DOLPHIN 60 AND COCKBURN SOUND'S WORLD WAR II ANTI-SUBMARINE BOOM NET - Site Inspection Report

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Department of Maritime Heritage
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1. Background and Aims

On the 7th of June 2024, staff from the Department of Maritime Heritage conducted a visit to Dolphin 60, a component feature of the World War II Anti-Submarine Boom Net Site in Cockburn Sound. The aim of the visit was to complete an inspection of Dolphin 60 assessing its current state and condition. This was pursued to ensure an accurate understanding of Dolphin 60's status and to facilitate informed decision-making regarding its conservation and management.

2. Logistics

Personnel

Ross Anderson	WAM OIC – Fieldwork
Arabella McLeay	WAM – Fieldwork, Report
Aurora Philpin	WAM – Fieldwork

File: File located on WA Museum server

Media: Images and Videos located on WA Museum server

3. Site Location

The structure is located at GPS position 32° 09.2106S and 115°40.7066E (GDA94) in 6.9m of water on a sandy seabed surrounded by seagrass beds, approximately 500m off the northeast end of Garden Island.

GPS Points (WGS 84. Shown in Figure 1)

Description	*Latitude*	*Longitude*
Dolphin 60	-32.153530	115.678370

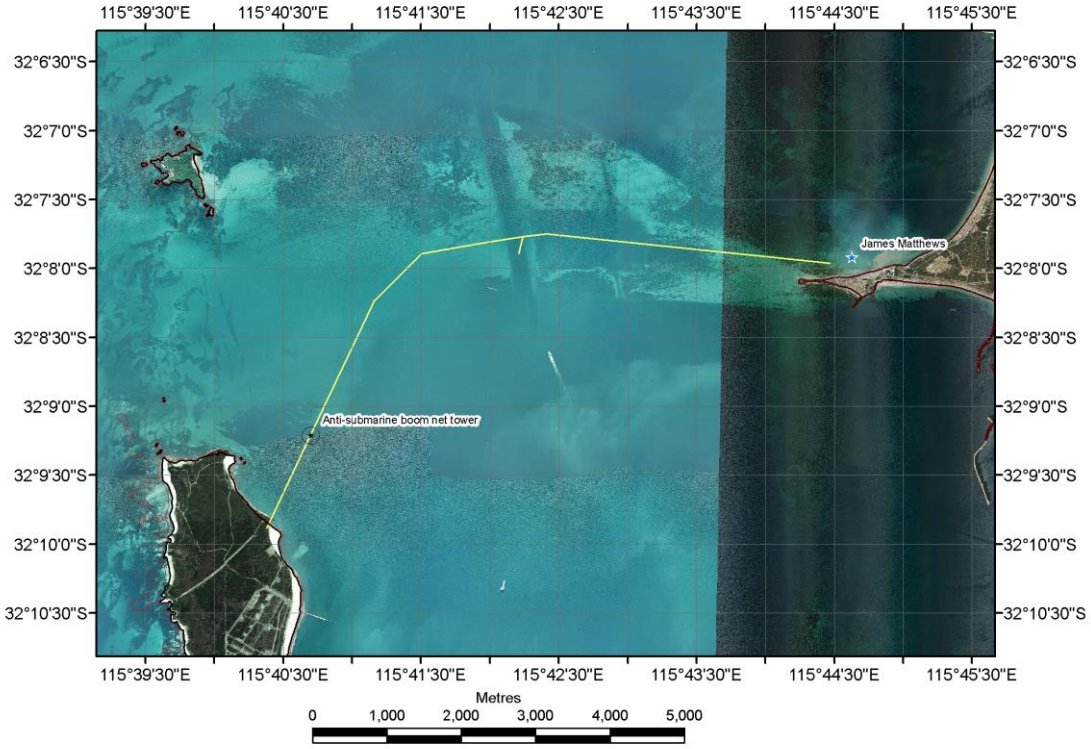

Figure 1. Location of Dolphin 60 (Cockburn Sound's Anti-Submarine Boom Net). WA Museum 2024

4. Site Description

Dolphin 60 rests on a flat, sandy seabed approximately 6 - 8 meters deep, where visible remnants including timbers, netting, and scaffolding protrude from the sediment. The wreckage extends longitudinally across the site, indicative of its substantial presence in the area. Among the debris scattered on the seabed is Dolphin No. 60, a casualty of the anti-submarine net's destruction, situated away from the main shipping channel. The exposed timbers exhibit a coating of marine growth, evidencing biological degradation likely attributed to naval shipworm activity, specifically Teredo Navalis. Documentation efforts include photographic surveys aimed at comparing the structural integrity of the wreck with previous assessments conducted by the Fremantle Port Authority, Heritage Council of Western Australia and the Western Australian Museums in 2010. The dynamic nature of water currents in the region contributes to ongoing changes in seabed morphology and sediment distribution over the site, influencing its preservation and environmental context.

