



East Harbour Regional Park

Resource Statement



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History & Cultural Heritage

1. Locality and origins of East Harbour Regional Park

The areas that lie within the East Harbour Regional Park reflect a series of historical narratives that cover a wide range of topics including ongoing Maori use and occupation, local early European settlement, important aspects of Wellington's maritime history and the use of the eastern harbour as an early and continuing place of recreation for Wellingtonians.

1.1 Pre-European Maori occupation

From Kupe to Whatonga and his descendants

The Maori history of Te Upoko o te Ika a Maui, or the Wellington region, is complex with many changes over the last 1000 years. The very early peoples were known as Maruwiwi or sometimes as kahui tipua. One of the earliest visitors to Te Upoko o te Ika was the Polynesian explorer Kupe, who named many places. These names persist today such as Te Tangihanga a Kupe (Barrett's Reef), Te Aroaro a Kupe (Steeple Rock off Seatoun) and Matiu and Makaro for the Islands in the harbour later called Somes and Ward Islands. Many iwi today claim descent from Kupe. One of those was Whatonga who lived at Mahia in the Hawke's Bay. Whatonga had two sons, Tara and Tautoki. Tara had a close association with Wellington with the harbour called Te Whanganui a Tara (the great harbour of Tara). The Ngai Tara people occupied areas around the South coast of Wellington for many generations and Parangarehu was a key Ngai Tara Pa located in Fitzroy Bay. It is said that the area was divided along the Heretaunga (Hutt) River, with Tara's people to the West from Otaki coast, southwards around to Turakirae and Tautoki having the East excluding the coastal area of Fitzroy Bay (Parangarehu). It is noted that Rangitane was the son of Tautoki.

The next migration from Waipukurau was Ngati Ira who followed the Ngai Tara people in this region and remained in the Eastbourne area until the return of the Te Atiawa from the Wairarapa in 1835.

The arrival of the musket significantly changed the balance of power in Aotearoa. Tribes with muskets were able not only to settle old scores with rivals, but also explore new places with impunity. Final events that triggered these changes were the great taua (war parties) to the south in 1819-20 led by the Nga Puhi Chiefs of Tamati Waka Nene and Patuone, to just south of Makara followed by the Amiowhenua taua of 1821-22. Originating with Ngati Whatua and other Kaipara, Tamaki and Hauraki peoples, the Amiowhenua proceeded first through Hawke's Bay and Wairarapa then north again to Waitara where it was joined by Ngati Toa and Ngati Awa¹. After significant altercations the Amiowhenua travelled through to the Wellington area.

These taua were followed by several waves of migration to the West coast around Waikanae and Kapiti of Ngati Toa, their kin from Ngati Koata and Ngati Rarua from Kawhia along with the Ngati Awa iwi of Ngati Tama, Ngati Mutunga and Te Atiawa from Northern Taranaki. Of these eventually Ngati Tama and Ngati Mutunga came into Te Whanganui a Tara and started to settle around the harbour around 1820 to 1830.

¹ Ngati Awa was the earlier generic term for what are now the iwi of Te Atiawa, Ngati Tama, Ngati Mutunga and Ngati Maru of Taranaki.

Later in this time the fighting Chiefs of Te Atiawa from Nga Motu (now New Plymouth) went to live in the Wairarapa. They returned from the Wairarapa when Ngati Tama and Ngati Mutunga left for the Chatham Islands in 1835 with Te Atiawa taking over places such as Waiwhetu, Ngauranga, Pipitea, and others predominantly around the harbour. After 1842 some of Ngati Tama returned to Wellington from the Chatham Islands and sought to take up their interests again in Upper Hutt. Eventually the Taranaki people, Te Atiawa, occupied all of the Hutt Valley shortly before European settlers arrived. These Te Atiawa iwi descendants have therefore maintained ahi kaa (rights of occupation) until the present time.

Kohanga-te-ra me Kohanga-piripiri (Pencarrow Lakes)²

Kohanga-piripiri was originally a narrow arm of the sea but ponding by ancient shingle beach ridges converted the inlet into the ponded mouth of a stream identified as the old-time Wai-mikomiko (q.v.). This stream rises in the hill now known as Mt Cameron and on modern maps it is re-named Cameron Stream. Best's 1916 map and S.P. Smith's Map No.6 in his Taranaki Coast, of Port Nicholson (Wellington Harbour) as it was prior to 1840, shows Kohanga-piripiri as being more extensive than it is now. This conforms to the geomorphological evidence that the 1855 uplift caused the level of the lagoon to be lowered with a south-western arm being eliminated.

The name has been explained thus: It is a very wind-swept place. The hollow containing the lagoon was figuratively referred to by the Maori as a 'nest' (kohanga), which had to 'cling very strongly' (piripiri), hence 'a strongly clinging nest'. Processes from the marine side of these lakes which could adversely affect the ecology, hydrology or limnology of these lakes would be very significant to tangata whenua.³

Evidence of Maori occupation as far back as the 'Archaic period' is discussed by Palmer (1963)⁴. Prior to uplifts in 1460 and 1855 the lakes would have been considerably deeper and more extensive than today and certainly navigable by canoe. Hut sites have been identified near the rockstack that juts out on the eastern side of Kohanga-te-ra (Keyes, 1970)⁵ and oven deposits in the raised beaches of both lakes have yielded information on species taken as food. Excavated oven deposits in the beaches have included a number of shells of present day species, seal and kiore bones. Of particular interest are the presence of huia mandibles and kakahi shells (freshwater mussel, *Echyridella menziesi*) at Kohanga-piripiri but not Kohanga-te-ra. Both sites contain evidence of workshop activity with adzes, cutting flakes, drills and chisels (Palmer, 1963). The Kohanga-te-ra area contains twice as many terraced sites as Kohanga-piripiri, suggesting that it was more sheltered from wind and food cultivation was easier.

The history of Maori tribes occupying the area is sketchy. Not until the early 19th century is there a clear picture with Ngati Ira occupying the Fitzroy Bay area until about 1825 when defeated by Ngati Awa from Taranaki. Outlying Maori villages around Wellington were abandoned by 1860 and people may have left Fitzroy Bay about that time⁶.

² Ibid p30

³ Raukura Consultants, 1993: *Port of Wellington – Cultural and Environmental Effects Assessment in Relation to a Proposed Dredging Project for Wellington Harbour* p30

⁴ Palmer, J.B. 1963, Maori Sites in Fitzroy Bay. *Newsletter New Zealand Archaeological Association*. Vol 6(3).

⁵ Keyes, I.W. 1968: Dendroglyphs from Kohangapiripiri, eastern Wellington. *Newsletter New Zealand Archaeological Association* vol 11 (3): 103-110.

⁶ Gibbs, George W., Pencarrow Lakes, Conservation values and management.



Kohanga-piripiri

A number of small groves of mature karaka trees that occur around the margins of the upper reaches of both lakes are presumed to be associated with seasonal occupation by Maori. (Best, 1942: 53)⁷. Those at the head of Kohanga-piripiri are particularly noteworthy for the presence of dendroglyphs, an extremely rare form of Maori art on the main islands of New Zealand (Keyes, 1968). Keyes identifies at least two tree trunks with carved features, some identifiable as “fish” motifs. His interpretation of the largest (48 cm long) is that it could represent a killer whale (*Orcinus orca*). It is suggested that the dendroglyphs were made immediately prior to any European influence. Keyes (1970) also draws attention to a possible “tuahu” (sacred place, consisting of an enclosure containing a mound and marked with the erection of rods or poles, which was used for the purposes of divination or other mystic rites).⁸ “Tuahu” can be found at the northern end of Kohanga-te-ra on the true right. This stonewall feature is within the Esplanade Reserve and might have served as some kind of shrine at a time when lake levels were higher.

Kohanga-te-ra Lagoon

These two lagoons are of identical origin but Kohanga-te-ra is the larger sheet of water; Gollans Stream is a ponded watercourse there. In supposed contrast to the basin of Kohanga-piripiri, the hollow occupied by Kohanga-te-ra is taken to be a sheltered place, again linked to a ‘nest’, but one basking in the sun (te ra), and the literal meaning is given as ‘nest basking in the sun’.⁹

⁷ Best, E 1942: Forest lore of the Maori *Bulletin of the Dominion Museum*, Wellington 14

⁸ Williams, H W. *A Dictionary of the Maori Language* 1985: p444

⁹ *Ibid* pp 31-31



S C Brees, 1847, Pictorial Illustrations of New Zealand, London

Scene of Pencarrow Head 1848 (the early Pencarrow Beacon [see section 1.3] is visible in this painting)

[Brees, Samuel Charles] 1810-1865: Pencarrow Head, Fitzroy Bay [Between 1842 and 1844. Drawn by S C Brees. Engraved by Henry Melville. London, 1849] Alexander Turnbull Library, E-070-015

Other Maori sites of significance

Ancient Maori sites are concentrated in the coastal areas and around the Pencarrow Lakes. These range from very old Pa sites through to midden sites.

Takapau-rangi Refuge¹⁰

This seems to have been the name of a remote inland temporary settlement site located at the upper end of Kohanga-te-ra lagoon in the Rimutaka foothills east of Pencarrow Head. The most notable point about it is its remoteness and inaccessibility except for approach on one side only – by canoe. Best states it was ‘a refuge hamlet’ and was prepared as a dwelling place in case of emergency for the women and children of Para-ngarehu Pa.

Te Rae-akiaki¹¹

Pencarrow Head at the entrance on the eastern side of the Wellington Harbour. This name means ‘the headland where [the sea] dashes up or pounds’.

Te Au o Tane Channel¹²

The present main entrance of Wellington Harbour. The name means ‘the current of Tane’. The legendary origin of the main channel was that it was forced by a taniwha named Ngake. Another local taniwha, named Whataitai, tried to force a passage via Evans and Lyall Bays but failed, and then assumed the form of a bird and flew to the top of Mt Victoria (Tangi-te-keo).

Nga Hu and Nga Rerenga¹³

Adjacent places on beach at or near Section 63, north of Pencarrow Head. So named for two women who had a narrow escape from drowning there’ (Best, 8, Pt5, p166). The land section is at Quarry Bluff (or Hinds Point) on the eastern side of the harbour and the location is thus exactly fixed.

¹⁰ Ibid pp79-80

¹¹ Adkin, G. Leslie. 1959: *The Great Harbour of Tara*, Whitcombe and Tombs Ltd p71

¹² Ibid p14

¹³ Ibid p45

Paraoa-nui kainga¹⁴

The position of Paraoa-nui seems to have been re-discovered in May 1955 by Messrs J.B. Palmer and C.S. Curtis, three-quarters of a mile south of Camp Bay, in the largest gully opening on the eastern side of the harbour between Eastbourne and Pencarrow Head. This gully has a flat bottom and is swampy marsh except at its lower end, where the flat becomes a dry terrace-like strip of ample extent immediately behind the 1855 raised beach and the modern beach ridge of fine shingle. The site is marked by extensive cooking-oven and midden debris, and appears to have been predominately a fishing village. No whare sites have been found but they could have been hidden under the sheets of scree which covers most of the relics of former occupation recently rendered visible by a road cutting (see Palmer, 41, pp342-55). This settlement site is an old one but apparently remained in at least periodic or occasional use by successive tribal incomers down to late times. 'Ati-Awa attacked the local people [Ngati Kahungunu and Ngati Ira] at Parawanui (or Paraoa-nui) and drove them away to Wairarapa'. The name means 'large whale' (sperm whale), but no information is available as to how the name originated or became attached to this site.

Korohiwa Pa¹⁵

'Said to have been the name of a fortified village [pa] on the eastern mainland shore opposite Ward Island'. This will be the pa marked on Best's 1916 map on the spur-end above Point Arthur and near the present bus garage.

Muritai¹⁶

The southern part of Eastbourne Borough at the rear of Robinson Bay (Okiwi-nui). Best (7, p85) gives this name attached to old-time middens in the above location in his accompanying map of middens of the Wellington district.

Okiwi-nui¹⁷

Located on the eastern shore of Wellington Harbour and was the original name of Robinson Bay, the open sandy bay on the south side of the Eastbourne.

Matua-iwi Pa¹⁸

'A Ngati-Ira pa' at Robinson Bay, originally known as Okiwi-nui, now Eastbourne. Matua-iwi pa was sometimes loosely referred to as the 'Okiwi-nui pa', meaning the pa at Okiwi-nui.

Orua-motoro Pa¹⁹

At Days Bay and traditionally built by Te Hiha, chief of Ngati Kahungunu. Also apparently the name of the bay (see Best's 1916 map). A Ngati-Ira fortified village [or pa] was situated here. This was perhaps Orua-motoro, but available information is confused and obscure. In the meantime the name can be attached to Days Bay itself.

Te Aewa Kainga²⁰

Said to have been located at Days Bay but no information regarding its position or period has been obtained.

¹⁴ Ibid p62

¹⁵ Adkin, G. Leslie. 1959: *The Great Harbour of Tara*, Whitcombe and Tombs Ltd p32

¹⁶ Ibid pp44-45

¹⁷ Ibid p51

¹⁸ Ibid p40

¹⁹ Adkin, G. Leslie. 1959: *The Great Harbour of Tara*, Whitcombe and Tombs Ltd p55

²⁰ Ibid p10

Whio-rau²¹ (Lowry Bay)

The name means '[the place of] many whio or blue duck (*Hymenolaimus malacorhynchus*)', and was apparently a favorable place for securing this species. Best mentions that Whio-rau was not only the haunt of numerous waterfowl, but that the beach there was also one of the favorite Ngati-Ira fishing grounds within the confines of the harbour.

Nga-matau²²

'Northern headland of Lowry Bay' now called Point Howard. The name means 'bite the fish hook'.

East Harbour Regional Park and the Pencarrow Lakes and the areas adjacent to them have a strong connection with Maori from the earliest times with Ngai Tara strongholds such as Parangarehu becoming places of significance later for the Te Atiawa tangata whenua. Although Parangarehu is outside the Park it remains a site that influences the history of the Pencarrow Lakes area of the Park.

1.2 New Zealand Company purchases and Crown purchases

In 1839, the New Zealand Company arrived in Wellington with plans of establishing a colony and efficient land transfer sales. A scheme to establish the town of Port Nicholson had been set out in a prospectus launched on 2 May 1839. Amid rumours that the British Government would soon intervene in New Zealand to seek sovereignty over the islands, the Company fitted out a ship named the *Tory* and their officials voyaged to New Zealand to buy land for colonisation. On 20 September 1839, the *Tory* sailed into Te Whanganui a Tara.²³

The arrival at Te Whanganui a Tara of New Zealand Company officials on the *Tory* was soon followed by negotiations with local Maori to acquire land for settlement. On 27 September 1839, the Port Nicholson Deed was signed with Te Atiawa leaders from Waiwhetu, Pito-One, Nga Uranga, Kaiwharawhara, as well as Pipitea, Kumutoto and Te Aro being involved in this land transaction. There were numerous difficulties with this attempt to purchase land. For example the deed was in English and the interpreter had only a basic grasp of Te Reo Maori. Te Wharepouri set out the boundaries for the Company using Maori tradition of boundary identification, starting from the coast at Turakirae and moving along the mountain tops naming peaks as he went to the top of Te Awakairangi river catchment in the Tararua ranges and back along the western hills and back to the coast at Rimurapa.²⁴

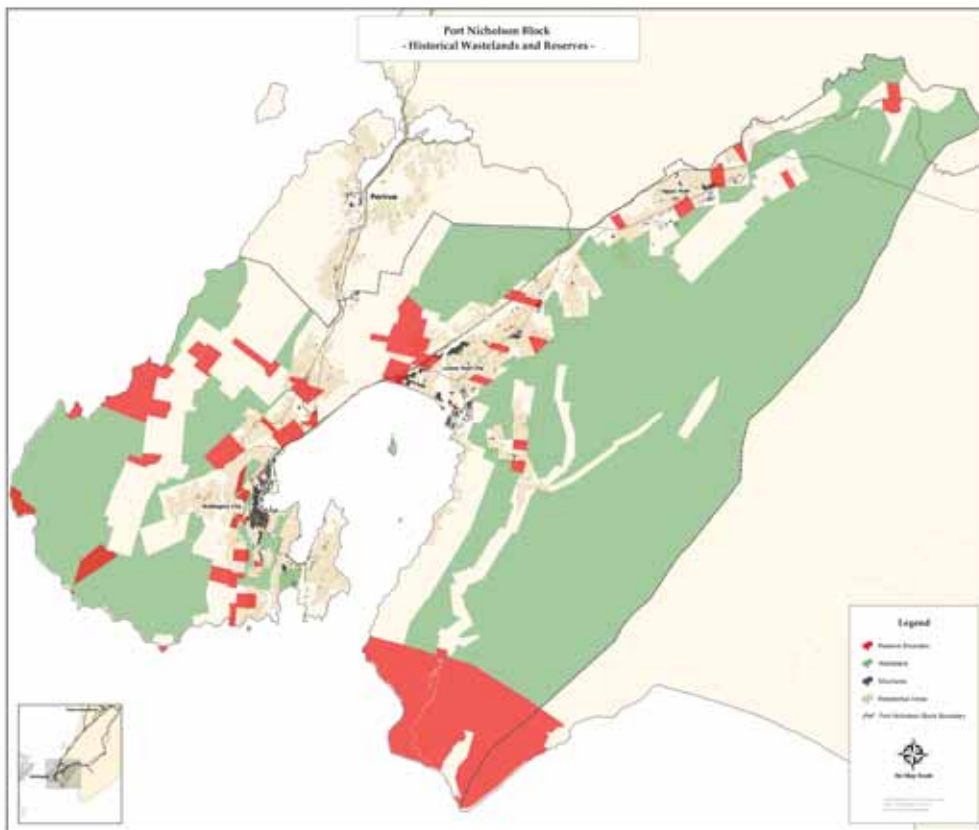
The New Zealand Company arrived at a time when the various rights to land around the region were still in the process, whereby ahi kaa were cementing the rights of conquest or raupatu. The Port Nicholson Block was occupied largely by Te Atiawa and their kin from a hapa of the Taranaki tribe and another hapa of Ngati Ruanui. Ngati Tama and Ngati Mutunga had previously departed to the Chatham Islands. The situation became complicated again with Ngati Toa using a tribe from Taumaranui, Ngati Rangitahi returning then to occupy parts of the Hutt Valley after 1840, to maintain Ngati Toa's interests in the area. They were driven from the valley by British troops and local Maori in 1846, with Ngati Tama then returning to the Hutt Valley from the Chathams to try to re-establish their interests.

²¹ Ibid p104

²² Ibid 48

²³ Ibid., pp.45-8

²⁴ Information on which this subsection is based has come from Waitangi Tribunal *Te Whanganui a Tara me ona takiwā*. Wellington: Waitangi Tribunal, 2003, pp.52-59



Map showing areas designated native reserve and wasteland within the New Zealand Company Port Nicholson Block.

The large Parangarau block extended from a point north of Pencarrow Head (Te Rae Akiaki) to Mukamuka on the Wairarapa Coast including all the coast headlands and bays but excluding several 'surveyed acres' largely on the flat land in the river valleys. This block of nearly 7000 acres included parts of the catchments of the Wainuiomata and Orongorongo Rivers along with the 'eel lagoons' of Kohanga-te-ra and Kohanga-piripiri.²⁵

The whole eastern harbour lands were viewed by Company officials as having been included within their land transaction with local Maori. As the boundaries and features of the purchase were mapped by surveyors, several of the places lying today within the East Harbour Regional Park were named after men with New Zealand Company connections. Pencarrow Head is named after the Cornish country residence of Sir William Molesworth who was a Director of the New Zealand Company.²⁶ Baring Head is named after a London banker who was a very keen supporter of the Company.²⁷ Hinds Point, passed when travelling along the coastal road, is named after the Reverend Samuel Hinds, said to be an avid clerical supporter of the Company.²⁸

1.3 The first navigational aids at Pencarrow

Not surprisingly, Pencarrow Head immediately featured amid Company plans for establishing navigational aids. In 1840 a public reserve for lighthouse purposes was set aside there although nothing was immediately put in place. Without any navigational guidance, shipwrecks soon began to litter the Wellington coast. On 4 August 1841,

²⁵ H H Turton, *Native Affairs and land Purchases in the North Island of New Zealand*, Vol 2, 1883

²⁶ East Harbour Environmental Association, *The Pencarrow Walk: Eastbourne to Kohangatera*, Eastbourne, The Association, 1991, p.6

²⁷ 18 Dec 1958, *Upper Hutt Leader*

²⁸ Bagnall, op cit, p.13

the *David* was wrecked near Sinclair Head with the loss of three lives²⁹ and on 12 December, the American whaling ship *Elbe* went aground in Palliser Bay. According to William Wakefield, the New Zealand Company's leading official in Wellington, the *Elbe* had run past the opening of Port Nicholson harbour. He suggested that had there been a lighthouse available, or even a beacon, the accident may not have happened.³⁰ Following this spate of sinkings, a public meeting was held at which Wakefield was censured for not having erected beacons previously. Early in 1842, the Company erected a pyramid-shaped beacon on Pencarrow Head³¹ but this was soon blown over in gale winds. A replacement beacon was erected which was described in 1844 as being 30 feet high and painted white. Other than in clear weather, however, the beacon could not be seen when more than five miles away.³²

The shipwrecks continued around Wellington. One of the more serious, of the cutter *Matilda*, occurred on the eastern shore at Fitzroy Bay. On 6 May 1848, the *Matilda*, coming to Wellington from the Manawatu with a cargo of wheat, was caught in a gale and was driven ashore in Fitzroy Bay near the heads of the harbour. Although the ship was discovered on the following day, there was no sign of the two-man crew. Two days later, however, both bodies were washed up on shore between Parangarehu pa and Pencarrow Head. The bodies were buried nearby. The anchors and masts were removed, but the badly damaged hull was left where it had beached.³³

Another shipwreck on the Pencarrow Coast occurred on 29 September 1849 when the *Inconstant*, travelling from Adelaide to Callao and entering Wellington harbour to replenish its water supply, ran aground at a point now named after the ship. Although quick action by the harbourmaster got the *Inconstant* off the rocks and towed into port, her hull was found to be so badly damaged that the ship was condemned. Soon after, prominent Wellington businessman John Plimmer bought the hull and used it as a warehouse and jetty. The well-known Wellington landmark was eventually nicknamed 'Plimmer's Ark' by locals.

One of the worst shipwrecks that Wellington experienced at this time occurred on 23 July 1851 when the barque *Maria*, sailing from Lyttelton to Wellington, came too close inshore and hit submerged rocks near Cape Terawhiti. When the masts collapsed the ship broke up and 26 lives were lost with only two survivors being pulled from the water.³⁴ This tragedy increased community demands for the erection of a lighthouse at Pencarrow.³⁵ By the beginning of 1852, Governor Grey had issued instructions that a lighthouse would be built. In response, on 23 April, Colonial Engineer Edward Roberts reported on the necessary height of the structure, the type of light that should be used and the nature and layout of outbuildings. He also recommended the lighthouse be made of iron to resist both fire and earthquake.³⁶

As planning for the lighthouse continued, another shipwreck occurred on the Pencarrow coast within the very vicinity of the beacon's location. On 5 June 1852, the schooner *Henry* was totally wrecked in Fitzroy Bay with the loss of the three young crewmen who were on board. The vessel was transporting army supplies from Porirua to Wellington when a sudden storm hit and the schooner was driven ashore where it

²⁹ Ingram, C.W.N. *New Zealand shipwrecks, 1795-1982*, 6th ed, Wellington, Reed 1984, p.18

³⁰ 5 Feb 1842, Wakefield to NZ Co. Sec., NZC3/2 No.89, Arch NZ, Wgtn.

³¹ Ibid

³² Wakefield, Edward Jerningham, *The Handbook for New Zealand*, London, John W. Parker, 1848: See also Ross, John O'Connell *The Lighthouses of New Zealand*, Palmerston North, Dunmore Press, 1975, pp.18-9

³³ Ingram, op cit, p.35. Also. *New Zealand Spectator and Cook's Strait Guardian*, 10 and 13 May 1848.

³⁴ Ingram, op cit, p.41

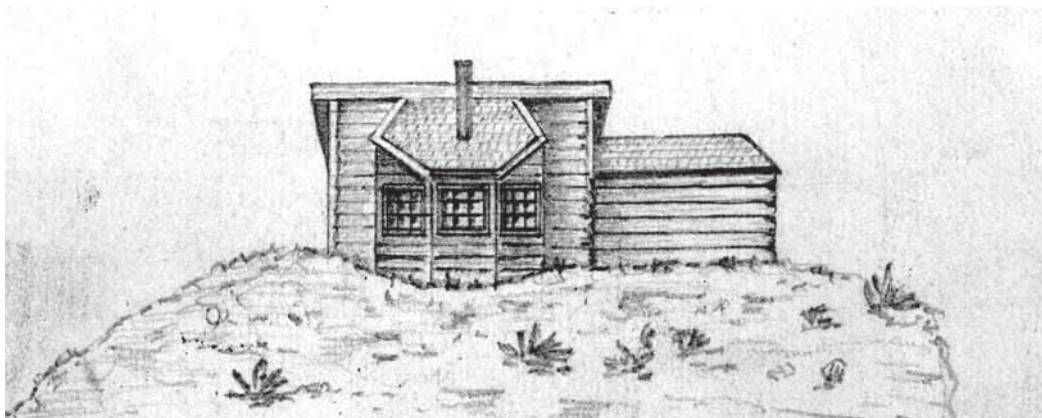
³⁵ East Harbour Environmental Association, op cit, p.11

³⁶ 23 Apr 1852, Roberts to Colonial Sec., LE1854/6, Arch NZ, Wgtn.

broke up. The Harbourmaster wrote to the Pilot seeking his view as to whether the presence of a lighthouse would have averted the disaster. The Pilot responded that a light would have been of no use in preventing this particular tragedy. Nevertheless, public concern had been created. A deputation, headed by Captain W.B. Rhodes, visited Governor Grey on 17 June 1852. The Governor informed these representatives that a decision had been made to erect an iron lighthouse on Pencarrow Head. He noted, however, that while planning was continuing there would be some delay in getting the structure built. Therefore Grey promised that as an interim measure, a lighthouse keeper's residence would be built featuring a large semi-circular window in which a navigational light could be placed.³⁷

The lighthouse keeper appointed to the job was George White Bennett, a seedsman from England, who came to New Zealand early in 1840. He was soon followed by his fiancée Mary Jane Hebden, the 21-year old daughter of the squire of Dacre Banks, a small West Yorkshire village. By mid-1852, the now married couple and their three children, moved out to the new lighthouse keeper's residence.³⁸ By 20 August 1852, however, Bennett was complaining about his residential circumstances:

*The House is neither Wind or Water proof. The Stove is of very little use. I have been four days without being able to boil the kettle inside or out. Water is a full quarter mile off. Wood from one to three miles.*³⁹



Bennett's House, c.1852 [Wilson, H]: First lighthouse at Pencarrow Head, built about 1852. From sketch owned by Mr H Baillie, City Librarian 30 October 1923 Alexander Turnbull Library, A-032-012

However, Bennett's complaints were received with little sympathy from officials.

*The house being perfectly new is as proof against the weather as wooden houses usually are in exposed situation. The stove is of the same description as those used in Government offices. Bennett was quite aware of the distances he had to carry fuel and water before accepting the appointment of lighthouse keeper and therefore has no present ground of complaint on that score.*⁴⁰

Possibly connected with the harsh conditions the family faced, in the first year of service at Pencarrow, one of the Bennetts' children, a daughter Eliza, died from illness.⁴¹

³⁷ See Ingram, op cit, p.43. Also *New Zealand Spectator and Cook's Strait Guardian*, 12 and 19 June 1852: And 17 Jun 1852, Domett to Rhodes, LE1854/6, Arch NZ, Wgtn.

³⁸ Ellen Ellis, "A first and only for Pencarrow Lighthouse", *Historic Places*, March 1987, No.16, pp.16-7

³⁹ 20 Aug 1852, Bennett to Colonial Sec., LE1854/6, Arch NZ, Wgtn.

⁴⁰ Beaglehole, op cit, p.36

⁴¹ Ibid

1.4 The coastal road

Whilst shipping to and from Wellington Harbour continued to face difficulties, European settlement over at the eastern bays began to progress. The first settlers in Lowry Bay, dating from 1841, were the Jackson Family and the Greenwood brothers. Within Day's Bay, the first European resident, also from 1841, was William Todd. The settler W.B. Rhodes occupied the area around Fitzroy Bay as a cattle run as early as July 1842 having probably come to some arrangement with the local Maori who occupied nearby Parangarehu.⁴²



The Pencarrow Coast Road

[Barraud, Charles Decimus] 1822-1897 :[Paraoa-nui near Pencarrow, Port Nicholson. 1865] Alexander Turnbull Library, B-006-022

As settlement proceeded in the eastern bays, new routes of travel were discovered. The first European settler recorded as using the land and beaches along the coast to travel to and from the Wairarapa was William Deans who undertook the journey in October 1840. Other Wellington settlers, such as Donald Sutherland and Richard Barton, who wished to ascertain the availability of flat pasture land within the Wairarapa, soon followed. It was not until April 1844, however, that the first recorded attempt to drive sheep around the coastal route occurred, a journey that was undertaken by Charles Robert Bidwill and two shepherds. Others soon followed.

