Rich Pickings: Abandoned Vessel Material Reuse on Rangitoto Island, New Zealand

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Rich Pickings:
Abandoned vessel material reuse on Rangitoto Island, New Zealand

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Abstract

This investigation into abandoned vessels and baches (holiday homes) on Rangitoto Island, New Zealand, addresses to what extent archaeological signatures inform the adaptive reuse of discarded watercraft material in local communities. A review of archaeological, archival and oral history data is undertaken to achieve several aims. These include determining the material available for salvage at the time of abandonment, what cultural site formation processes are visible at the individual vessel sites located in the ships graveyard at Boulder Bay and locating and recording the reuse of abandoned ship material in Rangitoto’s three bach communities; Beacon End, Rangitoto Wharf and Islington Bay. Finally, community behaviours towards abandoned vessels are identified and discussed and this information is used to update post-depositional site formation processes of abandoned vessels.

This research is archaeologically significant as it contributes to the theme of discarded watercraft reuse, an understudied area which has the potential to reveal meaningful interpretations about human behaviour. Furthermore, it is significant as the behaviours and attitudes of a disappearing community with a strong community identity and a history of reusing material are recorded.
Acknowledgments

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To the July field team, Maddy Fowler, Vanessa Sullivan, Howard Bennett and Sandy Wishart.

Finally, to Mum, Dad and my brother, for their ongoing love and support.
Declaration of Candidate

I certify that this thesis does not incorporate without acknowledgment any material previously submitted for a degree or diploma in any university; and that to the best of my knowledge and belief it does not contain any material previously published or written by another person where due reference is made in the text.

Kurt Bennett

2014
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Rothesay Bay

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My grandparents, this is for you
Introduction

A ship seems to have not only individuality, but sentient life, to be the companion as well as the servant of man, and the destruction of an old ship has about it something of the pathos of human dissolution in old age (Auckland Star [AS], 14 February 1924:4).¹

Ship abandonment in New Zealand, during the late nineteenth and early twentieth centuries was generally reserved for vessels that, if lucky enough to escape a shipwrecking event, were obsolete and past their economic working life. The redundant ships were stripped of their valuable items, leaving just enough structural components to keep them afloat. Confined to their moorings and no longer free to sail the open ocean, they became floating warehouses storing chemicals, coal, ammunition, meat and oil. Over time and with only the essential maintenance to keep the hulks afloat, the condition of the vessels would deteriorate—their upkeep considered uneconomical. When the hulks became too costly to keep afloat, their enterprising owners, made the decision to abandon the vessels in a remote location, leaving them exposed to the environmental elements.

Now in the twenty-first century, ship abandonment provides an insight into past shipping industries. Archaeological studies over the past two decades have documented reasons for abandonment. Most notably, Nathan Richards (1997; 2002) concludes abandonment is a result of technological and economic change. This, however, does not mean the use of a vessel stops when a ship is

¹ This thesis uses the Society for American Archaeology referencing style guide.
discarded and left to rot. It is possible that people unassociated with the shipping industry opportunistically see value in discarded vessel materials.

Rangitoto Island, New Zealand, presents an opportunity for a case study where vessels were abandoned in Boulder Bay, Rangitoto Island, during the late nineteenth and early twentieth centuries. During the time of abandonment, baches were constructed in three separate communities around the island. As this coincided with the Depression (1920s–1930s), material to construct modest holiday homes was scarce (Currie 2010:47). The abandoned vessels provided accessible and low-cost building resources. Bach owners saw these discarded watercraft not as an eyesore, but rather a place of opportunity. This thesis investigates the reuse of salvaged abandoned vessel material.

**Research question**

How did the adaptive reuse of the ships’ graveyard on Rangitoto Island influence the construction, modification and use of the island’s baches and what insights does this provide into the island’s bach communities?

**Aims**

1. What evidence do historical documents provide for the condition of Boulder Bay vessels at the time of abandonment?
2. What archaeological remains are located at Boulder Bay?
3. What cultural site formation processes are visible at the individual vessel sites?
4. Is there evidence of material culture located at the islands’ baches to suggest salvaging from the abandoned vessels?

**Justification**

Researching the Boulder Bay abandoned vessels will identify whether salvage and reuse processes are evident. This research contributes another aspect to the study of abandoned vessels by investigating the interaction between people and

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2 Bach is a word used to describe usually small and modest holiday homes in New Zealand.
ship remains. Richards (2008) created a national database of abandoned vessels around Australia. While he identified discarded watercraft and compiled data in relation to change in technology and economics, he did not investigate cultural interactions in the years after abandonment (Richards 1997, 2005; Richards and Staniforth 2006). This research builds upon his work and also explores this social interaction with abandoned cultural material.

In terms of past human behaviour, this research incorporates a preliminary historic review about ship abandonment and bach construction on Rangitoto Island. The historical data is used to draw conclusions regarding interactions between the island community and vessel remains at Boulder Bay. Furthermore, investigations of the study area for evidence into salvage and reuse of ship material contextualises the historic component.

People who built their holiday homes on the island were not wealthy and found themselves building these baches out of any materials they could find (Yoffe 2000:2). With most of the baches being built around the time of the Depression (Currie 2010:47), this research investigates the building materials used and determines whether they were salvaged from the nearby ships’ graveyard at Boulder Bay.

Cultural site formation processes are relevant to current debates regarding the understanding of how maritime archaeological sites change over time, especially through the actions of humans. It was the Self Contained Underwater Breathing Apparatus (SCUBA) that opened up the underwater world, and in particular shipwrecks, to the recreational diver (Muckelroy 1978:14). Despite this interest in submerged cultural material, abandoned vessels that were beached have been neglected and forgotten. This research contributes to the study of abandoned vessels by exploring how society has incorporated and interacted with discarded ship material.
Significance

Abandoned vessels are an extremely rich resource for archaeological information but it is only recently that abandonment sites have been subjected to archaeological investigations (Anderson 2008:103). In the 1980s, maritime archaeology was a relatively new subdiscipline (Barto Arnold III 1980:880). The development of SCUBA allowed the discipline to discover submerged material culture, providing insights into seafaring and ship construction (Muckelroy 1978:1). During this time, however, the study of abandoned vessels was neglected with the disciplinary focus directed toward submerged shipwrecks (Russel 2004:369). Michael McCarthy (1979:1) mentioned the potential of abandoned vessels as an archaeological resource in the late 1970s; but it was not until the late 1990s that Richards (1997) was the first to conduct a survey of deliberately abandoned vessels, located at the Garden Island ships’ graveyard in South Australia.

Richards’ 2008 book Ships’ Graveyards: Abandoned Watercraft and the Archaeological Site Formation Process is a published version of the Australian National Abandoned Vessels Database (ANAVD). Richards (2002) completed a national database comprising 1,500 abandoned vessels. He argues that the level of distinction between shipwrecks and abandoned vessels through accidental, deliberate, natural, cultural or catastrophic events predetermines aspects of site formation processes (Richards 2008:50). His study then investigates the correlation between abandonment of vessels and changes in technology and economics.

Richards’ (2008:42) study aimed to understand the interaction between national and regional events and archaeological phenomena. Richards (2008:42–43) approaches his study from a post-processual perspective and assesses social change through the historical and archaeological record. Richards (2008:47) then narrows his perspective down to a materialist-Marxist approach where he argues that human development is based on economic and technological changes that are evident through the archaeological record (Veth 2008:25).
This study of the Rangitoto Island ships’ graveyard will utilise the framework of behavioural archaeology. Being able to understand behaviour will significantly increase our knowledge of abandonment (Schiffer 1995:55). Chip Colwell-Chanthaphonh (2006:39), whilst agreeing with Schiffer, approaches behaviour related to abandonment from another angle. For him, abandonment is used to describe a range of attitudes determined by spatial implications and refuse disposal patterns (Colwell-Chanthaphonh 1995:30–31). Understanding the process of abandonment will help to identify how people have interacted with the Rangitoto ships’ graveyard and how the abandonment of vessels has influenced the attitudes of people visiting the site.

An identified gap in the literature is, if people are interacting with abandoned vessel sites; why and how are they doing so? Answers to these questions add to the investigation of behavioural archaeology for abandoned vessel sites.

The Boulder Bay abandoned vessels are a significant and archaeologically important site (Department of Conservation 2013). It is for this reason that permission was sought, through consultation with Auckland Council’s Principal Specialist Cultural Heritage officer, Robert Brassey, to carry out an archaeological investigation; however, no permits are needed to access the site or to conduct non-disturbance surveys (Robert Brassey, personal communication 2013).

**Study area**

Rangitoto Island is situated in the Hauraki Gulf, approximately 15 km northeast of downtown Auckland, New Zealand (Figure 1). With its close proximity to Auckland’s city centre, Rangitoto was opened up early for holidaymakers and day visitors to travel to the island, both by ferry and recreational vessels. Rangitoto was gazetted in 1890 as a public reserve (Currie 2010:47). Its first wharf was built in 1897 and a rough walking track to the summit was opened (Currie 2010:47). These services had an ongoing expense so landing fees were collected upon arrival. Another source of income was the offering of campsite leases.
By 1911, tearooms had been built to accommodate the day tourists and more permanent structures were being erected on the leased sites. By 1927, 59 baches had been built, with the total number increasing to 140 ten years later (Figure 2) (Currie 2010:47). The baches were spread out over three communities: Rangitoto Wharf, Islington Bay and Beacon End (Figure 3). The 1920s and 1930s saw these settlements consist of baches and boatsheds as well as communal facilitates, such as a swimming pool, community hall and tennis courts (Currie 2010:47). The 1920s and 1930s also saw forced labour provided by Mt Eden prisoners. They can be credited for creating the road following the shoreline, a walking track to the summit and other public amenities like the ones previously mentioned. The prisoners were withdrawn from the island in 1934.

The baches were modestly built, mostly from recycled materials or material washed up by the sea (Currie 2010:47). Living was basic, with no electricity, sewerage or water, which in turn created a bond between members of the community (Currie 2010:47). Families would help each other with construction and in the evenings they would gather to play cards or have a singsong.
This carefree way of living, however, ceased when the Ministry of Lands questioned the legality of the leases in the early 1930s (Currie 2010:48). From the late 1930s, existing leases were given a 20 year extension. At the end of the
leases in 1957, only 95 leases were renewed for 33 years (Currie 2010:48). The lease renewal came with strict conditions; no sale, exchange or rent, no additions or alterations and on the death of the leasees the bach was to be removed or demolished (Currie 2010:48; Yoffe 2000:1). The 1970s and 1980s saw most of the baches demolished as leases ran out or family members died (Currie 2010:48).

In 1990, 34 baches had their leases renewed for a further 33 years on the same conditions (Currie 2010:48). Islington Bay, Rangitoto Wharf and Beacon End bach communities were listed in 1997 as historic but their fates are by no means secure, with many owners now elderly (Currie 2010:48–49).

The abandoned vessels are located on the northern side of the island in Boulder Bay and Gardiner Gap (Figure 3). The vessels are not shipwrecks as such, having been deliberately abandoned between 1887 and 1947. The abandoned vessels are listed in Table 1.

This study focuses on abandoned vessels located in Boulder Bay on Rangitoto Island, but excludes Gardiner Gap where two submerged vessels, *Northern Chief* and *Clara Hargrave*, were abandoned. Due to their close proximity to each other, Boulder Bay will refer to both Boulder Bay and Wreck Bay (Figure 3). The latter two vessels were inaccessible to the bach owners at the time of bach construction and subsequently when salvage was most prevalent.

The construction of the baches occurred between the 1920s and 1940s and is seen as the main time range for large recreational salvage. There are 13 known vessels abandoned on Rangitoto Island. For this study, only 11 of those vessels accessible in the intertidal zone, without the need for SCUBA, are investigated. This is because public access to the two submerged vessels mentioned previously would not have been possible until the commercialisation of SCUBA in the 1960s. While all sites would have been visited at some point in time, the beached vessels were easily accessible to the bach communities and have been impacted most by human interaction.
Table 1. Rangitoto abandoned vessels (Department of Conservation and Auckland Regional Council n.d.).

<table>
<thead>
<tr>
<th>Name</th>
<th>Built</th>
<th>Origin</th>
<th>Vessel type</th>
<th>Abandoned</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rarawa</td>
<td>1903</td>
<td>Dundee, Scotland</td>
<td>Schooner-rigged, twin screw steamer</td>
<td>c. 1941</td>
<td>Boulder Bay</td>
</tr>
<tr>
<td>Dartford</td>
<td>1877</td>
<td>Sunderland, UK</td>
<td>Iron hulled, three-masted ship</td>
<td>1946</td>
<td>Boulder Bay</td>
</tr>
<tr>
<td>Columbia</td>
<td>1899</td>
<td>Hoquiam, Washington</td>
<td>Four-masted schooner</td>
<td>1938</td>
<td>Boulder Bay</td>
</tr>
<tr>
<td>Duchess (Lady of the Gulf)</td>
<td>1896</td>
<td>Glasgow, Scotland</td>
<td>Steamer</td>
<td>1947</td>
<td>Boulder Bay</td>
</tr>
<tr>
<td>Polly (ex Skovland)</td>
<td>1891</td>
<td>Porsgrund, Norway</td>
<td>Three-masted schooner</td>
<td>1928</td>
<td>Boulder Bay</td>
</tr>
<tr>
<td>Elinor Vernon</td>
<td>1876</td>
<td>Pembroke, USA</td>
<td>Barquentine</td>
<td>1928</td>
<td>Boulder Bay</td>
</tr>
<tr>
<td>Gladbrook (ex County of Anglesea)</td>
<td>1877</td>
<td>Liverpool, UK</td>
<td>Iron hulled barque</td>
<td>1945</td>
<td>Boulder Bay</td>
</tr>
<tr>
<td>Rothesay Bay (ex Activ)</td>
<td>1908</td>
<td>Dumbarton, Scotland</td>
<td>Iron hulled barque</td>
<td>1936</td>
<td>Boulder Bay</td>
</tr>
<tr>
<td>Ngapuhi</td>
<td>1900</td>
<td>Dundee, Scotland</td>
<td>Steamer</td>
<td>1941</td>
<td>Boulder Bay</td>
</tr>
<tr>
<td>Jubilee</td>
<td>1857</td>
<td>Cumberland, UK</td>
<td>Three-masted ship</td>
<td>1946</td>
<td>Boulder Bay</td>
</tr>
<tr>
<td>Arapawa</td>
<td>1908</td>
<td>Paisley, Scotland</td>
<td>Schooner-rigged, single screw steamer</td>
<td>1941</td>
<td>Boulder Bay</td>
</tr>
<tr>
<td>Northern Chief</td>
<td>1885</td>
<td>Freemans Bay, Auckland NZ</td>
<td>Three-masted barque</td>
<td>1929</td>
<td>East of Boulder Bay</td>
</tr>
<tr>
<td>Clara Hargrave (ex Achilles)</td>
<td>1856</td>
<td>Boston, USA</td>
<td>Wooden barque</td>
<td>1877–1890</td>
<td>Possibly Gardiners Gap</td>
</tr>
</tbody>
</table>
The Rangitoto Island ships’ graveyard was chosen for this study because of its close vicinity to the semi-permanent holiday community established on Rangitoto, its accessibility by walking tracks on the island, and the fact it has been open access to the public since 1890.

