

# Impact of a planting programme on historic and archaeological sites of Quail Island, Lyttelton Harbour

Michael Trotter and Beverley McCulloch  
Summer Wine Initiatives  
170 Tuahiwi Road  
Tuahiwi  
RD 1  
Kaiapoi 8252

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# Abstract

A programme of planting native trees on Quail Island in Lyttelton Harbour has been proposed by the Otamahua/Quail Island Ecological Restoration Trust. The impact that this would have on the Maori and European historic and archaeological sites on the island is assessed. It is concluded that in several areas the planting and growth of trees would adversely affect these sites (some of which are protected under the Historic Places Act 1993).

## 1. Introduction and background

Quail Island in Lyttelton Harbour in the Canterbury region is composed largely of volcanic rocks. Like Banks Peninsula, of which it forms a part, it was largely forested in the pre-human era. It has rich and diverse human history, probably dating back at least 700-800 years, but particularly relating to the European period, where it is unique in New Zealand. Evidence of its history can be seen over much of its 85 hectares and in places in the surrounding sea. Historic and archaeological sites bear testimony to some centuries of human endeavour, occupation and utilisation of the island, and it is important that they should be preserved to provide knowledge, as well as an enhanced understanding, of our cultural and social past.

Although historical research has been undertaken into a number of aspects of Quail Island's story (e.g. Dunnett 1972; Jackson 1990), no in-depth archaeological research, which would complement the recorded history and provide greater understanding of it, has been carried out.

The Otamahua/Quail Island Ecological Restoration Trust has recently been established for the purpose of revegetating the island with native trees, controlling the invasion of exotic plants and mammals, and reintroducing native fauna. While human associations with the island are acknowledged (Burrows 1999: 3), the Canterbury Conservancy of the Department of Conservation has requested this report to consider in detail "What are the impacts that a planting programme will have on historic and archaeological sites on Otamahua (Quail Island)?"

## 2. Historic and archaeological sites

For the purposes of this report an historic site is defined as any land or building that forms part of the historical and cultural heritage of New Zealand. This is basically the same as an "historic place" as defined by the Historic

Places Act 1993, and can include an archaeological site as well as anything that is in or fixed to such land.

An archaeological site is any specific locality which contains physical evidence of past human activity that may be able to provide through investigation by archaeological methods, evidence relating to the history of New Zealand. Archaeological sites are recorded in a nation-wide scheme operated by the New Zealand Archaeological Association, which allots a number to each site. These records are recognised by the New Zealand Historic Places Trust and form the basis of the Department of Conservation's Central Index of New Zealand Archaeological Sites (CINZAS).

Archaeological sites associated with human activity that occurred before 1900 and shipwrecks that occurred before that same date - whether or not they have been recorded - have automatic protection under the Historic Places Act 1993, and the authority of the New Zealand Historic Places Trust must be obtained before they are disturbed or damaged.

The New Zealand National Committee of the International Council on Monuments and Sites adopted a New Zealand Charter for the Conservation of Places of Cultural Heritage Value in 1993 (Icomos 1993), based on an earlier International Charter (the Venice Charter of 1966) along the same lines. Besides discussing the purpose of conserving places of cultural heritage value - which include historic and archaeological sites - it emphasises that the historical setting of a place should be conserved with the place itself, a view followed in this report.

The Management Plan for Quail Island prepared by the Department of Lands and Survey in 1982 supported this view with the policy "*To maintain historical and archaeological sites in a manner consistent with their integrity*" (Department of Lands and Survey 1982: 46).

The same Management Plan also recognised that "*Evidence of European occupation is presently widespread and includes derelict and functional buildings, wall constructions, quarry sites, leper graves, exotic plantations, developed farmland and formed building sites. Such features add considerably to the island's character and atmosphere and provide considerable potential for public interpretation on man's interaction with the environment and his past social attitudes.*" (Department of Lands and Survey 1982: 46).

