

Karaka (*Corynocarpus laevigatus*
J.R. et G. Forst.) in Wellington
Conservancy (excluding
Chatham Islands)

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Karaka (*Corynocarpus laevigatus* J.R. et G. Forst.) in Wellington Conservancy (excluding Chatham Islands)

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ABSTRACT

Information is provided about the distribution of karaka (*Corynocarpus laevigatus* J.R. et G. Forst.) in the Wellington Conservancy of the Department of Conservation. Karaka is an evergreen tree, with dark green thick glossy leaves, that grows to 20 m tall. It is found in coastal and lowland forest in the North Island and northern South Island and is closely related to species found in the New Hebrides and New Caledonia. The species is known in other countries as the 'New Zealand laurel' or 'karakaranut'. Karaka is an important food for birds, with kereru (New Zealand pigeon *Hemiphaga novaeseelandiae*) probably its main dispersal agent. Recommendations are made for conservation management of karaka in Wellington.

Keywords: Karaka, *Corynocarpus*, distribution, conservation management.

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1. Introduction

1.1 PURPOSE OF THIS REPORT

This report provides information about the distribution of karaka (*Corynocarpus laevigatus* J.R. et G. Forst.) in the Wellington Conservancy of the Department of Conservation (DOC) and makes recommendations for its conservation management to ensure its continued survival in the region. It provides baseline information about karaka as a contribution to implementing the regional Plant Conservation Strategy's section on 'Plants of Concern to Iwi'. This document will be of use to people wishing to learn more about karaka and its conservation needs, as well as those interested in the species from a cultural and historical perspective.

1.2 DESCRIPTION OF KARAKA

Karaka is an evergreen tree, with dark green thick glossy leaves (Fig. 1), that grows to 20 m tall. It is found in coastal and lowland forest in the North Island and northern South Island (Allan 1961) (Fig. 2) and is closely related to species found in the New Hebrides and New Caledonia (Stevenson 1978). Its berries occur in clusters, are dark green, ripening to orange from late summer to winter. On Rekohu (Chatham Island), the karaka is also known as kopi and is thought to have been introduced by the ancestors of the Moriori (de Lange et al. 1998). The Latin name *Corynocarpus laevigatus* is taken from the features used to describe the plant: *Corynocarpus* meaning 'club seed', *laevigatus* meaning 'smooth' in reference to its fruit (Molloy 1990). The species is known in other countries as the 'New Zealand laurel' or 'karakaranut'.

Figure 1. Karaka (*Corynocarpus laevigatus*) showing the dark green glossy leaves and the smooth club seed.



1.3 IMPORTANCE OF KARAKA

Karaka is an important food supply for birds, with kereru (New Zealand pigeon *Hemiphaga novaeseelandiae*) probably its main dispersal agent.

The inner kernel of the karaka berry was an important food source for pre-European Maori, especially in parts of the country such as Wellington where cultivation of introduced sub-tropical plants (such as kumara, *Ipomoea batatas*) was climatically marginal. The berry kernals, however, contain a virulent alkaloid poison that had to be leached out in a lengthy process involving steaming and steeping before they were edible (Best 1977). If people eat the raw seeds then they will suffer from spasmodic pains, giddiness, and partial paralysis (Clarke, 2000).

There is a close association between Maori occupation sites and places where karaka grows, and in pre-European times tribes are thought to have planted the karaka as a source of vegetable food to supplement their diet. However, karaka is also known to have recently spread into bushed areas, possibly helped by the kereru (Gabites 1993), and it need not indicate sites of Maori occupation. Some Wellington karaka groves were very extensive. On the south Wellington coast a single grove still covered 6 ha (15 acres) as late as 1890 (Beckett 1963) and in 1859 a grove of karaka extended for 'half a mile' (0.8 km) along the lower Wainui-o-mata valley (McFadgen 1963). On the Chatham Islands, the bark of many living kopi/karaka trees was carved with stylised human figures (Jefferson 1955).

Wellington Conservancy's plant conservation strategy identifies karaka as a plant of concern to iwi (Empson & Sawyer 1996).

2. Methods

Information on the distribution of karaka presented in this report is derived from a database held at Wellington Conservancy. The database is compiled from various sources, including:

- Protected Natural Area Programme reports (Ravine 1995; Beadel et al. 2000)
- Plant checklists for areas in Wellington Conservancy (Sawyer 2001)
- Scientific publications and natural history journals (Duguid 1990; Zotov et al. 1938)
- Vegetation survey reports (Wassilieff et al. 1986; Wetlands of Ecological and Representative Importance 1990; Sites of Special Wildlife Interest n.d.)
- Field reports by botanists (including species record sheets completed by staff of DOC and members of the Wellington Botanical Society)
- The New Zealand Archaeological Association site record central file (held by Science & Research Unit, DOC, Wellington)

