The archaeological examination of watercraft abandonment in Australia: A retrospective

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Introduction

The remnants of deliberately discarded watercraft have been a subject of maritime historical and archaeological enquiry for some time. Studies of ships re-utilised as ancient boat burials (such as the Snape Boat), votive offerings (the Cheops ship), or transformed into foundations, and many types of alternate structures (Ronson Ship) and buildings (for example, *Niantic* and *Inconstant*) are well known in maritime archaeological literature (see for instance, Kadry, 1986; Delgado, 1979, 1997; Reiss, 1997; O'Keefe, 1999, 2001). So too, the study of collections of vessels abandoned by their owners at the conclusion of their useful lives are noted in many instances; from the discovery of abandoned 18th century *bateaux* in Quebec, Canada (La Roche, 1987) and huge collections of vessels in Maryland, USA (Shomette, 1994, 1996), to studies of discarded hulks in the United Kingdom (Watson, 1993: 7; Wood, 1996: 6–7; Dobson, 1997: 3; Emery, 1997: 4; Milne, *et al.*, 1998).

In Australia, historical works dedicated to this category of ship are both extant and comprehensive (see Stone & Loney, 1983; Loney, 1991; Parsons & Plunkett, 1995; Plunkett, 2003), and abandoned vessels have been the focus of many archaeological and heritage-focussed studies. When compared with most other nations, the archaeological investigation of this site type appeared very early in the development of maritime archaeological research in this country. As early as 1983, Michael McCarthy wrote the following paragraphs for the second Southern Hemisphere Conference on Maritime Archaeology (held in Adelaide in March 1982).

> Here, I believe, is a valuable lesson. Amateur maritime archaeological groups throughout Australia, New Zealand and South-East Asia are in an excellent position to document, record and research such ships graveyards as Jervoise Bay and Careening Bay. There are such areas in Tasmania, South Australia, New Zealand and to my knowledge in most other Australian States. Once all sites within each area are found, documented, recorded and if possible identified, then work can and should begin on specific sites.

Ships' graveyards often become excellent areas for development by virtue of their location and characteristics (e.g. shelving beaches to enable salvage, former isolation, calm water etc.). The hulks within it should be documented, recorded etc., now and not when under threat (McCarthy, 1983b: 291).

McCarthy may not have realised it then, but these words would have importance in the creation of studies of ship abandonment, and a changing view of the significance of abandoned watercraft for the next two decades. Although some historical research and site discovery activity had been occurring regarding watercraft abandonment sites in Australia before this time, it was McCarthy's work with the Western Australian Maritime Museum (WAMM), in the late 1970s and 1980s that marked the beginning of watercraft abandonment studies in Australia (actually, the earliest reference found so far is a passing reference to a small ships' graveyard in the Alligator River by Scott Sledge (1979a: 26) also of the Western Australian Maritime Museum). It was also the commencement of a transition towards the serious archaeological investigation of abandoned watercraft—investigations that paved the way for changes in how these sites were perceived by researchers (see McCarthy, 1979b: 1, 1983a: 369–370). Additionally, the ideas that McCarthy outlined in these two short paragraphs have been pivotal to a group of studies concerning comparative approaches to maritime archaeological sites (see Richards, 2002, 2003b; Richards & Staniforth, forthcoming). In particular, the ideas of a creation of a national database of sites, the analysis of characteristics of sites, and the recording of remains well before their imminent destruction as outlined by McCarthy, would become central justifications for these new studies.

Around the time of WAMM's initial investigations, abandoned watercraft, like many other categories of maritime heritage, were of little importance due to predominant views concerning archaeological significance, and the dominance of the 'shipwreck' in maritime archaeological research. These views concentrated on a number of aspects; the age of a vessel, its association with famous individuals or events, and were pre-occupied with the condition or environmental setting of sites (see Dumas, 1972: 32; Green, 1977; Muckelroy, 1978: 60; McGrail, 1989: 12; Baker, 1998: 17–18). Invariably, the 'shipwreck emphasis' in Australia was also heavily influenced by shipwreck legislation and program funding which focussed on big events, big names, old ships and the archaeological interest in 'material culture'. However, the 1980s saw a challenge to this position, which argued that more modern watercraft, representing unspectacular aspects of the past, irrespective of their degree of intactness or environmental conditions had archaeological potential. To a large degree, these mirrored changes within terrestrial archaeology, which earlier had begun to reject the notions that 'we must dig

for our data, and that archaeological data must be old' (Rathje, 1981: 51).

In particular this change was justified through the work on inter-tidal and exposed vessel remains (Delgado, 1984, 1985, 1986; Bright, 1993; Fontenoy, 1994: 47; McCarthy, 1996: 217), as well as the arguments against 'celebrity ships' and 'the shrine complex' (Gould, 1983: 3–4, 2000: 11), which were later supported in subsequent work (see Gould, 1989, 1991; Souza, 1998). While these works have undoubtedly had an enormous impact on the way researchers have perceived abandoned watercraft (which are generally non-famous vessels in inter-tidal contexts), the arguments for the significance of iron and steam shipwrecks also had a substantial impact. In Australia, this stems from the landmark publication *Iron Ships and Steam Shipwrecks: Papers from the First Australian Seminar on the Management of Iron Vessels and Steam Shipwrecks* (McCarthy, 1988). In this, researchers developed a number of arguments which saw the 'grudging support' (as mentioned by Henderson, 1988: 11) of the worth of this resource slowly give way to a much more inclusive view of significance.

In particular, the view espoused by McCarthy (1996: 21–23) that the significance of iron and steam vessels have multiple layers related to their historical, technical and anthropological potential is a premise at the core of current studies of ship discard. A number of links further strengthens the analogy between the significance of the iron and steam shipwreck resource and the abandoned vessel resource. First, four out of the five vessels (*Otago, Santiago, Ozone* and *Cerberus*) that had recommendations made them at the seminar (for immediate and urgent recording due to their high significance) were also abandoned watercraft. Second, McCarthy's contention that the high number of iron and steam vessels included in Brouwer's *International Register of Historic Ships* (1999) supports the significance of this class of watercraft is equally applicable to abandoned vessels for the same reason (McCarthy, 1988: 7, 1996: 21–22).