Most of the historic sites on Quail Island can be identified and interpreted from written records and photographs, but even these have an archaeological component and for the most part must also be considered as archaeological sites. At the time of writing, sixteen archaeological sites have been recorded on the island and in this report are identified by their official numbers as allocated by the New Zealand Archaeological Association; these are listed in the Appendix and their locations are shown in Figure 2. More sites doubtless exist - for instance, the underground burnt soil, charcoal and ash found behind the South Bay beach by Ford (1980: 60-61, 129-131) are more than likely to have been of human origin prior to the construction of the Quarantine Station.

# 3. History

## 3.1 MAORI OCCUPATION

The earliest recorded Maori name for Quail Island is 'Kawa-Kawa', which appears on an 1838 French chart of Port Lyttelton, *Plan du Port Tokolabo (Nlle Zelande) par Mr Fournier 1838* (Maling 1981:20) and a chart of the ports of Lyttelton and Levy, *Plan de Baies de Tokolabo et de Koko-rarata*, published in 1840 from the surveys in 1838 by Fournier and d'Ubraye of the *Heroine* (Hight & Straubel 1957: plate 10). (Quail Island was included in that area originally claimed to have been purchased by the French.) This name was repeated on an 1843 British chart published by Wyld (Hight & Straubel 1957: plate 7). In 1852 'Te Kawakawa' was used in a letter by two Maori writers, Tame and Petera, making a claim for the island, and again in a reply from Walter Mantell where he used it as an alternative for Quail Island (Mackay 1873: 261). (Kawakawa is the Maori name for the pepper tree, *Macropiper excelsum*. The name is also applied to a fern, *Blechnum fluviatile*, and a dark variety of pounamu or nephrite.)

By 1894, on a sketch map showing Maori place names of Banks Peninsula, Canon James Stack recorded the name of the island as 'O Tamahua' (Stack 1894), which James Cowan (as 'Otamahua') later still explained as a reference to fowling expeditions by Maoris from the mainland, children in particular relishing birds' eggs (Cowan 1923: 19). It is of interest, however, that a Maori map of the South Island drawn for Edmond Halswell, Native Reserves Commissioner for the New Zealand Company, in the early 1840s gives the place-name 'Otomahiu' for a feature - which could well be intended for Quail Island - at the head of Lyttelton Harbour (figured by Brailsford 1981:151).

Johannes Andersen recorded 'O-ta mahua', 'Kawa-kawa', and 'Te Kawa-kawa' as options, giving early references to Admiralty Charts and Land Purchase reports for the last two (Andersen 1927: 180). In 1950 W. A. Taylor gave 'Te Kawa kawa', with 'Otamahua' as a more modern name (Taylor 1950: 62), and the latter usage was supported by Couch (1987: 95).

Artifacts, middens, cooking places, and human burials provide empirical evidence of pre-European Maori use of the island. Occupation clearly occurred on or near several beaches, and some activities must also have been carried out on the higher land. There was a "*Maori house at the west side*" of the island in 1851 (Ward 1951: 148).

When first visited by Europeans, Quail Island had little tall vegetation (see an 1844 sketch by J.W. Barnicoat in Maling 1981:65) and is thought to have been covered predominantly by silver tussock grassland with scattered matagouri scrub and cabbage trees (Genet & Burrows 1998: 6). However, it is considered that the island would have supported dry coastal broadleaf-podocarp forest a few centuries earlier (Genet & Burrows 1998:6), with tall shrub growth occupying only the harshest and driest north-facing slopes (Genet 1997: 91). There can be little doubt that the original forest cover of the island was destroyed by fire as a deliberate or accidental result of Maori occupation. Genet

suggests that it may have been cleared to facilitate the island's use for strategic purposes as well as for the cultivation of kumara and other vegetable crops (Genet 1997: 92).

Although no physical evidence of Maori gardening has been recorded, some of the north-facing slopes would very probably have been suitable for growing kumara. An anecdotal reference to kumara growing on Quail Island by Ngati Mamoe is given by Genet (1997: 92-93).