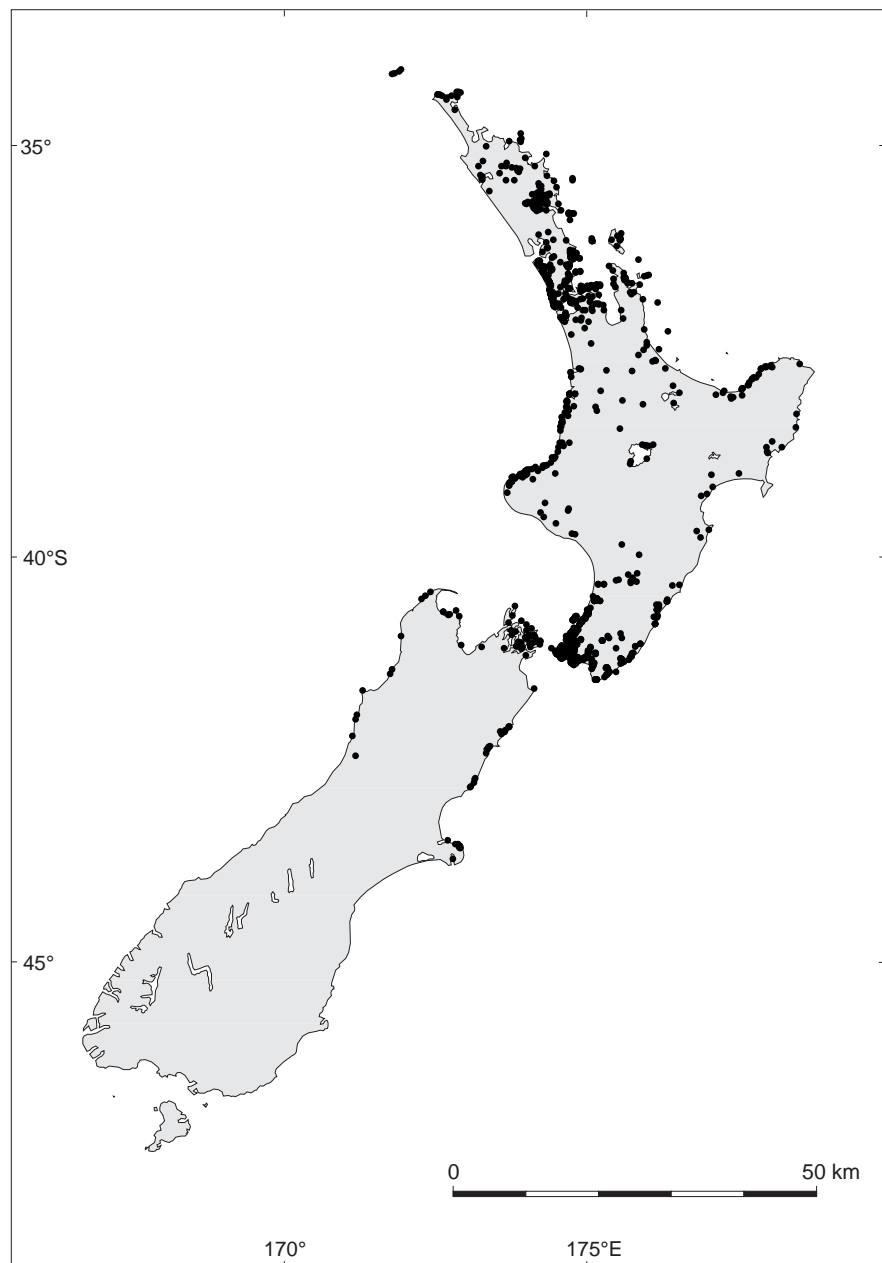
A generalised distribution of karaka in Wellington Conservancy is given in Fig. 3. The distribution is only approximate for two reasons. First, there are trees that are not yet recorded, including many in private gardens. Second, some records are old and the trees they describe may no longer exist. No attempt is made to indicate the numbers of karaka trees at each site and some dots represent individual trees.

3. Karaka distribution

It has been suggested that ancestors of the Maori brought karaka to New Zealand. Some botanists support this view, others insist that the karaka was already present before Maori arrived in New Zealand and it is therefore an indigenous species (see Stevenson 1978). The natural distribution of karaka is thought to be confined to New Zealand (Fig. 2) and its offshore islands, including Chatham Islands and Kermadec Islands.

It is uncertain if the karaka is endemic to Wellington. Its distribution in the Wellington Conservancy is mainly coastal (Fig. 3) and near places previously occupied by Maori, which suggests they introduced it to the region.

Figure 2. Distribution of karaka in New Zealand (data provided by Chris Stowe, Otago University).



Today, karaka is found in many private gardens where it has grown naturally from berries excreted by birds or has been planted for the ornamental quality of its glossy dark green leaves and the bright orange colour of its ripe berries.

4. Conservation management

4.1 PLANTING KARAKA

Karaka has been extensively used by Maori as planted trees around their settlements. As a result of this early form of management it has a wide distribution and is found, often in abundance, in many parts of New Zealand (Fig. 2). Continued use of karaka in this way will ensure the survival of the species in the landscape. Karaka will continue to be used in restoration and revegetation projects in Wellington Conservancy, and for that reason will remain a significant component of the regional flora.



Figure 3. Distribution of karaka in Wellington Conservancy (data taken from the Department of Conservation's national BIOWEB database).

