Boot Reef is a perfect ship trap – difficult to see, imperfectly charted and lying across one of the main entrances to Torres Strait

Irini Malliaros , Jacqui Mullen and Andrew White from Silentworld Foundation searching for 'black reef' on Boot Reef.

All images Julia Sumerling, Silentworld Foundation

Black reefs and the 'Jardine Treasure'

The Boot Reef Project 2018

In December 2018, a team from the Silentworld Foundation and the Australian National Maritime Museum located a mystery shipwreck at Boot Reef off Australia's far north-east coast. Archival research narrowed its possible identity to one of a small handful of wrecks from the early 19th century – foremost among them a site first reported in 1891, which, according to legend, contained a hoard of silver coins that came to be known as the 'Jardine Treasure'. Authors Kieran Hosty, Dr James Hunter, Irini Malliaros and Paul Hundley were members of the expedition.

BOOT REEF IS A DRYING REEF SYSTEM with two central lagoons. It is located 950 kilometres north of Cairns and some 30 nautical miles (56 kilometres) east of Yule Entrance at the extreme northern end of the Outer Great Barrier Reef.

The reef was given its European name by Lieutenant Matthew Flinders, who passed it in 1803 in the Colonial Government Schooner *Cumberland* on his way to England. Flinders had recently been rescued following the disastrous wrecking of HMS *Porpoise* and the merchant vessel *Cato* on Wreck Reefs in August 1803 (see *Signals* No 90).

In 1891, the crew of a *bêche-de-mer* (sea cucumber) fishing vessel, *Lancashire Lass*, located the remains of an early-19th-century vessel on a remote coral reef in the northern approaches to Torres Strait. *Lancashire Lass* was captained by Sam Rowe and owned by Francis (Frank) Lascelles Jardine, a pastoralist and plantation owner from Somerset, Queensland. The shipwreck site was discovered while the crew of *Lancashire Lass* – which had been pushed across the reef top into an enclosed lagoon during a tropical storm – attempted to cut a channel through the reef to extract their vessel.

Rowe and his crew recovered numerous items from the wreck, including an 'old-fashioned' anchor, a small bronze gun and several thousand Spanish silver coins minted between 1713 and the mid-1820s. Six boxes of specie (coins) were later exported from Mer (Murray Island) on 22 May 1891 and sent to England via the steamer *Tara*. According to the *Pall Mall Gazette* of 5 January 1892, *Tara* later landed a large quantity of specie – which the newspaper called the 'Torres Strait treasure' – with a value of £6,600 (equivalent to at least $1 million today). Colonial newspapers such as *The Sydney Morning Herald* and the *Morning Bulletin* took up the story, and the legend of what became known as the 'Jardine Treasure' was born.[1]

In newspaper accounts reporting the discovery, Rowe and Jardine speculated that the large number of Spanish coins recovered from the wreck indicated it was a Spanish vessel – likely one that had left South America with the payroll for Spanish garrisons in either Mauritius or the Solomon Islands. For some unknown reason, the ship had ended up wrecked in the remote, far-northern Great Barrier Reef.

While willing to share some information, Rowe and Jardine were understandably reluctant to reveal the location of the shipwreck. They only stated that it was at 'the very northern end' or 'the very outer edge' of the Great Barrier Reef. The mystery of the wreck's identity and location was compounded when Rowe was later murdered by the crew of his new lugger *Wren* in 1893.[2]

That's where the story of the Great Barrier Reef's 'mystery Spanish wreck' might have ended, had the Australian National Maritime Museum and Silentworld Foundation not commenced a long-term research project in 2012 to investigate shipping routes through and around the Great Barrier Reef that connected 19th-century Australia with the rest of the world.

Colonial newspapers took up the story of the shipwreck haul, and the legend of what became known as the 'Jardine Treasure' was born

Descending off the western side of Boot Reef, expedition divers located a second long-shanked anchor in 39 metres of water. Pictured is Kieran Hosty (ANMM).

As part of their archival investigations into historic shipwrecks along these maritime routes, the team came across several mentions of the lost 'Spanish shipwreck' and uncovered a tantalising clue to its possible whereabouts in the collection of the Museum of Applied Arts and Sciences (Powerhouse Museum) in Sydney. Object N12662 is described as a 'Coin, Spain, Ferdinand VII (1808–33). Dollar, Mexico Mint, 1817 found Boot Reef Torres Strait by Capt Rowe of *Lancashire Lass*.'[3]

The generous sponsorship of the Silentworld Foundation enabled the project team to survey Boot Reef last December to follow up these leads. Maritime archaeologists, researchers and staff from the Silentworld Foundation and maritime archaeologists from the Australian National Maritime Museum joined MV *Silentworld* at Thursday Island and commenced a 24-hour passage through the eastern Torres Strait and beyond the outer edge of the Great Barrier Reef to the remote atoll.

