The Mystery of the *St Michael*: Site Formation Processes and River Wrecks at Morpeth, New South Wales, Australia

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Abstract

In the 1820s European settlement had extended inland along the Hunter River, initially led by convict gangs. In 1827 the former South Seas trade vessel *St Michael* sailed from Newcastle (where it had operated as a floating storeship since 1826) up the Hunter to the small settlement of Morpeth. The vessel was converted to a private hulk/floating wharf and supply depot, and reportedly also as an administrative base for convict timber gangs. The storeship was eventually towed across to the other side of the river where it turned turtle and sank in 1841. Despite preparation for its recovery for use as a coal vessel and partial limited salvage, the vessel was never recovered and is believed to have settled in place, where it presumably remains. This paper details collaborative research undertaken by the University of New England with a local avocational historian to locate/identify the vessel and details the complexities of searching for early riverine wrecks in flood-prone areas. This paper builds upon ongoing research undertaken for the NSW Rivers Project, which is documenting and recording all aspects of use of rivers in NSW.

Keywords

maritime archaeology, hulks, fluvial geomorphology, remote sensing, shipwreck site formation processes, riverine shipwrecks, Australian shipwrecks, French shipwrecks, shipwreck, historical archaeology, site formation processes

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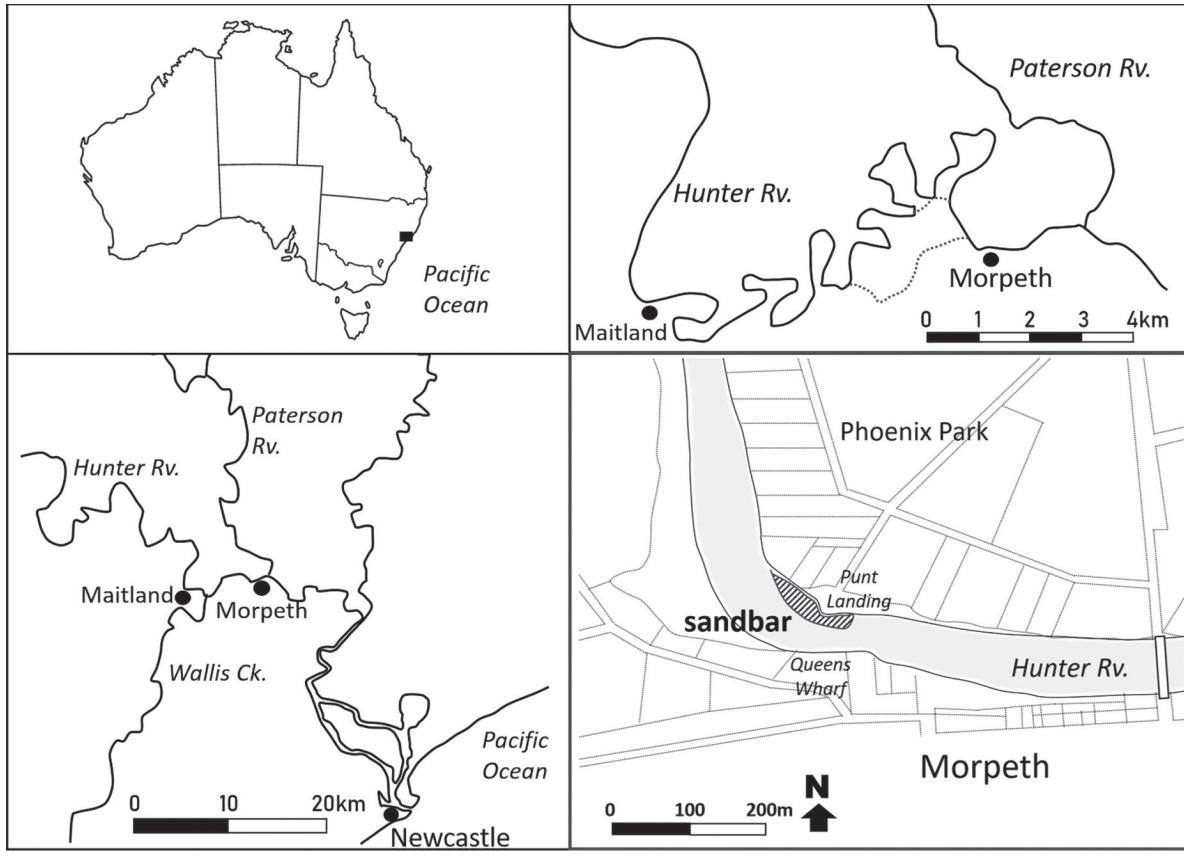

Figure 1. Location of the Township of Morpeth, NSW, Australia. Image: Martin Gibbs

Introduction

The small village of Morpeth sits on the banks of the Hunter River in New South Wales, Australia, 45 km (28 miles) upstream from the port town of Newcastle, at the highest point navigable by large vessels. Like so many settlements of its kind, during the mid-nineteenth century it had its heyday as a major river port and trading point for the region, developing wharfage and other maritime infrastructure. One of its earliest landmarks was the hulk of the *St Michael*, used variously as a store ship, commercial premises, and temporary residence in the 1820s and 1830s before it finally sank on the banks of the river in 1841. This paper reports on a collaborative project between the Morpeth community and members of the New South Wales Rivers Project (NSWRP) to explore the history and archaeology of the *St Michael*. A particular area of interest for the NSWRP is to develop a better understanding of the natural and cultural site formation processes working on riverine wrecks. Despite historical sources suggesting a relatively small area in which the remains of the *St Michael* (a substantial vessel) might lie, the difficulty in relocating the wreck affords us the opportunity to focus on what processes have influenced the site over time.