4.2 OTHER CONSERVATION MANAGEMENT TASKS

Other actions that would benefit karaka conservation include: physical protection of individual trees and forest remnants that support the species; collection of seed and cultivation of the species for use in ecological restoration projects; and raising public awareness of the value of karaka (both to birds and to people).

4.3 MONITORING

Little monitoring has been done of karaka in Wellington. On the Chatham Islands, detailed study has been undertaken of kopi trees where they support dendroglyphs (see Jopson & McKibbin 2000).

Mapping of karaka distribution in Wellington (Fig. 3) provides a baseline against which expansions and contractions in its range can be assessed. Monitoring of the condition (abundance, age structure and area covered) of karaka populations in Wellington will be undertaken in the future to provide information about the changing status of the species. This will contribute to the implementation of several strategic themes identified in the conservancy monitoring strategy (Ulrich & Brady, in press). Monitoring may also be required to demonstrate whether or not karaka is becoming a weed and changing the composition and structure of plant communities in Wellington.

4.4 THE SPREAD OF KARAKA

In some places karaka has been known to become a serious weed. This is especially the case when it has been taken outside of its known natural range. For example, it was introduced to Hawaii for reforestation and is now found on four islands there. It is a threat to endangered native plants such as *Exocarpos luteolus* (a shrub and member of the sandalwood family) and is being controlled. There is a major infestation at Koke'e on Kauai (the northernmost and oldest of the eight major Hawaiian Islands) where it grows in mesic habitats between 700 and 1500 m a.s.l.

Karaka fruit seems to provide a disproportionate part of the diet of some bird species and, consequently, it may be dispersed more rapidly than other plant species. The impact of any increase in numbers of karaka seedlings on forest ecology or vegetation succession is unknown. In Wellington, there are several places where aggressive regeneration of karaka is leading to replacement of existing plant communities by stands of karaka. At Papaitonga Scenic Reserve, for example, karaka is regenerating following the eradication of exotic weeds (such as *Tradescantia fluminensis*) from the understory. On Kapiti Island, following eradication of possums and rats, there has been an increase in numbers of karaka seedlings to an extent that large areas of forest support dense thickets of plants. The resulting change to forest structure will be monitored to determine whether control will be required to protect the existing plant communities.

5. Acknowledgements

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WEB ADDRESSES

<http://www.hear.org/pier/colae.htm>

Karaka fact sheet taken from Pacific Island Ecosystems at Risk (PIER) Web site (September 2002).

<http://www.geocities.com/RainForest/7109/karaka.htm>

Information about karaka in New Zealand (September 2002).

<http://homeoint.org/clarke/k/karaka.htm>

Information about medical conditions caused by eating untreated seeds (September 2002).

http://florawww.eeb.uconn.edu/acc_num/198500638.html

General information about karaka (September 2002).

<http://www.botgard.ucla.edu/html/MEMBGNewsletter/Volume2number2/Corynocarpus.html>

General information about karaka (September 2002).

Appendix 1

KARAKA (*Corynocarpus laevigatus*)
OCCURRENCES IN WELLINGTON CONSERVANCY*

Species distribution information :

25/11/2002

522 Species: *Corynocarpus laevigatus*

Common Names: karaka, karaka nut

Previous Names: *Corynocarpus laevigata*, 1952 (A.S. & A. Wilkinson)

Rank: M

Status:

RANK: Molloy, J. Davis, A. 1994 - Setting Priorities for the conservation of New Zealand's plants and animals. Department of Conservation, Wellington.

STATUS: de Lange et al. 1999. Threatened and uncommon plants of New Zealand. New Zealand Journal of Botany, 37: 603-628.

SITE Macro:	SITE Micro:	ECOLOGICAL DISTRICT:	DATE:	REF:	GRID REF:	COMMENTS:
			0	New Zealand Archaeological Association site record file.	U25	
Whakatomatomo Bush			0	Ecological Sites database (Department of Conservation)	S28	
Oroi Stream Bush			0	Ecological Sites database (Department of Conservation)	S28	
Donalds Bush			0	Ecological Sites database (Department of Conservation)	S27	
Spicer Bush			0	Ecological Sites database (Department of Conservation)	R27	
Ranona Bush			0	Ecological Sites database (Department of Conservation)	S28	
Lowlands Bush North			0	Ecological Sites database (Department of Conservation)	S27	
Forest Lake 2			0	Ecological Sites database (Department of Conservation)	S25	
Whangaimoana Stream Bush			0	Ecological Sites database (Department of Conservation)	S28	
Shepherd Bush B			0	Ecological Sites database (Department of Conservation)	T27	
Waikokino Bush			0	Ecological Sites database (Department of Conservation)	T27	
Opau Road Bush			0	Ecological Sites database (Department of Conservation)	R27	
Moanaroa Bush			0	Ecological Sites database (Department of Conservation)	U25	
Matarua Stream Bush			0	Ecological Sites database (Department of Conservation)	R27	
			0	New Zealand Archaeological Association site record file.	U26	

