Introduction
Current estimates based on historical and archaeological evidence suggest that at least 115 watercraft were deliberately discarded in Tasmanian waters between the years 1808 and 1997. When compared with the national total of sites outlined in the doctoral research of Richards (2002), discarded vessels in Tasmania account for around 9% of the Australian resource, with the Northern Territory the only region of Australia with less discarded watercraft (see Richards, 2004). This relatively small percentage of the national resource is attributable to three things; a large number of ‘unknown state’ candidates, the large number of vessels identified as discarded along the east coast of the mainland, and the extensive research in South Australia which has identified many additional watercraft. Despite this, in many ways, Tasmania is a good case study for examining the correlation between deliberate abandonment trends and economic and technological change.

Tasmania is also a particularly good case study because of the wealth and accessibility of archival sources pertaining to the economic history of the state. For example, it is well documented that trade in Tasmania (and Hobart especially) was highly seasonal throughout most of the nineteenth and twentieth centuries, due to its dependence on the fruit trade, so much so that Hobart harbour at one point resembled a graveyard of watercraft. This meant that without gainful employment, owners would resort to laying up their vessels in the off-season. Many owners who could not press their vessels into employment would either allow them to fall into a state of disrepair, and/or dispose of them. This phenomenon was the cause of the demise of many craft well known in Tasmanian maritime history, such as the ketches *Huon Chief* and *Violet*, as well as the steamer *Togo* (Hudspeth & Scripps, 2000: 208). These and other case studies are reminders of the correlations illustrative of the cause and effect relationship existing between historical processes and site formation processes in the archaeological record.

A number of sources have already communicated the rich history of watercraft discard 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 include reference to discarded watercraft in Tasmania.
There has also been some history of the archaeological examination of discarded 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).

In 1985, Cook (MAAT, 1985: 1) also made passing reference to an archaeological investigation of discarded watercraft in a report on maritime archaeological investigations at the Sarah Island penal station made by the MAAT in April 1985. This report notes that: ‘The Association further inspected a number of wreck and hulk sites within Macquarie Harbour and at ‘Hells Gates’. Following this, archaeological inspections of other sites were limited to surveys carried out by Mike Nash of the Parks and Wildlife Service from 1987, and subsequent investigations by Flinders University, with only two exceptions.

In the early 1990s, staff from the Tasmanian Parks and Wildlife Service carried out research pertaining to a collection of around 14 vessels within a newly established wildlife preserve at Tamar Island, on the Tamar River for the creation of interpretive labels at the Tamar Island Wildlife Preserve Interpretation Centre and two pamphlets. In 1996, McConnell and Clark carried out a heritage assessment of the Strahan area (McConnell & Clark, 1996). As a part of this assessment, the remains of the vessel Glenturk and Number 10 Lighter were included.

All of these investigations have been site-specific, and largely historical in focus. The research presented in this paper is an exploration of the significance of the Tasmanian discarded vessel resource based on the premise that the events and processes that bring the disposal of ships are mirrors of various developments within human communities. In particular, these processes themselves shed light on the effect of technological and economic change, and economic and social circumstances. In this regard the archival and archaeological resource of deliberately discarded watercraft have much analytical potential to shed light on issues concerned with the integration of technology into maritime commerce, and general economic processes. What follows is a discussion and analysis of ship discard data based upon a comparative methodology. There are two major sections to this article; first, there is an overview of the location of the vessel discard sites in Tasmania with a brief communication of the location of the two major ships’ graveyard sites in the state, followed by an analysis of the State’s discarded watercraft. The analysis emerges from the Australian National Abandoned Vessel Database (ANAVD), created
by one author (Richards) while at Flinders University, and amended with research while working for the Tasmanian Heritage Office. The more than 1 500 sites, and over 6 000 archival sources that constitutes this database can be found in nine volumes downloadable from the website of the Department of Archaeology at Flinders University (Richards, 2003a–i, see www.flinders.edu.au/archaeology). The updated Tasmanian data is also available in an unpublished report produced for the Tasmanian Heritage Office (Richards, 2003k). This report outlines the history for all of the watercraft used in this study, and communicates the archival sources upon which this article is based.

**Discard locations in Tasmania**

Deep-sea scuttling areas in Australia have all tended to be areas ‘declared’ or ‘designated’ under Commonwealth legislation enacted in the early 1930s. The *Beaches, Fishing and Sea Routes Protection Act, 1932* (Commonwealth Government, 1932), outlined in the *Statutory Rules for Commonwealth Acts* in 1933 (Commonwealth Government, 1933) was the first Federal mandate to define discard areas on the basis of their isolation from major shipping routes. These large circular areas, (with the exception of two areas declared for Albany, Western Australia which are adjacent to land) are located in areas of deep water of up to 100 fathoms. Authorities designated fourteen areas in all States (but not Territories), with some States having multiple areas defined.

The area for Hobart, known as Area 4 (Fig. 1) is located: ‘Outside the 100 fathom line within a circular area 5 miles in diameter with centre in latitude 43° 14' S., longitude 148° 22' E., Tasman Island Lighthouse bearing 270° distant 15 miles’ (Commonwealth Government, 1933: 99).