**Methods**

Historical research, conducted first, provided evidence of what remained of the vessels at the time of abandonment. This historical research took place at the Auckland Maritime Museum, Auckland Libraries, Auckland University Library and the Auckland War Memorial Museum. All are publicly accessible, but require documents to be requested and viewed in person.

As aforementioned, only vessels that are accessible from the shore were investigated. Both the vessels and baches underwent a non-disturbance survey for evidence of salvage activity and ship material reuse. Photography, archaeological drawings, an electronic database developed specifically for this project and Global Positioning System (GPS) recorded features located at bach and vessel sites.

Interaction with the abandoned vessels was measured by engaging Rangitotos’ bach communities. Oral histories, in the form of one-on-one interviews, recorded bach owners and family members memories from when they spent time on Rangitoto. The interviewee was asked a number of questions about the abandoned vessels and whether they have any knowledge of salvage activities. Interview questions were pre-approved by the Flinders University Ethics Committee before any interview took place (see Appendix 1). In accordance with ethics approval, the interview participants remain anonymous and therefore their transcripts are not included in this thesis.
Chapter outline

Chapter two reviews previous literature on abandoned vessel and bach studies. This includes theories that are applied to investigate behaviour towards discarded watercraft.

Chapter three outlines the methods used for this research. Historical and archaeological research is discussed, followed by the collection of oral histories.

Chapter four presents the results on the data collected for this thesis. This includes archival research, archaeological surveys and oral histories.

Chapter five analyses and interprets the context of the original research question and aims. In addition, these will be compared to similar studies to present behavioral insights into the bach communities.

Chapter six concludes this thesis by addressing the aims and research question. Limitations and future research are further discussed which will enhance this independent research and contribute to our understanding of behaviour towards abandoned vessels.

Conclusion

Using an opportunistic behaviour framework, this study establishes how, where and why abandoned vessel material was reused in the construction of holiday homes on Rangitoto Island. The ships’ graveyard was a place of inexpensive resources where bach owners salvaged material and incorporated it into their properties. Survey results, from both vessel and bach sites, shows evidence of salvage and reuse of vessel material. Bach communities were evidently built upon opportunistic behaviour and ambitions to own a holiday home during the 1920s and 1930s. Overall, this research contributes to the growing area of the archaeological study of abandoned vessels by addressing interaction with discarded watercraft, post-abandonment.
Literature review

This research fills a gap in understandings of social interactions with abandoned vessels through the analysis of baches located on Rangitoto Island. Previous research (LaRoche 2013; Richards 1997, 2002, 2005, 2008; Richards and Nash 2005; Richards and Staniforth 2006; Russel 2004) has concentrated on motivations behind abandonment, the use of vessels to reclaim waterfronts and to act as infrastructure. This research takes the notion of reuse a step further by concentrating on the social dimensions of salvage activities and how the reuse of material offers an insight into behaviour through the Rangitoto Island baches. This study fills a gap linking behaviour processes to abandoned vessels and bach studies.

Defining abandoned vessel sites

Keith Muckelroy (1978) suggested that an archaeological shipwreck site is static. The wrecking event transforms a ship from an organised dynamic assemblage to a disorganised but static state with long-term stability (Adams 2001:297; Colwell-Chanthaphonh and Ferguson 2006:38; Fowler 2011:11; Muckelroy 1978:157). Muckelroy (1978:157) argues that a shipwreck moves from a systemic to an archaeological context. Colwell-Chanthaphonh and Ferguson (2006:38) define systemic as the condition of an element when it is participating in a behavioural system, and an archaeological context as materials that have passed through a cultural system and which are now the objects of investigation by the archaeologist. Martin Gibbs (2006) highlights the cultural site formation processes involved in a wrecking event, including the abandonment process (Figure 4).
Gibbs (2006:5) identifies post abandonment processes as systematic and opportunistic salvage. Adams (2001:298) and Gibbs (2006:5) challenge Muckelroy’s (1978) concept by arguing that a shipwreck site is not stable because a site constantly undergoes transformation by external factors, such as environmental and cultural processes.

This argument of a shipwreck site not being stable can be applied to vessel abandonment. Richards (2008:146) illustrates this notion through a site formation diagram of disused watercraft (Figure 5). The diagram displays the processes that contribute to the transformation of vessels whereby the act of abandonment can be classed as a cultural process within a systemic context.
(Richards 2008:11). This is not to be confused with Schiffer’s (1987:89) definition, where abandonment is the process whereby a place (activity area), structure, or entire settlement is transformed to an archaeological context. Ship abandonment in coastal waters is exposed to cultural impacts such as salvage, which is defined as an ongoing activity and only when this ceases does the site enter the archaeological context (Richards 2008:11).

Figure 5. Site formation processes on disused watercraft (Richards 2008:146).
Richards (2008) also acknowledges that abandoned vessels can remain untouched and therefore enter the archaeological context immediately. Constant salvaging of material, however, makes the act of discard unclear to the researcher, due to the constant cultural interaction when salvaging material. In terms of Rangitoto vessel abandonment, the site is deemed to be still in a systemic context (Colwell-Chanthaphonh and Ferguson 2006:38). This is because the vessels, although considered abandoned, are still participating systemically during the bach construction period, due to their participation in the behavioural system.

**Abandonment behaviour**

Over recent decades, archaeology has established a focus on historic sites dated to the past century. During the 1970s, archaeologists independently rejected two traditional parts of the definition of archaeology—that we must dig for our data, and that archaeological data must be old (Rathje 1981:51). In maritime archaeology, Ross Anderson (2008:103), Joe Flatman (2011:320) and Michael McCarthy (1979:1; 1998:104) argue the importance of studying “ultra-modern”, meaning twentieth-century, shipwreck and abandonment sites because these can offer insights into past human activities.

Abandonment is a term used to describe rejection and the action of disposing of an unwanted or no longer useful object (Smith 2005:34). Abandoned vessels have been identified as an extremely rich area for archaeological investigation, as well as recognising discarded ships as a type of artefact in the archaeological record (Anderson 2008:103).

It was not until the late 1990s that archaeological methods were applied to ships’ graveyards to gain an insight into the past. Richards (1997) conducted a survey of deliberately abandoned vessels located at the Garden Island ships’ graveyard in South Australia. He investigated reasons for abandonment, citing technological and attitude changes as possible causes (Richards 1997). In a later study, Richards (2002; 2008) broadened the geographic area of ship abandonment and applied it nationally in Australia. He created the Australian
National Abandoned Vessels Database (ANAVD), comprising 1,500 discarded vessels. Again, the author investigated whether there is any correlation between the abandonment of the vessels and changes in technology and economics (Richards 2008). He argues that human development regarding vessel abandonment is based on economic and technological changes that are evident through the archaeological record (Richards 2008:47; Veth 2008:25).

Richards’ (1997; 2002; 2005; 2008) watercraft abandonment studies focus on reasons for abandonment and how these reflect economic and technological changes. While it is important to understand the past in terms of economic and technological conditions, this research takes the study of abandoned vessels one step further by investigating the nature or extent of social interaction with the vessels after abandonment. This is because once something has been discarded it is deemed as garbage, refuse, rubbish and junk (Smith 2005:34). Once vessels have been abandoned, surely they too are considered ‘rubbish’? Through public perception, Richards (2008:11) labels abandoned vessels as “eyesores” that littered shorelines. Richards, however, identifies that while abandoned vessels as a whole can be visually unappealing in the landscape, broken down they are considered a stockpile of reusable material.

The abovementioned public perception presents a biased perspective towards what abandoned vessels can yield in terms of cultural behaviour. Schiffer (1995:55) argues that being able to understand behaviour will significantly increase our understanding of abandonment. Schiffer (1995:57) does this by determining what activities took place at the site. He suggests narrowing down broad categories to find specific activities linked with cultural practices (Schiffer 1995:57). Colwell-Chanthaphonh and Ferguson (2006:30–31, 39) agree with Schiffer, but for them abandonment can be used to describe a range of behaviours determined by spatial implications and refuse disposal patterns (Figure 6). Understanding abandonment processes will provide insights into behaviour. Rangitoto Island is a case study used to understand the impact abandonment had on the bach communities’ behaviour towards the vessels.
Rangitoto Island presents a case study where behaviour towards abandoned vessels can be investigated. This visual representation is used to investigate social behaviour surrounding abandoned vessels. Understanding cultural processes provides an insight into post-abandonment behaviour, including salvage activities and reuse of abandoned vessel material.

![Figure 6](image.png)  
Figure 6. A visual representation of Schiffer and Colwell-Chanthaphonh’s approach to behaviour and abandonment (2014).

### Abandoned vessel site types and themes

There are three major site types that exist within the archaeological studies of abandoned vessels: isolated ship finds, discarded and recycled disarticulated vessel components and accumulations of watercraft known commonly as ships’ graveyards, marine bone-yards or rotten rows (Richards 2008:19). Throughout studies of these site types, there are a number of themes that represent behavioural traits (Richards 2008:19). Richards (2008:19–37) argues that ship abandonment studies provide an insight into the past working lives and operating environments of vessels. This insight influences researchers to look
at the events leading up to the time of abandonment and, while doing so, reflects on modern watercraft abandonment behaviours (Richards 2008:27).

Richards (2008) investigated watercraft in terms of discard behaviour, but studies linking post-abandonment cultural behaviours with ships’ graveyards are yet to be addressed. There are two types of ships’ graveyards. The first are vessels that are deliberately abandoned in the context of war. This is often linked with strategic abandonment, where vessels become barriers to stop enemy penetration (Richards 2008:27). The second type of ships’ graveyard is the dumping of unwanted vessels (Richards 2008:27). The difference between the two is that the dumping of vessels in conflict-related graveyards often occurs at one point in time or over a short period (Richards 2008:27). The second type of a general dumping ships’ graveyard contains vessels that are disposed of over an extended period (Richards 2008:27). Usually such sites have a large number of diverse vessels and mixed public perspectives (Richards 2008:27). Through the public perspective, ships’ graveyards are often regarded as “miserable places”, “hazards to navigation”, “eyesores” and “a veritable hell” for once glorious vessels (Richards 2008:27–28).

Richards (2008:20–26) identifies two cultural themes linked to ships’ graveyards. The first is seen through structural adaptation. The use of intact, articulated hulls as aboveground building material or foundations is a common reflection of functional and structural adaptation (Richards 2008:20). Three themes of abandoned vessel building relate to the types of post-abandonment functions that watercraft serve. These include reclamation schemes, structural foundations and buildings such as warehouses (Richards 2008:20–21). What binds all three together is how much of the remaining structure can be reused (Richards 2008:21).

Ships’ hulls converted into aboveground structures is well represented in the historical record (Richards 2008:22). Examples include vessels in Port Stanley, the Falkland Islands; three vessels—Arkanas, Niantic and Apollo—that were abandoned on the San Francisco waterfront during the Californian Gold Rush; and two nineteenth-century hulks, Edwin Fox and Inconstant abandoned in

The second cultural theme linked to the ships’ graveyard is salvage and recycling (Richards 2008:23). This constitutes the removal of parts of a vessel rather than the entire vessel for reuse elsewhere. In ancient and modern cultures, boats—including shipwrecks—have been broken up and used for building purposes, or firewood (Richards 2008:23). This act of dismantling for salvage and the reuse of parts is a common activity, demonstrating that unwanted vessels retain material value (Richards 2008:23). Irrespective of their hull material, all ships are considered biodegradable and destined to become condemned (White 1995:1). Even before a vessel is constructed, the owner has already made contingency plans for its retirement or replacement (Richards 2008:23).

To maintain seaworthiness, sometimes, complete overhauls and extensive and complicated maintenance is needed for the upkeep of vessels (Richards 2008:23). This continuing requirement for maintenance is an issue for many shipowners who may opt for the abandonment of their vessels (Richards 2008:23). Decisions are made to dispose of a vessel based on the economic risks for keeping an unseaworthy vessel (Richards 2008:23). The economic cost to the owner may involve a range of factors, including: wages, wharfage fees and danger of sinking (causing further costs associated with removal and clean-up) (Richards 2008:23).

Following the condemning of the watercraft, the vessel enters into a site type. There are two site types associated with the salvage and reuse of ship material: ship breaking industries as areas where ships were systematically broken down into vessel components for demolition or sale; and sites where humans reuse materials, such as salvaged timber for fuel to produce heat or power (Richards 2008:24). Richards (2008:24) suggests such sites are problematic to identify
due to difficulty in distinguishing between archaeological signatures of ship breaking and salvage activity. According to Richards (2008:24), few known sites represent these industries and activities. Considering this, the Rangitoto abandoned vessels present their own challenges in identifying salvage processes. This is because there are limited vessel material remains along the shoreline and this material is no longer represented as complete hulls.

Within these two site types (ship breaking industries and reuse), abandoned vessels are subject to two types of activities. Demolition is an act involving the systematic separation of components regarded by the salvor as more important than the hull itself (Richards 2008:24). The recycling of components is a human decision-making process based on the suitability of those components for other applications (Richards 2008:24). The transformation of a vessel and its initial use to another function is evidence of behavioural traits, from the ability to take risks in new markets to the ability to think opportunistically in times of economic stress and find new uses for unwanted vessels (Richards 2008:24). Other than their use as fuel, the other type of activity around abandoned vessels is the incentive to dismantle watercraft for their value and suitability in the manufacture of other structures (Richards 2008:24). Richards (2008:24) argues that it is unlikely that individual components of wrecked vessels will become significant features in terrestrial constructions. Locating and salvaging the remains of a wrecked vessel underwater is normally difficult and has little economic justification (especially in the pre-diving era) (Richards 2008:24). Richards (2008:24) suggests that old or unwanted vessels were more likely to have their components reused as building material, because of their proximity or transportability to ship breakers. He cites that the salvage tends to occur when dismantled vessel remnants would have been the major source of raw materials, especially in regions deprived of material suitable for the assembly of large structures (Richards 2008:24).