Background

Soon after British colonists landed in Australia in 1788, they engaged in exploration of the regions and resources north and south of the original settlement of Sydney. Extensive stands of timber, especially the much sought after Australian cedar (*Toona ciliata*), were identified along the upper reaches of the Hunter River as early as 1797. Only five months after the new penal settlement of Newcastle was established at the mouth of the river in 1804, convict timber gangs were extracting cedar from near the junction of the Hunter and Paterson rivers, 45 km upstream in an area known as Green Hills.[1] By 1819 the rich alluvial plains of the area were opened to free settlement, although government services, including the construction of towns and roads, lagged behind and the Hunter River remained the best means of transportation.[2]

In 1821, Lt. Edward Charles Close (a Peninsular War veteran) was granted a large area of land along the Hunter River adjacent to Green Hills.[3] His choice of allotments proved very astute as the water frontage he claimed included the highest point where larger vessels could sail up the Hunter. This meant that the area became a transhipment point, with larger vessels transferring cargoes and people to and from smaller lighters moving up to or down from the shallower areas on the Hunter and Paterson rivers.[4] By 1822 Close had excised a small portion of his holdings to develop a small settlement, initially called Illalung (the Wonnarua Aboriginal community's name for the area) and Green Hills, although later renamed Morpeth.

Maritime infrastructure began to be developed along the edge of the river and, presumably in a bid to expedite the development of facilities, a decision was made by several local landowners to bring an old vessel up the river for use as a floating storehouse. That vessel was the *St Michael*.

The Past Lives of the St Michael

Noted Australian maritime historian, the late Ronald Parsons, lists *St Michael* as a three-masted timber ship of 171 tons burthen, measuring 77 feet 6 inches (23.6 m) long by 23 feet 10 inches (7.3 m) beam by 9 feet 2 inches (2.8 m) depth and built in Bordeaux at an unknown date.[5] Two later researchers, Robson[6] and Lawry,[7] have suggested that originally the vessel was a Bordeaux-built French vessel, *Guepe*, taken as a prize by the English in the Napoleonic Wars (1803–15). Lawry[8] further advocates that the Royal Navy may have converted the vessel to a three-masted rig ship before recommissioning it as a spy vessel, HMS *Wasp*. However, it appears that the *Guepe* was 298 tons,[9] which is too big to be the vessel eventually located at Morpeth. Further historical research of various Registers of Shipping is ongoing, and several French prizes of comparable size have been identified (e.g., *Vigilance* and *Altona*—see Lloyd's Register 1808 and 1812, respectively).[10] However, once again their specifications and/or origins do not match the later *St Michael*. If the wreck is relocated, then timber species identification will be critical in determining the vessel's origins and possibly confirming its identity.

St Michael is not included on any Lloyd's Registers from 1800 to 1819,[11] which may be expected if the vessel was not a British Registered ship. Parsons's[12] earliest registration record for *St Michael* is in Calcutta in 1819, when the vessel was purchased by Capt. Dillon from J. Barretto and Sons in 1819, and on one voyage the vessel returned convicts to Sydney from India who had escaped from Hobart in February 1819 on the schooner *Young Lachlan*.[13] Between 1819 and April 1821 the vessel undertook several voyages between Australia and India, as well as between Sydney and Tasmania.[14]

In 1821 a report of a court case against Captain Dillon notes that *St Michael* was not an officially registered British vessel and hence was not supposed to be trading within the British Colony of Australia, and that it had made voyages to India

by "The Honourable Company's pass," referring to permission from the English East India Company.[15] This case is significant as it may indicate that the vessel was not of British Registry, lending support to Parsons's assertion that the vessel was of French origin,[16] and explaining its absence from Lloyd's Register.

The Rev. Walter Lawry purchased the vessel on April 9, 1822, and used it from April 1822 to 1824 to undertake missionary work throughout the Pacific. These missionary voyages were instrumental in uniting the warring clans of Tonga.[17] In March 1825, James Cobb (a Sydney merchant) bought a part share in *St Michael* to service his interests in Van Diemen's Land (present-day Tasmania), and Capt. Beveridge also retained his share and command of the ship, carrying merchandise and Government stores.[18] *St Michael* continued voyages between New South Wales and Van Diemen's Land, carrying a variety of general cargoes. It was sold again in September 1826 to Mr. Winder and Capt. Livingstone and sailed to the harbor at Newcastle.[19] Once there it was used as a storeship, receiving goods from the agricultural settlements along the Hunter River and loading them directly onto vessels which were running between Newcastle and Sydney, including Winder and Livingstone's cutter *Lord Liverpool* packet.[20] By April of 1827, "A quantity of Standing and Running Rigging, Sails, Blocks, Masts and Spars etc etc landed from the Ship *St Michael*" was advertised for sale by auction.[21]

History of the *St Michael* at Morpeth

Both Thomas Winder and Capt. Alexander Livingstone had extensive agricultural land holdings on the Hunter River near Morpeth,[22] so the issue of how to store and transport grain was important to them. In September of 1827, a newspaper report noted that "Mr Winder has taken the storeship *St Michael* to her moorings on the Hunter near the estate of Mr Close. This arrangement cannot fail of being of the greatest use to the settlers in that fine place."[23] Not only would using a vessel as a store provide an instant facility without need for construction, it also would have negated the need for a wharf, as well as providing security from theft and potentially from flooding, which was a perennial problem along the Hunter. Some writers have suggested that *St Michael* was being used a storeship to draw stores for the convict gangs and their guards.[24] While convicts remained a presence in the area for some years to come,[25] it seems more likely that the *St Michael* remained a private enterprise operation that may have serviced government requirements on a contractual basis.

By mid-1828, in order to fund other ventures, Winder had sold *St Michael* to Rapsey, Mitchell, and Livingstone.[26] One local history (possibly reflecting local oral histories) makes the unlikely suggestion that E. C. Close and family lived aboard the *St Michael* while their first home in Morpeth was being built.[27]

Payments from debts appeared to be a problem for the vessel's owner in 1830, when all debtors were advised to pay up in order to avoid legal action.[28] However, the venture remained successful, and *St Michael* became a landmark for the area. By the late 1830s, there were also as many as half a dozen steamers servicing the small port.