This paper is not a synthesis of historical or archaeological data. Rather, it is synopsis of sources (much of which is only in hard to find sources and 'grey' literature), and a communication and acknowledgement of the innovative work undertaken on abandoned watercraft in Australia for many decades. In light of recent trends in the study of abandoned watercraft outside of Australia, it is important to communicate the long tradition of study in this country. As a corollary, this further re-enforces the significance of this class of maritime archaeological site, for their role in the development of maritime archaeology in this nation, and also as sites worthy of future investigation. In order to chart the development of Australian investigation into abandoned watercraft the author has arranged it on a state-by-state basis, with examples arranged chronologically.

An overview of abandonment research in Australia

Western Australia

When commencing an overview of the history of watercraft abandonment studies in Australia the logical starting point is Western Australia. This is because the archaeological investigation of deliberately abandoned vessels and ships' graveyards, as already mentioned, largely emerged out of the work of the WAMM, and particularly the writings of Michael McCarthy in the late 1970s. Reflecting the history of the development of maritime archaeology in Australia, at this stage the WAMM was the only state maritime archaeology department in the country with the funding or training to undertake such studies.

The first study of an abandoned vessel by archaeologists in Australia was during the Careening Bay Project. This initiative was commenced by the Western Australian Museum in 1976 when the partially buried hull of *Day Dawn* was discovered adjacent to the HMAS Stirling Naval Base on Garden Island (other hull remains had been found and destroyed in 1973) (McCarthy, 1983b: 283, 285). The vessel, an ex-whaler built in Fairhaven, Massachusetts in 1851 was used as a hulk in Careening Bay, Garden Island and was eventually abandoned in the same bay sometime between 1887 and 1900 (Warne, 1986b: 63). Its remains were disturbed and damaged by harbour dredging in 1976 and moved to deeper water in 1979. The Maritime Archaeological Association of Western Australia (MAAWA) subsequently excavated it in 1980 (Sledge, 1979b: 245; Kimpton & Henderson, 1991: 25; and see McCarthy, 1980a). Due to the Royal Australian Navy's plans for the future development of a small boat harbour at HMAS Stirling in 1988, experts subsequently moved the vessel to a new site and covered it with tyres and silt to enable organic consolidation (Kimpton & Henderson, 1991: 25). The remains of *Day Dawn* would also be the subject of a range of reports emerging from the 1995 Post Graduate Diploma in Maritime Archaeology at Curtin University covering the vessel's construction, history, biodegradation, relocation, and management (Erskine, 1997a, 1997b; Moran, 1997; Thomson, 1997; Williams, 1997).

The WAMM, MAAWA and McCarthy were also the first to take a serious look at Australian ships' graveyards. A small ships' graveyard located 10 km south of Fremantle at Jervoise Bay was initially examined due to threats of the site's destruction from an expansion of the shipbuilding industry in the area (McCarthy, 1983a: 285). Authorities used this area as an official dumping area between 1890 and 1910 with eight known abandoned vessels, and two shipwrecks located in the area (McCarthy, 1979a, 1979b: 1–2, 1980b: 30, 1983a: 285, 337, 339; Jeffery, 1981: 54, 56; Loney, 1991: 150; Garratt & Souter, 1997). The detailed work undertaken at the ships' graveyard at Jervoise Bay was the first of its type in Australia.

This work is particularly important because it was the first to acknowledge the potential and significance of ships' graveyards and abandoned vessels. Additionally,

it was pioneering because of its willingness to examine the site as a collection that was the product of a set of nationally and locally prescribed variables, such as legislative requirements for vessel disposal. Later work at Jervoise Bay would also establish the scientific potential of these sites (see Cushnahan & Staniforth, 1982: 62). McCarthy also communicated that the Jervoise Bay Ships' Graveyard was not the only site of its kind, with other sites at Careening Bay and north of Fremantle (McCarthy, 1979b: 2). Both the Careening Bay and Jervoise Bay sites served as focal locations for the disposal of watercraft and were operating in this function around the same time (McCarthy, 1979b: 2, 1983a: 335).

Archaeologists have investigated a number of other deliberately abandoned ships in Western Australia. These investigations, to a degree, were cooperative projects between a heritage management agency/museum (WAMM) and an avocational maritime archaeology association (MAAWA). Between 1975 and 1982 MAAWA played a major role in work undertaken on the vessels *Dato, Day Dawn, Redemptora,* and *Cheynes 3,* as well as abandoned vessels on the Swan and Canning Rivers, and unidentified wreckage at the Marmion Angling Club (suspected as being the lighter *Lalla*) (Scrimshaw, 1978, 1986; Warne, 1983: 104–105, 1986a, 1986b).

In particular, the work on the *Cheynes 3* whale-chaser in April 1982 (eventually scuttled off Michaelmas Island in King George Sound on 23 June 1982) is worth mentioning because of the observations made concerning many of the logistical issues of salvage and sinking (Buhagiar & Stevens, 1986; Warne, 1986c). In 1988, Scott Sledge (1988: 61) also used this vessel as an example of the value of the iron and steamship wrecks. The tourism potential arising from the opportunity to scuttle the vessel as an artificial dive site for scuba divers was also communicated, alongside the research potential that the site provided by giving some insight into the corrosion and deterioration of ferrous-hulled vessels.

Another case study concerns a vessel known as the North Mole Wreck, a steel-hulled barge identified as Gareenup (Robinson, 1986: 69). While research would later prove that the vessel was not Gareenup (this vessel being timber-hulled) observations were made that the vessel may have been on its way to the deep-water graveyard off Rottnest Island, but due to 'short cuts' was scuttled prematurely (see Hosty, 1988).