The reported finding of "greenstone chips" (Jackson 1990: 16) indicates that Quail Island was occupied prior to the development around 400 years ago of more effective methods of shaping nephrite. Artifacts figured (Jackson 1990: 16) and seen in museum collections are mostly of types that are not dissimilar to those in use 200-500 years ago. It is probable, however, that there was some Maori utilisation of the island earlier than this, and it is known that utilisation continued until European settlement in the early 1850s and even later (Ward 1851: 148; Couch 1987: 18).

### 3.2 EUROPEAN OCCUPATION

The European use of Quail Island may be said to have started in 1842 with the arrival of Captain William Mein Smith, who was Surveyor-General to the New Zealand Company. It was Smith who bestowed the name 'Quail Island' after the native New Zealand quail (koreke, *Coturnix novaezelandiae novaezelandiae*) he found there (Wakefield 1848: 329; Straubel 1957:89-90). Quail Island has remained the official geographical name.

In 1849 Walter Mantell purchased an area of land around Lyttelton Harbour (then called Whakaraupo or Port Cooper) from the local Maori (the original French claim having been overturned), and later that year this was transferred to the Canterbury Association for organised European settlement (Straubel 1957). Later, Maori claims were made that Quail Island was not part of the original purchase, but these were not upheld (Mackay 1873: 261; Taylor 1950: 62).

#### Farming

In 1851 Edward Ward and his two younger brothers, Henry and Hamilton, chose to settle on Quail Island, building a wooden cottage at the head of a valley which looks over the Harbour towards Lyttelton, and bringing in livestock. Ward noted that the island had "*fine rich grass soil, abundant springs of water and a beautiful site for a house ... good grass for cows without the trouble of fences or fear of straying far away*", although there was a shortage of firewood (Ward 1951: 119,183 etc.). The first published description of Ward's holding was provided by C. Warren Adams, who visited it in 1851 and published his account two years later: "*The soil is good; and there is an excellent house, and a considerable quantity of cultivated ground round it. The House commands a fine view of Lyttelton; and as the colony increases, the island will prove a valuable property, both for supplying the town with vegetables and fruit; and ultimately, probably, as a summer residence for*

*men of business ...* " (Adams 1853: 49). The setting and view also inspired a drawing by local artist, W. H. Holmes, which accompanied Adams' account (Adams 1853, Plate 1; also reproduced in Ward 1951 facing page 144).

Various farming activities, including cultivation, grazing, planting of shelter trees, and the construction of tracks, fences, yards and buildings, continued intermittently on the island from that time until at least 1976 (Jackson 1990: 28-31. See also Dunnett 1972). Evidence of much of this activity still exists.

In spite of Ward's report of abundant water (Ward 1851: 119), a dam was later built to collect and store water for stock in a valley on the northwest side of the island, and although this was more recently repaired and heightened, it was superseded by a concrete collecting area and tank on a high central part of the island. (Today, water is piped in from Lyttelton.)

A track leading to a freshwater spring has been noted near the western end of the northeast-facing bay (Weaver et al, 1985: 37) and there is another track at the western end of Walkers Beach, but the history of these is not known.

### Quarrying

Exposed columnar basalt of the Church Formation (Weaver *et al* 1985: 35-37) was obtained for ships' ballast from two quarries on the northwestern coast of Quail Island from the early 1850s to the mid 1870s (Jackson 1990: 32-33), one of which was reused in the 1980s to supply material for the construction of a retaining wall at the jetty on the opposite side of the island. The aerial cableway used to transport rock to the top of the hill, from whence it was carted by tractor, still stands.

Lighter coloured, softer, and less dense rhyolite rock was also quarried as a building material, at least as early as 1863, when it was used for window surrounds on a church at Okains Bay on the eastern side of Banks Peninsula (Ogilvie 1990: 119). Retaining walls and a sea wall on Quail Island itself were also built of locally quarried rhyolite in the early decades of the twentieth century (Jackson 1990: 53-54).

