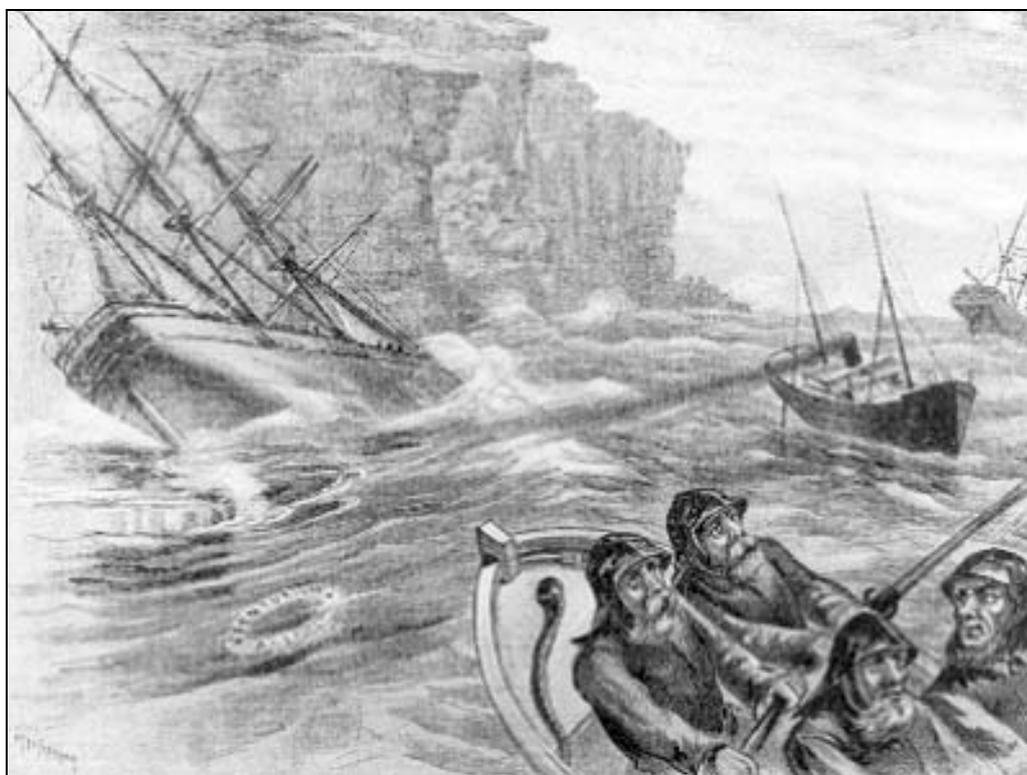


Centurion 1887: Maritime Archaeological Survey

***Centurion* 1869-1887** **Maritime Archaeological Survey**

June 2003 - February 2004



NSW Heritage Office

Maritime Heritage Program
PARRAMATTA 2004



Centurion Project manager: David Nutley
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Centurion 1887: Maritime Archaeological Survey

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Front cover: Initial grounding of *Centurion* at Old Man's Hat, North Head. *Illustrated Sydney News* 15 February 1887. Reproduced courtesy: State Library/Mitchell Library of New South Wales.

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CORE SURVEY TEAM

David Nutley	Maritime Archaeologist, Heritage Office (<i>Centurion</i> Project Manager)
Tim Smith	Maritime Archaeologist, Heritage Office
Colin Browne	Manly Hydraulics Laboratory
Phil Clark	Manly Hydraulics Laboratory

WATERWAYS AUTHORITY BOAT CREWS

Mr Leslie Brix-Nielsen	NSW Waterways Authority - Coordinator
Harry Parker	
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Alan Lang	
David Downey	
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Survey assistance from:

Kieran Hosty	Australian National Maritime Museum
Paul Hundley	Australian National Maritime Museum
Lee Graham	Australian National Maritime Museum
Dr Mark Spencer	Underwater Photographer



*Figure 1: David Nutley during installation of survey baseline.
Photograph by Mark Spencer.*

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1. ACKNOWLEDGEMENTS

The Heritage Office would like to acknowledge the following people and organisations for their generous assistance:

The NSW Waterways Authority provided expert boat crews and work platform for the duration of the joint survey exercise. The Department of Commerce (Manly Hydraulics Laboratory) (Colin Browne, Phil Clark) provided professional diving supervision and support. Staff Maritime Archaeologists from the Australian National Maritime Museum (Kieran Hosty, Paul Hundley, Lee Graham) provided additional diver support and recording equipment. The project could not have proceeded with a great deal of additional logistical support, valuable advice, contacts, and historical information provided by a number of people.

Debbie Hardy	Member, NSW Maritime Heritage Panel and diver, who initiated the first survey of <i>Centurion</i> in 1988. Debbie provided personal research materials
Dr & Mrs Donald	Aberdeen. Provided private research materials related to Captain Mitchell of <i>Centurion</i>
Mr Andrew Donald	
Dr Mark Spencer	Professional Underwater Photographer
Library	Australian National Maritime Museum
Library	Mitchell/State Library of NSW
Library	National Maritime Museum, Greenwich



Figure 2: View of Cannae Point and Quarantine Station behind North Head, Sydney from the wreck site. Photograph: David Nutley.

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1 EXECUTIVE SUMMARY

The June 2003 – February 2004 joint archaeological survey of the *Centurion* wreck site was conducted by the NSW Heritage Office and NSW Waterways Authority. The survey forms part of the underwater heritage site investigation and management tasks of the agency, which implements the NSW Underwater Heritage Program. The site also lies on the harbour bed controlled by the NSW Waterways Authority (and subject to their reporting requirements under the NSW *Heritage Act* 1977 (Section 170). The investigation aimed at determining the archaeological and research potential of the site, well known to divers, and to promote the site through the development of key educational products, including a comprehensive site plan.

2 SURVEY AIMS

2.1 *Centurion* 1887

The survey target was the wreck of the timber sailing vessel *Centurion* that lies on the harbour bed of Port Jackson (Sydney Harbour), just inside Cannae Point, North Head.



Figure 3: *Centurion*. Main mast section and marine life in 18 metres of water. Photograph by David Nutley.

The *Centurion* site is well known to recreational divers and fishermen, being easily accessible and a comfortable diving depth for Advanced-trained divers. However it has not been the focus of detailed study since 1988/9 and the archaeological potential of the site reconsidered in the light of later work on similar vessels wrecked in New South Wales. It is because of this, and the need to examine opportunities for better promoting the heritage values of the site, that the NSW Heritage Office and the NSW Waters Authority undertook the current survey operations.

Shipwrecks hold a particular fascination for their association dramatic events, often with loss of life and property

Shipwrecks, once located, form a focus of detailed study. They act as markers to earlier historic events, allowing divers and others the opportunity to return to the exact scene of an incident.

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By carefully recording and interpreting these fragile sites, direct access can be made to a past era. Information can be obtained on a range of themes, such as ship technology, transport, trade and industry. Special insights can be made into life on board through the goods and possessions they carried. Often this information has not survived in contemporary historic records.

Communities benefit from learning about local maritime history. This history can be interpreted through a range of activities including publications, dive tourism, land-based shipwreck walking trails and signage, and school study programs. The information can be disseminated through a variety of media such as plaques, video, CD's, books, research articles, etc.

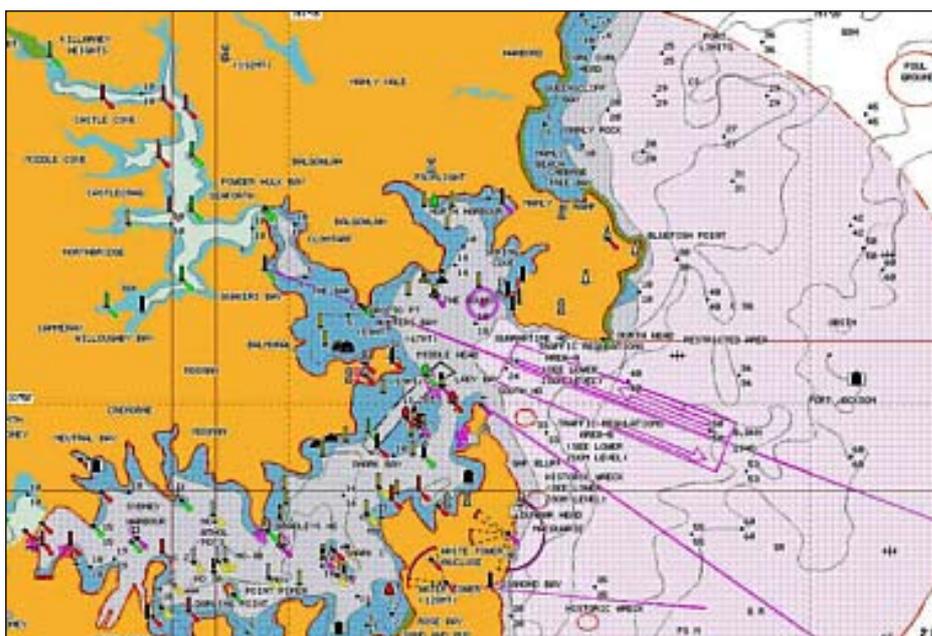


Figure 4: Wreck site location map. Courtesy: Department of Commerce.

3 THE CONTEXT OF SHIPPING DISASTERS IN PORT JACKSON

Numerous vessels came to grief at the entrance to Port Jackson, Sydney. Following the arrival of the First Fleet in 1788, the port gradually developed to be a premier destination on the world's trading routes and witnessed significant passenger traffic. Although a renowned safe port due to its scale and open roadsteads, the frequency of shipping traffic, dangers from coastal sea and storm, and human error, led to a significant number of calamities.

The earliest major shipwreck event befell the timber barque *Edward Lombe* on Middle Head in 1834. The deaths of passengers and crew shocked the infant colony. However, by far the worst disaster occurred in 1857 when the full-rigged ship, *Dunbar*, smashed into outer South Head with 121 lives lost and only one survivor.

Just nine weeks later the ship *Catherine Adamson* struck North Head with significant loss of life. Indeed, the North Head cliffs directly witnessed some eighteen significant shipwreck events. *Centurion* was technically also lost on these cliffs where it struck in 1887, before drifting off to sink at the head of North Harbour.

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The following is a list of some twenty-six of the reported major shipwreck incidents near the North Head cliff face between 1803 and 1902. This gives some indication of vessel traffic in the area.

Name	Type	Tons	Built	Length	Lost	Where Lost
Hope	Sloop	?	?	?	1803/10/31	Sydney Harbour, North Head
Liberty	Schooner	42	1824	13.10	1830/01/20	Sydney Harbour, North Head
St Patrick	Sloop	?	?	?	1835/01/??	Sydney Heads, off
Sarah	Cutter	33	1838	13.04	1839/06/??	Sydney Harbour, Between Heads
Ranger	Cutter	11	1842	8.47	1842/12/05	Sydney Harbour, between Heads
Ellen	Ketch	10	1846	9.9	1849/02/09	Sydney Harbour, between Heads
Two Friends	Brig	207	1836	26.02	1851/?/??	Sydney Harbour, between Gap & South Reef
Prosperous	Ketch	15	1846	12.5	1856/11/30	Sydney Harbour, between Heads
Catherine Adamson	Ship	886	1855	52.0	1857/10/24	Sydney Harbour, Nth Hd, Old Mans Hat
Annie	Barquentine	470	?	?	1858/06/30	Sydney Harbour North Head, 100 yds from <i>Catherine Adamson</i> .
Emily Hort	Schooner	141	?	25.7	1861/10/13	Sydney Harbour, North Head, Old Mans Hat
Snowdon	Schooner	83	1861	18.75	1863/01/28	Sydney Harbour, North Head
Brisk	Schooner	95	1831	23.3	1865/06/10	Sydney Harbour, North Head
William Hill	Brig	109	1847	21.39	1865/11/28	Sydney Harbour, North Head
Eagle	Brigantine	125	1848	25.5	1866/07/28	Sydney Harbour, North Head
Prince Patrick	Brigantine	117	?	23.28	1869/12/17	Sydney Harbour, North Head, just inside
Julia	Brigantine	64	1867	20.87	1873/08/10	Sydney Harbour, North Head, Old Mans Hat
Lady Emma	Schooner	128	1854	25.90	1880/04/30	Sydney Harbour, North Head
Sophia	Brigantine	209	?	35.66	1881/07/10	Sydney Harbour, North Head, Old Mans Hat
Falcon	Brigantine	195	1974	35.11	1886	Sydney Harbour, North Head, Old Mans Hat
Pomme de Terre	Schooner	72	1886	24.80	1887/05/19	Sydney Harbour, between Heads, collision
Emily Ann	Ketch	39	1876	18.65	1889/01/25	Sydney Harbour, northward of North Head
Emma Matilda	Cutter	12	?	?	1895	Sydney Harbour, North Head
Failford	Schooner	75	1898	29.32	1899/05/29	Sydney Harbour, outer North Head
May Byrnes	Schooner	234	1898	41.23	1901/01/01	Sydney Harbour, North Head
Tramp	Schooner	97	1902	29.23	1915/01/??	Sydney Harbour, North Head

Information extracted from NSW Heritage Office web site, *Maritime Heritage Online*
<http://maritime.heritage.nsw.gov.au>.