Recent investigations into ship abandonment in Western Australia have concentrated on the largest watercraft dumping sites in that State. The Rottnest Island dumping area, located about 16 nautical miles west of Rottnest Island is the major ship dumping area in Western Australia (Loney, 1991: 147; Tull, 1997: 39). At least 47 identified vessels of a diverse array of types and functions are in the graveyard, identified by Dena Garratt in a preliminary gazette of the site (see Garratt, 1999). Historical research suggests that many other vessels and materials are also in the area. After 1910, with few exceptions, ship-owners abandoned all unwanted

vessels in this deep-water graveyard (McCarthy, 1983a: 335). Rottnest represents the changing attitudes to submerged vessel remains. For example, a consortium sank the barge *Miwok 2,* in 1983 as a 'recreational asset' due to its potential as a dive site and Fish Aggregation Device (FAD). Indeed, archaeologists at the WAMM today play a major role in the decision making process concerning the scuttling of ships for tourism and fish aggregation purposes, and the Museum was consulted in relation to the scuttling of two redundant barges as recreational dive sites in 1993.

New South Wales
The earliest reference to research concerning deliberate abandonment in New South Wales involves the investigation of, 'above water wrecks and derelicts', by the Underwater Archaeological Research Group (UARG) in 1982 (Lorimer, 1982: 84). In 1988, Lorimer (1988: 39) wrote:

> The Underwater Archaeological Research Group (UARG) has taken measures to provide reliable and accurate information on the extent and nature of maritime archaeological sites in NSW. A number of projects are currently underway, including the locating and recording of ships' graveyards; [and] individual derelict or abandoned vessels in the rivers and Harbours of the state.

The Marine Archaeological Society of Newcastle (MAS) published a study on one abandoned vessel in 1984 (Waters, et al., 1984; Riley, 1988b: 141–142). This group also investigated the paddle steam tug *Commodore* (MAS Site No. 101), and in 1983 the documentation of the site became part of a cooperative effort between the MAS and the UARG. The study was carried out primarily to produce a descriptive report on the ship, that focused on its two side lever 'Grasshopper type' engines, which are not common on Australian sites. This study is significant because, in identifying *Commodore,* it dispelled the notion that the remains were those of the wreck Southland, basing identification partially upon the site's proximity to known dumping locations, and the substantially salvaged status of the archaeological site. Such observations illustrate the degree to which the spatial location and archaeological signatures of salvage and disposal are integral to the understanding of discarded watercraft.

In the same area, the vessels at the Oyster Bank, Newcastle have been a major focus of local maritime historical interest. In addition to a host of newspaper articles and papers dedicated to the shipwrecks in the area, at least one thesis has written about the site (Winspear, 1978). Of more interest is the archaeological work carried out on Stockton Breakwater (part of the Oyster Bank). The MAS carried out a number of inspections of the vessels that constitute the Stockton Breakwater from 1985, but concentrated mainly on the remains of the shipwreck Adolphe (1903) (Taylor, 1985: 13; Randell, 1985; Willcock, 1986).

Some references to investigations of the vessel *Ajax* in the Hunter River also date from around this time (see Gomboso, 1986). Later work by the MAS included a cooperative project with the Newcastle branch of the Shiplovers' Society and the Newcastle Maritime Museum Society (Newcastle Region Maritime Museum) in the renaming of the southern and northern breakwaters at the mouth of the Hunter River (Newcastle) to 'Macquarie Pier', and the 'Shipwreck Walk' (respectively) (MAS, *et al.*, 1991). This work also involved the archaeological inspection of many of the sites in and around the northern breakwater between April 1991 and January 1994 (Callen, 1994: 69). While the survey concentrated on a number of the wrecked vessels, it also included the survey of two unnamed hopper barges and an unnamed dredge (Humphreys, 1991: 110).

John Riley's 1988 work *Known Shipwreck Sites in New South Wales* is the closest that New South Wales has come to an overall attempt at documenting the abandoned vessel resource in detail. Although principally concerned with vessels catastrophically lost, this work does mention many abandoned vessels (Riley, 1988a: 9, 21, 29, 31, 75). Some years later, the *Shipwreck Atlas of New South Wales* (NSW Heritage Office, 1996) would also include these watercraft.

In 1993, Rebecca Bower carried out an investigation into three hulks within a ships' graveyard in Homebush Bay due to the area's redevelopment for a Bicentennial Park (see Fig. 1). The area, similar to other ships' graveyards in Australia (such as the Jervois Basin Ships' Graveyard, Port Adelaide) was once a ship breaking yard (the Maritime Services Board [MSB] Yard), and some of the vessels still lie in the vicinity of ship breaking equipment (Bower, 1993: ii, 1, 7). The NSW Heritage Office (2001: 2) has confirmed the existence of at least four named and identified vessels and in another publication (NSW Heritage Office, 1996: B39) shows their location. Later, Cosmos Archaeology investigated potential maritime sites in the bay in association with a remediation project on the Rhodes Peninsula (see Coroneos, *et al.*, 2001).

Two reports by Mike Richards (1996, 1997b), Shipwreck Heritage of the Clarence River, and Shipwreck Heritage of the Richmond River include many references to abandoned vessels. This was a deliberate inclusion due to the proliferation of such sites in the area. Indeed, he notes that abandoned hulks still visible on the banks of the rivers are the predominant type of vessel remains along their banks (Richards, M., 1996: 23, 1997: 35). Of particular interest are the observations that there are numerous examples of barges along the Clarence River being used after abandonment to stabilise banks from erosion, and that smaller isolated towns in northern New South Wales had 'rotten rows' (Richards, M., 1996: 53, 1997: 36, 60).

Curby (1997) and Coroneos (1997) also made a later survey of the maritime heritage of the Richmond River in 1996 that included some mention of vessels remains in the region. Although the assessment of surviving

Figure 1. Remains of Ayrfield (starboard side) (Photo N. Richards 19/09/2001)

maritime infrastructure sites (mainly remnant wharves and dry docks) was the main purpose of the project, one other aspect of it included the evaluation of abandoned vessel remains.