Current research indicates that only approximately one third of all Australian watercraft discard sites reside in ‘ships’ graveyards’. Moreover, vessels scuttled in Commonwealth designated areas (official ships’ graveyards) only account for around 15% of all discarded watercraft. Indeed, Area Number 4 is one of three designated areas that were never used (the other areas, numbers 11 and 12 are respectively adjacent to Rockhampton and Bowen on the Queensland coast).

Distance from major ports is the main reason for the total absence of watercraft in these particular areas. Other reasons are attributable to the lack of trade in the ports within closest proximity to particular dumping grounds. In the case of Area 4, however, a special clause in the dumping regulations for Tasmania was also a contributing factor. This clause notes: ‘The sinking area within the Hobart port limits is on the edge of the reef at the south end of Betsy Island situated to the eastward of the entrance to the Derwent River’ (Commonwealth Government, 1933: 99). This other area, now known as the Little Betsey Island Ships’ Graveyard is located some 27 kilometres from Hobart by sea as opposed to approximately 100 kilometres for the declared area (see Richards, 2002: 240–244, 450–463).

With Commonwealth Area 4 not used, ship discard occurred at other various locations around the Tasmanian coast. Our current understanding of individual discard events has identified other segments of the Tasmanian coastline as discard areas. These regions (working north to south) are; the Tamar catchment, Northern Macquarie Harbour, the Derwent catchment, the Tasman Peninsula, and South Cape (see Fig. 2).

Not all of these areas are major ship discard locations. This is accredited to the relationship between trade activities and discard events that see larger maritime commercial centres having more traffic, and hence more ships to discard. Due to this, only the Tamar and Derwent catchments are the major focal areas for these activities because of the existence of substantial and persistent trade in each region. Additionally, these areas have within them many individual sites, several of which separately contain large concentrations of discarded ships (ships’ graveyards). At the opposite end of the spectrum are the Tasman Peninsula and South Cape areas where vessels have been discarded on a much smaller scale, and normally for specific postdiscard utilisation (for example, where vessels have been transformed into breakwaters). The northern reaches of Macquarie Harbour is a more distinctive case study because the discarded vessels represent a period of boom in an isolated region, and the inability for shipowners to get unwanted vessels to more appropriate discard locations in a practical, and cost-efficient manner (see Richards, 2003) for more information).

Watercraft discard tends to follow trade. In the case of Tasmania, discard activities tended to peak with economic trends in particular areas. Invariably discard practices ceased concurrently with the conclusion of major periods of maritime-based or maritime-dependant economic activity in smaller commercial centres. This created another trend where vessels moved away from smaller economic centres, into more substantial ones, leading to the increased centralisation of the Derwent catchment as the main ship discard area in the State. In line with the centralisation of major ports as the main centres for ship discard, the two ships’ graveyards most stocked with vessels are in close proximity to the two major ports in Tasmania, Hobart and Launceston, although a number of other, smaller graveyards, and isolated discard sites exist outside of those areas.

**Major Tasmanian ships’ graveyards**

The largest and most recently used ships’ graveyard in Tasmania is the Betsey Island/Little Betsey Island Ships’ Graveyard, located adjacent to Hobart in Storm Bay (noted on Fig. 1). This graveyard has been in use since the scuttling of *Amy Louise* in 1915 and subsequently used for scuttling at least another 17 vessels over an 81-year period (concluding in 1997). It has also been a location for the disposal of other unwanted detritus, such as floating bridge sections (Jacques, 1997: 50). This ships’ graveyard, like most other deep-water scuttling grounds around Australia, contains a cross-section of watercraft
used in local intra- and inter-coastal trades, and is a veritable microcosm of Tasmanian maritime commerce. This is in stark contrast with the second major dumping area in Tasmania which represents a more specialised and creative use of obsolete and unwanted watercraft.

Within the Tamar Island Wildlife Preserve in the north of the State is a collection of at least 14 closely scuttled watercraft (see Figs 3 & 4). This site sits on the western boundary of Tamar Island, itself west of the main channel for shipping on the River Tamar. In association with a dredging scheme, authorities discarded a number of vessels at the site between 1926 and 1971 for the purposes of producing a tidal scour (Ferrall, 1983: 63). Ferrall (1983: 63) also cites some of the background to this scheme:

Port Authority dredging operations were based at Tamar Island with workers living in huts on Tamar Island. Occupation ceased in 1892, but the use of Tamar Island as a silt dump continued with the increasing needs of shipping in the early 21st Century, the British expert W.H. Hunter was commissioned to design a scheme for improved navigation of the Tamar... For Tamar Island, the most important part of Hunter’s Scheme included dredging the channel west of...
the island, and block up the western channel, to concentrate water flow and aid its scouring action. Old river barges were scuttled in the western waterway. With success, until the floods of 1929 washed most of them away. At least 17 known ships were scuttled by the 1970s; 14 are visible from the boardwalk...

Some evidence suggests that the site actually became a dumping ground in 1901 with the discard of the screw steamer Corio. This followed with Platypus and Zelateur (1932), John and Winthrop and Lighter Barge No. 3 (1939). The late 1930s would also be the time that the Launceston Marine Board discarded the most substantial number of vessels at Tamar Island:

There had been another ridiculous situation in 1939. The Harbour Master, Captain J.T. Reid, recommended that three old wooden barges belonging to the Board and which had just been condemned, should be stripped and scuttled behind Tamar Island as a tide barrier. This had been the practice for some years with old derelict vessels, recommended and endorsed by successive competent civil engineers and Harbour masters (Ferrall, 1983:63).