SITE Macro:	SITE Micro:	ECOLOGICAL DISTRICT:	DATE:	REF:	GRID REF:	COMMENTS:
Whangaimoana Stream Bush			0	Ecological Sites database (Department of Conservation)	S28	
Huia Street Bush			0	Ecological Sites database (Department of Conservation)	R25	
Ranona Riser			0	Ecological Sites database (Department of Conservation)	S28	
Mara Shrubland Birch Farm			0	Ecological Sites database (Department of Conservation)	U25	
			0	New Zealand Archaeological Association site record file.	U26	
Whangaimoana Stream Bush			0	Ecological Sites database (Department of Conservation)	S28	
Devils Creek Bush			0	Ecological Sites database (Department of Conservation)	T28	
Whangaimoana Stream Bush			0	Ecological Sites database (Department of Conservation)	S28	
Motuhara Bush			0	Ecological Sites database (Department of Conservation)	R26	
			0	New Zealand Archaeological Association site record file.	U25	
Lake Nganoke			0	Ecological Sites database (Department of Conservation)	S27	
Owahanga Scrub			0	Ecological Sites database (Department of Conservation)	U25	
Dog Hill Bush			0	Ecological Sites database (Department of Conservation)	R27	
Wairere Road Scenic Reserve			1986	Wassilieff, Clark and Gabites	R27708995	
Murphy's Road, Dempster Property			1996	Enright, P. and John, O.	R27719063	
Te Kaukau Point Seal haulout		Aorangi	0	Ecological Sites database (Department of Conservation)	S28	
Aorangi Range, Southern Wairarapa		Aorangi	0	Druce, A.P.		
Putangirua Stream	N165 74-77(east) 01-04(north)	Aorangi	0	Druce, A.P.	S28958706	
Cape Palliser, Aorangi	N168/9	Aorangi	0	Druce, A.P.	S28008524	
Putangirua Scenic Reserve		Aorangi	1986	Wassilieff, Clark and Gabites	S28965705	
Kapiti Island		Cook Strait		Ogle, C	R26728378	
Kapiti Island		Cook Strait		Wildlife Service notes 1926- 1970	R26720365	

SITE Macro:	SITE Micro:	ECOLOGICAL DISTRICT:	DATE:	REF:	GRID REF:	COMMENTS:
Oteranga Stream Gorge Bush		Cook Strait	0	Ecological Sites database (Department of Conservation)	R27	
Red Rocks to Karori Stream	N164 292132 - 247150	Cook Strait	0		R27543819	
Tomahawk Point (South side)		Cook Strait	0	Hughes, P.	R27602068	
Whitireia Park		Cook Strait	0	Hughes, P.	R27662099	
Terawhiti Bush		Cook Strait	0	Ecological Sites database (Department of Conservation)	R27	
Kapiti Island		Cook Strait	0	Ecological Sites database (Department of Conservation)	R26	
Sinclair Head (to Quarries)		Cook Strait	0	Ogle, C.C.	R27547825	
Sinclair Head	N164 31-15-	Cook Strait	0	Druce, A.P.	R27535815	
Kapiti Island		Cook Strait	1907	Cockayne, L.	R26728378	
Kapiti Island		Cook Strait	1952	A.S. & A. Wilkinson	R26728378	
Kapiti Island		Cook Strait	1980	Garrick, D.	R26725372	
Pukerua Bay (south scarp)		Cook Strait	1984	Clelland, D.	R26675177	
Pukerua Bay (south scarp)		Cook Strait	1984	Clelland, D.	R26679179	
Kapiti Island		Cook Strait	1985	Fuller, S. (Kapiti Vegetation Map)	R26705348	
Kapiti Island		Cook Strait	1985	Fuller, S. (Kapiti Vegetation Map)	R26700342	
Kapiti Island		Cook Strait	1985	Fuller, S. (Kapiti Vegetation Map)	R26692338	
Kapiti Island		Cook Strait	1985	Fuller, S. (Kapiti Vegetation Map)	R26718360	
Kapiti Island		Cook Strait	1985	Fuller, S.	R26735387	
Kapiti Island		Cook Strait	1985	Fuller, S. (Kapiti Vegetation Map)	R26737392	
Kapiti Island		Cook Strait	1985	Fuller, S. (Kapiti Vegetation Map)	R26707352	
Kapiti Island		Cook Strait	1985	Fuller, S. (Kapiti Vegetation Map)	R26711357	
Kapiti Island		Cook Strait	1985	Fuller, S. (Kapiti Vegetation Map)	R26698341	
Kapiti Island		Cook Strait	1985	Fuller, S. (Kapiti Vegetation Map)	R26723368	
Mana Island		Cook Strait	1987	Timmins, S. et al.	R26601122	
Smith's Gully		Cook Strait	1990	de Lange, P.J. and Taylor, G.	R27543987	
Lower Waipapa Stream		Cook Strait	1991	Horne, C. and Mitcalfe, B.	R27542822	

