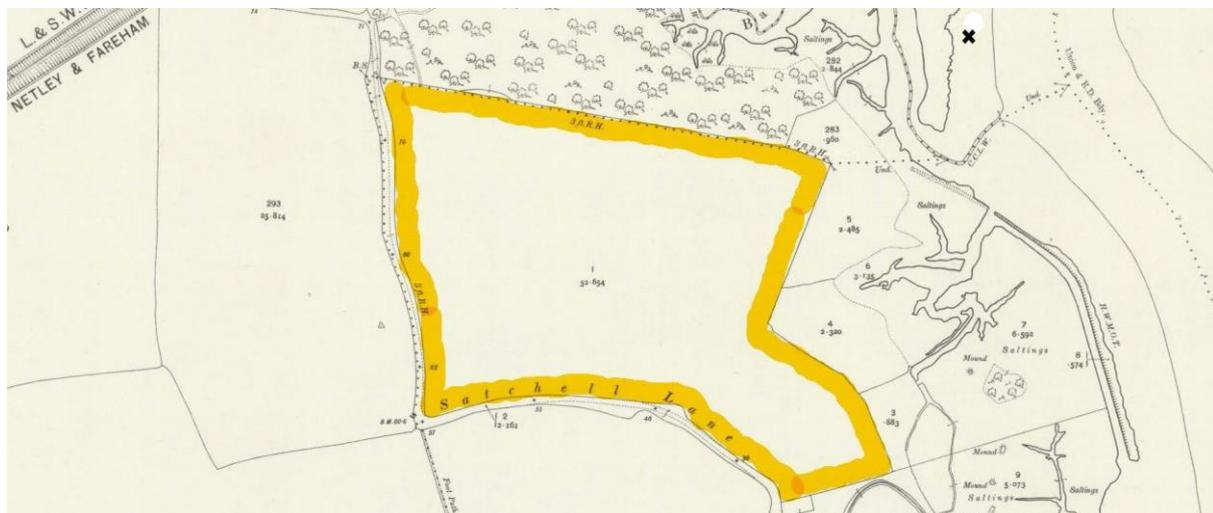


Figure 4: Base Workshop site (the position of the mast is indicated by X – top right)

A large shed was erected and used by the men of the boom defence to work on the hawsers and baulks for a new 'ladder boom'. A temporary jetty and a footpath across the low-lying land were constructed. He notes, too, that conditions were much improved for the men by the move from

Netley, and without *'the too handy public house their sobriety has improved in a marked degree – to the great advantage of the work carried on'*.

During 1908 the remaining vessels were moved to the new base and a more permanent jetty was constructed between the shore and the navigable channel, with the mast from HMS *Sultan*, a Victorian iron-clad battleship (see **Section 4.2**), marking the outer end. The jetty was accessed from Salterns Lane in Bursledon through a tunnel beneath the railway line.

The use of *Sultan's* mast was not originally planned, but the Harbour Board requested a slightly different position for the jetty than that first proposed. In a letter to the Harbour Board, M-C (by then a Commander) wrote in April 1908: *"... In making preparations for the construction of the landing Jetty, it has been found that in the new position which the Harbour Board requested me to adopt as the site, the deposit of mud is considerably deeper than in the old one - owing probably to its being more out of the influence of the main stream. In order to obtain a solid foundation for the outside pile of the Jetty, I propose to use an old iron mast, which has been supplied to me for the purpose by the Admiralty. I beg to report this to the Harbour Board, as the construction of the Jetty will so far differ from the plan I originally submitted to them."*

It is not known precisely when the mast was put in place but a report in *Yachting Monthly* in September 1909 stated: *"The pier is not easily seen by reason of the hulks being moored in front of it, but an old military mast, with two fighting-tops, forms a conspicuous object close to the pier itself"* (IMU). Historical sources (Robinson 1987) refer to it originally being sunk into the mud to a depth of approximately 30 feet (over 9 metres). Figure 5 shows the mast at around this time.



Figure 5: Mast ceremony (IMU). Probably 1908

The upper mast section and fighting top is still in place, rising up from the centre of the lower fighting top, the remains of which still survive close to the water level today.

In Figure 6 it can be seen that a jetty structure has been built across the lower fighting top and a roof added to the upper fighting top.

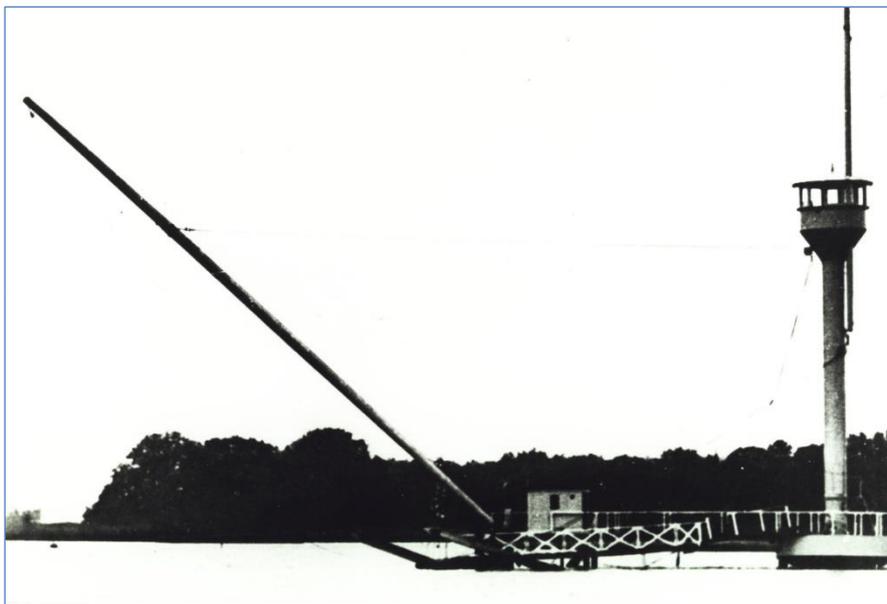


Figure 6: Mast with additional enclosure added to the upper level after its original placing (IMU)

