

Site Report

PS Ozone

Flinders University Maritime Archaeology Field

School

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Acknowledgements

The authors would like to thank both their team supervisor, Jun Kimura, and Dr Sam Turner of the St Augustine Lighthouse Museum. Both gave generously of their time and experience in assisting with the site work for this report and were unfailingly good natured when asked to be the “dumb end” of a survey tape.

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Introduction

This site report on the remains of the PS Ozone was generated as a group task assigned to the authors during the 2008 Flinders University Maritime Archaeology Field School. The Heritage Victoria staff onsite during this field school specifically requested that during this task the authors concentrate on the bow section as there was limited existing information on its current condition.

Aims

There were two basic aims in this tasking:-

1. To produce a general site report
2. To produce a site plan specifically for the bow section (or as much of it as could be produced in the allotted time)

Location

The remains of the PS Ozone are approximately fifty meters off the beach at Half Moon Bay, which is north of Indented Head. The North cardinal mark shown in Half Moon Bay in the extract from Aus 157 (Figure 2 - Extract from Aus157), actually marks the northern extent of the wrecks, including PS Ozone.

The PS Ozone is oriented with the stern to the NNW and bow to the SSE. Originally much of the wreck was above water; however it has deteriorated to the stage where only the port paddle wheel and a small amount of wheel support structure is still visible above water[Figure 1 – PS Ozone].

On the seabed there are a number of immediately recognisable items, such as the steering quadrant, the six boilers (three abreast fore and aft of the

paddle wheels), the collapsed starboard paddle wheel and the bow triangle. The rest of the structure has deteriorated to the point where it is mostly fallen into a series of piles of beams and plating over the site, although the outline of the hull can still be determined.



Figure 1 – PS Ozone in Half Moon Bay

Access to the site is either via a car parking area and footpath to the beach at the northern end of Half Moon Bay or through the Indented Head Caravan Park. The caravan park operators kindly allowed the authors to use a vacant lot within the park as a base of operations for the duration of the survey which made accessing the site significantly easier.

Comment [O1]: This may be Batman park – check with Jun's map book

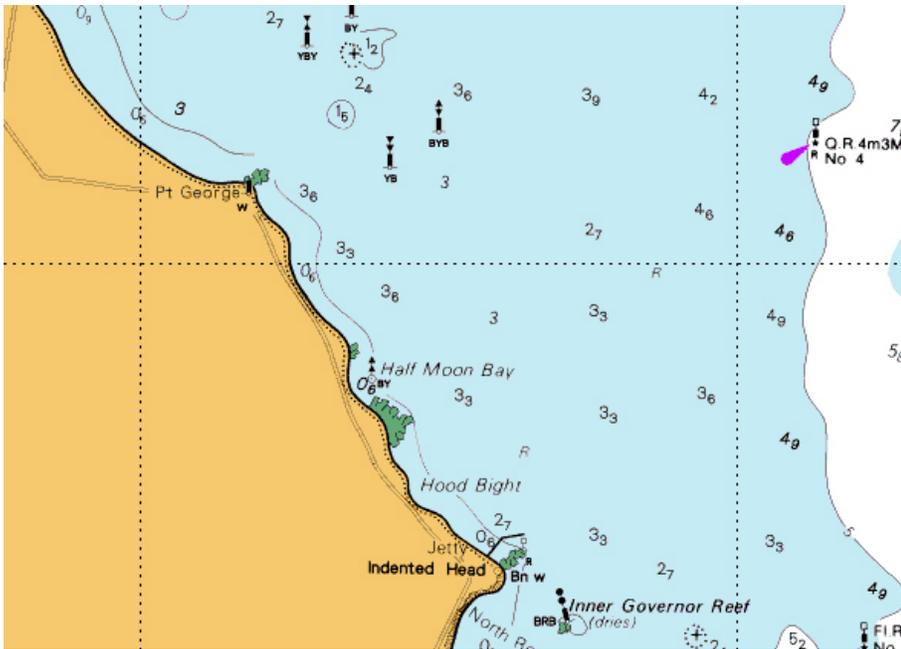


Figure 2 - Extract from Aus157

The site itself is only 3 meters deep at its maximum with a soft sandy bottom. It is exposed to swell from north westerly to south easterly winds which is the main reason the PS Ozone was deposited at this location, as described later in this report.