3.1 Shipwreck visitation

Historic shipwrecks have traditionally been a focus of recreational attention by SCUBA divers and other coastal users. With approximately 6,500 Historic Shipwrecks located around the Australian coast and along inland waterways, there are many opportunities to visit and explore these reminders of a former age. Many of the sites are associated with sensational stories and sagas, abound in marine life, and are unique in terms of the rewarding learning experience they offer.

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The *Centurion* wreck is already a focus of dive charter operations for those companies accessing Historic Shipwrecks in Sydney's northern suburbs. The frequency of visitation or regular diver numbers is not known, nor are divers' experiences in visiting the site. An opportunity exists to study the visitation cycles, levels of enjoyment, and potential opportunities for raising visitor enjoyment and understanding of the site. One immediate option is the development of a short two-sided Information Sheet featuring the wreck layout and history. These could be included as underwater diving slates by tour operators, and involve a short pre-dive briefing at the site. Issues regarding the archaeology of the site could be presented, increasing diver interest in preservation of the site.

4 METHODOLOGY

4.1 Background research

The NSW Heritage Office has, since 1988, assembled historic reference materials related to the loss of *Centurion*, as part of the NSW *Historic Shipwreck Database*. That information is accessible via the internet through the Heritage Office's *Maritime Heritage Online* web site <http://maritime.heritage.nsw.gov.au>. Researcher Debbie Hardy had also obtained a range of important information on the vessel for her independent survey of the site in 1988/9. A copy of this is available in the NSW Heritage Office.

4.2 Heritage Office site visits

The Heritage Office was aware of the identification of the *Centurion* shipwreck site, popularly visited by SCUBA divers since its discovery in the 1950's or 1960's.

Heritage Office Maritime Archaeologists had previously visited the historic site on *14 May 1993; 18 June 1993, and 25 May 2001*.

In 2003, Heritage Office staff revisited the site on *4 March* and *21 March*, as a prelude to extensive survey operations. A preliminary site sketch was developed and techniques for site survey identified.

The main survey work was subsequently undertaken on a number of days over following months, depending on Waterways Authority boat crew availability, together with the dive team and prevailing weather windows. Diving was conducted on:

13 June 2003
19/20 June 2003
8/9 May 2003
8 August 2003
10 February 2004
13 February 2004

4.3 Survey approaches and equipment deployment

Centurion is a complex archaeological site comprising a range of physical remains and materials. From elements associated with the hull and masts, to potential items of cargo and crew possessions, the site deserves proper analysis and careful interaction. The *Centurion* Project therefore aimed to undertake a detailed non-intrusive assessment of the site in an attempt to try and understand its complexity.

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Site plan

A key focus of the survey was the preparation of a site plan. This enabled visible features to be recorded and an analysis of site layout, materials and major elements to be conducted. The survey was a 'pre disturbance' investigation, where only surface exposed features were examined. The team was conscious that this was only a portion of the probable extent of buried hull and associated relics. Future disturbance of this historic fabric would require standard approvals under relevant legislation, professional supervision, conservation support, funding, etc.

Survey techniques

Several standard underwater survey techniques were deployed in order to generate a comprehensive site 'plan'.

A reference baseline was chosen as the most suitable tool by which to record elements across the generally 'flat' site. The baseline was positioned centrally through the main body of wreckage and fastened to star pickets placed into the sand away from the exposed structure. A tape was secured to the tensioned baseline and extended some 50 meters.

When recording elements of the site, divers employed two main techniques. 'Offset' surveying was used for features located relatively close to the baseline (~0-10 metres). The positions of features were determined by their distance along the baseline and their distance along a line running at 90 degrees to the baseline. The technique was chosen as it is fast and sufficiently accurate for short distances.

Elements positioned further from the baseline, and sometimes affected by water visibility, were positioned using 'trilateration'. The distance of a feature from two different parts of the baseline was recorded using two tapes roughly at 45 degrees to the baseline. By obtaining '3 sides of a triangle' for each 'fix', the results had a greater accuracy.

Photography

Constraints of diver in-water time meant that only the larger features could be surveyed. Finer details and relative associations of objects were added to the master plan through detailed photography. The entire wreck site was photographed in plan view with another diver moving a scaled grid and ranging poles between frames. This provided a convenient scale reference when tracing details from these photographs into the tape survey plan.

Video and general still photography was also used to capture the appearance of the wreck and to obtain additional details of key features. A photographic panorama of parts of the site was also obtained using a specially developed camera monopod. All still photography was undertaken with Nikonos V cameras fitted with 15mm lenses.

4.4 Composition of the team

The team comprised David Nutley, Maritime Archaeologist (*Centurion* Project Manager) and Tim Smith, Maritime Archaeologist, both from the NSW Heritage Office. The Department of Commerce (Manly Hydraulics Laboratory – *formerly DPWS*) diving support team comprised Colin Browne and Phil Clark. Additional specialist assistance was provided by the Australian National Maritime Museum's Maritime Archaeological staff and equipment - Kieran Hosty, Paul Hundley and Lee Graham. Underwater photography was supplemented by renowned underwater photographer Dr Mark Spencer.

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The dive platform was supplied by Waterways Authority of NSW under the direction of Leslie Brix-Nielsen, and crewed by Waterways Harbour Environmental Services staff.

4.5 Constraints

Weather and sea conditions

The *Centurion*, located adjacent to the Sydney Heads is exposed to all sea and swell activity from the south to south-east. At times, heavy rollers sweep across the site making diving conditions turbulent and visibility poor.

Generally winter westerly winds produce the best diving conditions for the site. Periods of heavy rain, run off from the harbour shore, and particularly from the Parramatta River, can significantly reduce visibility. During the present diving operations, visibility variations ranged from 0.5 metres to 30 metres+. The site is also subject to variations in water density with haloclines visible when surface rainfall layers overlay denser saline waters.

Diving Operations

The *Centurion* lies at an average depth of 19 metres. At this depth, it is accessible by the majority of recreation divers.

The current survey operations were undertaken within the Workplace diving regulations administered by NSW Workcover Authority. These require commercially trained divers to operate under the Australian Standard AS2299 training code using the approved DCIEM air tables. Each diver conducted one (1) to two (2) dives per day, the first of 30 minutes duration, with a 1 1/2 hour surface interval, and the successive dive limited to 25 minutes. In order to undertake substantive site measurements and photography, a number of return visits were made to the site. Divers were tethered to the surface for the majority of dives, with surface support comprising boat crew, standby diver, diver supervisor and dive tender.

Vessel traffic

The *Centurion* wreck is located close to the Sydney Harbour ferry routes between Circular Quay and Manly Wharf. As such, boat anchoring and diving operations required contact with the Harbour Master in order to advise vessels of the survey operations.

The survey team noted illegal motor boat traffic within the 100-metre exclusion zone around its displayed dive flag (blue and white) on several occasions. This activity signifies a degree of unfamiliarity with current boat rules by some small boat users and is a factor to be considered by dive visitors to the site.

Past activity at the site

As detailed below, early diving activity at the *Centurion* wreck site has resulted in some site disturbance and an unknown level of artefact removal. This activity has had an impact on the full archaeological potential of the site.

Non-disturbance archaeological survey

The 2003-2004 survey operations were undertaken as a standard 'non-disturbance' archaeological exercise. Only exposed and therefore visible portions of the wreck site were mapped and recorded. At no stage was the overburden of protective sand removed from any portion of the site. The depth and complexity of buried portions of the hull and fittings was not explored, other than through a limited probe survey.

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This approach avoided direct disturbance of archaeological materials as well as associated accelerated deterioration. It has retained relics, large and small, from their original context and retained the research potential of the site. A survey that involved recovery of artefacts would require approval of an archaeological permit under s139 of the NSW *Heritage Act* 1977. It would also require a tight network of control points to measure and track shipwreck and artefact associations, substantial conservation and laboratory support, archaeological supervision, and provision of ongoing storage, identification, research and display.

The 'non-disturbance' approach used by the Heritage Office has advanced the protection of the site while allowing quite complex evaluations to be made. In the event that site conditions do change and new parts of the site are exposed an extension of survey operations can be undertaken.

Research

Available research sources included newspaper clippings held by significant repositories such as the Mitchell Library in Sydney. In terms of the vessel, primary source data was located in registry records such as the Lloyds Register of British Shipping and personal family archives maintained by the Donald Family in Aberdeen, Scotland (summaries of much of this information is available the Heritage Office's Maritime Heritage Online web site <http://maritime.heritage.nsw.gov.au>). Pictorial material was restricted to a single etching as published in a contemporary Sydney paper, a copy of a painting also held by the Donald family, and copies of original building plans. Generally it can be noted that relatively few historical documents survive through which to interpret the history of the site. Hence, the physical record of *Centurion* as it exists on the seafloor, is extremely important as a record of the vessel's construction and fitting-out.

5 THE PHYSICAL SETTING

5.1 Sydney Harbour and environs

Port Jackson (Sydney Harbour) is a world renowned waterway that provides a natural harbour for the passage of watercraft. However, due to a variety of factors, a significant number of vessels were wrecked or damaged in shipping accidents within its boundaries. Depending on where an incident occurred, a vessel could have been recovered, partially salvaged, or totally lost to the actions of sea, swell and physical collapse. However, due to the fairly shallow nature of the waterway (generally averaging between 15-30 metres in depth), many sites can be readily accessed by SCUBA divers.

The deepest parts of the harbour only extend to approximately 40 metres in discreet areas. In most areas, the harbour bed is composed of sand sediments that can be mobile. This mobility can assist in the burial of shipwreck structures. Mobility however can also mean that sites can be periodically exposed through temporary movement of sand cover. Exposed timber elements are then reduced through the activity of marine organisms such as Toredos worms. In contrast, predominantly buried timber sites can retain a level of structural integrity.

6 LEGISLATIVE CONTROLS

Underwater cultural heritage sites and remains in Sydney Harbour are covered by the provisions of the NSW State *Heritage Act* 1977. The *Centurion* is a protected Historic

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Shipwreck under Section 48 of the Act, and is also covered by the archaeological relics provisions as set out in Section 139. Disturbance to the site is an illegal activity under the Act and substantial fines and/or jail sentences are applicable.

6.1 Heritage Act, 1977

The NSW *Heritage Act* 1977 is state legislation administered by the NSW Heritage Office. The relics provisions of the Act cover the entire extent of the State, and extend to the waters of the State. Any archaeological remains over fifty (50) years of age and related to the settlement of NSW within the land of New South Wales (including land under water), is protected from disturbance. An approved Excavation Permit is required to be issued by the Heritage Council of New South Wales prior to the recovery of archaeological materials, or in cases where excavation might likely disturb buried archaeological sites and deposits.