The history page of the official SIS/MI6 website records that M-C was 50 when he joined the Secret Service Bureau and set up its Foreign Section, joining in October 1909. He set up his own base with accommodation in London, but did not totally relinquish duties with the Boom Defence. In February 1910, he wrote to the Harbour Board about re-arranging the defence vessels and the need for a further temporary landing-stage (SHB minutes). In October the same year, the Harbour Master wrote to him at Ashley Mansions, London, sending condolences for his long illness, an illness that was presumably a cover for his Intelligence activities.

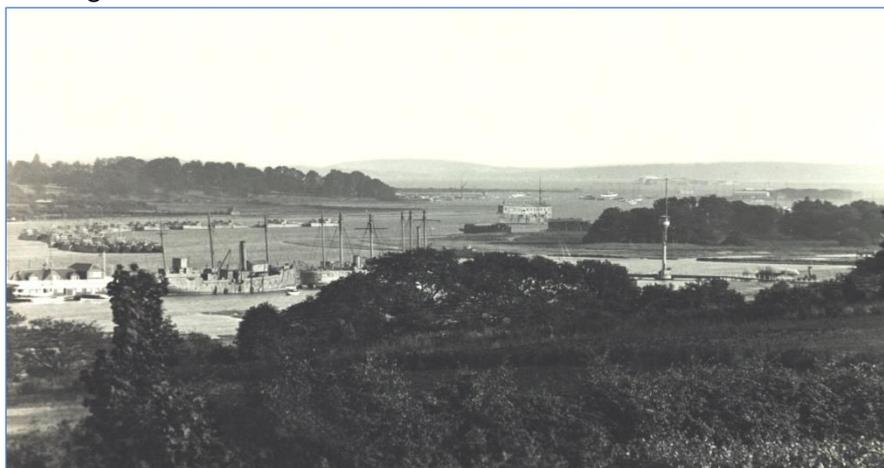


Figure 7: Taken from high viewpoint in Bursledon (IMU).

The lines of Motor Launches on the left of Figure 7 suggest that this photograph was taken post-war, as many of these vessels were kept in this area at that time, awaiting disposal.

Developments of the boom defence itself are covered in more detail in **Section 4.3**. With the abandonment of the use of hulks for the boom by 1910 in favour of a 'ladder-boom', the precise function of the base at Badnam Creek during the First World War is unclear, but the OS 25-inch map, published in 1932, clearly shows the mast, now with jetty, still in place (Figure 8).

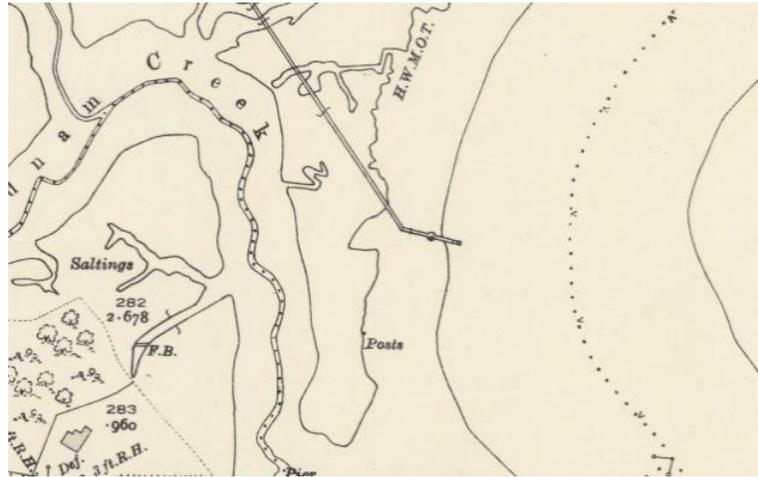


Figure 8: OS 25-inch 1932

The mast remained in place for nearly forty years after the end of the First World War.



Figure 9: The upper fighting top of *Sultan's* mast, circa 1950 (IMU), before it was removed

The Harbour Board minutes record that the upper structure of the *Sultan* mast (Figure 9) was removed from the Hamble River in 1956/7.