SITE Macro:	SITE Micro:	ECOLOGICAL DISTRICT:	DATE:	REF:	GRID REF:	COMMENTS:
Sinclair Head		Cook Strait	1991	Horne, C. and Mitcalfe, B.	R27535815	
Oteranga/Terawhiti/Ohau		Cook Strait	1993	Horne, C. and Mitcalfe, B.	Q27466875	
Smith's Bay, Smith's Gully		Cook Strait	1993	Horne, C. and Mitcalfe, B.J.	R27538975	
Kapiti Island, Wharekohu Bay		Cook Strait	1996	Wellington Botanical Society	R26688337	
Motungarara Island		Cook Strait	1997	Sawyer, J.W.D. and Monchy, P.	R26702238	
Cape Terawhiti		Cook Strait	9999	Mitcalfe	Q27457917	Two grid references: NZMS 260, R27 & Q27, 457917
Akitio Bush		Eastern Hawkes Bay	0	Ecological Sites database (Department of Conservation)	U25	
Tora Coast		Eastern Wairarapa	0	Ecological Sites database (Department of Conservation)	S28	
Homewood Road Bush		Eastern Wairarapa	0	Ecological Sites database (Department of Conservation)	T27	
Tora Coast		Eastern Wairarapa	0	Ecological Sites database (Department of Conservation)	S28	
Tora Coast		Eastern Wairarapa	0	Ecological Sites database (Department of Conservation)	S28	
Tora Coast		Eastern Wairarapa	0	Ecological Sites database (Department of Conservation)	S28	
Tora Coast		Eastern Wairarapa	0	Ecological Sites database (Department of Conservation)	S28	
Tora Coast		Eastern Wairarapa	0	Ecological Sites database (Department of Conservation)	S28	
Mount Percy Bush		Eastern Wairarapa	0	Ecological Sites database (Department of Conservation)	U26	
Tora Coast		Eastern Wairarapa	0	Ecological Sites database (Department of Conservation)	S28	
Tora Coast		Eastern Wairarapa	0	Ecological Sites database (Department of Conservation)	S28	
Mount Percy Shrubland		Eastern Wairarapa	0	Ecological Sites database (Department of Conservation)	U26	
Pahaoa Gorge	N166 14-71- to 19-11-	Eastern Wairarapa	0	Druce, A.P.	T27360808	
Eastern Wairarapa Taipos	N154/5 674975	Eastern Wairarapa	0	Druce, A.P.	U25829552	
Tora Bush Scenic Reserve		Eastern Wairarapa	0		S28170673	
Castlepoint, Eastern Wairarapa		Eastern Wairarapa	0	Davey, J. and Mercer, D.	U26817288	
Castlepoint, Eastern Wairarapa	N159 66-68-	Eastern Wairarapa	0	Druce, A.P. and Park, G.N.	U26817288	
Tora Bush		Eastern Wairarapa	0	Ecological Sites database (Department of Conservation)	S28	

SITE Macro:	SITE Micro:	ECOLOGICAL DISTRICT:	DATE:	REF:	GRID REF:	COMMENTS:
Glenburn Station Bush		Eastern Wairarapa	0	Ecological Sites database (Department of Conservation)	T27	
Honeycomb Coastal scarp		Eastern Wairarapa	0	Ecological Sites database (Department of Conservation)	T27	
Homewood Road Bush		Eastern Wairarapa	0	Ecological Sites database (Department of Conservation)	T27	
Kaiwhata River Bush A		Eastern Wairarapa	0	Ecological Sites database (Department of Conservation)	T27	
Glenburn Road treeland		Eastern Wairarapa	0	Ecological Sites database (Department of Conservation)	T27	
Tora Coast		Eastern Wairarapa	0	Ecological Sites database (Department of Conservation)	S28	
Mount Percy Bush		Eastern Wairarapa	0	Ecological Sites database (Department of Conservation)	U26	
Mataikona River		Eastern Wairarapa	0	Ecological Sites database (Department of Conservation)	U25	
Pahaoa Coastal Forest #1		Eastern Wairarapa	0	Ecological Sites database (Department of Conservation)	T28	
Glenburn Station		Eastern Wairarapa	0	Ecological Sites database (Department of Conservation)	T27	
Tora Coast Bush		Eastern Wairarapa	0	Ecological Sites database (Department of Conservation)	S28	
Waimoana Station, Eastern Wairarapa		Eastern Wairarapa	0	Hughes, P.	T27502877	
		Eastern Wairarapa	0	New Zealand Archaeological Association site record file.	T27	
		Eastern Wairarapa	0	New Zealand Archaeological Association site record file.	T27	
		Eastern Wairarapa	0	New Zealand Archaeological Association site record file.	T28	
		Eastern Wairarapa	0	New Zealand Archaeological Association site record file.	T28	
		Eastern Wairarapa	0	New Zealand Archaeological Association site record file.	T28	
Mount Percy, Eastern Wairarapa		Eastern Wairarapa	0	Druce, A.P.	U26843392	
		Eastern Wairarapa	0	New Zealand Archaeological Association site record file.	T27	
		Eastern Wairarapa	0	New Zealand Archaeological Association site record file.	S28	

