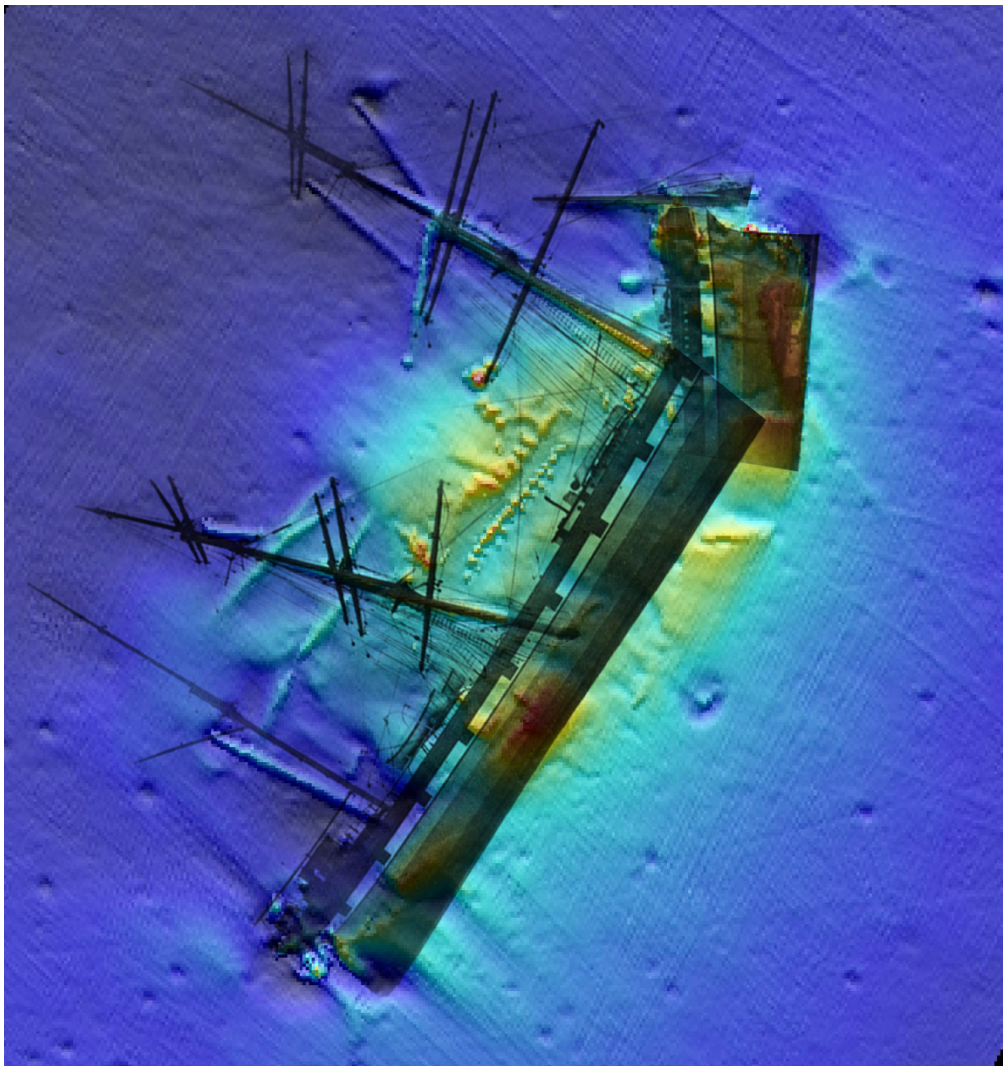
Wreck Inspection Report
Glenbank (1911), Dampier Marine Park



Ross Anderson and Deb Shefi

Report—Western Australian Museum, Department of Maritime Heritage, No. 346

March 2024

Cover image: Interpretation of *Glenbank* site (Ross Anderson/ WA Museum, Images: Precision Hydrographic Services, State Library of SA)

Thus the ancient Wainamonen
In his copper-banded vessel
Left his tribe in Kalevala
Sailing o'er the rolling billows
Sailing through the azure vapours
Sailing through the dusk of evening
Sailing to the fiery sunset
To the higher-landed regions
To the lower verge of heaven
(Canto 50 Line 493)

There his bark he firmly anchored
Rested in his boat of copper
But he left his harp of magic
Left his songs and wisdom sayings
To the lasting joy of Suomi
(Canto 50 Line 504)

Translations from *Kalevala, The Finnish national epic* by Elias Lönnrot (1835)

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Acknowledgements

Jennifer Brindle and Neil Hewitt – Precision Hydrographic Services
Troy and Glen Nuttall - Oceanic Offshore, Dampier
Daemon Bass, Michael Reid, Ash Sutton, Chickie Downey - Bass Marine
Brendan Hutchens - VAM Media

Site Inspection

Site Name: *Glenbank*

Date Lost: 1911

GPS position (WGS84): 20°19.262' S 117°02.603' E

Primary finder: Kevin Deacon
Secondary finders: Tom Radley, Johnny Debnam, Justin Leech, and Luke Leech

Dates of inspection: 18-20 August 2021

Survey dive team:

Ross Anderson (WA Museum)
Deb Shefi (WA Museum)
Ryan Chatfield (Terra Australis Films)
Johnny Debnam (Terra Australis Films)
Anouska (Nush) Freedman (Terra Australis Films)
Andre Rerekura (Terra Australis Films)

Support vessels:

MV *Kuri Pearl*, 25m twin screw liveaboard long-range expedition vessel, 16 berthed pax, 75 tons, in survey. Call sign: VJQ4772. Master(s): Daemon Bass, Ashley Sutton, Michael Reid

MV *Optimus*, 12.6m Naiad Aluminium Rigid Inflatable, 12 pax, in survey. Call sign: Optimus. Master(s): Daemon Bass, Ashley Sutton, Andre Rerekura, Johnny Debnam

Site conditions on inspection:

Sea and swell: nil	Surge: nil
Visibility: 6-8 metres	Current: Diving at slack water
Seabed: sand	Depth: 33-36 metres

Background

The location of a large 3 masted iron or steel sailing shipwreck north of Legendre Island, Dampier Archipelago believed to be *Glenbank* was first reported to the WA Museum in 2019 by Johnny Debnam, on behalf of the above-listed finders. After the

site was reported, the WA Museum contacted Neil Hewitt at Precision Hydrographic Services (PCS) to conduct a hydrographic survey of the site. PCS kindly carried out the survey on 5 May 2019 on a pro bono basis using their survey vessel *PHS Zephyr*, equipped with a C-Max CM2 side scan sonar and R2Sonic 2024 multibeam echo sounder (MBES).