Coroneos (1998b) also compiled a comprehensive listing of confirmed and potential vessels deposited off Sydney Heads as a part of a maritime archaeological assessment of fibre optic cable landing sites. This report does not exclusively mention shipwrecks, and instead lists all potential vessel remains in an area dominated by a designated ship discard region.

In 1999, the NSW Heritage Office carried out a maritime archaeological survey of the Myall Lakes and Tea Gardens region. Its main aim was to, 'document the known abandoned wreck sites in the vicinity of Tea Gardens, and to document and search for wreck sites and submerged jetty/slipway sites in the upper Myall Lakes' (Nutley & Smith, 1999: 4, 10). During this survey a number of abandoned vessels were documented; including two ships' graveyard sites at Witt's/Slip Island and in Pindimar Bay. This survey built on previous work undertaken in the area by Coroneos (1998a) in the Myall Lakes Shipwreck Study, which had been focussed upon exploring the extent and significance of located shipwreck and hulk sites in the Myall Lakes, on the NSW central coast, near Tea Gardens and Hawks Nest. Later historical research by Engel, *et al.* (2000, 2001) also makes reference to the abandonment of vessels in this area.

The Pindimar Bay graveyard (known as 'The Duckhole') was also the subject of investigations in the Myall Lakes region, by a number of authors. None totally agrees on the number or names of the abandoned watercraft. Callen's historical research (1978), for instance suggests the vessels *Brighton*, *Sydney* (ex *Mahinapua*), *Governor Musgrave*, *Kurrara* (ex *East Star*), and the *Duroby* are located at the site. While the existence of *Governor Musgrave* at the site, for instance, appears to be wrong, as sources (Parsons & Plunkett, 1995: 20; Parsons, 1978: 18, 32–35; *Customs House Register Fremantle*: 05/1916) suggest that the vessel lies abandoned off the coast of Sydney, other authors have confirmed the rest. A personal

Figure 2. Remains of Excelsior in the Mutton Cove Ships' Graveyard, Port Adelaide, South Australia (Photo

communication cited in Coroneos (1998a: 62) notes that the Duckhole contains the remains of the vessel *Brighton*, *Dobroyd* and six to eight World War II barges. While no reference to a vessel *Dobroyd* has been located, it is probably the same vessel as the *Duroby*. Nutley and Smith (1999: 15) note the existence of four other vessels at Pindimar Bay: *East Star*, *Deroby* (apparently Callen's *Duroby* and Coroneos' *Dobroyd*), *Sydney* and *Bingara.*

South Australia

The Garden Island Ships' Graveyard is South Australia's most documented, investigated, and material-rich watercraft abandonment areas. Newspaper articles referring to the area as the ships' graveyard are noted from the 1930s (*Adelaide Chronicle*, 20 July 1933: 37) and the first comprehensive representation of the extent of the accumulation dates from the late 1970s, with Captain Neil Cormack's 1978 *Marine Board Map* (Cormack, 1978).

The first investigations at this site came in the study of one of the vessels in this ships' graveyard, the iron barque *Santiago*. This vessel is the most prominent abandoned ship, and the only protected abandoned watercraft site in SA (see Department of Environment and Planning, 1983: 7; Jeffery, 1979: 24, 1983: 84–85; Marfleet, 1988: 55). *Santiago* has attracted attention for many years due to its unique technical details and status as an early iron sailing ship (built in 1856), and is reputed to be the earliest example of a restorable iron sailing ship (Brouwer, 1999: 33). The vessel has also received attention by ship preservationists, and been the subject of testing for sacrificial anode cathodic protection, rust conversion and epoxy coating systems (Cormack, 1979: 27; Kentish, 1995).

In the late 1980s and early 1990s, the Society for Underwater Historical Research (SUHR) published other work on vessels at Garden Island that focussed on the identification of individual watercraft, and an examination of their methods of construction (Brown, 1989a, 1989b, 1989c, 1990a, 1990b; Samuels, 1989; Christopher, 1990).

In 1996, Mark Staniforth of the Department of Archaeology at Flinders University began using the vessels

at the Garden Island Ships' Graveyard as a component of undergraduate training in a range of archaeology subjects. Over the ensuing years, a number of vessel inspection reports on a large number of the sites were produced (now housed at the Department of Archaeology at Flinders University). From 1997 Garden Island was also the subject of a range of honours and postgraduate student theses (see Richards, 1997 and Matthews, 1998) as well as being the genesis for the author's doctoral research. In particular the work of Richards (1997, 1998, 1999) investigated the archaeological and comparative nature of the site, concentrating on a range of site formation issues. A number of published articles have also emerged from work at Flinders University (see Richards, 1998, 1999, 2001). Additionally, booklets and reports have been produced associated with tours done by the South Australian Maritime Museum (South Australian Maritime Museum, n.d.), and subsequently a maritime heritage trail was set up by Heritage South Australia (see Hartell & Richards, 2001; Hartell, 2002).

From 1997, work by Richards expanded and became associated with other discard sites at the Jervois Basin, and Mutton Cove (Fig. 2) (Hartell & Richards, 2001: 3; Hartell, 2002), and subsequently the author discovered a range of other abandonment areas around Port Adelaide, at Broad Creek, and Angas and Barker Inlets. Some of the vessels located at these places were also included as case studies in a 1999 thesis by Rebecca O'Reilly (1999).

Other work in the 1990s in South Australia includes Jeffery's work (1989, 1991) concerning the steam lifeboat *City of Adelaide*, once abandoned off Port Lincoln, but now protected under the Historic Shipwrecks Act 1981 (and located at the Axel Stenross Maritime Museum), and Kenderdine's important studies on the Murray River which were also extended to sections of the river in New South Wales and Victoria (see Kenderdine, 1992, 1994, 1995). Kenderdine's studies in particular, are examples of the increasing sophistications of comparative and regional research in Australia, some of which would include abandoned watercraft.