### Human quarantine

Early in 1874 Thomas Potts, at that time the owner of Quail Island, offered the use of the land as a Quarantine Station for immigrants, and work commenced on buildings on the south side of the island. Although they received some use, the buildings were utilised more at a later stage as an isolation hospital for those with infectious diseases, and the quarantine barracks were also used as a sanatorium for convalescents.

Then in 1906 a leper was transferred to Quail Island, marking the beginning of New Zealand's only Leper Colony. Cottages were built on the hillside at the western end of the Quarantine Station area to accommodate the patients and continued to be used as a Leper Colony until 1925. Quail Island was no longer used as a human Quarantine Station after this date (Jackson 1990: 42-52).

## Animal quarantine

As early as 1853 a suggestion was made that Quail Island be used as an animal quarantine station for scabby sheep (McIntyre 1980: 297), but it was not until 1881 that five acres was set aside for the isolation of 'cattle' (a term which at that time included sheep). By 1892 the whole of the island had been declared a quarantine ground - mostly for farm livestock and dogs.

From 1901 to 1929 Quail Island achieved historical fame as a quarantine site for animals (ponies, mules, and dogs) used by the Antarctic exploration teams of Scott and Shackelton during what is today termed the 'heroic era', and later, for the dogs of Commander Byrd.

## Shell gathering

For more than forty years from 1929 the Walker family gathered shell under licence for the manufacture of shell-grit for poultry, from what is known as Walkers Beach on the southwest side of the island.

In 1989 this beach was recognised by the Joint Earth Sciences Working Group on Geopreservation as a significant landform worthy of preservation, such beaches being uncommon at this latitude (Priestly et al. 1989).

## Recreation reserve

Quail Island has always been a popular recreation spot for Cantabrians - and in later years, tourists. One of the entertainments offered to newly arrived immigrants early in 1851 was to be rowed to Quail Island for a picnic (Scotter 1968: 24).

After its last use as an animal quarantine ground about 1929, there was much informal recreational use of the island, and it was officially declared a Recreation Reserve in 1975. Since then, considerable development of Quail Island has taken place, with a new wharf, a walkway, a visitor centre, water supply and a planting programme. Regular public access is by private boat or ferry service.

# 4. Planting proposals

During the period of European occupation, most of the trees deliberately planted on Quail Island were exotics such as macrocarpas, pines, sycamores, and oaks. Areas of these trees can be seen in the 1962 aerial photograph shown in Fig. 1, although those on the northwest half of the island have now gone. Plantings of some native species were carried out in the early 1980s (Genet 1997: 38-41).

Recently a programme of planting native species with a view to 'restoring' native vegetation on the island, starting with a series of "forest cell" nucleus

areas for initial plantings, has been suggested (Genet 1997; Genet & Burrows 1998), and followed up with this end in view by the formation of the Otamahua/Quail Island Ecological Restoration Trust.

Although there is no formal plan for this programme, the Trust is active in both promoting and implementing the proposal, and some planting has already been undertaken. Although some of the remaining exotics have been removed, it is intended that most of them are to remain as part of the island's history (Burrows 1999: 3).

#### 4.1 AREAS PROPOSED FOR INITIAL PLANTING

Areas currently proposed by members of the Otamahua/Quail Island Ecological Restoration Trust for planting over the next few years are indicated on Fig. 2 as A to M respectively (information supplied by the Department of Conservation, Canterbury Conservancy).

Area A - on the north side of an historical stock-watering dam at the western end of Quail Island.

Area B - on the northern side of Wards Valley.

Area C - on the hillside above Walkers Beach.

Area D - an area of recent slipping above the western end of the Quarantine Station site.

Area E - above the historic Dog Kennel site.

Area F - overlooking part of the early Quarantine Station.

Area G - in the open space between the Quarantine Station barracks building and the Visitor Information Centre and includes some recent planting of young trees.

Area H - covering much of the promontory above the Old Jetty.

Area I - west of the present Visitor Information Centre.