Many of those travelling around the coast, recorded developments occurring at the Te Atiawa village of Parangarehu, on the coast at Baring Head. In March 1846, the missionary William Colenso recorded that he found about 40 residents there engaged in threshing their wheat of which they already had 80 bushels.⁴³

Eventually, the Government granted a 1600-acre reserve at Parangarehu with the Reserves Commissioner noting that Pito-one Te Atiawa had "eel-ponds, extensive cultivations and other vegetable productions" in this area. He also recorded that Parangarehu was an important fishing station.⁴⁴

In January 1850, Crown official Henry Tacy Kemp undertook a census of the local Wellington Maori population. He described Parangarehu as being a small fishing village and noted that the surrounding land was being leased by its owners to Pakeha runholders which he thought was an ideal arrangement.

*The contractors have their fat cattle within a short distance of town and the Natives derive an annual and almost certain income from the rents of land which would probably otherwise lie unoccupied.*⁴⁵

Despite the land being leased out, Te Atiawa occupation continued. In 1853, a traveller named Carter recorded seeing a dozen huts at the village of Parangarehu. He had reached there by using the coastal road which was still the main route to the Wairarapa. Carter described the road as follows:

The course before me was mainly over a narrow belt of land by the sea shore with high bluffs and hills on my left, and the open ocean on my right. The road I had to travel was no road at all. It was a native track, improved in places 'few and far between' by European settlers who had driven cattle over this – the first and original road to the Wairarapa. Sometimes this

⁴² Bagnall, op cit, pp.38-40

⁴³ Ibid, p.16

⁴⁴ Ibid

⁴⁵ 1 Jan 1850, H.T. Kemp to Colonial Secretary, found in the New Munster Gazette, 21 Aug 1850, Vol.III No.16

road seemed to terminate in an impassable swamp, in places it ran through wet bush; then it passed over rocks and between huge stones and took a sudden turn down to the sea beach along which it continued over ground composed of loose stones, soft sand, fine and coarse gravel, till some natural obstruction appeared to vary the monotony of the sea beach and of this Nature's coast road...

Despite these difficulties, for many years the coastal route was the main way to take sheep and cattle into the Wairarapa until the Rimutaka hill road was opened in 1856.⁴⁶ Even after this date, however, the Pencarrow coastal route remained popular especially after 1855 when the earthquake that struck Wellington raised the East Harbour coastline by about 2 metres enabling an improved degree of access around the coast.⁴⁷

1.5 New Zealand's first lighthouse

After 1852, progress continued with the Government's intention to erect a lighthouse at Pencarrow especially as the light displayed in the keeper's house was said to be: "... of an extremely inferior description, which appears to be of little, if any, real utility, and is considered... as likely to mislead the unwary."⁴⁸ Plans for possible lighthouses were submitted to the Governor by September 1852 but a question arose as to whether Pencarrow Head or Point Dorset was the best location. After inquiries were made of the Wellington Harbour Master and Pilot, Pencarrow remained the chosen site. As estimates and designs for the lighthouse came forward, however, further delays arose as cost cutting measures were always being suggested by officials.⁴⁹

In the absence of any specific action taking place at Port Nicholson, and with pressure rising for the urgent establishment of lighthouses around New Zealand, a Select Committee of the House of Representatives was appointed on 16 June 1854 to investigate and report.⁵⁰ On 31 July the Committee reported that the erection of a lighthouse at Wellington was of the "most urgent importance."

The harbour itself is more difficult of access at night than any other harbour in the Colony equally frequented by shipping; and the coast in its immediate neighbourhood is so formed that both life and property are endangered to a great extent by want of such a safeguard.⁵¹

Despite this recommendation, no immediate action was taken.

As the Government prevaricated over the building of the lighthouse, the existing keeper's difficulties had continued. One visitor recorded in May 1853 that in heavy gales the house:

...rocked and shook so much as to frighten the keeper and his family out of it, who in that case, took refuge in a sort of cave or cabin, which he had scooped out of the side of the hill, over which he had fixed a thatched roof and in which he had built a rude stone chimney. This cabin was his house of refuge and his cooking place. Altogether it was a most wretched place for any civilised human being to live in, even in New Zealand...⁵²

⁴⁶ 18 Dec 1958, *Upper Hutt Leader*

⁴⁷ East Harbour Environmental Association, op cit, p.4

⁴⁸ "Report of the Beacons and Lighthouses Committee", Votes & Proceeding of the House of Reps, Sessions 1-2, 1854

⁴⁹ See LE1854/6, Arch NZ, Wgtn.

⁵⁰ "Report of the Beacons and Lighthouses Committee", op cit.

⁵¹ Ibid

⁵² As quoted in Sheehan, Grant and Gibbons, *Anna Leading Lights: Lighthouses of New Zealand*, Christchurch, Hazard Press, 1991, pp.48-9



The First Permanent Pencarrow Lighthouse, constructed 1858 Historical Society of Eastbourne

The Bennett family's misfortune was not over, however. In June 1855, whilst travelling across the harbour in rough weather on his return to Pencarrow, George Bennett, and the coxswain of the boat in which he was travelling, were washed overboard. Both managed to reach a rock 50 yards offshore. As Bennett could not swim he was reluctant to leave the rock and clung there for two hours. Eventually, he was washed off and drowned.⁵³

Whilst inaction over the lighthouse continued, ships in Wellington continued to be wrecked. One of these occurred on the eastern harbour coast on the rocks off the Pencarrow Head and therefore presumably just below the keeper's house. On 5 May 1856, the schooner *Queen of the Isles*, sailing in the early hours of the morning with a fair wind and in bright moonlight went aground at Pencarrow and sank. Although no lives were lost, the cargo of wool, cheese and wheat was completely lost.⁵⁴

By 1857, the Wellington Provincial Council decided that the lighthouse that had been designed by Edward Roberts five years earlier should be built immediately and the order was placed with Cochrane and Co. of Woodside in England.⁵⁵ Before this could occur, however, another serious wreck occurred on the Pencarrow Coast.

On 15 April 1858, in Fitzroy Bay, the dismasted wreck of the schooner *Port Glasgow* was found by local Maori two miles south of the keeper's house. Wreckage was strewn along the beach, but there was no sign of the crew. The schooner's lifeboat was found on rocks below the lighthouse smashed to pieces. It was presumed that all hands had perished in a gale that had blown the previous day.⁵⁶

Two months after this tragedy, in June 1858, the components of the lighthouse finally arrived in Wellington. The cast iron pieces were shipped in 480 packages weighing 60 tons in total.⁵⁷ The structure had been erected by December. Opening day, which was to be on the first day of the New Year, was one of celebration. A morning and afternoon excursion was provided by the steamship *Wonga Wonga* to go out and view the newly completed building. A German-style band had been engaged and the passengers danced on deck. On the approach of the morning excursion to the Heads, with 65 people on board, the lighthouse was described as having a "bold appearance."

*The engines were stopped, guns fired, "God save the Queen" was played, and, amidst enthusiastic cheers, the party on board congratulated those on shore who had been concerned in the great work.*⁵⁸

For the afternoon excursion, which bore the official party to open the lighthouse, the *Wonga Wonga* was crowded with 300 people but there was still room for dancing. The Wellington Provincial Superintendent and others landed, and after being shown over the lighthouse, lit the light for the first time.

The lighthouse stood 98 metres (320 ft) above the water with a light that could be seen for 50 miles. The lighthouse experienced difficulties, however. Despite being opened

⁵³ Ellis, op cit, pp.16-7

⁵⁴ Ingram, op cit, p.49

⁵⁵ Churchman, Geoffrey B. *New Zealand Lighthouses*, Wellington, GP Books, 1989, p.12

⁵⁶ Ingram, op cit, p.54. *New Zealand Spectator and Cook's Strait Guardian*, 21 Apr 1858.

⁵⁷ Churchman, op cit, p.103

⁵⁸ *New Zealand Spectator and Cook's Strait Guardian*, 5 Jan 1859.

with an occulting light with eclipses every two minutes, on 1 September 1859 this was changed to a fixed light due to problems with the mechanism.⁵⁹

The first keeper of the new lighthouse was Mary Jane Bennett, who it appears had unofficially taken over her husband's duties on his death four years earlier. She was 40 years old at the time and was given the annual salary of £125 inclusive of firewood. This made Pencarrow not only the first permanent lighthouse in New Zealand, but it also meant that Mrs. Bennett was the first and only woman lighthouse keeper in the country's history.⁶⁰ She remained keeper at Pencarrow until 1865 when it is believed she returned to England for the sake of her children's education.⁶¹ Her Assistant Keeper was William Lyall.

1.6 Shipwrecks and a new light

For a number of years after the erection of the Pencarrow lighthouse, few wrecks are recorded on the Wellington coastline. In 1867, however, two incidents took place, both occurring on the shores of Pencarrow. On 2 August the cutter *Cordelia* was wrecked near Baring Head with the loss of three lives. Later in the year, on 6 November, the barque *Affiance*, sailing from New South Wales to Lyttelton, hit rocks off Kapiti Island during a gale and anchored off Fitzroy Bay in calmer water. Despite the efforts of the crew at the pumps, however, the ship was taking on too much water and soon sank without loss of life.⁶²

Despite the presence of the long-awaited lighthouse, the Pencarrow Coast remained a dangerous threat to shipping. Many wrecks occurred during the 1870s although none resulted in loss of life. The cutter *Supply* was wrecked on rocks just inside Pencarrow Head during the night of 6 December 1870 after it slipped its moorings in a heavy gale. Six years later, on 18 May 1876, the schooner *Nile* became a total loss on rocks below the lighthouse in the similar circumstances of coming adrift from moorings in heavy wind. The following year, on 10 November 1877, the wooden steamer *Waihopai* drifted onto rocks near Pencarrow Head whilst entering Wellington Harbour also during a gale. Exactly a year later, the barque *Carlotta*, carrying 500 tons of coal from Newcastle, went aground on rocks immediately below the lighthouse. The crew was taken off by a passing steamer, but before any attempts could be made to salvage ship or cargo, the continuing heavy seas completely broke the ship. The decade ended with a further shipwreck, again at Pencarrow Head, of the brigantine *Hannah Broomfield* on 4 October 1880.⁶³

All of the above shipwrecks were caused by high winds blowing ships ashore and the lighthouse played little part one way or the other. With several cases in the last decades of the century, however, a flaw in the positioning of the lighthouse was a major contributory factor to several accidents.

During a voyage from Greymouth to Dunedin in July 1881, the *Maggie Patterson* encountered heavy seas and gale winds in Cook's Strait. Little progress south was made and several sails were soon split. When the light at Pencarrow was seen, the captain changed his course and made for this destination instead. As the schooner headed towards Pencarrow, an exceptionally heavy rain squall obscured the lighthouse.

⁵⁹ Ross, op cit, pp.21-2

⁶⁰ Churchman, op cit, pp.12 and 103

⁶¹ Sheehan and Gibbons, op cit, pp.48-9

⁶² Ingram, op cit, pp.127-8. Also. *Evening Post*, 8, 11, 12, 13, 14, 18 Nov 1867.

⁶³ *Ibid*, pp.147, 172-3, 183, 189-90 and 198.



Lighthouses at Pencarrow Head, Wellington, Alexander Turnbull Library, 1/2-035193

Original permanent (1858) lighthouse at left, 1906 low level light at right

Shortly after, the *Maggie Patterson* went aground on rocks off Pencarrow Head. Although the crew got off safely, the pounding of the storm and heavy seas soon broke the ship up.⁶⁴

Five years later, in 1886, a similar set of circumstances relating to the weather combined to render the Pencarrow light again ineffective. On the night of 1 November, the iron steamer *Tui* left Queen's Wharf on a voyage to Foxton. As the ship was leaving the harbour, heavy wind and thick rain combined to obscure the lighthouse. Soon after, the steamer, travelling too fast and without precautions being taken to account for the weather, struck rocks a mile north of the lighthouse. The speed at which the *Tui* was travelling was such that the steamer ran right over the reef ripping out the bottom of the vessel. The captain sought to turn the vessel around and beach it at Worsler Bay, but the water was entering into the head of the ship so quickly that little progress was made. Within 15 minutes, the ship went down in 8 fathoms of water with the masts sticking three feet out of the water. Before this happened, the ship's two lifeboats were launched and all nine passengers and nine crew landed safely on the western side of the harbour. However, virtually nothing had been saved of their possessions. It was reported that women passengers had not been able to fully dress and came ashore in bare feet. Their purses had been left under their pillows. The Captain had been able to grab the ship's papers but the crew lost all their worldly possessions. Several of the passengers were part of a bridal party travelling to a wedding in Foxton and all the wedding presents and dresses, as well as the cake, went down with the wreck. It was hoped to be able to raise the ship and one failed attempt was made, but some days later the weather again came up and the ship broke up.⁶⁵

Although during the 1890s, there were fewer shipwrecks of larger vessels on the Pencarrow shore, three were recorded: the cutter *Vinnie* on 13 May 1892 at Pencarrow Head, the barque *Halcione* on 8 January 1896 on rocks in Fitzroy Bay and the ketch *Reliance* at Hinds Point on 29 February 1896. No loss of life was recorded in any of

⁶⁴ Ibid, p.203.

⁶⁵ Ibid, pp.228-9 Also *Evening Post*, 2, 5, 11, 12 Nov 1886.

these accidents. In the case of the *Halcione*, which had sailed to Wellington all the way from London, it was again recorded that the Pencarrow's light had been obscured by the weather conditions until it was too late and the ship was on the rocks. When the crew tried to reach the shore in one of the lifeboats it was capsized and dashed on the rocks. Although no lives were lost the men were bruised and their clothing had been shredded. They made for the lighthouse where the keepers and their families rallied round to assist the stricken crew.⁶⁶

The tendency of the Pencarrow light to be obscured by fog or rain was partly attributed to its location on the top of headland. To counter this problem, in July 1898, New Zealand's first fog signal was installed at the lighthouse. It was an explosive cotton-powder signal. During fog, signals were fired at intervals of 15 minutes.⁶⁷ Explosions could be heard up to seven miles away.⁶⁸

In addition, on 10 October 1906, a low level light was established on the shoreline directly below the older lighthouse.⁶⁹ The new white concrete tower was rose 18 metres above sea level. Every twelve seconds it would flash of white and red lights (the former having a range of 19 miles, the latter, 15 miles). The illuminant was kerosene.⁷⁰ The low-level light was viewed as a harbour light and came under the care of the Wellington Harbour Board, whilst the Pencarrow light, as a coastal light, remained under the Marine Department's administration.⁷¹

1.7 Three dramatic sea rescue attempts

In the early decades of the twentieth century, the keepers at the lighthouse were actively involved in attempts to rescue stricken seamen. The stories are important to tell for the sheer drama of events. Some were successful, others were not.

On 13 September 1910, the ketch *Felicity*, heading for the Marlborough Sounds with a cargo of timber and fruit, struck difficulty in the winds of the Cook's Strait and sought to return home. When coming into the harbour, however, some of the ship's sails came away. With less control available, the *Felicity* struck a large reef said to have been 80 feet long and 30 feet wide and located about 100 yards from the low-level light at Pencarrow. The three-man crew reacted quickly and scrambled along the rigging at the fore of the ship and lowered themselves onto the reef which fortunately for them was well out of the water. They had only had time to grab a change of clothing, a blanket and two tins of canned meat. Meanwhile, the *Felicity* was being pounded on the reef until within only a few minutes the ketch broke up and sank. By this time it was 6.30pm and too dark for the men to attract the attention of the keepers in the lighthouse. They sheltered under a ledge on the reef and prised open the cans of meat whilst the sea continued to pound the rocks around them. The three maintained vigil all night but were soaking wet and famished despite their small meal. When dawn came at 6am the next day, the men began to wave their blanket at the lighthouse. The keeper, Mr Parkes, soon spied them, set out in a boat and brought the crew ashore for hot food and dry clothes after which they walked to Days Bay and caught the ferry into town to report the wreck.⁷²

⁶⁶ Ibid, pp.247, 262 & 263. Also *Evening Post*, 9 Jan 1896.

⁶⁷ "Pencarrow Head Lighthouse" by Supt. of Lighthouses, George Tanner, p.10, found on M1 8/45/14/1, Arch NZ, Wgtn.

⁶⁸ Churchman, op cit, p.20

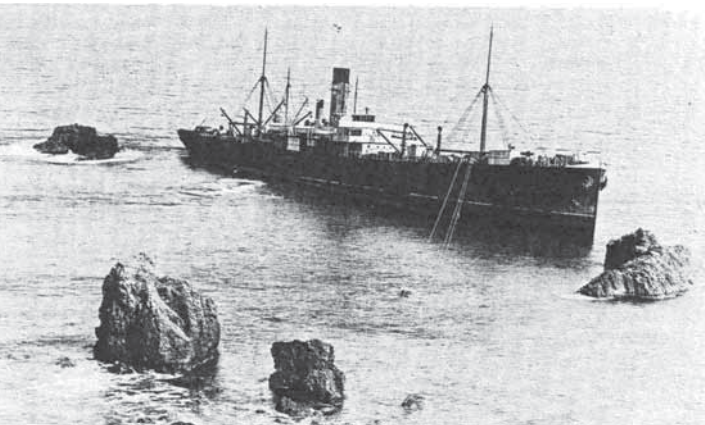
⁶⁹ Tanner, op cit, p.11

⁷⁰ Churchman, op cit, p.101

⁷¹ *Evening Post*, 9 Sept 1933

⁷² Ingram, op cit, p.293. *Evening Post*, 10 Jul 1906.

Another dramatic rescue resulted on 25 August 1913, when the steamer *Devon*, on a voyage from Montreal to several New Zealand ports, turned into Wellington harbour in high winds, thick rain and heavy seas. Confusing the identity of inner harbour lights, the master of the ship came in too close to the Pencarrow shore. At 8.15pm the ship went aground on rocks 300 yards from shore and directly opposite the low level light at Pencarrow Head. The lighthouse keeper, having witnessed the collision, informed Wellington and soon various vessels sought to reach the stricken ship. Whilst the harbour ferry and tug could not get out, the new inter-island ferry *Wahine* reached the wreck site but could not get close enough to take any action. On board the *Devon*, the crew were unable to lower lifeboats in the heavy seas and were stranded in darkness as the onboard lights had gone out when the engine room flooded. With waves crashing over the side of the ship, the crew huddled on deck waiting for morning. By dawn, would-be rescuers had gathered on the shore opposite where the *Devon* was stranded. Three lines on which the crew would be brought ashore were shot from the steamer but either fell into the sea or became entangled in rocks. A party of five men volunteered to struggle out through the rocks and dashing sea to try and recover the lines. After some effort they were successful and secured a line to enable the crew to be taken off. With more than 50 crew, and several minutes required for each rescue, the operation took four hours to complete. All the crew were rescued, including the ship's cat and her litter of kittens. On the afternoon of 26 August, the bottom of the *Devon* collapsed and soon after the port side of the stern broke to pieces.⁷³



Wreck of the Devon, 1913. Wellington Maritime Museum and Gallery

Compared with the successful rescues attending the wrecks of the *Felicity* and *Devon*, on the morning of 30 January 1921, the staff of the lighthouse were involved in a tragic incident for which they could only be helpless spectators and for which they later were partly blamed. As the morning dawned, John Hussey, a gardener by trade who had been employed as a temporary lighthouse keeper, observed a small schooner, the *Omaka*, coming from the south and making for the harbour. Although the weather was rough, the schooner was less than a quarter of a mile from the lighthouse and all seemed well. As Hussey's shift had ended, he put out the light and made for downstairs. When he looked again for the schooner, it

had somehow capsized. It was just before 5 am. Looking for signs of the six-man crew, Hussey saw one clambering up the side of the vessel which then broached, sweeping the man off. Two other men were seen in the wreckage. Another was in the lifeboat but he had no oars and in less than three minutes he was capsized. Hussey ran to the principal keeper to get help. There was little they could do but watch. At 5.20am, the steamer *Wairau* came into the harbour and passed within 300 yards of the men in the water. The keepers tried to signal the boat's attention but without success. The lighthouse's signal flagstaff had not been used for many years and by chance had been taken down on the previous day for repairs. On board the *Wairau*, the wreckage of the schooner could not be seen as the vessel had broken up and the conditions of the sea obscured the struggling crew.

The lighthouse staff continued to watch the *Omaka's* crew. They could now see three men. One was clinging to a tank, two others had their arms wrapped around a plank. Although the current was bringing them into the harbour, it was not pushing them

inshore. As the keepers watched, the man on the tank slipped into the water and disappeared. Shortly after, another steamer, the *Baden Powell*, came into the harbour and was less than 100 yards away from the two men who were clutching either end of the plank. They climbed onto the plank and drew themselves up into a kneeling position to attract those on board the steamer. The lighthouse staff also waved and called out. The *Baden Powell* passed by not having noticed the men. As one of the keepers followed along the shore, he saw one of the men swept off the plank and disappear from sight. The last man maintained his grip until he was opposite Gallards Bay when he then went from sight. During the inquiry that followed the tragedy, the lighthouse keeping staff expressed their view that had the flagstaff been available and had they a small boat at the lighthouse, then some lives might have been saved.⁷⁴

Two months after the capsizing of the *Omaka*, the auxiliary scow *Magic* went aground on Inconstant Point. The crew landed safely in the lifeboats, the *Magic* broke up and was a total wreck.⁷⁵

1.8 Recreation and Reserves

Dating from the beginning of Pakeha settlement, the hills within the East Harbour Regional Park have been a lure for bushwalkers and trampers. Charles Heaphy wrote of a trip he and naturalist Dieffenbach took as early as 1839 travelling up to the West Wainuiomata ranges. They were trying to locate the rare native bird the huia which they had heard could be found in this locality. Accompanied by two Maori youths the party reached the ridge and made camp in the bush. Just before morning, Heaphy awoke to the sound of bellbirds:

*Thousands of these singing together... the sound seemed to arrange itself into scales, like peals of bells running down octaves. As the sun rose this music ceased altogether.*⁷⁶

As the town of Wellington began to grow in the 1840s, the east harbour hills remained comparatively unspoilt by development. Dating from the late 1850s, the shores of the eastern harbour became a popular destination for holiday excursions. Initially, these were centred on Lowry Bay or York Bay. Although the land of both bays was in private ownership, permission was given to groups to use it on condition that a donation was paid which went towards charity. Initially, groups wishing to picnic on the eastern shore found their way across in a variety of vessels but as the 1860s progressed, and the numbers increased, especially on public holidays, steamers were chartered for the occasion. On shore, bands would often set up and the scene would become one of dancing as well as picnic luncheons. So popular did the eastern harbour prove to be, that by Boxing Day 1869 more than 700 persons were recorded as having visited Lowry Bay, the local paper reporting: "The greatest good humour, however, prevailed, and if any of the visitors were not merry, it was their own fault."⁷⁷



Hiscocks, Ercildoune Frederick *Sunday on the Day's Bay steamer en route for Rona Bay (the new Jerusalem)*. [ca 1910]
Alexander Turnbull Library, NON-ATL-0060

⁷⁴ Ibid, p.337. Also See Marine Department Archives, M1 13/13, Arch. NZ, Wgtn

⁷⁵ Ingram, op cit, pp.318-9

⁷⁶ Ibid

⁷⁷ Beaglehole, op cit, pp.24-5

Within neighbouring Days Bay, the first European resident, William Todd, had acquired most of the land. Although part of Todd's land was leased to George Day, in 1894 and 1897 it was sold to J.H. Williams who began to develop the site as a picnic spot for Wellingtonians. In the last decades of the nineteenth century, the owners of land in Days Bay had developed the area as something of an amusement park and the focus of holiday excursions shifted to this destination. The landowners tried to link the success of their amusement park to the successful establishment of a cross-harbour ferry service but competition, expense and insufficient total numbers of visitors meant that the business always struggled. Nevertheless, on summer weekends and public holidays the popularity of Days Bay remained high. Despite this, by 1910, the owners of the Days Bay park were reluctant to continue maintaining the high cost of keeping attractions going. Instead, they decided to subdivide the land into residential lots and sell these off. A public outcry arose. Through a combination of private donation, public subscription and Wellington City Council subsidy, the area was purchased as a reserve and renamed Williams Park after one of the major contributors. In 1914, William Dick was appointed custodian, a position he held till 1948. He patrolled the park on horseback, particularly the bush area, checking for fires or vandals, assisting picnickers or walkers and maintaining tracks.⁷⁸ In 1919, the bush area of Williams Park was redesignated as a forest plantation for further protection.

In addition to Days Bay, the area in which the Pencarrow lighthouse was located had also become a popular site for visitors by the 1920s. The two-hour walk along the coast road was a difficult but dramatic journey:

*The view is certainly fine along, the ridge, valley and hills on one side and the blue sea on the other, but for those who don't mind a scramble in places and rather heavy going, the route along the coast is not without interest. Here and there, especially during the last mile or so, can be seen half buried in the shingle and sand the bleached bones of scows and other hapless wooden vessels which in days gone by have been driven on to the rocky coast. And at the end of the walk, at the very foot of Pencarrow Head, the gaunt iron bows of the ill-fated Devon.*⁷⁹

The increased popularity of the coast road brought for the lighthouse keepers, a number of problems as they noted in 1928:

*Of late year the number of visitors to the Reserve has been a source of considerable worry to the keepers, as frequently locks have been broken off the buildings (including the Magazine) horses have been shot and small fires started on the beach.*⁸⁰

In the summer of that year an incident occurred that illustrated the danger of public access. In March 1929, a party of two husband and wife couples visited Pencarrow Head on a fishing excursion. Whilst the men were away fishing off the rocks, the women began cooking breakfast. However, in the face of a strong north-westerly wind, the flames got out of control and soon were sweeping up the hill from the beach and towards the lighthouse buildings and dwellings. Lighthouse staff got the threatening blaze under control, but it was a close call and a dangerous situation as the keeper later reported:

⁷⁸ Ibid, pp.92-4

⁷⁹ *Evening Post*, 19 Jan 1929

⁸⁰ 27 Mar 1928, Pencarrow Head Lighthousekeeper to Secretary, Marine Dept, M1 8/45/15, Arch NZ, Wgtn.

It required strenuous efforts on the part of the three men to get the fire under, and in so doing, the assistant keeper, Mr. Donaldson, had the soles burned off his shoes, and also the bottoms of the legs of his trousers were burned off as high as his knees and his legs were scorched.⁸¹

In addition to Days Bay and Pencarrow, by 1900, the hills surrounding Eastbourne had also developed as a popular haunt for bushwalkers. This in turn led to the establishment of reserves in that locality as well.

A major part of the Eastbourne Domain began its life in 1878 as an education reserve land. These reserves were originally intended as endowment land for the use of the Wellington College Board of Governors. As Wellington day-visitors to the eastern bays increased, however, the land became popular for bushwalks. From the turn of the century, local ratepayers lobbied for the land to be set aside as a bush reserve.⁸² Before this occurred, however, in 1907 a total of 127.14 hectares of land adjoining the education reserve was gazetted as the Eastbourne Domain and initially vested in the Crown.

By 1911, the education reserve was revested in the Crown and added to adjacent land to form a forest plantation in 1918. In 1931, the former education reserves were formally added to the Eastbourne Domain. Subsequent additions to the Domain were recorded of 6.59 hectares in 1930 and 21 hectares in 1939. An addition of 0.5 hectares in 1940 and 3.16 hectares in 1942 completed the Domain which was initially vested in the then Eastbourne Borough Council (now amalgamated into the Hutt City Council).

Other east harbour reserve land also dates from the 1930s. In Lowry Bay, following occupation by the Jacksons and Greenwood, much of the land was bought as the site for Governor's Grey residence. By the later half of the nineteenth century, however, almost all of the land in the Bay had been acquired by Sir Francis Bell. When Bell died in 1936, the northern portion of his estate was subdivided for sale. As part of the terms of the subdivision, Walter Road was formed and a scenic reserve was set aside. The Francis Bell Scenic Reserve of 55.278 hectares was vested in the Crown in 1937.⁸³ In 1972, the Lands and Survey Department vested the Reserve in the Eastbourne Borough Council.

The 1939 addition of land to the Eastbourne Domain had involved a swap of land between the Eastbourne Borough Council and local resident George Burdan in order to secure a popular picnic spot that had developed at Butterfly Creek. The name of Butterfly Creek is said to have emerged by around the 1930s. Although the origin of the name is not certain, one source holds that it was derived from a strange patch of lighter coloured vegetation in Gollans Valley which could be seen from the top of the Matipo Street track that was exactly in the shape of a butterfly. Although this shape was discernible through to 1951, it gradually lessened due either to bush fires or bush clearance.⁸⁴

The popularity of the Eastbourne Domain for holidaymakers increased when, during the Depression, unemployed workmen on relief schemes cut new walking tracks into Gollans Valley from Kowhai Street and Muritai Park. A third track was cut soon after leading from McKenzie Road. Following on these improvements to access, the Council



Women in the bush, Days Bay, Eastbourne, Alexander Turnbull Library, 1/2-104775

⁸¹ Ibid

⁸² Beaglehole, op cit, p.129

⁸³ Ibid, p.150

⁸⁴ Ibid, pp.129-130

gave Alf Hollis permission for a kiosk to be erected near the junction of Butterfly and Gollans Creek which from 1936 sold tea, soft drinks and freshly made scones and cakes and sandwiches, the latter being carried in by Hollis and his wife. Fireplaces and toilets were erected and a camping site grew up in the area. On Saturday evenings, campers would walk to the picture theatre in Eastbourne and return to their tents by torchlight. The kiosk remained in business for almost 20 years but after repeated acts of vandalism during the 1950s, was closed down and then pulled down.⁸⁵

The Eastbourne parkland has been largely maintained largely by voluntary assistance. From 1919, the possibility of appointing special honorary rangers was first discussed but the idea did not become a reality until 1928. From this date, the Eastbourne Forest Rangers were actively involved in conservation, track maintenance, fire-fighting and even search and rescue.