Queensland

McLeod's *History along the waterways: the abandoned hulks of the Brisbane River and Moreton Bay* (1974) is the most comprehensive published work dedicated to the abandoned vessel resource in the State of Queensland. There has also been some small amount of archaeological work done in Queensland on deliberately abandoned vessels. May (1988a: 19), for instance describes Maritime Archaeological Association of Queensland (MAAQ) work carried out in March 1983 by Nicholas Clark on the vessels *Bandicoot* and *Gayundah* (see Fig. 3). May (1988b: 26) acknowledges that there is a wealth of abandoned vessel remains in Queensland (and particularly the Brisbane and Moreton Bay areas), and that many of them had been researched and identified.

Gayundah has been the focus of some attention over the years, due to its connection with the colonial navy of

Figure 3. Remains of Gayundah at Woody Point, Redcliffe, Queensland (Photo N. Richards: 06/06/2001)

Queensland as a gunboat, and flagship of the Queensland Marine Defence Force, and one of the first vessels in the Royal Australian Navy (Wilson, 1996: 25).

The Curtin artificial reef, 'Tangalooma Wrecks', 'Bulwer Wrecks' and the abandoned vessel *Cementco/ Crusader 2* are all sites that are noted in the diving literature as major diving locations within Moreton Bay (according to a pamphlet entitled Dive World Class Sub-Tropical Sites with South Bank Dive Aboard the Ugly Duck). The *Tangalooma, Bulwer* and *Kooringal* sites have been the subjects of a maritime heritage trail pamphlet produced by the Maritime Archaeological Association of Queensland (MAAQ, et al., 1997).

Largely the MAAQ undertook the only significant and accessible archaeological work on abandoned watercraft in the Brisbane region. This work has focussed on some of the sites that once made up the Bishop Island Ships' Graveyard. Many MAAQ records are in the maritime archaeology section of the Queensland Museum (which is now a part of the Museum of Tropical Queensland and located in Townsville). Amongst the records held in these files are Warren Delaney's photographs of what the remains of *Lucinda, Queenslander* and *Maida*, taken in June 1987 and February 1989.

The emphasis of the MAAQ's fieldwork on Bishop Island focussed on the remains of *Maida*. Subsequently, the first real attempt at an archaeological analysis of the remains of vessels on Bishop Island is in the report *The*

Maida Barque (MAAQ, n.d.). The report covered research and fieldwork (survey and excavation) on the vessel between 1986 and 1992 after which wharf development and reclamation destroyed most of the vessel remains on Bishop Island. This vessel, built in 1857 as a wooden barque at Moulamein, Burma and abandoned at Bishop Island in 1931 for breaking up (in 1932) was singled out because of its significance as a 19th-century 'country built' vessel. Despite the concentration on *Maida*, the MAAQ also carried out recording exercises on many of the other vessels at Bishop Island before their destruction. During the reclamation project, developers either bulldozed, or cut the sites to the surface.

In 2000, Cosmos Archaeology Pty. Ltd. (Coroneos, 2000) was contracted by Archaeo Pty. Ltd. (working for WBM Oceanics Australia) to carry out a preliminary assessment of maritime archaeological remains at the mouth of the Brisbane River due to government proposals to extend the existing port facilities in the area. While this assessment included structures on the shoreline or seabed, submerged terrestrial sites, and other forms of cultural materials, its assessment of the shipwreck resource included a discussion of the abandoned ship resource that was once at Bishop Island. Although the report did not examine the site in great detail, one of its recommendations concerned the researching of the use of Bishop Island as a dumping ground for unwanted vessels. The Cultural Heritage section of the WBM

Figure 4. The remains of the J7 submarine, Sandringham Pier, Port Phillip Bay (Photo N. Richards, 25/05/2001)

Oceanics Australia report (WBM Oceanics Australia, 2000: 10.1–10.19) concentrated mainly on the Indigenous cultural heritage of the area but includes much of the information outlined by Coroneos concerning the Bishop Island Ships' Graveyard.

In northern Queensland, James Cook University has carried out archaeological fieldwork on a range of vessels at Magnetic Island, as a part of an undergraduate maritime field school subject since 1998. Out of this fieldwork, students have written numerous reports on many of the abandoned vessels on the island, such as *Moltke, City of Adelaide* and *George Rennie* (see for instance Cerny, *et al.*, 1999 and Lewczak, *et al.*, 1999a; 1999b). Despite the fact that the student reports tended to have a methodological focus, part of the investigation into the vessels, such as *Moltke* involved the examination of archaeological signatures in relation to the use of explosives on the hull (or, so called 'detonation activities'). Additional examinations included the investigation of evidence of modification and the post-abandonment utilization of the vessels as breakwaters, all integral aspects of the investigation of deliberate abandonment processes.

In 2000 Doyle completed an archaeology MA thesis entitled, An Examination of Associations Between Significant Historic Events and the Loss and Discard of Vessels in the Townsville Catchment, 1865–1981. In this thesis, Doyle specifically examines discard behaviour associated with a number of deliberately abandoned vessels in the Townsville Region. This research asks two fundamental questions: What are the correlations between the rate of loss and historically significant events? and, What are the correlations between the rate of discard and historically significant events?

Victoria

There have been a number of studies carried out in Victoria on abandoned vessels. Victorian research has paid attention to a large number of individual sites, as well as graveyards in general. These studies generally fall under two categories: studies undertaken by the cultural resource management agency Heritage Victoria (and its antecedent, the Victoria Archaeological Survey), and those by the State's avocational maritime archaeological association, the Maritime Archaeological Association of Victoria (MAAV). The MAAV has had a long-standing interest in the scuttled vessels in and around Melbourne, particularly those off Barwon Heads, and have written on vessels abandoned in Victoria (see for instance Charlesworth, 1990; Caldow, 1991). Indeed, much of the initiative to work on abandoned vessels seems to have come out of this organization.