An account of a voyage up the Hunter River to Morpeth in 1831 describes the situation of the former vessel:

> You reach the Green Hills, where the steamer discharged her cargo into the store ship St. Michael which affords a most commodious warehouse, being roofed in and divided into compartments for the reception of goods for the steamer, for and from Sydney, and at the place the passengers land and rally forth to their various destinations filled with praises of the steamer . . .[29]

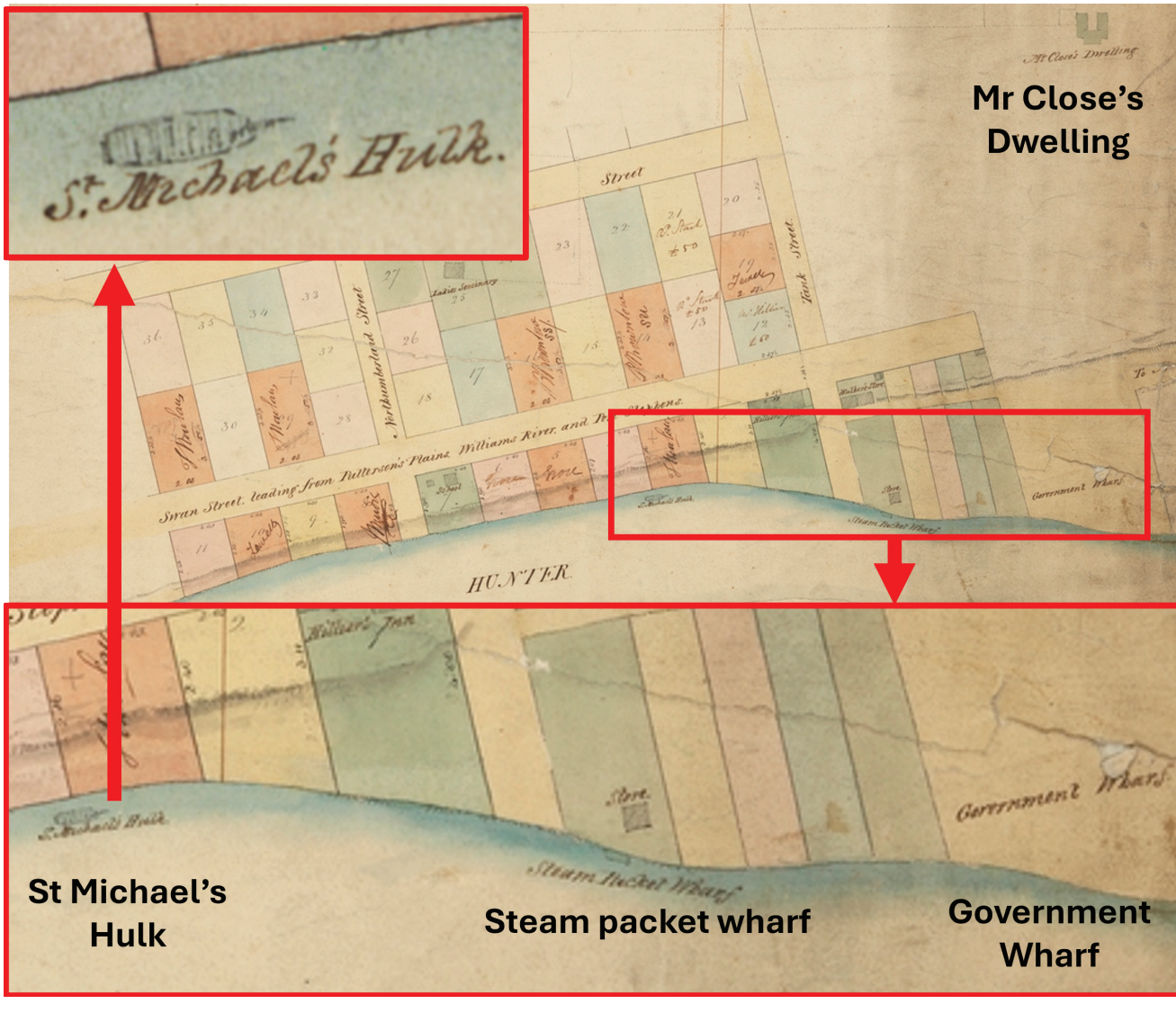

Figure 2. E. C. Close, Town of Morpeth formerly called Illulaung, 1834. Note: North is at the bottom of the image. Image: State Library of NSW Collection

The position of *St Michael* while operational may have shifted at least twice. An account from early 1831 states that the vessel was moored alongside one of the allotments of Phoenix Park on the northern side of the river, although this may have been advertising spiel to promote allotment sales on that side of the river.[30] Close's 1834 plan of town allotments on the southern shore shows the position of "*St Michael*'s Hulk" adjacent to the southern bank (fig. 2).[31] This plan is also significant as it provides an insight into Close's intention to lease or sell land to entrepreneurs to build hotels and warehouses to establish the township. Early infrastructure is already visible along the shoreline, including the Government Reserve on the western (right-hand) edge of town where, in 1837, the public Queens Wharf was established, directly below Close's residence at the location of the earliest landing.[32]

St Michael was again sold in 1838, to Richard Cornelius[33] who advertised it as a well-stocked wine and spirit store which would accept farming produce for payment and had suitable storage space to let[34] and a dry and secure space for wool storage.[35] Cornelius sold the vessel to J. H. Atkinson in July 1840,[36] although by September of the same year it was advertised for sale by auction, described as:

> in first rate order for business [as] a general store, with a loft capable of holding twenty tons; a main Deck 19 by 22 (ft) with crane and a retail store adjoining; sitting rooms (opposite); bedrooms above and below; a lazaret; and storage for two hundred ton of goods in the hold.[37]

It was also suggested that the vessel could be moved to the Patterson or Williams Rivers for similar use as a store or hulk.[38] The hulk is still shown in the same location at Morpeth in Close's 1840 plan.[39]

Tragedy struck in May 1841 when it was reported that the new lessee proprietor (Mr. F. B. Thurtell) had drowned.[40] After this time, it appears the vessel was neglected, with an article reporting that it had been "remarkably leaky" before finally sinking in November 1841 "probably from the effects of her extreme age."[41] This article suggests that the owner had been aware of its impending fate and had advertised the vessel's stores for auction, disposing of most of them before it sank. It is not clear how the vessel was raised or removed to the opposite (northern) shore, although local historian Harry Boyle recorded that the ship broke its mooring in a gale and drifted over to the other side of the river, where it sank.[42] This contradicts the previous account of sinking and then removal, although there is no doubt that once on the northern side of the river, the vessel capsized.