While the relics provisions of the Heritage Act apply to shipwreck sites, a shipwreck site is also protected under this Act as an *Historic Shipwreck* if it situated in State waters, or otherwise within the limits of the State for seventy five (75) years or more (Section 48). A *Historic Shipwrecks Permit* is required prior to disturbance of a site, including disturbance for archaeological recording, recovery and display (Section 51). Such a permit would be granted only if the research or educational benefits of disturbance is identified. This would normally require and Archaeological Assessment of the site, a developed research, conservation and management plan, and the support of associated interest bodies, including council, relevant government agencies and Aboriginal Land Councils, where applicable.

7 THE SITE – ITS HISTORY

7.1 Centurion

The *Centurion* (1887) forms one of the most interesting shipwreck dives in Sydney Harbour.

An earlier Ship named *Centurion* had traded to Australia for George Thompson's *Aberdeen White Star Line*, also built by Walter Hood & Co in 1850.² Another Australian-built timber schooner named *Centurion* was built in 1863, and later wrecked ashore at the Brunswick River in 1875.

When their namesake *Centurion* (built 1869) was lost in Sydney during 1887 it was described as a barque (sailing vessel square-rigged on two of three masts). The vessel was a well-known visitor to Sydney having been a regular trader “for the last seventeen years” (*Sydney Morning Herald*, 17 January 1887). With a length of 63 meters (208 feet) and tonnage of 965 tons gross, the vessel had been built in Aberdeen, Scotland, in 1869 (Official Number ON2457). *Centurion* was built in the yard of the famous Aberdeen shipwright Walter Hood for George Thompson & Co.'s *Aberdeen White Star Line*. As noted, it was the second vessel of that fleet to be so named.

² An advertisement for a departure by this *Centurion* can be found in the *Sydney Morning Herald*, 3 July 1857, where the vessel is described as “the first class Aberdeen clipper ship”.

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The Walter Hood & Co. yard had previously built the *Fame* (built 1840), *Walter Hood* (built 1852) and *Queen of Nations* (built 1861), all wrecked in NSW. In 1862, prior to *Centurion* and these vessels being built, Hood had died in a harbour accident at the age of sixty (Mawer, 1994; 58).



Figure 5: Oil painting of *Centurion*.
This view depicts the vessel in its earlier 'clipper' ship configuration.
Courtesy: Mr Andrew Donald, Aberdeen.

Centurion had originally been built as a full-rigged ship (MacGregor: 1988; 151), and was finished within a year of the yard's most famous 'extreme' clipper, *Thermopylae* (launched September 1868). That vessel, also built for George Thompson & Co., became famous in celebrated races against its rival, *Cutty Sark*, in the China tea trade and later the Australian wool trade (see Matheson: 1984; 29ff). A painting in possession of descendants of the first captain, Thomas Mitchell, shows *Centurion* as built, with a plethora of sails, hallmarks of these, the fastest sailing ships ever built at that time.

Lubbock provides an indication of the acclaim with which the Aberdeen White Star Line was held, "*no ships that ever sailed the seas presented a finer appearance than these little flyers. They were always beautifully kept and were easily noticeable amongst other ships for their smartness; indeed, when lying in Sydney Harbour or Hobson's Bay with their yards squared to a nicety, their green sides with gilt streak and scroll work at bow and stern glistening in the sun, their figure heads, masts, spars and blocks all painted white and every rope's end Flemish-coiled on snow white decks, they were the admiration of all who saw them*" (Lubbock: 1921: 111).

The *Centurion* witnessed many years of blue ocean international trade and travel, its maiden voyage being under command of Captain Thomas Mitchell (MacGregor: 1988; 151). Descendants of Captain Mitchell hold important archival material related to his time in command, including private letters on the vessel's initial performance. These were obtained from Dr Robin and Helen Donald of Aberdeen, Scotland, and have previously been included in an important work on the *Aberdeen White Star Line* (Carnegie: 1991).

Captain Thomas Mitchell was an old hand at the Aberdeen White Star Line, having previously had command of *Phoenician*, *Transatlantic*, then the newest Ship, *Queen of Nations* in which he sailed for seven years (1861-1868). It was in 1869 that he was given command of the company's newest edition, *Centurion*, on its maiden voyage to Australia that year.

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Initially, Captain Mitchell (1832-1870) was disheartened by the first voyage of *Centurion* during the trip from London to Sydney.

In a letter to Captain Edward he commented:

My dear Captain Edward

In case I should drop across a homewards bound ship near the Equator, I sit down to let you know how we are getting along we passed the Start on Sunday 27th June, early. The wind freshened at East to a brisk breeze, 8 knots, which we carried for three days. Here I was disappointed in the Centurion's sailing power, with the wind aft several common bluff bowed ships almost kept up, and one of those white painted French ships, which you must have come across, came up and went out of sight ahead, during the day, us with skysails set and study-sails on both sides, as many as we had. Evidently she is not going to do much with a running wind. We lost the fair wind in 40° N and got a southerly one. On a wind, we came up and passed all the ships in sight, but as soon as we got the wind aft again, some of the ships we passed came up and passed us again³.

Also of disappointment was the final fitting out of the vessel at Hood's yard, where Captain Mitchell lamented the lack of certain equipment and spares:

We found after coming away to sea many things wanting, especially the study-sail gear. Before we got the skysails and study-sails set, all the spare rope we left Aberdeen with was used up, with the exception a piece 2 ½ ". Now this is too bad. I wrote twice to Mr Burgess, but he did not think fit to answer either of the letters, so that he will write me before I write him again. I would advise the next Captain who goes to Aberdeen to look after a new ship, to have every sail set, or see that they are fitted before she leaves. We went away in too great a hurry but it is the old story of marry in haste and repent at leisure.

Of equal concern was the assessed competence of *Centurion's* First Mate, who proved a continual disappointment:

I am not at all pleased with my Mate – he is, without exception, the greatest booby I ever saw on a ship's quarterdeck. He has never been able to work a chronometer sight for me, and not even a course and distance by any of the sailings I have given over talking to him about his work now. I have got tired over it. But I still make him work the sight in his own way, also the day's work – which takes him the whole afternoon to do – and put the work in my cabin. I mean to keep them for curiosities in Navigation. My Second Mate cannot work a sight, or a course and distance either. He has a Mate's Certificate. So you will observe, I am well off for Navigators. I would not care for that if the Mate had only any idea of keeping ship in order; but he expects me to look after all ship keeping affairs and tell him what to send the hands about.

Captain Mitchell continued his concerns for *Centurion's* seagoing capabilities during the inaugural trip in a letter⁴ to his wife Mary from onboard ship:

Well, darling, the more I see of the Centurion the more I am convinced the 'Queen' (ie Queen of Nations) would beat her. I am very much annoyed at this as everyone expects she is going to do such wonders. I can't understand it myself. I never saw but one ship go past the Queen the whole eight voyages I was in her but I have already seen several go past the 'Centurion'.

These comments were repeated in a letter⁵ to a Mr Greig who was presumably a Shipwright or affiliated with the building yard:

³ Letter Capt Thomas Mitchell to Captain Edwards. Courtesy: Mr Andrew Donald, Aberdeen, Scotland.

⁴ Letter from Capt Thomas Mitchell to his wife Mary from aboard *Centurion* on maiden voyage in 1869. Courtesy: Mr Andrew Donald, Aberdeen, Scotland.

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To Mr Greig, Dear Sir

In your letter to me in London you wanted most particularly to know all the good or bad qualities of the Centurion. Of course, at that time, I could not say much either way, but now that I have had a trial at her, I am better able to tell you (No, you must not be astonished when I tell you that **she is not going to be an extreme clipper**).

After leaving London, until the pilot left off Torbay, we had nothing but calm and light airs to contend with, but he was no sooner gone that a gentle breeze sprang up from the North, and hauled into the East. Of course, I would take advantage of this change and got studdysails and skysails to work. But fancy my disgust next morning, to see alongside of us, a North American square box, called the Eastern Empire, almost keeping up with us. Then we came up with a small barque carrying no royal or study-sails and we certainly did not sail a knot an hour faster.

But my greatest disappointment that day was to see a French ship come up and go out of sight ahead before dark. This is all with a running wind, smooth water and all possible sail. A few days later we got a head wind and certainly she seemed to go along a little better, but we could not hang the wind like the other ships I have tried her with all the staysails down, and that makes a little difference when she is close hauled. Off Madeira we fell in with a bluff bowed Dutch barque who kept alongside of us all day, with a brisk breeze going 8 knots close hauled. She not only kept alongside of us but weathered on us. I would not have expected that, as she was in ballast.

Now my dear fellow, you must not get downhearted at this – you wanted me to state all the Centurion's good or bad qualities, and taking them in rotation, the first is the worst. We were detained about the Line and North of it, it being the worst season of the year to cross over to the Southern Hemisphere, and to make things still worse, the SE trades hung so far to the south when we did get it that I was forced over to the coast of Brazil, when we had to beat down along from Cape St. Roque to Bahia, before I got a wind to clear the coast. **The 'Centurion' almost broke my heart.** I fancied when we got the wind anyway forward, she would go along, but she never went more than 8 ½ knots all through the NE trades, and that was as much as she could stand up to with all sails. I am sure the Queen of Nations would have licked her there.

However on the 3^d August we seemed to get clear of all our difficulties, for the wind shifted into the NE and I was perfectly astonished, with little wind, to find she was going 10 knots. Judge to my surprise the next day, with the wind the same way on, a little stronger, she was going 11½ and 12 and from what I have seen since **the wind from abeam to 3 points always is her wind.** If it goes more forward or aft she does not sail so fast. You will see, by the enclosed copies of my log, her distances each day. **I have been quite delighted with her since leaving the Brazilian coast.** There has been such a difference from 8 to 13 knots.

She is a fine sea boat everywhere but aft and there you ought to get some alteration. In a breeze aft I can't get the men to stop at the wheel. You ought to carry the House right aft. It would not be 5 tons more weight on the ship and she would sail equally as fast. We lose a great deal by bad steerage in a breeze. They say there is nothing to keep them in and it takes them all their time to look aft themselves (ie: from waves breaching over the stern).

We have had no time to speak of to try her yet, but I have no doubt when we get a breeze she will go along, especially if it comes anyway about beam. She is quite stiff – sits as upright as a church and is a very handy ship to work – I mean about the deck. In stays, she is rather slack – but she is a long ship Two or three turns of that splendid pump soon throws that out. Your patent water preventer I can say nothing about, as on the passage up to London we never had occasion to have it on, neither coming down Channel, but I have no doubt it will do very well.

⁵ Letter from Capt Thomas Mitchell to a Mr Greig from aboard Centurion on maiden voyage in 1869. Courtesy: Mr Andrew Donald, Aberdeen, Scotland.

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An extract from Captain Mitchell's personal notebook on this inaugural voyage includes some insight into the running of a vessel of this size, and also an historical insight into particular requests for exotic items from the southern hemisphere ⁶:

Rough notes on taking over Centurion 1869 - from Captain Mitchell's notebook
To get from Sydney-
Tree ferns
Stag horn ferns
History of Australia for Mr Duncan
Small bamboos for fishing rods
Church chair for Poop

Centurion arrived in Sydney after 79 days on 10 September 1869, which "while not a record, was equal to some of the best passages of this period" (Watson, 1915: 3929).

Captain Thomas Mitchell tragically died on his second trip on *Centurion*, during its return voyage to England in 1871. He was accompanied on this trip by his wife and family, when 75 days out from Sydney, he suffered a stroke (Carnegie: 1991: 68).

The progression of captaincies aboard *Centurion* and its sailing and cargo record for the intervening 16-year period (1871-1887) has yet to be examined in detail. It is known that Captain Thomas Taylor took over the vessel for its third trip (Watson, 1915: 3987), while *Centurion* was involved in a collision with the steamer *Agnes Irving* in Sydney Harbour on 8 December 1874 ⁷.