The MAAV was responsible for three early studies on deliberately abandoned vessels in Victoria in 1983. A site called 'St Leonard's Site A' was investigated by the MAAV from March 1983, and was believed to be one of three vessels abandoned by Captain George Ward Cole in the 1850s as a jetty (Hewitt, 1984b). The MAAV commenced an investigation of the Swan Island Torpedo Boat in April 1983, aiming to identify the structure. The vessel, buried in the sand was the torpedo boat *Countess of Hopetoun* (Williams, 1984). The MAAV commenced the search for the Queenscliffe torpedo boat *Lonsdale* in July 1983 (Cahill, 1996: 51). The vessel, decommissioned in 1889, had disappeared after a time in the 'rotten row' off Port Melbourne (Fitchett, 1976: 39). Reports suggested that the vessel ended its days abandoned on a beach at Queenscliff around 1920, and had since disappeared due to a natural reclamation of land in that area. Eventually the organization re-discovered the site in 1984 almost a kilometre from the shoreline (Arnott, 1984).

The MAAV through their '*Cerberus* Group' also undertook research and survey work on the vessel *Cerberus*, an early turret warship, designed for the defence of Melbourne (arriving there in 1870), from 1983 (Cahill, 1984, 1988: 160–162; Charlesworth, 1996). Following the disbanding of the Commonwealth submarine unit in 1924, and its sale, the vessel was sold with the intention of taking it outside of the heads for breaking up. Instead, the vessel was taken to Half Moon Bay where it was sunk in shallow water as a breakwater. Later, *Cerberus* was also part of a study by Foster (1989a: 19–21) entitled Defense and Victorian Shipwrecks, and was a part of the work undertaken by Gould (2000: 268, 271, 277–281, 288–289, 290).

The remains of the 'Port Welshpool lighter', a flat-bottomed timber vessel believed to be a bottom dump lighter was investigated by the MAAV in March 1984 and described by Hewitt (1984a, 1984c: 24–34). The vessel was supposedly abandoned in its present position for over 50 years (from 1984) and was used by local cray fishermen as a coffer. Jordan (1995: 294) also adds that, from information from the Port Albert Maritime Museum, the lighter was a hopper barge at Port Welshpool and was still in a floating condition in the mid-1920s.

In the 1990s, MAAV continued its investigations of abandoned watercraft, producing site inspection reports on the vessels *Anieura, Courier, Uralba, Carmen* and *Ozone* (Charlesworth, 1990, 1996; Derksen, 1990; Caldow, 1991, 1996; Taylor, 1996; Venturoni, 1996). While all of these studies have been particularistic, and do not specifically

Figure 5. Remains of Otago at the Otago Bay Ships' Graveyard, East Risdon, River Derwent, Tasmania (Photo: N. Richards 20/12/2000)

address the nature of watercraft abandonment, they are important preludes to later studies, which eventually came to be major joint projects with Heritage Victoria. In particular, the work of Foster (1987, 1988, 1989b, 1990) in Port Phillip Bay is important, because of its comparative approaches and types of analysis.

While Foster primarily worked on all lost watercraft sites within a defined geographical limit, she also included abandoned watercraft sites that represent deliberate decisions such as beached vessels, and watercraft sunk as breakwaters and piers (Foster, 1990: 28–37). In other places Foster (1988: 21, 1989: 21) also listed hulked vessels and 'scuttled or beached [vessels] as the result of legitimate decision-making'. Volume 3 of the study includes a section on, 'Vessels broken up or deliberately beached' (Foster, 1989b: 20, 40). It also makes reference to other abandonment sites, such as an unidentified vessel on the Maribyronong River (Foster, 1990: 14) and lists the abandonment of HMAS *Lonsdale*, *S.F. Hersey* and *Countess of Hopetoun* in relation to the defence of Port Phillip (Foster, 1987: 39). Hulks feature prominently in Foster's aforementioned study on the defence of Victoria (Foster, 1989a: 24–26).

The historical and archaeological investigations undertaken on abandoned vessels in the State of Victoria are also probably the most developed on a number of levels. In particular, the Barwon Heads Ships' Graveyard and the J-class submarines (of which some are in the Barwon Heads graveyard) are noteworthy.

The MAAV commenced their investigation of the J-class submarines in 1989 (Arnott, 1996: 26), and since then they have become some of the most studied abandoned vessels in Australian maritime archaeology. The six submarines (*J1, J2, J3, J4, J5* and *J7*) were part of a gift from the British Government after the conclusion of the First World War and sailed into Geelong in 1920 (Smith, 1990: 9; Victoria Archaeological Survey, 1992). Within a few years, the vessels were decommissioned, and four were sold to ship breakers (in 1922), the submarine *J3* being converted into a pier and power station at Swan Island before being sold for salvage in 1926. The last remaining submarine, *J7* followed suit in 1924 (Smith, 1990: 12). The remaining two submarines were transformed into breakwaters, *J3* near Swan Island in Port Phillip Bay, and *J7* off Hampton (see Fig. 4) (Stone & Loney, 1983: 35–36; Victoria Archaeological Survey, 1992). Some interpretation has been also been carried out on the J-class submarines. Namely, the inclusion of the *J2* submarine also known as the 'Shallow or 90 foot submarine' in two pamphlets comprising historical information and diving details presented in the Underwater Shipwreck Discovery Trail (Victoria Archaeological Survey, 1992). Some mention is made of the other located submarines, although their actual identification is not determined (due to their basically identical nature) and they have instead been named the '120 ft or Broken Submarine', the 'Deep

Figure 6. Seized vessel before its burning, East Arm of Darwin

Submarine' and the 'New Deep Submarine' (being the *J1*, *J4* and *J5* submarines). The *J3* has also played a role in the development of new photogrammetric methods of underwater archaeological recording, when in 1999 it was one of the first vessels to be comprehensively surveyed using Photomodeler Pro software (see Franke, 1999).