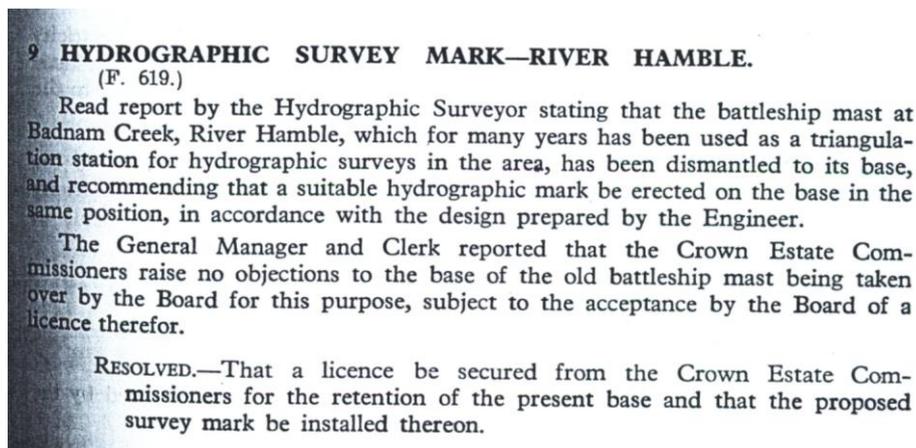


Figure 10: Harbour Board Minutes - 8th Feb 1957.

2.3 Research Questions

Research questions relating to the site include:

- How do the remains at Badnam Creek relate to maritime infrastructure in the Hamble River during the First World War?
- What is the extent of surviving elements?
- Can the surviving elements tell us anything about the ship they came from?
- Are the traces of a structure across the marsh close to the mast the remains of the pier?

3 Methodology

3.1 Desk Based Research.

Desk-based research into the site was undertaken in 2017/18. This research examined the following potential resources:

- Historic Ordnance Survey mapping.
- Channel Coastal Observatory aerial photos.
- Southampton City Library and Archives.
- The National Archives.
- Newspaper archives.
- Available historical photographs.
- General related searches of the Internet.
- Local history groups.
- Books by local historians/residents.

For details, see Section 4.1.

3.2 Fieldwork.

Although the site is above the low-water mark, it is not suitable for field surveying, evidenced by the fact that approximately half of the mast sunk into the mud when it was first erected (Ritchie; Robinson states 30ft). In May 2016 a drone survey was undertaken, resulting in 224 photographs of the *Sultan* mast's lower fighting top and these were used for site assessment (see Section 4.2).

4 Results & Interpretation

4.1 Desk Based & Historical Research

The investigation initially comprised primarily internet research, starting with searches on variations of the site name and 'boom defence', and also consulting documents in the Southampton City Library and Archives. While providing useful general background and leads for further research, many websites were found to contain numerous suppositions and inaccuracies. Several books written by

local historians, such as Susannah Ritchie and Nicolas Robinson, give additional background information (Susannah's father used to work in the Boom Defence team), but, again, sources are often unreferenced and details contradictory.

Attempts to obtain further information from the National Museum of the Royal Navy and the Portsmouth Royal Dockyard Historical Trust regarding the placement of the mast were unsuccessful.

4.1.1 Historical Ordnance Survey mapping

A historical map progression relating to the area was undertaken, using the National Library of Scotland (NLS). The maps below (Figure 11 – 14) are reproduced with the permission of the National Library of Scotland: <https://maps.nls.uk/copyright.html#noncommercial>

Neither the OS 25-inch map of 1909 (Figure 11), nor 6-inch map of 1910 shows evidence of the Boom Defence base, since the surveys would have taken place two or three years before publication:

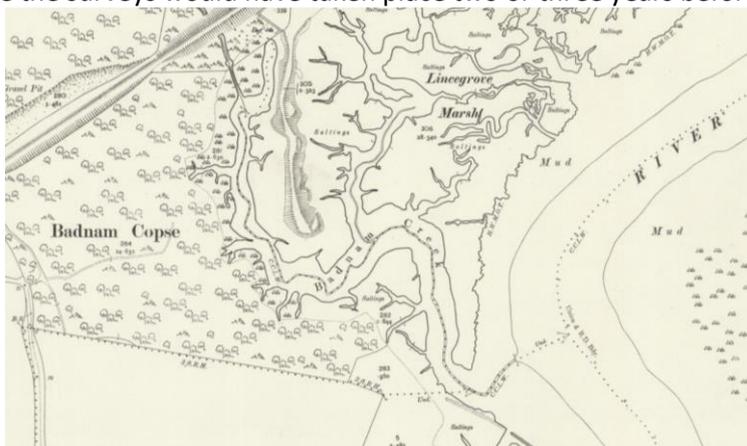


Figure 11: OS 25-inch 1909

During the war years, many OS staff members were posted overseas, producing maps for military purposes. The inevitable economies post-war and the backlog meant that no revisions were published of the area until 1932 (Charles Close Society). Figure 12 shows the jetty and mast. The 30-acre plot has been split, with a gravel pit occupying part.