Towards the latter part of its life, the vessel had been transformed into a bulk cargo carrier – a collier, carrying thousands of tons of coal around the world's ports. The date of entering this phase of operations is presently unknown. Port arrival information⁸ confirms the following visits by *Centurion* to Sydney, although this list is not complete:

10 September 1869; 22 April 1870; 22 July 1870; 2 June 1871; 6 July 1872; 5 September 1873; 7 July 1874; 20 June 1877; 26 September 1878; 12 October 1879; 22 February 1881, and 15 January 1882.

7.2 Wreck event – 1887

It was on one such trip in 1887 when departing Sydney under tow out of the Heads for Honolulu, when it got into difficulties. *Centurion*, was then under command of Captain Charles Taylor and on a voyage from Sydney to Newcastle, then Honolulu with coal. Prior to obtaining the full consignment of coal at Newcastle, *Centurion* already had 400 tons aboard and some 60 tons of ballast (stone). Under tow of the Brown Brothers' tug ss *Phoebe*, *Centurion* left Walker's Wharf, Dawes Point, at 1.00am on 16 January 1887 (*Sydney Morning Herald*, 17 January 1887).

Weather conditions were poor with heavy southerly winds. When the vessel's reached the harbour entrance they deteriorated further. A very heavy rain squall had descended upon the vessels when they noticed another barque anchored between the Heads. This proved

⁶ Stuart Read, heritage landscape specialist, NSW Heritage Office, advised that these 'exotica' were of great interest/high fashion for Victorian conservatories. Pers.com. 5 May 2004.

⁷ *Marine Board of Enquiry* Report: 2/10541 State Records of NSW, Kingswood repository.

⁸ Shipping Masters Office: Index to Vessels Arrived 1837-1900. State records of NSW. AO Reel 2502.

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to be the *Manhegan* at emergency anchor with its tug, the *Young Bungaree*, keeping strain on the tow cable.

Phoebe's master, Captain Sutherland, got too close to the *Manhegan* and during evasive procedures, the tow rope was slackened. *Centurion* began moving away under its' own momentum. Sutherland decided to stop engines and go astern to avoid collision. The *Centurion*'s tow rope fouled *Phoebe*'s propeller, was cut, and the vessel Drifted towards North Head. Captain Taylor aboard *Centurion* realised the absolute danger and ordered one of his anchors deployed. Sixty fathoms (110 metres) of chain was run out but it failed to stop the vessel. *Centurion* crashed into North Head "between the inner and outer North Head, near the Old Man's Hat" (*Sydney Morning Herald*, 17 January 1887).

The vessel lay broadside to the cliffs riding hard from the mainmast (amidships) to the stern. Masts and spars began to strike the cliff walls, and the hull ground against the rocks. Suddenly the vessel rolled over "on her beam ends".

The Pilot Steamer, *Captain Cook*, which had come out to the assistance of the *Young Bungaree* and *Manhegan* stood by while two boats were lowered from the *Centurion*. With *Centurion* pointed seaward, the boats got under the bow and the crew jumped in between waves and swell. [Check this – DN]

Phoebe managed to attach another tow cable and pulled *Centurion* off into calmer water but the vessel soon sank inside Cannae Point in 19 meters of water (*Illustrated Sydney News*, 15 February 1887. Captain Taylor was last to leave, just as *Centurion* "gave a huge plunge forward and disappeared beneath the waves" (*Sydney Morning Herald*, 17 January 1887). Nothing could be saved in the short time available, and the crew was taken back to Sydney.

Described as "particularly unfortunate!" (*Illustrated Sydney News*, 15 February 1887), it was Captain Charles Taylor's first command of *Centurion* after its regular Captain, Thomas Taylor, stayed in England due to ill health (*Sydney Morning Herald*, 17 January 1887).

Today the remains include a substantial portion of the hull (buried), deck frames, sections of the masts, anchor chain and other fastenings.

7.3 'Composite' Construction

One of the single most important research questions that can be asked of *Centurion* is its construction during developments in 'composite' construction techniques. This unique period in large vessel construction lasted but a short time but was a pivotal link from the changeover of all timber-built sailing and steam vessels, to all iron (and later steel) vessels. The style is most known within the 1860's-1870's period, although it is worth remembering that experiments with iron components had been around since the early decades of the nineteenth century.

Noted maritime historian David MacGregor acknowledged that *Centurion* was one of only three (3) ships built in the Aberdeen yard of Walter Hood & Co. that witnessed this hybrid construction (*Thermopylae, Centurion and Charles Chalmers*⁹ - MacGregor: 1988; 151).

⁹ Although Mawer identifies another, *Thyatira* of 1867. Mawer: 1994; 73).

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This is supported by Basil Lubbock in his important work (Lubbock, 1921: 110), who also includes the *Aviemore* in this list.

It is interesting to note that the same year *Centurion* was built (1869), the Walter Hood yard launched its first all-iron sailing vessel for the company – the *Patriarch* (Watson, 1915: 3930). In 1870, *Aviemore* became the last of the wooden ships built for Thompson's (Lubbock, 1921: 116).

Only seven coastal sailing vessels are known to have been wrecked in NSW's waters that showcased this style of construction (apart from the traditional paddle steamers that operated on the inland rivers').

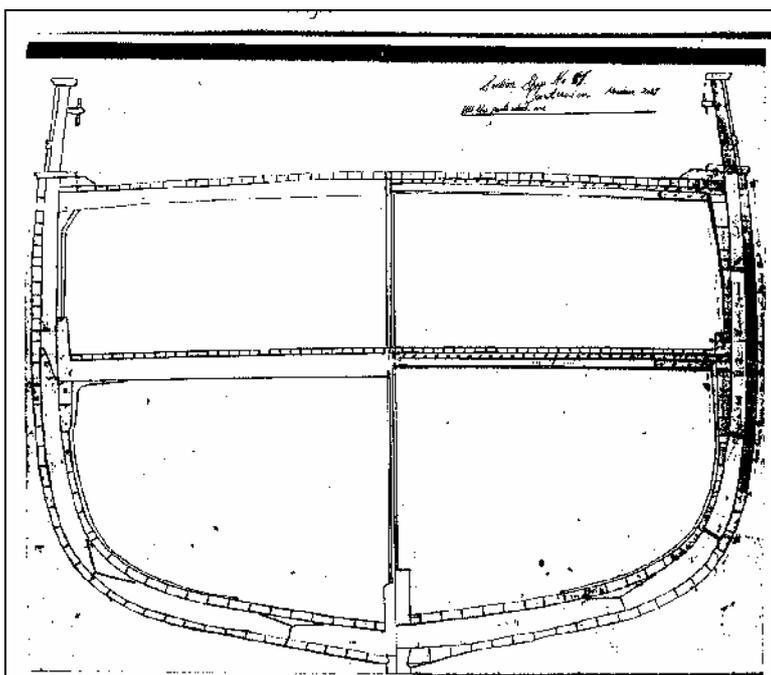


Figure 6: Original cross-sectional drawing of the *Centurion*. This view shows the main elements of hull layout, including two decks, timber hull frame and planking, but with addition of iron deck beams and supports. Original in possession of National Maritime Museum, Greenwich, United Kingdom. Copy obtained from Debbie Hardy.

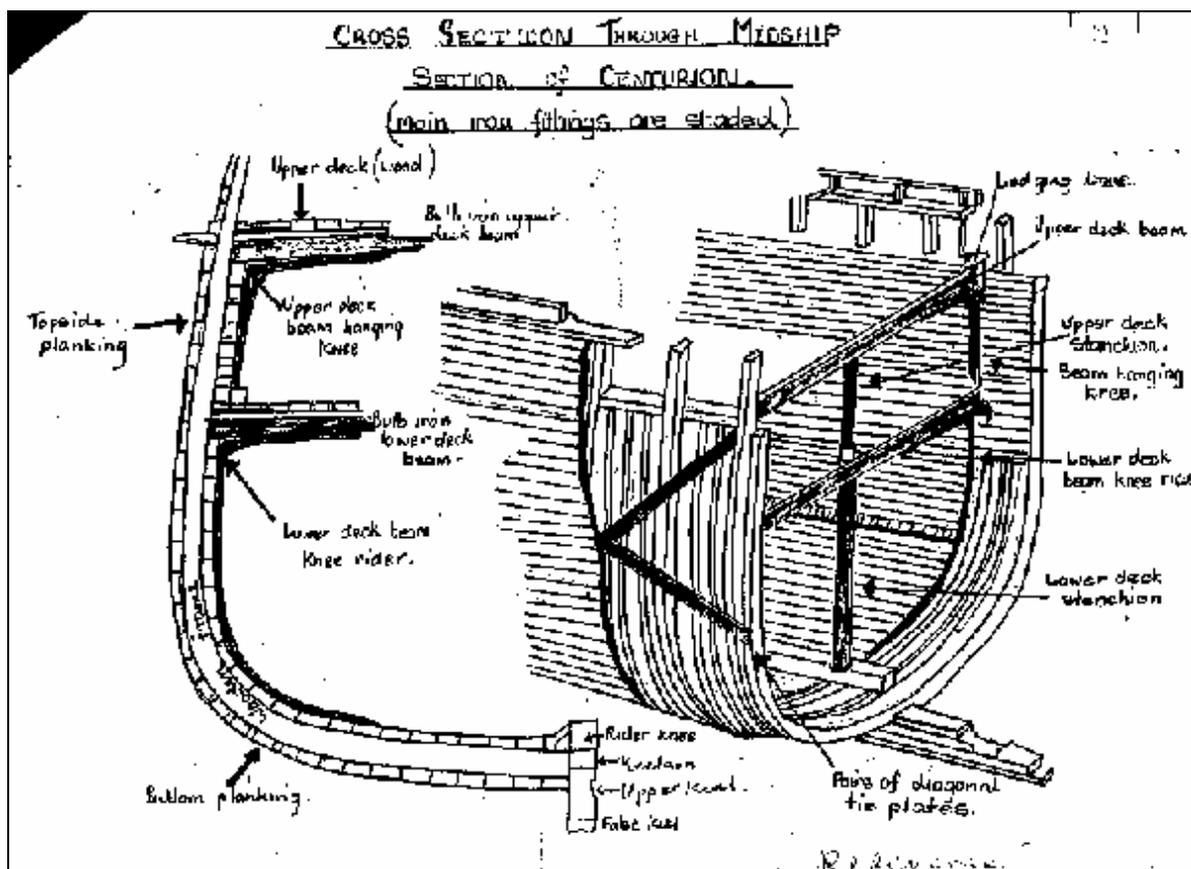


Figure 7: Useful interpretation of the main elements of *Centurion's* hull. This drawing, from the research notes of Debbie Hardy, is adapted from one of several published examples of hull cross-sections.

Centurion, it has been argued, is not a 'composite' vessel in that it did not possess iron frames within its hull (Hardy: 1990; 31; and Haug¹⁰). This is technically correct, while noting MacGregor's and Lubbock's contention that it did fit within this style. There were certainly variations in construction techniques at this time within a single yard, and across the major building centres in England, Scotland, and overseas. A yard could be producing standard timber sailing vessels alongside all iron vessels.

An explanation for *Centurion's* design differences might be explained by the expense of building large sailing ships, with some yards employing the new technologies in full (eg iron frames, deck beams, deck supports, diagonal braces, fastenings like knees, and iron masts), while others chose to use elements of these features within more 'traditional' timber hulls.

Centurion boasted the innovative integration of iron deck beams and supports (stanchions) instead of the standard timber.

The composite construction techniques strove to provide rigidity and greater space saving by employing the new wonder material - iron, en masse. *Centurion's* lower main and foremast were now also of riveted iron, together with lower sail yards.

¹⁰ Letter Ron Haug to Tim Smith, Pers.com, 22 March 2004.

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Further, its (still traditional) timber framed and planked hull was strengthened by the fitting of 24 pairs of diagonal iron cross straps along the vessels length – sometimes heralded as a marker of composite construction, as were iron hull frames (Haug argues contrary, noting that this strapping technique was employed in standard vessels as early as the 1840's).