No current research identifies events of subsequent discard for another two decades, and it was not until 1962 that another vessel, a Floating Dock (known as Maggie) was discarded. The deliberate dumping of vessels at the site appears to have concluded with the disposal of Inveresk in 1971 (Richardson, 2001: 98). The discard of at least eight other vessels known as Tamar Island Lighter Barges also occurred at an unknown time.

Analysis and discussion
The discarded vessels of Tasmania are a rich database from which we may extrapolate many aspects of Tasmanian history. This is not only attributable to the large number of discard sites, but also because of the richness of the historical record concerning their construction, use and context of discard.

There is some precedent for using aggregate data from historical documents to assess and re-appraise aspects of history. For instance Broxam (1998: ix) suggests that the tonnage of vessels coming into port may be an indication of that port’s prosperity. He also claims, in the specific case of Tasmania that:

Another indicator of the colony’s maritime prosperity can be seen in the number of tonnage of ships built during the period 1845–1850. It will be seen that after a mini-boom in the late 1830s, it dwindled away to nothing by 1845, this is largely due to the ‘lag-time’ between ordering new vessels at the height of the depression (1842/3) and their completion. However, the recovery was swift and the resultant boom of the late 1840s was not repeated in Tasmania for nearly a century.

Broxam also explains that an apparent ‘dip’ of some magnitude in 1849 was apparently the result of several large vessels ordered in 1847/48 but incomplete until 1850. The massive influx of overseas ships on the market as a result of the gold-rushes was the almost total collapse of the industry which was not revived again to any appreciable extent until the 1860s (Broxam, 1998: ix).

While Broxam’s implications that shipping arrivals may be a way of assessing local economic prosperity, and that shipbuilding output may be a mirror of local economic boom and bust cycles, is largely untested, his use of this data as economic correlate is an alluring premise for researchers looking at economic maritime history. Arguably, Broxam’s view also insinuates that the examination of watercraft abandonment trends may similarly become an interesting reflection of economic development. This is reinforced by the understanding that discarded watercraft are abandoned due to technological and economic issues (and not catastrophic circumstances). This view maintains that the incidence of discard, and the types of vessels discarded (because of the willingness of owners to repair, or buy newer vessels) are a potentially useful litmus test of technological and economic change.

We must acknowledge, however, that the process of discard is a complicated one, and that economic and technological events do not often manifest themselves immediately in increased or decreased rates of watercraft discard. In essence, it is important to factor in ‘lag-times’. For example, Broxam (1998: ix) also cites that a so-called ‘mini-boom’ in shipbuilding in Tasmania in the 1830s had dwindled away by 1845 due to ‘the ordering of vessels at the height of the depression (1842/3) and their completion’. If this is the case, then trends in discard may also be subject to lag-times. The best example of a ‘lag-time’ in watercraft abandonment is when a shipowner ‘lays up’ a vessel during periods of economic downturn,
Figure 5. Number of abandoned watercraft by year of abandonment (where year is recorded) (n=87).

Figure 6. Gross tonnage of abandoned watercraft by year of abandonment (where year is recorded) (n=87, 21,273.65 gross tons total).

Figure 7. Average lifespan of watercraft abandoned in Tasmania by year of build (where year of build and year of discard is recorded) (n=65).
One of the most effective, and simple analyses, is an examination of the incidence of discard across the history of a region. This diachronic analysis is two-fold; the examination of the number of vessels discarded in a particular year (Fig. 5), and the charting of accumulated gross tonnage of all vessels by year (Fig. 6). Once this data is plotted it is possible to interpret the trend in discard by examining potential correlations with other data, such as economic data (reports of economic health, boom and bust) obtained from archival sources. There are, however, inherent problems with the analysis of regional economic circumstances.

What follows is an attempt to interpret the watercraft discard history of Tasmania. There are two variations of discard analysis outlined here, monochronic (non-temporal), and diachronic (temporal) analyses. The authors have grouped construction and discard dates by decade in order to make general statements illustrative of common trends. As there were not any vessels built during the 1830s, 1930s and 1950s eventually discarded in Tasmania, gaps exist for these periods.

![Figure 8](image)

**Figure 8.** Nationality of build of watercraft abandoned in Tasmania by decade (1800-1980) (n=90).

![Figure 9](image)

**Figure 9.** Hull material (upon build, where year of construction is known) of watercraft abandoned in Tasmania (1800-1980) (n=90).

Often prolonging the process of abandonment just in case economic conditions improve. This indicates that in attempting to carry out discard analyses, there are many important considerations to make.

One of the most effective, and simple analysis, is an examination of the incidence of discard across the history of a region. This diachronic analysis is two-fold; the examination of the number of vessels discarded in a particular year (Fig. 5), and the charting of accumulated gross tonnage of all vessels by year (Fig. 6). Once this data is plotted it is possible to interpret the trend in discard by examining potential correlations with other data, such as economic data (reports of economic health, boom and bust) obtained from archival sources. There are, however, inherent problems with the analysis of regional economic circumstances.