SITE Macro:	SITE Micro:	ECOLOGICAL DISTRICT:	DATE:	REF:	GRID REF:	COMMENTS:
		Eastern Wairarapa	0	New Zealand Archaeological Association site record file.	S28	
		Eastern Wairarapa	0	New Zealand Archaeological Association site record file.	T27	
		Eastern Wairarapa	0	New Zealand Archaeological Association site record file.	S28	
		Eastern Wairarapa	0	New Zealand Archaeological Association site record file.	S28	
		Eastern Wairarapa	0	New Zealand Archaeological Association site record file.	S28	
		Eastern Wairarapa	0	New Zealand Archaeological Association site record file.	S28	
Mount Percy, Eastern Wairarapa	N159688800	Eastern Wairarapa	1965	Druce, A.P. and Park, G.	U26840392	
Tora Bush Scenic Reserve		Eastern Wairarapa	1986	Wassilieff, Clark and Gabites	S28284635	
Kaiwhata River Valley, Eastern Wairarapa		Eastern Wairarapa	1995	Enright, P. and Horne, C.	T27540984	
Pahaoa Gorge, Eastern Wairarapa		Eastern Wairarapa	1996	de Lange, P.J., Foster, G., Sawyer, J.W.D. and Townsend, A.J.	T27343811	
Hinewaka		Eastern Wairarapa	1999	John, O. and Enright, P.	T27092359	
Castlepoint Proposed Reserve		Eastern Wairarapa	9999	Turner & Carlin 1975	U26814286	
Hokio Bush, Lake Horowhenua		Foxton		Ogle, C.C. and West, C.		
Arawhata Bush, Lake Horowhenua		Foxton		Ogle, C.C. and West, C.	S25003627	
Te Kowhai Bush, Lake Horowhenua		Foxton		Ogle, C.C. and West, C.	S25018633	
Otaki Beach, Rangiora Road, Otaki		Foxton	0	Hughes, P.	R25889480	
Lake Papaitonga		Foxton	0	Ecological Sites database (Department of Conservation)	S25	
Te Horo Bush		Foxton	0	Ecological Sites database (Department of Conservation)	R25	
Hongoeka Bay (north by stockpiles)		Foxton	0	Hughes, P.	R26649141	
Round Bush, Foxton		Foxton	1968	Esler, A.E. and Greenwood, R.M.	S24040825	
Lake Papaitonga		Foxton	1973	Ogle, C.C.	S25988602	
Papaitonga Scenic Reserve		Foxton	1986	Wassilieff, Clark and Gabites	S25986602	

SITE Macro:	SITE Micro:	ECOLOGICAL DISTRICT:	DATE:	REF:	GRID REF:	COMMENTS:
Himatangi Bush Scenic Reserve	N148 885256	Foxton	1986	Wassilieff, Clark and Gabites	S24115830	
Round Bush Scenic Reserve	N148 800 248	Foxton	1986	Wassilieff, Clark and Gabites	S24040825	
Nga Manu Bird Sanctuary		Foxton	1989	Workers Education Association - Botany Group	R26835358	
Horowhenua Lowlands		Foxton	1990	Duguid, F.		
Pakipaki, Foxton		Foxton	1996	Ogle, C.C.	S25970665	
Raumati		Foxton	1997	Mitcalfe, B. and Horne, C.		
Te Horo (Bush patch)		Foxton	2000	Enright, P. and John, O.	R26870397	
Otaki Plain	N156-7 66-82-	Manawatu Plains	0	Druce, A.P.	S25904438	
Prouse Scenic reserve		Manawatu plains	0	Wassilieff, M.	S25028612	
Waikanae Bush		Manawatu Plains	0	Ecological Sites database (Department of Conservation)	R26	
Prouse's Bush		Manawatu Plains	0	Ecological Sites database (Department of Conservation)	S25	
Manawatu Gorge		Manawatu Plains	0	Druce, A.P.	T24	
Waikanae	Old bulb farm	Manawatu plains	0	Hughes, P.	R26827343	
Waikanae Scenic Reserve	N157 618 752	Manawatu Plains	0		R26860376	
Waiopahu Scenic Reserve		Manawatu Plains	0	Wassilieff, M.	S25066605	
Otaki Plains		Manawatu Plains	1966	Druce, A.P.		
Kiripiti Scientific Reserve	N157 667 823	Manawatu Plains	1986	Wassilieff, Clark and Gabites	S25904440	
Manawatu Plains Ecological District		Manawatu Plains	1995	Ravine, D.		
Field Reserve		Manawatu Plains	1999	White, P.	R26810323	
Haywards Scenic Reserve		Tararua		Park, G.	R27718962	
Taita, Hutt Valley		Tararua	0	Druce, A.P.	R27748006	
Kohangatera Shag Colony		Tararua	0	Ecological Sites database (Department of Conservation)	R27	
Hadfields Bush (Nikau Scenic Reserve)	N156/7 560680	Tararua	0	Druce, A.P.	R26804313	
Fitzroy Bay/Pencarrow	N164	Tararua	0	Druce, A.P.	R28666792	
Catchpool, Rimutaka	Just above forks	Tararua	0	Hughes, P.	R27716825	
Pounui Bush		Tararua	0	Ecological Sites database (Department of Conservation)	R27	
Hadfields Bush (Nikau Scenic Reserve)	N156/7 560680	Tararua	0	Druce, A.P.	R26804314	
Mukamuka Bay South (Professors campsite)		Tararua	0	Hughes, P.	R28764775	