The shore side landscape is primarily suburban with the caravan park on the foreshore. A small general store (which does quite acceptable lattes) is located inland from the caravan park.

An anchor from the PS Ozone is mounted as a display on the headland bounding the northern side of Half Moon Bay. This anchor is the topic of a report by Jody Bulman, also produced during the 2008 field school. An information board about the Ozone and the Dominion (the 'other' wreck in Half Moon Bay) is located at the southern end of the beach.

Comment [O2]: Would do this as one paragraph

History

Bay Steamers

Port Phillip Bay has had a long history of steam powered passenger craft plying the routes between Melbourne and the bay towns. Many of the bay towns were tourist destinations for Melbourne from virtually the decade after Melbourne was founded. This trade was initially an ad hoc affair with the passenger boats performing various other roles as tugs and workboats, when not carrying passengers. The passenger boats were used because of the poor or non existent roads and railways connecting Melbourne to the southern parts of the bay.

In the mid 1800's however a new era of tourism began with the introduction of a series of passenger ferries which became increasingly luxurious and faster. These dedicated ferries culminated with the introduction of firstly the Ozone in 1885, then the Courier and Hygeia, and lastly the Weeroona in 1910. These boats dominated the passenger trade in the bay for the best part of forty years.

Gradually however the land based transport improved and the popularity of taking a ferry to the bay side resort towns declined. By 1932 only the Weeroona remained in service. It was purchased in 1942 for war service and never returned to Port Phillip Bay.

PS Ozone

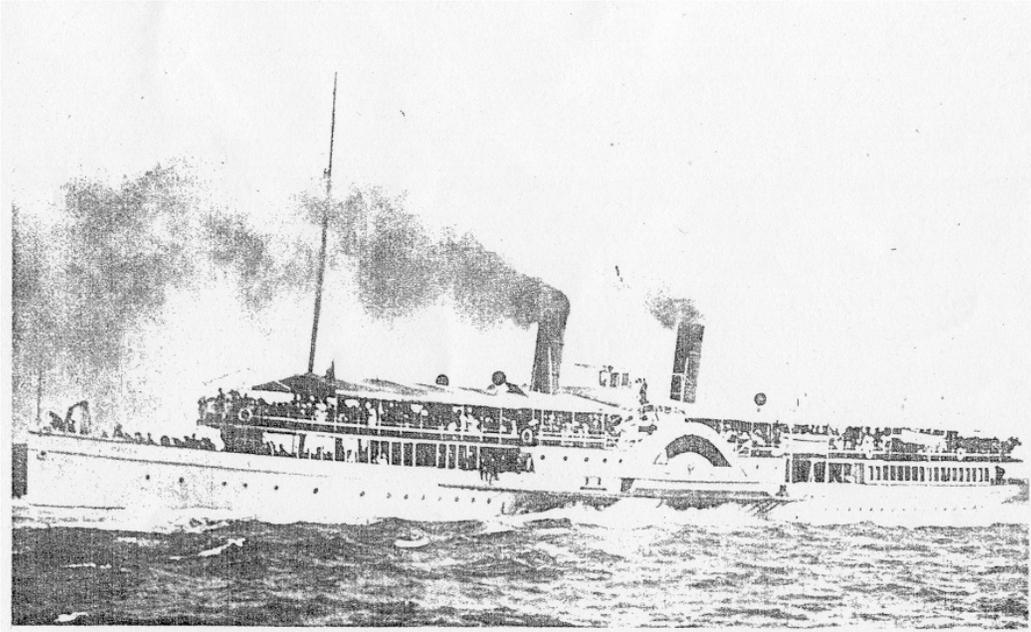


Figure 3 - PS Ozone [J.Andrews, 'A log of great Australian Ships', 1980, p115]

Construction

The Ozone was built in Glasgow by Messrs Napier, Shanks and Bell and launched in 1885. It was designed specifically for the bay tourism trade and was capable of carrying up to three thousand passengers in speed and comfort around Port Phillip Bay. Its hull was a riveted all iron construction using plates over frames. Its engines and boilers were designed to be light, powerful and well balanced (important for a passenger ship where vibration needs to be minimised). It used side paddlewheels, a common propulsion choice for the time. After its launch in Glasgow it spent two months steaming to Port Phillip Bay and then spent the next 32 years servicing the bay passenger trade.