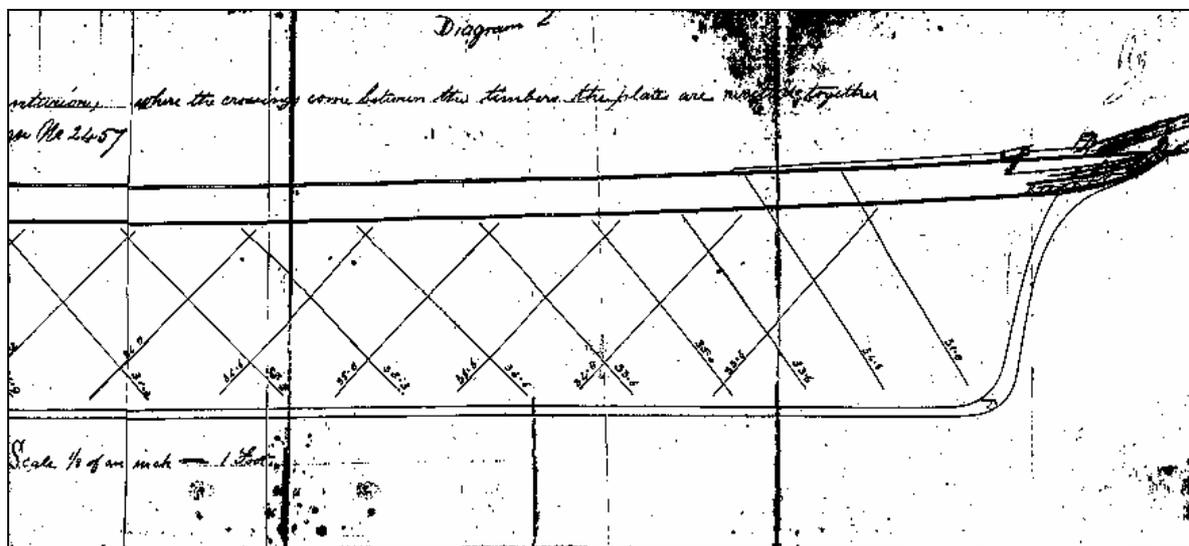


Figure 8: Copy of original survey diagram.

This drawing formed an attachment to the official Lloyds Building Survey Report. This shows the location of the diagonal iron strapping along the hull and details of bowsprit configuration. Original in possession of National Maritime Museum, Greenwich, United Kingdom. Copy obtained from Debbie Hardy.

Details of these novel techniques have come down through the surviving British survey Report required by Lloyds of London and some plan drawings. However, it is to the wreck site today that we can appreciate first hand, the scale of these fittings and their employment within the ship.

There are a few extant surviving examples of full composite ships; they include the clipper *Cutty Sark* (built 1869) and *City of Adelaide* (built 1864), and the Royal Navy Sloop H.M.S. *Gannet* (built 18VV).

Although the world's first iron ship was built in 1819 there was a brief period around 1860 to 1880 when hybrids were built with iron frames and wooden planking. These composite construction ships were fast, light and had good cargo-carrying abilities. Their design and construction was largely experimental in nature, and the ships were expensive.

Nonetheless, they were successful, being built by high quality yards, and served well in high quality and profitable markets. They represent a peak in the innovative skills of the ship-builder.

The *Lloyds Building Survey Report*¹¹ noted specific elements of *Centurion*'s construction:

The vessel is built of good and sound materials fastened with treenails, yellow metal and galvanised iron bolts and dumps built under a waterproof roof..... has 25 pairs of diagonal plates let in outside frame 5 x 12/16ths extending from upper deck beams to beyond the floor heads and where they cross are riveted together. Has a rider keelson of Greenheart fitted and fastened as per Rule Section 39. The deck beams are formed of bulb iron 8 x 10/16 with angle bars

¹¹ Lloyds Building Survey report, *Centurion* 1869. National Maritime Museum, Greenwich, United Kingdom.

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on upper edge 3? X 3 x 6/16 with stringer plates on their ends 30 x 9/16 the hold beams are formed of bulb bar 9 x 10/16 with angle bars on upper edge 3 x 3 x 8/16 with stringer plates on their ends 22 x 10/16 the masts fore and main are iron formed of 4 plates 7/16 thick, lands? double clenched, butts double and treble riveted. The fore and main lower yards are iron formed of 2 plates The vessel was launched 28 April 1868.

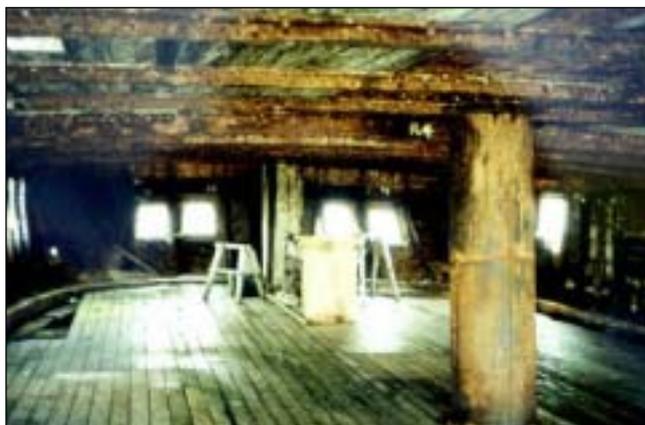


Figure 9: Internal view of the clipper *City of Adelaide*.

This is one of a few composite ships to survive in the world today. The iron deck beams, iron mast between decks and traditional timber decking and sides would have looked very similar to *Centurion*. Image source: http://www.sunderlandmaritimeheritage.com/ad_current.htm

Further, the survey report notes that the deck beams length amidships was 32 feet. 36 hold beams. The floor timbers were of Baltic Oak, the first futtock of the frames Baltic Oak, the second and third futtocks (sections within each frame) of Baltic Oak and Larch, the main piece of rudder Greenheart, the windlass of Teak, the stem and sternpost of Baltic Oak, keel of English Elm, the deadwood of American and Baltic Oak, deck and hold beams of bulb and angle bars, breast hook of iron, knees of iron. Planking outside: keel to first futtock heads is American Elm, from there to the wales was Pitch Pine, wales of Baltic Oak as were the topsides, with sheer-strakes of Greenheart. The decks were of Yellow Pine.

Fastenings to the hold deck beams included 32 pairs of iron hanging knee riders, two pairs of iron hanging knees, two pairs of iron lodging knees and two pairs of bilge straps. Upper deck beam fastenings included 36 pairs of iron hanging knees and three pairs of iron lodging knees.

7.4 Early disturbance

Anecdotal evidence suggests that the *Centurion* shipwreck site was located early during the period of pioneer SCUBA diving explorations in and around Sydney. Author Tom Byron stated in 1985 that the site “*is somewhat of a scavengers paradise. Much is below the sand and many craters are evident of divers’ digging in the hope of uncovering some valuable artifact*” (Byron: 1985: 202).

Recreationally available diving gear started entering Sydney during the early 1950's and was a direct result from the extensive military use of diving apparatus in World War Two. These early divers often experimented with their own modifications and enjoyed unparalleled control over underwater shipwreck sites, previously only the preserve of spear fishermen. While most key sites were probably known to the latter group, divers opened up new insights into the extent of material lying on the seabed, through their recovery of relics for private collections or for monetary salvage value.

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It was during this period that significant sites like the *Dunbar* (1857) at South Head were first visited, together with the *Catherine Adamson* (1857) on North Head and *Edward Lombe* (1834) on Middle Head. It is probable that *Centurion* was also visited during this formative period (1950's-1960's), although details have not been determined.

It is known that the majority of sites suffered significant damage at this time due to the wholesale removal of artefacts and quite common use of explosives to dislodge wreck material for recovery. This activity was prior to the introduction of heritage legislation to protect underwater sites. At this time, the community did not fully appreciate that Historic Shipwrecks were an irreplaceable cultural resource that demanded protection, preservation and disturbance only for scientific-based research.

It is therefore difficult today to know the extent of disturbance to the *Centurion*. Documented activity is very limited but includes the recovery of an iron Admiralty pattern anchor and chain in the 1980's (now retained for display at the NSW Water Police Headquarters at Balmain and currently undergoing conservation treatment by NSW Waterways Authority), collections of relics said to have been removed from the site and reported during the Commonwealth Historic Shipwrecks Amnesty (1993-1995), and diver's reports of underwater dredge hoses being visible on site. Each phase of this activity has lessened the archaeological value of the site and divers appreciation of the once pristine wreck.

7.5 Previous Research

It is perhaps surprising that one of the most visited Historic Shipwrecks in Sydney, and one of the few located sites within Port Jackson, has received such little formal assessment and recording. It has no doubt suffered from its own familiarity.

In 1988 the site was subject to the first recorded detailed surveys. This work was undertaken by the (then) Maritime Archaeological Association of New South Wales (MAANSW). The ensuing report by club member Debbie Hardy (Hardy: 1989), stands as the only published work on the archaeology of the site.

The NSW Heritage Office, through its Underwater Heritage Program, had visited the site in 1989, 1991 and 1993. These preliminary dives aimed to familiarise staff Maritime Archaeologists with the complexities of the wreck. Ten years later in 2003 and with the support of the Waterways Authority, the Heritage Office embarked on the current survey which aimed to establish a definitive site survey plan, with a detailed archaeological assessment of the surviving fabric and appreciation of the significance of the site.

The Office had been building up to this work with the examination of three other vessels wrecked in NSW and built by the same Aberdeen shipwright's yard as *Centurion*: *Fame*, *Queen of Nations* and *Walter Hood*. These studies were completed in 1991.

8 CURRENT FIELDWORK RESULTS

8.1 Location

The wreck site is located in 18-19 metres of water at GPS position:

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33° 49.0566' S / 151° 16.8633' E / WGS 84.

The exposed portion of the wreck site extends for approximately forty metres by fifteen metres.



Figure 10: View of the survey team preparing for the archaeological inspection.

The work platform was provided by the NSW Waterways Authority for the duration of the survey operations. Photograph by Tim Smith.

8.2 Environmental context

The *Centurion* wreck site lies on the harbour seabed within the North Harbour Aquatic Reserve managed by NSW Fisheries¹³. The bottom topography in this region is composed of clean sand that forms a fairly flat profile. The wreck site structure is partially exposed above the sand level, although a substantial portion of the site is known to be buried within this deposit to an unknown depth. A gentle probe survey of specific areas determined buried structure at least to 1.7 metres beneath then current sand levels.

The area has been partially surveyed by the Department of Defence during sidescan sonar trials and data compilation for a variety of defence needs. In February 2004¹⁴, the Heritage Office approached the Defence Science and Technology Organisation (DSTO) for any suitable sidescan imagery potentially collected over the *Centurion* wreck site. Unfortunately, only general wide area data had been obtained at the time which did not delineate the wreck site.

8.3 Discussion of survey results

The Archaeological footprint - a chameleon?

The *Centurion* wreck site is a chameleon - while some features like the scattered mast fragments, ballast and chain are always visible, much of the underlying structure is revealed at the whim of shifting sand cover. Being located adjacent to the Sydney Heads,

¹³ http://www.fisheries.nsw.gov.au/mpa/ars/ar_north_harbour.htm

¹⁴ Les Hamilton at DSTO Pers.com 20 February 2004 to Tim Smith.

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sand movement across the wreck is highly active, although generally uniform. A visit after storm and sea activity can expose 'new' sections of underlying timber structure, or alternatively, bury previously identified features of the site.

How much of *Centurion* is left?

The visible portion of wreck structure evident during the 2003-2004 survey covers an area approximately 45 metres long by 20 metres wide. The vessel when lost was 63 metres long (208 feet) and 19.8 metres wide.

Key elements include the pile of anchor chain (measuring approximately 7x4 metres), a concentration of ship's ballast stone (measuring approximately 11x5 metres), a metal mast with tennon joint (3.70 metres in length, diameter of 75 centimetres), a metal mast section protruding through a metal deck support plate (mast surviving length of 1.70 metres and diameter of 75 centimetres), and off the site, two crossed sections of upper masts, one complete with a crows-nest support (these sections measure 9.8 and 2 metres in length).