Richards (2008:26) maintains his view on the importance of abandoned vessel studies and what they tell us about watercraft prior to abandonment. The reuse of timbers and salvage activities highlight the process of watercraft abandonment (Richards 2008:26). Abandoned ship sites provide insights into
the nature of trade and technology in the past and inform us about the changing function of vessels over time (Richards 2008:26).

Modern era ships, made of iron and steel, bring a new meaning to salvage activities. Richards (2008:26) proposes that these ships take on a new role concerning such activities. Iron and steel can be melted down and reformed (Richards 2008:26). As a result, the archaeological signatures, such as shape, condition and size, can be lost (Richards 2008:26). Compared to iron vessels, timber structure can register in the archaeological record due to its soundness and the suitability of their physical form for compatible use in a new structure or object (Richards 2008:26).

**The bach**

The second primary archaeological component for this study of ship reuse at Rangitoto Island is the baches. In a social context, the bach is defined as a functional structure or shelter originally built for weekends of fishing and hunting activities (Yoffe 2000:2). Baches have been described as rustic seaside cottages, built of second-hand materials on undesirable sites (Collins and Kearns 2010:62; Wood 2000:44; Yoffe 2000:2). Yoffe (2000:2) states “…part of the pleasure of the bach was being its sole creator.” Amateurs, using second-hand or demolition materials, built baches and the level of design was often rudimentary (Foster 2003:39; Yoffe 2000:2). Due to the baches’ remote locations and limited resources, living standards were minimal, without running water or electricity and toilet facilities (Currie 2010:47; Yoffe 200:2). The living space doubled as sleeping quarters and cooking was done over an open fire, or sometimes on an iron stove (Yoffe 2000:2). Baches were constructed close to nature areas, such as beaches, lakefronts and riverbanks in order to exploit outdoor recreational activities (Yoffe 2000:2).

Peter Wood (2000) suggests that the New Zealand bach offers architectural value that is not simply the product of physical architectural expression, but rather acts as a cultural repository that houses nationalistic values, which in
turn constructs its architectural significance. In his book *The Bach*, Paul Thompson (1985:7) denotes the origin of the word ‘bach’ as:

The term bach is an abbreviated form of the word bachelor. The man who lived by himself in a simple surrounding was said to be baching…. Men who were without assumedly civilizing influence of a wife were taken to be domesticated and lacking in the necessary housekeeping and culinary skills required to live in a ‘proper’ manner, so ‘to bach’ or ‘baching’ referred to a rather basic level of living.

Woods (2000:44) argues that Thompson’s (1985:7) derivation for the origin of the word bach refers to a condition of living that rejects traditional home values. He continues by saying, “The bach is for the unmarried [male], it is uncomplicated, uncivilised, undomesticated, it is the place of the improper house” (Wood 200:44). The bach was by no means an act of an architectural revolution refusing to be classified according to typology (Wood 2000:44). The word ‘bach’ does not reflect the true architectural value but reflects more a unique type of built form (Wood 2000:44). The structure is considered by Wood (2000:45) to be based upon the expression of domestic organisation.

It is critical to understand the cultural framework in which the word ‘bach’ becomes associated with an object of the built environment (Wood 2000:45). As a verb, the usage of the word ‘bach’ is traceable to the nineteenth century and refers to a kind of domestic living arrangement characterised by being temporary, uncivilised, communal and independent (Wood 2000:45). The utilisation of ‘bach’ to describe an architectural type (The Bach) is identified no earlier than 1911 (Wood 200:45). The New Zealand edition of the *Oxford Dictionary*, however, gives 1929 as the most accurate origin of current typological usage (Wood 2000:45). This is unsurprising considering that the interval between 1920 and 1930 represents the first two periods of intense bach building (the second period occurring between 1945–1955) (Wood 2000:45). Both periods represent a time of economic hardship and scarce resources.
The first baches were constructed without legal tenure and remained under squatter’s rights, resulting in little incentive to invest in improvements (Yoffe 2000:2). The first bach on Rangitoto was built c. 1910. Development of larger and more permanent bach communities during the 1920s and 1930s brought with it a social consensus to remain basic (Yoffe 2000:2). “Being ‘flash’ or ‘showy’ was socially suspect, in fact a certain pride [amongst bach owners] was taken in making do and inventive utilisation of whatever materials came to hand” (Yoffe 2000:2). Since the 1940s, the legality of baches in New Zealand was rigorously enforced, with the introduction of local building bylaws (Kearns and Collins 2006:231).

The basic, no frills bach is fast becoming a relic of New Zealand’s past (Yoffe 2000:2). Baches, like those on Rangitoto Island, were built during a period of freedom and without building regulations. As regulations were being introduced in the late 1940s, baches had to comply with new building codes and safety regulations. Baches are still being built around New Zealand but now represent lavish modern homes (Collins and Kearns 2010:64). The modern New Zealand bach no longer reflects the unregulated freedom that was once experienced in the early 1900s.

**Linking the bach to abandoned vessels**

Considering the above definition of ‘bach’ in its socio and typological form, construction was often practiced using reuse processes. Schiffer (1987:28) defines reuse as a change in the user, use or form of an artefact, following its initial reuse. An opportunity for reuse arises when an object breaks, wears out or can no longer carry out its practical or symbolic functions (Schiffer 1987:28). The reuse of objects is prevalent throughout society, representing a principle means of conserving sometimes scarce resources (Schiffer 1987:28). Schiffer (1987:28) associates reuse with a cost effective approach to securing new items or changing one’s activities.

(2008:55) states that reuse processes are behaviours that see a change depending on the user, use or form of a particular artefact and that different reuse mechanisms are associated with distinct behaviours.

*Lateral cycling* is the process where there is a change in the user or the transfer of ownership of an artefact without a change in the form and use of the object. This is represented in maritime commerce where the ownership of a vessel (object) is transferred without changing its original use as a tool for trade (Schiffer 1976:38–40).

*Recycling* entails the introduction of cultural material into the industrial process that transforms an object’s fabric into some other form and/or function. An example would be salvage and dismantling activities (Schiffer 1976:38–40).

*Secondary use* refers to changes in the function of cultural material without substantial alteration to the form of the material. This occurs in objects that have undergone extensive wear. In context of the ship abandonment process, once seaworthy ships are converted into secondary support vessels, such as hulks and lighters (Schiffer 1976:38–40).

*Conservatory* processes constitute the transition of an object from its techno-function (related to use) to socio- or ideo-function. Such processes are not common with ship abandonment and are only represented when vessels are conserved for historical value (Schiffer 1976:38–40).

In the context with the Rangitoto baches, the ships graveyard is a place that provides material for recycling. Considering the characteristic of salvaging and reusing material for construction, it is possible that the baches contain abandoned vessel material. When considering recycling as a process, the bach owners can also be seen as opportunistic by specifically selecting materials that they consider useful for bach construction. Gibbs (2003:140) defines opportunistic salvage as occurring usually after a crisis and/or during the survivor phases in a shipwrecking event, but notes that it may precede or
follow systematic salvage. He applies this in a shipwreck context but the process can be used as a framework for salvage activities towards abandoned vessels more generally.

Opportunistic salvage depends on a range of factors, including: accessibility, technology and perceived returns (Gibbs 2003:140). The salvage activity is likely to be of short duration, sporadic and involving a number of persons over a period (Gibbs 2003:140). The purpose of the activity is for the recovery of readily removable materials perceived to have use either as collectables or for their monetary value (Gibbs 2003:140). The removal of materials will, according to Gibbs (2003:140), be generally a non-systematic removal of contents, accessible fixtures, fittings and minor structural elements. In addition, Gibbs (2003:140) acknowledges that the archaeological signature will be variable. Visibility will range from non-detectable to significant and obvious absences of cargo, fittings and structures may be observed (Gibbs 2003:140).

**Conclusion**

The concepts of reuse in this thesis apply recycling and opportunistic salvage processes to the case study of the Rangitoto baches to assess the behaviour between the Rangitoto ships’ graveyard and bach communities. These processes will provide an insight into whether an abandoned ships’ graveyard is considered to be a deposit of reusable material and, if so, to what extent. This thesis will also provide an insight into the attitudes towards recycling materials at the time of bach construction. No longer will ships’ graveyards be labelled with the premise “where ships came to die!” (Department of Conservation and Auckland Regional Council n.d), because the adaptive reuse of ship material provides a new lease of life.
Methodological approach

To understand opportunistic behaviour towards abandoned watercraft, a location exemplifying a ships graveyard and built communities was investigated. The abandoned vessels needed to possess a range of materials worth salvaging, while the reuse of the material needed to contribute to the surrounding built environment. Further, the salvaged material had to be knowingly removed from a ship, transported and reused to offer an insight into opportunistic behaviour.

Rangitoto Island was chosen due its use as a location for discarding watercraft and the presence of three holiday communities. Thirteen vessels were abandoned here in the same period that three holiday communities were established (1910–1939). The abandoned vessels varied in the types of material worth salvaging and provided a central place for people to salvage material. The communities were each built up over a period of 30 years with baches constructed by their owners. Baches were probably constructed with any material the owner could acquire cheaply and readily (Yoffe 2000:2). The construction of the baches also took place during the depression years when building material was scarce.

The research team consisted of Kurt Bennett (researcher), Maddy Fowler (archaeologist), Vanessa Sullivan (archaeologist) and Howard Bennett (skipper). Howard provided the use of his private vessel, Chinook, to access the island. Chinook is a 6.5 m fibreglass planing hull and was primarily used to
access the remote parts of the island: Boulder Bay and Beacon End (Figure 7). These two locations are remote because of walking distance and time from Islington Bay wharf by ferry. Chinook was also used to access the wharf at Islington Bay. This allowed the team to travel outside of the scheduled ferry times and provided more working hours on the island during the day.

Camping and over night stays are not permitted on the island; therefore transport to the island had to be sought daily. Fullers ferries, a commercial ferry company for the Auckland region, offers a daily service to Rangitoto Island from Auckland’s CBD. During the winter months in which this data collection took place, the first ferry arrives into Islington Bay at 10:05am and the last ferry departs at 15:30pm. This gave the team five hours to walk to and from each site and conduct fieldwork. The ferry arrives and departs from the Islington Bay wharf because the main wharf, known as Rangitoto Wharf, was undergoing an upgrade.

Transport on the island was limited to walking from the Islington Bay wharf to site each day. In order to cover long distances, mountain biking was considered, however, it is not permitted on the island due to health and safety
concerns from the Department of Conservation (DoC). On occasion, the DoC ranger provided vehicle transport on Rangitoto Island, as well as Fullers staff who operate the tourist tractor. Vehicle transport was only offered in passing and was not pre-arranged. Walking, however, was the principal mode of transport. Walking tracks on the island are well-established and range in difficulties. There is an unsealed flat road connecting all of the bach communities. The track leading out to Boulder Bay from the main road is rough and sometimes unmarked.

The surveys of both abandoned vessels and baches were similar in methodological approaches. The aim was to investigate every bach site, including non-existing baches, and visually inspect them for evidence of ship material and, if present, to assess how that material is being reused. The material was then recorded to allow for further diagnostic features that would link it to the vessels at Boulder Bay. The abandoned vessels were investigated for signs of salvage activity and, if present, what type.

**Historical archives**

Historical archives were accessed before fieldwork for one week in February and July 2014. Only archives in the Auckland region were used; included was the Takapuna, Auckland, Auckland University, Auckland War Memorial Museum and Voyager Maritime Museum libraries. These institutions were used to provide information about the abandoned vessels and baches. Online archives such as Trove (www.trove.nla.gov.au) and Papers Past (www.paperspast.natlib.govt.nz) provided newspaper articles and photos relevant to the discarded vessels.

Each library institution held different information and publications. The local libraries and Auckland University Library were accessed for publications on Rangitoto Island. The museums provided archival information in the form of ships’ plans and historic photos. These are used to further understand the types of materials found on the vessels.
Information on the abandoned vessels included researching the history of the vessel and the time and place it was abandoned. Many ships were found to have a range of uses once they were deemed unseaworthy. Examples of this included changes from ocean-going ships to storehouses or coal hulks. This is important to understand as it illustrates the economic life of a ship.

For the purpose of looking at abandoned vessel material, documents describing the conversion and subsequent stripping of materials by ships’ owners are useful. Using a process of elimination of what material is left on the vessel at the time of discard, it provides an understanding of what material is left to salvage and what to look for when investigating the bach sites.

**Oral history**

Oral history interviews with bach owners/families were collected between 1 July and 6 July 2014. Prior to the commencement of interviews, advertisements were placed in the *New Zealand Herald* (NZH) and through the Rangitoto Island Facebook page. Information packs in accordance with the ethics requirements were sent to the two Rangitoto Island bach associations; Rangitoto Island Historic Conservation Trust (RIHCT) and Rangitoto Island Bach Community Association (RIBCA). This allowed for direct communication with bach families.

Bach owners and family members were invited to participate in oral history interviews. Interviews were held at the Birkenhead Library between 12:00pm and 15:00pm daily. Interviews were scheduled to run for 45 minutes and were recorded using a Sony BX Series MP3 digital voice recorder. The interview was conducted in a private room to ensure confidentiality for the participant. If a person was unable to travel to the library, interviews were also conducted using Skype at a time arranged with the interviewee.

Once the interview was finished, the digital recordings were then transcribed using ExpressScribe software. The transcript was then sent to the interview participant for final authorisation, acknowledging their approval for the
information to be used in this thesis. As a condition of the interview, the interviewees remain anonymous and their personal information is not included in this thesis. As per requirement of ethics approval, the transcriptions will be stored at Flinders University for five years.

Fieldwork

Data collection on Rangitoto Island took 12 days, starting on 11 July and concluding on 23 July 2014. Over this duration, investigation of the bach communities and abandoned vessels was broken up in the following: two days was spent at Beacon End, four at Rangitoto Wharf, four at Islington Bay and two at Boulder Bay. Access to each of these locations ranged in the form of private vessel, commercial ferry, walking or vehicle transport.