Specifications

Length	260' (78.8m)
Breadth	28' (8.5m)
Draft	10'6" (3.2m)
Displacement	572 tons
Construction Type	Iron frame with iron plate
Engine Power	314 horsepower
Rated Speed	18 knots
Maximum Speed	19 knots

Propulsion

It was fitted with six "Navy" boilers (a variation of the scotch boiler) which used a forced draft furnace system resulting in improved steam production. The boilers were located fore and aft of the engines, three abreast across the hull. Stokeholds fore and aft of the boilers were fan ventilated and provided a much improved working environment for the stokers. The boilers were coal fired. The steam system was a closed system, utilising a condenser to cool the waste steam before pumping the condensate back to the boilers.

The engines were direct acting diagonal compound piston engines with ancillary equipment driven off the piston rod crossheads via drag links and bellcranks, balancing the reciprocating masses. Located centrally in the hull, these engines directly drove the paddlewheels. The paddlewheels were 21'10" in diameter and used feathering floats as opposed to fixed floats.

Comment [O3]: Changed this up for a bit of variation in sentence structure

Service History

During the Ozone's 32 years of service it was involved in four minor accidents, none of which resulted in fatalities and most of which the Ozone was exonerated for by the subsequent boards of inquiry. It was involved in a famous race with its main contemporary rival, the Courier, a screw propelled vessel. The Ozone won the first race by a narrow margin but when the Courier tried for a rematch a year later the master of the Ozone stopped his engines and declined to race, in order to maintain the Ozone's record. This race was a classic competition between the two types of propulsion, paddlewheel and screw, at a time when both were undergoing continuous development and improvement (think vhs v.s. beta) so the results and the subsequent refusal of the Ozone to race were fiercely debated by the proponents of the different propulsion methods.

In 1917 due to falling patronage the Ozone was withdrawn from service and laid up.

Disposal

In 1925 the Ozone was sold to a shipbreaker, J.Hill, who stripped it of its equipment and fittings primarily to be sold as scrap. Most of the engine room equipment, such as the main engines and condenser, were cut out and sold; the boilers were considered not worth removing. The hull was then sold to a Capt. Forbes who planned to sink it as a breakwater near Indented Head.

A breakwater is used to provide protection to craft moored on the lee side of the breakwater. Old ships have often been used in this role as they were generally cheap, could be easily moved to the desired position and,

once sunk, were unlikely to move again. Even a J class submarine was used as a breakwater at Sandringham before the present marina was built. In the case of the Ozone, it was blown out of its intended position by strong north easterly winds and grounded in its current position. Capt. Forbes attempted to retrieve the breakwater plan by grounding the Dominion to the north of the Ozone but vandals boarded the vessels and set both alight destroying much of their above water portions.

Previous Inspections

The authors have seen references to a comprehensive body of site information produced by the MAAV. Unfortunately, this information is not, to the authors' knowledge, published or otherwise available. Two previous site plans are available in Heritage Victoria's site file. One is a soundings plan from 1980 of the bay which shows the locations of the Ozone and the Dominion. The other is a detailed plan of the first several metres of the bow and the connection detail of the plating butt strap by Greg Hewitt in March 1997.

Methodology

The authors were tasked with the site survey of the Ozone late on the 10th February and on the morning of the 12th February travelled to the site itself. No member of the team had visited the Ozone previously or had a site plan so the first action was to perform a reconnaissance swim over the wreck site to determine the general layout. As Heritage Victoria had requested that we concentrate on the area ahead of the forward boilers, this was the main focus of our reconnaissance.

A preliminary measurement of the forward wreck area showed it was 32 metres from the forward face of the boilers to the bow triangle and 21 metres from the furthestmost portside debris to the furthestmost starboard debris. The surrounding bottom is soft sand. The wreck itself is covered with extensive flora which obscures much of the wreck structure. There were no useable external tie off points for a baseline outside the limits of the wreck.