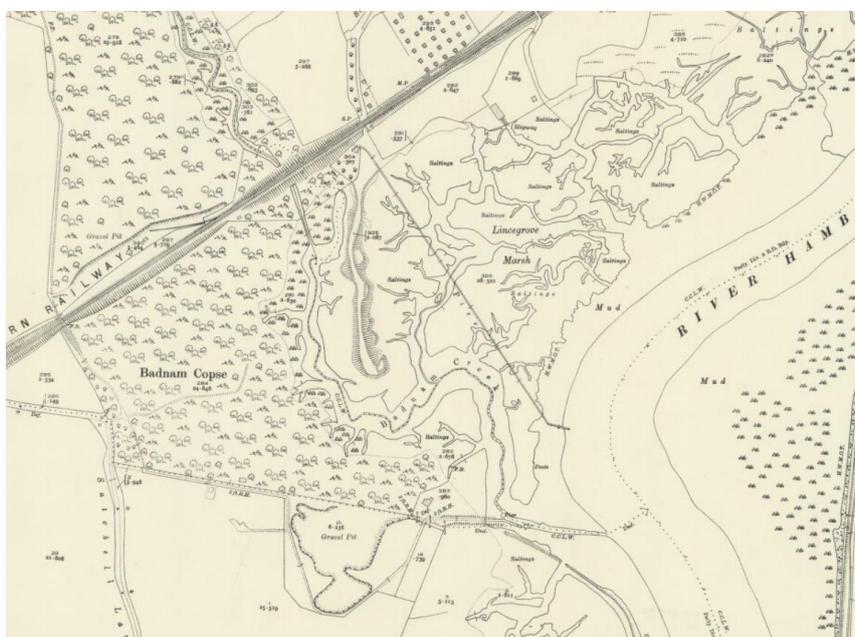


Figure 12: OS 25-inch 1932

The jetty appears, too, on the OS Six-inch map published in 1947, and 1:25K published 1951 (Figure 13).

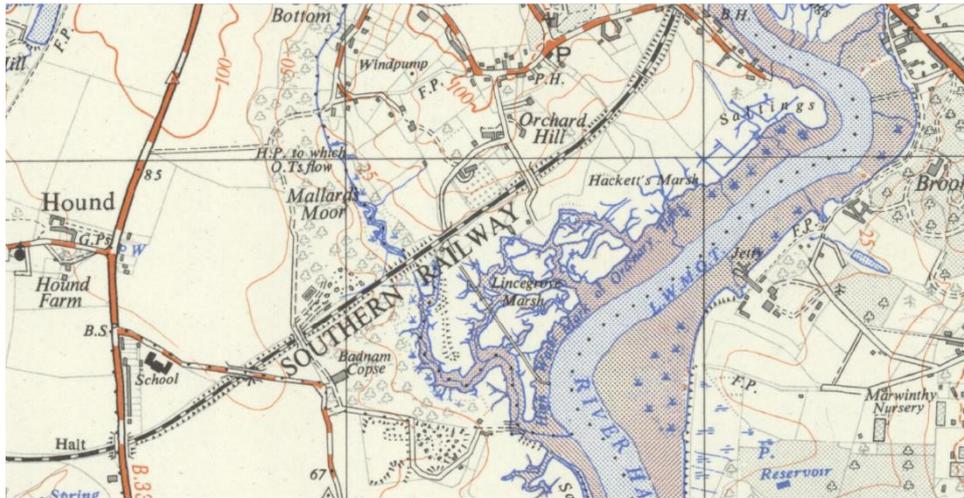


Figure 13: OS 1:25K 1951

By the time of publication of OS 1:10K of 1962/3 (Figure 14) the jetty and mast are no longer shown.

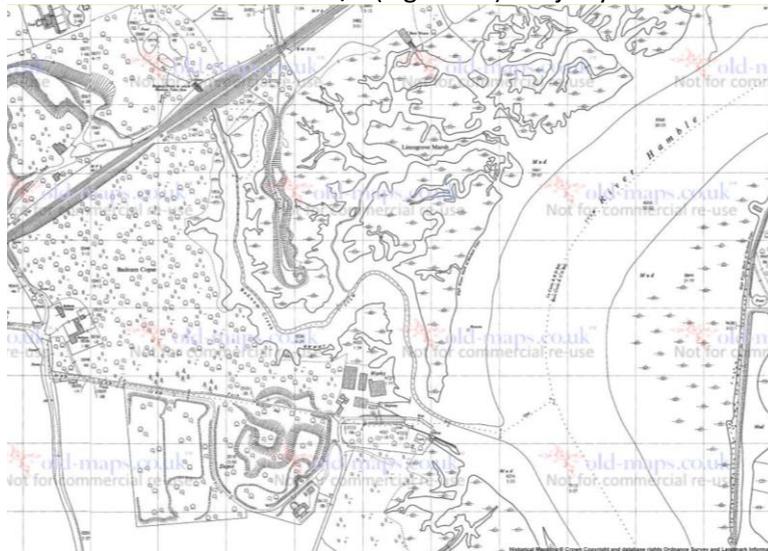


Figure 14: OS 1:10K 1962

4.1.2 Channel Coastal Observatory (CCO) aerial photography

This resource has the advantage over other satellite imagery in that it shows coastal areas at low water (Figures 15 & 16).



Figure 15: Channel Coast Observatory view - 2013

Although the view from directly overhead does not show many features of the fighting top, it is interesting to note the shadow in Figures 15 and 16.



Figure 16: Channel Coast Observatory view - 2016

4.1.3 Southampton City Library and Archives

In the 'Local Studies and Maritime History' section of the Southampton Central Library are the bound minute books of the Southampton Harbour Board, which had jurisdiction over the Hamble Estuary during the period of interest.

In the Southampton City Archives, the 'Letter Books' contain the carbon-copies of outgoing correspondence on very thin paper (80 sheets are 2mm thick). There is a helpful hand-written index at the back of each volume. Unfortunately, they do *not* contain incoming documents or any associated material, e.g. plans. A number of letters are simply apologies for not being in the office when M-C called, or postponing a scheduled meeting. The letters are mostly addressed to M-C at HMS *Argo* or *Bridgewater House*, the vessels moored in the Hamble River that he lived aboard.