Area J - adjacent to the present Visitor Information Centre.

Areas K and L - located in the vicinity of stockyards and holding paddocks at the eastern end of the island.

Area M - a small area on the edge of a terrace on which the western part of the Quarantine Station was built.

## 5. Vegetation versus cultural heritage

The growth of any plants, including the grasses and trees already present, inevitably affects archaeological and historic sites through disturbance by roots of the plants as they grow. Moreover, vegetation obscures both the sites themselves and their settings, which need to be preserved for clear appreciation of their historical context.

Planned planting can only accelerate these effects, as well as disturbing the ground in which the sites occur by the actual planting operation.

The perceived value of planting native species on the island has to be balanced against the loss of the cultural heritage value of irreplaceable and unique historic and archaeological sites (and the information they may yield) of both Maori and European origin.

## 6. Known sites in relation to planting areas

### 6.1 AREA A, STOCK DAM

*Cultural Values:* No Maori or European sites have been recorded on the northern hillside above the Stock Dam, but the proposed planting area is immediately adjacent to, and may well impinge upon, the dam, which is a European archaeological site (M36/134). Having been built in 1878 (albeit having been modified in recent years) to collect and hold water for farm stock, this site is protected under the Historic Places Act 1993.

*Planting Impact:* Although planting on the hillside above the dam is unlikely to cause any direct damage to the site, it will affect the setting.

*Recommendation:* Authority from the New Zealand Historic Places Trust should be obtained prior to planting in the immediate vicinity of the dam.

### 6.2 AREA B, WARDS VALLEY

*Cultural Values:* Although no Maori archaeological features have been recorded in this valley, the north-facing slope in particular is perhaps the most likely place on the island to have been used for pre-European kumara gardens. At this stage no attempt has been made to search for evidence of Maori cultivations, and until proved otherwise, there remains the possibility that such evidence could be found in the ground there.

The valley is the site of the first European settlement on Quail Island, with an artificially levelled area where Edward Ward's cottage was built in 1851, at the head of it; the levelled area is about twelve by eight metres in size, with retaining walls of basalt boulders on at least two sides (site M36/121). Around the cottage site and stretching down the sides of the valley is where Ward established his gardens, dog kennels, drains, pathway, and other features; this is recorded as a separate archaeological site, which also includes more recent (and as yet unexplained) 'earthwork' features of twentieth century cultivations (site M36/122). Historical records, including a sketch of the area made in 1852 by W. Holmes, give details of Ward's operations (Ward 1851: 129 *et seq.*, facing page 144; Adams 1853:48-49, plate 1). See Figures 4 and 5 of this report.

*Planting Impact:* Planting is probably not planned to cover the cottage site itself but it will affect its setting, especially as described by Adams and sketched by Holmes shortly after Ward and his two brothers had established themselves there (Adams 1853, plate 1 and included here as Fig. 4). Planting on the sides of the valley could disturb or destroy evidence of both Maori and European utilisation of the area.

*Recommendation:* Planting is not recommended in this area. If it is to be carried out, it will be necessary to first obtain permission from the New Zealand Historic Places Trust, which may require intensive archaeological investigations to be made beforehand.

### 6.3 AREA C, ABOVE WALKERS BEACH

*Cultural Values:* There are no known archaeological sites in the area on the hillside above Walkers Beach although there are three recorded Maori sites below it on the beach itself - an extensive shell midden and human burial (site M36/30), a smaller mixed midden which could relate to the headland at the southern end of the beach (M36/128), and the remains of a tidal fish trap (M36/127). For several decades from about 1929 shells were harvested from this beach to make poultry grit, and a concrete slab above high water mark probably dates to this period. A clearly defined track on the hillside at the northern end of the beach is of unknown origin.

*Planting Impact:* Planting will have no direct effect on known archaeological or historic sites in this area, provided that it is kept to the upper parts of the hillside above the central part of the beach. Hillsides above both ends of the beach should be avoided.