A specific requirement of this survey was to be able to tie it into previous surveys which had plotted the aft faces of the forward boilers; thus a robust measurement of the forward faces of these boilers was part of the survey plan. Additionally the team wanted to produce a site plan which covered, in greater or lesser detail, the entire forward area without using excessively long measurement lines. These requirements led to the use of two baselines, one running across the site about one metre in front of the forward boilers and another leading off perpendicularly towards the bow. The ends of the baselines were fixed by stakes driven into the sand. Once the baselines were set up they were left on site for the duration of the survey.

The only stakes available at the time were bamboo garden stakes and these, combined with the soft sand, resulted in somewhat delicate survey lines. There was a certain amount of catenary in the survey lines which can be seen in some of the photographs taken during the survey. Rebar or star pickets would have been a better choice in this situation as they are much more sturdy and could have been driven further into the sediment.

The baselines allowed a simple baseline/offset measurement system to be used which considerably simplifies the gathering and processing of the

positional data. This site, however, is not a "flat" wreck. Items such as the boilers, the bow triangle, a number of isolated structures and, of course, the port paddlewheel are a considerable height above the seabed. In order to assist in the measurement of the raised items of interest the baselines were set approximately one metre above the seabed. This worked well in most cases although, in retrospect, plumb bobs should have been a regular accessory for anyone surveying during this operation.

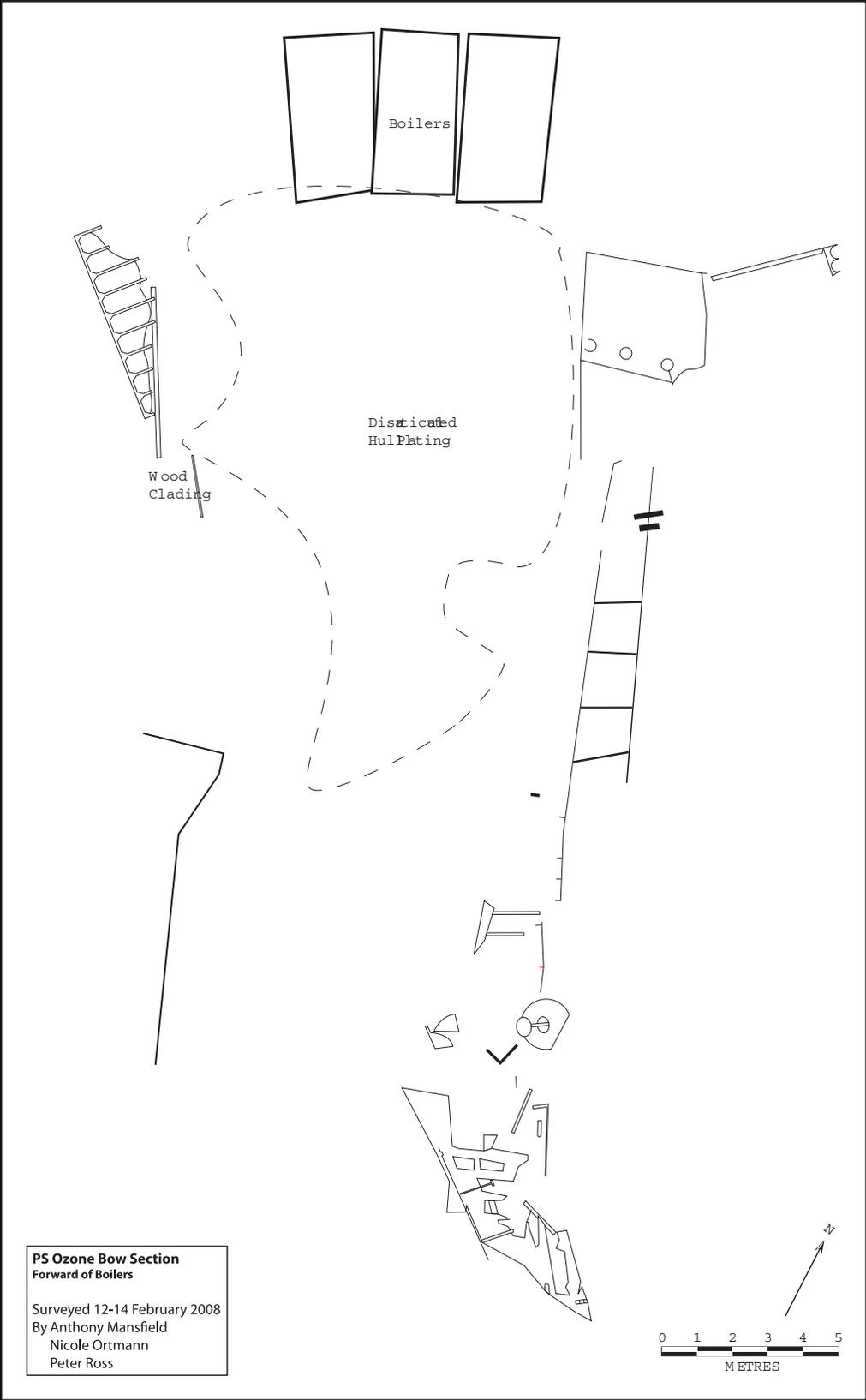
The measurements taken on site were recorded on mylar sheets which were then transcribed by the individual according to their preference. Once a clean copy of the data had been produced the figures were entered into a spreadsheet and the plan itself was produced using Adobe Illustrator.