1.9 From Pencarrow to Baring

The lighthouse at Pencarrow, visible to all from many parts of Wellington, became a local landmark of the harbour. Will Lawson's evocative poem "Between the Lights" of rowing a whaleboat in Wellington harbour at night refers to the lighthouse:

*The course and the channel to mark.
The ranges rise so clear ahead –
The Somes' light flashes from white to red,
And from red it turns to white and green –
Pencarrow burns white, and we're swinging between,
Down to the island that parts the tide
Where the steamers creep with plunging lead
And the shoal-buoys sway and ride.*⁸⁶

Routine at the lighthouse had been established over several decades. During the winter months, the two keepers operated a system of four hours on and four hours off. With shorter nights in summer, they came to their own arrangements. The keepers recorded the state of the weather, the light's consumption of fuel, checked stores, signalled passing ships and cleaned and trimmed the lamps before kerosene lamps negated the need for this duty.⁸⁷

Little had changed at the lighthouse since the turn of the century. In May 1927, the foghorn was replaced by another device that sent a fog signal using compressed air to create a 3-second blast every minute.⁸⁸ The new signal was described as follows: "The apparatus delivers a harsh note, each blast being terminated in a rapid lowering of the tone giving the effect of a grunt." The previous foghorn had been replaced due to unreliability. Although the older system's sound was said to penetrate quite a distance, at times it would fail altogether and not produce any noise.⁸⁹

As the 1930s approached, the situation at Pencarrow was re-examined with discussions focusing on the need for relocation. A new site was identified at Baring Head. In 1932,

⁸⁵ Ibid, pp.130-1

⁸⁶ Lawson, Will (Quilp N.) *Between the Lights and Other Verses*, Wellington, Ferguson and Hicks, 1906, pp. 7-11

⁸⁷ *Evening Post*, 19 Jan 1929

⁸⁸ Churchman, op cit, p.20

⁸⁹ *Evening Post*, 5 May 1927

the local farming family, the Riddifords, donated land on which to build the new lighthouse at Baring Head. A contract was let to build the structure, but the Great Depression is said to have deferred the project.⁹⁰

The justification for the shift to Baring Head arose from an ongoing complaint that the Pencarrow light was too close to the actual entrance of the harbour to be of much assistance to shipping approaching the heads in thick weather. When Pencarrow Head was in mist or fog, Baring Head could often be seen due to it being located further out into Cook Strait.⁹¹ Another reason for the need to replace Pencarrow was that the lighthouse had a fixed light whereas for the faster modern ships it was felt that a flashing light would more readily be picked up by masters.⁹²

Eventually the project went ahead and the Baring Head lighthouse, New Zealand's first electric lighthouse, was opened on 17 June 1935. The light at Pencarrow was extinguished but the structure was retained as a daymarker. The white concrete tower at Baring Head was 12 metres high with the light being 87 metres above sea level. The range of light was 19 miles. The electricity came from two diesel-powered generating sets. Features of this system included automatic protection against the failure of a generating unit, automatic replacement of a burnt out lamp and an alarm warning in the keeper's house of any other failures.⁹³ A light-sensitive valve started the apparatus up at dusk and shut it down at dawn. The electrical equipment was supplied by the same firm that had kitted out the Pencarrow light 76 years earlier.⁹⁴

On the official opening day of the Baring Head lighthouse, flags and bunting were draped from the tower down to the approach gate. Up to a hundred invited visitors attended including representatives from Government Departments, the Harbour Board and shipping companies. The usual speeches were given during which Eric Riddiford was praised for his gift of land. The Minister of Public Works, whose Department built the structure, formally handed it over to the Marine Department commenting that he hoped the lighthouse, in its operation, would always be as efficient as those who had built it. As the speeches continued, the steamer *Tamahine* passed on its way to Picton and sounded a series of long blasts on its horn. After speeches, the Marine Department put on tea. Not all were impressed, however. Attending the opening was the 82-year old Mr. A. Hansen, who had been the keeper at Pencarrow in 1879, and as a keeper for 41 years had served at 14 different stations. Now retired for 15 years, Hansen inspected the lighthouse's plant and climbed the tower to examine the lamp only to conclude that the station could not compare with those of the olden days.⁹⁵

On 12 January 1939, an additional 42.5 acres was gifted by the Riddiford family to the Crown to improve the amenities at the lighthouse.⁹⁶ During the War, a radio and signal station was established at Baring Head.⁹⁷ By 1945, Baring Head was described as a well laid out station surrounded by a planted shelterbelt of native trees and shrubs that had been donated by a local botanical society when the lighthouse was first built. Within the grounds were located two houses for the keepers and their families as well as utility buildings such as the powerhouse, workshop and garages. It appears that Baring Head

⁹⁰ Ross, op cit, p.136

⁹¹ *Evening Post*, 9 Sept 1933

⁹² *Evening Post*, 18 Jun 1935

⁹³ Churchman, op cit, pp.19 and 33

⁹⁴ *Evening Post*, 18 Jun 1935

⁹⁵ *Evening Post*, 18 Jun 1935

⁹⁶ See W1 23/419/11, Arch.NZ. Wgtn

⁹⁷ Churchman, op cit, p.33

was seen as providing an easier tour of duty than some other lighthouses, although this was not necessarily welcomed by the keepers as Thomas Smith, who was there in the mid-1940s, noted:

*With no night watches or weather reporting Baring Head was an easy station; apart from routine powerhouse and tower duties, most of our time was spent outdoors, and we deplored the fact that we were, in the main, groundsmen not Lighthouse keepers! We did have quite a few visitors, however; often groups from schools or clubs on bus tours.*⁹⁸

In 1950, Baring Head lighthouse was connected with the mains supply.⁹⁹ The Baring Head lighthouse remains in operation, but from 1989, it has been an unmanned station.¹⁰⁰ Prior to this the last notable shipwreck to occur along the east harbour coast adjacent to the Park was that of the 10,000-ton bulk-carrier *Pacific Charger*, which ran aground on Baring Head immediately below the lighthouse at 3am on 21 May 1981. Although the sitting of such a large ship out of the water made a spectacular sight, the crew safely disembarked and the damage was sufficiently minimal that by 5 June the ship was towed off the rocks and into harbour for temporary repairs before returning home. Greater drama came from the inquiry which showed that this brand new ship, on its maiden voyage and carrying the most modern technology and navigational aids, was crewed by unqualified officers who had little experience in use of the technology that was aboard. The finding of the inquiry showed a long list of human errors although the court had no jurisdiction over non-Commonwealth ships and charges could not be laid.¹⁰¹

In 1959, a centennial ceremony took place at the Pencarrow lighthouse and a plaque unveiled marking the structure as New Zealand's first lighthouse. Attending the commemoration was one of George and Mary Jane Bennett's surviving grandchildren.¹⁰²

By the mid-1960s, although the external steel structure of the lighthouse remained in relatively good condition, the inside was described as dilapidated with the timberwork having rotten from lack of maintenance.¹⁰³ In 1979, the Department of Lands and Survey created the Pencarrow Head Recreation Reserve based on land surrounding the lighthouse. The Pencarrow lighthouse, as New Zealand's first permanent lighthouse and one of the few structures surviving from the Wellington Provincial Government era is today vested in the Historic Places Trust. The first major conservation work was undertaken in 1980. From 1990, regular exterior maintenance began and significant corrosive treatment work was undertaken in 1999.¹⁰⁴

⁹⁸ Smith, Thomas G. *Man the light! The life story of Thomas Smith and his family and their service in New Zealand lighthouses*, Auckland, T.G.Smith, 1996

⁹⁹ Churchman, op cit, p.19

¹⁰⁰ Ibid, p.33

¹⁰¹ McLean, Gavin *Shipwrecks and Maritime Disasters*, Wellington, Grantham House, 1991, pp167-73: Ingram, op cit, and pp.463-4.

¹⁰² *Evening Post*, 18 Feb 1959

¹⁰³ 11 Oct 1966, Controller Lighthouse Service to Acting Nautical Adviser, M1 8/45/14/1, Arch NZ, Wgtn.

¹⁰⁴ Churchman, op cit, p.102

1.10 The Wahine storm

One of the most significant historical events associated with the East Harbour Regional Park was the wreck of the inter-island ferry *Wahine* on 10 April 1968, with the loss of 51 lives. The tragedy began across the harbour entrance when at 6.41am the ship struck Barrett's Rock during one of the worst recorded Wellington storms. With the starboard propeller taken away and the port engine having failed, *Wahine* drifted until her anchors held in position at 11am off Steeple's Rock. Passengers remained onboard at this point because of the intensity of the weather and the lack of any immediate danger. After midday, however, the ship began to list and the order was given to abandon ship. Despite lifeboats being lowered and a collection of vessels standing off the *Wahine* ready to pick up survivors, the extreme weather and fast running tide meant that many of the survivors on liferafts or in the water, were soon being carried towards the shore of the eastern harbour. With police, officials and authorities having recognised this likelihood, rescue efforts were concentrated on the eastern shore. Machinery was sent to clear debris from the sea and slips blocking the coast road past Burdan's Gate. Rescue teams, themselves exposed to great danger, combed the shoreline. The danger for those survivors in the water was less of drowning, but in landing among crashing surf and unseen rocks. More than 260 of the 734 persons on board the *Wahine* came ashore on the eastern shore, the majority of these between Camp Bay and Hinds Point. Of these, 47 had died in the surf or soon after being pulled ashore. Today a memorial stone marks the shore along the Pencarrow coast.¹⁰⁵



Wahine storm: Survivors picked up near Burdan's Gate Dominion Sunday Times

¹⁰⁵ Ingram, op cit, pp.417-24; Beaglehole, op cit, pp228-9; Johnson, David *Wellington Harbour*, Wellington, Maritime Museum Trust, 1996, pp377-379

1.11 East Harbour Regional Park

Following the concept of establishing a series of regional parks for Wellington being first mooted in 1973, a report was produced two years later that specifically outlined the formation of a proposed park at Pencarrow. Originally, the Pencarrow Regional Park was intended to encompass a larger area of land than the current size of the East Harbour Regional Park. Extending from the hills behind Lowry Bay down to Pencarrow and Baring Heads, the intended area included much privately owned land which was to be dealt with either through purchase or through management under the direction of the regional authority. However, opposition of the private landowners to having their land included within the park required a reworking of the concept. By 1979 the park proposal was reconfigured based only on land existing in public ownership. In 1981 the park was renamed the East Harbour Regional Park and included the scenic and public reserves of Lowry Bay, Days Bay and Eastbourne owned variously by the Hutt City Council and the Department of Conservation (DoC), the Pencarrow and Baring Heads lighthouse reserves also held by DoC and the Pencarrow coast road, under Hutt County Council's management.

Additions were made to the East Harbour Regional Park during the 1980s and early 1990s. In 1981, during the subdivision of the Orongorongo station, the Department of Lands and Survey acquired the beds of the two Pencarrow lakes Kohangatera and Kohangapiripiri whilst 20-metre strips around the lakes were vested in the then Hutt County Council as esplanade reserve. In December 1987, the lakes were transferred into the Department of Conservation estate and designated as Wildlife Management Reserves.

In 1981, the Hutt County Council acquired the Pierard Estate on the Eastbourne and Wainuiomata Hills to control development, give public access to the hills, provide recreation and forestry opportunities and for aesthetic and conservation purposes. In 1982, the fee simple of 191.54 hectares of the Wainuiomata Town Belt was also acquired by the Hutt City Council. By 1987, the Wellington Regional Council acquired land behind the Eastbourne Domain that was surplus to the needs of the Wainuiomata Golf Club to provide the East Harbour Regional Park with access from the Wainuiomata Coast Road.

In 1991, the Wellington Regional Council purchased the 360-hectare Lakes Block from Orongorongo Station. Recognised for its landscape and biological significance, this block of the East Harbour Regional Park would provide future protection of the land. An interim grazing lease was issued to M.Curtis which expired in 2004. Throughout the 20th century, cattle and sheep on two farm blocks (Gollans Farm and Orongorongo Station) had grazed the hills surrounding the lakes, with access to the lake shorelines for water.

In 1992, the Wellington Regional Council advertised its intention to prepare a management plan for the East Harbour Regional Park. Although this was completed with support from DoC and the Hutt City Council (which had taken over former responsibilities of the Hutt County and Eastbourne Borough Councils), the plan was not formally ratified by all three agencies due to a legal technicality. Therefore, for the next decade the management of the East Harbour Regional Park presented something of a challenge. With three agencies as landowners and each pursuing distinct management and utilisation policies in respect of their landholdings, development of the park has been difficult to advance. The Management Plan had, as its basis, encouragement of the three agencies to work together on matters of mutual interest and responsibility.

However, discrete management areas were also recognised with the Hutt City Council primarily responsible for managing the forest lands behind Eastbourne, and the Department of Conservation the southern lakes. Furthermore, the location of private land at certain points on the margin of the Park, especially along the southern coast, has made access to the Lakes Block and Baring Head Reserve less certain. Consequently provision of visitor services and amenities has been restricted.

As the forgoing narrative has shown, the heritage values of East Harbour Regional Park are exceptional. Evidence of pre-European and ongoing Maori use and occupation has been documented and physical remains include stone walls, middens, dendroglyphs and cultivation sites. The presence of three lighthouses, including New Zealand's first lighthouse is also significant. The numerous shipwrecks and the original route to the Wairarapa adds to the importance of the coastal areas of the Park. Finally, the ongoing importance of the northern area of the Park as an early and continuing place of recreation is a key feature.

1.12 Archaeological evidence

Archaeology in New Zealand

New Zealand has many archaeological sites that tell unique and wonderful stories of our history.

Our archaeological sites include sites and places where people lived and worked, where they made or gathered food and resources, and where people fought and died. They may be sites associated with the first people in New Zealand, the Polynesian voyagers who became the Maori. Later settler communities such as European sealers and whalers, settlers and farmers, and Chinese goldminers also left many sites through the country.

All our archaeological sites are important, no matter how small or similar to other sites. Every site contributes something to the story of our country.

Archaeological sites in East Harbour Regional Park

There are a large number of recorded archaeological sites located within the East Harbour Regional Park, skirting the eastern side of Wellington Harbour. Sites include a wide variety of site types and are of both Maori and European origin.

Nearly all recorded sites within the park are located on the coastal platform, or around the two lakes: Lake Kohangapiripiri and Lake Kohangatera. The types of sites present from the pre-European period indicate the life style of the Maori occupants of the coast. Sites include pa, pits, terraces, middens, stone rows and other sites. People were living around the coast and were utilising the rich resources the environment would have offered – fish and shellfish from the sea, and birds and plants from the forest. Plant crops would have been grown on the rich alluvial soils by streams and stored in underground storage pits dug for that purpose. Stone rows were also probably used for horticulture.

A particular feature of the coastal region is the number of groves of karaka trees. Maori often deliberately planted karaka; the kernels of the fruit were eaten and groves of karaka often indicate the location of archaeological remains. Of particular significance are the dendroglyphs, or carvings, carved into the bark of some of the trees. These carvings are of enormous interest as they are an extremely rare art form on the New Zealand mainland (they are also found in reasonable numbers on the Chatham Islands).

Later European sites are also found in the park. They include the Pencarrow Lighthouse. The first lighthouse on this site was built in the 1850s and the current structure, which is also registered as a Category 1 historic place by the New Zealand Historic Places Trust, was built in 1858, and operated until 1935. A newer automated light is located on the coastal flat below the Pencarrow lighthouse. There are a number of unrecorded archaeological features in the vicinity of the Pencarrow lighthouse, which are remnants of activities associated with the lighthouse operators. There are two house sites, a zig-zag track down to the beach, a former tramline/cable car path, and a probable ditch and bank fence.

A child's grave surrounded by a white rail fence, visible from the road, rests just below the original lighthouse on the northern side. It is of Evelyn Violet Amy Wood who died in March 1896. She was the daughter of one of the lighthouse keepers.

The prime location of the ridge where the lighthouse currently sits is shown by the number of Maori sites also found along the same ridge: its height and easy accessibility gives strategic advantage.

The coastline is noted for the number of shipwrecks that have occurred on it. These wrecks are discussed in detail in sections 1.2 and 1.4-1.6. In situ archaeological sites associated with two of these wrecks have been identified. The *Paiaka* was a steamer that was wrecked in Fitzroy Bay in 1906. The iron hull of the ship has been lifted out of the tidal zone and can be seen lying beside the coast road to Fitzroy Bay. The *Devon* was wrecked on Pencarrow Head in 1913 during a violent storm. The ship was caught fast on the rocks and eventually broke up and was scattered along the coast.

One of the better-known wrecks is that of the *Inconstant*, wrecked in 1849 at what is now known as Inconstant Point. The wreck was bought by John Plimmer, and was used by him as a floating warehouse on the Wellington city shore, just off present day Lambton Quay. After the 1855 earthquake the ship was partially disassembled, and the base of it was buried by reclamation. It was rediscovered in 1997 during renovations of the historic BNZ building, where associated artefacts and interpretation are on display, while wooden remains of the hull that have been removed for conservation are also on display at Queen's Wharf on the Wellington City waterfront.

Recorded archaeological sites:

Archaeological sites in New Zealand are recorded by the NZ Archaeological Association. Sites are referred to by the mapsheet on which they are located and then by their site number. So R27/62 is the 62nd site recorded on the R27 mapsheet.

Map sheet	Site number	Easting	Northing	Site type	Date recorded
R27	62	2665700	5981600	dendroglyphs	1987
R27	64	2664900	5981700	Pa	1987
R27	65	2664900	5981000	Pa	1987
R27	66	2665400	5981000	Terraces	1962
R27	67	2665200	5980700	midden/ovens	1987
R27	68	2665800	5981500	Terraces	1987
R27	69	2666200	5980600	pits/terraces	1987

Map sheet	Site number	Easting	Northing	Site type	Date recorded
R27	71	2665900	5980100	Terraces	1967
R27	72	2665900	5981000	karaka trees	1963
R27	73	2665900	5981000	karaka trees	1963
R27	74	2666000	5981000	karaka trees	1963
R27	75	2666000	5981000	karaka trees	1963
R27	76	2666200	5980900	stone lines	1970
R27	77	2666400	5981000	Terraces	1987
R27	78	2666400	5981000	karaka grove	1963
R27	79	2666800	5980900	Karakas	1963
R27	80	2666900	5980800	karaka trees	1963
R27	81	2667000	5980800	karaka trees	1963
R27	82	2667000	5980900	karaka trees	1963
R27	83	2667200	5981100	karaka trees	1963
R27	84	2666500	5980500	Karakas	1963
R27	93	2666600	5985700	karakas/midden	1966
R27	106	2665800	5984300	Midden	1962
R27	107	2665700	5983900	midden/oven	1962
R27	108	2665500	5983800	Midden	1956
R27	109	2665900	5983700	house	1956
R27	110	2664800	5981700	Midden	1956
R27	111	2664700	5981200	Midden	1956
R27	199	2664700	5981400	Lighthouse	1999
R27	206	2664500	5981400	Shipwreck (<i>Devon</i>)	1995
R28	4	2667300	5977500	karaka trees	1963
R28	5	2666900	5978500	karaka grove	1963
R28	6	2666900	5978300	stone rows	1987
R28	7	2666900	5978400	Midden	1987
R28	8	2666800	5977500	pits/ovens/midden	1995
R28	9	2666900	5977700	wall/midden/pits	1995
R28	10	2666000	5979700	pits/ovens	1994
R28	11	2666200	5979900	Terraces	1982
R28	12	2666100	5976900	Ovens	1964
R28	14	2666600	5978900	cooking area	1982
R28	15	2666100	5976400	rock shelter	1964
R28	16	2668900	5975000	pits/stone walls	1987
R28	17	2666700	5978900	Terraces	1963
R28	18	2666700	5979100	Karakas	1963

Map sheet	Site number	Easting	Northing	Site type	Date recorded
R28	20	2666200	5979800	Terraces	1963
R28	30	2666100	5979700	ovens/workshop	1994
R28	36	2666300	5975900	Burial	1963
R28	37	2666300	5975900	cave with midden	1963
R28	38	2666400	5979200	midden/ovens	1963
R28	39	2666900	5978500	midden/ovens	1963
R28	42	2666200	5979400	Shipwreck (<i>Paiaka</i>)	1994
R28	43	2666500	5977300	Pits	1995
R28	247	2664947	5981018	Dugouts	2004

Potential for unrecorded sites

The Wellington Archaeological Society carried out a number of strategic, comprehensive surveys of the East Harbour area in 1987. This followed surveys of particular areas by Fell in the 1930s and by Palmer in the 1950s. Thus the wider area has received a high degree and coverage by archaeologists, and the majority of sites are likely to have been located. However there always remains the potential for further sites, especially from the pre-European period: the range and density of sites already recorded indicate there was a large and active human population all along the coast. Vegetation or talus cover can always obscure sites at the time when recorders are working, so management of the park should include the potential for further unrecorded sites.

The sea and weather along the coast can be very dramatic and violent, and can occasionally reveal buried or submerged shipwrecks or material associated with shipwrecks. Such revealed sites should be treated with care and recorded and dealt with appropriately.

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Physical Environment

2. Topography, geology and landforms

2.1 Physical features and topography

East Harbour Regional Park comprises three separate blocks of coastal hill country and uplifted marine terraces around the eastern shores of Wellington Harbour. The total area of the three blocks of the park amounts to 2,070 ha. The location of the park with respect to the other regional parks managed by Greater Wellington Regional Council is shown in Map 1. Map 2 shows the location and pattern of title ownership of East Harbour Regional Park in more detail.

The northernmost and largest block (c.1700 ha) is locally known as the **'Eastbourne Hills'**, the prominent backdrop of forested hills which can be seen looking east across the harbour from downtown Wellington City. The Eastbourne Hills block extends beyond the catchment of Wellington Harbour, reaching across two parallel ridge systems to the Wainuiomata River valley in the east. This part of the park rises steeply from just above sea level between Point Howard and Eastbourne to the main ridge system extending for 8km from the summit of the Wainuiomata Hill Road almost to Wry Hill. This main ridge lies only about a kilometre from the coastline and maintains an altitude of 200-300m, with the highest points being Lowry (373m) and Hawtrey (343m) trigs. Immediately east lies the core of the Eastbourne Hills block, the heavily-forested headwaters of Gollans Stream and its tributary, Butterfly Creek, flowing south between this main ridge and a parallel ridge (200-360m high); the eastern boundary of the block lies along the foot of this ridge, around 100 m in the Wainuiomata Valley.

The second, southerly block (c.360 ha) of the park is generally known as the **'Lakes Block'**. It consists of rocky headlands, a pronounced wave-cut shore platform with shingle beaches, and two lakes – Kohangapiripiri and Kohangatera – impounded in former embayments at the northern end of Fitzroy Bay by shingle accumulating as barrier bars through longshore drift from the mouth of the Orongorongo River.



Fitzroy Bay and Lake Kohangapiripiri. Photo: Lloyd Homer, ©Institute of Geological & Nuclear Sciences Ltd



Eastbourne Hills. Photo: Lloyd Homer, ©Institute of Geological & Nuclear Sciences Ltd



Upper reach of Lake Kohangatera. Photo: Lloyd Homer, ©Institute of Geological & Nuclear Sciences Ltd



West Wainuiomata Hills and upper Gollans Valley. Photo: Lloyd Homer, ©Institute of Geological & Nuclear Sciences Ltd



Coastal landscape, Pencarrow. Photo: Les Molloy

The Lakes Block lies just outside the main harbour, around Pencarrow Head on the eastern side of the harbour entrance. The Eastbourne Hills and Lakes blocks are linked by a narrow coastal strip encompassing the Pencarrow Coast Road and the Hutt Valley/Wainuiomata sewerage outfall just south of Pencarrow Head.

The third block in the park is very small – just less than one hectare of lighthouse reserve around the site of the historic lighthouse at Baring Head.

The topography of East Harbour Regional Park and its surrounding landscape is shown in Map 3. The coast from Eastbourne to Fitzroy Bay consists of a series of steep sand and gravel beaches developed on a rocky wave cut shore platform and separated from each other by reefs and rocky promontories (such as Point Arthur, Hinds Point, and Inconstant Point). The Pencarrow Coast Road from Burdan's Gate runs along the narrow strip of land between the beaches and the foot of the steep, scrubby coastal escarpment. Within only 300-500 m from the shore, this escarpment rises to 150-200 m above sea level (with Mt Cameron, 252 m, the highest point). The wide gravel beach running SSE from Pencarrow Head, past Baring Head, the mouths of the Wainuiomata and Orongorongo Rivers, to Turakirae Head has a series of storm ridges that have been stranded by successive tectonic uplifts. Behind the beaches and around Lakes Kohangapiripiri and Kohangatera are further wave-cut cliffs of the coastal escarpment. These cliffs are the coastal edges of a discontinuous series of ancient shore platforms that have been uplifted (and tilted), leaving them as gently-sloping terraces 80-140 m above sea level. The well-known landmarks of Pencarrow Lighthouse and Baring Head Lighthouse sit atop the seaward edge of these terraces.

Gollans Stream (with a catchment of 1700 ha) rises on the forested southern slopes of Mt. Lowry in the Eastbourne Hills block of the park and flows 14 km to Fitzroy Bay on the south coast. Below its junction with Butterfly Creek, the middle six kilometres of Gollans Stream flows through privately-owned pasture and regenerating shrubland. The stream becomes incised and meandering before it enters a considerable area of wetland on the private land. It re-enters the park in the Lakes Block about 2.5 km before discharging into Fitzroy Bay. The lower section of the stream flows sluggishly through 150 ha of wetlands and finally into the 17 ha Lake Kohangatera. The smaller Cameron Creek (catchment 280 ha) rises below Mt Cameron and flows for 3 km through bush, regenerating farmland, and 43 ha of wetlands and Lake Kohangapiripiri (13 ha) before entering the northern end of Fitzroy Bay at Bluff Point. Both lakes are barrier bar lakes which are rather uncommon coastal landforms in New Zealand (Lowe & Green, 1987; Viner, 1987). The two lakes are often collectively termed the '**Pencarrow Lakes**'.



Gollans Stream. Photo: MIRO

2.2 Tectonic setting of East Harbour Regional Park

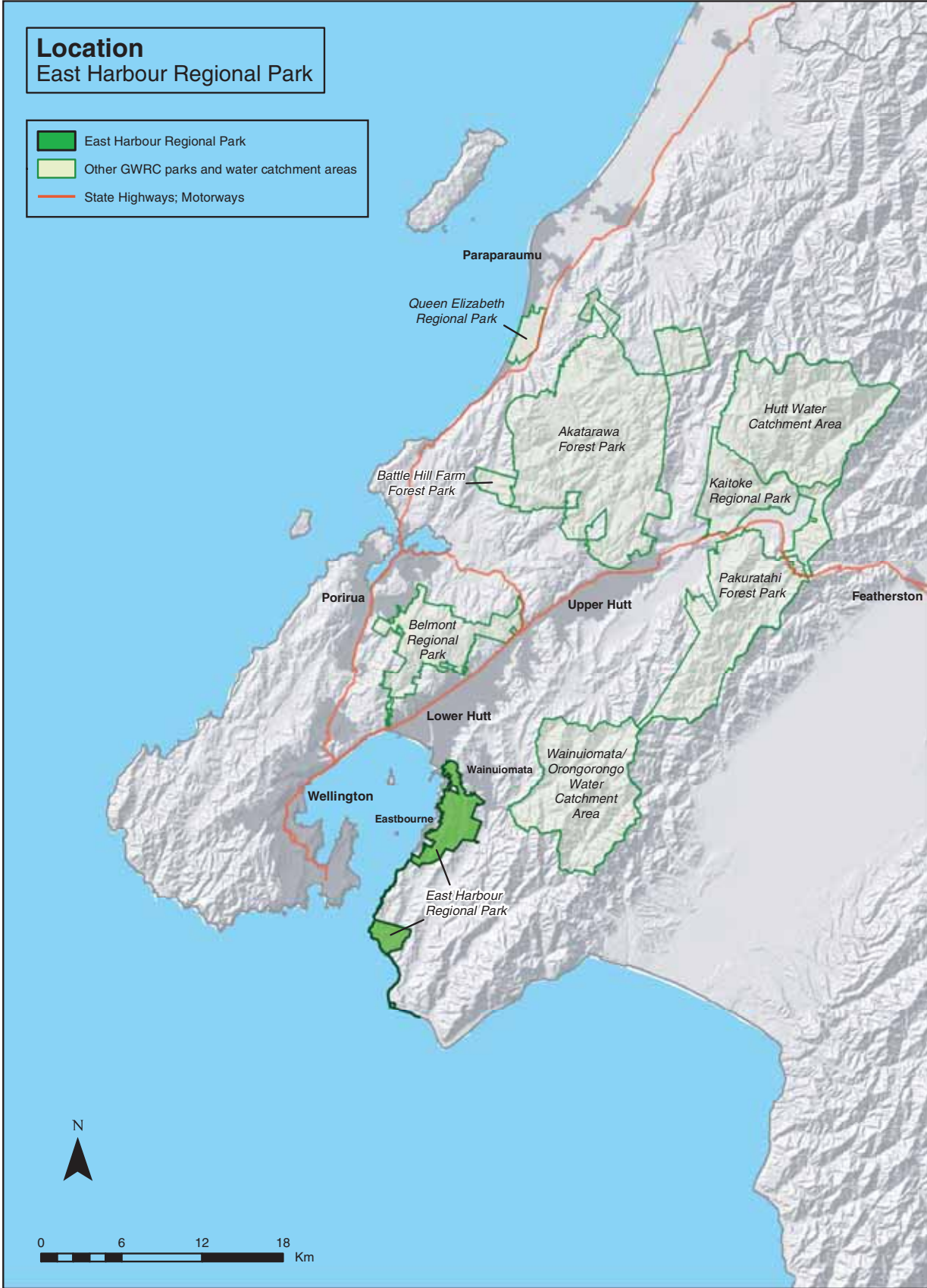
The bedrock in the park consists of Torlesse greywackes of the Rakaia Terrane (named after Mt Torlesse in the greywacke ranges of Canterbury), which forms much of the mountainous backbone of central and eastern New Zealand. The greywacke occurs in a tightly folded, steeply dipping sequence, with the possibility of a large scale fold structure along the ridge closest to the harbour (Leask & Stirling, 1992). The sediments which make up the individual grains in the greywacke were eroded from the eastern part of the ancient continent of Gondwana 240-140 million years ago and deposited in an adjoining trough known as the New Zealand Geosyncline. From 140-100 million years ago, these sediments, consolidated now into rock, progressively rose out of the sea in a major period of tectonic uplift and mountain building (known as the Rangitata Orogeny) to form much of the landmass that was to eventually become New Zealand.