Upon arriving at Boot Reef, we were pleased (and somewhat amazed) to find near-perfect weather conditions; the sea was flat and glistening in the tropical sun, with only a slight swell barely breaking to indicate the edge of the reef. While pleasant, these conditions also highlighted what a perfect ship trap Boot Reef could be, as it was difficult to see, imperfectly charted and lying across one of the main entrances to Torres Strait.

Our search for an anchorage emphasised the hazards posed by Boot Reef during the 19th century. No shallow-water anchorages exist at Boot Reef because it is a seamount with near-vertical walls that rapidly rise from a depth of 1,500 metres to a narrow plateau less than 100 metres wide at 90 metres depth. From this point, the seabed again rises vertically to sea level. Armed only with a 50-fathom (90-metre) sounding lead and relatively inaccurate charts, 19th-century sailors would have been caught completely off guard if they encountered the reef at night or in dead-calm conditions.

With no anchorage available, we decided to anchor inside the lagoon of nearby Ashmore Reef (see *Signals* No 112) at night and make the 10-nautical-mile (16-kilometre) journey to Boot Reef each morning.

One of our first tasks was to circumnavigate Boot Reef in *Blackwatch*, the largest of *Silentworld*'s three tenders. Because Boot Reef has a perimeter of more than 18 nautical miles (33 kilometres), this took several hours but allowed us to visually scan the reef top and look for signs of shipwrecks, including anchors, anchor chain and ballast mounds. It also facilitated collection of a series of GPS plots for the outer edge of the reef, which could be used for mapping once fieldwork was complete. Meanwhile, John Mullen of Silentworld Foundation managed to pilot the project's remote-sensing survey vessel *Maggie III* over the reef top into the smaller of Boot Reef's two completely enclosed lagoons. An investigation of the area located a few promising magnetic anomalies that could indicate the shipwreck discovered by Rowe.

With more fine weather the next day, the team continued the remote sensing survey along Boot Reef's western side. The crew aboard *Blackwatch* towed the magnetometer along the outer and northern areas of the reef, while those on *Maggie III* surveyed the two sheltered, but surprisingly deep, lagoons. They also investigated areas on the reef flat which, in 2017, had been identified by maritime archaeologists from Silentworld Foundation and the Australian National Maritime Museum through satellite imagery as possible locations of a phenomenon known as 'black reef' – a consistent pattern of dark discolouration on the reef flat that correlated with the plotted locations of historic shipwreck sites.

Black reef is observed at sites of modern shipwreck or natural disaster.[4] The relationship between black reef and shipwrecks has not been well studied, and research is ongoing. However, current and past investigations have noted a biological 'phase shift' in affected reefs,[5] in which a coral-dominated benthic ecosystem (inclusive of microalgae) is replaced by a predominantly (macro)algal one in response to stresses such as pollution via run-off, severe storm damage and shipwreck.

Black reef was not observed or recorded during the 2017 field season at Kenn Reefs, as it only became apparent during post-fieldwork GIS (Geographic Information Systems) analysis.

The effects of historic shipwrecks on coral reefs are poorly understood. A primary aim of the Boot Reef project was to collect samples and acquire empirical data to contribute to a broader understanding of the relationship between black reef and historic shipwreck sites. Our research also hopes to quantify the potential of black reef to act as a predictive indicator for locating shipwrecks. The ability to review satellite imagery before undertaking fieldwork and to select areas of interest based on the phenomenon's presence could potentially revolutionise the way sites are located on the Great Barrier Reef and in the Coral Sea.

01

On the expedition's fifth day, the magnetometer team found a series of significant magnetic anomalies on the western side of Boot Reef, along the upper edge of a near-vertical 90-metre drop-off. At the very same time, a team of snorkellers investigating a patch of black reef 50 metres to the east of these anomalies coincidentally located a run of anchor chain. Later in the day, the team aboard *Maggie III* found an early-19th-century old-pattern Admiralty long-shanked anchor lying on the reef top. The anchor appeared to be associated with, but was not physically connected to, the run of chain.

Aided by an aerial drone, additional magnetometer survey work and in-water searches, other shipwreck material was soon discovered, including copper-alloy hull fastenings, iron chain plates (used to attach the standing rigging to the hull of the ship) and a heavily eroded glass decklight.

The presence of an anchor and chain does not necessarily indicate a shipwreck site. It could instead mark where a vessel struck the reef and an anchor was used to 'kedge', or pull the hull into deeper water, before sailing away and leaving the anchor behind. However, the presence of the structural material strongly suggested that the vessel had endured significant damage and broke up as it was pushed across the reef flat.

With the anchor chain oriented almost directly east–west across the reef flat, the team investigated the area around either end in an effort to find the remains of the ship.

On the reef's western side, the anchor chain was broken at the very edge of a 90-metre drop-off. Did this indicate the vessel had come from the east, struck the reef and bounced over the top, paying out its anchor and chain before either sailing away or sinking off the western edge of the reef? The only way to find out was to send teams of scuba divers down the drop-off to search for signs of the wreck.