A large number of photographs were also taken, primarily along the baselines but also of some of the main points of interest over the wreck site. A mosaic of a section of the bow triangle has been produced from these photographs and the site plan overlaid[Figure 4 - Photo Mosaic of bow section].

Results

Site Plan

The primary result from this survey was the aggregated site plan produced. This shows the general layout of the forward section of the site and gives a number of good reference points for any future surveys to build upon, such as the boilers' forward faces and the bow section. The areas marked as "disarticulated hull plating" consist of multiple layers of hull frames and plating, liberally covered in marine growth. These areas would require days or possibly weeks of survey to record in any detail. Even photo surveys would not assist due to the plant life obscuring the underlying details.



PS Ozone Bow Section
Forward of Boilers
Surveyed 12-14 February 2008
By Anthony Mansfield
Nicole Ortmann
Peter Ross

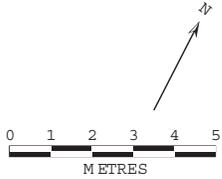


Photo Mosaic

A small photo mosaic was produced from the photographs taken while snorkelling over the site on the start of the second day of surveying. It was produced using the baseline as a basic guide to positioning although due to the height of the baseline above the seabed and the catenary due to the flimsy supports the baseline itself, it cannot be matched up exactly.

Once the series of photographs had been assembled the site plan was overlaid.

In retrospect it would have been simpler to match photographs to the site plan instead of simply stitching them together and then overlaying the site plan; however it seems to have worked out reasonably closely.

No attempt has been made to compensate for perspective or distortion in this mosaic due to the time restraints placed upon the authors.

The photo mosaic does show the extent of marine growth over the wreck quite clearly.