The proximity of Wellington to the active margin of the continental Indian / Australian Plate and the oceanic Pacific Plate has generated intense tectonic stresses, causing the greywacke bedrock to fracture along four main fault lines. From east to west these faults are: the Wairarapa Fault; the Wellington Fault; the Ohariu Fault and the Pukerua Fault (McConchie, 2000). The hills of East Harbour Regional Park form part of the **Pencarrow fault block** which lies between the Wairarapa Fault and the Wellington Fault (Suneson, 1992). Both the Wairarapa and Wellington Faults are many tens of kilometres long and run roughly parallel to each other with an overall northeast trend. Movements on the faults are mainly *lateral* and *dextral*, that is, if viewed from one side of the faultline, the opposite land moves laterally to the right in an earthquake.

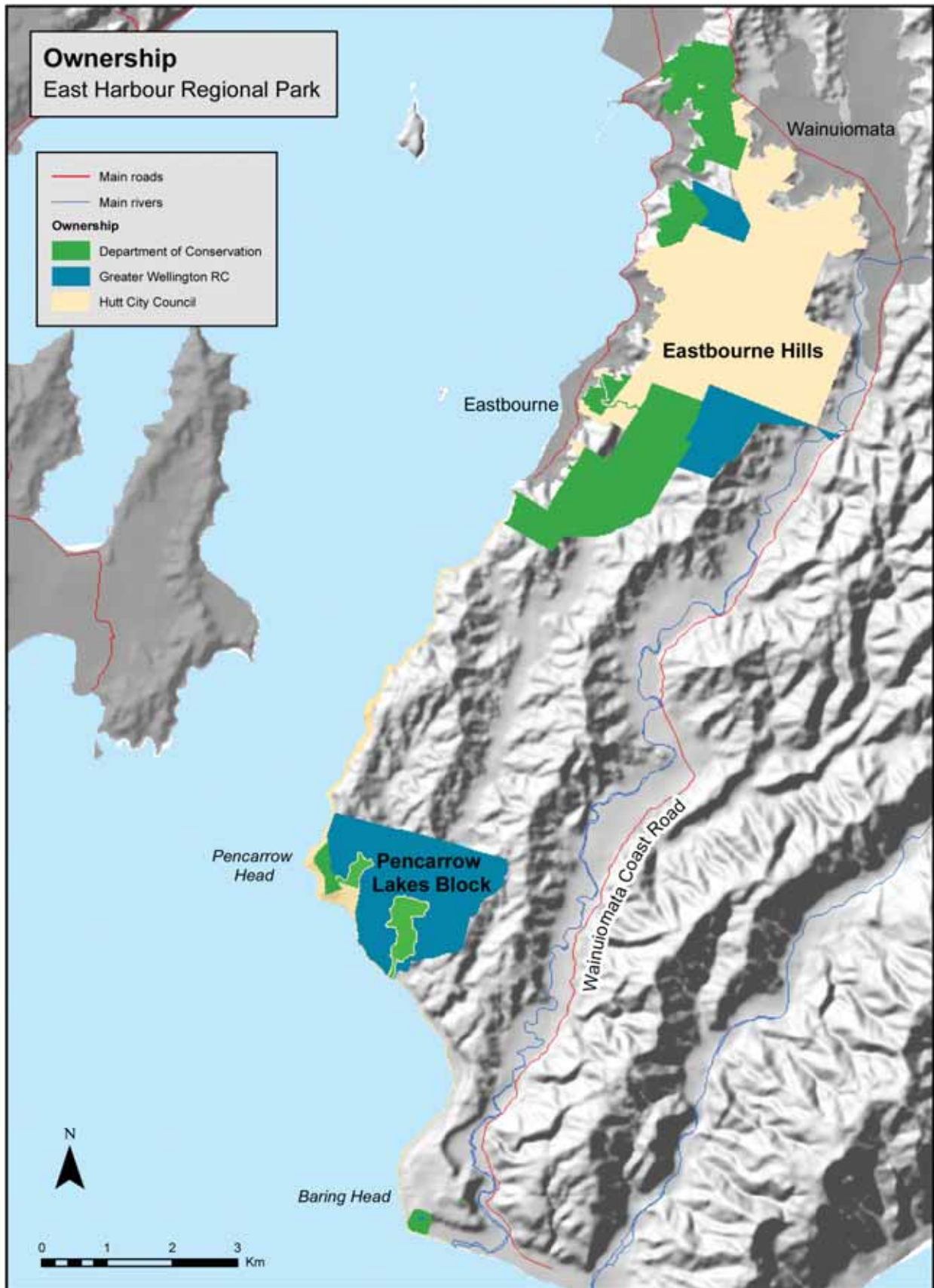
The rock types, faults and landforms of national and regional significance are shown in Map 4.

All the Wellington faults also display *vertical* displacement of the land and the combined effect of this lateral and vertical movement has produced a series of uplifted blocks tilted to the west, with sharp escarpments just to the west of each fault line and a depression to the east. The topographic effect is for hills to rise steeply immediately to the west of each fault. Over the last 25 million years during the most recent period of tectonic uplift (known as the Kaikoura Orogeny) the Pencarrow block has conformed to this pattern by being uplifted and tilted so that the eastern side is now considerably higher than the western side (Cotton, 1921a). Because East Harbour Regional Park lies towards the western margin of the Pencarrow fault block, its hill summits (ranging from 200-373m) are not as high as those of the Rimutaka Range (up to 900 m) at the eastern margin of the block adjacent to the Wairarapa Fault (see Map 3, *Topography*).

Maps 1 Locality



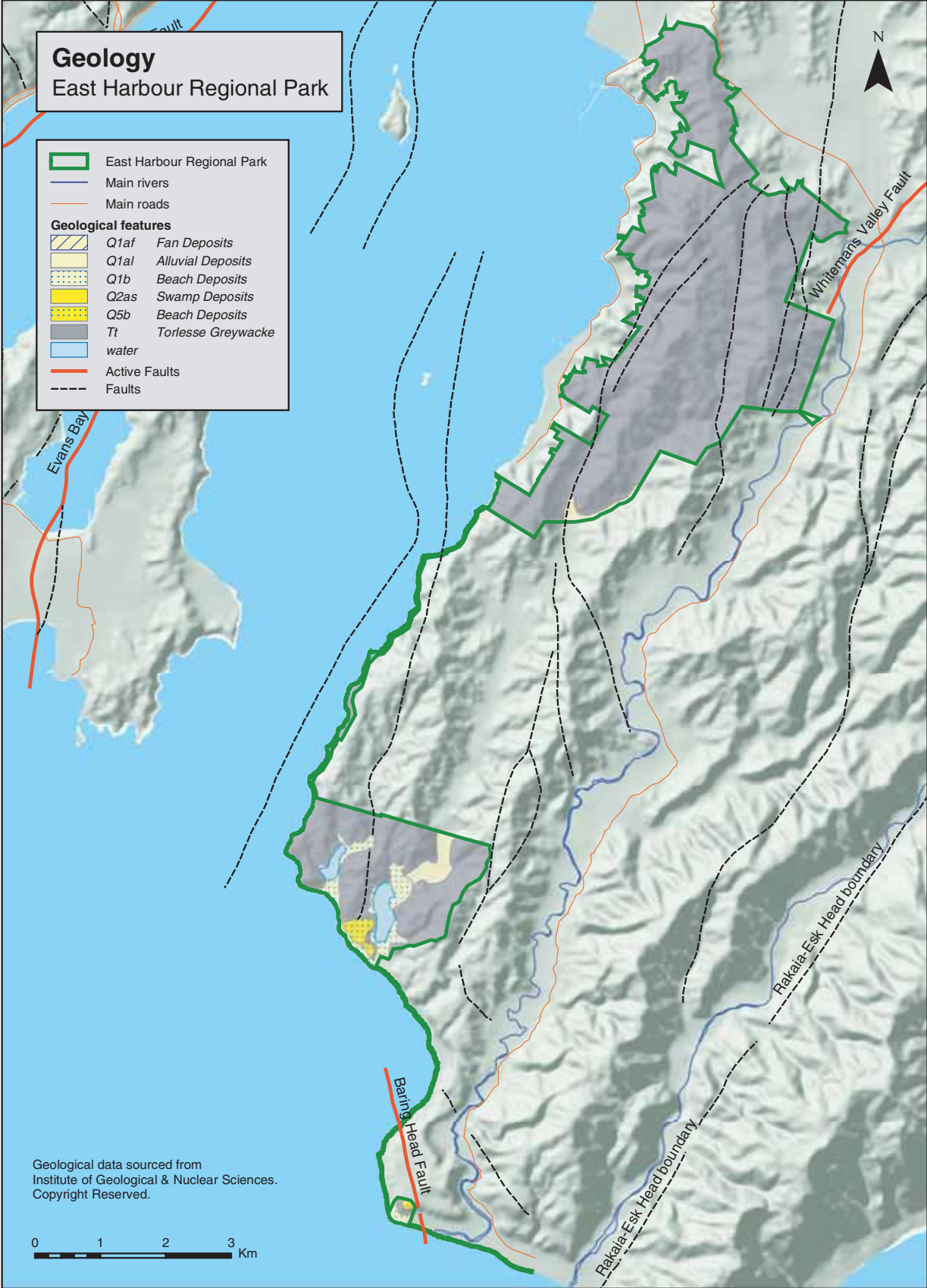
Map 2 Land ownership



Map 3 Topography and waterways



Map 4 Geology



2.3 Coastal landforms showing progressive uplift

East Harbour Regional Park contains several landforms – old beach ridges, coastal platforms and marine terraces around the coastline – which provide evidence of progressive tectonic uplift of the Wellington landscape. These former wave-cut features are most easily recognized at Pencarrow Head and Baring Head in and adjacent to the park, and in the famous raised beaches of Turakirae Head. This series of uplifted marine terraces has been surveyed to calculate the rate of uplift and tilting of the Pencarrow fault block (Stevens, 1973). The highest terrace remnant recognised in the vicinity of the Orongorongo River mouth has been uplifted to as much as 431m above present day sea level and may be as old as 300,000 years (Kenny and Hayward, 1993). The tilting of the whole Pencarrow block to the west is superbly illustrated by one particular terrace (formed around 100,000 years ago during the last interglacial) which is 21m above sea level at Pencarrow, 90m at Baring Head, and 210m at Turakirae Head – indicating how the eastern edge of the block (the Rimutaka Range crest) is rising the most rapidly. The terraces are generally covered with marine gravels and sand from which project isolated rock stacks up to 7 m in height (Cotton, 1921a). While similar marine terraces occur elsewhere on Wellington's south coast (for instance at Tongue Point west of Sinclair Head), those between Pencarrow and Turakirae Heads are the largest and most distinctive in the Wellington area (Kenny & Hayward, 1993).

Sea water eventually flooded into the lower reaches of the valleys on the down-tilted, western side of the block. Wellington Harbour is the largest example; Lakes Kohangatera and Kohangapiripiri at Pencarrow are much smaller examples. Evidence of inundation is found in the wave-cut cliffs surrounding the lakes, and a sea stack at the margin of Lake Kohangatera (Cotton, 1921b; Stevens, 1974). Over time, barrier bars formed at the mouths of the drowned valleys, built up from gravel transported by longshore currents from the Orongorongo River mouth to be deposited along the south coast and inside the mouth of the harbour. Gradually these tidal reaches at the mouth of Gollans Stream and Cameron Creek — Cotton's "winding lanes of sea water" were cut off from the sea to become freshwater lakes. A closed barrier was in place between Lake Kohangapiripiri and the sea between 7000 and 5000 years before present (BP) (Cochran, 1995; Cochran, 2000), but other evidence suggests that larger Lake Kohangatera was not cut off from the sea until about 4300 years BP (Upston, 2002).

Severe earthquakes since this time have contributed to the widening of the gravel barriers between the lakes and the sea in two ways: by *increasing sediment supply* to the beach and by *uplifting the beach itself*. The southern end of the Rimutaka Range is being uplifted at a rapid rate (probably close to 10mm/yr) and earthquakes have been a major cause of the scarring evident on the flanks of the range and consequent aggradation of the bed of the Orongorongo River. Major earthquakes severely affected the range around 1460 AD and on the 23rd of January 1855, the latter (associated with the Wairarapa Fault) causing the Rimutaka Range to rise by nearly 3 metres. Gravel from landslides caused by the 1855 earthquake is thought to have begun arriving at Fitzroy Bay around 85 years later (Mathews, 1980). In addition to the periodic catastrophic impact of earthquakes, the severe storms that sweep through Cook Strait – such as the 'Wahine Storm' of 10th April 1968 when wind speeds reached almost 300km/hr – have damaged much of the vegetation cover on the unstable slopes of the Rimutaka Range, accelerating the erosion process, and the eventual accumulation of more sediment on the beaches of Fitzroy Bay.

Evidence of uplift events is preserved on the beaches below the lakes in the form of a series of stranded beach ridges (Adkin, 1955). In the past, the levels of the two beach ridges were more distinct at Lake Kohangatera. However, in recent years the original form of the seaward beach ridge (the youngest, elevated in the 1855 earthquake) has been largely obliterated by gravel mining operations (Cochran, 1995; PCE, 1994). The higher inland ridge is still largely intact, its crest standing about 7.6 m above mean sea level. The top of the gravel barrier at Lake Kohangapiripiri is now 3.5 m above the present day bridge ridge and the surface of the lake is about two metres above sea level (Cochran, 1995). These Pencarrow raised beach landforms are considered to be of national geomorphic importance (Kenny & Hayward, 1993). Sand dunes have formed on top of the gravel barriers and these support a number of nationally and regionally threatened plant species (Milne & Sawyer, 2002), which are discussed in Section 6.5.

The beach ridges at nearby Turakirae Head are believed to represent at least five uplift events from 1855 to about 6000 yr BP (Berryman *et al.* 1992; Moore, 1987 and Stevens, 1975). These 'ancient shorelines' provide conclusive evidence of 24 m of uplift in the last 6500 years, just 9 km from the Pencarrow Lakes (Hull & McSaveney, 1996). Geomorphic investigations of the Turakirae Head raised beaches and Lakes Kohangapiripiri and Kohangatera have stimulated on-going discussion on the tectonic influences exerted on landforms around the Wellington coast.

3. Soils of East Harbour Regional Park

The soils of the park have developed on weathered greywacke or on loess deposits on the gentler slopes; under beech/rimu/rata forest on the inland hills and under a low forest of ngaio/kohekohe/karaka on the more exposed coastal slopes. They are described below and their distribution is shown in Map 5, which is based on the field work of H.S.Gibbs (and published as an interim soil map in Heine (1975)).

The soils are classified and given a series name based on a geographical location where that soil was first described. The two soil classification systems used in New Zealand are used below to classify the soils: the New Zealand Genetic Soil Classification (NZG) describes soils according to *how they were formed* (Taylor, 1948), while the present New Zealand Soil Classification (NZSC) describes soils *as they are* (Hewitt, 1998). The following soil descriptions are from Bruce (2000) and a more general description on the relationship between soils and landscapes in the Wellington region can be found in Molloy (1988).

Tawai steepland soils are the most common soils in the hills east of Wellington Harbour and the Hutt Valley. They form on steep slopes (18° to more than 30°), in greywacke colluvium and other slope deposits. Because there is constant soil rejuvenation by downslope movement of colluvium, Tawai Soils show very little horizon development. The gritty, clay loam becomes increasingly stony with depth and is easily eroded.

Tawai soils are typically found associated with the hard beech/black beech/kamahi forest covering the steeper central, southern and western part of the Eastbourne Hills block of the park.

NZSC: *Typic Yellow Ultic Soils.*

NZG: *Steepland soil related to yellow-brown earths, strongly leached.*

Taita series soils are widespread on the deeply weathered greywacke of the more moderate slopes, especially under hard beech in the northern part of the Eastbourne Hills block, especially on the Wainuiomata side. They have clay loam topsoils which give way to firm clay subsoils, and their colour changes from greyish brown to yellow and red with increasing depth. The subsoils are more silty, often with red, weathered greywacke stones. The strong red colour and high clay content of the Taita hill soils has often been considered evidence of their greater age (and development in materials weathered during the last interglacial).

NZSC: *Typic Yellow Ultic Soils.*

NZG: *Yellow-brown earths, strongly leached.*

Gollans series soils are restricted to the flat swampy gullies of Gollans Stream and Cameron Creek. Here, grey or reddish brown silt or clay loam overlies grey clay loam subsoils. Mottles throughout the horizons indicate that the soil is often wet and drainage is poor. In places a peaty phase darkens the soil colour to brown or black.

NZSC: *Typic Acid Gley Soils.*

NZG: *Peaty gley soils.*

Around the southern Lakes block of the park the soils are a mosaic of **Porirua**, **Paremata**, or **Terawhiti** soils depending on the steepness of their slopes and whether they have developed on loess or wind-blown sand, or greywacke colluvium. All three soil series have developed in a drier and more salt-influenced environment than the Tawai and Taita soil series.

Porirua series soils occur on the undulating uplifted marine terrace surfaces between Pencarrow Head and Baring Head. They have developed in sandy loess deposits and have a thin greyish-brown fine sandy loam topsoil over a compact sandy subsoil.

NZSC: *Mottled Fragic Pallic Soils*

NZG: *Yellow-grey earths*

Paremata series soils are often associated in the same landscape with Porirua soils, but in much thinner loess and generally on steeper slopes (hilly and steepland). Their topsoils are a thin (less than 15cm) grayish brown silt loam (or fine sandy loam) over a distinctive clay loam subsoils which can be very compact.

NZSC: *Mottled Fragic Pallic Soils*

NZG: *Yellow-grey earths*

Terawhiti steepland soils occur in patches among the rocky cliffs of the coastline. These skeletal soils develop on shallow greywacke slope deposits. A dark grey, stony, sandy or silt loam overlies stony, silt or clay loam textured subsoils.

NZSC: *Typic Immature Pallic Soils.*

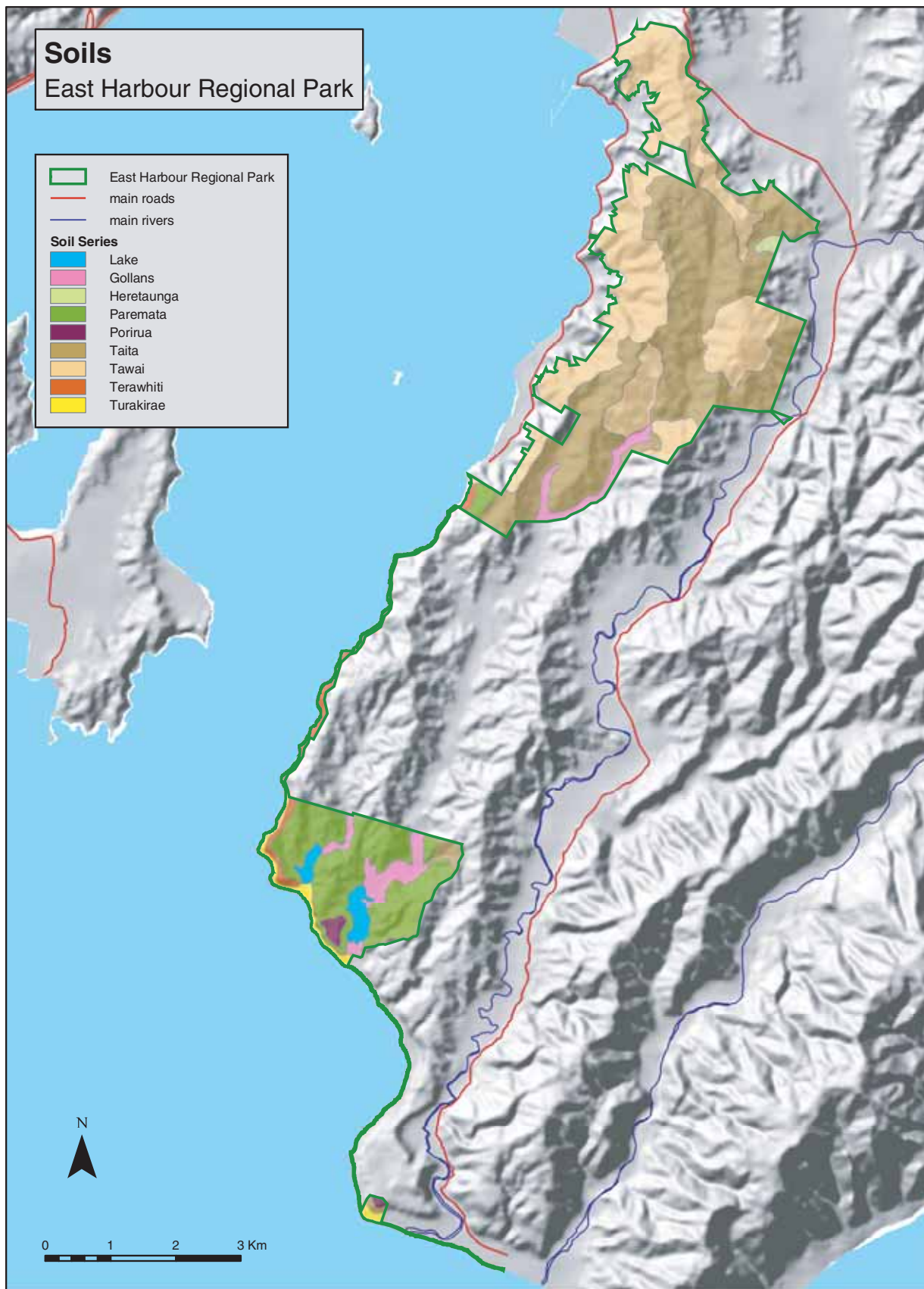
NZG: *Steepland soils related to yellow-grey earths.*

On the stony uplifted beach ridges of the south coast where strong winds drive sand inshore, very thin soils (**Turakirae** series) have developed. Specialised salt-hardy plants like grasses trap and stabilise wind blown debris but soil formation is slow and continually disturbed. Despite a moderate rainfall these gravelly, immature soils can be very dry.

NZSC: *Orthic Raw Soils.*

NZG: *Recent soils.*

Map 5 Soils



4. Climate

4.1 Climate of East Harbour Regional Park

There are no permanent climate stations within the park, so the climatic environment has been extrapolated from long-term measurements in surrounding locations, especially Wellington Airport and Gracefield which are the closest climate stations. There are two main climatic zones in the park, reflecting the sharp differences in topography (see Section 2.1, above): the exposed southerly coast of the Lakes Block and the higher country of the Eastbourne Hills to the north.

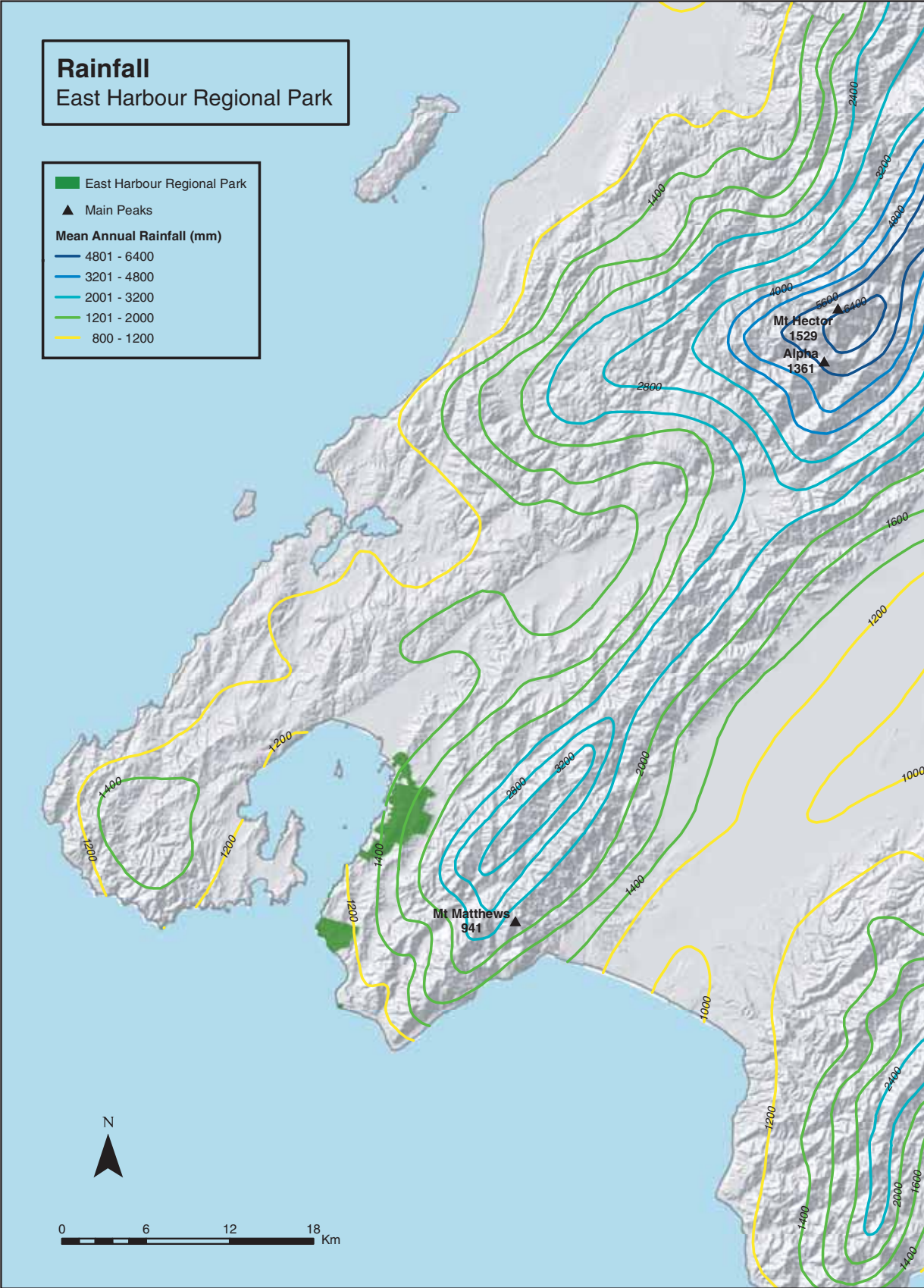
East Harbour Regional Park has a windy climate, because of its proximity to Cook Strait and its exposure to westerly and northerly winds crossing Wellington Harbour. Wellington's prevailing westerly winds follow the path of least resistance and are funnelled through the Strait by the ranges to the north (Tararua and Rimutaka Ranges) and south (hills of the Marlborough Sounds), giving an average wind speed of 33 km/hr in the narrows of Cook Strait. The hills surrounding Wellington can have the effect of 'bending' westerly winds into a "nor'wester" (Dickson, 1986).

Consequently, the predominant winds in the park are from a more northerly direction, with NW/N/NE winds occurring 55% of the time at Baring Head. This coastline is particularly exposed to air movements; it is calm only 3% of the time (Harvey & Nichol, 1994). South and south-east winds are more common in the winter, occurring 32% of the time (compared with a low of 26% of the time in the spring) (Hessell, 1993). As well as bringing rain, southerlies are the strongest winds, often comprising storm force 10 and above (88-101 km/hr) (Harvey & Nichol, 1994). Extreme winds are more common in the late winter/spring (Goulter, 1984) and like the rest of Wellington's exposed southern coastline, East Harbour occasionally experiences very high maximum wind gusts but these have not been measured. The *Wahine* sank at the entrance to Wellington Harbour opposite Baring Head in one such extreme storm event in April 1968, when the maximum gust recorded at Hawkins Hill was an incredible 237 km/hr (Goulter, 1984; Reid, 1998).