A site inspection between 13-24 August 2021 was subsequently undertaken in collaboration with Terra Australis Productions and VAM Media, as part of the Disney+ six-part documentary series *Shipwreck Hunters Australia*.

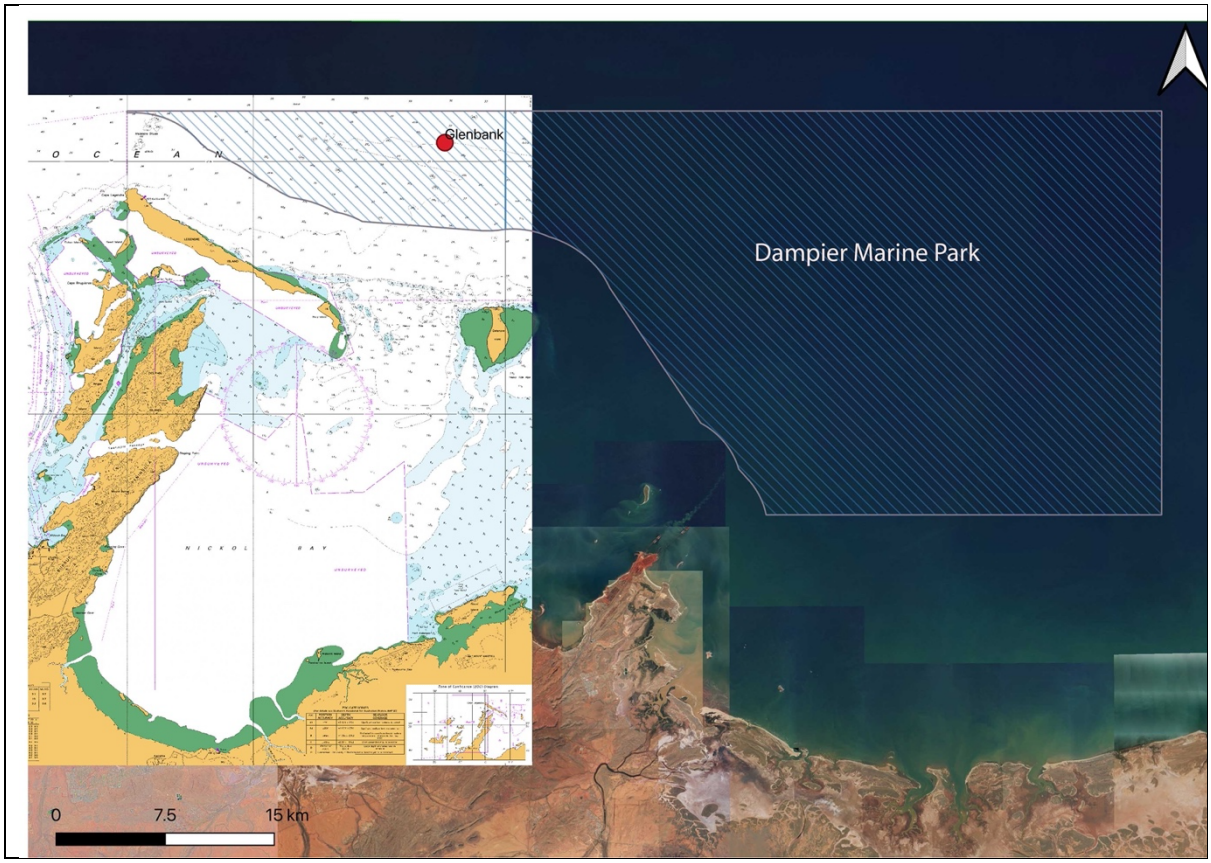

Figure 1 Location of Glenbank wreck inside the Commonwealth Dampier Marine Park (WA Museum, Landgate, Commonwealth Marine Parks, AUS327)

2021 Survey

The survey dives took place between 18-20 August 2021. All activities were undertaken in accordance with Commonwealth Marine Parks Permit PA2021-00068-1– Scientific Research in the Eighty Mile Beach, Dampier, Roebuck, Ningaloo, Gascoyne Marine Parks (WA Museum). The Precision Hydrographic Surveys MBES survey established the depth, major features and dimensions of the vessel in order to plan the inspection dives. The MBES confirmed the wreck to be that of a 75m long, three-masted iron sailing ship.

The aims of the survey were to:

- Inspect a reported shipwreck site that was believed to be *Glenbank* (1911) with the site reporters;
- Confirm the identification of the site;
- Obtain digital photography and video of the site;
- Assess the archaeological significance of the site to inform future management recommendations;
- Recover diagnostic samples, chance finds or items under threat of looting;
- Work with Terra Australis Productions and VAM Media to obtain footage and provide interviews to create a documentary episode of *Shipwreck Hunters Australia*.