5. Historical Precise

The history of the Cockburn Sound's Anti-Submarine Boom Net and the Dolphin 60 structure within in is recorded within Peet (2008), Anderson and Carter (2010), Anderson (2009) and the Heritage Council of Western Australia site listing.

The Cockburn Sound Anti-Submarine Boom Net, recognized by the Heritage Council of WA on July 14, 2011 was part of Australia's World War II defensive infrastructure. It comprises remnants of a strategic anti-submarine boom system, providing tangible evidence of the nation's wartime fears and defensive strategies against potential invasion threats. The extensive linear site includes submerged timber pylons, beams, and sections of submarine netting, situated in an open ocean setting that once spanned from Garden Island to Woodman Point, constructed to protect the waters of Cockburn Sound and nearby Naval bases from enemy submarine attacks.

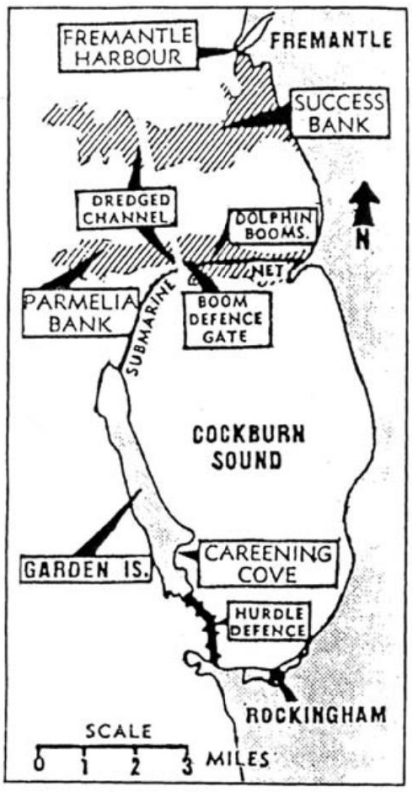

Figure 2: Map of area and Cockburn Sound boom defences (Jeffery 1988)

Constructed in 1942 over a span of two years, the boom net was a crucial part of Australia's coastal defense during World War II. Submarine warfare played a crucial role in naval strategy, with all major powers deploying submarines. These vessels were not only vital for torpedoing enemy ships but also for coastal reconnaissance, intelligence gathering, mine-laying in hostile waters, and executing special missions such as deploying and retrieving agents. To safeguard vulnerable ports and harbors,

the construction of anti-submarine boom nets became essential during World War II. As the war reached the Pacific, the risk of submarine attacks on Australian ports and critical shipping routes became a pressing concern. Building these boom nets demanded significant investment, requiring substantial labor, resources, and capital at a time when all were in short supply.

The Cockburn Sound anti-submarine structures included an anti-submarine boom in the northern approaches, and Type ‘A’ anti-boat scaffolding in the southern approaches. A key part of these structures were "dolphins" or groups of timber piles, ranging from four to fourteen, that were driven into the seabed and spaced about 100 meters apart. Depending on their location, the dolphins either supported steel mesh anti-submarine nets or the Type ‘A’ anti-boat scaffolding. The piles were made from Western Australian jarrah and driven to a depth of 11 to 20 feet (3.4 to 6.0 meters). To protect against marine borers, some piles were charred and coated with tar. Additionally, an indicator loop was installed 183 meters north of the anti-submarine boom net on Parmelia Bank, west of the channel. The anti-submarine netting was made of either three-foot (91cm) or three-foot six inches (106.2cm) diagonal mesh wire cable, supported by steel cylindrical floats and anchored to the seabed with concrete blocks (Anderson and Carter 2011).

6. Previous Site Inspections

Following World War II, the boom net defences fell into disrepair. Concerns over structural deterioration prompted the Fremantle Port Authority to seek intervention from the WA Museum’s Department of Maritime Archaeology in 2007. Despite discussions about potential demolition due to navigation hazards, heritage consultants highlighted the significant historical value of the structure. This prompted a series of site inspections and assessments to document the remaining elements and recommend preservation measures.