Surveys at both the abandoned vessels and bach communities were conducted using a non-intrusive, non-disturbance survey method. The sites were visually inspected for evidence of salvage and reuse. The process consisted of a reconnaissance survey, with field-crew noting general observations on site features.

While the visual survey was the general process, the area of each survey varied slightly. The area of a demolished bach site was defined by identifying the density of the vegetation. Vegetation was sparse where the building once stood and therefore a boundary could be identified. Rubble that was used for building foundations was left in a number of square patterns, indicating the structures footprint. Once the area and footprint had been identified, a visual survey was conducted (Figure 8). Depending on the size of the field team for that particular day, two or three people walked over the area identifying cultural remains and looking for evidence of ship material. An extant bach site was recorded in the same way as identifying a property area based on vegetation density. Along with the garden area, buildings were also investigated for ship material. Visually inspecting the individual architectural features and identifying diagnostic ship features achieved this.
Surveys of the garden areas were executed with people walking along the existing pathways and in larger areas, walking transects approximately 2 m apart.

To record each bach site an iPad application was developed by the researcher (available on accompanying CD). Filemaker Pro version 12 was used as the database software and the design is to be used as an application (app) on an iPad 4. Filemaker Go is the iPad application that allows the database to function on an iPad. As recording options, the app included Bach (Figure 9), Vessel (Figure 10), GPS, Photo and Anchor forms. Bach recording variables were pre-programmed to direct the operator into recording architectural features of the bach, whether ship material was present and how it was reused. The application was also used to capture photographic evidence of the site and record GPS coordinates.

The database was developed in advance prior to the commencement of fieldwork. The database facilitated the data processing in the field at the end of each day. The benefits of the database were standardisation and the ability to
process data quickly. Standardised variables means the same answer can be selected by different operators and minimises recording error. This eliminates the variables that are miss-spelt, interpreted differently or missed all together. The database effectively controls how the operator records the site. This should not, however, be interpreted as influencing how the site is recorded. For example (a question from the database), what community does the bach belong to? The options are: Islington Bay, Rangitoto Wharf, and Beacon End.

Figure 9. Bach recording form used on an iPad.
These act as a control for the operator. The answer can only be one of the three options. The pre-programmed options also control the spelling. This is an important factor when it comes to data processing by providing consistency throughout the database.

Figure 10. Vessel recording form used on an iPad.

The app-based database allowed for faster data processing at the end of each field day. The forms recorded during the day were exported and saved to a separate folder on a MacBook computer and subsequently backed up using
Google Drive. Exporting and downloading data eliminated the need to manually enter data from handwritten records to a spreadsheet. Pre-programmed variables also allowed for faster data processing. When the records were checked, all answers were consistent with each other regardless of user. This eliminated the need to go through and change spelling and typing mistakes. It also controlled what was being recorded and which elements of the feature were focused on. The database was used to record archaeological evidence from visual surveys conducted at both the bach and vessel sites.

Visual surveys at Boulder Bay employed the survey method of pedestrian transects. Ship material was sparsely scattered along the shoreline and covered a larger area than a general bach site. Due to the large area of vessel material, the field team members executed transects approximately 8 m in width and parallel to the shoreline (Figure 11). Ship material was individually inspected for evidence of salvage, with the recording of the individual vessel sites also employing the use of a pre-programmed iPad database.

Figure 11. Pedestrian transects parallel to the shoreline of Rarawa after © 2010 Kevin L. Jones Archaeologist Ltd.
Individual equipment

Using a Garmin 62sc GPS, waypoints marked the location of each bach. The GPS waypoint was a general site point identifying where the bach exists, or once existed, and the general area of the property. The points were recorded four times across the GPS, iPad, field notebook and GPS log to ensure copies existed in case of data being lost.

Two GPS waypoints recorded each vessel site, indicating the maximum extent of the scattered material. These are recorded as western and eastern extremities of the site indicating an approximate area of scattered material (Figure 12). Where there was more than one vessel within the same area, only two waypoints recorded the extent of the site using the aforementioned extremities. This is because the scattered material could not be identified from one vessel. Using the GPS waypoints, the area of scatter was calculated.

![Figure 12. Maddy Fowler and Kurt Bennett recording eastern extremity of Gladbrook looking towards Ngapuhi’s stern, facing east (Sullivan 2014).](image)

Two 50 m measuring tapes were used to record the length, width and, when appropriate, the height of each bach site. Only the dwelling or footprint was measured. Where the bach existed the length and width was measured from the
two widest points. The height was recorded from the highest point on the roof or to the highest gable and to the bottom of the building but not including the rock foundations. If the building was in the form of an irregular shape, the measurements were recorded as if the building was square. The measurements are not crucial for this study. The overall area of the built structure was recorded for the purpose of recording a disappearing resource and to indicate a maximum size of the built structure for future research.

Measurements for the vessels were only undertaken if the keel or part of the keel remained. The two 50 m measuring tapes were used for this. Other measurements were not taken due to the scatter area being too large, and the information not contributing to the research question.

An Olympus 14mp HD 10x Super Wide and Sony DSLR-A230 were the two cameras used for photography. Photos taken included working shots of team members, general context, and evidence of salvage, ship material and reuse. A north arrow was used to provide a north orientation in the photo. Photographic scales were also used in feature photos to provide scale to the object. Two types of scales were used: first, a scale rod measuring 175 cm in length with red and white 25 cm divisions and, second, a small plastic Department of Archaeology (Flinders University) photographic scale. The latter was used for close-up feature photos.

**Limitations**

The three methods aforementioned have associated limitations which are now considered. The interview questions had the potential to influence the analysis by the way they were presented. For this reason, the questions needed to be designed and presented in a way that the person being interviewed did not feel uncomfortable answering the set questions. Otherwise, it may have affected the analysis and therefore the overall interpretation. Also, because the questions rely on a person’s memory, interpretation of these oral histories was limited to how the interviewee recalls certain events—the answers were thus accepted with merit.
Several bach owners were unavailable for an interview, meaning not every bach owner was able to share their memories associated with the ships’ graveyard. As a result, future investigation on salvage and reuse activities may benefit from additional oral history collections.

Access to the baches’ interior was not made available for all homes, as it was up to the owner’s discretion. Therefore, vessel-related cultural material may have been missed if only visible on the inside of the baches. Since the bach surveys were mostly limited to the exterior, a full assessment on reuse could not be made. The evidence of reuse found on the exterior of select bach homes warrants future research into the internal structure of the baches, as the identified evidence suggests reuse did take place.

Identification of ships timbers at the baches was limited to visual attributes, because the collection of timber samples is beyond the scope of this thesis. Some timber may be part of a structural component in the baches and permission would have to be sought from the bach owners for timber sampling in the future. As timber samples determine the species of the wood, identification could link the timber located at the baches to the vessels at Boulder Bay.

**Conclusion**

This fieldwork employs a pedestrian survey method to investigate the abandoned vessel and bach sites for evidence of salvage and reuse. Basic survey equipment consisting of tape measures, GPS and cameras aided the recording of salvage and reuse features. Employing an iPad and database software assisted in the fieldwork, which relied heavily on a technological component. The use of the iPad contributes to technological advancements in the field and is adaptable for future archaeology projects where an electronic recording method is sought. The results of archaeological investigations, archival research and the collection of oral histories are presented in the following chapter.
Results

Organised into four separate localities around Rangitoto Island, this chapter presents the results collected over the course of this project. The results will be used to understand the process of opportunistic salvage activities with abandoned vessel material. Findings at the abandoned vessel sites are presented first, followed by the bach communities: Beacon End, Rangitoto Wharf and Islington Bay, and results from the oral history interviews.

Abandoned vessels

Eleven abandoned vessels were surveyed along approximately 1 km of shoreline, located in Boulder Bay (Figure 13). The intertidal zone consists of smooth pebble beaches and jagged basalt cliff faces formed from the islands’ previous eruptions. Boulder Bay is a dynamic zone, which experiences large ocean swells and high-energy waves on a seasonal basis. This is evident in the natural polishing of the volcanic rock found on the beaches.

Boulder Bay can be accessed either by boat or walking track. Anchoring in the bay is hazardous due to unknown submerged rocks and ship material. Landing on the shore is then limited to smaller vessels that can withstand contact with the pebble beaches and in rough seas the bay is inaccessible. A walking track, which connects to the main road between Islington Bay and Rangitoto Wharf, is the best possible route for people to access the bay.
Historical and archaeological findings

Eleven of the 13 known abandoned vessels at Boulder Bay were researched in libraries around the Auckland region. Information relating to the process of abandonment for each vessel will be outlined in this chapter, as well as the material likely to have been present at the time of abandonment. For comparative pictures of the vessels prior to abandonment see Appendix 2.

The eleven vessels underwent an archaeology survey on 15 and 16 July 2014. These dates were chosen to coincide with low tide times for the area exposing the majority of ship material along the foreshore. Low tide was 0.2 m at 15:20pm and 0.3 m at 16:11pm. Surveying at low tide allowed access to remains that would sometimes be submerged but still accessible to people engaging in salvaging activities. Non-disturbance pedestrian surveys, employed at each of the vessel sites, determined if they were subjected to salvage activities.

Presently, vessel remains are limited to scattered material ranging between 20 cm pieces of timber and iron to larger hull sections, including stern engine
mounts, bow and stern. From the scattered and overlapping remains it is
difficult to identify the vessels individually. For the purpose of the
archaeological survey, site names are assigned in relation to the Auckland
Council interpretation sign located at Boulder Bay (Appendix 3).

Of the eleven sites inspected, two showed signs of salvage activity. This
included saw marks, a burning pit and cultural deposits of iron fasteners from
burnt timbers (Table 2). Individual results from each site inspection will be
detailed below.

Table 2. Abandoned vessel sites displaying salvage activity.

<table>
<thead>
<tr>
<th>Vessel site</th>
<th>Site condition</th>
<th>Evidence of salvage</th>
<th>Salvage activity</th>
<th>Target material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arapawa, Jubilee and Ngapuhi</td>
<td>Scattered</td>
<td>No</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Rothesay Bay</td>
<td>Scattered</td>
<td>No</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Gladbrook</td>
<td>Not visible</td>
<td>No</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Elinor Vernon</td>
<td>Not visible</td>
<td>No</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Polly</td>
<td>Not visible</td>
<td>No</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Duchess</td>
<td>Scattered</td>
<td>No</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Columbia</td>
<td>Scattered</td>
<td>Yes</td>
<td>Saw marks in wood and sawing of frames attached to keel</td>
<td>Wood</td>
</tr>
<tr>
<td>Dartford</td>
<td>Scattered</td>
<td>Yes</td>
<td>Cultural deposits of iron fasteners from burnt timbers</td>
<td>Wood and metal fasteners</td>
</tr>
<tr>
<td>Rarawa</td>
<td>Scattered</td>
<td>No</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

*Ngapuhi*

Ordered by the Northern Steamship Company (NSSCo) in 1900, shipwrights
constructed *Ngapuhi* at Dundee, Scotland. Measuring 57.9 m (190 ft) the
vessel had the capacity of 199.20 tons (Furniss 1977:28, 185). After servicing
passengers around the Hauraki Gulf the owners decommissioned the vessel in
1930 and converted it into a hulk (Furniss 1977:185). *Ngapuhi* almost shared
the same fate as *Rarawa* by contributing to the war effort. Between 1941–
1942, the Marine Department transferred the vessel to the Navy and earmarked
its machinery to be used in a mine-sweeper, although this never eventuated (Auckland Harbour Board Archives, Auckland Harbour Department [AHBA]: Hulks Record Book [HRB]:8; Furniss 1977:32, 185). On 3 November 1944, the iron hull came to rest on the shore in Boulder Bay (AHBA:HRB:8; Furniss 1977:185).

**Jubilee**

*Jubilee* was constructed in Cumberland, England, in 1857. *Jubilee* was a three-masted ship of 776 tons and 58.5 m (192 ft) in length (Sythes 2006:140 [1969]). In 1901, the vessel under the ownership of the Westport Coal Company was converted into a hulk and “…stripped down to the bare essentials” (Johnson 1996:168). *Jubilee* was towed to Auckland in 1917 and its register was closed in 1926. Dismantled in 1945, it was towed to Rangitoto Island on 15 June 1946 and beached alongside *Ngapuhi* (AHBA:HRB:63).

**Arapawa**

*Arapawa* was a single screw schooner-rigged, steel steam ship (Brewer 1993:17; Furniss 1977:84). Constructed in Paisley, Scotland, in 1908, it measured 36.7 m (120.5 ft) in length and had a capacity of 128 net tons (291 gross) (Brewer 1993:17; Furniss 1977:175). The ship never became a hulk; instead it remained in service of the Union Steamship Company’s (USSCo) colours until 1938. In March 1941, the ship was stripped and partly broken up with the remainder towed and beached in Boulder Bay on 8 April 1941 (AHBA:HRB:128; Auckland Regional Council 2012; Furniss 1977:175).

**Arapawa, Jubilee and Ngapuhi**

At present, *Ngapuhi’s* stern section and part of the keel remains intact which allows identification of the vessel and acts as a datum for positioning other vessels. Positive identification is attributed to the stern section possessing two prop shaft housings. This feature does not fit with the single screw *Arapawa* and wind-driven *Jubilee*. *Arapawa* is situated to the east of the stern section of *Ngapuhi* and its remains are fragmented and not visible from the shoreline. Due to its close proximity next to *Ngapuhi* and *Arapawa*, and no visible intact structure, *Jubilee* is included in the same survey area. As a result of all vessels grouped together, material from each of the three vessels have been mixed
together. This was taken into consideration when surveying the three vessels for salvage activities.

Ship material covered an approximate area of 40 m by 90 m. GPS points marking the extent of ship material recorded the western extremity as northing -36.77036, easting 174.87958 and the eastern extremity as northing -36.77004, easting 174.88046. Material consisted of broken pieces of timber and iron ranging in sizes from 0.2 m to 4 m. Every piece of ship-related material was inspected for salvage evidence. Pertaining to these vessels, no evidence of salvage was recorded.

**Rothesay Bay (ex Activ)**

*Rothesay Bay*, an iron-hulled barque measuring 56.9 m (186.8 ft), 699 tons, was constructed in 1877, Dumbarton, Scotland (Brewer 1993:45). From 1922, the USSCo used the vessel as a hulk to store coal (AS, 8 January 1923:3). In 1936, the company dismantled the hulk, its steel parts sold to Japan and the remaining hull beached in Boulder Bay (Figures 14, 15 and 16) (AHBA:HRB:8; Brewer 1993:45).