*Recommendation:* Planting should be kept to the upper parts of the hillside above the centre of Walkers Beach.

### 6.4 AREA D, SLIP ABOVE QUARANTINE STATION

*Cultural Values:* An historic pathway from the northern end of the rhyolite quarries (site M36/129) runs across the hillside to the level of the western

part of the Quarantine Station. It is likely that this was constructed before 1900 and would therefore be protected under the Historic Places Act.

*Planting Impact:* Planting would be detrimental to the pathway leading from the rhyolite quarries.

*Recommendation:* There would be no problem in planting well above the pathway. If planting is to be carried out at the pathway level, any parts of it not destroyed by the slip should be fully recorded beforehand.

## 6.5 AREA E, ABOVE THE DOG KENNEL SITE.

*Cultural Values:* The remains of historic Dog Kennels built for "heroic era" Antarctic expeditions and two tracks leading in opposite directions just above them have been recorded as an archaeological site (M36/133). Historical data are available on the dog kennels but not on the tracks, which may or may not be associated with them.

*Planting Impact:* Planting in the vicinity of the Dog Kennels would have an adverse effect on the setting of this site and would be detrimental to the tracks, but higher up the slope would not be a problem.

*Recommendation:* It is recommended that planting be kept at least ten metres above the tracks associated with the Dog Kennel site.

## 6.6 AREA F, ABOVE THE QUARANTINE STATION

*Cultural Values:* There are no recorded archaeological sites in this planting area, although it overlooks the Quarantine Station (site M36/131). Three small terraces have been cut into the hillside on the western side of the area (not to be confused with collapsed under-runners higher up the slope), but their origin and significance is unknown. An historical photograph, looking across the mens' barracks (which is registered as a Category 1 historic structure by the New Zealand Historic Places Trust) to the Old Jetty, was taken from the knob at the bottom end of this planting area.

*Planting Impact.* Planting will have no direct effect on historic or archaeological sites, although it would be advisable to identify the three small terraces before planting over them, but trees at the bottom end of the area would hide the view of the Quarantine Station.

*Recommendation:* Planting should be confined to the area above the knob from which the historic photograph was taken.

## 6.7 AREA G, ABOVE THE QUARANTINE STATION

*Cultural Values:* There are no recorded archaeological sites in this area, and no historic records or photographs of this area are known.

*Planting Impact:* Planting in this area is unlikely to have any adverse effect on historic or archaeological sites.

*Recommendation:* There is no restriction to planting in this area.

## 6.8 AREA H, ABOVE THE OLD JETTY

*Cultural Values:* The promontory above the Old Jetty has been recorded as an archaeological site where numerous spalls of basalt occur in the ground (M36/132). The origin of these is not known though they are interpreted as being of early European rather than Maori origin, probably waste flakes produced in the course of shaping basalt blocks for building purposes - see Figure 6. The extent of the spalls and any other archaeological evidence has not been investigated.

*Planting Impact:* Planting in this area would be detrimental to the archaeological site.

*Recommendation:* Planting is not recommended at this stage. Authority from the New Zealand Historic Places Trust will be required before planting is carried out in this area. As the extent and significance of the site are unknown, an archaeological investigation is likely to be necessary before such authority is granted.

## 6.9 AREAS I, J, K, AND L

*Cultural Values:* These areas are associated with European occupation, tree planting, farming operations, and animal quarantine, and although no specific archaeological or historic sites have been recorded actually in them, Areas J, K, and L have historic sites in close proximity.

*Planting Impact:* The growth of native trees in these areas will inevitably affect the settings of historical evidence and appreciation of aspects of past European land use.

*Recommendation:* Careful consideration should be given to the historic values of these areas, particularly J, K, and L, before any decision is made to plant native vegetation in them.

## 6.10 AREA M, EDGE OF TERRACE, QUARANTINE STATION

*Cultural Values:* The terrace at this point, some 15-20 metres above the beach, is the site of the western part of the Quarantine Station which was established in 1874 (site M36/131). Artificially distributed beach gravel is visible in the edge of the bank, and on the terrace itself are concrete and rhyolite foundations of buildings, underground tanks and drains, rhyolite retaining walls, and other structures. There are a number of records and photographs of the utilisation of this general area.