There are two sets of 'Letter Books': the Clerk's covers periods of 4-6 months per volume, while the Harbour Master's covers 4 or 5 years. Several have suffered from damp and have multiple pages stuck together.

4.1.4 The National Archives – Kew

<http://discovery.nationalarchives.gov.uk/details/r/C2153185> is a file titled "Boom Defence records 1904-1908", reference ADM 179/130. It consists of correspondence between M-C, Portsmouth Dockyard and the Admiralty on boom defence matters. ADM 179 contains Portsmouth Station Correspondence from 1880 to 1948; subfolder 130 is the only one with "Boom Defence" in the title.

<http://discovery.nationalarchives.gov.uk/details/r/C4113665> is a file titled "Grand Fleet intelligence office packs, Vol XXVII, additional pack" reference ADM 137/1999. It consists of lists and charts of boom defences in various locations including the Solent.

<http://discovery.nationalarchives.gov.uk/details/r/C6678077> is a file titled "Plans, Sections and Elevations of Dolphins A and B" reference WO 78/4955/2. It consists of plans dated 1910, and undated charts showing the range of the QF armaments installed.

The most useful of these three is ADM 179/130, but it contains documents only to 1908, when work was underway constructing the new 'ladder boom'. A TNA Discovery search of "boom defence 1800 – 1924" revealed two further files which have not been inspected:

- ADM 116/1265/B Boom Defence Experiments Committee 1908 -1914.
- ADM 179/71 Boom Defence Records 1892 -1902.

4.1.5 Newspaper Archives.

Accessed via subscription, <http://www.britishnewspaperarchive.co.uk/> has digitised papers with a search function.

Jan/Feb 1902 – Newspaper cutting re boom. It appeared in *The Hampshire Advertiser* (1st February 1902), *The Pall Mall Gazette* (25th January 1902) and *The Portsmouth Evening News* (27th January 1902), all syndicated. It describes "A number of strange-looking structures being collected in a nook of the Solent behind Calshot Castle", and that "they resemble square, sturdy rafts with huge clenched fists sticking up at each end."

May 1904 – Hampshire Telegraph; describes heavy timbers, underwater 'entanglements' and the fitting of steam winches.

4.1.6 Available historical photographs

In addition to those in the books of local historians, Ian Underdown of Hamble Local History Society has been an extremely valuable source of photographs (these reference IMU in the caption) and other material.

4.1.7 Books by local historians/residents

Suzannah Ritchie, a resident of Bursledon, had *The Hamble River* first published in 1984. She describes the hulks, the siting of the mast and the men arriving at Bursledon railway station and walking through the village to the pier. Her father, Robert, worked at the base as a civilian from about 1903, and was highly praised in M-C's report of January 1908 (ADM 179/130).

Nicolas Robinson's *Hamble – A Village History* (1987) also describes the siting of the mast, and adds detail of the boom itself.

4.2 HMS *Sultan*

HMS *Sultan* was a Victorian ironclad laid down in 1868 at Chatham Dockyard and launched in 1870. The vessel was unusual in having a central box battery on two levels, rather than broadside batteries and an unusually rounded midship cross-section. After initially serving in the Channel Fleet, *Sultan* was refitted, reduced to a barque rig, and served twice in the Mediterranean (with a further re-fit inbetween). In 1889 the ship grounded on an uncharted rock in the channel between Malta and Gozo and sank in a gale a week later. After 5 months, *Sultan* was salvaged, made seaworthy in Malta dockyard, and returned to Portsmouth.

Between 1892 and 1896 the vessel was modernised: a new engine and boilers were installed, decks replaced and the sailing rig was removed to be replaced with two military masts with fighting tops. *Sultan* (Figure 17) then served in the reserve, but was found on manoeuvres to be unable to match the speed of newer vessels in the fleet.



Figure 17: HMS *Sultan* 1896 after its re-floating and modernisation

In 1906, the vessel was partially dismantled and became an artificers' training ship in Portsmouth, *Fisgard IV*, joining three others of the same name (Figure 18). The forward mast was removed and superstructure added. At this stage, it seems the remaining mast became available for use in the Hamble.

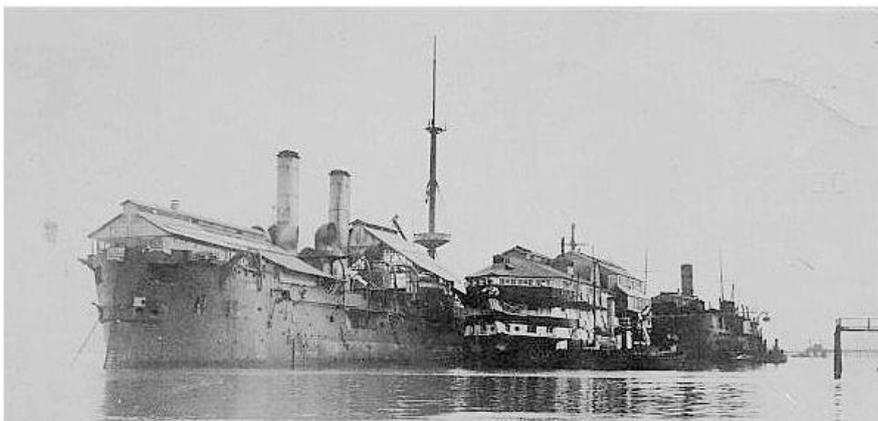


Figure 18 *Fisgard IV* (left) - c.1906

The vessel served in this function until *Fisgard* became a shore-based establishment in Chatham in 1930, when the ship reverted to being HMS *Sultan*, a mechanical repair ship and, during the Second World War, a depot ship for minesweepers, before being sold in 1947 (Wikipedia).