The analysis of boom and bust in Van Diemens Land
and Tasmania has tended to concentrate on trade phases defined in relation to English trade cycles (see Hartwell, 1954: 187, 190; Morrissey, 1967: 64). Between 1820 and 1850 Van Diemens Land is cited as being very economically depressed for the periods 1826–1827, 1834–1835, 1841–1845, in the midst of moderate depressions in 1824–1825, 1838, 1848–1849, and having experiencing a boom in 1846–1847. It had periods of mixed prosperity 1820–1823, 1828–1833, 1836–1837, and 1846–1847. All of these are cited by Hartwell (1954: 187–190) to have coincided with the six cycles of British prosperity over the same period. Based on a simple hypothesis; that economic decline will
cause business decline, and increase watercraft discard, and that conversely boom periods will facilitate wealth, and decrease the incidence of watercraft discard, we would expect to see corresponding changes in discard trends. By taking into account the aforementioned ‘lag times’, and understanding that the short periods of time cited by Hartwell are often too short to expect a corresponding change in the discard trend, it can be seen that a change to the discard trend would only be expected during protracted advantageous or adverse economic change. Hartwell notes this in a number of the cycles in relation to Tasmania, and in the short-lived economic depressions of other ports. In this case, early economic growth periods in Tasmania (such as the booms of 1829–1832, 1839–1840) do seem to correspond with periods of reduced discard activities, or the absence of discard (Roberts, 1968: 291; Shaw, 1969: 5). However, because of the small numbers of watercraft this is not a definitive test of correlation.

This does not preclude the perception of early regional depressions in the discard trend; it simply means that the small sample size of discarded vessels in regions will not be as distinct as in a national analysis. Increases in discard events do not appear to correspond with the earliest economic depressions that gripped the colonies after their establishment (Richards, 2002: 254–260, 265–270). This may be due to a number of factors that define the early economic development of Australia; such as the rate of immigration, government expenditure, and the system of land grants and land rents. It could also be attributable to the relatively small size (and often experimental nature) of trade in new colonies, as well as the options for vessels to trade in nearby colonies. For instance, an increase in disposal activity does not show up in the discard trend of the 1840s in Tasmania despite many events that should have had adverse economic impacts on the colony. This includes the cessation of convict transportation in 1853 (and hence cheap labour), the mass exodus of people from the colony because of the Californian and New Zealand Gold Rushes (1849 and 1852 respectively), and the establishment of the new colonies of South Australia (1836), Victoria (1850), and Queensland (1859) (although both Victoria and Queensland had been colonized earlier) (Graeme-Evans & Wilson, 1996: 8; Hudspeth & Scripps, 2000: xvi, 11, 32, 42). Indeed, the economic depressions in Tasmania, are credited for lasting from the 1840s until the 1870s, but are very poorly represented in the trends depicted, probably due to the drastic fall in shipping arrivals to Tasmania over this period. Certainly, Hudspeth and Scripps (2000: 41) cite that in the years between 1857 and 1872, the tonnage of shipping plummeted from 105,000 to 50,000 tons, and yearly arrivals dropped from 547 arrivals to 195. No doubt, this was also directly related to booming mainland economies around this time.

In the case of Tasmania, this inconsistency is probably attributable to a number of compensatory economic events, such as the growth of the timber and produce export industries due to the increased demand arising through gold-rushes after 1849 in California and in New Zealand, Victoria and New South Wales in the early 1850s. Indeed, many researchers note that the early 1850s was a boom period before serious competition from the United States in late 1853 (particularly in the timber market) began to erode this growth. Along with these industries, the local shipbuilding trade would grow in importance, arguably ‘smoothing out’ the economic hardships experienced elsewhere, and having a marked influence on the tendency to discard vessels (Graeme-Evans & Wilson, 1996: 8, 10–11; Hudspeth & Scripps, 2000: xvii, 11, 32–33, 42).

In other cases, economic booms in other regions of Australia could have dramatic effects on the economic health, and discard trends in states not experiencing this growth. Often, however, this manifests itself in a way that seemingly goes against the nature of national booms. The Victorian gold rushes, for instance, had as much of a negative effect on Tasmania, as it did a positive effect on Victoria (Kok, 1999: 19). In 1850 Broxam (1998: ix) notes that Van Diemens Land was seemingly on the verge of ‘unprecedented prosperity’ but was disrupted by the commencement of gold fever on the Victorian gold fields in 1851 (this is supported by Clark, 1980: 135–136). This not only scaled the colony’s fate as somewhat of an economic backwater for the ensuing decades, but was also an event from which it is reputed to have never fully recovered. This was due mainly to the cessation of the transportation era, an associated increase in labour costs, and increased migration to the mainland.

The analysis of national watercraft discard data shows that this instance of regional economic development is significantly different from the global ones that will be discussed. The rush in Victoria appears to have caused no increase whatsoever in ship discard in Tasmania, probably due to those ships travelling to Victoria for the rushes. Indeed the phenomenon of ship desertion by crew appears to have only occurred in Victoria (see also Clark, 1980: 120). The analysis of ownership and vessel type data that correspond with the duration and aftermath of the Victorian gold rush indicates that many vessels eventually disposed of in Victoria had been operating in Tasmania. In this way, a regional economic boom which brings the transportation of people to that region will normally be coincident with a decrease in discard in the state from which the migration occurs. An increase in the discard of vessels at the place of the economic boom will also likely occur. This appears to be the only instance of such a reversal.