> A sheer Hulk – The *St Michael*, an old vessel of large calibre, stationed in the river at Morpeth as a storeship, has been allowed by some mismanagement to capsize and will we are afraid become useless, and from her position and hulk it is feared she cannot be righted excepting by the expenditure of a large sum of money.[43]

Although the vessel was sold to a merchant (John Wiseman) who planned to salvage the vessel and turn it into a coal barge, it could not be raised, and local residents were surprised at the apathy of the government who did nothing further to remove it.[44] A later description of the capsize of the *St Michael* notes:

> it was moored alongside of where the coal shoots are now, and used as a store; it required something done to it, and was taken over to the other side, and was not properly secured when there, she was found the following morning canted over, with her deck to the deep water: she gradually settled down, and there her hulk remains, although it was attempted to break her up, and a number of planks and bolts taken from her. Yet her hull was still unbroken . . . 3 or 4 years ago there was a craft loaded with

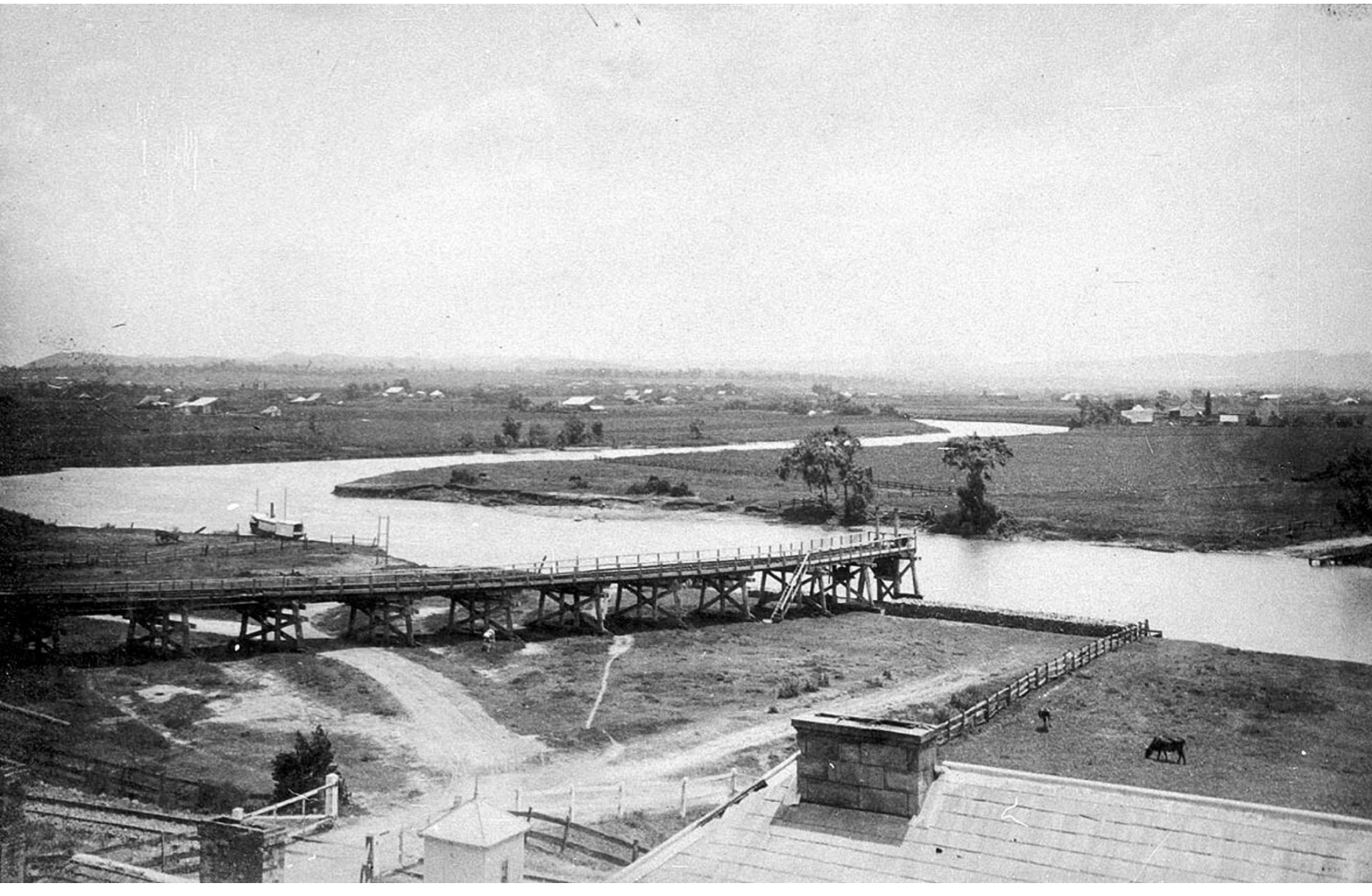

Figure 3. Coal staithes at Morpeth, showing Taggarts Point in background. Image: Ballard 1885

> coal sank close alongside of the old *St Michael*, and never any attempt made to raise her. Now I think I can account for the sandbank accumulating at the back of the two vessels . . . I fear unless something is done (and that soon) to remove the sand by dredging at the wharf, the evil will constantly increase.[45]

This account is interesting as it informs on the disposition of the wreck, that there was at least some salvage (i.e., the removal of some planks and bolts), and the sinking of a coal vessel alongside. This is likely the coal barge *Jolly Rambler*, which sank in 1847.[46] It is not clear if the structure of either vessel was still visible in 1857, although tantalizingly the article makes a connection between these two sunken vessels and the formation of a sandbank. Neither sunken vessel appears on maps of the period.