A rainfall isohyet map for the Wellington region is shown in Map 6: *Rainfall for Wellington and East Harbour Regional Park*. The mean annual rainfall at the south coast and Lakes Block is between 1000 and 1200 mm but this rises to more than 1400 mm at Lowry and Hawtrey trigs in the Eastbourne Hills. This compares with mean annual rainfalls for Belmont Regional Park of 1306 mm (Salinger, 2000) and 1240 mm at Kelburn (Goulter, 1984). Sometimes, ahead of a north-westerly front, it may be raining in Wellington City but dry at the park. Southerly winds are associated with the longest duration of rain and the highest rainfalls (Goulter, 1984). In southerly or south-easterly conditions rainfall is generally higher in the park than on the western side of the harbour (Smith, 1994). In these circumstances local streams rise quickly and may flood.

The range of temperatures within East Harbour, as for the rest of Wellington, is small compared to the rest of the country. This is because Wellington's maritime location and winds have a moderating effect on air temperatures. The region's average winter mean temperature is 8.2°C and the average summer mean temperature is 16.4°C (see Table 4.1 below for 30-year average temperatures for sites within the region). The night/day temperature differences in the region are also small (Salinger, 2000). However, local temperatures can vary because of the rugged topography within the region (Goulter, 1984) and this is likely to be the case within the park.

Map 6 Rainfall



Temperatures at the coastal Lakes Block are more likely to be similar to those recorded at Wellington Airport and at Gracefield (Table 4.1). These are slightly above average for the region. Low temperatures are moderated by the proximity of the sea and high temperatures by almost constant wind. In particular, temperatures vary markedly throughout the park depending on exposure to wind. For instance, the popular picnic area at Butterfly Creek is very sheltered and consequently warmer than the coast or the ridges of the Eastbourne Hills.

	Minimum °C	Mean °C	Maximum °C
Wellington Airport	10.5	13.5	16.6
Gracefield	9.7	13.1	16.5
Kelburn	9.7	12.8	15.8
Wainuiomata Golf	8.4	12.3	16.3
Avalon	9.3	13.1	16.9
Taita	8.9	12.7	16.5
Wallaceville	7.7	12.3	16.8
Kaitoke	6.9	11.3	15.7

Table 4.1: Mean daily temperature normals, (1961-1990) (Tomlinson 1994).

Snow is rare in the park but hail is more frequent especially about the south coast. Fog can occur at any time of the year. It is often associated with a weak southerly flow bringing fog across Cook Strait, into the harbour and up the Hutt Valley (Goulter, 1984). Morning fogs usually dissipate a few hours after sunrise but occasionally last for one or two days.

5. Freshwater: streams and lakes

5.1 Hydrology

The geography of Gollans Stream, Cameron Creek and the Pencarrow Lakes (Lakes Kohangapiripiri and Kohangatera) is outlined in Section 2.1, and the main waterways are shown in Map 3: *Topography*.

Gollans Stream is not only the larger catchment (1700 ha, compared with 280 ha for Cameron Creek), but it also rises in the Eastbourne Hills where rainfall is significantly higher. Both catchments face the south, the direction from which most rain arrives. During periods of high rainfall Gollans Stream and its tributary, Butterfly Creek rise quickly and are muddied by clay from the Taita and Tawhai soils of the steeplands (Smith, 1994). Cameron Creek, on the other hand, drains an area of lower rainfall — lower hills with shallow, sandy soils.

Lakes Kohangapiripiri and Kohangatera were once inlets of the sea but successive uplift events and strong wave action have resulted in barrier bars forming across their seaward entrances. The lakes have been brackish/freshwater for about 4300-5000 years. They are flat bottomed and in places have sediments to a depth of more than 9 m (Cochran, 1995; Upston, 2002). Drainage of both lakes is by seepage through the beach gravels, although breaching of barrier bars occurs during flood events (Gibbs, 2002). Lake levels fluctuate markedly with varying rainfall. The water of both lakes is stained yellow brown.

Lake Kohangatera has about 17 ha of open water with a maximum depth of 2 m and is described as *mesotrophic* (having moderate levels of nutrients) (Gibbs, 2002). The lake has a soft organic base and the strong winds common to the area are likely to stir up bottom sediments and reduce water clarity (Gibbs, 2002). Sediments below the base are a dark grey, clayey mud with some sand (Upston, 2002). The beach ridge system is about 420 m wide and an outlet channel reaches through this to the road. Concrete culverts are present under the road. Records of breaching have not been kept but the lake is thought to breach in response to heavy rainfall. At the time of writing (October 2005) the stream is flowing from the lake directly into Cook Strait and whitebait are visible moving up the beach section of the stream below the culvert.

Lake Kohangapiripiri has about 13 ha of open water, 1-2 m deep, and is described as borderline *oligotrophic/mesotrophic* (having low to moderate levels of nutrients) (Gibbs, 2002). A firm sandy base overlies brownish black mud. Changes to the outlet channel since the 1950s suggest that breaching has not occurred for ten years or more (Cochran, 1995). However, it has breached in 2005 and 2006.

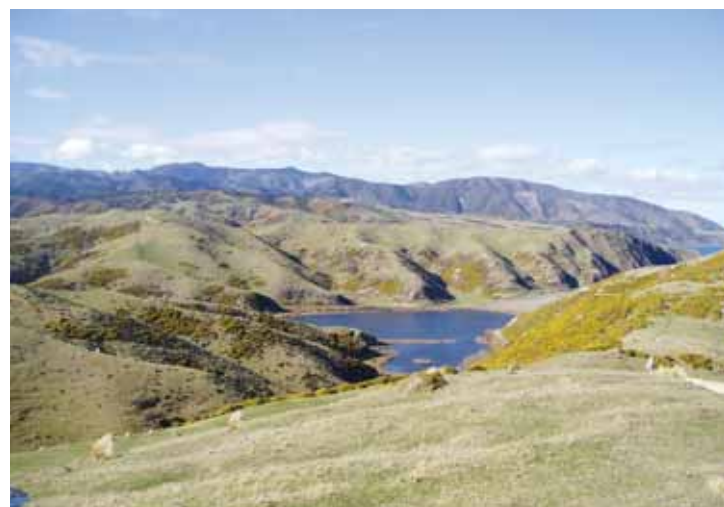
Wetlands began to develop around the edges of Lake Kohangatera about 4300 years ago but only more recently (about 800 years ago) around Lake Kohangapiripiri. These wetlands currently extend up both valleys for considerable distances. Above Lake Kohangatera they cover about 150 ha and above Lake Kohangapiripiri they cover about 43 ha (Gibbs, 2002). The wetlands and lake margins had been leased out for grazing in the past but stock were retired from the area after 2004 (GWRC, 2003).

Stream health has not been tested in either catchment. Possible sources for contamination are the now closed landfill of the former Eastbourne Borough Council and farm runoff. The landfill was sited south of Eastbourne township on a tributary of Gollans Stream.

Large amounts of sea-salt are likely to be deposited on the soil and vegetation in the Pencarrow and Baring Head parts of the park. Some of this salt will be leached into the waterways but it is not known what effect it has on the water quality of the Pencarrow Lakes. Recent surveys showed no evidence of a salt layer in Lake Kohangatera.



Lake Kohangatera



Lake Kohangapiripiri

Biodiversity

6 Flora

6.1 Pre-historic vegetation of East Harbour

Prior to the arrival of humans in the region, climatic change was probably the main determinant of vegetation on the eastern hills of Wellington Harbour. There have been many periods when temperatures in Wellington have been both warmer and colder than today, sometimes by as much as 4°C (Mildenhall, 1994). The warmer periods seem to be associated with higher rainfall and the cooler ones with windier weather. More than 80,000 years ago the climate was warm, rather similar to today. Palynological studies (of ancient pollen grains and wood fragments found at depth in soil cores) show that the lowland forest around Wellington Harbour then was dominated by rimu (*Dacrydium cupressinum*) and tree ferns (*Cyathea* species). Northern rata (*Metrosideros robusta*) forest was at that time established at Seaview (Mildenhall, 1994). During the last glaciation the forest retreated into sheltered gullies and warm west facing slopes. When this cold period ended 10,000 years ago, the forest flourished again with the gradual rise in temperature.

About 7,000 years ago, another cooling phase began and the climate also became drier with more frosts and wind. Black beech (*Nothofagus solandri* var. *solandri*) and hard beech (*N. truncata*) – both species able to withstand cooler temperatures – began to slowly invade southwards from the Tararua and northern Rimutaka Ranges. Red beech (*N. fusca*) was much slower at spreading southwards from its Ice Age refugia on the moister, more fertile, colluvial soils in the valleys of these ranges (Gabites, 1993). Today it has only reached a southern limit around the head of the Pakuratahi River between the peaks of High Misty and Bawbaw. The wetter upper slopes of the main Rimutaka Range were suited to silver beech (*N. menziesii*), however, and in the absence of red beech, silver beech was able to establish itself at lower altitudes (c. 550-600 m) than the usual situation in the southern Tararua Range (c. 800 m) (Gabites, 1993). The clay-rich Taita and Tawai soils of the ridges in the Eastbourne Hills seem to have suited black and hard beech and, by 2000 years ago, they had reached the south coast and Pencarrow Lakes area, even replacing podocarp forest around where Lake Kohangatera lies today (Upston, 2002). Furthermore, periodic earthquakes had uplifted the land, creating a series of wetlands above Pencarrow Lakes and a broad gravel beach backed in places by dunes. As a result, forest species decreased near the coast (except matai [*Prumnopitys taxifolia*]), and wetland species such as Cyperaceae increased (Upston, 2002).

6.2 Human impacts on the vegetation

Anthropogenic change to this natural environment began with the settlement of New Zealand by Polynesians about 1000 years ago. There is evidence of major fires throughout the country, most occurring roughly 750 years ago and leading to extensive deforestation (McGlone, 1989). According to the accounts of early European settlers, however, the eastern hills of Wellington Harbour appear to have suffered little of this loss, although Maori did have localized cultivation on the banks of the Hutt River.

So, in 1839, the first European settlers who disembarked at Pito-one on the shores of Port Nicholson were confronted by a forested landscape: black and hard beech on the eastern hills and podocarp/broadleaf forest on the moister, more fertile alluvial soils



of the floor of the Hutt Valley. Around the eastern coastline from the mouth of the Hutt River to opposite Ward Island, there was uninterrupted forest with trees overhanging the water (Heaphy, 1879). By then, however, the south coast, around the Pencarrow Lakes and across to the Wainuiomata River, had been cleared of forest, leaving tauhinu (*Ozothamnus leptophyllus*), manuka (*Leptospermum scoparium*), tussock and native grasses growing on the spur south of Gollans Valley (Bagnall, 1972). Bagnall's history of the Eastern Bays refers to sporadic Maori fires in this coastal area. Coastal forest and shrublands extended north from the head of Lake Kohangatera except on the valley floor which was a raupo (*Typha orientalis*) swamp with toetoe (*Cortaderia toetoe*) fringes. It is uncertain whether the karaka (*Corynocarpus laevigatus*) around the coast was a natural occurrence or had been introduced by Maori as a food-providing tree (Orchard, 1995; Park, 1999).

The European settlers set about deliberately lighting fires to clear the land for farming and these often burned out of control across the eastern hills. Some fires burnt across the ridge from the harbour edge to Wainuiomata (Lawrence, 1984). The resulting scars were rapidly colonised by native manuka and introduced gorse (*Ulex europaeus*), both of which have fire-resistant seeds. Throughout much of the 20th century accidental fires were commonplace on the eastern hills and with each successive fire gorse gained a stronger hold.

Grazing by cattle, sheep and goats in the southern coastal hills over the 150-or-so years since European settlement has had a significant detrimental effect on beach and wetland native vegetation, especially at Fitzroy Bay. Stock were retired from the area in 2004 and the surrounding farmland is being left to gradually revert to natural vegetation in order to protect the lake values (Dixon, 2003). A re-vegetation plan has been developed (Park, 2007)

6.3 The forests of the hills behind Eastbourne

Today the Eastbourne Hills are covered in a mixture of variously-aged beech forest and scrub (Gabites, 1993; Sawyer, 2005). The regenerating forest on the disturbed escarpments is predominantly beech. Beech seeds are winged and carried by the wind for moderate distances so the trees need to be nearby in order to colonise a disturbed area. They compete well with broadleaf trees in low fertility situations but where soils

have been rejuvenated (by the addition of soil due to down-slope movement), broadleaf forest will succeed. Black beech tends to dominate on dry, exposed ridges and spur tops while hard beech is more successful on shallower slopes with steepland soils of unstable colluvium (Moynihan, 1975). By 1975 when Moynihan was writing there were areas of regenerated forest where pole sized beech trees were reaching the canopy. The contrast between the beech forest of these eastern hills and the podocarp/broadleaf forest on the western side of the harbour is attributed to differences in soil fertility. The soils of the eastern hills are more weathered (clay-rich) compared with those in the west, where thicker coatings of loess also contribute to higher levels of nutrients in the soils (Druce & Atkinson, 1959; Gibbs, 1983). The distribution of indigenous forest types and different categories of



Beech forest, Eastbourne Hills



Emergent rimu in regenerating lowland forest, Gollans Valley. Photo: MIRO

scrub and regenerating forest are shown in Map 7: *Vegetation of the Eastbourne Hills*.

The red mistletoe (*Peraxilla tetrapetala*) which grows almost exclusively on beech trees is found in the Eastbourne Hills. Mistletoes are highly palatable to possums and are now rare in many parts of New Zealand (Fuller, 1985; Sawyer & Rebergen, 2001).

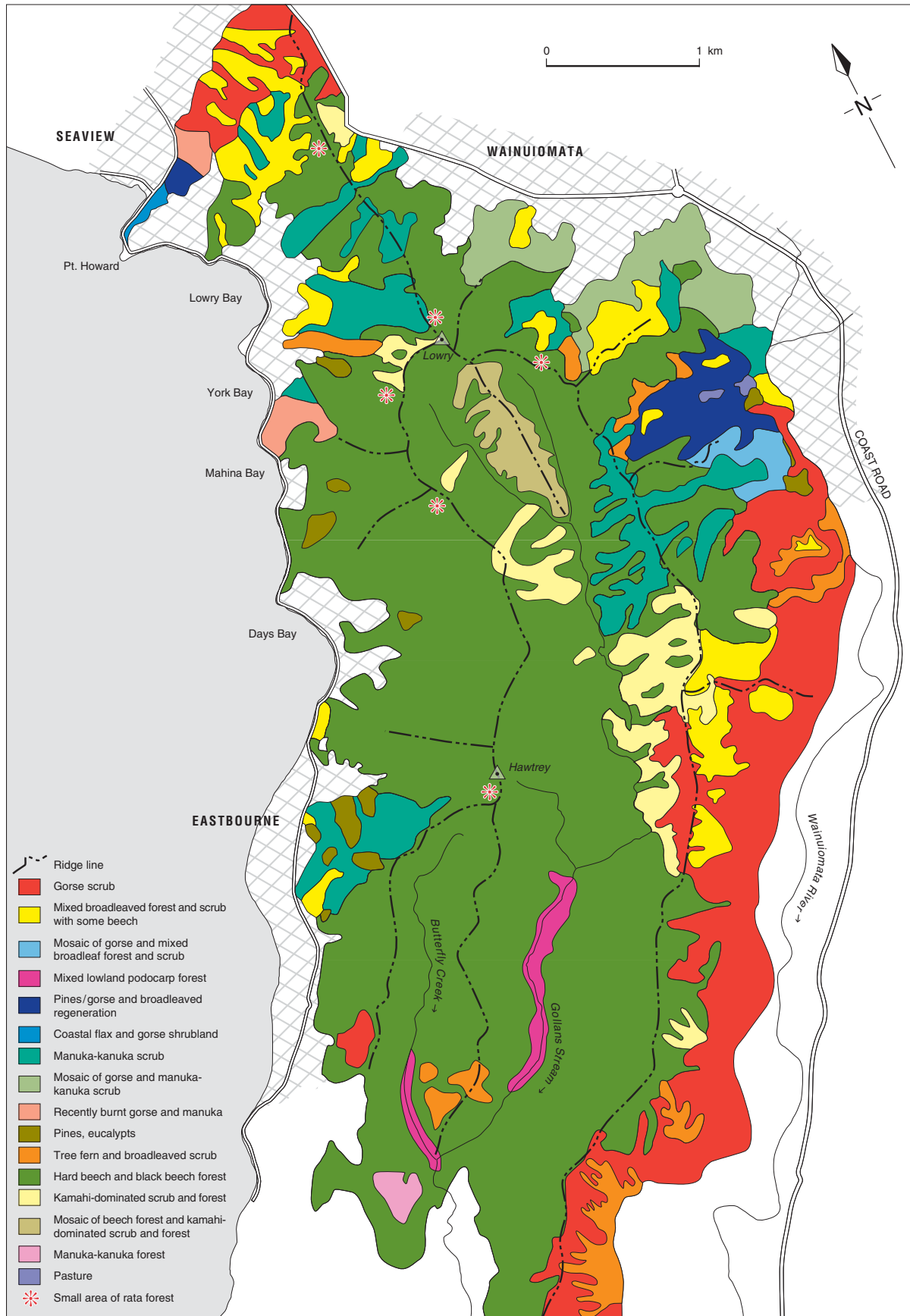
The lowland podocarp/broadleaf forest is confined to the valley floors in the lower part of Butterfly Creek and the middle reaches of Gollans Stream. The podocarps consist of large mature specimens of rimu, miro (*Prumnopitys ferrugineus*), matai and kahikatea (*Dacrycarpus dacrydioides*). Although seedlings of kahikatea and matai are present there are few podocarps at intermediate stages of growth. Rimu occur on better drained, fertile colluvium whereas kahikatea is more common where drainage is

poor (for example, beside the stream where the bush track enters the park at the top of Cheviot Road, Lowry Bay). Pukatea (*Laurelia novae-zelandiae*) is a common emergent species associated with kahikatea and, unlike the podocarps, is regenerating well. A kohekohe (*Dysoxylum spectabile*) remnant can be found in Lowry Bay area.

Northern rata is found throughout the Eastbourne Hills, where it has generally established as a terrestrial tree rather than as an epiphyte. When it establishes as an epiphyte, the rata seed germinates and grows on the branch surface or trunk of the host tree, usually a rimu or other podocarp (Dawson & Lucas, 2000). The rata then gradually encloses the host and remains standing long after it has died; such northern rata can be 25 m or more tall. With a terrestrial tree, the seed germinates on the ground and the resulting tree (which may have multiple trunks) is generally not as tall. A terrestrial specimen in Lowry Bay Scenic Reserve however, is reported to be 20 m tall (Kelly, 1965a). Rata that establish on the ground do so in sunny open spaces at the heads of gullies and on rocky outcrops (Wassilieff & Clark, 1986), and have been seen growing in a band along the boundary between two soil types – *in situ* material and colluvium (Kelly, 1965b). There are terrestrial rata of all size classes in this part of the park.

The number of rata in the park has declined due to selective logging in the past and damage caused by possums. Piles of rata logs were still present on the Lowry Ridge in the 1980s (Beauchamp, 1994). Many of the seedlings that established in the ground in clearings opened by the Wahine storm did not survive, in part because of subsequent browsing by possums (Beauchamp, 1994). Tony Beauchamp noted that rata is the second-most preferred food of possums (after mistletoe). As well as browsing the floor of the forest, possums also establish themselves in the canopies of tall rata where clumps of epiphytes provide additional palatable vegetation. Supplied here with a wide range of food, the possum can remain in the crown of the tree until it is completely defoliated (Blake, 2002). In 1986 some of the larger rata in the park were fitted with metal bands to deter possums (MIRO, 2001). Following monitoring of possums and extensive trapping Greater Wellington began a survey in 2001 to monitor the health of 55 large rata in the park with assistance from MIRO and Project Crimson.

Map 7 Vegetation



6.4 Conservation significance of the plants of the Eastbourne Hills

John Sawyer (2005) has recently evaluated the plants of the Eastbourne Hills in terms of their conservation significance within the local Wellington region and the wider Wellington Conservancy (of the Department of Conservation), a larger region incorporating the Tararua Range, Wairarapa and Horowhenua. A special feature of this lowland forest is the range of terrestrial and epiphytic orchids found here – 33 recorded to date. This is one of the richest orchid floras for any area of equivalent size in Wellington, and the number of species is 50% of the orchids known throughout the entire conservancy. Different orchids flower at different times of the year and there is usually at least one species flowering in any month (Chisholm, 1994). Although individual plants are small, species such as *Earina autumnnalis* can form large clumps in open, sunny situations under the beech forest, filling the air with their scent in early autumn. The threat to orchids comes not from possums but from avid collectors. (Mitalfe, 2002).

Of the 264 species of native vascular plants recorded from the Eastbourne Hills, only one, *Libertia edgariae*, is considered to be endemic to this locality (Sawyer, 2005). Eight plant species are considered to be regionally threatened, that is, considered to be in danger of regional extinction and listed in the Department of Conservation’s regional plant conservation strategy (Sawyer, 2004). They are listed in Table 6.1 below.

Latin Name (* Denotes coastal species)	Common Name	Regional Status+
<i>Botrychium biforme</i>	Fine-leaved parsley fern; patotara	Susceptible
<i>Einadia allanii</i> *		Serious decline
<i>Gonocarpus incanus</i>		Sparse
<i>Libertia edgariae</i>		Range restricted
<i>Melicytus obovatus</i> *		Regional critical
<i>Morelotia affinis</i>		Sparse
<i>Pterostylis cardiostigma</i>	Greenhood orchid	Sparse
<i>Schizaea bifida</i>	Forked comb fern	Regionally critical

+ Sawyer 2004.

Table 6.1: Regionally Threatened Plants recorded from the Eastbourne Hills

In addition, Sawyer (2005) lists another nine plants of the Eastbourne Hills as being of local conservation significance, because of their rarity elsewhere in the Wellington Conservancy. The locally-significant list includes *Pittosporum divaricatum*, one of Wellington’s rarest plants, and the population of northern rata which are considered one of the most significant in the Wellington region. This population is the largest stand of terrestrial rata in the Wellington region. The majority of northern rata in the Rimutaka and Tararua Ranges have established epiphytically.

Another Eastbourne Hills plant feature of conservation significance noted by Sawyer is the uncommon occurrence of three species of maire (*Nestigis montana*, *N. cunninghamii*, and *N. lanceolata*). Because of the easy access to the forests of the Eastbourne Hills their moss and fungi flora has also been well documented, although



Easter orchid (*Earina autumnnalis*) in flower



Greenhood orchids (*Pterostylis cardiostigma*) in flower

none of these species is considered to be endemic or nationally threatened. Eighty-six species of moss have been recorded from the Butterfly Creek locality of the Eastbourne Hills (see Appendix 1) and 105 species of fungi throughout the entire park (but most of the type localities are in the Eastbourne Hills) (see Appendix 1).

6.5 Vegetation of the Pencarrow Lakes block and southern coastline



Cushions of *Raoulia* and *Pimelea*, Fitzroy Bay shore platform.
Photo: Les Molloy



Wetland vegetation on the margins of Lake Kohangapiripiri.
Photo: Phil Benge

The coast between Eastbourne and Pencarrow Head is a narrow rocky marine platform which separates low cliffs from a series of steep coarse sand and gravel beaches. It is exposed to strong northwesterly winds and some southerly swells and because the intertidal area is so dynamic it is only able to support a low diversity of biological life (Rosier & Hastie, 1992).

Wind sheared gorse, ngaio (*Myoporum laetum*), tauhinu and occasional taupata (*Coprosma repens*) cling to the cliffs and debris slopes. Interspersed with these are a number of hardy low shrubs of *Coprosma propinqua* and *Olearia solandri*, tangled shoots of *Muehlenbeckia complexa* and native spinach (*Tetragonia implexicoma*). The spikey Cook Strait speargrass (*Aciphylla squarrosa*) lies in wait for the unwary. Sand binding plants, such as shore bindweed (*Calystegia soldanella*), *Carex pumila*, *Poa anceps* and the introduced marram grass (*Ammophila arenaria*), occur in pockets on the sandy shores.

Beyond Pencarrow Head the coast is exposed to the full force of the heavy southerly swells and winds of Cook Strait. The gravel and sand beaches are wider, with a series of ridges the rearmost of which is topped with blown sand. To the east of Lake Kohangatera a high dune has been built up against the cliffs. These dunes and gravel ridges support a number of nationally and regionally threatened species such as leafless muehlenbeckia (*Muehlenbeckia ephedroides*) and sea holly (*Eryngium vesiculosum*) (Milne & Sawyer, 2002). Many broad cushions of *Raoulia hookeri* bind together sand and gravel surface. This is the most extensive occurrence of this species in the region (Stephenson, 1975). The small shrub *Pimelea urvilleana* also forms cushions on the beach.

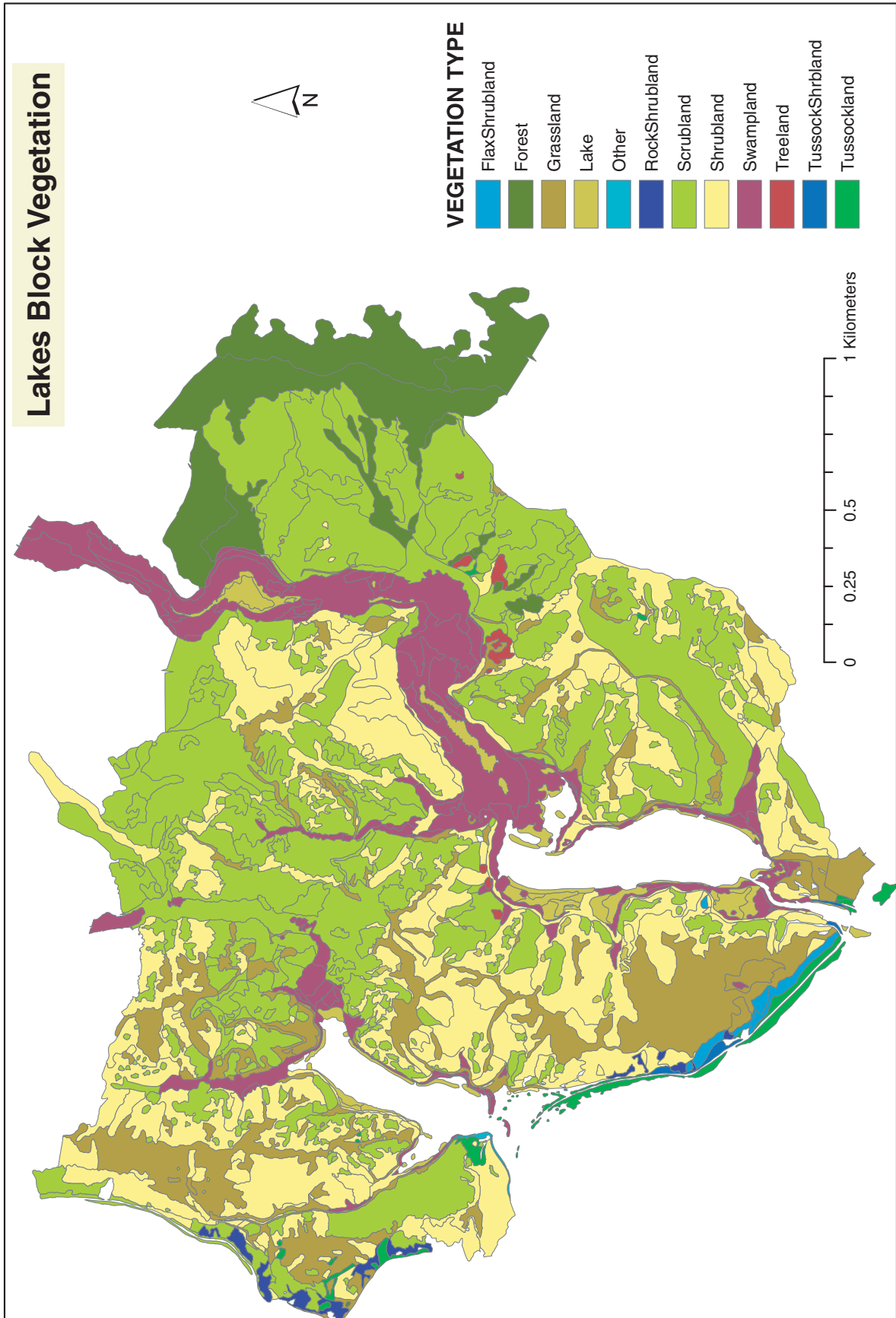
Behind the beach, the dune communities contain sedges such as pingao (*Demoschoenus spiralis*) and *Carex pumila*, the grasses *Austrofestuca littoralis* and *Spinifex sericeus*, another cushion plant *Colobanthus muelleri*, and extensive mats of *Pimelea prostrata*. The poorly drained slacks behind the dunes support eel grass (*Zoysia minima*), umbrella sedge (*Cyperus ustulatus*) and *Isolepis prolifera*, all typical plants of wet coastal habitats. Three significant coastal plants are known to occur at Baring Head: *Austrofestuca* sp., an unnamed species of *Leptinella*, and a key population of the attractive divaricating coastal shrub *Muehlenbeckia astonii* (the latter so rare in the wild that it now numbers only about 20 plants on the Wellington coastline between Turakirae head and Sinclair Head).