Some authors (Nayler, 1974: 84; Loney, 1980: 86, 1991: 143) have noted that the location of the main Victorian ships' graveyard as being approximately 5 nautical miles (8 km) south-west of Barwon Heads in depths up to 27 fathoms. Publications have emerged from investigations into this site including a declaration for protection (Duncan, 1994) and a popular pamphlet.

This pamphlet covers the provisional declaration of the vessels in the ships' graveyard as historic shipwrecks under the *Historic Shipwrecks Act 1976* (as defined in Duncan, 1994) and briefly outlines some of the historically significant vessels in the assemblage. Duncan's 1994 Barwon Heads Report follows fairly standard Australian reporting procedures including a database print-out of the vessels in the graveyard, location information (noted positions and rudimentary mapping) before proceeding into site description, site plans, site significance assessments, and assessment of threat. The recommendations included in the report, however, were successful in gaining provisional declaration for the graveyard vessels, and has made the site undoubtedly one of the best-documented ships' graveyard sites in Australia. Additionally, it is the first (and currently only) protected ships' graveyard under the *Historic Shipwrecks Act 1976*. It is interesting, however, to note that it was the status of many of the individual ships as historic 'shipwrecks', and not the standing of the area as an assemblage of sites that brought about their protection. This is indicative of the problems with sites of comparative potential and systems of significance assessment. In addition, their importance was considered low, as this quote suggests:

> A number of the vessels were dismantled and sunk in the Ships' Graveyard off Barwon Heads have been located in recent years. MAU has accurate positions for most of the vessels obtained from contemporary records and the

records of the Ports and Harbours Hydrographer Office at Queenscliffe. At present, these sites are considered of low priority (priority 5) for wreck inspection though they represent an interesting cross-section of vessel types and even the stripped hulls may be of some value for future research (Staniforth, 1988: 43).

More recently the remains of a possible deliberately abandoned vessel known as the 'Pier 35' wreck was found on a bank of the Yarra River, Melbourne during development for a Marina Complex (the site had previously been mentioned by Foster 1990: 14). The area where the vessel was found was a well-known 'rotten row' known as '*Siberia*' adjacent to wharves and storage facilities (the same area mentioned by Fitchett, 1976: 39 in relation to Lonsdale). The Pier 35 vessel was the hull of a wooden sailing ship, the timbers of which are believed to be of North American origin. The vessel could not be moved and was instead buried in order to preserve it beneath the fill of the development. An unpublished manuscript entitled The Pier 35 Wreck held by Heritage Victoria suggests that numerous vessels were abandoned in Melbourne during the gold-rushes of the 1850s, and that vessels became derelict after being abandoned by their crews. This manuscript also tells of the conversion of old sailing ships for other uses such as storage hulks and prison hulks (Jordan, 1997).

Tasmania

As noted in another publication (Richards & Nash, 2005), a number of sources have already communicated the rich history of watercraft abandonment in Tasmania. This includes seminal shipwreck publications, including the two volumes of *Tasmanian Shipwrecks* (Broxam & Nash, 1998, 2000), Harry O'May's *Wrecks in Tasmanian Waters: 1797–1950* (1985), and other publications by Graeme Broxam (1993, 1996a; 1996b). Other published sources, such as *Dive Tasmania* (Jacques, 1997), *The Tasmanian Trading Ketch* (Kerr, 1998) and *Maritime Australia Volume 1: the Port of Hobart, Tasmania* (Hammond, 1996), also reference abandoned watercraft in Tasmania.

There has also been some history of the archaeological examination of abandoned watercraft in Tasmania. The earliest reference is to the investigation of a ships' graveyard along the Derwent River at East Risdon by the southern branch of the Maritime Archaeological Association of Tasmania (MAAT) in 1983 (Lester, 1983: 28–29). The 'Hulks in the River Wrecks Programme', reported by Lester concentrated on the remains of *Otago*, because of its association with the famous writer Joseph Conrad, who was for a time the vessel's captain (see Foulke, 1989).

While Strachan (1988: 49) includes *Otago* among the most noted iron and steamship wrecks in Tasmania, its significance has never really been for archaeological reasons. Indeed, this vessel, more so than any other abandoned vessel or shipwreck in Australia has had its remains diminished because of a perception of its

'literary' significance. In short, this damage has come about because of its association with the world-renowned novelist Joseph Conrad (1957–1924). The vessel was his first and only command, and some have credited it with playing a major role in the events of his well-documented life from playing, 'such a big role in fostering Conrad's love of the sea' (*Southern Star*, 05.07.1989), to being the inspiration for writing short stories *The Shadow Line* (which was reputedly written on board the vessel) and even *Lord Jim, The Nigger of Narcissus* and *Typhoon,* despite being its Captain for only a relatively short period (Crowther, 1975: 2; Bowes, 1995: 54). Nevertheless, the site is a lost opportunity for cultural tourism and as Bowes (1995: 54) has said, 'if only people had had the foresight, [it could] have become one of the great literary pilgrimage sites of the world'.

This damage commenced in 1957 with its purchase by the Moreland Metal Company, which recovered metal from its rusting remains. In the 1970s, however removal of sections of the hull as souvenirs became more organized and a range of groups, including Polish Americans in the Conradian Society cutting sections of the hull away and turning the material into medallions (Saturday Evening Mercury, 27.11.1971: 17; Loney, 1980: 107). The vessel's wheel, installed by the Honourable Company of Master Mariners on the sloop Wellington is preserved in London. Additionally, a 5-ton section of the stern was removed and taken to Los Angeles for display in a maritime museum. The bow of the vessel was also transported to a museum in Turin, Italy (*The Mercury*, 27.11.1964: 5; *Sea History*, Fall 1978: 41). There are, however, some remnants of *Otago* in Tasmania, namely the old companionway superstructure, which sat in a residential backyard for some years before being restored and presented initially to the State Library of Tasmania, and then to the Tasmanian Maritime Museum, Hobart (Crowther, 1975). Besides *Otago,* the wooden river steamer *Togo* and steel river steamer *Westralian* receive some mention in other texts (Stone & Loney, 1983: 24).