By 1865 a new coal loading facility (known as "the coal staithes") was installed on the southern side of the river at the site of Queens Wharf. Queens Wharf was rebuilt in 1870 on either side of the coal staithes but was shorter than the original structure. By 1875 the coal staithes had been completed to supply local coal through Morpeth to waiting steamships and colliers. After the con-

struction of a railway in 1866 the river trade started to decline. The installation of the Morpeth Bridge in 1898 meant that larger vessels could no longer easily access the western side of Morpeth, except for colliers.[47]

Determining the Location of the Wreck

Given the significance of the *St Michael* as a feature of Morpeth and the surrounding region's early history, a substantial body of documentary evidence was collected and there was great enthusiasm to determine if anything remained of the vessel's structure. In this context the Morpeth Heritage Conservation Group (Stephen and Heather Berry) asked for professional archaeological assistance from the NSWRP.

The historic record provides the general location where the *St Michael* capsized as being Taggarts Point on the other side of the river opposite the original coal staithes.[48] Similarly, an advertisement for the *Jolly Rambler* hulk states "she now lies under water near Mr. Portus's Wharf."[49] If *Jolly Rambler* was the barge dumped next to *St Michael*, then it may have been partially refloated to that location to ensure that it did not block the wharfage of the port on the southern side of the river. Figure 3 shows Taggarts Point in the 1880s (looking northwest over the 1865 coal staithes), with the sandbank visible on the north side behind it and the Morpeth Punt access ramp on the far right.[50]

Robson[51] maintains that *St Michael* had a draft of 6–7 ft. (1.8–2.1 m), meaning that the vessel had to be moored in at least that depth of water at low tide offshore at Taggarts Point, although if it had only been partially refloated before being moved over it may have needed to be deeper. The river at this point is approximately 60–75 m wide, with Allan and White's 1844 plan showing between 9–14 ft. (3–4.5 m) of water depth in the area directly offshore from the Morpeth punt and up to 29 ft. (8 m) on the southwest side,[52] and current water depths range from 0–20 ft. (0–6 m) in channels.[53] This means that the vessel could have been pulled in close to the shore during that period. The various accounts indicate that the wreck capsized toward the center of the river with the deck in the deepest water and keel shallowest.[54] Assuming that the levels of river had sedimented up following the sinking of *St Michael* (i.e., not gotten deeper), it is logical that the vessel could have been pulled hard up to the bank (i.e., it was not restricted by shallow waters close to shore). Given the maximum depth of the vessel was 9.5 ft. (2.9 m) to the gunnel, it is feasible that the remains of the vessel could exist at least 10 ft. (3.1 m) out from the bank, and possibly more if it slid down any underwater slope of the northern bank. The beam of the ship, c. 22 ft. (6.7 m), meant that the upper side of the ship would probably have been close to or above the water in this area, based on the 1844 plan.[55]

Archaeological Surveys

In 2016 a sidescan sonar survey was undertaken of the riverbed from the western extremity of Taggarts Point to the eastern extremity of Morpeth township, covering most of the riverbed on both sides of the river. No trace of any shipwreck material was found during this survey, although structural evidence of the earliest wharves, piers, and jetties was located and documented along the southern side of the river (which will be the subject of another paper). A second sidescan survey was planned in 2019 to take advantage of riverbed scouring following a particularly big flood, but equipment failure on the day and subsequent travel restrictions associated with the COVID pandemic prevented further access to the area until recently.

In 2020, Berry commissioned an aerial drone inspection of the river frontage to better understand the geomorphology of the waterway. This included high-definition imagery of the area around Taggarts Point including the sandbank. Unfortunately, the constant turbidity of the water precluded any visual inspections of riverbed features.

Figure 4. GPR survey of the sandbank opposite Morpeth at Taggarts Point showing Baseline 1 and pin flags that indicate the start of each survey lane. Image: Brad Duncan, 2023

Figure 5. Locations of the extent of the anomaly, superimposed over Google Earth aerial imagery. Note yellow markers show the survey baseline extremities, with red and purple markers showing anomaly extents on each transect line. Image: Brad Duncan, 2023, after Google Earth map, December 2012

Figure 6. The location of the extent of the GPR anomalies between people standing at each end on the sandbank. Image: Brad Duncan, 2023

Based on the possible relationship between the sandbar along Taggarts Point and the two wrecks, a ground penetrating radar (GPR) survey was undertaken on November 3, 2023, across accessible portions of the sandbar, coinciding with minimum low tide and extreme low water flow in the river. The visible ground surface of the exposed bar was sand and silt, standing only about 0.2 m above the water surface. The Mala Ground Explorer system fitted with a 250 MHz shielded antenna was able to achieve penetration depths of up to 8 m below ground despite the presence of brackish water (fig. 4). GPR velocity was set to 70 m/ns with a reading interval of 0.05 m.

It was possible to establish a southeast to northwest baseline parallel to the riverbank, with GPR transects running at 90 degrees (in a southwest to northeast orientation) toward the northern riverbank and spaced at 2 m intervals. Each transect was continued until reaching vegetation (reeds), fallen tree limbs, or the swampy back channel close to the high northern bank, a distance of 5–10 m. The beginnings and ends of large anomalies were plotted with steel pin flags. At the end of this survey, two longitudinal transects were taken through the middle of the group of anomalies in a southeast to northwest orientation (see fig. 5). A second baseline with similar 90-degree offsets was established to the southwest of Baseline 1, using the same methodology as outlined above, but no anomalies were encountered in this area.

There were various anomalies visible in the upper half meter of the GPR transects, which are most likely buried tree branches and trunks, rocks, and refilled depressions, consistent with what is visible on the surface. The edges of the back channel (running along the edge of the high northern bank) are visible on the north (right-hand) side of the traces (marked in purple), while the main channel formation below the sandbar is visible at greater depth. The survey indicated the presence of a large anomaly (see fig. 6). This strong inverse parabolic reflection occurs at 1–2 m depth, as much as 10 m wide, and extending about 20 m roughly southwest to northeast. The VHF signal of