The two lakes, Kohangapiripiri and Kohangatera, and their associated swamps contain extensive communities of wetland plants which exhibit the influence of salt on plant diversity and growth. Although the lakes have not been open to the sea for 5000-7000 years, salinity levels fluctuate with storms and floods; salt-marsh species, such as the jointed wire rush or oioi (*Apodasmia similis*) and glasswort (*Sarcocornia quinqueflora*), coexist with freshwater species. Pure stands of single species are the rule in wetlands, each one dominant in a particular zone (Johnson & Brooke, 1998). This creates a mosaic pattern where zones of salinity, water depth, and soil fertility are defined by the vegetation. While larger species such as raupo, lake club rush (*Schoenoplectus tabernaemontani*), toetoe, flax and giant umbrella sedge visually dominate the wetland vegetation, a great many small herbs hide between these large clumps or form a dense grass-like sward. The tiny floating water fern, *Azolla filiculoides*, covers calm areas of open water, while below the lake surface, water milfoils (*Myriophyllum* spp.) grow and flower.

In 2004, a NIWA survey of submerged aquatic flora found that the two lakes, while similar, each had their own character (Wells & Champion, 2004). Lake Kohangapiripiri had a sparse cover of submerged vegetation, with around 80% of the lake floor covered with blue-green algal balls (*Nostoc* sp.). In Lake Kohangatera, the submerged flora was very dense and dominated by *Myriophyllum triphyllum*. New Zealand now has few examples of these dense, tall-growing macrophytic lake communities left, as most other lakes have suffered from exotic weed invasion. These lakes are highly susceptible to invasion by oxygen weed (*Egeria densa*, *Lagarosiphon major* and *Elodea canadensis*) or hornwort (*Ceratophyllum demersum*) which would displace most of the native flora if introduced through recreational activities.

A simplified landcover pattern for the Pencarrow Lakes block is shown in Map 8.

Map 8 Vegetation, Lakes Block



6.6 Conservation significance of the Pencarrow Lakes locality

The Pencarrow raised beach landforms (impounding Lakes Kohangapiripiri and Kohangatera) are considered to be of national geomorphic importance (Kenny & Hayward, 1993) (see section 2.3).

The Pencarrow Lakes wetlands are significantly larger than the better known Taupo Swamp at Plimmerton. This type of wetland habitat is uncommon in the Wellington region and, although the vegetation has suffered from fires and trampling by stock, it has not suffered as much disturbance as many other wetlands in the region. These swamps are of particular scientific interest because not only are they the youngest in the region, but they also have features which indicate that salt marshes once occupied the basins now covered by freshwater (or brackish) swamps. The conservation values of the two swamps are high because they:

- have not suffered as much disturbance as other freshwater swamps in the Wellington region;
- exhibit several excellent examples of plant community succession from water to dry land around the margin of the lakes (Stephenson, 1975; Wolfenden, 1989; Brown, 1992);
- are the youngest freshwater swamps in the Wellington region;
- contain a greater variety of plant communities than any other freshwater swamp in the Wellington region;
- are the habitat for 16 regionally endangered or uncommon plant species;
- provide breeding habitat for four species of regionally uncommon native birds;

Cushions and low shrubs of *Pimelea urvilleana* on the Pencarrow Lakes storm beaches support three significant species of moth: *Notoreus* sp., *Ericodesma aerodana* and *Agrotis innominata* (Patrick, 1992). Milne and Sawyer (2002) cite just three populations in the Wellington region (Pencarrow, Lake Onoke and Castlepoint), suggesting that their disjunctive distribution could indicate that historically the distribution of such coastal cushion communities may have once been more widespread (Orchard, 1995).



Wetlands extending up Gollans Valley above Lake Kohangatera

7. Fauna

7.1 Birds

The large variety of habitats in the park – coastal, wetland and lowland forest – probably accounts for the more than 50 species of birds recorded. The proximity of seasonal food sources in residential gardens in Eastbourne and Wainuiomata around the periphery of the park is probably another key habitat factor for birds.

7.1.1 Forest birds

The northern, forested Eastbourne Hills block supports most common native bush birds, including tui (*Prosthemadera novaeseelandiae*), bellbird (korimako, *Anthornis melanura*), rifleman (titipounamu, *Acanthisitta chloris granti*), NZ kingfisher (kotare, *Halcyon sancta vagans*), NZ pigeon (kereru, *Hemiphaga novaeseelandiae*), morepork (ruru, *Ninox novaeseelandiae*), whitehead (popokatea, *Mohoua albicilla*), fantail (piwakawaka,

Rhipidura fuliginosa placabilis), grey warbler (riroriro, *Gerygone igata*), silvereye (tauhou, *Zosterops lateralis*), and shining and long-tailed cuckoos (pipiwharauoa, *Chrysococcyx lucidus* and koekoea, *Eudynamis taitensis*). Other less common forest birds are the NZ falcon (karearea, *Falco novaeseelandiae*), kaka (*Nestor meridionalis septentrionalis*), and yellow-crowned parakeet (kakariki, *Cyanoramphus auriceps*).

A breeding pair of falcon has been seen nesting in a tall rimu in the Eastbourne Hills for several years (MIRO, 2001) and there is anecdotal evidence pointing to their increasing occurrence throughout the Eastbourne Hills. Falcon probably disperse from here over a wide area, regularly flying across the harbour to Wellington City (where they are known to prey on rock pigeon, *Columba livia*).

Forest birds are responsible for the pollination and seed dispersal of many plant species within the park, including the threatened mistletoe populations (Sawyer & Rebergen, 2001). The tuis and bellbirds play a key role in pollinating many of the nectar-bearing flowers in the forest and fringing shrublands, particularly rata, pohutukawa (*Metrosideros excelsa*), rewarewa (*Knightia excelsa*), kowhai (*Sophora spp.*), tree fuchsia (*Fuchsia excorticata*), and puriri (*Vitex lucens*). Other forest trees, like tawa (*Beilschmiedia tawa*), hinau (*Elaeocarpus dentatus*), pigeonwood (*Hedycarya arborea*), rimu, miro, and karaka have large berry-like fruit favoured by birds such as kaka and kereru (Falla *et al.*, 1978). However, with the decline of fruit-eating birds, seed dispersal of a range of forest species is often restricted to just one bird species - kereru. Although the population of kereru in the Eastbourne Hills appears to be sustaining itself (in part because of food sources in nearby Rimutaka Forest Park, as well as puriri, kowhai and karaka planted in adjacent residential gardens), the Department of Conservation has warned that the age structure of current populations of kereru is such that catastrophic declines in kereru numbers are likely in the future (Hitchmough, 2002). Without them as a vector for seed dispersal, populations of forest plants reliant on kereru will decline, leading to further loss of diversity in already fragmented forests.

7.1.2 Birds of the wetlands and coast



Shining cuckoo



Falcon fledglings, Eastbourne Hills.
Photo: Richmond Atkinson

Further south at Gollans Stream swamp, one of only four breeding colonies of black shag (*Phalacrocorax carbo*) in the Wellington region breeds in a grove of karaka trees (Powlesland *et al.*, 1992). Although secure overseas, populations of black shag in New Zealand are sparse. Gollans and Cameron's Stream wetlands also shelter breeding populations of Australasian bittern (*Botaurus poiciloptilus*), New Zealand dabchick (*Poliocephalus rufopectus*), spotless crake (*Porzana tabuensis plumbea*), pukeko (*Porphyrio porphyrio melanotus*), pied stilt (*Himantopus himantopus leucocephalus*), grey duck (*Anas superciliosa superciliosa*) and black swan (*Cygnus atratus*) (Beaglehole, 1989; Brown, 1992 & Stephenson, 1975). These latter two species are game birds and the grey duck, although secure overseas, is in serious decline in New Zealand especially where populations overlap with mallard (*Anas platyrhynchos*). The brown, heron-like, bittern is threatened overseas as well as being nationally endangered in New Zealand. The dabchick is sparsely but widely distributed in the North Island but very scarce in the South. It usually avoids shallow lowland lakes with high eel populations (Falla *et al.*, 1978).

The coast is inhabited by a number of seabirds and shorebirds, some of which breed on the raised gravel beaches and cliffs. Notable among these are blue penguin (*Eudyptula minor*), variable oystercatcher (*Haematopus unicolor*), banded dotterel (*Charadrius bicinctus bicinctus*) and black backed gull (*Larus dominicanus*) (Clark & Horne, 1993; Gibbs, 2002 & Stephenson, 1975). Although some banded dotterel nest on ocean beaches, most nest inland on the braided river systems of the South Island. In the Wellington region, the banded dotterel breeds regularly on Kapiti Island and only occasionally on the mainland at the mouth of the Waikanae River – and, more recently, at Fitzroy Bay. Listed as being in gradual decline, dotterel are very prone to disturbance from off-road vehicles.

7.2 Freshwater fish

The waterways in the Eastbourne Hills block of the park pass through relatively pristine beech forest and podocarp/broadleaf forest, with few human modifications save for the small picnic area at Butterfly Creek. Downstream, however, and around Cameron Creek in the south, pastoral farming practices have left stream and lake edges without native tree cover. An old landfill sited near a tributary of Gollans Stream may also affect stream health. Many of the fish species in the park are migratory and come and go from the area according to environmental conditions. There has been some concern that changes in fish diversity in recent years are caused by natural and built barriers at the coast that may restrict fish migrations between freshwater and the sea, and commercial/recreational exploitation of eel and whitebait fisheries.

The two main waterways in the park (Gollans Stream and Cameron Creek) exit the lakes at the coast through barrier bar systems. The wave regime at the coast keeps the barriers closed for long periods, forcing the water to drain gradually through the gravel barriers. When water builds up in the lakes, especially at times of high rainfall, the barrier may be breached, thereby providing an opportunity for migratory fish to begin or complete their journey.

This natural hydrological system has been modified in both lakes by the presence of a road that passes between the lakes and the sea. It is not known whether the road's culverts reduce the frequency and/or duration of breachings or creates some other additional barrier to fish migration. This is being investigated. Lake Kohangatera is known to have breached in 2003, 2005 and 2006.

Lake Kohangapiripiri has a far smaller catchment than Lake Kohangatera (198 ha compared with 2080 ha). As a result, flows in the stream are smaller and the barrier bar is breached less often. Breaching has occurred in 2005 and 2006, but no breaching was recorded for many years prior to that. The culvert at this lake is thought to be acting as a barrier to fish passage because it is perched. Common bullies from Lake Kohangapiripiri were found to be a landlocked population, while those from Lake Kohangatera had all been to sea (Joy & Hewitt, 2002).

Butterfly Creek/Gollans Stream, the Pencarrow Lakes, and Lowry Bay Stream were surveyed for native fish by Massey University in April



New Zealand dabchicks, chick and adult



Blue penguin



Banded kokopu



Giant kokopu (juvenile)

and May 2002 (*ibid.*). Records of earlier fish surveys are listed on the NIWA database. These surveys, usually with electric fishing during daylight and set fyke nets overnight, do not necessarily reveal all fish present in the stream; so there may be more species in the catchment than have been recorded. While night hunting with a torch in a Taranaki stream Mike Joy saw fish species not seen when day fishing in the same stream using conventional methods (Mike Joy, *pers. comm.*).

Nine species were reported in the recent survey of Butterfly Creek and Gollans Stream, including giant kōkopu, which are listed as being in gradual decline under the NZ Threat Classification 2002 (Hitchmough, 2002). Lowry Bay Stream had very high densities of banded kokopu (*Galaxias fasciatus*). Catches at Butterfly Creek and Gollans Stream showed a marked decrease in diversity in comparison with 1987 records, with four species previously recorded not being found: giant bully (*Gobiomorphus gobioides*); redfin bully (*G. huttoni*); inanga (*Galaxias maculatus*); and lamprey (*Geotria australis*).

Further research conducted by Massey University Masterate student, Carol Nicholson, in 2004, 2005 and 2006 found that there were healthy populations of banded kōkopu, giant kōkopu and long-finned eels in Gollan's Stream, and redfin and other bullies were found, but concern remained about the recruitment of these species (Nicholson, *pers. comm.*). The investigation into the road culverts, proposed telemetered water level monitoring of the lakes and breaching records provided by the Ranger will assist in informing management of the lakes in the future.

A summary of freshwater fish recorded in the waters of the park is presented in Table 7.1.

Gollans Stream 1987	B' fly Creek 1963	B' fly Creek 1987	B' fly & Gollans 2002b	Ko' piri 1966	Ko' piri 2002a	Ko' piri 2002b	Ko' tera 1974	Ko' tera 2002a	Ko' tera 2002b
banded kokopu	banded kokopu	banded kokopu	banded kokopu	giant bully	common bully	common bully	banded kokopu	common bully	common bully
brown trout	giant kokopu	longfin eel	brown trout	giant kokopu	eel short	longfin eel	giant kokopu		common smelt
common bully	koura	koura	common bully			shortfin eel			shortfin eel
eel longfin	lamprey		longfin eel						inanga 1 only
eel shortfin	redfin bully		shortfin eel						
giant bully			giant kokopu						
giant kokopu			koura						
inanga			Changes			Changes			Changes
koura			new finds			new finds			new finds
redfin bully			zero			longfin eel			common smelt
			not found			not found			shortfin eel
			giant bully			giant bully			not found
			inanga			giant kokopu			banded kokopu
			redfin bully						giant kokopu
			lamprey						

Table 7.1: East Harbour Regional Park freshwater fish statistics (NIWA nzffd, Sept 2003; Joy & Hewitt, 2002).

7.3 Lizards

There are eleven species of lizard in the Wellington region (seven skinks and four geckos) (Parrish, 1984). As with the bird species, these fauna will have suffered from habitat loss and predation by introduced mammals. Three of the region's skinks have been recorded in the East Harbour area. Common (*Oligosoma nigriplantare polychroma*), brown (*O. zelandicum*), copper (*Cyclodina aenea*) and ornate skink (*C. ornata*) are likely to be present in the park. Spotted skink (*Oligosoma lineocellatum*) has been recorded at Turakirae Head and Baring Head, so is possibly present in the Lakes Block. Of the region's geckos, one species is confined to Mana Island, but the other three; common (*Hoplodactylus maculatus*), forest (*Hoplodactylus granulatus*) and green gecko (*Naultinus elegans punctatus*) have been recorded in the East Harbour area so are likely to be present in the park.



Green gecko

7.4 Invertebrates

Knowledge of invertebrate diversity is limited in New Zealand, because of a lack of information about most species and their distribution. The vast majority of the indigenous invertebrates are forest-dwellers and it is likely that these species have suffered from the same impacts as the birds and lizards. A variety of invertebrates were recorded in the forest behind Days Bay in 1926 (Grimmett, 1926). Species of flatworms, earthworms, amphipods, isopods, centipedes, millipedes, springtails, earwigs, cockroaches, moths, ant, two-winged flies, true bugs, beetles, spiders and wetas were noted.

The forest ringlet butterfly (*Dodonidia helmsii*) and its parasites have been studied in the Eastbourne forest (Gibbs, 1980). Other invertebrates recorded include *Wainuia urnula*, bush slug (*Pseudoneita papillatus*), peripatus (*Peripatoides novaezelandiae*), glow-worm (*Arachnocampa luminosa*) and large dragonfly (*Uropetala carovei*), (Moonen, 1994). An invertebrate monitoring programme was set up by Greater Wellington in Gollan's Valley in 2002. Twenty pitfall traps have been sampled monthly from October to March since that time.

Zooplankton have been sampled in Lakes Kohangapiripiri and Kohangatera (Frank, 1995). Few other invertebrate studies have been completed in the Lakes block, but known recordings are detailed in Gibbs, (2002).

Environmental Management & Land Uses

8. Ecosystem classification and environmental protection

8.1 East Harbour's ecosystem

One of the goals of the East Harbour Regional Park management plan is to protect and enhance indigenous ecosystems within the park. This ecosystem approach reflects a recognition that everything is interconnected and processes which occur in an ecosystem are as important as the species living within them. Defining ecosystems is not simple, as they generally lack concrete boundaries and biological communities are complex, with continuous variation across landscapes. In the late 1980s ecological districts and regions across New Zealand were defined, using landscape and ecological patterns. East Harbour Regional Park is part of the Tararua Ecological District, which covers the Akatarawa, Tararua and Rimutaka ranges. This ecological district is characterised by the steep, dissected greywacke and argillite hills, high rainfall and strong westerly winds (McEwen, 1987).

A numerically-based approach to ecosystem classification has recently been developed — the Land Environments of New Zealand (LENZ), (Ministry for the Environment, 2003). Within LENZ, ecosystem patterns are mapped through consideration of 15 environmental drivers, combining climate, landform and soil variables such as, temperature, solar radiation, water supply, slope, soil drainage, soil fertility, etc. While the environmental drivers in LENZ were chosen primarily because of their importance for tree species growth, they are also useful for depicting the distribution of other organisms.

Throughout New Zealand, LENZ has defined and mapped these 'environments' at different scales. Twelve environments of the most detailed LENZ classification level are found in the park. This reflects the variation in habitats both between and within the Eastbourne Hills and the Lakes Block. Four of these ecosystem types are found largely only in the Wellington region, while some others are nationally depleted, such as lowland environments in Gollans Valley and at Baring Head.

8.2 Impact of introduced pests on the vegetation

Possums (*Trichosurus vulpecula*), red deer (*Cervus elaphus*), goats (*Capra hircus*), mustelids (*Mustela* spp.) and rats (*Rattus* spp.) have major impacts on the ecological values of the park. Pigs (*Sus scrofa*), cats (*Felis catus*), mice (*Mus musculus*), rabbits (*Oryctolagus cuniculus*), hares (*Lepus europaeus occidentalis*), hedgehogs (*Erinaceus europaeus*) and magpies are also contributors to the decline of native flora and fauna. Possums eat leaves, seeds, fruit and seedlings of plants and are also known to predate native birds and insects. Possum damage varies between plant communities and possums will often target certain preferred food sources, such as rata and tawa (Pekelharing, 1995). Possums have colonised the Wellington region since the late 1800s and caused great damage to the vegetation during this early invasion phase. The vegetation change is

now more gradual, but ongoing impacts can be seen where possums are not controlled. Goats browse the seedlings of the forest and shrublands. They are not present currently in the Eastbourne Hills, but periodically invade the Lakes Block from neighbouring land. They are capable of removing much of the forest understorey. This browsing increases erosion of steeper slopes, weakens forest structure and inhibits natural regeneration processes. Rats and mustelids are major predators of birds, invertebrates and lizards.

Pest plants have the potential to significantly change the composition or structure of native habitats. Many climbing pest plants, such as old man's beard (*Clematis vitalba*) and Japanese honeysuckle (*Lonicera japonica*) can smother mature plants, while other plant pests interfere with regeneration and compete with indigenous plants for space and soil nutrients.

8.3 Control of introduced mammalian pests and weeds

Possoms

In 1996, a survey commissioned by Hutt City Council (Knightbridge, 1996) showed evidence of possum damage to the forest in the Eastbourne Hills. Soon after this report, the care-group MIRO was established and members of the group began kill-trapping possums with Hutt City Council support. MIRO focussed their efforts around rata forest near Hawtrey Trig. In 2001, a contractor using leg-hold traps was contracted by Greater Wellington to cull possums in the forest and on adjoining land. Nearly 9,000 possums were culled. The residual trap catch (RTC) rate of 22.6% recorded before the operation fell to 1.9%.



Bait station and possum trap operated by MIRO and Greater Wellington. Photo: MIRO

MIRO and Greater Wellington developed a fixed network of kill traps across 16,500 ha in 2004. An initial knockdown operation using cyanide was completed and MIRO members now service these traps on an ongoing basis. In 2003, prior to the start of this second operation, possum numbers had risen to 5.7% RTC. A re-monitor of possum numbers in late 2004 showed possums to be at 2.9% RTC, well below the target threshold of 5% RTC.

In 2004, Greater Wellington completed a ground-based 1080 possum control operation in the Lakes Block of East Harbour Regional Park. Possum numbers fell from 38.1% to 1.0% RTC. In 2006, the area was re-controlled using brodifacoum in bait stations as a Tb operation. The area will receive possum control on an ongoing basis through Tb operations.

Ungulates

Goats have occasionally made their way into the Eastbourne Hills from neighbouring farmland, but in general few goats are present in the area. One goat was culled in 2005, but no other reports of goats in the area have been received. Deer and pigs were culled by recreational hunters through a permit system when the area was managed by Hutt City Council. Some professional hunting was initiated in 2006. In the Lakes Block, some goats have been culled, but again, while there are goats on neighbouring land, few are present in the park itself. Pigs also move in and out of the Lakes Block periodically.

Other animals

MIRO targeted rats and stoats in some localised areas during the late 1990s. Over 1,000 rats were trapped in the Eastbourne Hills during the 2001 possum cull operation. Since 2004, diphacinone in bait stations have been used on an ongoing basis to target rats near possum kill traps, as rats eat the bait in the traps. Intensive rat control began in a 300ha mainland island site within Gollans Valley in 2006. A grid of bait stations placed 150m by 100m apart was installed. A rat bait trial is currently underway.

Rat numbers will have fallen in the Lakes Block through the use of 1080 and brodifacoum in the two possum control operations completed there since 2004. Some stoat trapping around the lakes has been undertaken in spring in some years.

Pest plants

Hutt City Council and East Harbour Environmental Association carried out pest plant control in the Eastbourne Hills over a number of years and had some success in reducing the size of the old man's beard infestation on the front-facing slopes. A pest plant strip was cut over a number of years starting in 2001, on the eastern face by Greater Wellington to create a buffer area between the urban area and the forest. In 2004, a pest plant survey was completed by Greater Wellington and a total of 78 pest plant species were recorded in the Eastbourne Hills. Twenty-nine species were targeted for control. The most extensive infestations are of climbing asparagus (*Asparagus scandens*) and wilding radiata pine (*Pinus radiata*). There are also infestations of very weedy plants such as wild ginger (*Hedychium gardnerium*), cathedral bells (*Cobaea scandens*) and old man's beard that require ongoing control. Contractors and a pest plant team deliver the outcomes detailed in the East Harbour Regional Park Pest Plant Plan, 2005-2009 (Greater Wellington, 2005).

The Lakes Block is largely farmland, with regenerating native shrubs. Field surveys for pest plant species in the Lakes Block were completed in 1996 (Mitalfe and Horne, 1997). Large areas of gorse are present, but it is thought that native bush regeneration will occur over time in these areas with the gorse acting as a nursery crop. Some control of gorse has been undertaken where it is in the wetland area. The pest plant of most concern is water buttercup (*Ranunculus trichophyllus*) – an invasive aquatic plant. Aquatic pest plants are very difficult to control, as using herbicides in wetlands can cause damage to non-target species. The spread of the water buttercup and other pest plant species will be monitored.

Monitoring and ecosystem rehabilitation

Eastbourne Hills

MIRO is actively involved in ecosystem rehabilitation in the area. Working in conjunction initially with Hutt City and now with Greater Wellington, MIRO has focused on restoring the health of the forest. Rata bands were placed on a number of rata trees in 1986. Members of the group are involved in pest control activities aimed largely at keeping possum numbers at low levels. A 300ha area of bait stations installed in a 100m by 150m grid has been established in 2006. The goal is to keep rats at low levels within this area and MIRO is investigating possible bird reintroductions.

Monitoring activities are carried out by MIRO and Greater Wellington. The monitoring methods include rodent/mustelid tracking (completed every three months), digital analysis of rata foliage, fruitfall plots and foliar browse transects. Five-minute bird counts have been completed on a three-monthly basis by MIRO



Healthy specimen of northern rata in flower

members since 1999. An enclosure plot and its associated control plots were installed and measured in 2001. Other monitoring in the Eastbourne Hills includes invertebrate sampling using pitfall traps, monthly phenology recording and titoki (*Alectryon excelsus*) and fuchsia photopoints. Pest plant infestations are being monitored through mapping surveys.

Lakes Block and Baring Head

The Lakes block was grazed under a lease arrangement until 2004. The land has now been retired from stock and allowed to revert to natural vegetation in order to protect the lake values. Six 20m by 20m permanent plots were installed in the block in 2004 to provide information about changes in the vegetation over time. Photopoints were also established in 2005. Members of the Ormithological Society of NZ (OSNZ) complete monthly bird counts along the coast and on the edge of the lakes. A member of the Global Volunteers has begun a study of the dotterels that nest on the seaward side of the lakes. Some plantings may occur in the area and a restoration plan has been prepared. MIRO members have started a nursery in Eastbourne to grow plants for restoration purposes.

The lakes themselves have been surveyed by Greater Wellington for the regional wetland database and by Landcare Research for national wetland survey purposes. A NIWA report that details the submerged aquatic flora in the Pencarrow lakes was commissioned to provide baseline information about the status of the lakes (Wells & Champion, 2004). Some rehabilitation work has been completed at the remote Baring Head block. Fences are maintained to keep stock out however, and some plantings of native species has occurred over the years. Bait is regularly replenished in bait stations installed to control possums in this block.

9. Landscape character

From afar, the hills on the eastern side of Wellington Harbour are seen in entirety as a single landscape unit – the eastern backdrop to Wellington Harbour. At close quarters they are experienced as a collection of landscapes, each with its own particular character.

9.1 Regionally significant landscape

The East Harbour hills are listed as regionally significant landscape features because of their contribution to the harbour's setting. The long ridge immediately to the east of the harbour from Wainuiomata Hill to Pencarrow Head is the least modified skyline in the harbour's visual catchment. Its profile is unimpaired by structural developments, such as the telecommunications masts, transmission line pylons and the wind turbine that have been built on the skyline on the western side of the harbour.

The northern section of the Eastbourne Hills, above the residential areas of the eastern bays from Point Howard to Camp Bay, is largely forested. It has a natural character that harmonises with the forested hills of the Rimutaka Range, bringing the forested hill country of Wellington's mountain setting right to the shores of the harbour.

On the southern section, from Camp Bay to Baring Head, the forest cover is largely absent, reflecting the history of farming in this area. It is thought that the ridgeline between Camp Bay and Baring Head and the hills fronting onto Fitzroy Bay were clear at the time of European settlement in the 1840s. In 1907 Katherine Mansfield described them, seen from Island Bay, as "fold upon fold of splendid golden hills. Two white lighthouses, like great watching birds perched upon them."

Historically, these hills have visually complemented the southern end of the Rimutaka Range behind them, as seen from Wellington. Their lighter colour and gentle linear form contrasts with the dark bulk of the Range behind. This may change in future as the re-establishment of native forest cover progresses on Mt Cameron and the higher parts of the ridge between Gollans Valley and Wainuiomata Valley.

Pencarrow Head and Baring Head mark the point where the East Harbour hills meet the sea. These twin headlands on the harbour’s seaward coast echo the twin headlands in the harbour – Point Jerningham and Point Halswell. Visible from many parts of Wellington, Pencarrow Head and Baring Head are the ocean outriders of the harbour and command the air and sea approaches to the city.

9.2 Landscape units

At the local landscape level six separate landscape units can be distinguished within the East Harbour landscape area. The units are distinguished on the basis of their relative visibility and homogeneous landscape character. East Harbour Regional Park lies within six of these units. The units are detailed below:

Eastbourne Hills	the hills behind the eastern bays from Wainuiomata Hill to Camp Bay.
Upper Gollans Valley	the public land in Gollans Valley upstream of the Martin property.
Western Wainuiomata Hills	the hills on the western side of the Wainuiomata Valley from Wainuiomata Hill to Para Saddle.
Pencarrow Coast	the coastal hills from Camp Bay to Pencarrow Head.
Fitzroy Bay	the coastal hills fronting Fitzroy Bay from Pencarrow Head to Para Saddle, including the Lakes Block.
Baring Head	the headland and terraces south of Para Saddle.

Eastbourne Hills landscape unit

This landscape unit comprises high steep hills clad in a mosaic of forest types reflecting a history of varied land use and localised wild fire.

These hills have a largely natural character and are an important element in the harbour’s natural setting. Equally, the harbour is an important element in the landscape character of these hills as experienced by walkers on the tracks that cross them. The deep shade of the forest contrasts with the bright light reflected off the harbour surface to create a landscape of intense light and shade.

The Eastbourne Hills landscape unit has very high visual sensitivity, because it is so visible and because of the role it plays as a component of the harbour’s visual environment.

Critical issues affecting the management of the Eastbourne Hills landscape unit are the protection of the forest cover and the preservation of the natural character of the ridgeline.



Days Bay and Eastbourne viewed from the Eastbourne Hills. Photo: Les Molloy



Upper Gollans Valley, looking south. Photo: Lloyd Homer, ©Institute of Geological & Nuclear Sciences Ltd



Gollans Stream. Photo: MIRO



The Western Wainuiomata Hills rising to Mount Lowry

Most of the Eastbourne Hills landscape unit lies within East Harbour Regional Park. There are a number of large private properties that extend up the hill sides from Eastbourne. Two properties in York Bay extend over the ridge into the upper Gollans Valley landscape unit.

Upper Gollans Valley landscape unit

A deeply cut valley of unmodified native forest enclosed by high hills, the upper Gollans Valley has a remote character that is unique for an area so close to urban settlement.