Figure 14. Removal of material from *Rothesay Bay* (AS, 24 April 1936:11).
Rothesay Bay was surveyed west to the site of Arapawa, Jubilee, and Ngapuhi. The extent of scattered material is situated at -36.77022 northing and 174.87941 easting in a small cove. The material consisted of one bollard, one scupper or hoarse pipe and a possible frame from the bow or stern. No hull structure remains above the low water mark. No salvage activity was seen on the aforementioned materials.

Figure 15. Further removal of material from Rothesay Bay (NZH, 7 May 1936:8).

Gladbrook (ex Countess of Anglesea)

A 67 m (220 ft), 1,103 ton iron-hulled barque, originally named Countess of Anglesea was built in Liverpool, England, in 1877 (AS, 19 December 1945:6; Churchouse 1984:92; Farquhar 2001:229; NZH, 20 December 1945:6). It made one trip to Auckland on 8 June 1911 and was converted into a hulk after arrival (Farquhar 2001:229). In 1918, the hulk was re-commissioned and rigged as a barque with the new name, Gladbrook (Farquhar 2001:229). By 1928, the vessel was once again converted into a hulk and moored in Auckland.

Gladbrook was owned by the USSCo from 1911 to 1945 and used for storing coal (NZH, 20 December 1945:6).
According to a *New Zealand Herald* report, on 19 December 1945, *Gladbrook* was blown up with a 15 pound (lb) charge in 5 ft (1.52 m) of water near Gardiner’s Gap (NZH, 20 December 1945:6). Before abandonment, the vessel was stripped of all useful material, however, records are not specific about what material (*Evening Post* [EP], 20 December 1945:10; NZH, 20 December 1945:6).

*Gladbrook* is located to the west of *Rothesay Bay* and approximately 10 m from the low tide shoreline. Ship material is located at the eastern extremity as...
northing -36.76985 and easting 174.87938, with the western extremity northing -36.76995 and easting 174.87923. A series of wooden ship frames approximately 20 cm above the waters surface during low tide marked the eastern GPS point. The frames were accessible by using the small tender from Chinook. The western extremity was recorded on the waters edge at 14:25pm when the tide was at 1.2 m. No visible material remained along the shoreline and it is possible that related objects are submerged. As a result no evidence of salvage was seen.

_Elinor Vernon_

Built in 1876, Pembroke, USA, _Elinor Vernon_ was a 45.7 m (150 ft), 570 ton barquentine. In April 1894, the vessel was converted into a hulk in Dunedin, New Zealand. By 1907, it was used as a coal hulk in Wellington Harbour and in 1916 it was towed to Auckland. On 21 June 1928, the hulk was towed to Boulder Bay and burnt, similar to _Polly_ (Figure 17) (AHBA:HRB:55).

![Elinor Vernon burning at Boulder Bay](image)

Figure 17. _Elinor Vernon_ burning at Boulder Bay (NZH, 22 June 1928:13).

_Elinor Vernon_ is located to the northwest of _Gladbrook_. The approximate position of the vessel is off the northwest point in Boulder Bay. The site is located at northing -36.76947 and easting 174.87912. The material from the
ship was absent along the shoreline, probably because of the steep cliff faces, and is possibly submerged. Therefore, there was no evidence of salvage associated with *Elinor Vernon*.

**Polly (ex Skovland)**

*Polly*, a three-masted wooden barquentine, measured 41.7 m (137 ft) and had a capacity of 339 tons (The Adelaide Chronicle [TAC], Saturday 22 August 1908:38; The Advertiser [TA], Saturday 15 August 1908:10). Shipwrights constructed the vessel in Porsgrund, Norway, in 1891. Up until 1908, the vessel sailed on trade routes to and from New Zealand. In November of the same year, the USSCo purchased the ship and converted it into a hulk. By 1927, the owners condemned the ship and anything of value, including machinery, was stripped from the vessel (AHBA:HRB:25; AS, 22 June 1928:9). On 22 June 1928, it was filled with rubbish and burnt at Boulder Bay (Figure 18) (AHBA:HRB:8).

On reaching the place marked off for her doom the *Polly* was maneuvered into position and gently forced on to the rocks. Several tins of kerosene were poured over the rubbish in the hulk, and the application of a match was the final touch in an act of destruction (AS, 22 June 1928:9).

Similar to *Elinor Vernon*, remains of *Polly* are suspected to be located off another rocky point. About 100 m west of *Elinor Vernon*, the vessels approximate location is northing -36.76885 and easting 174.87878. No material existed on shore due to the steepness of the coastline and therefore there is no evidence of salvage activity. It is possible that remains of *Polly* are submerged further off the headland in deeper water.

**Duchess (Lady of the Gulf)**

Built in Glasgow, Scotland, between 1896–1897, *Duchess* was originally a schooner-rigged steel ship of 308 tons and 41–44 m (134.5–145 ft) in length (Balderston 1991:16; NZH, 19 November 1930:12). It was designed for passenger ferry services and employed in Wellington Harbour.
After 30 years service in Wellington, Duchess changed owners and transferred to Auckland to operate as a passenger service to Waiheke and Kawau Islands (Balderston 1991:16; NZH, 19 November 1930:12). Until 1938, it operated on the Kawau route and in 1940 as a passenger ferry to Waiheke Island (AS, 29 January 1938:4; NZH, 29 January 1940:6). The Royal Navy purchased the vessel in 1940 and for the next five years, the ship contributed to the war effort, being used as a mine-sweeper (Balderston 1991:16). In 1947, the Navy decommissioned the vessel and beached it at Boulder Bay on 11 June of the same year (AHBA:HRB:142; Auckland Regional Council).

Duchess is located to the west of Polly, off a headland. Western and eastern extremities of the site are marked as northing -36.76932, easting 174.87854 and northing -36.76902, easting 174.8782, respectively. The area of scattered material measures 52.5 m north south, up the beach towards the vegetation, by 46 m, which extends to the low tide mark. Located in the intertidal zone at low tide, iron deck framing are the only remnants of the ship. The length of visible frames measured is 14.52 m in length and 4.92 m in width. No material associated with the Duchess site had evidence of salvage.
**Columbia**

*Columbia* measured 61 m (200 ft) in length, a four-masted schooner built in 1899, Washington, USA (Auckland Regional Council 2012). In 1926, the Devonport Steam Ferry Company purchased the vessel, converted into a hulk and moored it in Auckland. Rigging, sails and machinery was stripped out of the ship (Figure 19) (NZH, 22 September 1926:10). In 1935, an ambitious businessperson purchased the vessel, cleared it of all deck fittings and converted it into a floating cabaret (NZH, 9 December 1935:14). The venture did not last long and in 1938 the vessel was towed to Boulder Bay and burnt (Figure 20) (AHBA:HRB:86).

![Figure 19. *Columbia* in the process of being converted into a hulk in 1926 (NZH, 7 October 1926:13).](image)

Covering an area of 25 m by 40 m, the site is located west of Duchess with the western extremity as northing -36.76914, easting 174.87796 and the eastern extremity as northing -36.76937 and easting 174.87836. *Columbia* is located to the west of *Duchess* and above the high water mark. A large ships section of the timber keel, keelson and frames measure 12.85 m in length and 4.5 m in width at its widest point.
The survey team observed charring on the timber, which clearly shows the vessel was burnt. This assisted in the identification of the vessel. Scattered material including iron fasteners, hull timber planking or framing surrounds the vessel. Salvage activity is evident on the keel, frames and the scattered remains. This includes the action of (wood) sawing and a firepit.

Evidence of sawing occurred to the west of the keel under a section of bolted ship timbers (Figure 21). The piece of wood subjected to the sawing activity is not ship-related and identified as a piece of driftwood. Two grooves each measuring 1 cm wide were cut by someone into the piece of wood as shown in Figure 22. Sawing activity seen in the frames at the Columbia site, on the west side of the keel, clearly demonstrate a flat smooth face; evidence that their ends are cut off. Whereas, other frames have charring remains and splintered ends (Figure 23). Approximately 30 m south of the keel—coordinates northing -36.76949 and easting 174.87810 are the position of a firepit (Figure 24). A circle perimeter (2 m by 1.9 m) created out of local rock, formed the shape of the firepit.
A rockwall on the northern side of the circle measured 0.7 m in height. The pit contents consisted of iron, bolts and charred timber. Small shrubs were also established in the pit indicating that it has not been used in recent times.
Dartford

Constructed in Sunderland, England, 1877, *Dartford*, a full-rigged iron ship, measured 67 m (221.5 ft) in length and had a capacity of 1,273 gross tons (Brewer 1993:64; Farquhar 2001:229). In March 1908, the NSSCo purchased the vessel, used it as a cadet ship and later converted it into a hulk (Brewer 1993:64). By 1918, the owners had it converted back from a hulk into a

Located to the west of Columbia, Dartford is the only vessel in the area. Scattered material at the site covers an approximate area of 40 m by 40 m with the western extremity recorded as northing -36.76859, easting 174.87761, and the eastern extremity as northing -36.76912 and easting 174.87776. Material consists of timber ship structure, iron framing and a capstan.

Salvage activity by means of extracting metal fittings or fasteners from timber was located above the high water mark. There existed a large concentration of burnt timbers and a cultural deposit of bolts (Figure 25). Fifteen iron bolts were counted with the lengths ranging from 55 cm to 30 cm and all having a diameter of 1.5 cm. Three bolts had round heads measuring 4.4 cm in diameter—the rest were corroded below their original surfaces.

Figure 25. Bolt deposit ranging in size (Sullivan 2014).
One of the timbers that once possessed bolts was measured to determine if the bolts are related. Timber 1 was 180 cm long with a width of 13 cm and had one bolt hole. The internal diameter of the hole was 3.5 cm (Figure 26).

![Figure 26. Bolt hole in Timber 1 (Fowler 2014).](image)

One of the timbers, characterised by the full extent of charring, possessed four possible bolt holes (Figure 27).

![Figure 27. Timber 2 split in half showing where bolts once were (Fowler 2014).](image)
The timber measured 203 cm in length and 25 cm in width at its widest point. It had been split in half longitudinally. The length of the fastener holes ranged between 14 cm and 20 cm and the diameter of the bolts would have been between 2 cm and 3 cm.

*Rarawa*

On 30 April 1903, *Rarawa* was launched in Dundee, Scotland, for the NSSCo (Furniss 1977:29, 189; Taranaki Herald [TH], 30 September 1903:3). It measured 64 m (210 ft) in length, weighed 450.59 tons, was rigged as a fore-and-aft schooner and driven by two sets of steam-powered triple expansion engines (Furniss 1977:189; TH, 30 September 1903:3). The vessel was fitted out with a variety of timbers such as Hungarian Ash, Maple, Mahogany, Yellow Pine and Teak for use as decking, paneling and furnishings (TH, 30 September 1903:3).

Once used as a coastal passenger steamer for the Manukau to New Plymouth route, the advent of World War Two required the vessel to be stripped of all useful material. During 1941, its engines and internal fittings were removed and installed in *Rimu* and *Hinau*, two of three commissioned mine-sweepers (Furniss 1977:32). *Rarawa* was completely stripped, filled with concrete and beached to the west of Boulder Bay in March 1941 (AHBA:HRB:113; Auckland Regional Council 2012).

*Rarawa* is the most western and isolated vessel surveyed. GPS coordinates of the area are northing -36.7663, easting 174.87334 (western extremity), and northing -36.76636, easting 174.87408 (eastern extremity) and give an approximate area of 70 m by 30 m. Material remains are scattered along the shoreline, however, there are large sections of the hull still present. The bow, framing, iron plating and stern with two propeller shaft housings are visible above the low water mark. Present material does not display signs of salvage.

**Conclusion**

Of the eleven vessels abandoned in Boulder Bay, three were burnt, one blown up and seven beached along the shoreline. In preparation for abandonment,
material considered of value was stripped from the hulks before they were
towed out of port. This material consisted of rigging, machinery and fittings.
Material available for salvage consists of timber, iron and possibly some
internal fittings and fasteners from the hulls’ superstructure. The amount of
material would depend on how much was left after the vessel was blown up or
had stopped burning.

An archaeological survey of vessels has demonstrated two vessels, Dartford
and Columbia, displayed evidence of salvage activities. This evidence included
saw marks, burnt timbers and a cultural deposit of bolts extracted from ship
timbers. The other nine vessels were either not visible or do not display any
salvage activity. It is possible that the salvage evidence on the less intact
vessels has been lost over time due to the weathering of materials.

**Rangitoto baches**

Between c.1910 to 1939, baches were constructed on Rangitoto Island in three
communities: Beacon End, Rangitoto Wharf and Islington Bay. In total 140
leases were granted during this time, allowing families to spend time
holidaying on the island. The construction period of the baches coincided with
difficult economic times caused by two world wars and the depression years
(1920s–1930s). Economic hardship made it difficult to buy material for
construction and subsequently forced the families to become resourceful in
obtaining inexpensive construction goods from neighbours, friends or scrap
yards. This period of bach construction (1910–1939) also coincided with the
abandonment of watercraft at Boulder Bay, which can be seen as a
concentration of ‘free’ building materials accessible to the bach communities.

**Historical background**

Some of the first timber ships were burnt to the waterline but
bach owners made good use of later wrecks, stripping them of
fittings and timber to use in their holiday homes (Bercusson and
Walsby 2008:53).
Once a vessel had been abandoned, word spread amongst the bach communities and their families would descend upon Boulder Bay to acquire new construction material. “A day or two after the Rarawa was brought to Rangitoto for dumping, it had fourteen dinghies tied alongside” (Cottrell 1984:23). ‘First in, first served’ applied to those who could get to Boulder Bay quickest which provided the best opportunity for material.

Cottrell (1984:23) lists the types of material salvaged from both Rarawa and Ngapuhi, “Partitions, doors, fittings and even a teak staircase were removed. Another vessel, the Ngapuhi, had teak decks and these were taken up.” Where this material was used in the baches and what for is not stated.

Yoffe (2000:46) provides some insight into where and how these salvaged materials were used: “We had the door to the toilet and one of the bedrooms from the Rarawa.” Other salvaged material included items of value which could pay for the holiday. “When I was a schoolboy, fourteen or fifteen, we paid for the holiday one year by going out to the wreck and getting all the brass off it” (Yoffe 2000:47).