The response of colonies and states to national economic depressions, however, is highly divergent. While the depression of the 1890s is clearly evident in the examination of trends in South Australia and Queensland (Richards, 2002: 255–256), it is not nearly as marked in the Tasmanian trend despite its documented adverse effects. Likewise, despite the unfavourable effects of the depression of the 1930s on all States of Australia (Matthews, 1998: 3) it is not as marked in the Tasmanian discard trend.

RICHARDS & NASH: UNFIT FOR FURTHER USE: WATERCRAFT DISCARD IN TASMANIA (1808–1997)
This may be due to record crops yields and port arrivals in the early 1930s, the lifting of coastal clauses in the Navigation Acts in 1932, the reduction of wharfage rates in the mid 1930s (both stimulated trade), and documented problems in gaining trade after the depression (due to increased competition), which effectively ‘smoothed out’ this trend. Another factor may be that Tasmania was in the midst of depression by the 1920s, which deepened in the 1930s (Hudspeth & Scripps, 2000: 163–164, 171, 193–195, 199). Indeed, after the depression Tasmania’s attempts to re-establish the timber trade with New Zealand failed due to the commencement of timber trading between New South Wales and New Zealand. The eastern coast bark trade was also lost, due to successful competition from South Africa. A twenty percent downturn in the Hobart–Melbourne trade and a fifty percent downturn in the Hobart–Adelaide trade compounded this substantially (Hudspeth & Scripps, 2000: 193). The gross tonnage of vessels arriving in Hobart in 1933/34 was a sudden record. The lifting of coastal clauses on shipping under the Navigation Acts which served to stimulate trade and passenger transport from 1932, augmented with a 10% reduction in wharfage rates in 1935 was the main reason for this. This growth was to continue throughout the 1930s, with a tonnage record set in 1936/7 (Hudspeth & Scripps, 2000: 194–195, 199).

The economic ramifications of war are also a cause of regional variations in response to isolated historic events. For example, despite the fact that the First World War is supposed to have sped up economic development in Australia, this is not reflected in all states. In Tasmania, its influence is reputed to have been negligible until 1917, when the effects of the decline in shipping (due to the adoption of wartime tonnage) began to have ramifications. Much later, when it was a source of major disruption to trade throughout Australia it still did not deter many states from expanding their port infrastructure. This would change later due to the prolonged nature and intensification of the conflict. June 1918 saw the prices of quayage and port dues rise substantially, despite general hardship in the State brought about by the shipping decline ensuing after the outbreak of hostilities in the First World War. The changes in how these dues were determined (a change from net tonnage calculations to gross tonnage calculations), constituted a major financial drain on struggling merchants and shipowners. The cessation of hostilities in late 1918 did not see a major change, with high fees now coupled with a seaman’s strike, causing post-war continuation of hardship. When the big ships did return, it was soon found that they had indeed become bigger, mainly due to the establishment of new, more direct routes in international trade (London to Hobart), a problem for the port due to the depth of the water (Hudspeth & Scripps, 2000: 153–155, 158–159). Additionally, the Second World War brought about a slow turn around of shipping in Tasmania, and became a reason for vessels not to visit the port. This in turn meant that Hobart suffered from a lack of trade at this time, worsened by the requisitioning of vessels for use in conflict. The level of shipping, which was at its highest in 1938, would not reach the same level until 1958 (Hudspeth & Scripps, 2000: 242, 256).

Some other major economic events that feature notably in relation to later Tasmanian economic history are the decimation of the fruit export industry in the 1970s, the oil crisis in the Middle East (which is credited with ushering in a recession), the Stock Market Crash of 1987, and the economic rationalism of the 1990s (Hudspeth & Scripps, 2000: xvii, 318, 337). It is evident from the discussion above, that there is some degree of correlation between economic vigour and trends in discard, but that this relationship requires further exploration on a regional level because of the myriad of economic influences at play, the small number of candidates, and the erratic economic conditions of the State. Nevertheless, there are other, specific analyses (outlined below) that can be extrapolated from the discarded watercraft resource.

<table>
<thead>
<tr>
<th>Type</th>
<th>National</th>
<th>Tasmania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary and Secondary use only (never hulked)</td>
<td>39</td>
<td>50.59</td>
</tr>
<tr>
<td>Primary support (built as hulk)</td>
<td>42</td>
<td>36.00</td>
</tr>
<tr>
<td>Secondary support (converted into hulk)</td>
<td>51</td>
<td>54.74</td>
</tr>
<tr>
<td>Average</td>
<td>44</td>
<td>47.11</td>
</tr>
</tbody>
</table>

Table 1. Comparison of the average lifespan of watercraft in the national discarded vessel dataset (data derived from Richards, 2002: 313), and the Tasmanian discarded vessel dataset (values rounded to second decimal place).
Table 2. Four most prevalent nations of build in National data (from Richards, 2002: 197) and Tasmanian component.