Description of site

The site is located 30 nm from the town of Dampier boat ramp and 8 nm north of Legendre Island, the outermost island of the Dampier Archipelago. As a remote, deep-water site further than two hours from the nearest recompression chamber (operated by Oceanic Offshore, Dampier), planned dive times to 33-36m were conservatively limited to 6 minutes bottom-time. Dive planning utilised the MBES imagery, and each dive team was deployed to survey and digitally record a specified area of the vessel (i.e. bow, midships or stern). Depending on tidal state the minimum depth of the site was 28.9m and maximum depth 36.8m. The shallowest point over the wreck is 3.5m above the seabed (PHS 2019: 15), which is the highest part of the collapsed bow and stempost.

The site was that of a three-masted steel or iron sailing barque, and covers an area of 75 x 45m, with the maximum extent of the collapsed hull measured as being 75m in length. Most of the hull was buried, however large sections of the starboard hull plating and keel protruded from the seabed, and a little of the port-side hull plating was visible. The hull plating and three masts had collapsed to port consistent with sole survivor Antti Ketola's description of *Glenbank* capsizing on its beam ends. In between dives the ROV was deployed to record site features and the marine environment, and was beneficial in allowing a better visualisation and understanding of the site layout, features and site formation processes.

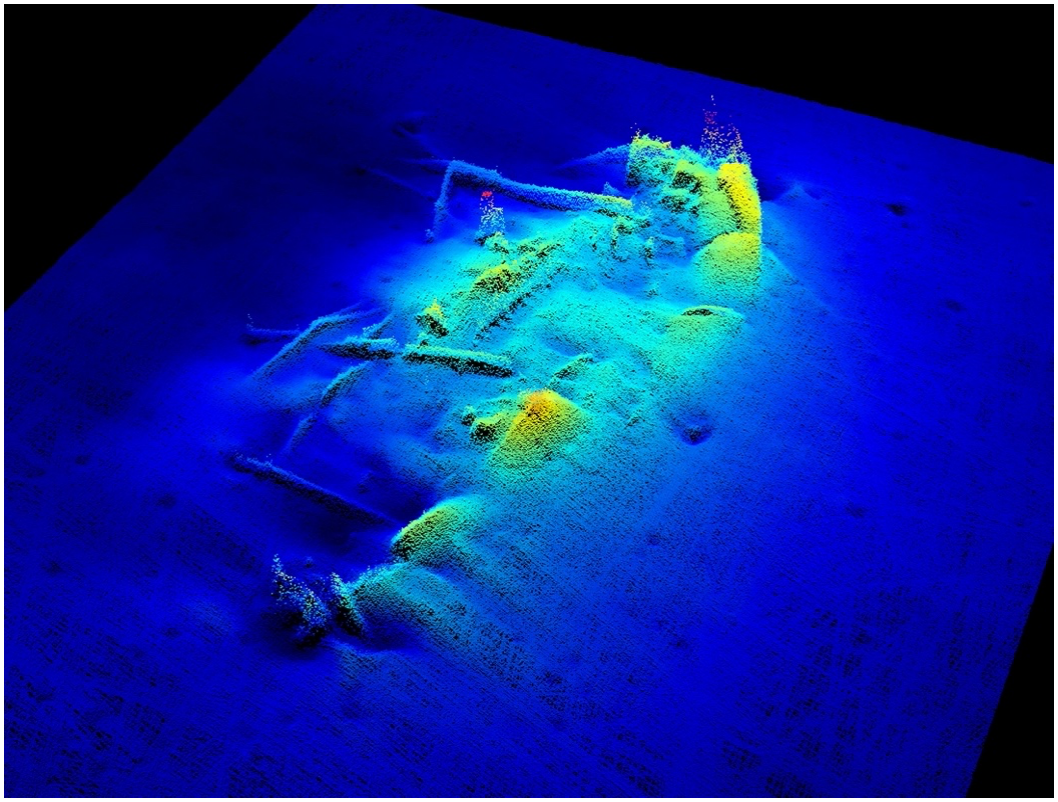

Figure 2 3D view of Glenbank site, view from stern looking north (Precision Hydrographic Services)