In 2007 Environmental Resources Management Australia (ERM), a consultant employed by the Department of Defence assessed the Garden Island pile structure as having 'medium significance' and advised that removal of the remnant submarine boom pylon structure would not be considered a significant impact. They also noted that the structure may have State significance as it is within State Waters, and recommended Department of Defence consult the Western Australian Museum. the DMA the DMA undertook a site inspection of the timber pile structure. The report highlighted the structure presently lies within a mussel farm aquaculture zone. Underwater elements of the structure include collapsed timber piles, cut off or collapsed pile stumps, collapsed timber platform bracing and the Type ‘A’ anti-boat hurdles made of steel scaffolding. In the resulting site inspection report, some of the

issues associated with the structure and a range of recommendations were presented (Anderson 2007).

In 2008, The Heritage Council of Western Australia commissioned a report by historian Lindsay Peet with the main goal of identifying and conserving the remaining piles.

In 2010, there were further inspections and documentation efforts by WAM staff aimed to survey and geo-reference underwater features related to the anti-submarine net, using aerial photographs and historical plans. Surveys confirmed the *in-situ* presence of sections of collapsed net and key structural features of the anti-submarine boom defence remain on the Cockburn Sound seabed. This verification and official updated record of the existence of submerged components provided detailed records of their current state. The ongoing preservation and documentation efforts underscore the site's importance as a testament to Australia's wartime history and the technological innovations deployed to safeguard its coastal waters. See Anderson and Carter (2010) for more historical context and background.

Figure 3: Diver and piles of Dolphin No.60 underwater in April 2007 (Patrick Baker / WA Museum)

7. 2024 Inspection

During the inspection, the now-collapsed remains of Dolphin 60 were found to be in a deteriorating condition, with several key observations noted:

7.1 Observations

The exposed timber structure is significantly compromised, with evidence of further decay due to marine organisms. The jarrah timbers, once upright, now lie scattered on the sea floor. The observed presence of Teredo Navalis suggests ongoing biological degradation, which is impacting the structural integrity of the remaining timbers.

Figure 4: Diver (Aurora Philpin) measures Jarrah Timbers Diameter (Arabella McLeay / WA Museum)

Jarrah seafloor timbers measurements identified during the dive		
Pylon	**Length**	**Diameter/Thickness**
1	7.73m	27 - 34cm
2	6.62m	37cm
3	1.39m	26cm
4	9.50m	40cm
5	8.51m	45cm
6	10.73m	45cm

Figure 5: Timber pile structure off Garden Island since identified as Dolphin No. 60 in April 2007 after loss of timber platform bracing in a storm in 2006, view looking southeast. (Patrick Baker / WA Museum)

Figure 6: Diver (Arabella McLeay) measuring Dolphin No.60 timber pile structure (Aurora Philpin / WA Museum)

7.2 Marine Growth

The timbers are heavily encrusted with marine growth, obscuring some details of the structure but also indicating its ecological role in the marine environment. The growth patterns were assessed to understand the potential for archaeological recovery and conservation interventions. The surrounding marine habitat of Dolphin 60 is characterized by extensive seagrass beds, which play a crucial role in supporting local marine biodiversity. These seagrass meadows provide nursery grounds for juvenile fish and act as natural filters, improving water quality and stabilizing sediment. During the inspection, the habitats were assessed, noting signs of resilience amidst environmental stressors. There is the presence of damaging organisms such as Teredo Navalis. Additionally, shifting sediment dynamics resulting from stronger currents and storm events may lead to increased scouring of the site. A comprehensive understanding of these climatic impacts is essential for developing effective conservation strategies that address both the archaeological and ecological dimensions of the site.