Materials were salvaged for monetary and functionality values. Boulder Bay provided a place of useful materials to aid in the construction of baches and to finance the holidays spent on the island. The vessels became a destination of “rich pickings” for the bach communities (Cottrell 1984:23).

Bach archaeology

Beacon End, Rangitoto Wharf and Islington Bay underwent an archaeological non-disturbance pedestrian survey from 11 to 23 July 2014. Both extant and demolished bach sites across all three bach communities are included in the investigation. Out of a total of 103 surveyed sites, 36 dwellings exist and 16 were found to have ship material (Figure 28). Ship materials recorded at the bach sites include iron fasteners, ships tanks, timber beams, doors, porthole glass and two masts.
Figure 28. Total number of bach sites surveyed with and without ship material.

**Beacon End**

There are a total of 10 bach sites located in the Beacon End community. Seven of those baches have been demolished, leaving three that still exist. On 14 July, the bach, B. Boswell, was surveyed and found to have a possible ship’s timber. The timber was located to the southeast of the dwelling amongst vegetation, measuring 105 cm in length and 23.5 cm at maximum width. It also contained two iron bolts with square washers (Figure 29).

When inspected from the side profile, it resembled two pieces of timber that were bolted together. The top piece had a depth of 13 cm and the bottom 12 cm. Although similar in size to the other timbers measured at Boulder Bay, this fragment was not easily identifiable to an individual vessel.

**Rangitoto Wharf**

Recording at the Rangitoto Wharf community included 43 bach sites. Twenty-four no longer exist, while 19 dwellings remain today. The archaeological survey of the community was carried out between 20 and 23 July 2014. Only existing bach sites recorded ship material as none was found at any demolished locations. Three baches had ship’s tanks and three with possible ships timbers. The results are presented in Tables 3 and 4.
Figure 29. Possible ship timber at B. Boswell bach site (Fowler 2014).

Table 3. Ship’s tanks at Rangitoto Wharf.

<table>
<thead>
<tr>
<th>Bach name</th>
<th>Type of vessel material</th>
<th>Dimensions (cm) (L x W x D)</th>
<th>Description</th>
<th>Identifiable to vessel</th>
<th>Definite or possible ship material</th>
</tr>
</thead>
<tbody>
<tr>
<td>E. Hart</td>
<td>Ships tank</td>
<td>76 x 76 x 76</td>
<td>Riveted seams, hole and tap added</td>
<td>No</td>
<td>Possible</td>
</tr>
<tr>
<td>Freeman, Humpheries,</td>
<td>Ships tank</td>
<td>120 x 120 x 120</td>
<td>Riveted seams, 60 cm diameter inspection hatch</td>
<td>No</td>
<td>Definite</td>
</tr>
<tr>
<td>Burton</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turner, Gregory, Walsh</td>
<td>Ships tank/crockery crate</td>
<td>120 x 120 x 120</td>
<td>Riveted seams, bolted lid around perimeter, no inspection hatch</td>
<td>No</td>
<td>Possible</td>
</tr>
</tbody>
</table>
The water tank in use at E. Hart bach measured 76 cm in length, width and height (Figure 30). The tank had undergone modification with the addition of a tap and a hole in the top to allow rainwater to enter via a pipe.

![Figure 30. Water tank at E. Hart bach (Fowler 2014).](image)

The iron water tank at Burton bach (formerly owned by Freeman, Humpheries), measured 120 cm in length, width and height (Figure 31). It had a 60 cm diameter inspection hatch in the top. Hexagonal nuts enabled the hatch to be screwed shut and the corners of the container were riveted together. It is used as a rainwater tank.

A rainwater tank, recorded at the Walsh (formerly owned by Turner, Gregory) bach site measured 120 cm in length, width and height. This tank does not have a hatch; instead, a lid covers the entire top. It is fastened to the tank with bolts along its perimeter.

Three suspected ships timbers were recorded at bach sites: E. Hart; M. Sharp (formerly Ardean, Smith, M. Doyle) and Hayward (formerly F. Green, J. Green). Measurements and descriptions are shown in Table 4.
Figure 31. Water tank at Walsh bach (Fowler 2014).

Table 4. Possible ships timbers located in the Rangitoto Wharf bach community.

<table>
<thead>
<tr>
<th>Bach name</th>
<th>Type of vessel material</th>
<th>Dimensions (cm) (L x W x D)</th>
<th>Description</th>
<th>Identifiable to vessel</th>
<th>Definite or possible ship material</th>
</tr>
</thead>
<tbody>
<tr>
<td>E. Hart</td>
<td>Timber with iron bolts</td>
<td>132 x 32</td>
<td>Charring, dark grain</td>
<td>No</td>
<td>Possible</td>
</tr>
<tr>
<td>Ardean, Smith, M., Doyle, M., Sharp</td>
<td>Timber with bolts</td>
<td>92 x 18 x 14; 4 cm bolthole diameter</td>
<td>Charring, dark grain</td>
<td>No</td>
<td>Possible</td>
</tr>
<tr>
<td>Green, F., Green, J., Hayward</td>
<td>Timber with bolts missing</td>
<td>181 x 32 x 13; 4 cm bolthole diameter</td>
<td>Dark grain</td>
<td>No</td>
<td>Possible</td>
</tr>
</tbody>
</table>
Islington Bay

Fifty bach sites comprising of existing dwellings and demolished sites were recorded between 12–13 and 17–18 July 2014. Ten bach sites exhibited ship material; seven had extant buildings on site while the remaining three were demolished bach sites. A range of possible and definite vessel related material underwent recording, including ships water tanks, cabin doors, porthole glass, timbers and a bolt assemblage. Details of the recorded material are presented in Tables 5, 6, 7 and 8.

Table 5. Possible and definite ships tanks found in Islington Bay.

<table>
<thead>
<tr>
<th>Bach name</th>
<th>Type of vessel material</th>
<th>Dimensions (cm) (L x W x D)</th>
<th>Description</th>
<th>Identifiable to vessel</th>
<th>Definite or possible ship material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unknown</td>
<td>Ships tank</td>
<td>NA</td>
<td>Broken up, rusted, riveted seams</td>
<td>No</td>
<td>Possible</td>
</tr>
<tr>
<td>Mrs Crooks</td>
<td>Ships tank (T1)</td>
<td>122 x 123.4 x 122.8</td>
<td>Riveted seams, folded corners, inspection hatch (40.2 cm diameter)</td>
<td>No</td>
<td>Definite</td>
</tr>
<tr>
<td></td>
<td>Ships tank or crockery crate (T2)</td>
<td>98 x 98 x 98</td>
<td>Riveted seams, open top, bolt holes around perimeter</td>
<td>No</td>
<td>Possible</td>
</tr>
<tr>
<td></td>
<td>Ships tank (T3)</td>
<td>102 x 123 x 123</td>
<td>Riveted seams, folded corners, inspection hatch (34 cm diameter)</td>
<td>No</td>
<td>Definite</td>
</tr>
<tr>
<td>Crockery Crate (C1)</td>
<td></td>
<td>100 x 100 x 99</td>
<td>Open top, welded seams, bolt holes for lid along perimeter of top, added tap at base</td>
<td>No</td>
<td>Possible</td>
</tr>
<tr>
<td>Built for Justice Herdman. Last owner Turner</td>
<td>Ships tank or crockery crate</td>
<td>122 x 123 x 122</td>
<td>Riveted seams, inspection hatch unknown due to accessibility</td>
<td>No</td>
<td>Possible</td>
</tr>
<tr>
<td>Built by Bill Davidson. Owner Te Hira</td>
<td>Ships tank</td>
<td>124 x 122 x 125</td>
<td>Riveted seams, folded corners, inspection hatch (45.5 cm diameter)</td>
<td>No</td>
<td>Definite</td>
</tr>
</tbody>
</table>
Table 6. Possible and definite ships timbers found in Islington Bay.

<table>
<thead>
<tr>
<th>Bach name</th>
<th>Type of vessel material</th>
<th>Dimensions (cm) (L x W x D)</th>
<th>Bolt hole diameter (cm)</th>
<th>Description</th>
<th>Identifiable to vessel</th>
<th>Definite or possible ship material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mrs Crooks</td>
<td>Possible spar</td>
<td>304 x 8</td>
<td>NA</td>
<td>Used possibly for washing line, one tapered edge</td>
<td>No</td>
<td>Definite</td>
</tr>
<tr>
<td>Bob Capt. Price</td>
<td>Timber with iron bolts</td>
<td>148 x 21 x 17</td>
<td>2.5</td>
<td>Cut at each end, weathered, possibly a hardwood, light grey in colour (dry)</td>
<td>No</td>
<td>Possible</td>
</tr>
<tr>
<td>Built by Jones, Owner ????. Rae</td>
<td>Mast</td>
<td>463 x 6–8.8</td>
<td>NA</td>
<td>6 cm equals tapered end, 8.8 x 8.8 cm is square end, used as a possible clothes line</td>
<td>No</td>
<td>Definite</td>
</tr>
<tr>
<td></td>
<td>Mast</td>
<td>823 x 7x7–12</td>
<td>NA</td>
<td>7 cm equals worked square end, 12 cm equals tapered round end, possibly used as a clothes line</td>
<td>No</td>
<td>Definite</td>
</tr>
<tr>
<td>Built by Jack Harris, Last owner B??K Bd.</td>
<td>Ships timber (BDT1)</td>
<td>228 x 29.5 x 10.5</td>
<td>4.5</td>
<td>Used as a seat/bench at back of bach</td>
<td>No</td>
<td>Possible</td>
</tr>
<tr>
<td></td>
<td>Ships timber (BDT2)</td>
<td>105 x 29 x 17</td>
<td>2.5–3.4</td>
<td>Contained 3 bolts, length ranged from 34–36 cm, used as support for seat</td>
<td>No</td>
<td>Possible</td>
</tr>
</tbody>
</table>
Cabin doors displayed an angled characteristic. It is possible that the doors in ships were angled to fit the sloping decking in the hull. It could also have been used to create an illusion for passengers that the ship remains square. Table 7 outlines the angles of the molding and whether they are possible or definite ships doors. A recording of a cabin door with the angle of the molding is shown in Figure 32.

Table 7. Cabin doors from the abandoned vessels located in Islington Bay.

<table>
<thead>
<tr>
<th>Bach name</th>
<th>Type of vessel material</th>
<th>Dimensions (cm) (L x W x D)</th>
<th>Angle of molding (degrees)</th>
<th>Description</th>
<th>Identifiable to vessel</th>
<th>Definite or possible ship material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ellis</td>
<td>Cabin door</td>
<td>191 x 74.5 x 2.4</td>
<td>2.3</td>
<td>Door from Rarawa, possibly a cabin door, has lock and door knob, used as an internal bedroom door</td>
<td>Yes (oral history)</td>
<td>Definite</td>
</tr>
<tr>
<td>cabin door</td>
<td>220 x 66 x 2.4</td>
<td>1</td>
<td>Door from Rarawa, possibly a cabin door, no door knob, used as door to outhouse</td>
<td>Yes (oral history)</td>
<td>Definite</td>
<td></td>
</tr>
<tr>
<td>Briggs</td>
<td>Cabin door</td>
<td>175 x 61.5 x 2.4</td>
<td>1.6</td>
<td>Found on a pile of material from the demolished bach, one side has varnish—possibly original, 3 door hinges added, no door handle or lock</td>
<td>No</td>
<td>Possible</td>
</tr>
</tbody>
</table>
Figure 32. Drawing of cabin door used as a bedroom door in Ellis bach.

Conclusion

A range of ship-related material categorised as possible or definite were found in all three bach communities (Figure 33). A total of 16 recorded possible ship-related items existed at Beacon End (1), Rangitoto Wharf (5) and Islington Bay
Nine items were recorded as definite vessel material; Rangitoto Wharf (1) and Islington Bay (8). A total of 25 ship-related items exist across all three communities. Only the ships doors located in the Ellis’s bach were identified as coming from the abandoned vessels at Boulder Bay. The other 23 items will be discussed in the following chapter.

Table 8. Other possible ship material located in Islington Bay.

<table>
<thead>
<tr>
<th>Bach name</th>
<th>Type of vessel material</th>
<th>Dimensions (cm)</th>
<th>Description</th>
<th>Identifiable to vessel</th>
<th>Definite or possible ship material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Built by Cleaver 1922, Owner Mr. M. Pelham</td>
<td>Possible porthole glass</td>
<td>20 (diameter) x 0.64 thick (estimate)</td>
<td>Round glass, thickness estimate only due to being located in the back of the chimney</td>
<td>No</td>
<td>Possible</td>
</tr>
<tr>
<td>Trotter</td>
<td>Bolt assemblage</td>
<td>Length 9.5–30.5 x diameter 0.5–1.5</td>
<td>Cluster of bolts at back of demolished bach site</td>
<td>No</td>
<td>Possible</td>
</tr>
</tbody>
</table>

Figure 33. Possible and definite ship material found in all three bach communities.
Oral histories

Between 1 and 6 July 2014, the author conducted oral histories interviews at the Birkenhead Library, Auckland, for people who have had, or still have, an association with Rangitoto Island. In total, nine people attended seven interviews. Of the nine, eight people still owned, had owned or spent their childhood at a bach on Rangitoto. The other person interviewed participated in the demolition of one bach in the 1970s. The bach participants ranged from current leaseholders to children of the leaseholder and they represented all three bach communities in the following breakdown: Beacon End (1), Rangitoto Wharf (1) and Islington Bay (6).

The collected oral histories provide a link between the salvage and reuse of abandoned vessel material. Questions directed at the participants asked about their knowledge of the vessels at Boulder Bay, whether they or their family members had engaged in salvage activities and subsequently if that material was reused in their baches (Appendix 4). Of the eight bach interviewees; five had memories of Boulder Bay and visiting the watercraft.

Abandoned vessel salvage

Situated on the northern side of Rangitoto Island and on the opposite side of the bach communities, Boulder Bay is best accessed from the water. Alternatively, a walking track provides access from the main road, but this path is rough, in some parts unformed and thus would prove difficult to transport large salvaged material. According to Guest 5, bach residents from Islington Bay would “…row out there and then up [Gardiner Gap] and turn left at the point and go up to where the wrecks were in Boulder Bay” or they would “…chug around on a 12–10 ft [3.65–3.04 m] boat with a seagull engine…” from Beacon End (Guest 4).