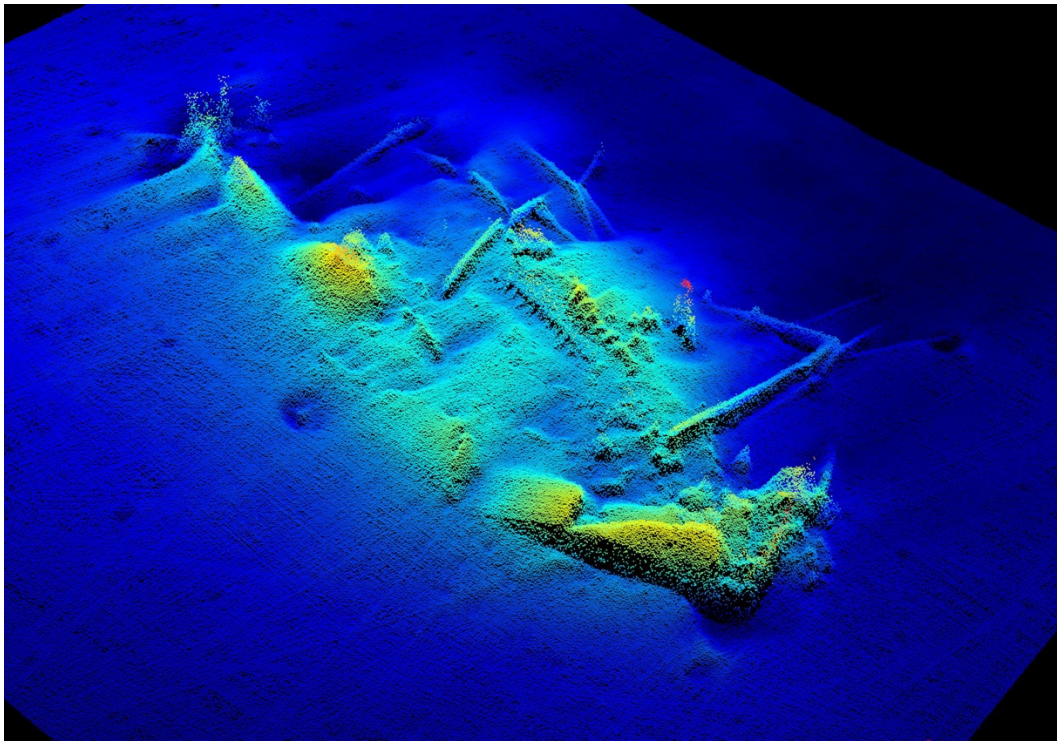

Figure 3 3D view of Glenbank site, view from bow looking southeast. Note buildup of sediment at stern; areas of sediment scouring; exposed starboard hull plating; and port side hull with upper and lower deck beams protruding between the fore and main masts. (Precision Hydrographic Services)

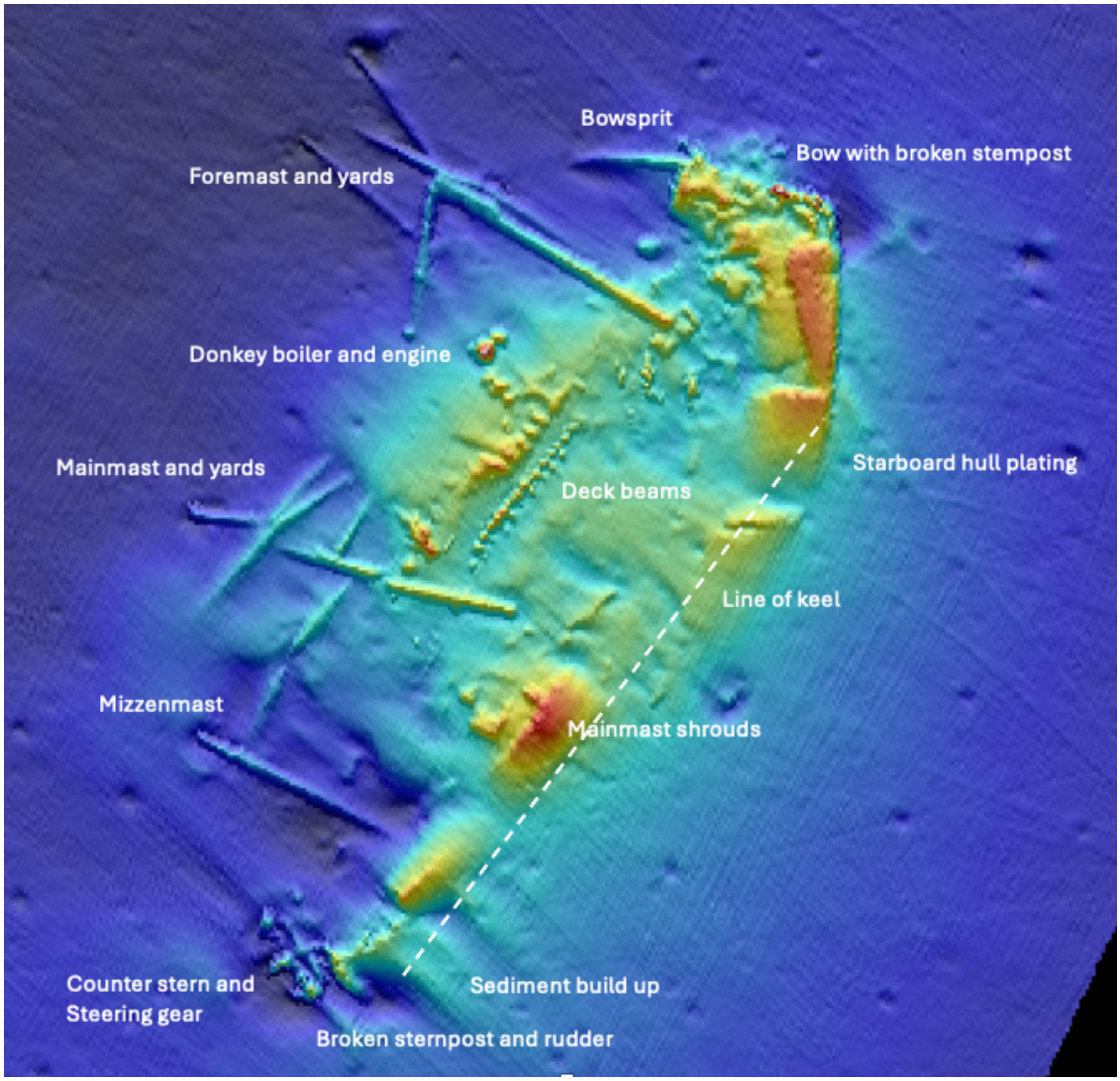

Figure 4 MBES site plan showing major features of the site (WA Museum/ Precision Hydrographic Services)

Bow area: The bow area consisted of the remains of the collapsed bow, with broken stempost, and bowsprit also broken away with a section of detached stempost. The bow is missing all of the starboard side plating, although a small section of plating with the thicker gauge steel hawse hole and hawse pipe has collapsed into the wreckage. Chain coming out of the hawse hole was attached to an iron-stocked starboard bower Admiralty anchor that is lying across the collapsed bowsprit, with an anchor davit and cathead also visible amongst the wreckage. The foremast base was broken. The stempost dimensions were measured to be 12 x 20cm, and the angle of heel of the intact section of stempost still attached to the keel was measured to be 35° from the horizontal, giving an indication of the level of collapse to port. A section of keel with a mast step was located showing that the bow section had broken away, and the ship's keel is broken in at least one, possibly two places.