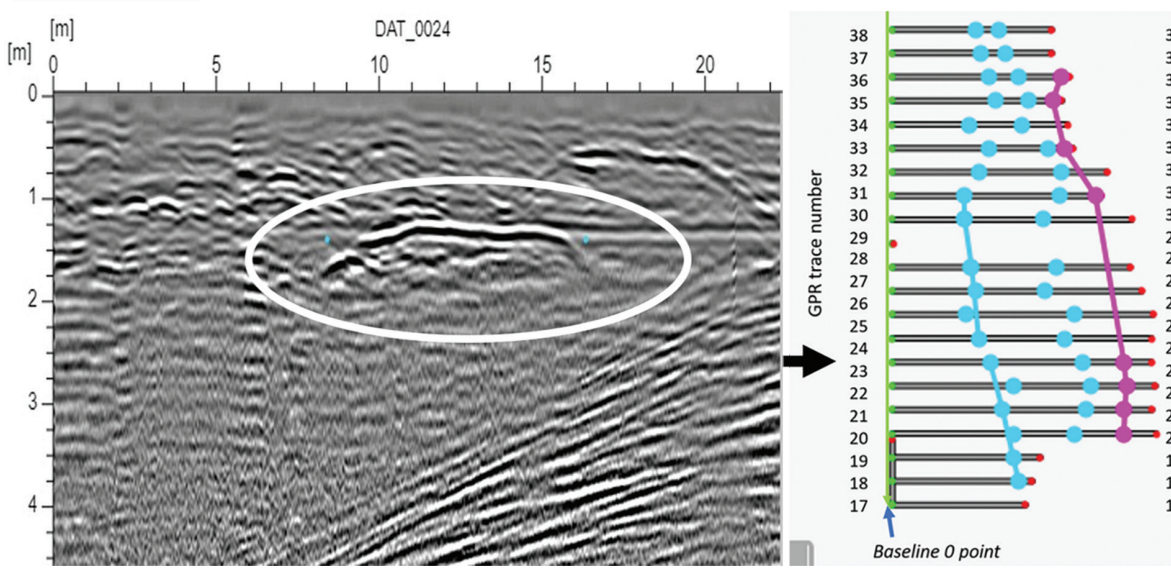

Figure 7. Example GPR transect (24) showing strong inverse parabolic anomaly, generated from Marla Vision Software. Image: Martin Gibbs, 2024

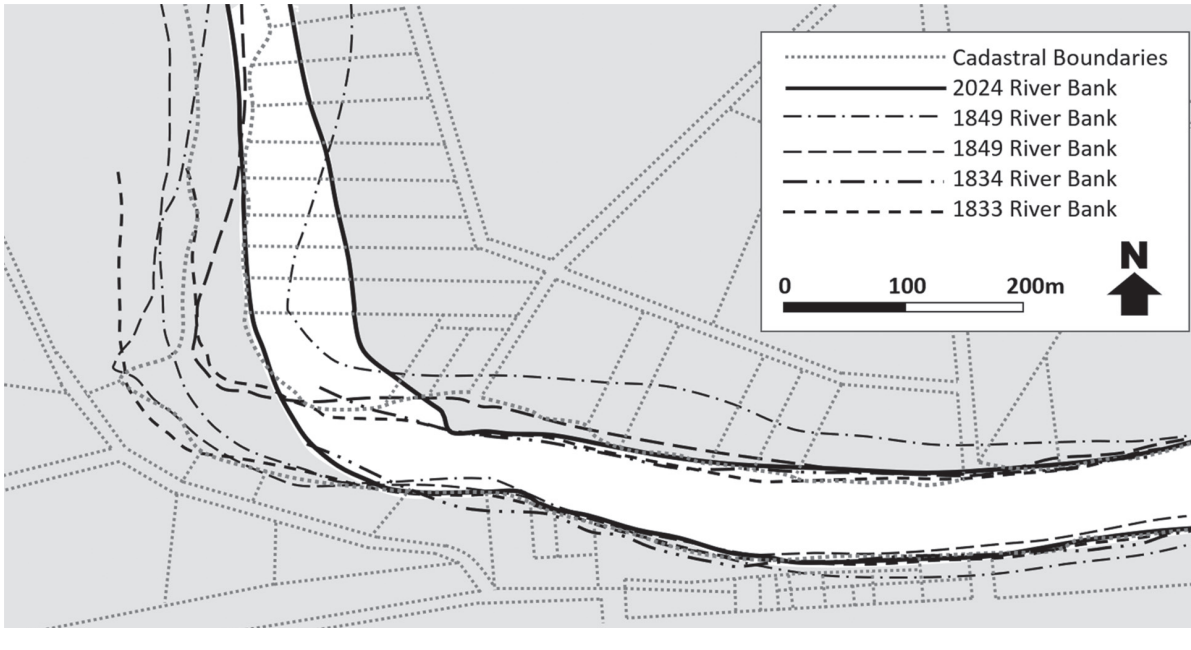

Figure 8: Current and former locations of river courses based on georeferencing of historic plans. Also note the location of the sandbar where the GPR survey was undertaken. Image: Brad Duncan and Martin Gibbs, 2024

the radar indicated a reflection off a wide curved shape buried below the ground level (see fig. 7). Half a dozen consecutive transects in the southern part of the grid show a very distinct return of an anomaly of roughly the same size and orientation, although further north the anomaly flattens and is far less distinct.

It is tempting to connect the anomaly to the collapsed structure of a capsized vessel, as this is consistent with the expected alongshore orientation as suggested by the historical accounts, along with the anticipated size of *St Michael*. The size and shape of the anomaly also raises questions about whether the position of one or the other wrecks may have been changed over time and this represents some remnant of the structure, or if this is a completely separate anomaly such as a layer of discharged ballast. Test-pitting or a sample probe is planned to check the nature of this feature.

Riverine Geomorphological Processes at Morpeth

It is often mistakenly believed that compared to coastal environments, rivers present a relatively benign setting for the preservation of shipwrecks. While this is sometimes true, the NSWRP has repeatedly found that rivers are subject to significant and dynamic natural and cultural site formation processes that alter or destroy sites. *St Michael*, a substantial vessel which was subject to only minimal contemporary historical salvaging (i.e., only some planks and bolts were removed) at the time it was wrecked, should be relatively "easy" to relocate and offer substantial remains. It is of course possible that even with the historical record of its location, its position may fall outside the current survey area. However, during the processes of additional historical research and the preliminary archaeological survey, we also had the opportunity to consider the forces which might have influenced these sites. Historical evidence of flooding became a particular point of interest.