Once at the vessels, material such as timber was targeted for salvage. Guest 5 remembers his grandfather cutting a keel up for firewood. “…The keel was 90 ft [27.43 m] long, it was every 6 ft 6 [1.82 m] there were boltholes. My grandfather was cutting slabs out between the boltholes and rowing them in a
Manually operated tools helped the bach residents extract the timber. “He [granddad] had a double-ended crosscut saw…” and “…a bow saw” and they would cut the timber into 6 ft (1.82 m) lengths to transport it back to their bach (Guest 5). When preparing the timber for firewood they “…would split the stuff with axes and then we would put it, as I remember, these china tanks became the, ah, wood tanks” (Guest 5).

Replay of ship material
Timber that was salvaged was either for firewood or reworked into furniture. Guest 5 recalls his father going to Boulder Bay in the 1940s and “…when dad got down there, grandpa was sawing it up for firewood, dad said ‘no, no, I want to make some furniture’.”

While not every bach resident was interviewed, the interview participants named other baches that may contain ship material. Guest 5 continues:
Bach 71 I think, they talk of using the paneling from the Rarowa [Rarawa] on the walls and that was Nana Franklin’s bach and Bach 89, which I think was Hori Stewart. He too talks about using the paneling from the Rarowa [Rarawa].

Rangitoto Island does not have a natural running water source forcing bach owners to collect and store rainwater throughout the year. To do this, many residents reused watertight iron or steel tanks. Guest 2 recalls “crockery always used to come out from England…in great big, I suppose so, big steel metal tanks, usually square, sometimes round and they would buy those second-hand and use them as our water tanks.” Through oral histories, there is no link between bach owners salvaging water tanks from the abandoned vessels.

The oral histories present a link between bach residents and the salvage and reuse of ship-related timber materials. While it provides evidence of salvage activity at Boulder Bay it does not specifically identify positive reuse of material in the baches. As a result, bach residents actively went to Boulder Bay for material, whether for use in construction or subsistence, while spending time on the island.

**Conclusion**

During the abandonment period, the vessels were stripped of all useful materials and left at Boulder Bay with just the hull consisting of structural iron, timbers and fasteners. This material, however, was still a valuable resource for the bach residents. Possible ship timbers were found in all three bach communities along with other related material. Definite material was identified as being associated with a ship. Both the possible and definite material is still unknown as to whether it was salvaged from the abandoned vessels on Rangitoto. Only the doors located at the Ellis’s bach, however, are confirmed through oral history as being salvaged and reused.
Discussion

Like huge skeletons they were, their ribs, blackened by fire and broken by storm, sticking out of muddy water like so many crazy picket fences. What ghouls had picked the bones of these dead ships so clean, I wondered? (AS, 23 July 1930:6).

The purpose of this thesis is to explore the adaptive reuse of abandoned vessel material through its use in buildings and how it provides an insight into behaviour towards ship’s graveyards. To address the aforementioned, Rangitoto Island, home to a ships graveyard and three bach communities, underwent archaeological investigation. In particular, recorded salvage and reuse activities are used to discuss the influence on the buildings and the insight into the bach communities. While the archaeological record can reveal salvage and reuse activities, the material culture does not always reflect a direct link between the two. Oral histories collected serve as a linkage tool that tie the two together through the analysis of opportunistic behaviour. This chapter will combine the historical, archaeological and oral history data from the previous chapter to discuss abandoned vessels as a resource, what materials were targeted for salvage, how this material has influenced the adaptive reuse in and around the islands baches and what behavioural insights this provides into the bach communities.

Abandoned vessels as a resource

To study abandoned ship remains as a resource, it is important to first understand the types of materials available when a discarded vessel undergoes salvage activity. Richards (2008:146), illustrates the post-abandonment site
formation processes of discarded watercraft (Figure 5). Under the directive of the ship’s owner(s), a vessel underwent pre-depositional salvage where the physical appearance of the ship remained and the only changes resulted from the removal of items irrelevant to the vessel’s structural integrity. Material considered irrelevant or of value, such as machinery and rigging, was stripped out and either reused or sold. Archival sources used for this study describe the pre-depositional phase, where prior to abandonment in Boulder Bay, the vessels underwent commercially-backed salvage. Only superficial structure and some fittings remained to allow the watercraft to be towed to their final resting place.

The next phase is the abandonment process where the hulk is either scuttled or beached. Through the act of beaching, including methods such as burning, driving ashore and the use of explosives, Boulder Bay became a ships graveyard with 11 vessels onshore. Richards (2008:146) suggests it is these beached remains that go through a post-depositional phase, or secondary salvage, motivated by commercial interests. Evidence of post-depositional salvage is likely to affect material crucial for the vessel’s watertight integrity. Abandoned ships, situated on shore, no longer need to stay afloat, resulting in hull material targeted for salvage. No records indicate post-abandonment commercial salvage taking place at the Rangitoto Island ships’ graveyard, resulting in more vessel material for the island’s communities to salvage.

The next phase of salvage is labelled again as post-depositional but now becomes the third phase of salvage. Richards (2008:155) describes this tertiary phase as the act of salvage that occurs over a length of time and involves activities that are both intermittent and opportunistic. People who carry out these activities are often not associated with any prior salvage attempts including being related to the ships owner or reclaim group (Richards 2008:155). At this point in time, a new social group is introduced to the interaction with abandoned vessels. In the case of Boulder Bay, ship material was accessed to aid the construction of the Rangitoto baches. The owners and family members, having no previous association with the discarded watercraft
and who were opportunistic when salvaging material, were a social class influenced by economic changes during the 1920s to 1940s.

Targeted material: Archaeological remains and cultural site formation processes

The Boulder Bay abandoned vessels are a resource that was opportunistically salvaged. Two vessel sites displayed evidence of salvage activity, consisting of a cultural deposit of bolts, a firepit and sawn timbers. This indicates that timber and metal fasteners were likely targeted. As the oral histories suggest, ships timbers offered a reliable source of firewood. Since there is no electricity on the island and cutting the island’s protected Pohutukawa forest was prohibited, wood from Boulder Bay provided fuel for heating and cooking. The process of cutting the timber was a manual task and a family affair, with bach owners using bow saws to cut the timber into manageable pieces for firewood.

Ship timbers for firewood were not available to everyone who had a bach on Rangitoto. For those family’s who had a private watercraft, Boulder Bay was easily accessible. Families would make day trips around to the vessels with children exploring the remains while the parents would gather firewood. Positive evidence of sawn timber seen in the archaeological record is associated with Columbia. Determining what other vessel(s) were subjected to similar resource gathering is inconclusive, however, salvage interaction with any of the 11 beached vessels is likely to have taken place. The abandoned ships timber provided a free and useful resource for families spending time on the island.

Metal fasteners played a role in paying for one families’ holiday when a teenager stripped a vessel of its brass fittings and paid for that year’s holiday (Yoffe 2000:47). How they extracted this material is unknown, however, the archaeological record indicates fire was used. A firepit found close to Columbia is likely to have been employed as a method for extraction. Richards (2008:161) suggests that the burning of wooden hulls is a salvage strategy in order to gain the metal fastenings, namely copper and iron. Delgado (1981:2, 6), Matthews (1930:160) and Shomette (1982:247–252) indicate that the fire
method is not a new phenomenon for discarding vessels and extracting metals of value. People used fire for salvaging materials from discarded ships during the California Gold Rush in the 1840s and 1850s as well as discarded watercraft in Maryland in the 1920s (Richards 2008:161–162). McCarthy (1980:8) also references the steamer, Zephyr (Perth, Australia), being subjected to fire until it “…was completely destroyed and all the copper fastenings recovered….”. People who visited Boulder Bay had the intent to target materials of value and would extract it any way necessary. Fire or sawing would have been the best method for extracting metal due to the remoteness for transporting large machinery.

It is possible the method of sawing was also used to remove fasteners from timbers. Maddy Fowler (2011:51–52) discusses the sawing method where salvors sawed bolts from shipwreck timbers. This was not seen in the archaeological record at Boulder Bay, but from the evidence of sawing activity it is possible fasteners were removed in a similar way.

Further evidence of salvage activity did not feature in the archaeological record at Boulder Bay. This is likely to be a result of the dynamic environment in which the vessels are located. Richards (2008:162) notes that the lack of archaeological signatures is the result of natural site formation processes. Boulder Bay is on the northeastern side, which is the most exposed side of Rangitoto Island; especially large ocean swells from the Pacific Ocean. Combined with the substrate of sharp volcanic rock and loose gravel, it creates a destructive effect on the abandoned vessels. Over time, these environmental processes twisted metal and splintered timber, leaving what is viewed today—scattered material remains (Figure 35)—as opposed to what was observed in 1944 (Figure 36). If other archaeological signatures of salvage activity exist, it is likely to be buried and away from the turbulent intertidal zone (Richards 2008:162).
During the abandonment process at Boulder Bay, ships provided a resource for the local island’s communities. As they underwent the removal of material, the vessels continued to be systemic where activity involving the watercraft was continual. Once salvage activity ceased, around the time bach construction was prohibited and the last ship was abandoned (1939–1947), evidence of salvage...
entered the archaeological record. Features’ existing within the archaeological context, such as a firepit, timber sawing and a concentration of fasteners, provides an insight into the resources targeted. While the archaeological record does not have a direct link to the bach communities, it is known through oral histories that community members interacted and salvaged material from Boulder Bay. Bach residents identified the discarded watercraft as a free and readily available resource.

Adaptive reuse

The previous discussion of the types of material available for salvage at Boulder Bay, indicate possible materials located at bach sites: Islington Bay, Rangitoto Wharf and Beacon End, that could be a link between salvage and reuse. This is important as it answers part of the research question, ‘how does adaptive reuse of the Rangitoto ships’ graveyard influence the construction, modification and use of the island’s baches?’ Similar materials to those targeted at Boulder Bay, such as timber and metal fasteners, exist in the Rangitoto bach cultural record. Other material, such as ships tanks and wooden masts are present at bach sites, but do not exist in the archaeological record at Boulder Bay. These latter materials represent definite ship material but do not have diagnostic features that link them to the Rangitoto Island ships’ graveyard.

Definite ship material

Definite ship material recorded at the bach sites includes masts, ships tanks and cabin doors. Each item displayed diagnostic features that allowed for definite identification. The features, however, only identified the material as once being used on a ship but is not linked directly with the vessels at Boulder Bay.

Masts recorded on Rangitoto Island showed traits that allowed for identification. The masts exhibited the tapering and squaring of their ends, which was to fit into their mast steps (Figure 37) (Hope 1903:112). While they are definite ship material, it is unlikely that they are salvaged from the Rangitoto ships’ graveyard. The masts measure a maximum 8.23 m, which
determines their lengths is not long enough to be from the discarded vessels. It is likely that they once belonged to small coastal yachts, similar in size to Couta boats ranging between 6.7 m and 9.1 m in length (22–30 ft) (Burnham 2005:103).

The masts were all used as support poles for washing lines, which indicates the adaptive reuse of ship material. They are no longer employed in their primary use as rigging on sail boats but have been adapted into a secondary use and reused to serve a purpose at the bach sites. They still serve a functional role as components of the bach surrounds allowing people to dry clothes.

![Figure 37. Squaring of mast towards mast step (Hope 1903:105).](image)

When families spend their holidays on Rangitoto, they rely on rainfall for their fresh water supply. When it does rain, water is captured and stored in water tanks located next to the baches. Owners adapted basic metal crates and connected them to the guttering along their bach roof, storing freshwater for the summer months.

The five recorded water tanks, at bach communities Rangitoto Wharf and Islington Bay, are of various sizes, however, are consistent with the classic ships tank characteristics of:
• mild steel;
• 122–123 cm square in length, width and height;
• rounded rivet heads;
• rounded seams on all edges; and
• a single circular hole (30–60 cm diameter) located centrally or to one side.

The smaller tanks recorded are also consistent with original ship tank sizing of 92–97 cm and 72–77 cm in length, width and height (Pearson 1992:24). While these are ships tanks, there is no evidence to link them to the ships graveyard. Without makers marks, dates cannot be assigned to the tanks, which would indicate if construction occurred before, during or after the abandonment phase. This is significant because the tanks dated post-abandonment could not have been associated with the Boulder Bay abandoned vessels.

Baches originally started as basic one-room structures sharing living, cooking and sleeping areas. Over time, further acquisition of material transformed the basic dwellings into two or three bedrooms with separate living and kitchen areas. Oral histories link two doors located at the Ellis bach in Islington Bay to activities of salvage at Rarawa. Used in the construction of the bedroom and outhouse, the doors exhibited angled features that would be unusual for a normal house. The angles of the doors indicate they are from a ship and most likely used as cabin doors. Rather than shaping a vessel to fit a door, the door was adapted to fit the camber of the ships decks. The Oxford Companion to Ships and the Sea defines camber as “the athwartships curve of a ship’s deck, usually giving a fall towards the sides of a quarter of an inch to each foot” (Kemp 1976:132). For example, the bedroom door in the Ellis bach is hinged on the left meaning the door opened right to left. The plans of Rarawa indicate the door is from midships to forward of the vessel and on its starboard side (Figure 38). The Rarawa cabin doors present the only evidence of definite salvaged ship material from Boulder Bay.
Figure 38. Rarawa ships plan (RARAWA blueprint plan / Designer, George Gow. W. A. Laxon Collection, Voyager New Zealand Maritime Museum [2005.352.81]).
Possible ship material
Ships tanks also fall within the category of possible ship material, as some did not have definitive diagnostic features. Limited evidence of features, such as inspection hatches, riveted seams and no folded seam corner (Figure 30 and 31), created doubt on positively identifying these crates as ships tanks. Oral histories, however, describe these tanks as crockery crates, used to transport ceramic and porcelain plates, mugs, and other homeware goods from overseas. Having been reused, it is possible the crockery crates were originally ships tanks. Pearson (1992:25) suggests that “the recycling of tanks was their selling point.” Pearson (1992:25) continues by quoting an advertisement by Frederick Braby, a maker of ships tanks:

These tanks are now extensively used as packing cases, they being found to convey goods more safely and free from damage by water, &c, than do ordinary wooden cases. The cover is hermetically fastened down after the goods are packed. They are readily sold at a good price abroad, especially in the Colonies, where they are eagerly bought up for use as water tanks, for which ultimate purpose they are appropriately made (Frederick Braby & company (limited) London, Liverpool, Glasgow, and Deptford, & c [catalogue no9, London 1883], p 134 in Lewis 1992:98).