SITE Macro:	SITE Micro:	ECOLOGICAL DISTRICT:	DATE:	REF:	GRID REF:	COMMENTS:
Lake Kohangatera wetland		Tararua	0	Ecological Sites database (Department of Conservation)	R27	
Mount Hawtrey, Rimutaka Forest Park		Tararua	0		R27703889	
Waiorongomai Bush		Tararua	0	Ecological Sites database (Department of Conservation)	S27	
Turakirae Head		Tararua	0	Ecological Sites database (Department of Conservation)	R28	
Tararua Ranges, Rimutaka and west Wellington hills		Tararua	0	Druce, A.P.		
Muritai Park, Eastbourne		Tararua	0	Forest & Bird	R27688878	
Camerons Bush		Tararua	0	Ecological Sites database (Department of Conservation)	R27	
Turakirae Head to Windy Point and Baring Head	N164 42-06-	Tararua	0	Druce, A.P.		
Baring Head Scarp		Tararua	0	Ecological Sites database (Department of Conservation)	R27	
Raumati Escarpment Reserve		Tararua	0	Wassilieff, M.	R26780276	
Link Bush		Tararua	0	Ecological Sites database (Department of Conservation)	R27	
Gibbs Covenant, Eastbourne		Tararua	0	Enright, P. and John, O.	R27689881	
Battle Hill Farm Forest Park		Tararua	0	Enright, P. and John, O.	R26725150	
Mount Hawtrey Bush		Tararua	0	Ecological Sites database (Department of Conservation)	R27	
Mangaone Stream		Tararua	0	Townsend, A.	S25902419	
Paraparaumu Coastal Scarp		Tararua	0	Ecological Sites database (Department of Conservation)	R26	
Tararua Mountains		Tararua	1938	Zotov, V.D. et al.		
Wainui Ridge		Tararua	1960	Victoria University of Wellington	R27710932	
Lowry Bay		Tararua	1965	Kelly, G.C.	R27705928	
Orongorongo, Rimutaka Forest Park		Tararua	1970	Lane-Taylor, J.	R27754833	
Wainui Ridge (to York Bay)		Tararua	1972	Coulter, I.	R27712922	
Lake Pounui, Wairarapa		Tararua	1972	Ogle, C.C.	R27865828	
Turakirae		Tararua	1975	Bagnall, R.	R28703730	
Eastern Hutt Hills		Tararua	1975	Melhuish, M.W. and Hutt Valley Conservation Society		

SITE Macro:	SITE Micro:	ECOLOGICAL DISTRICT:	DATE:	REF:	GRID REF:	COMMENTS:
100 Acre Bush (Kerehoma) Kays Covenant		Tararua	1975	Ogle, C.C.	R26698167	
Haywards Scenic Reserve		Tararua	1982	Butcher, S.	R27717961	
Haywards Scenic Reserve		Tararua	1983	Tararua Tramping Club	R27716960	
Butterfly Creek, Eastbourne		Tararua	1984	Wellington Botanical Society	R27692873	
Fitzroy Bay	Burnt bach	Tararua	1984	Clelland, D.	R27670785	
Fitzroy Bay	Shag colony	Tararua	1984	Clelland, D.	R27671809	
Lake Kohangatera, Pencarrow	N164	Tararua	1984	Clelland, D.	R28799659	
Orongorongo Valley		Tararua	1984	Campbell, J.	R27748827	
Turakirae Head Scientific Reserve		Tararua	1986	Wassilieff, Clark and Gabites	R28689748	
Nikau Scenic Reserve	N157 561 681	Tararua	1986	Wassilieff, Clark and Gabites	R26804313	
Lowry Bay Scenic Reserve		Tararua	1986	Wassilieff, Clark and Gabites	R27705940	
Turakirae		Tararua	1986	Wassilieff, Clark and Gabites	R28728752	
Turakirae		Tararua	1986	Wassilieff, Clark and Gabites	R28725747	
Turakirae		Tararua	1986	Wassilieff, Clark and Gabites	R28712733	
Turakirae		Tararua	1986	Wassilieff, Clark and Gabites	R28727748	
Haywards Scenic Reserve		Tararua	1986	Wassilieff, Clark and Gabites	R27716960	
Hemi Matenga Memorial Park	N157 625747-614706	Tararua	1986	Wassilieff, Clark and Gabites	R26860355	
Paraparaumu Scenic Reserve	N157 575 685	Tararua	1986	Wassilieff, Clark and Gabites	R26813322	
Days Bay, Eastbourne		Tararua	1987	Workers Education Association	R27698901	
Muritae Park, Eastbourne		Tararua	1993	Wellington Botanical Society	R27687877	
Wainuiomata River		Tararua	1993	Clark and Horne	R28674757	
Haywards Reserve		Tararua	1993		R27718962	
Orongorongo River Mouth		Tararua	1994	Clark, Horne and Mitcalfe	R28690750	
Eastbourne, Gibbs QEII Covenant, Muritae		Tararua	1994	Queen Elizabeth II National Trust	R27689882	
Corner Creek, Wairarapa		Tararua	1994	Wellington Botanical Society	R28808798	
Baring Head		Tararua	1994	Frank, M.	R28663762	
Lowry Bay Scenic Reserve		Tararua	1995	Horne, C.	R27707927	
Mukamuka Stream Catchment		Tararua	1996	Mitcalfe, B., Horne, C. and Sawyer, J.W.D.	R28776794	
Wharekauhau Station		Tararua	1996	Enright, P. and Wellington Botanical Society	R27835824	
Turakirae Scientific Reserve		Tararua	1996	Townsend, A.J.	R28690741	
Stokes Valley		Tararua	1997	Mitcalfe, Horne and Sugato	R27706994	