This suggests that a significant portion of the wreck still lies buried to depth beneath the sandy harbour bed. This conclusion is supported by the form retained by the substantial piles of anchor chain and ballast stone - ie they must be supported by underlying wreck structure. It was evident that the 1988 survey by MAANSW witnessed significant sections of the ship, not visible during the current 2003-2004 survey.

Hull timbers

As noted in the previous section, it is clear that substantial portions of *Centurion's* very lower hull survives beneath the sand and is always buried.

Towards the extreme 'northern' end of the wreck site is an isolated area of ship's timbers. These comprise a section of the hull measuring approximately 7x2 metres which retains portions of 9 strakes of planking. From the orientation of the underlying ~ 17 timber frames, this planking must be external 'outer hull' planking.



Figure 11: Maritime Archaeologist Tim Smith surveying the exposed section of timbers.

Sand movement can alternatively bury or exposed such features where sand cover is light-moderate. Note the degraded nature of timber exposed to marine organism attack and oxygenated water. Photograph by Mark Spencer.

The planking varies in size but ranges up to 18-20 cm (7-8 inches) in width. Based on the survey report, this makes it external hull planking, which while generally between 4 ½ - 5 1/2 inches across (11.5 - 14 centimetres), utilised broader planks in certain areas such as the lower hull garboard strakes (ie those next to the keel). The external hull planking comprised American elm, Pitch Pine and Greenheart.

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The larger sectioned frames average 32 centimetres wide (12 ½ inches) on their upper surface, matching the details provided in the Lloyds Building Survey Report for 1st and 2nd futtocks of each frame. Timbers used in this section of the frames include Baltic Oak and Larch.

Buried, but just visible between some frames, is the inner hull ceiling planking, upon which this section sits. It was on this ceiling planking or 'skin' (reported to be Tamarac or more commonly, Larch) that cargo could be placed.

The timbers are partly secured to each other by copper-alloy fastening spikes (2.3 centimetres in diameter, which correspond to the 15/16th inch yellow metal fastening bolts stated to have been used to secure the 'butt' ends of the timber planking). Timber treenail fastenings are also evident and used to secure timber planking to the timber frames.

The general arrangement of exposed features can be examined in the attached Site Plan.

Probe Survey

The fact that the site must be supported by deeper, buried portions, led the Heritage Office to undertake an air probe survey at various sections through the site. Three lines were completed across the visible 'end' portions of the site and did reveal buried materials beneath areas otherwise devoid of surface features. The depth of this material varied from immediately below the 'present' sand profile, and in cases, to the limit of the probe (1.7 metres). This suggests that there is variability of structure depth through the site.

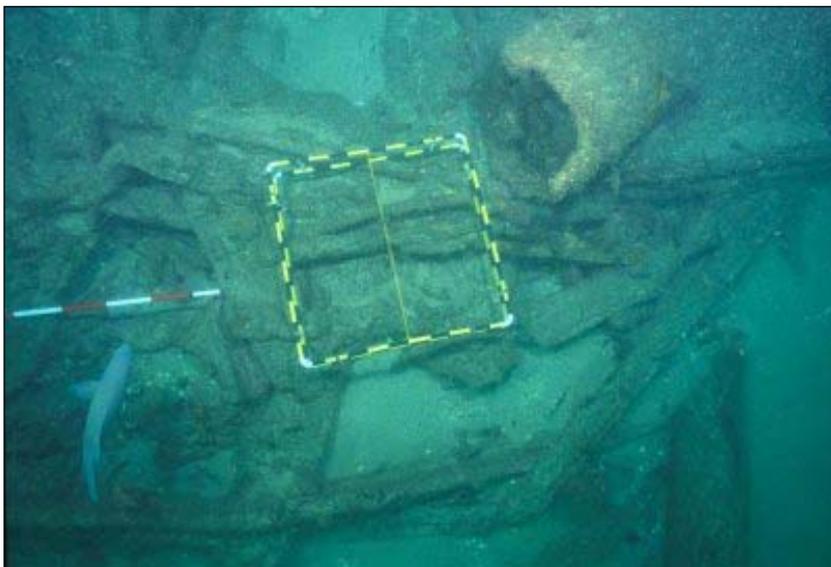


Figure 12: This image shows a portion of the *Centurion* wreck site. It includes the large iron mast section (top right). It shows the complexity of site materials that proved a survey challenge. Photograph by David Nutley.

Scattered through the site are large curved iron beams (probably deck beams). *Centurion* had 36 'hold' deck beams of iron measuring 32 feet in length (9.75 metres), and 38 'main' deck beams (total of 70 iron deck beams). Together with these were a similar number of bulb iron deck beam supports (stanchions) that supported the iron deck beams above the line of the keel (dimensions not recorded). The protruding tops of the iron (vertical) deck stanchions (supports) can be seen across the site (where still largely buried). These potentially mark the central line of the wreck site and are recorded in the site plan.

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Figure 13: View of debris field. The view shows the concentration of long iron fastenings that comprise deck beam supports (stanchions) and hanging rider knees from the lower hull. Note concentrated grouping of hull ballast stone (top left). Photograph by Mark Spencer.

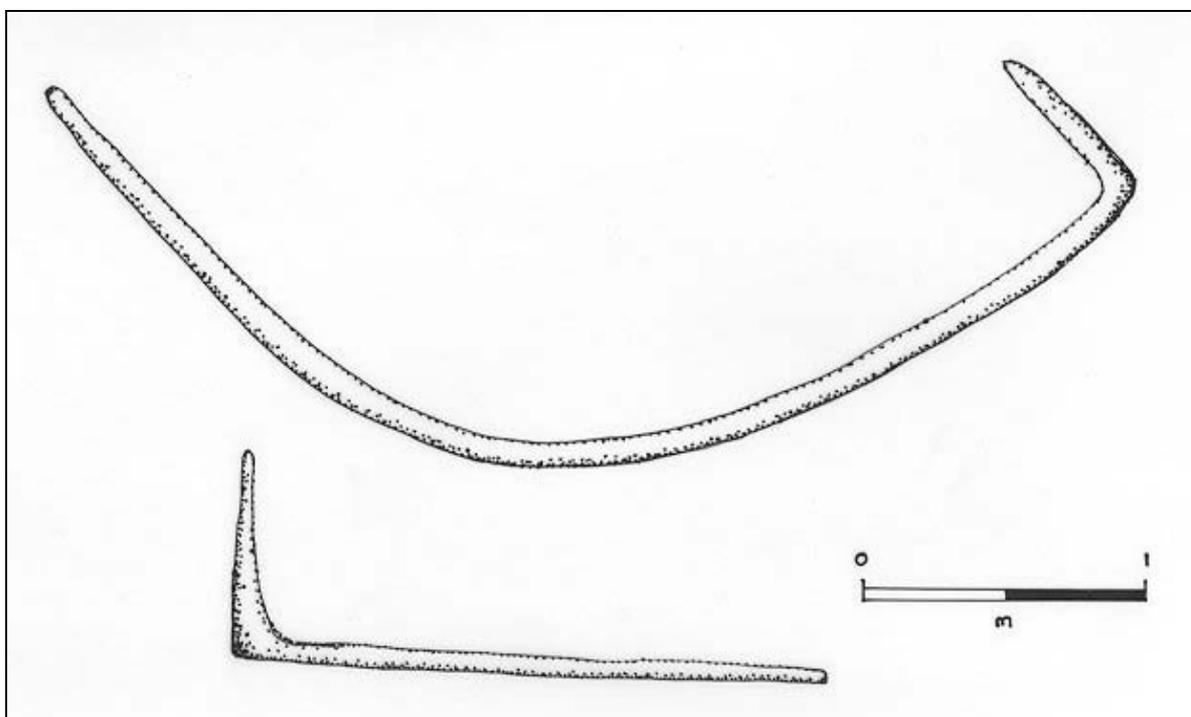


Figure 14: Measured drawings of representative hanging and rider knees. Drawing by Tim Smith.

A feature of the site is the many iron rider knees – solid fastenings used to secure the lower deck to the internal sides of the ship. They are marked by their long curved arms and short angled upper horizontal bar, with one example recorded at five metres in length. The Lloyds Survey Report identified the presence of some 32 pairs of rider knees.



ward iron knees (L-shaped hanging
ed to secure the decks to the sides
38 pairs of hanging knees and 5
measured on site and found to have
ded width of 0.08 metres (3 ¼

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Figure 15: Dramatic image of a cuttlefish 'defending' the *Centurion* site. Note especially the iron deck beam (top right) and fragmentary iron plating (foreground) that shows evidence of recent damage by boat anchors dragging through the site. The tell tale 'rust' colouring is evidence of accelerated corrosion activity. Photograph by Mark Spencer.

Several sections of miscellaneous iron plating are evident across the site which might comprise the sets of diagonal iron tie plates (or 'straps'), fitted along the entire length of the hull at approximately 45°. At present it is not possible to identify these elements with certainty. Iron plating is noted around the section of mast which forms a central feature of the wreck site, but does not appear mentioned specifically in the vessel's Building Survey Report. Hence the other visible sections of iron plating may derive from other areas of the hull.

Lumps of coal are readily sighted trapped within the visible wreckage and might be evidence of the 400 tons of coal already loaded when *Centurion* sank in 1887, or be leftover cargo from previous trips. Alternatively, a significant amount of coal 'rolls' around the harbour floor as result of past shipping (and coaling) activities, and other shipwreck events, and could explain its presence on *Centurion*.

Large shipwrecks like *Centurion* are usually marked by a number of large iron anchors. This is not a feature of the *Centurion* site although the absence of anchors can be explained. At least one was removed from the site in the 1980's. That anchor, a standard Admiralty 'new style' type (developed after 1841), is currently undergoing conservation treatment by the NSW Waterways Authority and will be housed at the NSW Water Police base at Campbell's Cove, Balmain.

The Lloyds Building Survey Report noted that *Centurion* (when built) carried a compliment of six anchors that included 3 main or 'bower' anchors, 1 stream anchor, and 2 smaller kedge anchors.

At least one of *Centurion's* main anchors was deployed between the Heads in a desperate attempt to stop the vessel crashing onto North Head. This failed, and it is likely that an anchor could still be located in the area¹⁵, or that further anchors may be found buried inside the collapsed hull should the sand cover naturally shift. However, it is equally likely that all anchors have been salvaged from the site between discovery and later protection under the NSW *Heritage Act* from 1977 (or illegally after that date).



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allegedly recovered from the general vicinity of the Old Man's its are unknown. Many anchors have been recovered from the protected relics under the NSW *Heritage Act* 1977 and require ery.

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Figure 16: An anchor recovered from the *Centurion* site. The anchor is undergoing conservation by NSW Waterways Authority before being housed at the new NSW Water Police base at Balmain. Photograph by Tim Smith.