Originally used for transporting goods and then as storage, bach owners reused the watertight qualities of the tanks to collect and store rainwater. This allowed the bach owners access to a reliable source of water and lived for extended periods on the island. All recorded metal tanks that serve as water tanks at bach sites are therefore possible ships tanks.

Together, timber, metal fasteners and a porthole glass window are also labelled as possible ship-related material, but no visual diagnostic features link them to the Boulder Bay vessels. For example, the timbers recorded at the individual bach sites are modified to such a degree that archaeological signatures suggesting it is ship-related and associated with salvage are not easily identifiable.
Insights and behaviours

Adaptive reuse of ship material is seen through the archaeological and systemic records at Boulder Bay, Islington Bay, Rangitoto Wharf and Beacon End, but what insight does this provide into the bach communities? The social and economic environment at the time of bach construction influenced behaviour towards the ships graveyard.

Social and economic conditions

During the bach construction period on Rangitoto Island, between c.1910 to 1939, New Zealand experienced global events that shaped its development. World War I (1914–1918), the Depression of the late 1920s to early 1930s and the start of World War II (1939), affected the economy and social values of those living and working in the South Pacific nation. Following World War I, housing developments, state funded financing schemes and job stability created an economic surge throughout the country (Yoffe 2000:14). By 1926, the start of the Depression created an economic pivot point of uncertainty between growth and stagnation—the latter affecting skilled labour in the cities and by 1933, 12 per cent of the work force was unemployed (Hawke 1985:6; Yoffe 2000:14).

The economic fallout, however, did not seem to sway New Zealander’s social values towards freedom and leisure. Even during economic hardship and constraints, people still found time to enjoy the outdoors (Yoffe 2000:14). This is especially true for Auckland, where ferries offered low cost transport which encouraged everyone to enjoy camping on the islands in the Hauraki Gulf—“that’s why Rangi[toto] was so good” (Yoffe 2000:15). At first, leases on Rangitoto permitted only camping, but with the growing need to control sanitation, permanent buildings and adequate hygiene became a requirement for the lease (Yoffe 2000:20).

In the beginning, Rangitoto camping leases offered an affordable option (2 pounds per annum) for working class families to have a relatively low-cost holiday (Foster 2003:39). The introduction of regulations in 1918 to erect
permanent structures as a condition of the lease soon made holidaying on the island a financial burden. The rules of the lease, however, did not stipulate the type of building, nor any building codes regarding materials. To maintain a place to carry out leisure activities, the economic conditions influenced leasees to reuse material to keep construction costs down. With no building codes, leaseholders pursued this freedom to reuse material and build anything out of anything, so long as it conformed to sanitation requirements. Basic one-room dwellings, enough to provide shelter at night, constituted the first baches. As finances became available, the baches developed into substantial two or three bedrooms and communities established themselves in three different localities (Foster 2003:39). Rangitoto offered an opportunity for people from all social backgrounds to own a bach and with it, developed a distinct local architectural character that reflects an idiosyncratic local history (Treadwell 1994:61).

Opportunistic behaviour

Forced by the economic conditions at the time, bach owner’s reused material to construct the baches on Rangitoto Island. The ships graveyard at Boulder Bay is a location that offered local, free and accessible materials for reuse. Although not every bach displayed the reuse of abandoned vessel material, oral recollections suggests bach owners were aware of salvage activities at Boulder Bay. Based on archaeological evidence, bach owners targeted specific material, such as timber, metal and doors, which Gibbs (2003:140) determines to be opportunistic behaviour. Once the material enters into the bach context, behaviour is then considered to be of a recycling nature. Schiffer (1976:38–40) describes this as transforming an objects’ fabric into some other form and/or function. This behaviour applies to material, such as the timber and metal, salvaged from the abandoned vessels. The Ellis bach doors, however, are classed as lateral cycling because the ownership changed, but the function and form did not (Schiffer 1976:38–40). Rangitoto bach owners therefore demonstrate opportunistic, recycling and lateral cycling behaviours at the ships graveyard at Boulder Bay.

Further, determined by the number of ship-related materials recorded in each bach community, Islington Bay is likely to have frequented and engaged in
recycling material from Boulder Bay more times than the other two communities (Figure 33). One reason is the locality of the community to Boulder Bay—the short distance meant people rowed their small dinghies. This means all bach owners who owned a small boat and did not own a launch, such as that needed for access from Rangitoto Wharf and Beacon End, could access the abandoned vessels. Islington Bay baches, therefore, display both opportunistic and recycling behaviours involving abandoned vessel material from the Rangitoto Island ships’ graveyard. Rangitoto Wharf community is second to Islington Bay based on the quantity of recorded material; however, ships tanks do not have a direct link to Boulder Bay. Therefore, Rangitoto Wharf community members are unlikely to have engaged in salvage and reuse of abandoned vessel material from Boulder Bay. The same conclusion is drawn at Beacon End due to the non-diagnostic nature of ship material recorded.

**Conclusion**

During bach construction on Rangitoto Island, community members accessed Boulder Bay for its resources. The abandoned vessels offered materials such as doors for reuse, metal fastenings to pay for the holidays and timber for firewood. From the 1920s to 1940s, the economic and social environment influenced the reuse of ship material. Bach owners were opportunistic in the way they targeted and salvaged ship materials. This study into reuse of abandoned ship material offers an insight into the idiosyncratic style of the baches and the resourcefulness of its people.
Conclusion

Even when the material past survives intact, without interpretation it may not offer an authentic insight into the past (McLean 2000:213).

This thesis set out to answer the following research questions:

1. What evidence do historical documents provide for the condition of Boulder Bay vessels at the time of abandonment?

Historical documents housed in the Voyager Maritime Museum Library and newspaper articles accessed through Papers Past and Trove provide evidence of pre-depositional salvage. Preparing the watercraft for abandonment, the ships owner(s) initiated commercial-lead salvage where items of value, stripped from the vessel was either reused or sold. The historical records indicate the abandoned remains at Boulder Bay consisted of timber and iron hull structure and were either beached, burnt or detonated.

2. What archaeological remains are located at Boulder Bay?

After salvage activity ceased in the 1940s, the discarded watercraft transferred from a systemic to an archaeological context. The present archaeological remains are scattered along the shoreline, spanning from the vegetation above the high water mark to below the low tide line. Only two stern sections exist, positively identifying two vessels—Rarawa and Ngapuhi. Other material is likely submerged and deposited in the bay due to environmental processes.
3. What cultural site formation processes are visible at the individual vessel sites?

Cultural site formation at Boulder Bay begins with the abandonment processes. Charring of timbers is seen on the timber vessels set alight at abandonment. Further, salvage activity initiated by un-associated people is limited to two vessel sites, *Columbia* and *Dartford*. A firepit, sawn timbers and a bolt deposit indicate salvage activity targeted specific items and that people engaged in destructive methods to extract vessel material. Oral histories conducted for this study supports this activity, whereby bach owners used wood saws and removed timber for firewood from the discarded watercraft.

4. Is there evidence of material culture located at the islands’ baches to suggest salvaging from abandoned vessels?

Islington Bay, located at Rangitoto Island’s eastern end, recorded the most ship remains reused at the baches. The vessel material consisted of ships tanks, masts, possible ships timber, bolts and porthole glass. This material, however, did not possess a visible link to the Boulder Bay vessels. Only two ships doors are identified as material reused from the abandoned vessels. These doors are confirmed through oral history as belonging to *Rarawa*. Ship material reuse is also located at Rangitoto Wharf, but is considered unlikely to be connected with Boulder Bay. Beacon End did not possess any abandoned vessel material.

These four aims contribute to the formulation of the primary research question, ‘How did the adaptive reuse of the ships’ graveyard on Rangitoto Island influence the construction, modification and use of the island’s baches and what insight does this provide into the island’s bach communities?’ Together, archaeological evidence, archival sources and oral histories better inform the interaction between abandoned vessel sites and communities. The bach communities influenced by economic and social impacts resulted in resourcefulness and reuse of materials throughout bach construction. By investigating two different site types, discarded watercraft and local built communities, our knowledge of behaviour towards ships as a material resource
are better assessed and understood. The post-depositional framework has been explored from a new angle to include the salvage and reuse behaviours discussed in this thesis. This framework now incorporates a social process whereby people un-associated with the shipping industry are now included in the post-depositional site formation process of abandoned vessels.

**Limitations**

Not all bach owners were interviewed for a number of reasons. Many owners have now passed away leaving a gap in the oral histories of bach families. Potential interviewees were unavailable for the interview or felt they did not have any information to contribute. As a result, the oral history component of this thesis is not a true reflection of personal memories associated with Boulder Bay.

Permission to carry out internal investigations of existing baches was at the owner’s discretion. Only two baches were examined internally out of 36 in total. Therefore, ship material used in the construction of the baches is limited and it cannot be concluded that ship material does or does not exist in the remaining baches.

**Future research**

A number of further research avenues could be explored on Rangitoto Island. Wood samples are recommended for collection from all recorded possible ships timbers located at all three bach communities. Identifying the timber species and comparing them to the ships timber located at Boulder Bay will determine an archaeological link. This will most likely confirm or refute the theory put forward in this thesis that timber was salvaged from the abandoned vessels at Boulder Bay and reused in the Rangitoto bach communities.

A full internal assessment of ship-related material at existing baches is recommended. A person who is knowledgeable on ship material is recommended to carry out such an investigation. This should be completed
sooner rather than later, before leases expire and demolition of the baches is enacted.

Future research could use the same approach at other local communities constructed in close proximity to discard sites. A comparative study between other ships graveyards and coastal communities could inform us of regional trends and different behaviours towards reusing abandoned vessel material. This framework can be applied globally to investigate international case studies and also to terrestrial-based sites where scrap yards and communities co-exist.

**Significance**

This research is significant as it has contributed towards the literature on abandoned vessel reuse. Recording the disappearing material and oral histories of the bach communities has contributed to raising awareness of the historical significance of the Rangitoto Island bach communities and ships’ graveyard. Both are historically and archaeologically significant which informs us of past abandonment, salvage, reuse and community behaviours. Bach families have a strong traditional bach identity stemming from a long history with Rangitoto and more recently documenting memories and fighting to preserve that bond.

**Conclusion**

Finally, this thesis contributes to the understanding of behaviour between communities and discarded material.

The analysis of “ultra-modern” wreck and abandonment sites can arguably offer insights into past human activities at older locations, the tangible as well as intangible activities and motivations of communities at such sites, which have a “ritual” aspect are every bit as significant as those of the past (Flatman 2011:320).

For this reason, the Rangitoto Island ships’ graveyard and three bach communities; Islington Bay, Rangitoto Wharf and Beacon End, are both
archaeologically and historically significant and should be preserved for the future.
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Appendices

Appendix 1. Flinders ethics approval

Dear Kurt,

The Chair of the Social and Behavioural Research Ethics Committee (SBREC) at Flinders University considered your response to conditional approval out of session and your project has now been granted final ethics approval. This means that you now have approval to commence your research. Your ethics final approval notice can be found below.

FINAL APPROVAL NOTICE

Project No.: 6368

Project Title: Archaeological Investigation of Abandoned Vessel Reuse—Rangitoto Island, New Zealand ships’ graveyard case study.

Principal Researcher: Mr Kurt Bennett

Email: benn0288@flinders.edu.au

Approval Date: 1 May 2014

Ethics Approval Expiry Date: 1 January 2016

The above proposed project has been approved on the basis of the information contained in the application, its attachments and the information subsequently provided.

RESPONSIBILITIES OF RESEARCHERS AND SUPERVISORS
1. Participant Documentation

Please note that it is the responsibility of researchers and supervisors, in the case of student projects, to ensure that:

- all participant documents are checked for spelling, grammatical, numbering and formatting errors. The Committee does not accept any responsibility for the above mentioned errors.
- the Flinders University logo is included on all participant documentation (e.g., letters of Introduction, information Sheets, consent forms, debriefing information and questionnaires – with the exception of purchased research tools) and the current Flinders University letterhead is included in the header of all letters of introduction. The Flinders University international logo/letterhead should be used and documentation should contain international dialling codes for all telephone and fax numbers listed for all research to be conducted overseas.
- the SBREC contact details, listed below, are included in the footer of all letters of introduction and information sheets.

This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee (Project Number 'INSERT PROJECT No. here following approval'). For more information regarding ethical approval of the project the Executive Officer of the Committee can be contacted by telephone on 8201 3116, by fax on 8201 2035 or by email human.researchethics@flinders.edu.au.

2. Annual Progress / Final Reports

In order to comply with the monitoring requirements of the National Statement on Ethical Conduct in Human Research (March 2007) an annual progress report must be submitted each year on the 1 May (approval anniversary date) for the duration of the ethics approval using the annual / final report pro forma available from Annual / Final Reports SBREC web page. Please retain this notice for reference when completing annual progress or final reports.

If the project is completed before ethics approval has expired please ensure a final report is submitted immediately. If ethics approval for your project expires please submit either (1) a final report; or (2) an extension of time request and an annual report.
Appendix 2. Vessels before abandonment in alphabetical order
(Note: Elinor Vernon, Jubilee and Polly are not included)

Arapawa


Columbia

Dartford


Duchess

Gladbrook (ex County of Anglesea)

The County of Anglesey, 1885–1946, Brodie Collection, La Trobe Picture Collection, State Library of Victoria.

Ngapuhi

**Rarawa**


**Rothesay Bay**

Appendix 4. Interview questions

Archaeological Investigation of Abandoned Vessel Reuse: Rangitoto Island, New Zealand ships' graveyard case study

Background

1. Do you or a family member own a bach on Rangitoto Island?
2. Where is the bach located?
3. When was the bach built?
4. Since what age have you been visiting the island and or bach for holiday trips?

Boulder Bay

5. Are you aware of the abandoned vessels located at Boulder Bay?
6. Was Boulder Bay a popular day trip destination for you and other bach residents?
7. For what purpose were trips made to Boulder Bay?
8. Are you aware of any salvage activities associated with the vessels?

Bach communities

9. To the best of your knowledge, was salvaged vessel material used to aid construction of the baches?
10. If so, how was material transported across the island?
11. Do you know if there was a link between baches and an individual vessel, whether through material salvaged or simply naming of the bach?