Amidships area: An intact donkey boiler with a steam winch is standing upright on the seabed just to the west of the collapsed hull plating and decks. It had likely had landed after detaching from the deck during the sinking, in order to land in this position. A manual deck winch lay nearby. A section of both the upper deck, and

another presumably attached section of lower deck and hull is buried on its side with rows of deck beams protruding vertically from the seabed. Hatch coamings are visible. Scattered pieces of copper ore were found in this area, with samples recovered. Remains of the steel fore, main and mizzen masts with their yards and steel wire rigging lay collapsed to the port side. Organic remains above the seabed including all wooden topmasts and yards, and wooden deck planking have been degraded through biological action and are missing. It is likely that organic remains that have become buried in the seabed are well preserved. No keel is visible along the exposed starboard plating, indicating that it is buried in the seabed.

Stern Area: The stern consisted of the sternpost with rudder attached, and remnant hull plating. The sternpost was bent near where it had broken, likely as a result of the weight of the counter stern which had itself broken away and collapsed with the steering gear still mounted, the rudder stock had also broken, and the rudder bracket was lying on the seabed nearby. Some intact port stern plating to the bulwark level with a hawse hole was visible protruding from the seabed. The sternpost was measured to have an angle of heel of 10° from the horizontal, lying almost on its side and again indicating the extent of capsize and burial.

Site formation: The unusual site formation, along with Antti Ketola's report of the vessel capsizing and deck planks being washed up on beaches, enables some understanding of what occurred to *Glenbank*. The evidence indicates that the ship effectively split apart during the sinking event. The different angles of heel of the bow and sternposts (35° and 10° respectively), and section of keel evident in the bow area show that the ship has broken its back in at least one, and possibly two locations, certainly at least one area in the location of the foremast where there are strong leverage forces once the ship was no longer floating. The opposing forces of the weight of the 1600 tons of copper ore; trapped air in the hull; and the weight of the steel masts, yards, and rigging put immense pressure on the hull and deck structures. This likely caused the upper deck, and possibly lower deck, to separate from the starboard-side hull plating during the sinking, and subsequent process of collapse. Over time as remaining structures collapsed, and were likely further impacted during strong tidal currents and cyclones, the intact remaining hull gradually sank into the seabed and filled with sediment. Based on the angle of the stem-post and exposed hull on the seabed, it is estimated that about 85% of the port side is completely buried, along with almost the entire cargo of copper ore.

Figure 5 Mainmast shrouds visible on bulwarks of starboard side hull plating (WA Museum/ Terra Australis Films)

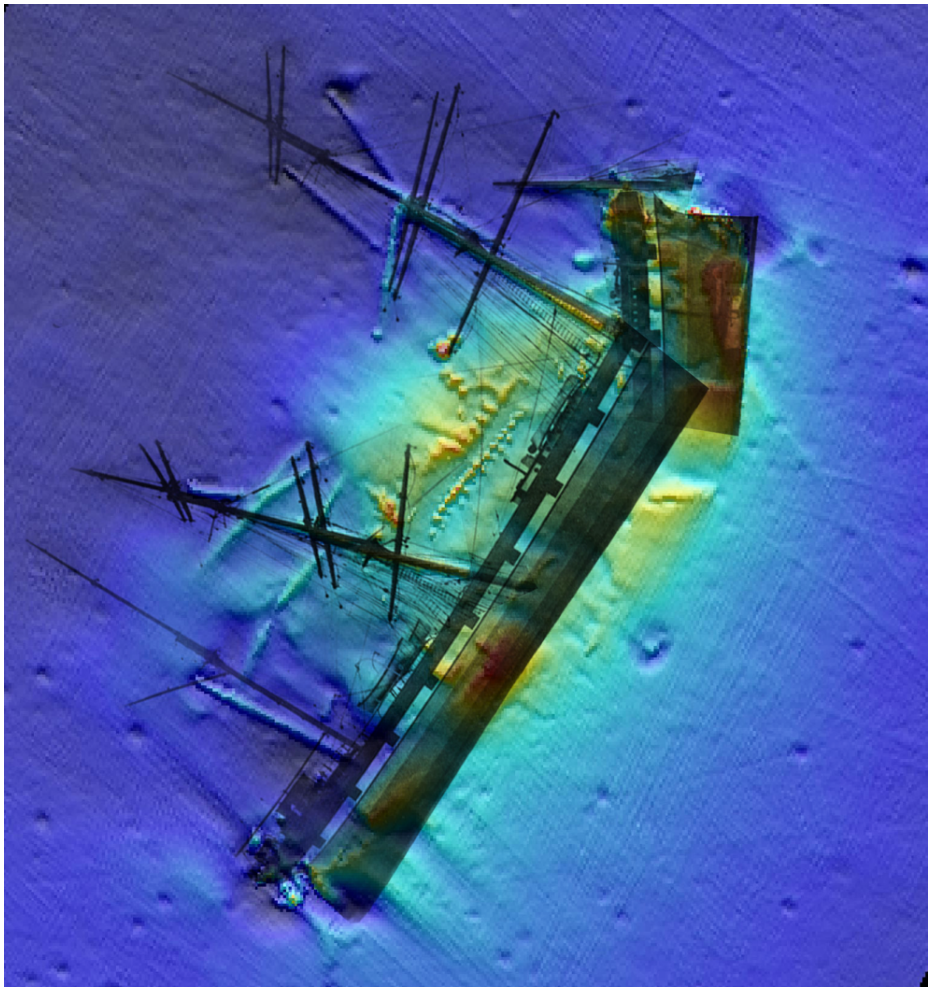

Figure 6 Interpretation of Glenbank site (Ross Anderson/ WA Museum, Images: Precision Hydrographic Services, State Library of SA)

Some scattered rocks likely to be copper ore were located amidships lying loose on the seabed; six samples were recovered for analysis (GLB6592, GLB6593)—see below for results. No other loose or portable artefacts were noted during the dives.