In June, July, and August of 1857, Morpeth experienced three destructive flood events raising the Hunter River by as much as 12 ft. (4 m). Damage along the riverbanks was extensive, with a report noting "Huge trees, locked one in another and piled up—some fully ten feet high—acted as a barrier to the smaller articles. Hillocks of sand, like snow-drifts, are here and there to be seen, varying from two to four feet high."[56] It is worth noting that this was the same period where Gilfillan speculated on the connection between the wrecks and the development of a sandbank.[57] A survey of the flooded areas included a bypass channel that reconnected a relict river course (Howes Lagoon) and discharged on to Taggarts Point.[58]

To determine if there have been significant changes to the course of the river and the banks, plans from 1833 to 1865 were georeferenced using common points in the modern cadastre (see fig. 8). The results showed that while the banks immediately adjacent to the town on the southern side and opposite are consistent with Close's 1834 plan[59] and have changed very little, there has been significant movement at and upstream of the river bend cornered by Taggarts Point. For instance, the boundary of many of the original Phoenix Park allotments (to the northwest of Taggarts Point project) are as much as 80 m across the current river channel, reaching in some cases to the current far bank (i.e., the river channel has at that point moved east). This movement is also physically evident by a section of low-lying sandbank which has formed on the western side of the river north of the township, opposite (southwest of) Taggarts Point. The reshaping of the western part of Taggarts Point appears to have occurred around 1893, when the particularly strong floodwaters tore away half the banks on the northeastern side of the river and excised half the farmlands at Phoenix Park,[60] and it was further exacerbated by the major flood of 1952.

However, the area of the sandbar and the supposed resting place of the wrecks seems to have changed very little, which may reflect its position out of the way from the high energy flow channel of the river.[61] Analysis of historic aerial imagery of Taggarts Point also shows that the area around the current sandbar has not substantially changed since at least the 1950s and appears to be the most stable area of the point.

Analysis of the curtilage boundaries (i.e., property boundaries) in the area of the project survey location in comparison with a 2021 flooding event indicate that in this area the property boundaries are based on high flood events (i.e., the property allotments end at the high-water mark). Therefore, the former foreshore would have been at least 10 m further out from the boundaries shown along the river, which has not changed, and the former historic foreshore location is consistent with the current location of the shoreward side of the sandbank being investigated.

The possibility of anthropogenic modification of the course of the river and the location of banks in the likely area of the *St Michael* wreck was also considered. There are records of limited dredging of the river in 1853 and in 1869, which was concentrated around the wharf areas on the southern side of the river,[62] in 1879 and 1883/1884.[63] After the 1898 opening of the bridge restricted passage of larger vessels, there is no further evidence of dredging near the wharfs.

After the 1857 flood there were various recommendations for how to mitigate future flood events.[64] Previous studies supplied by the State Government (Michael Clarke) showed that from 1860 to 1964, the installation of levees and cutoffs had shortened the distance from Maitland in the upper Hunter valley to Morpeth from seventeen miles to six miles by river.[65] Despite these modifications, it appears that the area downstream of Taggarts Point had not been significantly altered by infrastructure. Michael Clarke commenced construction of the Lower Hunter Flood Mitigations Scheme in 1957 as the Public Works Department's resident engineer, and he continued in that role until 1966. Clarke demonstrated that although major works had been undertaken starting from approximately 400 m north of Taggarts Point and proceeding upstream (whenever and wherever levees and cutoffs were constructed in the 1950s), the areas downstream of this point were not affected or disturbed.[66]

The Effects of Riverine Geomorphology, Groynes, and Sandbanks on Shipwreck Site Formation Processes

The project team have considered what (if any) of the wreck may still be present in situ. If *St Michael* was lying on its side, it is likely that the wreck collapsed quickly onto itself as vessels in this position lacked structural integrity to support their hulls,[67] a phenomenon observed in various wrecks including the *Mary Rose*.[68] It is also possible that if the vessel was buried quickly then it might have retained some structural rigidity and hence integrity. However, as some salvage was undertaken on the hull,[69] including the removal of planks, it is possible that the river flow may have torn further structural members/planks off the wreck as the current could penetrate the hull, especially during periods of high-velocity water movements (such as floods). Floods in this region can reach over 12 m and have peak velocities of up to 40,000 cubic feet of water a second.[70] Furthermore, the brackish environment of the tidal river in this area may have also led to ongoing damage from teredo worms (*Teredo navalis*), further weakening the timber hull. Repeated major flooding events have occurred since 1841, including in 1857, 1867, 1870, 1949, 1950, 1952, 1955 (record flood levels), 1971, 1977, 2007, 2015, and 2022.[71] During these periods it is likely that any portion of the wreck that projected above the riverbed would gradually have been either worn down due to mechanical effects of

the river current or subjected to abrasive wearing associated with collisions from waterborne debris (including floating logs), unless the hull structure was buried early (not long after the vessel sank). In this scenario, it is possible that one side of the wreck has disappeared, with the remaining side buried under the riverbed, a scenario that is somewhat similar to the *Mary Rose*.

The historical records report that the 1857 flood deposited massive amounts of sand within the river, while the receding waters at Maitland (upstream of Morpeth) also left behind sand dunes 1–6 ft. (0.3–1.8 m) high in riverside paddocks.[72] It is highly probable that the wrecks at Morpeth were covered with significant amounts of riverine sediment at least by 1857 (and probably earlier).