4.3 *Sultan's* mast/fighting top

The metal fighting top from *Sultan* protrudes from the mud, being visible at all states of the tide. At low tide, a section of the mast can also be seen below the fighting top (Figure 19). It is only the lower fighting top that survives, the upper one having been removed in the 1950s (see Section 2.2).



Figure 19 Fighting top viewed from the west

The diameter of the fighting top is approximately 4.8m and the maximum height of the metal rim approximately 0.8m, with a 4cm reinforcing band around the top. The raised rim of the fighting top is extremely corroded. Several sections (approximating to one quarter of the total) are missing.

On the west (shore-facing) and east sides, the straight and relatively clean edges to the missing sections suggests intentional removal. On the western side, two sections have been cut out, approximately 60cm wide, with approximately 1m between them. Small square holes can be seen in the top corners of the rim on either side of one of the missing sections, though their purpose is not known. (Figure 20).

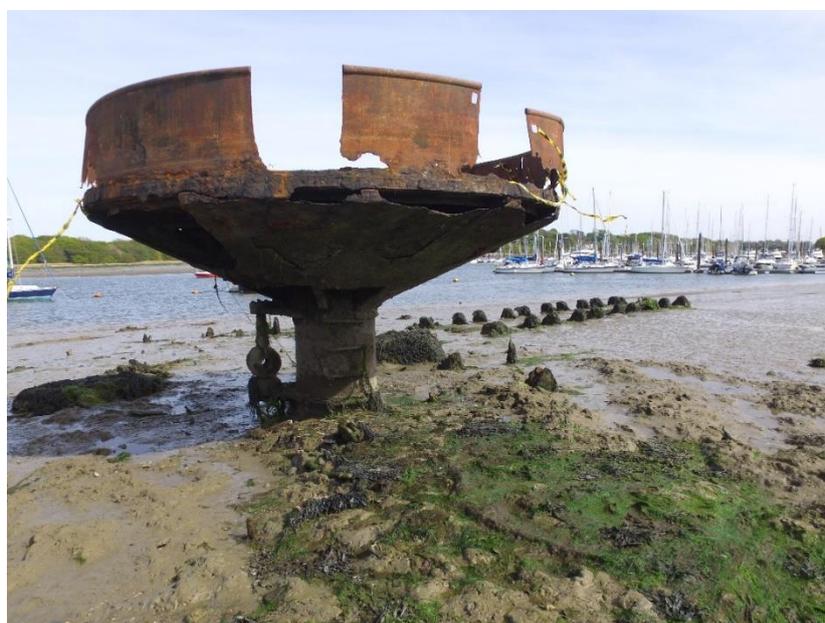


Figure 20 Fighting top, west side

Opposite, on the east (river-facing) side, another deliberately cut section is missing (Figure 21). It is possible that there was also a central bit of rim on this side (to match the west side) that has since broken off.



Figure 21 Fighting top, east side

The alignment of the two missing sections in the fighting top rim can be seen most clearly in the photo taken from directly above (Figure 22). It is highly likely that the recesses were cut in the fighting top rim to accommodate the pier structure shown in Figure 6.



Figure 22 Fighting top from above.

Ladder rungs, that would have been used for climbing the mast from the deck to the lower fighting top, can be seen on the northern and southern sides of the mast. On the south side three rungs are visible (with a possible fourth close to the mud, obscured by weed). Fixing points indicate that an additional rung at the top is no longer present (Figure 23).



Figure 23 Fighting top, south side rungs

On the opposite (north) side of the mast, four rungs are visible. On both sides, square-ish access holes into the fighting top can be seen.



Figure 24 Fighting top, north side rungs.

At low tide, the underside of the fighting top can be seen: again, heavily corroded, particularly on the northeast side. Approximately 1.25m of the lower mast is exposed beneath the fighting top, disappearing into the mud. The approximate diameter of the mast is 85cm. The corrosion provides a rare view of the internal structure and construction methods and materials of a Victorian era fighting top (Figure 25).



Figure 25 Fighting top, northeast side

On the northern side of the mast, two metal brackets are fitted, one near the base of the fighting top, the other just above the riverbed. Between the two brackets is a fitting (Figure 26). It is highly likely that this feature relates to the rigging that would have supported *Sultan's* mast, being part of the arrangement by which the shrouds or stays were attached to the mast (Figure 27).



Figure 26 Rigging feature.