Marine life: The wreck has created its own ecosystem, with a rich and diverse population of marine creatures including lemon sharks, bronze whaler sharks, bull sharks, rankin cod, sea turtles and dolphin. Humpback whales have also been reported lingering over the site, potentially using the exposed hull to scrape marine growth from their skin (J. Debnam, pers. comm.).

Copper ore samples analysis

Six rocks thought to be possible copper ore were recovered from the *Glenbank* site for analysis (Kasi 2022). A Bruker AXS Handheld Tracer III-SD SN T3S2520 portable X-ray Fluorescence (XRF) spectra was used to test the composition of the samples. Instrument specifications included: channel resolution of 2048, X-ray source Rhodium tube and 10 mm^2 XFlash® SDD peltier cooled detector with typical resolution of 145 eV at 1000,000 counts per second (cps), X-ray beam area ~8 mm^2.

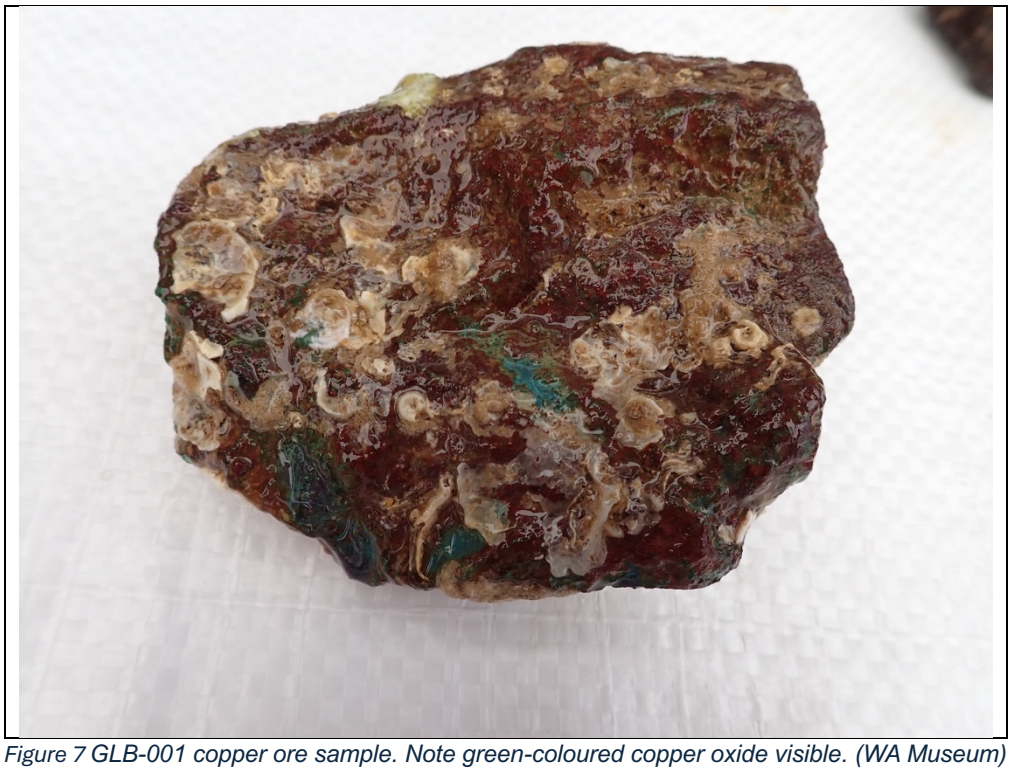

Figure 7 GLB-001 copper ore sample. Note green-coloured copper oxide visible. (WA Museum)

The samples were analysed without cleaning or preparing the surface. Two different spots on each core exterior were analysed. The results were compared with ballast rocks from the *Trial* (1622).

After normalising the data, the results identified significant amounts of copper present, as well as zinc. It is concluded that the copper and zinc are part of the rock core itself, and that the samples have not been contaminated by a non-ferrous object nearby.

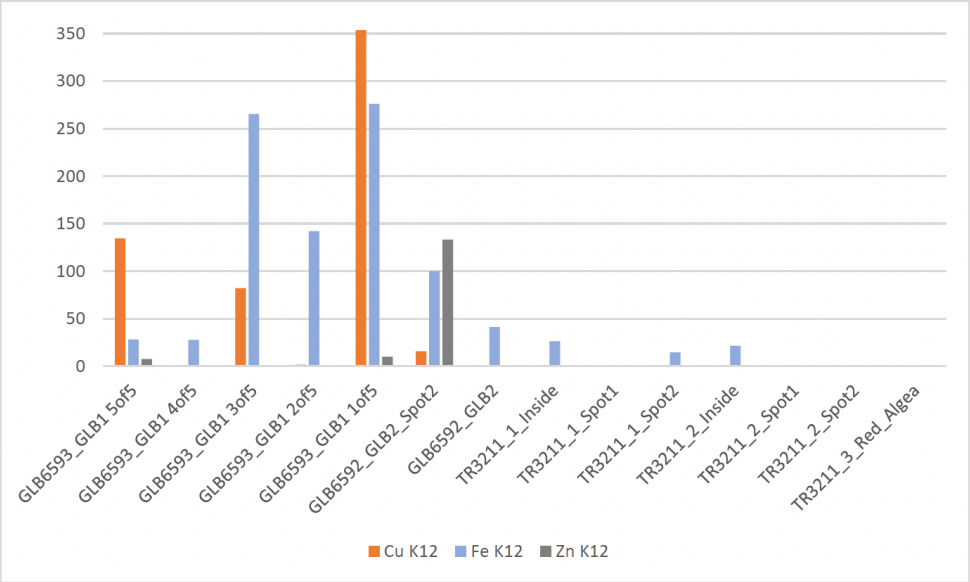

Figure 8 Copper, iron and zinc present in rocks and copper ore samples recovered from Glenbank *(1911) compared with ballast rocks from* Trial *(1622) (Kasi, K. 2022, Table 3).*

History of *Glenbank*

Figure 9 Glenbank in an unidentified port (A.D Edwardes Collection, State Library of South Australia (PRG 1373/18/26)

Glenbank was a 1481 ton steel sailing barque built in 1893 by Anderson Rogers & Co., Glasgow for Archibald Sterling and Company's Glen Line. It had dimensions of 73.2 x 11.3 x 6.4m, one deck, two tiers of beams and one bulkhead. At the time of its loss its owners were J.A. Zachariassen & Co, and it was registered at the port of Nystad (now Uusikaupunki) Finland. Finland was at that time part of Russia, hence *Glenbank* was sailing under the Russian flag.