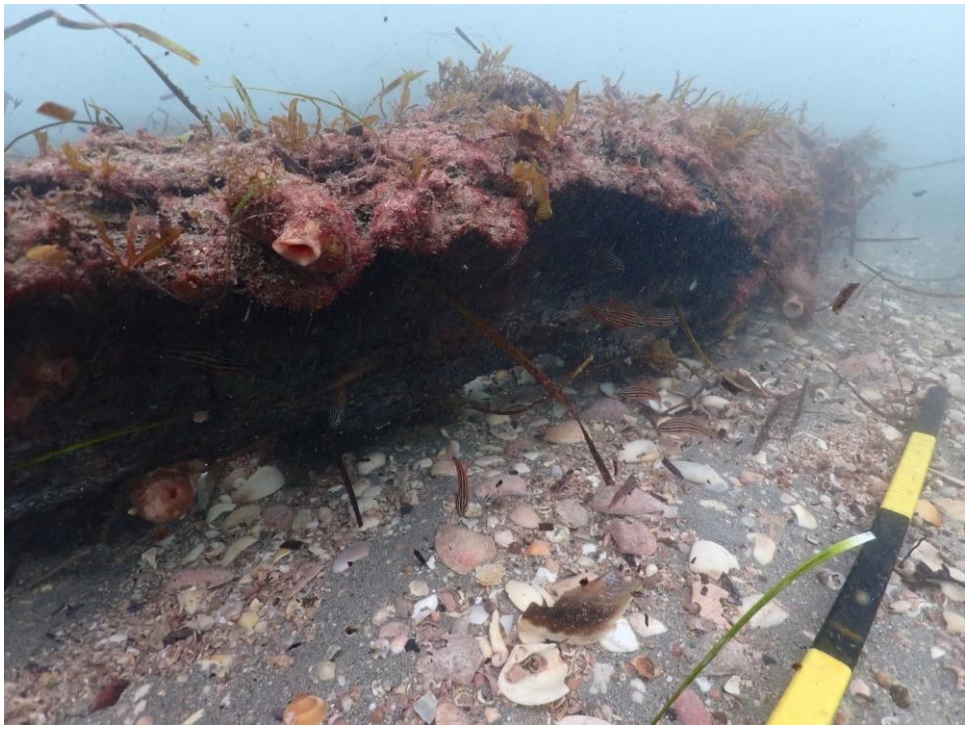

Figure 7: Marine growth on jarrah timbers (Arabella McLeay / WA Museum)

7.3 Debris Field

The debris scattered around Dolphin 60 includes fragmented timbers and sections of netting, suggesting a broader site of historical importance. Documentation through photographic surveys will facilitate comparisons with previous records from 2010, revealing changes in the site over the past years.

Figure 8: Marine growth on jarrah timbers along with surrounding debris (Arabella McLeay / WA Museum)

Figure 9: Surrounding Debris within Dolphin 60 radius (Aurora Philpin / WA Museum)

7.4 Sediment Dynamics

The inspection noted shifting sediment around the structure, likely influenced by prevailing currents. While the site's location inside Cockburn Sound is semi-protected, it is subject to natural impacts of swell and currents. The dynamic nature of the

environment poses challenges for conservation and may affect visibility and accessibility for future assessments.

8. Statement of Significance

8.1 Archaeological

Dolphin 60 represents a significant component of Australia's World War II maritime heritage, providing insights into military engineering and defense strategies of the era. The site serves as an underwater museum, offering archaeological potential for research into the technologies and methodologies employed during wartime.

8.2 Historical

As a remnant of the Cockburn Sound's Anti-Submarine Boom Net, Dolphin 60 is historically significant, symbolizing the nation's wartime preparedness and response to external threats. Its preservation aids in understanding the socio-political landscape of Australia during World War II, reflecting the historical narrative of national defense.

9. Legal Protection

Lying within State coastal waters, Dolphin 60 is protected under a Conservation Order (P17789) issued from Heritage Council of Western Australia, which recognizes the site's significance at state levels. Continued monitoring and assessments are essential to maintain compliance with legal frameworks governing maritime heritage conservation.

10. Recommendations

The 2024 inspection of Dolphin 60 revealed significant insights into the site's condition, highlighting ongoing biological degradation and sediment movement impacting the fabric of the remaining structure. These findings underscore the need for continued monitoring and a proactive approach to conservation management to stablise the site. By recognizing the historical significance and environmental context of Dolphin 60, we can develop a comprehensive strategy that balances the preservation of cultural heritage with the protection of its surrounding marine ecosystem.

Based on the inspection findings, the following recommendations are proposed to enhance the conservation and management of Dolphin 60:

- Continued protection of the cultural heritage site by Heritage Council of Western Australia and monitoring by the Western Australian Museum.

- Leave the site with minimal intervention rather than demolition and/or removal and monitor it over the long-term. Continue detailed photographic and video surveys to create a comprehensive record of the site's current condition. This will assist in future comparisons and highlight trends in degradation or preservation.
- Underwater interpretation could be provided along the section of the boom mesh net at Woodman Point and promoted as an underwater cultural heritage dive site to inform the local diving community of the significance of the site.

By implementing these recommendations, the Department of Maritime Heritage can help ensure that Dolphin 60 remains an enduring testament to Australia's maritime history while contributing to ongoing ecological research and education.

11. References

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12. List of Figures