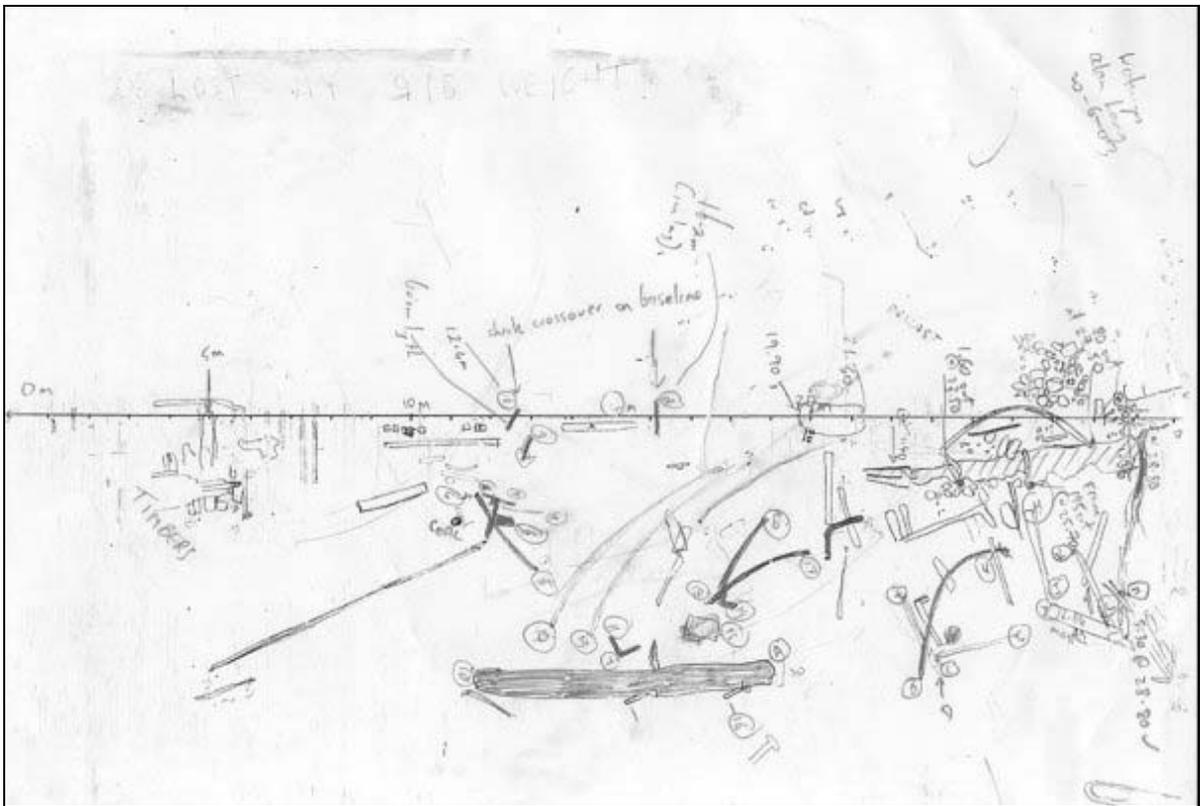


Figure 17: Working drawings compiled during the survey work.
© NSW Heritage Office 2004.

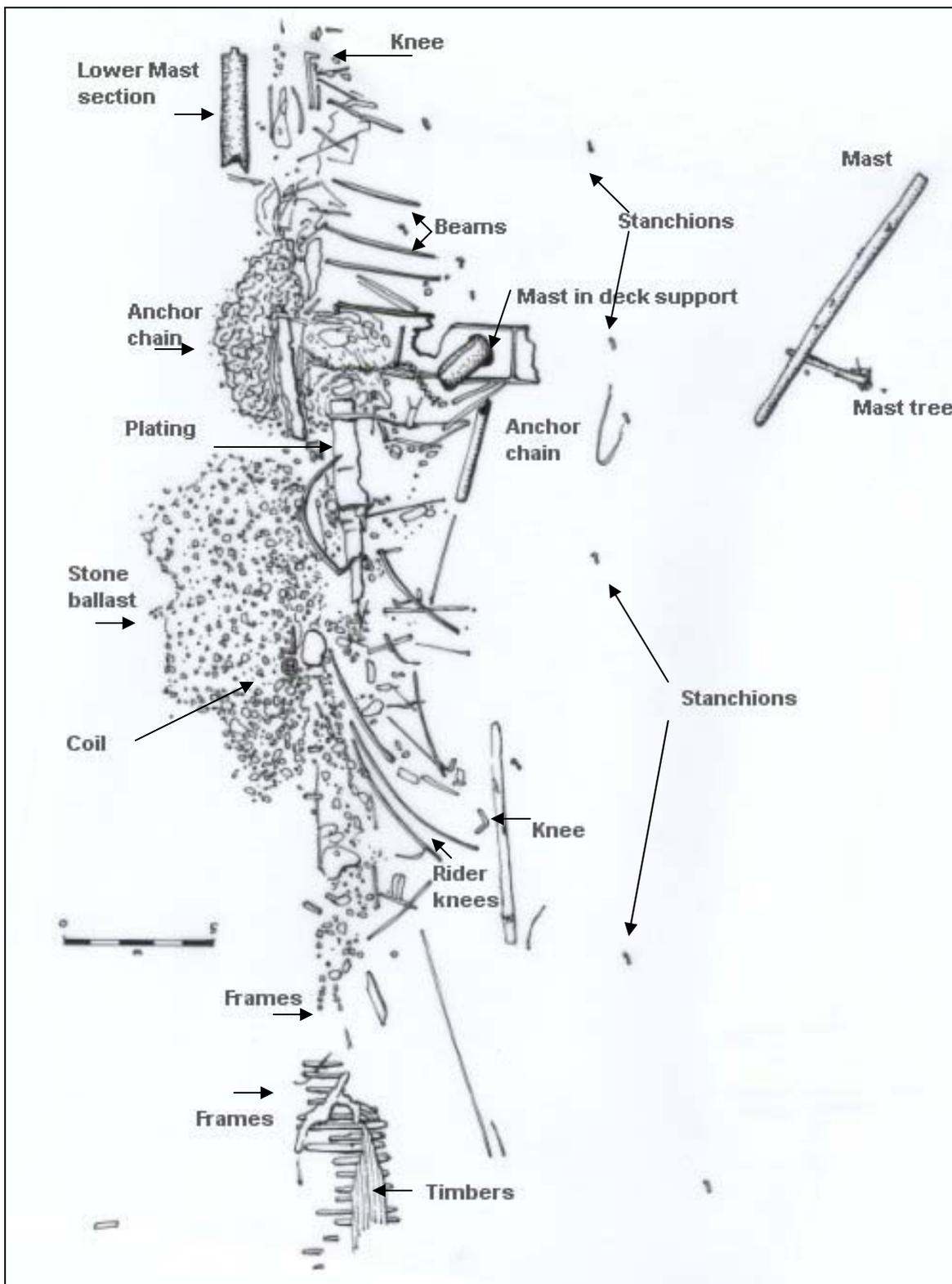


Figure 18: Final wreck site plan of observed features to February 2004.
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9 ASSESSMENT OF SIGNIFICANCE

9.1 Introduction

Significance has been assessed in accordance with the nature and degree of significance of the site's primary attributes. These include attributes related to historical, social, archaeological, scientific and interpretative significance.

9.2 Attributes of Significance

Criterion (a): An item is important in the course, or pattern, of NSWs cultural or natural history.

	Include		Exclude
X	<ul style="list-style-type: none"> • shows evidence of a significant human activity 		<ul style="list-style-type: none"> • has incidental or unsubstantiated connections with historically important activities or processes
	<ul style="list-style-type: none"> • is associated with a significant activity or historical phase 		<ul style="list-style-type: none"> • provides evidence of activities or processes that are of dubious historical importance
	<ul style="list-style-type: none"> • maintains or shows the continuity of a historical process or activity 		<ul style="list-style-type: none"> • has been so altered that it can no longer provide evidence of a particular association

Comment

- *The site, through its extent and accessibility, demonstrates evidence of the risks faced by shipping entering and leaving Sydney Harbour and of the role of sailing ships in the coal trade.*

Criterion (b): An item has strong or special association with the life or works of a person, or group of persons, of importance in NSWs cultural or natural history.

	Include		Exclude
	<ul style="list-style-type: none"> • shows evidence of a significant human occupation 		<ul style="list-style-type: none"> • has incidental or unsubstantiated connections with historically important people or events
X	<ul style="list-style-type: none"> • is associated with a significant event, person, or group of persons 		<ul style="list-style-type: none"> • provides evidence of people or events that are of dubious historical importance
			<ul style="list-style-type: none"> • has been so altered that it can no longer provide evidence of a particular association

Comment

- *The Centurion is strongly linked the expert shipbuilding designs and traditions of the celebrated 19th century shipwright yard of Walter Hood & Co. of Aberdeen. Built alongside the celebrated clipper ship Thermopylae, the Centurion came into being at a time of extreme competition. That competition produced unique innovations in traditional large sailing ship design and construction.*

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Criterion (c): An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW.

	Include		Exclude
X	<ul style="list-style-type: none"> shows or is associated with, creative or technical innovation or achievement 		<ul style="list-style-type: none"> is not a major work by an important designer or artist
	<ul style="list-style-type: none"> is the inspiration for a creative or technical innovation or achievement 		<ul style="list-style-type: none"> has lost its design or technical integrity
	<ul style="list-style-type: none"> is aesthetically distinctive 		<ul style="list-style-type: none"> its positive visual or sensory appeal or landmark and scenic qualities have been more than temporarily degraded
	<ul style="list-style-type: none"> has landmark qualities 		<ul style="list-style-type: none"> has only a loose association with a creative or technical achievement
X	<ul style="list-style-type: none"> exemplifies a particular taste, style or technology 		

Comment

- The Centurion was one of only three ships built at the yard of Walter Hood & Co and stated to belong to the 'composite' design. This transitional style of shipbuilding was a hallmark of the period c.1860's-1870's and witnessed the introduction of iron elements into the traditional timber sailing ship design; changes that ultimately concluded in the complete iron hulled vessel.*

Criterion (d): An item has strong or special association with a particular community or cultural group in NSW for social, cultural or spiritual reasons.

	Include		Exclude
X	<ul style="list-style-type: none"> Is important for its associations with an identifiable group 		<ul style="list-style-type: none"> is only important to the community for amenity reasons
X	<ul style="list-style-type: none"> is important to a community's sense of place 		<ul style="list-style-type: none"> is retained only in preference to a proposed alternative

Comment

- The site is of important for its associations with the recreational diving community, drawn to the site by its visual appeal and its accessibility, through position and depth.*
- The wreck site lies prominently near the track of the famous Manly ferries, just inside the entrance to the celebrated harbour of Port Jackson. As the remnants of a large timber sailing vessel dating from the highpoint of international trade by sail, the wreck site lies as a marker to this prominent time in Sydney's mercantile history.*

Criterion (e): An item has potential to yield information that will contribute to an understanding of NSWs cultural or natural history.

	Include		Exclude
X	<ul style="list-style-type: none"> has the potential to yield new or further substantial scientific and/or archaeological information 		<ul style="list-style-type: none"> the knowledge gained would be irrelevant to research on science, human history or culture
	<ul style="list-style-type: none"> is an important benchmark or reference site or type 		<ul style="list-style-type: none"> has little archaeological or research potential
	<ul style="list-style-type: none"> provides evidence of past human cultures that is unavailable elsewhere 		<ul style="list-style-type: none"> only contains information that is readily available from another resource or archaeological sites

Comment

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- *The Centurion site provides research potential to demonstrate innovative design elements introduced within sailing ship construction styles in the late 1860's. The wreck contains structural elements consistent with the composite style, providing an important physical record of these technological features.*
- *The site has potential through archaeological investigation of the material associated with the lives and activities of the crew and that is anticipated to remain buried on the site.*

Criterion (f): An item possesses uncommon, rare or endangered aspects of NSW cultural or natural history.

	Include		Exclude
	<ul style="list-style-type: none"> • provides evidence of a defunct custom, way of life or process 		<ul style="list-style-type: none"> • is not rare
	<ul style="list-style-type: none"> • demonstrates a process, custom or other human activity that is in danger of being lost 		<ul style="list-style-type: none"> • is numerous but under threat
	<ul style="list-style-type: none"> • shows unusually accurate evidence of a significant human activity 		
	<ul style="list-style-type: none"> • is the only example of its type 		
X	<ul style="list-style-type: none"> • demonstrates designs or techniques of exceptional interest 		
	<ul style="list-style-type: none"> • shows rare evidence of a significant human activity important to a community 		

Comment

- *Historic Shipwrecks in NSW waters include a small number of examples demonstrating the composite design styles. The Centurion is rare in being substantially complete and situated in an easily accessible area for scientific study.*

Criterion (g): An item is important in demonstrating the principal characteristics of a class of NSW cultural or natural places; or cultural or natural environments.