<table>
<thead>
<tr>
<th>Nation</th>
<th>% National Data</th>
<th>% Tas. Data</th>
<th>% Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>54.82</td>
<td>58.8785</td>
<td>-4.0585</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>30.88</td>
<td>29.90654</td>
<td>0.97346</td>
</tr>
<tr>
<td>United States</td>
<td>3.79</td>
<td>4.672897</td>
<td>-0.882897</td>
</tr>
<tr>
<td>Canada</td>
<td>3.08</td>
<td>1.869159</td>
<td>1.210841</td>
</tr>
<tr>
<td>TOTAL%</td>
<td>92.57</td>
<td>95.327096</td>
<td>-2.757096</td>
</tr>
</tbody>
</table>

Table 3. Percentages of own-state built vessels in each state of Australia, and next most prevalent state of build. Breakdown is by geography as it translates to current state boundaries. It should be acknowledged that prior to 1850, vessels built in what is today Victoria were actually within the political boundary of the colony of New South Wales.

<table>
<thead>
<tr>
<th>State</th>
<th>Most prevalent</th>
<th>%</th>
<th>Next most prevalent</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>New South Wales</td>
<td>New South Wales</td>
<td>84</td>
<td>Victoria</td>
<td>4</td>
</tr>
<tr>
<td>Northern Territory</td>
<td>New South Wales</td>
<td>50</td>
<td>Queensland and Western Australia</td>
<td>25 (each)</td>
</tr>
<tr>
<td>Queensland</td>
<td>Queensland</td>
<td>43</td>
<td>New South Wales</td>
<td>41</td>
</tr>
<tr>
<td>South Australia</td>
<td>South Australia</td>
<td>53</td>
<td>Victoria</td>
<td>16</td>
</tr>
<tr>
<td>Tasmania</td>
<td>Tasmania</td>
<td>53</td>
<td>New South Wales</td>
<td>11</td>
</tr>
<tr>
<td>Victoria</td>
<td>Victoria</td>
<td>42</td>
<td>New South Wales</td>
<td>27</td>
</tr>
<tr>
<td>Western Australia</td>
<td>Western Australia</td>
<td>60</td>
<td>New South Wales</td>
<td>13</td>
</tr>
</tbody>
</table>

Table 4. Percentages of British built vessels in each state of Australia by Region.

<table>
<thead>
<tr>
<th>State</th>
<th>%English</th>
<th>%Scottish</th>
<th>%Welsh</th>
<th>%N. Irish</th>
<th>%Unknown</th>
<th>%Total</th>
</tr>
</thead>
<tbody>
<tr>
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<td>65.56</td>
<td>2.22</td>
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<td>0.00</td>
<td>0.00</td>
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<td>100.00</td>
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</tr>
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<td>2.38</td>
<td>0.00</td>
<td>0.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

and those that were hulked (almost 4 years older on average in Tasmania). While the primary support lifespan is lower than the national average, this is attributable to the small sample of primary support vessels with known dates of build and discard (only three vessels). Another factor is the comparative lack of non-propelled watercraft (such as barges) in Tasmania (when compared for instance to states such as South Australia and Victoria, where the riverine trades were often dominated by barges). Diachronic analysis (Fig. 7) of the lifespan of the watercraft before their disposal in Tasmania between 1800 and 1970 indicates that the use-life of vessels declined over time from an average over 60 years, to around 40 years. This generally conforms to the national dataset, where there was also a general decline from an average lifespan of around 70 years around 1800 to less than 30 years by the 1970s (see Richards, 2002: 316). This decrease in lifespan is undoubtedly a consequence of the loss of options for shipowners in relation to the conversion of their watercraft into support vessels, which effectively knocked a number of years off the lifespan of their vessels. If we consider, however, that improvements to infrastructure (such as the provision of marinas, boat sheds and moorings) improved as the colony developed, and should have had a positive affect on the use life of vessels by not placing them under undue strain and wear, it is clear that the economic causes for any reduction in watercraft lifespan is substantial. Such was the case in Tasmania in its Depression of the 1850s,
the Marine Board constructed boat-ways and a boat harbour so that redundant water taxis did not have to be beached for prolonged periods while there was no work (Hudspeth & Scripps, 2000: 45).

<table>
<thead>
<tr>
<th>State</th>
<th>% Wood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tasmania</td>
<td>70.43</td>
</tr>
<tr>
<td>Northern Territory</td>
<td>69.05</td>
</tr>
<tr>
<td>Victoria</td>
<td>49.72</td>
</tr>
<tr>
<td>South Australia</td>
<td>47.86</td>
</tr>
<tr>
<td>Western Australia</td>
<td>43.29</td>
</tr>
<tr>
<td>New South Wales</td>
<td>38.68</td>
</tr>
<tr>
<td>Queensland</td>
<td>31.35</td>
</tr>
</tbody>
</table>

Table 5. Percentages of wooden-hulled vessels discarded in each State of Australia.

The nationality of build of the watercraft discarded in Tasmania conforms closely with the statistics cited by Richards (2002: 197) in relation to the nationality of watercraft in the national dataset. Accordingly, the most prevalent nations in both datasets (in order of prevalence) are Australia (including the Australian colonies before 1901), the United Kingdom, unknown nation, the United States of America, and Canada. These nations make up 92.57% of vessels of known origin in the national dataset, and 95.33% of vessels of known origin in the Tasmanian dataset. The correlations are closer still when looking at the individual percentages for these nations (see Table 2) (and there is only around a 3% difference between the values of each). This is largely attributable to there being slightly more Australian built vessels in the Tasmanian sample (4%), and more ships from Canada in the national dataset (1.2%). One conclusion from this analysis is that despite the fact that Tasmania only represents a relatively small portion of the discarded watercraft resource in Australia, in relation to watercraft purchasing and utilisation trends; it nevertheless represents a microcosm of Australian trade.