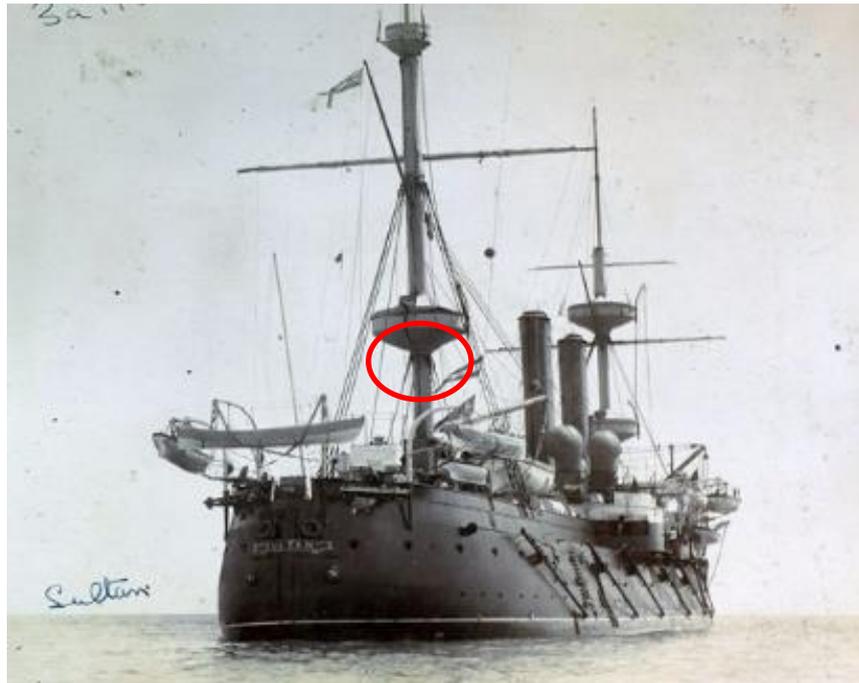


Figure 27 Mast shroud attachments on aft mast (unable to identify source of image)

No equivalent fitting is present on the opposite (southwest) side of the mast, though at the top, where it meets the fighting top, a line of small holes can be seen in a reinforcing strip, suggesting there may have been something attached here previously (Figure 28).



Figure 28 Fighting top, southwest side.

The fighting top itself was filled with concrete, most probably straight after the removal of the upper section and three metal fixings are embedded in the concrete. While no documented evidence relating to the installation of a 'suitable hydrographic mark', as proposed in the SHB minutes (Figure 10) could be found, IMU recalls a red port-hand can marker held up by metal poles. The three fixings embedded in the concrete may be related to such a mark (Figure 29).



Figure 29: Fighting top showing fixings.

Figure 30 shows one of the three fixings, which appear to have been cut off close to the concrete. All are tubular and angled towards the centre of the platform. This one alone appears to be attached to a securing bracket.



Figure 30: One of the fixings.

On the intertidal mudflats to the west and north of the fighting top, some of the probable remnants of the jetty can be seen in other drone photographs taken in the area.



Figure 31: Possible jetty remains.

Remnants of a structure can be seen below the high water line and traces of it across the marsh; the angle corresponds with that shown for the jetty on the 25-inch OS map of 1932. Whether or not they are linked cannot be verified without closer on-site examination.

4.3 The Boom Defence

The boom defence across Southampton Water (Figure 32) was only one of a number of similar installations around the coast, some small, protecting a harbour entrance, while others were much larger, such as those at Calshot, Sheerness or Plymouth Sound.

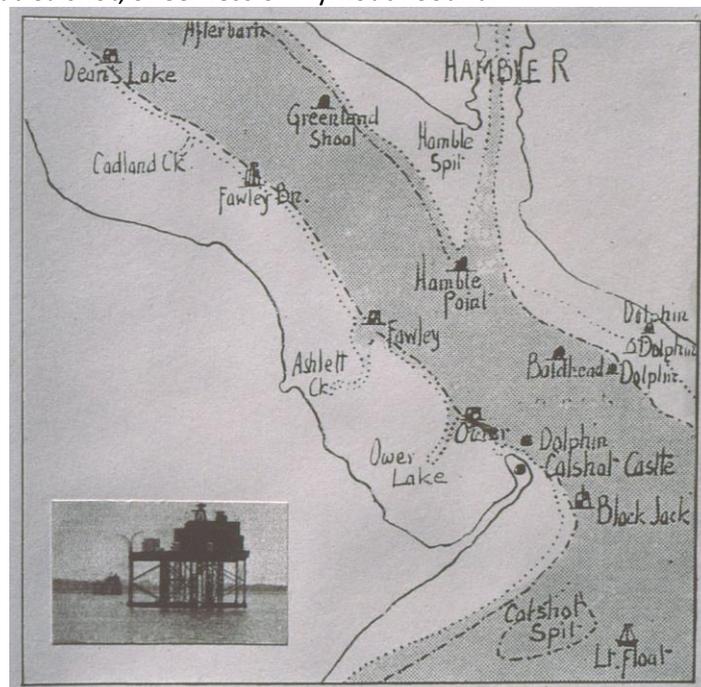


Figure 32: from IMU, attributed to Yachting Monthly Sept. 1909.

Inset shows one of the centre two dolphins (new design)

A distinction should be drawn between the supporting structures and the defence boom itself. Whether the boom comprised a line of hulks, chains or hawsers, it needed to be secured to permanent structures: these are known as 'dolphins'. The Calshot defence line was originally made up of redundant vessels - hulks, which when not in use, were anchored first off Netley, then later at moorings near Badnam Creek in the Hamble estuary.