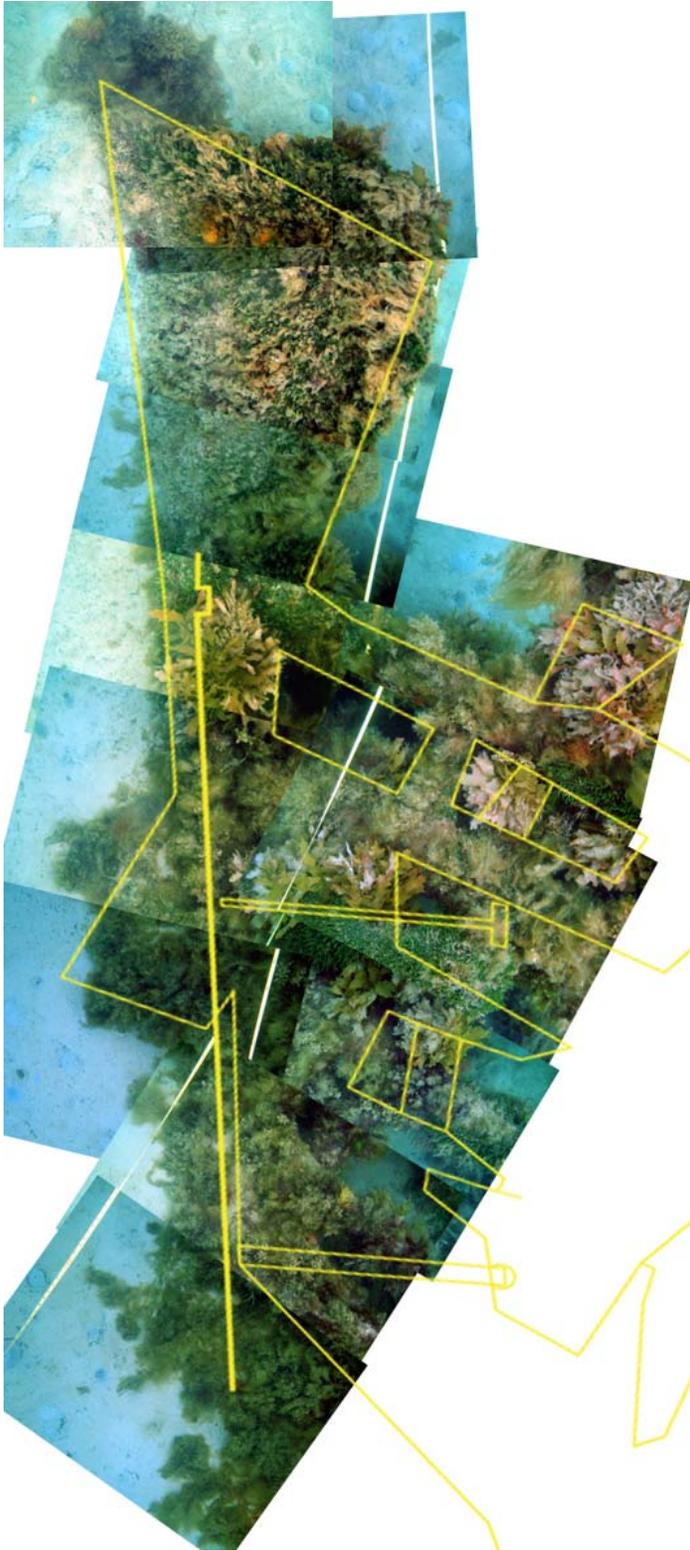


Figure 4 - Photo Mosaic of bow section

General Description

The Ozone has been at Half Moon Bay for eighty two years now and has reached the stage where much of the exposed hull structure is falling into piles of tangled iron beams and plates. The site is exposed to waves from the southern part of Port Phillip Bay and is in shallow water where these waves become more concentrated. This probably contributes to the deterioration of the wreck. Additionally as the wreck is primarily iron and is in such shallow water, it is particularly vulnerable to corrosion.

Comment [O4]: I would be tempted to leave this out

The boilers are still mostly whole although they have shifted from their originally installed positions and now lie at slight angles to each other and the hull. The starboard paddlewheel collapsed in April 1991 and the port paddlewheel is mostly wasted away below the waterline. The bow triangle is still proud of the sand surface although further shell plating has decayed since the survey of 1997 by Geoff Hewitt.

Flora and Fauna

PS Ozone has become an artificial reef, with a great variety of marine plants and animals making their home among the wreckage. Almost every surface, be it metal or wood, has become covered with life, making a detailed survey a difficult task to carry out. The edges of features and artefacts are hidden beneath dense clouds of vegetation; we conducted our survey as carefully as possible as to not damage the delicate ecosystem.

Many types of algae and seaweeds from the green, brown and red phylums can be seen adhering to the structural remains. Some examples are *Caulerpa brownie*, a short green alga that thrives in the cooler Victorian waters (Edgar 2000, p.38), *Phyllospora comosa*, a common brown alga in

southern Australian waters (Edgar 2000, p. 58), and *Ptilonia australasica*, a flat fronded alga associated with much of the coral on the wreck (Edgar 2000, p. 84). Corals and sponges compete for space on the iron and wood along side the algae. Anemones account for much of the colour that can be seen on PS Ozone. *Anthothoe albocincta* (Edgar 2000, p. 127), *Phlyctenanthus australis* (Edgar 2000, p. 128) and *Corynactis australis* (Edgar 2000, p. 131) are a sample of the anemone population present.