A more detailed analysis of regions within these nations also illustrates a number of correlations between the Tasmanian and the national data. The first of these is in relation to the geography of build of Australian vessels. Here it is clear that the most prevalent Australian state of build of vessels discarded in Tasmania is the Tasmanian built vessel (52%). Table 3 indicates that with the exception of the Northern Territory (due to its small sample size) there is a tendency for each State to have mostly Australian built vessels that were constructed in their own state, eventually discarded in their state. In most cases, this is followed by a large percentage of vessels from New South Wales. The overwhelming majority of vessels built and eventually discarded in New South Wales itself further supports this (see Table 3).

In relation to British built vessels, all states of Australia illustrate the dominance of English and Scottish built vessels in the discarded resource (Table 4). The tendency to purchase English built ships is, however, much more marked in the states of Western Australia, Tasmania, and Victoria.

Due to the small sample of US built vessels in the Tasmanian database of sites it is difficult to make interstate comparisons in relation to ships built in the United States. Nevertheless, there appears to be a preference for vessels built on the east coast of the United States, rather than the west coast.

A diachronic analysis of these trends in nationality between 1800 and 1980 (Fig. 8) shows that British-built vessels dominated until the late 1830s. This gave way around the 1840s due to the growth of Australian-built vessels until a drastic drop in the 1860s. Australian-built vessels would again grown in prevalence from the 1870s, and reach a major peak of around 75% from the start of the 1890s to the end of the 1910s. The American percentage of vessels built was its largest in the period from 1810 to 1820 (around 30%), and would only comprise a relatively small proportion of watercraft between 1840 and 1900. From around 1870 until the 1940s, the nationality of watercraft became more diverse. After this time, the discard of vessels in Tasmania was predominantly occurring to Australian-built ships. This data corresponds with the general trends in Australian, British, North American, and ‘other state’ building trends on a national level (see Richards, 2002: 198–200), and similarly adds credence to the assertion that the nationality of the vessels that were disposed of in Tasmania are a reflection of a number of themes in Australian history. This includes the dominance of British trade on Australian economic development over a major portion of Australian colonial history and the development of the Australian shipbuilding industry. Other themes include the dramatic influence of the American Civil War on the output of American shipyards, the purchase of American vessels, and the affect of naval construction during the two world wars (which increased, and maintained the percentage of Australian-built vessels) (see Richards, 2002: 202–203).

Hull material

An analysis of the hull material of watercraft discarded in Tasmania shows that the vast majority of vessels were wooden hulled. This is a general trend for all states and territories of Australia, with wooden-hulled vessels being the most predominant hull type. Table 5, however, shows that the dominance of the wooden hull in the discarded vessel resource varies substantially from state to state. When examined in relation to a diachronic analysis (Fig. 9) of the hull types discarded in Tasmania by their year of build it becomes clear to what extent wooden hulled vessels carried out Tasmanian commerce. This analysis shows that the construction of wooden-hulled vessels was occurring until the late 1940s, and that until the beginning of the 1920s they remained the most statistically dominant...
RICHARDS & NASH: UNFIT FOR FURTHER USE: WATERCRAFT DISCARD IN TASMANIA (1808–1997)

<table>
<thead>
<tr>
<th>State</th>
<th>Propulsion</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>New South Wales</td>
<td>Steam (Single screw)</td>
<td>37.74</td>
</tr>
<tr>
<td>Northern Territory</td>
<td>Motor (Single Screw)</td>
<td>71.43</td>
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<td>Queensland</td>
<td>Steam (Single Screw)</td>
<td>35.14</td>
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<tr>
<td>South Australia</td>
<td>Sail (None)</td>
<td>22.57</td>
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<td>Sail (None)</td>
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<td>Victoria</td>
<td>Sail (None)</td>
<td>98.67</td>
</tr>
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<td>Western Australia</td>
<td>Sail (None)</td>
<td>37.20</td>
</tr>
</tbody>
</table>

Table 6. Dominant final propulsion systems of watercraft discarded in each State of Australia.

hull material. While ferrous-hulled ships emerge in the 1840s, they remain a relatively small component of the discarded watercraft record in the state. This is especially true of iron-hulled vessels, built between the 1840s and the late 1890s. These ships reached prominence in the 1860s, and began to erode the dominance of wood in shipbuilding until the introduction of steel.

The enacting of the Tasmanian Inspection of Machinery Act, 1884, however, suggests that this is not a simple matter. This legislation saw the appointment of three surveyors; two for iron hulls and one for wooden hull, and probably indicates that there was probably a large difference in the size of these vessels, with ferrous-hulled ships becoming increasingly larger, and needing specialised attention (Hudspeth & Scripps, 2000: 119). The 1920s would see the drastic overtaking of steel to such a degree that by the end of the 1970s steel vessels would be the only ships discarded in Tasmania.