01
Near the deep-water anchor, divers also discovered fragments of timber – an unusual find, given the warmth of the water and the presence of wood-eating marine borers. Pictured is Kieran Hosty (ANMM).

02
Libby Illidge (AIMS) and Jacqui Mullen (Silentworld) plotting the run of open-link anchor chain across the reef top. The anchor chain led the team to the drop-off and eventually the second anchor.

'Black reef' is a consistent pattern of dark discolouration on a reef flat that correlates with the plotted locations of historic shipwreck sites

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The presence of an anchor and chain does not necessarily indicate a shipwreck site

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For their orientation and equipment check dive, the expedition divers revisited the site of the *Comet* (1829) on Ashmore Reef.

02
Irini Malliaros (Silentworld Foundation) and James Hunter (Australian National Maritime Museum) recording one of the old-pattern Admiralty long-shanked anchors found on Boot Reef.

Recovered from the wreck were several thousand Spanish silver coins minted between 1713 and the mid-1820s

Given the extreme water depth and Boot Reef's isolation, this would be no ordinary reef dive. It required considerable planning and additional safety equipment, including emergency 'bail-out' air cylinders, in case the divers experienced equipment malfunction at depth.

Thanks to the reef's excellent underwater visibility, the divers were able to scan the edge of the drop-off from sea level down to between 70 and 80 metres depth. They didn't locate the shipwreck, but they *did* find a nearly identical Admiralty long-shanked anchor precariously perched on a coral ledge at 39 metres. Its presence, and the broken anchor chain on the reef flat almost directly above it, suggest that the vessel approached from the west and struck the reef's western edge, where the crew dropped one of the anchors before running out its anchor chain. The vessel then appears to have slid eastward across the reef top, losing various structural components along the way.

A survey of the eastern side of Boot Reef located another scatter of shipwreck material in about two metres of water, including large iron keel bolts, mast rings, mast caps, lead shot, lead sounding weights and fragments of coal. At least two iron gudgeons (large hinges mounted on a ship's stern upon which the rudder pivots) were also found, suggesting that the vessel's stern section came to rest on the reef's eastern edge. While the team did not find articulated timber hull components, evidence suggests that the Boot Reef shipwreck represents an early-19th-century sailing vessel of some 200–300 tons that was copper sheathed and iron fastened.

Although the annotation associated with the silver coin in the Powerhouse Museum collection states that Rowe collected it from Boot Reef, the archaeological fieldwork conducted in December 2018 has cast some doubt on his assertions. While an early-19th-century shipwreck was located on the reef flat, the site does not resemble the description provided by Rowe in historic newspaper accounts. Also, archival research conducted by the team after the 2018 survey uncovered a 1911 statement by Frank Jardine that the shipwreck was located 'in a lagoon of Portlock Reef'.[6] This statement appears to contradict Rowe's 1891 assertion that the wreck was located 'on the extreme outer reef of the Great Barrier Reef Chain'. However, it is worth noting that Portlock Reef has historically been considered the extreme northern limit of the Great Barrier Reef.[7]

Whether or not the shipwreck found by *Lancashire Lass* was on Boot or Portlock Reef is a matter of conjecture, but there is reason to believe that it was the remnants of *The Sun*, an English-built, 185-ton brig that arrived in Hobart in early 1826 with a cargo of tea from China. It then sailed to Sydney, where its captain secured a cargo worth 30,000–40,000 Spanish dollars (equivalent to as much as AUD1.4 million today) in silver specie to deliver to Singapore. In December 1826, reports arrived in Sydney, via India, that *The Sun* had been wrecked on a remote coral reef near the northern entrance to Torres Strait. The entire crew appears to have survived and arrived at Mer after a two-day voyage in the ship's boats. Tragically, 24 crewmen drowned when their boat capsized in the surf as they attempted to land.

Although it is difficult to confirm that Rowe and the *Lancashire Lass* crew found the wreck of *The Sun*, the type of coinage and its date range seem to favour the theory.

If the Boot Reef wreck is not the vessel located by Rowe, then archival research seems to indicate that it may be the *Eliza* (1815), *Fame* (1817), *Henry* (1825) or *Venus* (1826). These share many of the characteristics of the wreck found on Boot Reef, but only further research will be able to confirm its identity.

1 Most of the specie was sent by the Jardine family to England, but it is uncertain what happened to it.

2 *The Brisbane Courier*, 28 November 1893.

3 maas/291947, accessed 30 May 2018.

4 Hatcher, B, R Johannes and A Robinson (1989), 'Review of the Research Relevant to the Conservation of Shallow Tropical Marine Ecosystems', *Oceanography and Marine Biology* 27: 337–414.

5 Done, T J (1992), 'Phase Shifts in Coral Reef Communities and Their Ecological Significance', *Hydrobiologia* 247(1): 121–132.

6 *The Brisbane Courier*, 27 May 1911.

7 *The Sydney Morning Herald*, 5 May 1846.

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