Previous studies undertaken as part of the NSWRP and for Heritage NSW[73] have observed that shipwrecks, abandoned hulks, and maritime infrastructure[74] create their own sandbanks around them by acting as inadvertent sand groynes. Gilfillan's 1857 comment noting "the sandbank accumulating at the back of the two vessels" suggests that the process of formation was active at the time he wrote.[75]

Anthropogenic groynes are designed to slow down alongshore currents and cause them to drop their suspended sediment to create artificial beaches in coastal scenarios (probably the best-known scenario is the Brighton seafront on the south coast of the UK). The authors have also observed the use of these structures in riverine scenarios in NSW. Where groynes breach the surface, there is usually a total degradation of suspended sediment, leading to what appears as scouring in front of the structure. Where the obstruction is not total, a tapered spit or bank appears to form in front of the structure. If the sandbank at Taggarts Point is being produced by submerged shipwrecks, then it is anticipated that a tapered sandbank may be produced as a result as sediment overspill occurs above and around the sides of the wreck.[76]

The presence of a sandbank in the Taggarts Point area is to be expected as part of natural sedimentation accretion associated with reduced velocity flows on the inner side of river bends. However, the retention of the sandbank even after major flooding in this region (see aerial images for 1965)[77] suggests that there may be a solid structure in this area on the riverbed that is trapping sediments by slowing down the current even in periods of highly dynamic peak water flows.

Comparative Sites

Research was also undertaken to determine whether any comparative data was available for sites of similar time period and river size. In 2019, excavation of the riverbed at Windsor in the Hawkesbury River (approximately 123 km southwest as the crow flies) associated with the installation of the new Windsor Bridge revealed the remains of at least three small timber vessels dating to approximately the same time period—roughly, the 1840s.[78] The wrecks were located at a depth under the riverbed of approximately 1–1.5 m, under a thick layer of silt. Although the river is marginally wider in this area (110 m), it is located just downstream of a significant bend and in an area historically known for flooding, and hence the conditions are comparable to the Morpeth site. Therefore, it is possible that the remains of any wreckage located at Morpeth would also be located under a similar layer of sand / flood silt.

The Morpeth Punt

So what is the likelihood that the *St Michael* and the other unnamed coal barge (possibly the *Jolly Rambler*) are still in situ if they exist under the sandbar? As demonstrated above, there has been a history of hydrological engineering in the Hunter River upstream of Taggarts Point from the earliest days of settlement. These works included measures to increase speed along transportation routes by shortening or cutting through river bends as well

as later subsequent flood mitigation infrastructure installed approximately 400 m upstream to the north of Taggarts Point from the 1950s onward. However, it appears that Taggarts Point and the downstream section have not been disturbed during this period.[79]

The installation of the Morpeth to Phoenix Park Punt by around 1842[80] saw the punt route extend across the river from the current boat ramp to the west of Queens Wharf, across the river to the north side to join up to the river extension of Macfadyen's Road (as indicated in current curtilage maps). This placed the northern route of the punt directly across the sandbank at Taggarts Point. Ongoing studies of other similar sites by the authors as part of the NSWRP[81] have determined that punt sites typically require a sloping approach ramp on each side of the river (which was often reinforced with timber or later concrete/steel rails or boat ramps) to provide a secure landing platform for swim end punts (i.e., flat-bottomed vessels with a broad flat bow raked forward at 45 degrees to the keel—similar to a Thames Sailing Barge). It appears, from LIDAR coverage of Taggarts Point and analysis of historic imagery, that the punt approach was likely graded to angle down the steep bank, and hence the northern ramp was located slightly to the east of the access road (see fig. 3).[82] It is possible that when the *St Michael* sank, the formation of the subsequent sandbank (or even the wreck itself) provided a perfect approach ramp, with the capsized vessel lying deck downward offshore and its bulbous hull sloping upward toward the shore. This observation might also be supported by the installation of the northern punt road access after the capsize of the vessel.

If this is the case, then the presence of the punt may have led to the non-disturbance of the wreck for a substantial time, as the sandbar would have been considered an essential component of the transport infrastructure until the Morpeth Bridge was completed in 1898. Following that time there are no documented reports that the authors could find of any further disturbance of this area, and we know from the hydrological engineers that there has been no further disturbance of this area since at least the 1950s onward.

Considering Anthropogenic Change as an Indicator for the Presence and Location of Archaeological Sites in Riverine Environments

Over the last two decades there has been increased interest in the influences of anthropogenic impacts of fluvial and oceanic geomorphology, and the ability to detect these changes as a possible archaeological record in coastal and riverine environments.[83] This study has begun to investigate the notion that seemingly natural elements of the environment may actually be archaeological indicators not only of anthropogenic change (e.g., the modification of river courses both directly and indirectly through human activities), but it may open up new avenues of research which are indicative of the potential presence of previously unknown buried or submerged archaeological sites themselves (and their unexpected influence on riverine geomorphological dynamics). Our research provides indications of potentially exciting new characterizations to be considered for archaeological shipwreck research which have not been widely explored prior to this time (i.e., does the presence of seemingly natural riverine features such as sandbanks actually indicate the presence of an archaeological site?), particularly for riverine and waterway environments. These avenues are still being explored and will be the subject of another paper at a later date.

Conclusion

Further work is now planned to take core samples, and possibly conduct excavations in the areas of the GPR anomalies, and also to undertake further geophysical investigations using magnetometer and sub-bottom profiling technology in submerged areas of the sandbank off Taggarts Point, as well

as further down the river to search for any debris field. Side-scan sonar surveys are also planned for after the next major flood to take advantage of any environmental scouring of the riverbed.

This study has highlighted a scantly investigated area in Australia, of the temporary use of hulks as essential infrastructure during the period of initial settlement prior to more permanent installations. Aside from a few exceptions,[84] there are relatively few studies where archaeologists and/or historians have investigated the phenomena of the recycling of wrecks and hulks for essential waterfront infrastructure in Australia, a common practice worldwide, and this will be addressed in another paper.

The effects of continued flood dynamics on this area of river have led to movement of the river course and made what was initially a seemingly easy search for a wreck in a defined location into a multidisciplinary investigation to identify both its location and possible origins. This study has demonstrated the complexity of searching for shipwreck sites in areas of high-velocity waterways and the difficulty of pinpointing seemingly obvious locations for wrecks even in relatively small search areas that are impacted by ongoing geomorphological processes.

Based on the investigation presented above, it is likely that the remains (if they have not been totally washed away) will be buried at least 1–1.5 m below the riverbed, with only sections of the lower side of the vessel still intact due to the impacts of high-velocity flooding on any exposed sections of the site: a *Mary Rose*–style scenario. One day, the remains of this wreck may be found . . . the search continues.

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