Chrysaora sp. (Edgar 2000, p.146), small jellyfish with red and purple centres are a common sight during our dives; we learnt early on to avoid them as their tentacles stung viciously. Once or twice, a larger species, *Catostylus mosaicus*, was seen on the site. These were recognised by the distinctive cross on the top of their bells and lack of traditional tentacles (Edgar 2000, p.147).



Figure 5 - Chrysaora sp



Figure 6 - *Catostylus mosaicus*

Both Spotted and Banded Stingarees (*Urolophus gigas* and *Urolophus cruciatus*) are frequent visitors to the wreck site. Divers need to be wary of where they put their hands as these potentially dangerous fish are often buried in the sand (Kuitert 1996, p.20). A Maori Wrasse was spotted lurking near the boilers by our baseline. The Barred Toadfish, *Contusus richiei* (Kuitert 1996, p. 414, a number of different Goby and Port Phillip Bay Pipefish were all spotted during survey dives. During one set of measurements, one of the team discovered a brilliant orange nudiboranch hiding in the vegetation. Identified as *Ceratosoma brevicaudatum*, this species is abundant on the southern coast, enjoying moderately exposed reefs (Edgar 2000, p. 279).



Figure 7 - Maori Wrasse

Conclusions

Limitations

The circumstances under which this survey was performed has limited the quantity and accuracy of the information gathered. Listed below are these observations along with suggestions for their future avoidance.

1. The survey was conducted at very short notice (approx 24 hours) thus very little research was performed prior to arrival at the site. Since the completion of the survey a previous site plan for the bow triangle has been found which provides a useful guide to the changes in the structure. Should this have been available prior to any surveying being performed, the team could have made more informed choices. It is suggested that as much notice as possible is given for future survey teams to allow them to do this essential preliminary research.
2. The time on site was limited. Three days were allocated for this survey which did allow enough data to be collected to ensure that the team's evenings were fully occupied by processing and plotting. Further time to refine and expand the site plan coverage would have allowed for a more in depth and informative report to be provided to both Heritage Victoria and the public.
3. The allocated three days coincided with a patch of particularly cold and windy weather (particularly day two) which made data collection somewhat harder. Several dives were actually cut

short due to team members becoming too cold to function competently. Ironically the day before the three day window and the day after were sunny and calm, perfect for diving, however the team was assigned to shore activities on these days. It is suggested that the teams are given greater control over their dive schedules.

Discussion

The PS Ozone is an interesting part of the history of Port Phillip Bay, particularly in conjunction with the development of the tourism trade in the southern bay side towns. It is in the slightly unusual situation of still being an important icon for the southern part of the bay after eighty years, due to its distinctive paddlewheels being above water and so close to the shore. The anchor mounted on the shore overlooking the wreck site and the information boards on the beach adjacent to the site make major contributions to the public awareness of the significance of the wreck visible off the beach.

The very features which make it a well known wreck to the public however are also major hazards to its future stability and longevity. Iron corrosion at the air water interface, exposure to shore waves and easy access by members of the public all contribute to the site transformation processes. At some stage the port paddlewheel will also collapse and this will result in a decrease in public awareness of the wreck and likely a decrease in public interest.

Recommendations

It is suggested that measures to slow the deterioration of the existing paddlewheel are investigated to preserve the iconic status of this wreck for as long as possible. Additionally the information boards on the shore could be updated to indicate the fragile nature of the wreck and emphasise the hazards already alluded to for members of the public intent on climbing on or jumping from parts of the. A final recommendation is for Heritage Victoria to look into acquiring copies of the reports and documentation both published and unpublished of the Maritime Archaeology Association of Victoria (MAAV). Reference has been made in their 1996 project reports of extensive site survey work being performed. At present, this information does not appear to be currently available to researchers.

References

Andrew, G. 1980. *A Log of Great Australian Ships*.

Fitchett, T.K. 1973 *Down the Bay*

Engineering 1886, "Engines of the Paddle Steamer "Ozone"