In November 1910, *Glenbank* arrived at Balla Balla, Western Australia. The ship had been chartered by Whim Well Copper Mines Ltd to transport copper ore from Balla Balla to the United Kingdom. The Whim Well Copper mine was located about 20 kilometres inland from the coast. A private, single-track, narrow-gauge railway was used to transport the copper ore from the mine to Balla Balla jetty, which had been leased to the company. At the jetty, the ore was put on to lighters (a type of flat-bottomed barge) and ferried out to the anchorage near Depuch Island. There, the ore was loaded on to cargo ships, such as *Glenbank*. This would have been a manually laborious and time-consuming process; it could take months to load a ship. *Glenbank* had 23 crew members who were mostly Russian, Norwegian, and Finnish, and was under the command of Finn, Captain Fredrik Gonrad Moberg (1870-1911).

On 6 February 1911, Glenbank was anchored off Depuch Island, partially loaded with around 1,600-1,800 tons of copper ore. It was cyclone season and by the afternoon the worsening weather conditions indicated a severe cyclone was imminent. *Glenbank*'s anchors began to drag and Captain Moberg decided to leave Depuch anchorage and ride out the gale at sea. *Glenbank* was still in the process of being loaded with ore when Moberg decided to quit the anchorage. The cargo had not yet been trimmed and other stowage preparations had not yet been made. Exacerbating the situation, only some of the ore was bagged; the rest was loose (in 'bulk') and was more susceptible to shifting if not stowed properly (*West Australian*, 25/2/1911:11). The partially-loaded ship was thus sailing west-northwest in the open ocean off the Dampier Archipelago by 9pm, where in an increasing gale and seas, despite the efforts of the crew to furl the sails, the high winds swiftly caused the ship to heel, capsize, and sink. It is likely that the unsecured ore cargo shifting in the hold during the storm contributed to *Glenbank* heeling and capsizing so quickly. A large amount of wreckage washed up on nearby islands, however initial efforts to locate survivors or the wreck were unsuccessful, with one diver reporting that visibility was limited by muddy waters. Only one member of *Glenbank*'s crew survived.

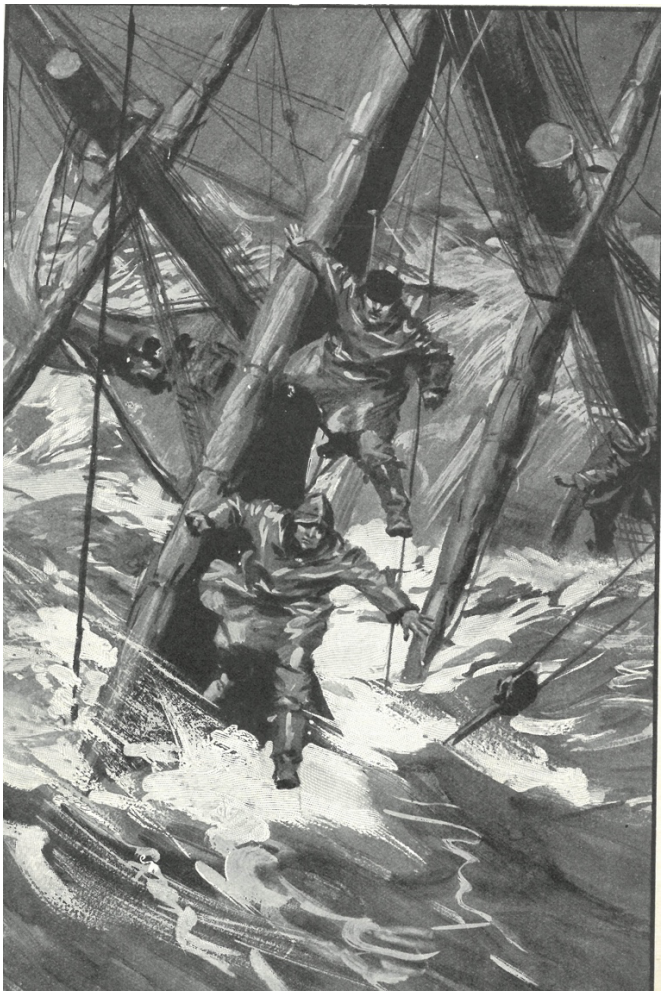

Figure 10 'Ketola and Bergstrom clung to the yard until it dipped right into the sea, and then jumped clear' (Wide World Magazine, January 1913 Vol. XXX, No. 178: 314)

Antti Ketola, a 22-year-old Finnish seaman provided an account of what happened to *Glenbank* and his own survival to *The West Australian* newspaper:

> About 8 p.m. we were having something to eat, when all hands were called on deck, and six of us were ordered aloft to take in the leeside of the lower main topsail, but only myself and the third mate went aloft. It was blowing that hard I could scarcely get up the rigging. We made the lee side of the topsail fast, and whilst doing so the vessel took a heavy list. She was shipping heavy seas at the time. I was on the yard, and the third mate got as far as the mast, when the vessel capsized right over… I stuck to the end of the yard until it sank, and then commenced to swim… I just kept myself afloat. About half an hour afterwards I saw a shark, but kept it off with my knife every time that it would attempt to come near me… As the sun was rising next morning I landed on the island. (*The West Australian*, 13 February 1911)