Because it is visually isolated from the surrounding urban areas by the hills that enclose it the upper Gollans Valley has low visual sensitivity in the long view. Conversely, seen close, it has very high visual sensitivity. Any developments that impinge on its character as an unmodified natural area will detract from the particular value of the recreational experience this valley provides at present.

Most of the upper Gollans Valley landscape unit lies within the East Harbour Regional Park. A small area at the very head of the valley lies within private property that extends over the ridge from York Bay.

Western Wainuiomata Hills landscape unit

Clad in tall vegetation – either gorse, revegetating native forest or remnant native forest – these hills provide a natural setting and backdrop for the Wainuiomata urban area and the rural properties in the lower Wainuiomata Valley.

Being highly visible from the valley, these hills have very high visual sensitivity, especially their higher slopes and ridge lines.

The northern section of these hills from the Wainuiomata Hill to the Wainuiomata Golf Course, lies within the park, except for a private property adjacent to the southern end of the urban area. South of the Wainuiomata Golf Course this landscape unit lies within private property.

Pencarrow Coast landscape unit

This unit comprises the hill side and shoreline on the eastern side of the harbour entrance. The hill sides are clad in gorse and pasture and have a wild natural character reflecting their exposed position at the harbour mouth. Pencarrow Head, with its cliffs and two white lighthouses, provides a dramatic terminus to the long undulating crest of these hills.

The Pencarrow Coast is very popular for walking and cycling. It lies well to the sun and provides easy access to the experience of the elemental forces of nature.

This landscape unit has very high visual sensitivity. It is seen from Wellington as a base line and foreground to the rugged

Rimutaka Range. It is also experienced at close quarters by the large numbers of people who use the Pencarrow Coast Road for recreation. There is considerable room for enhancement of its scenic qualities through appropriate management of the hill sides and the shore platform between the road and the beach.

The beach and coast road, the hill side of the Lakes Block and the Pencarrow headland are in public ownership. The hill sides above the coast road from Camp Bay to the northern boundary of the Lakes Block are in private ownership and so lie outside the park area.

Fitzroy Bay landscape unit

A series of ridges and gullies opening on to Fitzroy Bay – Katherine Mansfield’s *fold upon fold of splendid golden hills*. The higher ridges and terraces are visible from Wellington and the Cook Strait ferries as they enter or leave the harbour.

The seaward margin of this unit has a rugged exposed character. It is part of the much larger landscape of Cook Strait, defined by the sweep of the coast line at the harbour entrance from Baring Head to Sinclair Head and the mountains and hills of the South Island across the water. The details of the Hutt sewer outfall and the Fitzroy Bay gravel mining operation intrude on the experience of this shore as a rugged, largely natural area. The coastal platform has its own distinct landforms. These include the stable dune systems with their low shrubs and grasses, and the more dynamic wave washed beach with its coarse grey gravels.

Back from the sea edge the unit has a gentler character and a more intimate scale. The hills are rounded and lower than in other parts of the park. The folds of the gullies provide seclusion and shelter from the wind.

The hill tops, the hills facing the sea and the shore platform have high visual sensitivity. They are part of the backdrop to Wellington Harbour and the harbour entrance and are seen from many parts of Wellington. Also, many people use this coast for recreation and experience its landscape character at first hand.

Most of the unit lies within the Pencarrow Lakes Block. Parts of the northern side and the southern end of the block lie on private property.



Lake Kohangatera, Fitzroy Bay and Baring Head. Photo: George Gibbs



The Pencarrow Coastline. Photo: Les Molloy



Baring Head viewed from Fitzroy Bay



Baring Head Lighthouse Reserve



Visiting the historic Pencarrow Head Lighthouse

Baring Head landscape unit

Baring Head is the second southern terminus of the East Harbour hills. The headland and adjoining terraces to the north are a bold, wedge-shaped landform. The area's form and visual impact are enhanced by the visual character of the pasture which clads its upper surfaces. The pale colour and smooth texture of these surfaces, when seen from a distance, contrast strongly with the colours and textures of the hills behind giving the area considerable visual prominence when viewed from any distance. The detail of the lighthouse reserve above the cliffs at the southern end provides a focus for the headland, reinforcing its role as a southern terminus of the East Harbour hills.

Viewed at close quarters, the area has strong landscape character of very high quality. Again, this is a function of its strong simple form and the smooth textures of its upper surface. These provide an experience of immense space, matching the spacious character of the views across Fitzroy Bay to Wellington and the South Island. Baring Head is the meeting place of the land, the sea and the sky.

Walking on the headland one experiences a strong impression of the elemental forces of nature. Most of the Baring Head area is private land. The lighthouse reserve at the southern end is Crown land but the public do not have free access to it at present.

The Baring Head area has very high visual sensitivity, resulting from its role as the terminus of the eastern backdrop to Wellington Harbour and from the quality of its landscape experienced close at hand.

10. Recreation

10.1 General pattern of recreational use

East Harbour Regional Park is an important recreation resource for the people of Eastbourne, Wainuiomata, the Hutt Valley, and the greater Wellington region. The following description of the recreational values, opportunities and uses is primarily based upon recreation studies carried out in 1990 (Tourism Resource Consultants, 1990) and 2001 (Cosslett, 2001).

The recreational opportunities and patterns of use tend to conform to the three well-defined geographic areas of the park:

- the forests of the Eastbourne Hills
- the coastline and road from Burdans Gate at Korohiwa to Pencarrow Head
- the Pencarrow Lakes and south coast road to Baring Head



Walking to Butterfly Creek

Most of the recreational users are Eastern Bays residents (that is, from Point Howard to Eastbourne). They make up 31.3%, almost six times as many as Wainuiomata users (5.7%), probably reflecting the harbour focus of the park's entry points and attractions, as well as the alternative outdoor recreational attractions (especially Rimutaka Forest Park) available to Wainuiomata residents. Lower and Upper Hutt residents account for 23% of visitors and Wellington City 20.9%. (Cosslett, 2001).

10.2 Preferred recreational activities

The preferred recreational activities in the 2001 recreational survey are listed in Table 10.1 below. Walking (including with a baby buggy) was the overwhelmingly popular activity, more than four times more popular than the next activity, mountain-biking. Although dog-walking is not listed as a separate recreational activity in Table 10.1, it is a popular activity in the park (for 18.7% of visitors surveyed); most dogs were accompanying walkers, but a small number were with runners and cyclists.

	Overall %	% of Eastbourne Hills users	% of Pencarrow Road/Lakes users
Walking	67.6	82.5	58.0
Mountain biking	16.1	4.7	23.4
Running	8.7	16.6	3.6
Picnicking	8.5	8.1	8.8
Fishing	4.1	-	6.7
Passive Recreation	3.9	-	-
Tramping	3.0	5.2	1.5
Swimming	1.9	2.4	1.5
Rock climbing	1.9	-	3.0
Shellfish gathering	0.6	-	0.9
Diving	0.4	-	0.6
Kayaking	0.4	-	0.6
Botanising	0.4	0.9	-
Other (eg photography)	2.2	NA	NA

* Modified from Cosslett (2001)

Table 10.1 Recreational Activities Surveyed in East Harbour Regional Park*

Dogs are excluded from the Pencarrow Lakes block because of its indigenous wildlife values; however, dogs are allowed on the tracks of the Eastbourne Hills and along the Pencarrow Road, provided they are on a leash.

10.3 Sites preferred by recreational visitors

The preferred sites for these recreational activities are listed in Table 10.2. The coastal road from Burdans Gate to Pencarrow Head was the most popular site (43% of visitors). Only a small percentage travelled the short distance to the beach at the southern end of Camp Bay, for most preferred to walk (62%) or cycle (25%) further, beyond the headland at the southern end of Camp Bay but not as far as Pencarrow Head. Only about 21% of those visitors passing Burdans Gate intended going as far as Pencarrow Head (or further) because of the distance involved; consequently, cyclists made up the majority (62%) of these more adventurous visitors compared with walkers (38%).

Some of the cyclists on the coastal road are also surfers, especially local teenagers who carry their surfboards as they ride to various bays between Burdans Gate and Pencarrow Head. Shellfish-gathering and fishing is also popular along this section of coast, especially closer to the Camp Bay end (and further from the Bluff Point sewer outfall).

The level of visitation to Fitzroy Bay and the Pencarrow Lakes is low (a combined figure of about 2% of visitors to the park), obviously because of their isolation from park entry points, and possibly the exposed nature of this coastline and its proximity to the Bluff Point sewer outfall. Most visitors to the Pencarrow Lakes are education groups, scientists and conservation groups who wish to observe the wildlife and flora. Trips to this part of the park are occasionally run by Victoria University, Wellington Botanical Society, NZ Ornithological Society, Forest & Bird Society, East Harbour Environmental Association, etc. The lakes are also used by a limited number of duck-shooters during the hunting season.



Mountain-biking on the Pencarrow coast road



Rock climbing at Baring Head

Site/Area	% of people surveyed
Coast road south of Burdans Gate	43.1
Eastbourne Hills tracks (between Point Howard and Days Bay)	20.7
Butterfly Creek tracks	15.2
Coast between Baring Head and Wainuiomata River mouth	12.0
Pencarrow Head	9.3
Lowry Trig/Main Ridge track (included in 'Eastbourne Hills tracks' above)	6.9
Baring Head	2.4
Camp Bay beach (just beyond Burdans Gate)	2.0
Pencarrow Lakes	1.1
Gollans Valley (upper)	1.1
Fitzroy Bay coast (between Baring and Pencarrow Heads)	0.9

*adapted from Cosslett (2001)

Table 10.2 Recreational Visitor preferences for Sites within East Harbour Regional Park*

The next most important and popular sites are the forest tracks of the Eastbourne Hills, enjoyed in aggregate by around 36% of visitors. The Butterfly Creek tracks (15.2% of visitors), giving access to opportunities for picnicking, swimming, and botanizing, were by far the most popular of these tracks (especially the Kowhai Street track). The roadend signposting of the Eastbourne Hills forest tracks, and the upgrading of a number of them, in the autumn of 2005 (a programme which is likely to carry on during 2006), will probably encourage more use of this part of the park.

Baring Head is a popular rock-climbing location, with climbers making up 3% of all visitors to the southern part of the park. However, access is problematic, particularly because of the restrictions on access from the Wainuiomata Coast Road across the low saddle to the north of the head. An alternative route is to wade across the mouth of the Wainuiomata River but this is not popular, especially with cyclists.

The coastline between Baring Head and the mouth of the Wainuiomata River is the next most popular location in the park, attracting around 12% of visitors. A high proportion of these visitors are from Wainuiomata, with the Wainuiomata Coast Road giving vehicular access to the mouth of the Wainuiomata River and the wild southern coastline. This coastal site is popular for sightseeing, fishing, surfing and swimming (with care).

The heavily forested and untracked upper Gollans valley is the only part of the park with a remote character. It is only visited by around 1% of park visitors but its wilderness recreation qualities are highly valued.

The location of the main walking tracks and roadend facilities for the Eastbourne Hills block are shown in Map 9 and in Map 10 for the Pencarrow Lakes block.

11. Network utilities

11.1 Water main

A water reservoir supplying the local residential area is situated at the end of Howard Road and within the northern end of East Harbour Regional Park. The reservoir is fed by a 200mm diameter pipe running from the Gracefield Road pumping station. Another feeder pipe runs from the reservoir down to Cheviot Road.

A 1 metre diameter water main supplies water to Wellington city via a tunnel under the Wainuiomata Hill. The water is supplied from the Greater Wellington Wainuiomata – Orongoronga Water Collection Area.

11.2 Sewer main

The main sewer pipe runs parallel with the main road and takes treated sewage from Upper Hutt and Hutt City to an outfall located along the coast beyond Pencarrow Lighthouse.

Map 9 Recreation Eastbourne Hills



Map 10 Recreation Lakes Block



Lakes Block EAST HARBOUR REGIONAL PARK

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Appendix One

East Harbour Regional Park plant and fungi species

Sources include: Butler; Clelland, 1984; Druce & Silbury, 1994; Gibbs, 2002; Wgtn BotSoc, 1984 & 1994; Wassilieff & Clark, 1986; Frank, 1993; Clark & Horne, 1993; AP Druce, 1975-1992; Froude & Parrish, 1982; Orchard, 1995

Nomenclature follows “Ngaa Tipu o Aotearoa – New Zealand Plants, Manaaki Whenua – Landcare Research database (<http://nzflora.landcareresearch.co.nz>)

Species name	Common name	Maori name
Gymnosperm Trees		
<i>Dacrycarpus vdacrydiodes</i>	white pine	kahikitea
<i>Dacrydium cupressinum</i>	red pine	rimu
<i>Podocarpus totara</i>	totara	totara
<i>Prumnopitys ferruginea</i>	brown pine	miro
<i>Prumnopitys taxifolia</i>	matai	matai
Monocot Trees		
<i>Cordyline australis</i>	cabbage tree	ti kouka
<i>Cordyline banksii</i>	forest cabbage tree	ti ngahere
<i>Rhopalostylis sapida</i>	nikau palm	nikau
Dicot Trees and Shrubs		
<i>Alectryon excelsus</i>	titoki	titoki
<i>Alseuosmia pusilla</i>	mountain alseuosmia	karapapa
<i>Aristotelia serrata</i>	wineberry	makomako
<i>Beilschmiedia tawa</i>	tawa	tawa
<i>Brachyglottis kirkii</i>	Kirk’s daisy	kohurangi
<i>Brachyglottis repanda</i>	rangiora	rangiora
<i>Carmichaelia arborea</i>	broom	
<i>Carmichaelia australis</i>	NI broom	makaka, tarangahape
<i>Carpodetus serratus</i>	marble leaf	putaputaweta
<i>Coprosma foetidissima</i>	stinkwood	hupiro, hupirau-ririki, naupiro
<i>Coprosma acerosa</i>	sand coprosma	tarakupenga, tatarahake or tatarahake
<i>Coprosma areolata</i>	thin leaved coprosma	
<i>Coprosma colensoi</i>		
<i>Coprosma crassifolia</i>		
<i>Coprosma grandifolia</i>	kanono	kanono
<i>Coprosma lucida</i>	shining karamu	karamu
<i>Coprosma microcarpa</i>	small seeded coprosma	
<i>Coprosma propinqua</i>	mingimingi	mingimingi
<i>Coprosma propinqua hybrids</i>		
<i>Coprosma repens</i>	taupata	taupata
Dicot Trees and Shrubs		
<i>Coprosma rhamnoides</i>		
<i>Coprosma robusta</i>	karamu	karamu
<i>Coprosma rotundifolia</i>	round leaved coprosma	
<i>Coprosma tayloriae</i>		
<i>Coprosma tenuicaulis</i>	swamp coprosma	
<i>Coriaria arborea</i>	tutu	tutu

Species name	Common name	Maori name
Dicot Trees and Shrubs continued		
<i>Coriaria sarmentosa</i>	tutu	tutu
<i>Corynocarpus laevigatus</i>	karaka	karaka
<i>Discaria toumatou</i>	wild irishman, matagouri	tumatakuri, tumatakuru, tuturi
<i>Dodonaea viscosa</i>	akeake, sticky hop bush	akeake
<i>Dracophyllum filifolium</i>		
<i>Dracophyllum longifolium</i>	turpentine shrub, grass tree	inanga, inaka
<i>Dysoxylum spectabile</i>	kohehohe, NZ mahogany	kohehohe
<i>Einadia allanii</i>	goose foot	parahia, poipapa
<i>Einadia triandra</i>	berry salt bush	poipapa
<i>Elaeocarpus dentatus</i>	hinau	hinau
<i>Elaeocarpus hookerianus</i>	pokaka	pokaka
<i>Fuchsia excorticata</i>	tree fuchsia	kotukutuku
<i>Gaultheria antipoda</i>	bush snow berry	tawiniwini
<i>Geniostoma rupestre</i> var. <i>ligustrifolium</i>	hangehange	hangehange
<i>Griselinia lucida</i>	puka	puka
<i>Haloragis erecta</i>		
<i>Hebe stricta</i> var. <i>atkinsonii</i>	koromiko	koromiko
<i>Hebe stricta</i> var. <i>macroura</i>	koromiko	koromiko
<i>Hedycarya arborea</i>	pigeonwood	porokaiwhiri
<i>Ileostylus micranthus</i>	small-flowered mistletoe	
<i>Knightia excelsa</i>	rewarewa	rewarewa
<i>Korthalsella lindsayi</i>	dwarf mistletoe	
<i>Korthalsella salicornioides</i>	dwarf mistletoe	
<i>Kunzea ericoides</i>	kanuka	kanuka
<i>Laurelia novae-zelandiae</i>	pukatea	pukatea
<i>Leptecophylla juniperina</i>	prickly mingimingi	mingimingi
<i>Leptospermum scoparium</i>	tea tree	manuka
<i>Leucopogon fasciculatus</i>	tall mingimingi	mingimingi
<i>Leucopogon fraseri</i>		
<i>Lophomyrtus bullata</i>	ramarama	ramarama
<i>Lophomyrtus obcordata</i>	rohutu	rohutu, routu, tuhuhi
<i>Lophomyrtus obcordata</i> x <i>bullata</i>		
<i>Macropiper excelsum</i>	pepper tree	kawakawa
<i>Melicope simplex</i>		poataniwha
<i>Melicope ternata</i>	wharangi	wharangi
<i>Melicytus crassifolius</i>		
<i>Melicytus lanceolatus</i>	narrow-leaved mahoe	mahoe wao
<i>Melicytus micranthus</i>	swamp mahoe	manakura
<i>Melicytus obovatus</i>		
<i>Melicytus ramiflorus</i>	whiteywood	mahoe
<i>Metrosideros robusta</i>	northern rata	rata
<i>Metrosideros robusta</i> x <i>Metrosideros excelsa</i>		
<i>Mida salicifolia</i>	willow leaved maire	maire taiki
<i>Muehlenbeckia astonii</i>	shrubby puhuehue	
<i>Muehlenbeckia ephedroides</i>	leafless muehlenbeckia	
<i>Myoporum laetum</i>	ngaio	ngaio
<i>Myoporum laetum</i> var. <i>laetum</i>	ngaio	ngaio
<i>Myrsine australis</i>	red matipo	mapou
<i>Myrsine salicina</i>		toro

Species name	Common name	Maori name
Dicot Trees and Shrubs continued		
<i>Neomyrtus pedunculata</i>	rohutu	rohutu, routu, tuhuhi
<i>Nestegis cunninghamii</i>	black maire	maire
<i>Nestegis lanceolata</i>	white maire	maire
<i>Nestegis montana</i>	narrow-leaved maire	maire rororo, maire kotae, maire rauriki
<i>Nothofagus solandri var. solandri</i>	black beech	tawhai rauriki
<i>Nothofagus truncata</i>	hard beech	tawhai raunui, hutu or hututawai
<i>Olearia paniculata</i>	akiraho	akiraho
<i>Olearia rani</i>	tree daisy	heketara
<i>Olearia solandri</i>	coastal tree daisy	
<i>Olearia virgata</i>	twiggy tree daisy	
<i>Ozothamnus leptophyllus</i>	tauhinu, cassinia	tauhinu
<i>Pennantia corymbosa</i>	kaikomako	kaikomako
<i>Peraxilla tetrapetala</i>	red mistletoe	
<i>Pimelea aff. arenaria</i>	sand daphne, sand pimelea	autetaranga, toroheke
<i>Pimelea prostrata</i>	strathmore weed	pinatoro, wharengarara
<i>Pimelia urvilleana</i>		
<i>Pittosporum cornifolium</i>	perching kohukohu	tawhirikaro, wharewhareatua
<i>Pittosporum crassifolium</i>	karo	karo
<i>Pittosporum divaricatum</i>		
<i>Pittosporum eugenioides</i>	lemonwood	tarata
<i>Pittosporum tenuifolium</i>	kohuhu, black matipo	kohuhu
<i>Plagiantus divaricatus</i>	saltmarsh ribbonwood	makaka, houi, runa
<i>Pseudopanax arboreus</i>	five-finger	whauwhaupaku
<i>Pseudopanax crassifolius</i>	lancewood	horoeka
<i>Pseudowintera axillaris</i>	lowland horopito	horopito
<i>Raukawa edgerleyi</i>	raukawa	raukawa, haumangaroa
<i>Schefflera digitata</i>	seven-finger	pate
<i>Solanum laciniatum</i>	poroporo	poroporo
<i>Sophora microphylla</i>	kowhai	kowhai
<i>Streblus banksii</i>	large-leaved milk tree	ewekuri, pukariao, towai, turepo
<i>Streblus heterophyllus</i>	small-leaved milk tree	tawari, towai, turepo
<i>Syzygium maire</i>	swamp maire	maire tawake
<i>Urtica ferox</i>	tree nettle	ongaonga
<i>Weinmannia racemosa</i>	kamahi	kamahi
Monocot lianes		
<i>Freycinetia banksii</i>	kiekie	kiekie
<i>Ripogonum scandens</i>	supplejack	kareao
Dicot Lianes		
<i>Clematis forsteri</i>	small white clematis	puawanaga
<i>Clematis afoliata</i>	clematis	
<i>Clematis paniculata</i>	white clematis	puawanaga
<i>Meterosideros colensoi</i>	climbing rata	
<i>Meterosideros diffusa</i>	white climbing rata	rata
<i>Meterosideros fulgens</i>	scarlet rata	rata
<i>Meterosideros perforata</i>	clinging rata	aka, akatea, akatorotoro, whakapiopio
<i>Muehlenbeckia australis</i>	muehlenbeckia	pohuehue
<i>Muehlenbeckia complexa</i>	wire vine	pohuehue
<i>Parsonsia heterophylla</i>	kaihua, NZ jasmine	kaihua

Species name	Common name	Maori name
Dicot Lianes continued		
<i>Passiflora tetrandra</i>	NZ passion vine, kohia	kohia
<i>Rubus australis</i>	swamp lawyer	tataramoa
<i>Rubus cissoides</i>	bush lawyer	tataramoa
<i>Rubus squarrosus</i>	leafless or yellow prickled lawyer	tataramoa
<i>Tetragonia implexicoma</i>	NZ spinach	kohihi, rengamutu, tutae-ika-moana
Lycopods and Psilopsids		
<i>Huperzia varia</i>	hanging clubmoss	whiri o Raukatauri
<i>Lycopodium scariosum</i>	creeping club moss	
<i>Lycopodium varium</i>		
<i>Lycopodium volubile</i>	climbing club moss	waewaekoukou
<i>Tmesipteris elongata</i>	fork fern	
<i>Tmesipteris lanceolata</i>	fork fern	
<i>Tmesipteris tannensis</i>	fork fern	
Ferns		
<i>Adiantum cunninghamii</i>	NZ maidenhair	huruhuru tapiru
<i>Anarthropteris lanceolata</i>	lance fern	
<i>Asplenium appendiculatum</i>		
<i>Asplenium appendiculatum subsp. marinum</i>		
<i>Asplenium bulbiferum</i>	hen and chickens fern	manamana
<i>Asplenium bulbiferum x flaccidum</i>		
<i>Asplenium flabellifolium</i>	necklace fern	
<i>Asplenium flaccidum</i>	hanging spleenwort	makawe o Raukatauri
<i>Asplenium oblongifolium</i>	shining spleenwort	huruhuru whenua
<i>Asplenium polyodon</i>	sickle spleenwort	petako
<i>Azolla filiculoides</i>	Pacific azolla (aquatic fern)	retoreto, returetu, karerarera, karearea
<i>Blechnum "black spot lowland" formerly B. capense</i>		
<i>Blechnum chambersii</i>	lance fern	nini
<i>Blechnum discolor</i>	crown fern	piupiu
<i>Blechnum filiforme</i>	thread fern	panako
<i>Blechnum fluviatile</i>	ray water fern	kiwakiwa
<i>Blechnum membranaceum</i>		
<i>Blechnum minus</i>	swamp kiokio	kiokio
<i>Blechnum novae-zelandiae</i>	kiokio	kiokio
<i>Blechnum penna-marina</i>	little hard fern	
<i>Blechnum procerum</i>	small kiokio	
<i>Blechnum vulcanicum</i>	mountain hard fern	korokio
<i>Botrychium australe</i>	parsley fern	pototara
<i>Botrychium bifforme</i>	fine leaved parsley fern	pototara
<i>Cheilanthes sieberi</i>	rock fern	
<i>Ctenopteris heterophylla</i>	comb fern	
<i>Cyathea dealbata</i>	silver tree fern	ponga
<i>Cyathea medullaris</i>	black tree fern, mamaku	mamaku
<i>Cyathea smithii</i>	soft tree fern	katote
<i>Dicksonia squarrosa</i>	rough tree fern	wheki
<i>Grammitis billardierei</i>	strap fern	
<i>Grammitis ciliata</i>	strap fern	
<i>Histiopteris incisa</i>	water fern	matata
<i>Hymenophyllum bivalve</i>	filmy fern	

Species name	Common name	Maori name
Ferns continued		
<i>Hymenophyllum demissum</i>	drooping filmy fern	irirangi, piripiri
<i>Hymenophyllum dilatatum</i>	filmy fern	matua mauku, irirangi
<i>Hymenophyllum ferrugineum</i>	filmy fern	mauku
<i>Hymenophyllum flabellatum</i>	fan like filmy fern	mauku
<i>Hymenophyllum flexuosum</i>	filmy fern	mauku
<i>Hymenophyllum multifidum</i>	much divided filmy fern	mauku
<i>Hymenophyllum rarum</i>	filmy fern	mauku
<i>Hymenophyllum revolutum</i>	filmy fern	mauku
<i>Hymenophyllum sanguinolentum</i>	filmy fern	piripiri
<i>Hymenophyllum scabrum</i>	hairy filmy fern	mauku
<i>Hypolepis ambigua</i>		rarauhi, nehenehe
<i>Hypolepis dicksonioides</i>	giant hypolepis	
<i>Lastreopsis glabella</i>	smooth shield fern	
<i>Lastreopsis hispida</i>	hairy fern	
<i>Lastreopsis velutina</i>	velvety fern	
<i>Leptolepia novae-zelandiae</i>	lace fern	
<i>Leptopteris hymenophylloides</i>	single crepe fern	heruheru
<i>Lindsaea linearis</i>		
<i>Lindsaea trichomanoides</i>		
<i>Microsorium pustulatum</i>	hounds tonue	kowaowao
<i>Microsorium scandens</i>	fragrant fern	
<i>Paesia scaberula</i>	ring fern	matata
<i>Pellaea rotundifolia</i>	button fern, round leaved fern	tarawera
<i>Pneumatopteris pennigera</i>		pakau
<i>Polystichum neozelandicum</i>	prickly shield fern	pikopiko
<i>Polystichum vestitum</i>	prickly shield fern	punui
<i>Pteridium esculentum</i>	bracken	rarauhe
<i>Pteris macilentia</i>	brake	titipo
<i>Pyrrosia eleagnifolia</i>	leather-leaf fern	ota
<i>Rumohra adiantiformis</i>	leathery shield fern	karawhiu
<i>Trichomanes reniforme</i>	kidney fern	raurenga
<i>Trichomanes venosum</i>	veined bristle fern	
Orchids		
<i>Acianthus fornicatus</i>		
<i>Acianthus reniformis</i>		
<i>Acianthus sinclairii</i>		
<i>Bulbophyllum tuberculatum</i>		
Orchids		
<i>Caladenia catenata</i>	Caladenia green column	
<i>Corunastylis nuda</i>		
<i>Corybas cheesemanii</i>	spider orchid	
<i>Diplodium alobulum</i>	greenhood orchid	
<i>Diplodium trullifolium</i>	greenhood orchid	tutukiwi
<i>Orchids cntd.</i>		
<i>Drymoanthus adversus</i>	drymoanthus spotted leaf	
<i>Drymoanthus flavus</i>		
<i>Earina autumnalis</i>	Easter orchid	raupeka
<i>Earina mucronata</i>	Spring or bamboo orchid	peka a waka
<i>Gastrodia cunninghamii</i>		hupere