Outside of the Hobart Region, only two sites—one at Strahan (on Tasmania's west coast), and another on the Tamar River near Launceston—have previously been examined for their heritage value. McConnell and Clark carried out a heritage assessment of the Strahan area in 1996 (McConnell & Clark, 1996). As a part of this assessment, the remains of the vessel *Glenturk* and *Number 10 Lighter* were included. The assessment contains brief historical information and makes no recommendations regarding the heritage of the vessels—they are effectively seen as hazards to navigation, and development, despite being close to shore and perfect candidates for interpretation. In all cases, the vessels along the Strahan foreshore were considered to be of low to medium significance. These vessels were also included in a comparative study of abandonment in Strahan (Richards, 2003a).

The ships' graveyard on the Tamar River is on the western boundary of Tamar Island, west of the main channel for shipping on the River Tamar. A wildlife preserve has been set up that includes the 14 to 17 vessels within its boundaries. Historical research on the site is limited and comprised of interpretive labels at the Tamar Island Wildlife Preserve Interpretation Centre, two pamphlets produced by the Tasmanian Parks and Wildlife Service and some information in the book, *The Story of the Port of Launceston* (Ferrall, 1983: 63). The vessels were sunk at the site between 1926 and 1971 in association with a dredging strategy on the Tamar that saw them used to produce a tidal scour. The site was visited at extremely low tides and could not be accessed due to deep mud and high surrounding vegetation that precluded both foot and boat access.

Two related studies have been produced examining the potential of the entire Tasmanian abandoned vessel resource as (currently known) (Richards 2003b; Richards & Nash, 2005).

Northern Territory
Tom Lewis' *Wrecks in Darwin Waters* (Lewis, 1992) is the only widely available source touching upon abandoned watercraft in the Northern Territory. Its focus is on the dive sites of Darwin and, therefore, has limited historical information. Within this publication, some information is available on the refugee boats seized by authorities and abandoned near the port of Darwin. Most of the work in the publication of abandoned vessels has come from the diving and recreational fishing industries in the Northern Territory. Cullen Bay Dive has produced a small publication entitled the *Handbook on Diving in Darwin* (Cullen Bay Dive, 2000). Although not comprehensive, it helps to identify where many of the abandoned vessels and artificial reefs, such as the 'Fenton Wrecks' and 'Saigon Wrecks' are located.

The popular annual fishing magazine *North Australian Fishing Maps: Fish Finder* (Flynn, 2000) is the most comprehensive depiction of the vessel based artificial reefs and refugee boat dumping sites. This publication covers the entire coastline from the Kimberley region in Western Australia to the northern reaches of Cape York and the Gulf country in Queensland. As the focus of the magazine is the dissemination of information of good fishing locations it publishes information regarding abandoned ships, which are often good artificial reefs and FAD. Of particular interest are the maps of Darwin Harbour and the Darwin foreshore (Flynn, 2000: 69, 72–73, 76–77), which include vessel plots on aerial photos, coupled with differential GPS spatial data. The publication also includes descriptions of the scuttled vessels in the region (Flynn, 2000: 68, 70).

The draft survey of the submerged material culture of the Beagle Gulf Marine Park (including Darwin Harbour) compiled by the Museum and Art Gallery of Northern Territory (Clark & Jung, 1999) is the only archaeological work done on abandoned vessels in this region. The abandoned vessel resource is well represented in the Northern Territory shipwreck database (Clark & Jung,

2001: 46–52) that, because of the Northern Territory's wealth of cultural remains resulting from the Second World War, (especially the remains of vessels and aircraft destroyed in Japanese attacks in 1942), has been more open to the inclusion of non-shipwreck remains. This does not just include refugee boats destroyed or abandoned near Darwin, but also artificial reefs (whether containing vessel remains or not). A comparative study of discarded watercraft in the Northern Territory, including recently burned vessels (see Fig. 6) has also been published (Richards, 2004).

Conclusions

It is highly likely that the literature cited here is an incomplete list of the unpublished examinations of abandoned ships in Australia. Nevertheless, there are enough here to demonstrate that in comparison to many other regions of the world, the deliberately abandoned ship resource in Australia has not only been studied for a long time, but has also been the subject of innovative research not really found elsewhere. We may see these inventive approaches in the work of professional and avocational alike.

Each of the case studies cited above have also proved to be important preludes to recent comparative and thematic investigation of ship discard and the archaeological abandonment process (for example, Richards, 1998–2004; Doyle, 2000; Richards & Nash, 2005; Richards & Staniforth, forthcoming). Indeed, without such studies making up the 'database' of sites for analysis, comparative and thematic investigation would not be possible. They are also indicators of the range and diversity of the vessels deliberately discarded in Australia over the past two centuries—and the changing economic and technological processes that bring about the deliberate abandonment of watercraft.

Increasingly it is becoming obvious that these sites are also important for archaeological reasons. Such sites are significant for how they contribute to our understanding of behaviours associated with cultural site formation processes such as salvage, demolition, and scuttling translate to the archaeological record. Abandoned watercraft have also proved to have scientific and experimental potential, and to be able to give us insight into the causal aspects of discard activities, the spatial dimension of deliberate abandonment, and the changing nature of the disposal and post-abandonment re-utilization of unwanted watercraft.

In some ways, the transition from site-based examination to comparative investigation seen in this particular site type may also be a sign of other developments in maritime archaeology. Progressively, collections of previously recorded maritime archaeological sites are proving themselves to have the potential for re-examination and re-contextualization via new methodological and theoretical tools, in Australia and abroad. The potential for similarly recorded non-shipwreck maritime archaeological sites to unveil new information about the past is largely undiscovered.

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