By 1902, the defence was being strengthened; the Hampshire Advertiser and Portsmouth Evening News reported early that year that "A number of structures are being collected in a nook of the Solent behind Calshot Castle. In appearance they resemble square, sturdy rafts with huge clenched fists

A chart dated August 1917 (ADM 137/1999) shows submarine nets and other defences around the Solent, but only lights (presumably on the dolphins) at the old Calshot defence line (Figure 39). It is likely that the Badnam Creek base was therefore redundant by this time. At least two of the Boom Defence hulk vessels were re-assigned around the time of the outbreak of the First World War and the only references to the Boom Defence during the war years in the SHB minutes are the continued lighting of the dolphins – the lights were maintained by the SHB and costs charged to the Admiralty.

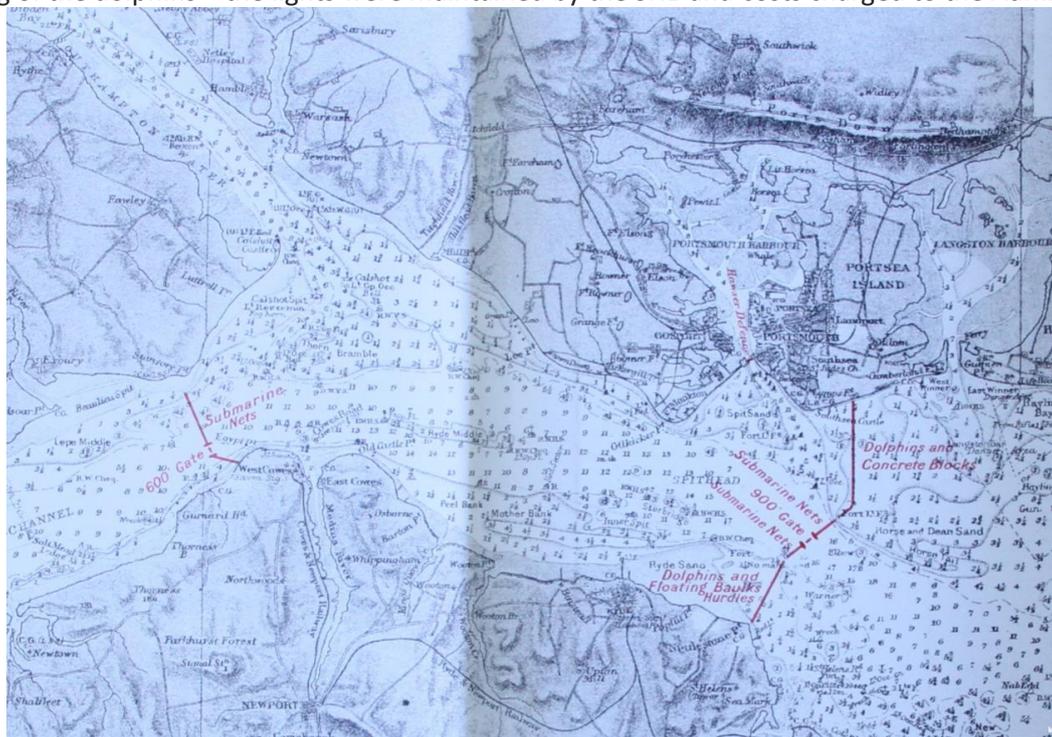


Figure 34: Solent Chart – August 1917 (TNA ADM 137/1999)

In March 1920, HM Dockyard invited tenders for the removal of all the dolphins (SHB minutes). The following November, the chosen contractor was reporting difficulties removing the piles, and it was agreed that the piles of the dolphins closest to shore could be cut off at the seabed, but that the others had to be withdrawn (SHB minutes).

5 Conclusion

It is clear from TNA Boom Defence records that the fighting top/mast near Badnam Creek in the Hamble estuary was associated with the Calshot boom defence line while M-C was in command. While no specific evidence was found that the mast came from HMS *Sultan*, whenever a particular vessel is named, it is always *Sultan* (e.g. Ritchie, Robinson and several websites). Historical photographs (Fisgard Association) show the vessel without one, then without both of its masts at around the time of the mast's placing in the Hamble. Its later history, albeit scant, is recorded in the minutes of the SHB.

Details of the boom defence itself are also patchy. ADM 179/130 contains some detailed correspondence on the technical aspects of the boom, but only for the period 1906 – 1908, and makes no mention of the dolphins.

A TNA Discovery search of “boom defence 1800 – 1924” highlighted two files that had not been inspected:

- ADM 116/1265/B Boom Defence Experiments Committee 1908 - 1914. This may have technical details of boom design or the recommendation to scrap Calshot boom.
- ADM 179/71 Boom Defence Records 1892 -1902. Is too early to contain anything regarding the mast, but may contain more background on the unit.

These records may uncover further information of use.

The remains near Badnam Creek, while limited, warrant further investigation due to their fragility and the significance of HMS *Sultan* and its career. It offers a rare opportunity to obtain information about the construction of late 19th century fighting tops and further investigation of the rigging fitting underneath the fighting top, would add to knowledge of late 19th century rigging equipment. If this feature was recorded and published, it would provide a useful example for comparison with material recovered from wreck sites, possibly aiding dating and identification. Additional fieldwork on the site could further examine the pier/jetty remains identified in aerial photographs (Figure 31) and establish if any further remains survive further inland.

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