*Planting Impact:* Because it is only a very small part of the recorded archaeological site, planting is unlikely to cause much direct damage, but it would clearly affect the setting of this historic and archaeological site.

*Recommendation:* Planting is not recommended, but if it is to be carried out, authority from the New Zealand Historic Places Trust will be required because the Quarantine Station dates to before 1900.

## 7. Summary and conclusions

While it appears that Quail Island was largely forested prior to the arrival of humans, this forest cover was removed during the time of Maori occupation. At the time of European settlement there was virtually no tall vegetation. Both during the Maori period and in the hundred and fifty years since European arrival, Quail Island has been the scene of a series of different activities, some of them unique in New Zealand's history. Evidence of this human endeavour, both Maori and European, has been left in the form of historic and archaeological sites which provide an irreplaceable cultural and social record.

The growth of plants, particularly trees, will have an adverse effect on this record in some areas, both by actually damaging historic and archaeological sites and by obscuring their settings. With natural regeneration the effects will be comparatively slow, but nonetheless damaging, and at some stage a decision will have to be made as to whether it should be controlled.

Deliberate planting will hasten the adverse effects, and it should be avoided entirely in areas of known high cultural value, particularly Wards Valley, the rhyolite quarries, the Leper Colony, and the Quarantine Station. Elsewhere, a 'buffer zone' should be maintained between recorded sites and areas of planting.

We believe that the human species is as much a natural part of the ecology of an area as any other living thing. Any attempt to restore the pre-human ecology of Quail Island (by human beings themselves) must be balanced against a need to preserve the record of earlier human activities which were a more natural result of the interaction of the human species with its environment.

Sites dating from before 1900 are automatically protected under the Historic Places Act 1993 and require the authority of the New Zealand Historic Places Trust before they may be disturbed.

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## 9. Appendices

### RECORDED ARCHAEOLOGICAL SITES ON QUAIL ISLAND

The following archaeological sites had been recorded on Quail Island at the time of writing (June 1999); it is certain that others exist. Grid references are for Topographical Map 260 M36 Lincoln, 1997 edition.

<i>Site No</i>	<i>Grid Ref</i>	<i>Culture</i>	<i>Type</i>
M36/30	848.5 306.5	Maori	Midden, burial, artifacts
M36/41	849 309	Maori	Adze-head find spot
M36/121	850.5 312	European	Cottage, terrace, stone walls, etc.
M36/122	851 312	European	Fields, dog kennels, path, fence lines, cultivation lines, etc.
M36/123	847 313.7	European	Basalt ballast quarry
M36/124	845 317	European	Basalt ballast quarry
M36/125	844.6 319.7	Maori	Midden
M36/126	844 309	European	Ship hulks
M36/127	846 307.5	Maori	Fish trap
M36/128	848 305	Maori	Midden
M36/129	849 306	European	Rhyolite quarries, tracks
M36/130	850 307	European	Leper Colony - terraces, walls, foundations, etc.
M36/131	853 307	European	Quarantine station - terraces, tanks, etc. (plus historic building)
M36/132	856 306.5	European	Basalt spalling area
M36/133	852 308	European	Dog kennel site, tracks
M36/134	847 311.5	European	Stock-watering dam

### AERIAL PHOTOGRAPHS

The following aerial photographs of Quail Island have been used to help identify sites of cultural value and areas of vegetation for this report; they were made available by the Department of Conservation.

Survey 0165	Photo 134/14	Date 17.01.1941	Scale 1:5000
Survey 1408	Photo 3154/54	Date 11.09.1962	Scale 1:5000
Survey SN2634	Photos L/49, M/49	Date 29.09.1973	Scale 1:6000
Survey SN9703	Photo 10	Date 1997	Scale 1:6000