Propulsion

An analysis of the system of propulsion of watercraft upon their disposal (i.e. taking into account modification) indicates that the most prominent propulsion technology in Tasmanian history was unassisted sail (i.e. no auxiliary engine), followed closely by single screw steam vessels. This is similar to other States of Australia, with unassisted sail, and single screw steam vessels being the dominant systems of propulsion in all but one region of Australia (the dominance of motor vessels in the Northern Territory is attributed to the modern nature of the discard practices in the region) (see Table 6). Again, an examination of systems of propulsion over time (in this instance on systems of propulsion upon their build, before any modification) is a classic case of the technological innovation, and subsequent diffusion of technology into Tasmania (Fig. 10). This analysis indicates that, although steam appeared in Tasmania from as early as 1832 (Hudspeth & Scripps, 2000: 35), sail vessels dominated the types of vessels constructed up until the late 1860s, when screw steamers became dominant. The analysis also shows the introduction of paddle steamers around the 1840s, followed closely by screw steamers in the following decade. Motor vessels are not represented until the 1940s, and do not seem to persist for very long until unpropelled watercraft (barges) take over almost completely. The economic consequence of changing propulsion technologies in Tasmania are well documented, and Kerr (1998: 105) cites that the increased use of steam vessels in the 1880s was a major reason for the decrease in the use of the barge trade in Tasmania. Hudspeth and Scripps (2000: 194) also note that after the Great Depression in the 1930s most of the ships visiting Hobart were coal-fired screw-steamers. This was soon to change through the gradual replacement of these vessels with diesel engines. By the conclusion of the Second World War, one-quarter of all shipping would be diesel fuelled. These statistics do not show up in Figure 10 because of the eventual movement of these craft into other trades outside of Tasmania. Other evidence supports this.

Kerr (1998: 126–127) has noted that the direct impact of road transport from the 1920s (coupled with the effects of the Great Depression) was a drastic drop in available freight. This meant that vessel operators had few choices, convert vessels to fishing trades, sell vessels interstate, or lay vessels up. In this case, vessels were arguably sold off interstate, as a direct consequence of the growth of road and rail transportation. Additionally, the spread of these transportation services were a direct cause of the disposal of vessels in Tasmania. After the Second World War, for instance, the further development of road infrastructure was to be a major force in changing the barge trade in Tasmania, as well as causing a decline in the timber trade (Kerr, 1998: 105; Hudspeth & Scripps, 2000: 171, 193). Indeed, the expansion of alternative transportation systems may be the single biggest contributor to the death of Tasmanian coastal trades.

When the Australian Newsprint Mills changed to road transportation the consequence of this was the scuttling of their fleet of barges in 1986 (Jacques, 1997: 51; Hudspeth & Scripps, 2000: 333). Similarly, Graeme-Evans & Wilson (1996: 46) cite the use of semi-trailers for the transportation of grain in 1956 as the main reason for the sale (due to fears of the vessel’s redundancy) and modification of the vessel Leillateah.

Another possible cause is containerisation. By 1965, shipping companies had turned to the container system. Some ports, such as Tasmanian ports did not begin to undergo the process of containerisation in earnest until the 1980s, and therefore were not building the new type of larger diesel propelled ship, which only periodically visited (Hudspeth & Scripps, 2000: 291, 301). In this circumstance, while diesel vessels may have dominated trade when looking at volume of exports and imports, the smaller screw-steamers and sailing vessels, which were a part of the Tasmanian coastal trade, would have been the only ones situated in ports like Hobart at the end of their working life.
Rig

An analysis of rig types in the Tasmanian discarded watercraft record is another examination of technological change. The most prevalent rig types employed in Tasmania were the schooner and barque rigs, and constitute 15% and 13% (respectively) of the vessels (or around 24% each where ‘unknown rig’ and ‘no rig’ fields are excluded). Although the percentages are substantially different from those quoted by Richards (2002: 302–303), which cite that barque and schooner rigs constitute 36% and 35%, it nevertheless corresponds with the popularity of those two particular configurations of rig.

An examination of this data diachronically indicates that from the early 1800s, until the late 1860s the dominant types of rig were those that predominantly employed square-rigged sails, such as barques, and brigantines. While fore-and-aft sail configurations feature in the resource after the 1830s with the emergence of ketch, schooner and cutter rig configurations, eventually the schooner rig would erode away the dominance of the barque rig in sailing vessels. This is possibly further evidence of the increasing popularity of fore-and-aft rig configuration due to the high crewing requirements of square-rigged vessels, and the increasing competition from steam and motor vessels. The construction of sailing vessels discarded in Tasmania occurred before the 1920s. When vessels of ‘no rig’ (i.e. barges, steam and motor vessels) are added, we can see that following the 1920s, when steam power, and then motor power was increasingly popular, the ‘no rig’ type becomes dominant in a matter of a few decades (Fig. 11).

Conclusion

There are many potential research directions that emerge from the comparative analysis of deliberately discarded watercraft. This arises from perceiving watercraft discard as a reflection of economically driven and technologically derived trade. This paper has been an attempt to communicate the Tasmanian resource of discarded watercraft. It has also been an attempt to refine the national dataset in order to more comprehensively the forces at play that shape the nature of economic and technological change in any region, and to determine appropriate indices against which the degree of correlation can be more adequately assessed. This study suggests that the remnants of obsolescence, in the historical and archaeological record have the potential to shed light on the processes of such transitions.

Acknowledgements

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References