Ketola was on Legendre Island for three days, surviving on raw shellfish. He was eventually seen and picked up by the pearling lugger, *Pearl*, and taken to the nearby port of Cossack. Within days of the sinking, wreckage from *Glenbank* had washed

ashore on Legendre, Hauy and Delambre Islands and a large quantity of wreckage was drifting in Nichol Bay. The Roebourne police cutter searched the coastline for survivors and divers from a pearling lugger were engaged to search for the wreck. The schooner *Queenie Alice* was also dispatched from Cossack by Dalgety and Co. to aid in the search for the wreck and any survivors without success. In April 1911, Fremantle's acting Harbour Master Captain Winzar received a telegram advising that a pearl diver had claimed to have found the wreck inside the Legendre Reef (*Daily News*, 19 April 1911 p.2), but this is an unlikely story given the location of the wreck eight nautical miles north of Legendre Island.

Site identification

Known losses in the area: *Glenbank* is the only large, three-masted iron sailing ship recorded to have been lost in this area off the Dampier Archipelago.

Length: The length of the site measured at 75m is consistent with *Glenbank*'s registered length of 73.9m, allowing for the collapsed stern and bow structures.

Site formation: The wreck lying on its port side is consistent with sole survivor Antti Ketola's description of the wreck capsizing to port.

Cargo: Copper ore recovered from the wreck is consistent with *Glenbank*'s recorded cargo of loose copper ore loaded at Balla Balla.

Summary: Based on known losses in the area, site length, number of masts, visible hull remains, and copper ore recovered, the site is confirmed to be *Glenbank*.

Legal Protection

The wreck of *Glenbank* is protected under the Commonwealth *Underwater Cultural Heritage Act 2018*. It is an offence to damage, disturb, or remove any artefacts from the wreck without a permit. *Glenbank* also lies within Commonwealth waters within the National Park Zone of Dampier Marine Park, where no recreational or commercial fishing is allowed, and a permit is required for any commercial, non-fishing tourism. Recreational diving within the National Park Zone is allowed without a permit.

Statement of Significance

Historical

Glenbank is representative of a class of steel and iron-hulled sailing vessels essential to international trade that were used globally between the 1870s and 1920s, to transport bulk cargoes such as wheat, coal, guano, timber and mineral ores.
Glenbank is associated with the early development of the minerals and mining industry of north-west Western Australia, that is now a major contributor to Western Australia's, and Australia's economy. It is associated with the international export of copper ore from the Whim Well mine, shipped out through the port of Balla Balla. It is

part of a suite of related maritime archaeological sites at Balla Balla/ Depuch Island including the archaeological remains of the jetty and lighter wrecks, the iron sailing ship *Crown of England* (1912) wrecked on Depuch Island in a cyclone with a cargo of copper ore and the loss of eight lives, and burials on Depuch Island.
Glenbank is also significant as one of the major cyclone wrecks and maritime tragedies of north-west Western Australia which resulted in significant loss of life. The wreck demonstrates the risks to shipping using north-west semi-sheltered ports with poor or non-existent mooring infrastructure, exposed to cyclones.
The cyclone that caused the loss of *Glenbank* led to many other pearling luggers and other small vessels being wrecked, with damage widespread in the Montebello Islands, Onslow and Roebourne areas (Worsley 2021).
The ordeal experienced by the sole surviving crew member Antti Ketola was widely published in newspapers and international magazines, and his surviving a shark attack is an early account of a shark incident in Australia, and the 11th shark attack recorded in Western Australian waters (Meagher et al., Record 157). The discovery and archaeological inspection of *Glenbank* was featured in the Disney+ series 'Shipwreck Hunters Australia' (2022), that showcased the story of the wreck to a global audience of 150 million subscribers.

Social

Glenbank has social significance for the loss of life of 22 crew members, to the north-west marine community who have known of the history of the wreck, and for the finders who discovered and first dived the site. There are documented links between the *Glenbank'*s crew and their descendant families in Finland (Shipwreck Hunters Australia, *Glenbank* Episode 1).

Archaeological

Glenbank is archaeologically significant with an estimated 5m and 60% of the hull buried in the seabed, including almost the entire cargo of 1600 tons of copper ore. The wreck is likely to contain artefacts such as ship's fittings, provisions, the crew's domestic possessions and human remains, preserved in the seabed.

Aesthetic/ Environmental

The wreck of *Glenbank* has formed a seabed structure habitat supporting a diverse range of marine flora and fauna that has remained relatively untouched. *Glenbank*'s location in a prohibited fishing zone in the Dampier Marine National Park will ensure that this localised marine ecosystem offering an incredible diving experience remains intact, and can be enjoyed and studied by recreational and scientific divers.

Scientific

Further study of *Glenbank*'s marine ecosystem may contribute to a better understanding of historic shipwrecks as 'islands of biodiversity for marine microbiomes' with their influence extending to the surrounding seabed, shaping biogeography on the seafloor. (Hamdan et al. 2021)

Recommendations

1. As the site is located within the National Park Zone of the Dampier Marine Park, and the remote and exposed location lends itself to self-protection, the recommendation is to leave the site with minimal intervention, and monitor it over the long-term.
2. Local divers and dive operators should be made aware of the site and encouraged to use and monitor it, and to report any significant changes, vandalism or damage.
3. Should a cyclone go through the area, another MBES survey should be carried out and if structural changes are noted, to revisit the site.
4. Liaise with the Australian Marine Parks Authority to ensure sustainable future management of the site in accordance with the Commonwealth *Underwater Cultural Heritage Act 2018*.

References

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