Species name	Common name	Maori name
Orchids continued		
<i>Gastrodia minor</i>		
<i>Ichthyostomum pygmaeum</i>	bulb leaf orchid, tiny orchid	piripiri
<i>Linguella nana</i>	greenhood orchid	tutukiwi
<i>Microtis unifolia</i>	onion leaved orchid	maikaika
<i>Nematoceras macranthum</i>	spider orchid	
<i>Nematoceras trilobum</i>	spider orchid	
<i>Petalochilus chlorostylus</i>		
<i>Plumatachilus plumosa</i>	greenhood orchid	tutukiwi
<i>Plumatochilus tasmanicum</i>	greenhood orchid	tutukiwi
<i>Pterostylis banksii</i>	greenhood orchid	tutukiwi
<i>Pterostylis cardiostigma</i>	greenhood orchid	tutukiwi
<i>Pterostylis graminea</i>	greenhood orchid	tutukiwi
<i>Pterostylus montana</i>	greenhood orchid	
<i>Simpliglottis cornuta</i>	green bird orchid	
<i>Singularlybas oblongus</i>	spider orchid	
<i>Thelymitra longifolia</i>	white sun orchid	maikuku
<i>Thelymitra nervosa</i>	sun orchid	
<i>Thelymitra pauciflora</i>	sun orchid	
<i>Winika cunninghamii</i>	ladies slipper	
Grasses		
<i>Austrofestuca littoralis</i>	sand tussock	hinarepe, matiatia,
<i>Cortaderia fulvida</i>	toetoe	toetoe
<i>Cortaderia toetoe</i>	toetoe	toetoe
<i>Dichelachne crinita</i>	long hair plume grass	
<i>Echinopogon ovatus</i>		
<i>Elymus multiflorus</i>		
<i>Festuca multinodus</i>	fescue	
<i>Hierochloa redolens</i>	holy grass	
<i>Lachnagrostis filiformis</i>	NZ windgrass	
<i>Lachnagrostis pilosa</i>		
<i>Microlaena avenacea</i>	bush rice grass	
<i>Microlaena stipoides</i>	meadow rice grass	
<i>Poa anceps</i>	broad leaved poa	
<i>Poa cita</i>	silver tussock	wi
<i>Rytidosperma gracile</i>	danthonia	
<i>Rytidosperma unarede</i>	danthonia	
<i>Spinifex sericeus</i>	spinifex	kauwhangatara, raumoa, turikakoa
<i>Trisetum antarcticum</i>		
<i>Zoysia minima</i>	sand twitch, sea grass	
Sedges		
<i>Baumea rubiginosa</i>		
<i>Sedges cntd</i>		
<i>Carex diandra</i>		
<i>Carex dissita</i>		
<i>Carex flagellifera</i>	Glen Murray tussock	manaia, mauria
<i>Carex forsteri</i>		
<i>Carex geminata</i>	cutty grass	rautahi, toetoe-rautahi
<i>Carex lambertiana</i>		
<i>Carex pumila</i>	sand sedge	

Species name	Common name	Maori name
Sedges		
<i>Carex secta</i>	purei	purei, purekireki, pukio, mata, matata
<i>Carex solandri</i>		
<i>Carex sp.</i>		
<i>Carex virgata</i>	swamp sedge	
<i>Cyperus ustulatus</i>	giant umbrella sedge	toetoe upokotangata, whatu-manu
<i>Desmoschoenus spiralis</i>	golden sand sedge	pingao
<i>Eleocharis acuta</i>	sharp spike sedge	
<i>Eleocharis gracilis</i>	slender spike sedge	
<i>Ficinia nodosa</i>	knotted / leafless sedge	wiwi
<i>Gahnia pauciflora</i>	cutty grass	
<i>Gahnia setifolia</i>	cutty grass	mapere
<i>Gahnia xanthocarpa</i>		
<i>Isolepis cernua</i>	slender clubrush	
<i>Isolepis inundata</i>		
<i>Isolepis prolifera</i>	three square	
<i>Isolepis reticularis</i>		
<i>Lepidosperma australe</i>	square stemmed sedge	
<i>Morelotia affinis</i>		
<i>Uncinia angustifolia</i>	hook sedge	matau, matau-ririki
<i>Uncinia banksii</i>	hook sedge	matau, matau-ririki
<i>Uncinia filiformis</i>		
<i>Uncinia scabra</i>	hook sedge	matau, matau-ririki
<i>Uncinia uncinata</i>	hook sedge	kamu, matau-a-Maui
Rushes		
<i>Apodasmia similis</i>	jointed wire rush	oioi
<i>Juncus australis</i>		
<i>Juncus bufonus</i>	toad rush	
<i>Juncus caespiticus</i>	grass leaved rush	wi, kopupungawha
<i>Juncus distegus</i>		
<i>Juncus gregiflorus</i>	leafless rush	wi, kopupungawha
<i>Juncus maritimus</i>	sea rush	wi, kopupungawha
<i>Juncus pallidus</i>	giant rush	wi, kopupungawha
<i>Juncus planifolius</i>	flat / grass leaved rush	wi, kopupungawha
<i>Luzula banksiana</i>	coastal wood rush	
<i>Luzula picta</i>		
<i>Luzula picta var. pallida</i>		
<i>Schoenoplectus tabernaemontani</i>	lake clubrush	kapungawha, kopupu, kutakuta
<i>Typha orientalis</i>	bullrush	raupo
Other Monocot Herbs		
<i>Arthropodium candidum</i>	small rengarenga	repehina-papa
<i>Arthropodium cirratum</i>	rengarenga	rengarenga
<i>Astelia fragrans</i>	bush lily	kahaha
<i>Astelia solandri</i>	perching astelia	kowharawhara
<i>Collospermum hastatum</i>	collospermum	kahakaha
<i>Collospermum microspermum</i>		
<i>Craspedia uniflora</i>	woolly head	puatea
<i>Dianella nigra</i>	blueberry	turutu
<i>Lemna sp.</i>		
<i>Lepilaena bilocularis</i>		
<i>Libertia edgariae</i>	NZ iris	mikoikoi, manga-a-huripapa, tukauki
<i>Libertia grandiflora</i>	NZ iris	mikoikoi, manga-a-huripapa, tukauki

Species name	Common name	Maori name
Other Monocot Herbs continued		
<i>Libertia ixioides</i>	NZ iris	mikoikoi, manga-a-huripapa, tukauki
<i>Phormium cookianum</i>	mountain flax	wharariki
<i>Phormium tenax</i>	swamp flax	harakeke
<i>Ruppia polycarpa</i>	horse's mane weed	
<i>Sparganium subglobosum</i>	burr reed	maru
<i>Triglochin striata</i>		
<i>Wolffia australiana</i>	<i>watermeal</i>	
Dicot Herbs		
<i>Acaena anserinifolia</i>	bidibid	piripiri
<i>Acaena pallida</i>	bidibid	
<i>Aciphylla squarrosa</i>	spaniard, speargrass	karamea, taramea
<i>Anaphalioides trinervus</i>	cudweed	
<i>Apium prostratum</i> subsp. <i>prostratum</i> var. <i>filiforme</i>	native celery	
<i>Atriplex buchananii</i>		
<i>Callitriche petrei</i> subsp. <i>petrei</i>	starwort	
<i>Calystegia soldanella</i>	shore bindweed	panahi, paraha, pohue, poue
<i>Calystegia tuguriorum</i>	shore bindweed	
"Cardamine glossy leaf"		
"Cardamine long style"		
<i>Cardamine</i> sp.		
<i>Centella uniflora</i>	centella	
<i>Centipeda</i> sp.		
<i>Colobanthus muelleri</i>		
<i>Craspedia uniflora</i> var.		
<i>Crassula kirkii</i>		
<i>Crassula sieberiana</i>		
<i>Daucus glochidiatus</i>		
<i>Dichondra repens</i>	dichondra	
<i>Disphyma australe</i>	NZ ice plant	horokaka, ngarangara, ruerueke
<i>Drosera auriculata</i>	sundew	wahu
<i>Drosera peltata</i> subsp. <i>auriculata</i>	sundew	wahu
<i>Elatine gratioloides</i>	waterwort	
<i>Epilobium alsinoides</i>	willow herb	
<i>Epilobium alsinoides</i> subsp. <i>atriplicifolium</i>	willow herb	
<i>Epilobium ciliatum</i>	willow herb	
<i>Epilobium insulare</i>	willow herb	
<i>Epilobium nerteroides</i>	willow herb	
<i>Epilobium nummulariifolium</i>	willow herb	
<i>Epilobium pallidiflorum</i>	willow herb	
<i>Epilobium pubens</i>	willow herb	
<i>Epilobium rotundifolium</i>	willow herb	
<i>Eryngium vesiculosum</i>	sea holly	
<i>Euchiton audax</i>	cudweed	
<i>Euchiton collinus</i>	cudweed	
<i>Euchiton involucratus</i>	cudweed	
<i>Euphrasia cuneata</i>	eyebright	tutae-kiore
<i>Galium propinquum</i>		mawe
<i>Geranium brevicaule</i>	geranium	
<i>Geranium microphyllum</i>	geranium	
<i>Glossostigma diandrum</i>		

Species name	Common name	Maori name
Dicot Herbs continued		
<i>Glossostigma elatinoides</i>		
<i>Gonocarpus incanus</i>		piripiri
<i>Gonocarpus micranthus</i>		
<i>Gratiola sexdentata</i>		
<i>Hebe procumbens</i>	hebe	hebe
<i>Helichrysum filicaule</i>	creeping everlasting daisy	
<i>Helichrysum lanceolatum</i>	everlasting daisy	
<i>Hydrocotyle heteromeria</i>	waxweed	
<i>Hydrocotyle hydrophila</i>		
<i>Hydrocotyle moschata</i>	hairy pennywort	
<i>Hydrocotyle novae-zelandiae</i>		
<i>Hydrocotyle pterocarpa</i>		
<i>Lagenifera pumila</i>		papataniwhaniwha
<i>Lagenifera sp.</i>		
<i>Lemna minor</i>	duckweed	
<i>Leptenella tenella</i>		
<i>Leptinella coronopifolia</i>		
<i>Leptinella dispersa</i>		
<i>Leptinella squalida</i>		
<i>Lilaeopsis sp. cf L. novae-zelandiae</i>		
<i>Limosella lineata</i>	mudwort	
<i>Linum monogynum</i>	NZ true flax	rauhuia, kako, matamatahuria
<i>Lobelia anceps</i>	NZ lobelia	
<i>Mazus novaezeelandiae</i>		
<i>Myriophyllum propinquum</i>	common water milfoil	
<i>Myriophyllum triphyllum</i>	milfoil	
<i>Nertera depressa</i>	fruiting duckweed	
<i>Oxalis exilis</i>		
<i>Oxalis magellanica</i>		
<i>Parietaria debilis</i>		
<i>Pelargonium inodorum</i>		
<i>Persicaria lapthifolia</i>	swamp willow weed	tutanawai
<i>Plantago raoulii</i>		tukorehu
<i>Polygonum sp.</i>		
<i>Potamogeton cheesemanii</i>	red pondweed	manihi, rerewai
<i>Potamogeton ochreatus</i>	blunt pondweed	
<i>Pseudognaphalium luteoalbum</i>		
<i>Ranunculus acaulis</i>	sand buttercup	
<i>Ranunculus amphitrichus</i>		waoriki
<i>Ranunculus glabrifolius</i>		
<i>Ranunculus limosella</i>		
<i>Ranunculus macropus</i>	swamp buttercup	raoriki
<i>Ranunculus reflexus</i>	bush buttercup	maruru, kopukapuka, pirikau
<i>Ranunculus trichophyllus</i>		
<i>Raoulia australis</i> agg.	scabweed mat daisy	
<i>Raoulia hookeri</i>	scabweed mat daisy	
<i>Raoulia tenuicaulis</i>	mat daisy	tutahuna
<i>Sarcocornia quinqueflora</i>	glasswort	
<i>Scandia geniculata</i>		
<i>Selliera radicans</i>	selliera	remuremu
<i>Senecio glomeratus</i>	woolly fireweed	pukatea
<i>Senecio hispidulus</i>	fireweed	
<i>Senecio lautus</i> var. <i>lautus</i>		

Species name	Common name	Maori name
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Dicot Herbs continued

<i>Senecio minimus</i>	fireweed	
<i>Spergularia media</i>	sea spurry	
<i>Stellaria decipiens</i>	chickweed	kohukohu
<i>Stellaria parviflora</i>	chickweed	
<i>Urtica incisa</i>	scrub nettle	
<i>Vittadinia australis</i>	white fuzzweed	
<i>Wahlenbergia gracilis</i>	NZ harebell	rimuroa, kuretao
<i>Wahlenbergia ramosa</i>	NZ harebell	

Mosses (Butterfly Creek)- Butler

<i>Achrophyllum dentatum</i>	Catagonium nitens subsp. nitens	Dicranoloma menziesii
<i>Achrophyllum quadrifarium</i>	Canalohypopterygium	Dicranoloma plurisetum
<i>Acrocladium chlamydophyllum</i>	tamariscinum	Ditrichum cylindricarpum
<i>Breutelia pendula</i>	Ceratodon purpureus	Ditrichum flexicaule
<i>Bryum billardierei</i>	Cladomnion ericoides	Echinodium hispidum
<i>Calomnion complanatum</i>	Cratoneuropsis relaxa	Fissidens asplenioides
<i>Calyptrochaeta brownii</i>	Cyathoform bulbosum	Fissidens leptocladus
<i>Calyptrochaeta deflexa</i>	Cyrtopus setosus	Fissidens oblongifolius
<i>Campyochaete ramulosa</i>	Dichelodontium nitidum	Fissidens rigidulus
<i>Campylopus clavatus</i>	Dicnemon calycinum	Funaria hygrometrica
<i>Campylopus introflexus</i>	Dicranoloma billardierei	Glyphothecium sciuroides
<i>Hymenodon pilifer</i>	Lopidium concinnum	Rhynchostegium tenuifolium
<i>Hypnodendron arcuatum</i>	Macromitrium gracile	Eurhynchium praelongum
<i>Hypnodendron kerrii</i>	Macromitrium longipes	Rhaphidorrhynchium amoenum
<i>Hypnodendron marginatum</i>	Macromitrium pusillum	Sauloma tenella
<i>Hypnum chrysogaster</i>	Neckera laevigata	Sematophyllum subhumile var. contiguum
<i>Hypnum cupressiforme</i>	Orthorrhynchium elegans	Tayloria callophylla
<i>Hypopterygium filiculaeforme</i>	Papillaria crocea	Thamnobryum pandum
<i>Hypopterygium rotulatum</i>	Pendulothecium punctatum	Thuidium furfurosum
<i>Lembophyllum divulsum</i>	Philonotis tenuis	Tortella knightii
<i>Leptodon smithii</i>	Ptychomnion aciculare	Trachyloma planifolium
<i>Leptostomum inclinans</i>	Pyrrhobryum bifarium	Triquetrella papillata
<i>Leptostomum macrocarpum</i>	Racomitrium striatipilum	Weymouthia cochlearifolia
<i>Leptotheca gaudichaudii</i>	Rhizogonium distichum	Weymouthia mollis
<i>Leucobryum candidum</i>	Rhynchostegium laxatum	Wijkia extenuata

Fungi

Fungi nomenclature follows Manaaki Whenua - Landcare Research database at <http://nzfungi.landcareresearch.co.nz/html/mycology.asp?ID=>

<i>Agaricus sp.</i>	
<i>Aleurodiscus berggreni</i>	
<i>Aleurodiscus coralloides</i>	
<i>Antrodiella rata</i>	
<i>Armillaria novae-zelandiae</i>	honey mushroom
<i>Asterostroma persimile</i>	
<i>Australoporus tasmanicus</i>	
<i>Bisporella citrina</i>	
<i>Bisporella claroflava</i>	
<i>Byssomerulius miniatus</i>	
<i>Calostoma rodwayi</i>	

Species name	Common name	Maori name
Fungi continued		
<i>Camarophyllus muritaensis</i>		
<i>Ceriporia tarda</i>		
<i>Ceriporiopsis merulinus</i>		
<i>Collybiopsis rimutaka</i>		
<i>Coltricia salpincta</i>		
<i>Coltriciella dependens</i>		
<i>Coprinus disseminatus</i>		
<i>Cortinarius "cinnamomeus"</i>	curtain fungi	
<i>Cortinarius "sangiuneus"</i>	curtain fungi	
<i>Cortinarius porphyroideus</i>	violet pouch fungi	
<i>Cosmospora vilior</i>		
<i>Cyathus hookeri</i>		
<i>Cyathus novae-zelandiae</i>		
<i>Cyclomyces tabacinus</i>	bracket type	
<i>Cystoderma clastrotrichum</i>		
<i>Echinochaete russiceps</i>		
<i>Entoloma convexum</i>		
<i>Favolaschia peziziformis</i>	fleshy pore type	
<i>Fomitopsis hemiterphrus</i>		
<i>Ganoderma applanatum</i>		
<i>Ganoderma australe</i>		
<i>Gibberella macrolopha</i>		
<i>Gloeoporus taxicola</i>		
<i>Guignardia cytisi</i>		
<i>Hericium coralloides</i>		
<i>Hohenbuehelia podocarpinea</i>		
<i>Hydnum crocidens var. wellingtonii</i>		
<i>Hydropisphaera cyatheae</i>		
<i>Hydropus ardesiacus</i>		
<i>Hygrocybe procera</i>	wax gill	
<i>Hymenochaete tabacina</i>		
<i>Hymenogaster viscidus</i>		
<i>Hypocrea ascoboloides</i>		
<i>Hypoxylon annulatum</i>		
<i>Hypoxylon bovei</i>		
<i>Hypoxylon diatrypeoides</i>		
<i>Hypoxylon howeanum</i>		
<i>Hypoxylon nummularium</i>		
<i>Hypoxylon subrutiloides</i>		
<i>Inonotus nothofagi</i>		
<i>Insiticia flavovirens</i>		
<i>Junghuhnia rhinocephalus</i>		
<i>Kuehneromyces sp.</i>		
<i>Laccaria laccata</i>		
<i>Laccaria lilacina</i>		
<i>Laccaria sp.</i>		
<i>Lactarius umerensis</i>		
<i>Laetiporus portentosus</i>		
<i>Leptoporus mollis</i>		

Species name	Common name	Maori name
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Fungi continued

Marasmius atrocastaneus
Marasmius croceus
Marasmius curraniae
Marasmius sp.
Morganella compacta
Morganella pyriformis
Mucilopilus violaceiporus
Mycena sp.
Mycogloea macrospora
Mycosphaerella spissa
Naematoloma sp.
Octaviania tasmanica
Omphalina foetida
Perennipora oviformis
Peziza repanda
Phellinus gilvius
Phellinus robustus
Phellinus setulosus
Phomopsis cunninghamii
Plectania rhytidia
Pleurotus australis
Pleurotus purpureoolivaceus
Pluteus sp.
Porpoloma amyloideum
Puccinia atkinsonii
Puccinia euphrasiana
Punctularia strigosozonata
Rigidoporus laetus
Rosellinia subiculata
Russula subvinosa
Schizopora paradoxa
Scoleciasis atkinsonii
Skeletocutis alutacea
Stereum hirsutum
Stereum vellereum
Stilbocrea macrostoma
Tricholoma testaceum
Tricholoma viridiolivaceum
Tylopilus brunneus
Tyromyces chioneus
Tyromyces guttulatus
Tyromyces hypolateritius
Tyromyces setiger
Wrightoporia novae-zelandiae
Xeromphalina leonina

Some Adventitious Plants		
Species name	Common name	Maori name
Dicot Trees and Shrubs		
<i>Berberis sp.</i>	barbary	
<i>Buddleja davidii</i>	buddleia	
<i>Cytisus scoparius</i>	broom	
<i>Cytisus monspessulanus</i>	broom	
<i>Leycesteria formosa</i>	Himalayan honeysuckle	
<i>Lupinus arboreus</i>	tree lupin	
<i>Lycium ferocissimum</i>	box thorn	
<i>Pinus radiata</i>	Monterey pine	
<i>Salix fragilis</i>	crack willow	
<i>Sambucus nigra</i>	elderberry	
<i>Ulex europeaus</i>	gorse	
Dicot lianes		
<i>Rubus fruticosus</i>	blackberry	
Grasses		
<i>Agrostis capillaris</i>	browntop	
<i>Agrostis stolonifera</i>	creeping bent	
Species name	Common name	
Adventive Grasses contd.		
<i>Aira caryophyllea</i>	silvery hair grass	
<i>Ammophila arenaria</i>	marram grass	
<i>Anthoxanthum odoratum</i>	sweet vernal	
<i>Briza minor</i>	shivery grass	
<i>Bromus hordeaceus</i>		
<i>Critesion murinum</i>	barley grass	
<i>Cynosurus cristatus</i>	crested dogs tail	
<i>Cynosurus echinatus</i>	rough dogs tail	
<i>Dactylis glomerata</i>	cocksfoot	
<i>Dichelachne crinita</i>	floating sweet grass	
<i>Echinopogon ovatus</i>	forest hedgehog grass	
<i>Elymus sp.</i>	rye	
<i>Elytrigia repens</i>	couch	
<i>Festuca rubra</i>	chewings fescue	
<i>Holcus lanatus</i>	yorkshire fog	
<i>Lagurus ovatus</i>	hares tail	
<i>Lolium perenne</i>	perennial ryegrass	
<i>Poa annua</i>		
<i>Schenodorus phoenix</i>	tall fescue	
<i>Vulpia bromoides</i>	vulpia hairgrass	
Rushes		
<i>Juncus tenuis</i>	slender rush	
Other Monocot herbs		
<i>Sisyrinchium iridifolium</i>	purple eyed grass	

Species name	Common name	Maori name
Dicot herbs		
<i>Acaena agnipila</i>	australian sheeps burr	
<i>Anagallis arvensis</i>	blue pimpernel	
<i>Arctotheca calendula</i>	cape daisy	
<i>Atriplex prostrata</i>	common orache	
<i>Bellis perennis</i>	double daisy	
<i>Brassica rapa subsp. sylvestris</i>	wild turnip	
<i>Callitriche stagnalis</i>	starwort	
<i>Capsella bursa-pastoris</i>	shepherds purse	
<i>Centaurium erythraea</i>	centaury	
<i>Cerastium fontanum</i>	mouse ear chickweed	
<i>Cerastium glomeratum</i>	annual mouse ear chickweed	
<i>Chrysanthemoides monilifera</i>	bone-seed	
<i>Cirsium arvense</i>	californian thistle	
<i>Cirsium vulgare</i>	scotch thistle	
<i>Conyza sp. "floribunda"</i>	fleabane	
<i>Cotula coronopifolia</i>	batchelors button	
<i>Digitalis purpurea</i>	foxglove	
<i>Euchiton sphaericus</i>	cudweed	
<i>Euphorbia peplus</i>	milkweed, petty spurge	
<i>Foeniculum vulgare</i>	fennel	
<i>Galium aparine</i>	cleavers	
<i>Geranium molle</i>	dovesfoot cranesbill	
<i>Geranium robertianum</i>	herb robert	
<i>Glaucium flavum</i>	horned poppy	
<i>Hypochaeris radicata</i>	cat's ear	
<i>Lotus pedunculatus</i>	birdsfoot trefoil	
<i>Mentha pulegium</i>	European pennyroyal mint	
<i>Mimulus guttatus</i>	monkey musk	
<i>Mimulus moschatus</i>	monkey musk	
<i>Myosotis laxa subsp. caespitosa</i>	water forgetmenot	
<i>Nasturtium officinale</i>	watercress	
<i>Oxalis sp.</i>		
<i>Parentucellia viscosa</i>	tarweed, yellow bartsia	
<i>Pelargonium tomentosum</i>	peppermint geranium	
<i>Plantago coronopus</i>	plantain	
<i>Plantago lanceolata</i>	narrow leaved plantain	
<i>Plantago major</i>	broad leaved plantain	
<i>Polycarpon tetraphyllum</i>	allseed	
<i>Polygonum aviculare</i>	wireweed	
<i>Polygonum hydropiper</i>	water pepper	
<i>Polygonum persicaria</i>	vietnamese mint	
<i>Portulaca oleracea</i>	purslane	
<i>Prunella vulgaris</i>	self heal	
<i>Ranunculus repens</i>	creeping buttercup	
<i>Ranunculus trichophyllus</i>	water buttercup	
<i>Raphanus raphanistrum subsp. maritimus</i>	sea radish	
<i>Rumex acetosella</i>	sheeps sorrel	
<i>Rumex sp.</i>		
<i>Senecio elegans</i>	purple groundsel	

Specie name	Common name	Maori name
Dicot herbs		
<i>Senecio jacobaea</i>	ragwort	
<i>Silybum marianum</i>	variegated thistle	
<i>Sisymbrium officinale</i>	hedge mustard	
<i>Solanum americanum</i>	small flowered nightshade	
<i>Sonchas asper</i>	prickly sow thistle	
<i>Sonchas oleraceus</i>	common sow thistle	puha
<i>Stellaria media</i>	chickweed	
<i>Torilis nodosa</i>	hedgehog parsley	
<i>Trifolium dubium</i>	suckling clover	
<i>Trifolium repens</i>	white clover	
<i>Verbascum thapsus</i>	woolly mullein	
<i>Vicia sativa</i>	narrow leaved vetch	

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Appendix Two

East Harbour freshwater fish species list

List compiled from results of various freshwater fish surveys within East Harbour Regional Park

Species name	Common name	Maori name
<i>Anguilla australis</i>	shortfin eel	tuna
<i>Anguilla dieffenbachii</i>	longfin eel	tuna
<i>Galaxias argenteus</i>	giant kokopu	kokopu
<i>Galaxias fasciatus</i>	banded kokopu	kokopu
<i>Galaxias maculatus</i>	inanga, common galaxias	inanga
<i>Geotria australis</i>	lamprey	piharau, kanakana
<i>Gobiomorphus cotidianus</i>	common bully	
<i>Gobiomorphus gobioides</i>	giant bully	
<i>Gobiomorphus huttonii</i>	redfin bully	
<i>Retropinna retropinna</i>	common smelt	
<i>Salmo trutta</i>	brown trout	
<i>Paranephrops planifrons</i>	freshwater crayfish	koura

Appendix Three

East Harbour bird species list

This bird list has been compiled from bird count surveys conducted quarterly since 1999 using the slow walk transect method described by Handford (2000).

Species name	Common name	Maori name
<i>Acanthisitta chloris granti</i>	rifleman	titipounamu
<i>Anas platyrhynchos</i>	mallard	
<i>Anthornis melanura</i>	bellbird	korimako, makomako
<i>Callipepla californica brunnescens</i>	California quail	
<i>Carduelis carduelis</i>	goldfinch	
<i>Carduelis chloris</i>	greenfinch	
<i>Chrysococcyx lucidus</i>	shining cuckoo	pipiwhara
<i>Circus approximans</i>	Australasian harrier	kahu
<i>Cyanoramphus auriceps</i>	yellow-crowned parakeet	kakariki
<i>Eudynamis taitensis</i>	long-tailed cuckoo	koekoea
<i>Falco novaeseelandiae</i>	New Zealand falcon	karearea
<i>Fringilla coelebs</i>	chaffinch	
<i>Gerygone igata</i>	grey warbler	riroriro
<i>Gymnorhina tibicen</i>	Australian magpie	
<i>Halcyon sancta vagans</i>	New Zealand kingfisher	kotare
<i>Hemiphaga novaeseelandiae</i>	New Zealand pigeon	kereru
<i>Larus dominicanus</i>	southern black-backed gull	karoro
<i>Mohoua albicilla</i>	whitehead	popokatea
<i>Nestor meridionalis septentrionalis</i>	kaka	kaka
<i>Ninox novaeseelandiae</i>	morepork	ruru

Species name	Common name	Maori name
<i>Passer domesticus</i>	house sparrow	
<i>Petroica macrocephala toitoi</i>	tomtit	miromiro
<i>Phalacrocorax carbo novaehollandiae</i>	black shag, black cormorant	kawau
<i>Platycercus eximius</i>	eastern rosella	
<i>Prothemadera novaeseelandiae</i>	tui	
<i>Prunella modularis</i>	hedge sparrow, dunnock	
<i>Rhipidura fuliginosa placabilis</i>	fantail	piwakawaka
<i>Sturnus vulgaris</i>	starling	
<i>Tadorna variegata</i>	paradise shelduck	putangitangi
<i>Turdus merula</i>	blackbird	
<i>Turdus philomelos</i>	song thrush	
<i>Zosterops lateralis</i>	silvereve	tauhou

Other species that have been seen by visitors to the Park (DOC, 1992; Gibbs, 2002; Stephenson, 1975 & WBS, 1992):

Species name	Common name	Maori name
<i>Alauda arvensis</i>	skylark	
<i>Anas rhynchotis variegata</i>	New Zealand shoveler	kuruwheangi
<i>Anas superciliosa</i>	grey duck	parera
<i>Anthus novaeseelandiae</i>	New Zealand pipit	pihoihoi
<i>Ardea novaehollandiae</i>	white-faced heron	
<i>Botaurus poiciloptilus</i>	Australasian bittern	matuku
<i>Branta canadensis maxima</i>	Canada goose	
<i>Cacatua galerita</i>	sulphur-crested cockatoo	
<i>Charadrius bicinctus</i>	banded dotterel	tuturiwhatu
<i>Cygnus atratus</i>	black swan	
<i>Daption capense</i>	Cape pigeon	
<i>Emberiza citrinella</i>	yellowhammer	
<i>Eudyptula minor</i>	blue penguin	korora
<i>Haematopus unicolor</i>	variable oystercatcher	torea; dark phase- toreapango
<i>Himantopus himantopus leucocephalus</i>	Australasian pied stilt	poaka
<i>Hirundo tahitica neoxena</i>	welcome swallow	
<i>Larus novaehollandiae scopulinus</i>	red-billed gull	tarapunga
<i>Phalacrocorax melanoleucos brevirostris</i>	little shag	kawaupaka
<i>Phasianus colchicus</i>	ring-necked pheasant	
<i>Poliiocephalus rufopectus</i>	New Zealand dabchick	weweia
<i>Porphyrio porphyrio melanotis</i>	swamphen	pukeko
<i>Porzana tabuensis plumbea</i>	spotless crane	puweto
<i>Vanellus miles novaehollandiae</i>	spur-winged plover	

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Water, air, earth and energy – elements in Greater Wellington’s logo that combine to create and sustain life. Greater Wellington promotes **Quality for Life** by ensuring our environment is protected while meeting the economic, cultural and social needs of the community

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