	Include		Exclude
	<ul style="list-style-type: none"> • Is a fine example of its type 		<ul style="list-style-type: none"> • is a poor example of its type
X	<ul style="list-style-type: none"> • has the principal characteristics of an important class or group of items 		<ul style="list-style-type: none"> • does not include or has lost the range of characteristics of a type
	<ul style="list-style-type: none"> • has attributes typical of a particular way of life, philosophy, custom, significant process, design, technique or activity 		<ul style="list-style-type: none"> • does not represent well the characteristics that make up a significant variation of a type
	<ul style="list-style-type: none"> • is a significant variation to a class of items 		
X	<ul style="list-style-type: none"> • is part of a group which collectively illustrates a representative type 		
X	<ul style="list-style-type: none"> • is outstanding because of its setting, condition or size 		
	<ul style="list-style-type: none"> • is outstanding because of its integrity or the esteem in which it is held 		

Comment

- *The Centurion retains and is representative of key design characteristics of a sub-class of composite built sailing ships and is part of a small group of NSW wrecks that fit within the general class of composite ships.*
- *The site is an outstanding part of the underwater cultural heritage of Sydney Harbour due its setting, condition and extent of the remains.*

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9.3 Statement of Heritage Significance

The Centurion wreck site is of special significance to Sydney as the largest extant sailing shipwreck site located within Sydney Harbour. The shipwreck has strong links to a famous period of shipbuilding where gracious clipper ships raced the world's oceans in search of fastest times and best cargoes. Sydney was a major destination of this trade. The Centurion's hull includes elements of a specific design style known as 'composite' construction during the transition from timber to iron vessels, known from the 1860's. The wreck site therefore provides a unique reference site for detailing specific elements of this pivotal period in large ship construction. As a dive site, the Centurion is a key element of the Sydney recreational wreck diving program.

10 MANAGEMENT OPPORTUNITIES – DISCUSSION

It was apparent during the survey work that some boat users have been damaging the *Centurion* Historic Shipwreck site by inappropriate mooring activities. This is evidenced by tell tale rust' colouring and wear to sections of the exposed iron plating. The damage could only have occurred by boat handlers dragging small anchors ('picks') through the site, whilst looking to anchor for either diving or fishing activities.

Similarly the wreck site has, from time to time, witnessed despoiling by boat visitors depositing rubbish over the side (predominantly bottles).

One opportunity to limit vessel damage would be to deploy a permanent mooring at the site. However this is associated with significant constraints that include the cost of permanent moorings and the need for ongoing maintenance, the wreck's location near to a major shipping route (Manly ferry run), and requirements for mooring approvals from appropriate regulatory authorities.

The Heritage Office recommends that boat users adhere to the 'wreck-safe' mooring protocols in its '*Anchoring on Shipwrecks Guideline Note*', available free via the Maritime Heritage Online web site <http://maritime.heritage.nsw.gov.au>. This system suggests that a small float with weight be placed over the wreck site after detection by sounder or GPS position. The mooring vessel then comes upwind and anchors out in barren sand off the wreck, and lies back on its mooring until adjacent to buoy, for diver descent to wreck.

There is also an opportunity to identify, in conjunction with discussions with diver charter operators and dive clubs, 'preferred mooring' sites in the vicinity of the wreck where boats are encouraged to anchor. Guidelines could be developed for which sites are appropriate under particular weather conditions.

Public access to the *Centurion* wreck site is promoted, together with opportunities for the diving and general public to learn more about its history, importance as an archaeological site, and to foster a higher level of interest in maintaining the site intact.

10.1 CONSERVATION

The *Centurion* wreck site is not considered to be at a significant need of conservation assessment in the medium to long term. Most large timber shipwrecks reach a stable rate of natural deterioration in their contextual setting. This activity is a complex interactive system that is impacted on by the type of seafloor sediments surrounding the site, microbial activity, the amount of natural sand cover, action of waves and swell, water temperature,

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salinity, dissolved Oxygen content, pH, effects of scouring patterns, and marine growth coverage, etc.

Left alone, Historic Shipwrecks naturally breakdown over centuries in a normal pattern of reduction. This process involves the slow deterioration of physical elements of the site and is part of the archaeological formation process. It does not necessarily require human intervention to arrest.

The most significant threat to Historic Shipwrecks derives from gross human interaction that acts to destabilise either the seabed surrounding the site (eg through development projects such as dredging, cable and trenching), removal of the protective marine growth covering a site (eg via anchor dragging damage, 'cleaning' of relics for observation, or through the removal of relics), and thus impacting on active corrosion/biological rates, and subsequent reduction of the archaeological potential of the site.

The Heritage Office promotes sound interacting with complex underwater heritage sites, by treating them as '*museums beneath the sea*'. All visitation should aim to promote the qualities of the site, by employing sound anchoring protocols and careful, safe, non-disturbance diving practices. No relics can be removed from the site except in accordance with the conditions of a NSW Heritage Council excavation permit. Divers should be encouraged to avoid damage to or disturbance of the protective marine growth coverings on the wreck site.

The *Centurion* is a Protected Historic Shipwreck under Section 48 and Section 139 of the NSW *Heritage Act 1977*. Severe penalties apply for individuals or commercial entities that wilfully damage or disturb underwater heritage sites.

10.2 DISPLAY AND PUBLIC ACCESS

The *Heritage Act 1977* provides public access to underwater cultural heritage sites as long as the visitor does not disturb the heritage remains. Promotion of our heritage through education is our strategic aim. In this regard the Heritage Office has been proactive with the development of an Award-Winning *Maritime Heritage Online* web site <<http://maritime.heritage.nsw.gov.au>>, which incorporates the official NSW Historic Shipwrecks Database.

The Heritage Office organises *Introduction to Maritime Archaeology Training Courses* in conjunctions with the Australasian Institute for Maritime Archaeology (AIMA) and the Nautical Archaeology Society (NAS) in the UK. These courses are open to divers and the general public, and have produced a range of publications, brochures and educational materials aimed at encouraging sound management of underwater cultural heritage, and enjoyment of the resource.

The *Centurion* features on the Maritime Archaeology Online web site which contains historic information on the loss and details of the current survey, historic and current photographs of the site, and video footage of the archaeological diving activities. The inspection work has also featured in the Office's official newsletter, *Heritage NSW* (Summer 2003). This Conservation Management Plan is also provided for visitors to the web site.

The wreck site has been an ongoing feature of public lectures provided by the NSW Heritage Office, and in local displays of maritime history (eg 2003 Manly Environment Centre exhibition).

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Information Sheet

The Heritage Office has produced an *Information Sheet* featuring the *Centurion* as part of its annual series (attached). These are available to download and photocopy from the web site, and are aimed at dive shops, libraries, councils and any visitor to the site.

Underwater Interpretative Plinth

Underwater Heritage sites can be interpreted to the non-diver by shore-based signage or marker plinths. These have been effectively established across Australia and provide a vantage point to look out over a wreck site and to learn of the historic events associated with the loss. In appropriate cases, underwater concrete pyramidal plinths can be deployed adjacent to a wreck site for the enjoyment of divers or snorkellers. These typically include a metal anodized sign with text detailing the wreck event and images. They can also include a brush or plastic scrape which divers can use to keep the sign free from algae.

Underwater plinths have been established near Australian shipwreck sites since the 1980's. However, to be effective, they require a stable bottom matrix to eliminate settling, and a surge free environment to ensure that they are not lifted by storm action to damage the fragile Historic Shipwreck structure. The construction and deployment of plinths is a fairly labour intensive process and requires the agreement of the land manager upon which the site sits (NSW Waterways Authority in regard to the *Centurion*). Underwater plinths are valued by the diving population and provide an effective marshalling area for divers on the bottom, and an opportunity to learn more about a site and to appreciate its inherent heritage qualities.

The NSW Heritage Office is currently assessing the suitability of constructing a plinth for deployment near the centurion site. This will require the monitoring of surge and swell activity and movement of sand profiles across the site.



Figure 19: TV coverage of the survey operations. Maritime Archaeologist David Nutley being interviewed for a segment on Channel 10's *Totally Wild* program. Photograph by Tim Smith.

TV Documentaries

The survey of the site by Heritage Office Maritime Archaeologists was featured in a short TV segment aired on Channel 10's *Totally Wild* children's information program on 23 March 2004. This medium provides an effective way to promote the existence of rare, fragile archaeological wreck sites in NSW's waters, and the fascinating stories and information that they contain. Future opportunities to interpret the *Centurion* wreck site through such programs should be promoted.

10.3 MANAGEMENT RECOMMENDATIONS

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1. copies of this report be placed in the Heritage Office Library and on the *Maritime Heritage Online* web site for ease of public access. Additional copies be provided to the major dive charter operators using the *Centurion* wreck site
2. inclusion of *Centurion Shipwreck Information Sheet* on the *Maritime Heritage Online* and Manly Shire Council web sites
3. copies of this report be forwarded to key local and State government agencies with management responsibilities in the vicinity of the site, eg NSW Waterways Authority, NSW Fisheries, and interested parties including Manly Shire Council, Department of Conservation (Quarantine Station site interpretation).
4. interpretative opportunities be explored to promote the existence and values of the *Centurion* wreck site. This could include
 - a shore-based sign or plaque, perhaps linked to the North Harbour Aquatic Reserve
 - information about the wreck is incorporated in NSW Waterways, NSW Fisheries and Manly Shire Council information brochures
 - design, approval and deployment of an underwater concrete interpretative plinth adjacent to the wreck site, to enhance the wreck as a recreational dive site
 - inclusion of the site in future electronic and print media projects
5. encouragement of ongoing non-disturbance mapping of the site by recreational divers, eg, through coordinated dive shop *Wreck Diver* certification courses and AIMA/NAS Maritime Archaeology courses.
6. promotion of the need for a marine biological study of the *Centurion* wreck site to identify the range of colonising marine organisms and fish stocks at the site
7. ongoing monitoring of the site by the NSW Heritage Office
8. addition of site survey results to NSW Waterways Authority Section 170 *Heritage and Conservation Register* (under NSW *Heritage Act 1977*).
9. publication of the findings of this report in an appropriate academic journal

11 CONCLUSIONS – further research

This report details recent site survey operations at the *Centurion* wreck site. It does not aim to provide a comprehensive summary of the historical associations of the vessel. The Heritage Office is aware that additional archival materials could be accessed for the site, particularly details of individual voyages as reported in contemporary newspapers. A systematic search of these sources would provide additional information on the day to day activities of the vessel and particulars of cargoes, trades and transformation over time to a working bulk cargo carrier.

The *Centurion* wreck site is an important archaeological reminder of the past glory days of international travel by sail. The vessel was built in the heyday of fast clipper ships and was associated with famous vessels such as *Thermopylae*, household names in their day. Because of its technical design elements, the *Centurion* is an important repository of information on the transformation of vessels from all timber construction to all iron. Further debate is required to assess whether *Centurion* can be

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identified as a 'composite' vessel, or whether it should be classed as a standard timber ship with modified structural components.

Because the NSW Historic Shipwreck resource includes four vessels built by the Walter Hood shipbuilding yard (*Fame*, *Queen of Nations*, *Walter Hood* and *Centurion*), all of which have been located and inspected by the NSW Heritage Office, the collective sites form an important area of future research. This could include an assessment of design changes within that one yard across a formative era of shipbuilding practices. Specific study of materials used, scantlings and hull form could add to discussions regarding the development of features such as the 'Aberdeen bow', clipper ship design, specific construction methods, sources of materials, etc.

The present study of the *Centurion* wreck site has demonstrated scope for ongoing study of specific elements of the site such as fastening types, hold and deck beam construction, and configuration of diagonal bracing of the hull.

Apart from the hull, the *Centurion* wreck site is expected to contain relics associated with the operations of the vessel (eg sail gear, etc), cargo and items belonging to the crew and shipboard life. These small relics are presumed to lie buried within the confines of the hull, despite some suggested prior disturbance of the site. These items hold particular value in being able to document life on board through rigorous scientific study. However, due to the massive costs associated with archaeological recovery, interpretation, conservation, display and ongoing storage of collections, no current archaeological excavation of the site is planned.

Such activity would require the prior approval of the Heritage Council of New South Wales through the granting of an Excavation Permit under the Act. Such approvals would require an approved archaeological research design justifying the reasons for disturbance to the site, an approved excavation and conservation methodology, and sound financial and professional support.

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