SITE Macro:	SITE Micro:	ECOLOGICAL DISTRICT:	DATE:	REF:	GRID REF:	COMMENTS:
Waiorongomai	N165 684256	Wairarapa Plains		Druce, A.P.	S27905923	
Allsops Bay Bush		Wairarapa Plains	0	Ecological Sites database (Department of Conservation)	S27	
Allsops Bay, Lake Wairarapa		Wairarapa Plains	0	Townsend, A.	S27901881	
Holmes Memorial Bush		Wairarapa Plains	0	Ecological Sites database (Department of Conservation)	S27	
Waiorongomai Stream Bush		Wairarapa Plains	0	Ecological Sites database (Department of Conservation)	S27	
Ruamahanga River Bush		Wairarapa Plains	0	Ecological Sites database (Department of Conservation)	S27	
Wharekauhau Bush Fragments		Wairarapa Plains	0	Ecological Sites database (Department of Conservation)	R28	
Waikanae (Scenic Reserve)	N156/157 620750	Wairarapa Plains	0	Druce, A.P.	R26860376	
Waiorongomai Fragments		Wairarapa Plains	0	Ecological Sites database (Department of Conservation)	S27	
Waiorongomai Fragments		Wairarapa Plains	0	Ecological Sites database (Department of Conservation)	S27	
Waiorongomai Bush		Wairarapa Plains	0	Ecological Sites database (Department of Conservation)	S27	
Wairarapa lake Shore Scenic Reserve		Wairarapa plains	0		S27266666	
Wharekauhau Bush Fragments		Wairarapa Plains	0	Ecological Sites database (Department of Conservation)	R28	
Wharekauhau Bush Fragments		Wairarapa Plains	0	Ecological Sites database (Department of Conservation)	R28	
Wharekauhau Bush Fragments		Wairarapa Plains	0	Ecological Sites database (Department of Conservation)	R28	
Waiorongomai Bush		Wairarapa Plains	0	Ecological Sites database (Department of Conservation)	S27	
Western Lake Road Bush		Wairarapa Plains	0	Ecological Sites database (Department of Conservation)	S27	
Lake Wairarapa	N161 71-30-	Wairarapa Plains	0	Druce, A.P.	S27935968	
Tauherenikau		Wairarapa Plains	0	Ecological Sites database (Department of Conservation)	S27	
Waiorongomai Bush		Wairarapa Plains	0	Ecological Sites database (Department of Conservation)	S27	
Waiorongomai Bush		Wairarapa Plains	0	Ecological Sites database (Department of Conservation)	S27	
Tauherenikau Racecourse		Wairarapa Plains	1973	Wellington Botanical Society	S27090063	

SITE Macro:	SITE Micro:	ECOLOGICAL DISTRICT:	DATE:	REF:	GRID REF:	COMMENTS:
Greytown Park, Wairarapa Plains		Wairarapa Plains	1973	Wellington Botanical Society	S26166117	
Tuhitarata Scenic Reserve		Wairarapa Plains	1986	Wassilieff, Clark and Gabites	S27004875	
E.C. Holmes Memorial Scenic Reserve		Wairarapa Plains	1986	Wassilieff, Clark and Gabites	S27997888	
Oporua Scenic Reserve		Wairarapa plains	1997	Rebergen, A.	S27000894	
Te Whiti (Caveland Road), masterton		Wairarapa Plains	1998	Rebergen, A.	T26341157	
Patera QEII Covenant Longbush		Wairarapa Plains	1999	Enright, P. and John, O.	S27284955	
Wairarapa Plains Ecological District		Wairarapa plains	2000	Perfect et al.		
Wellington South Coast	N160 49-58-	Wellington		Druce, A.P.		
Tawa (Redwood Bush)		Wellington	0	Bagnall, R.	R27624015	
Wellington Botanic Gardens		Wellington	0	Ecological Sites database (Department of Conservation)	R27	
Pukerua Coastal Scarp		Wellington	0	Ecological Sites database (Department of Conservation)	R26	
Horokiri Valley Reserve		Wellington	0		R26726153	
Waiariki Bush South		Wellington	0	Ecological Sites database (Department of Conservation)	R27	
Elsdon Reserve (Porirua)		Wellington	0		R27632064	
Porirua (14a Arawhata Street)		Wellington	0	Hughes, P.	R27662099	
Ngauranga Gorge Bush		Wellington	0	Ecological Sites database (Department of Conservation)	R27	
Porirua Scenic Reserve		Wellington	0	Enright, P., Beveridge, P., Allan and John, O.	R27625054	
Pauahatanui Inlet	N160 44- 45-	Wellington	0	Druce, A.P.		
Makara Estuary		Wellington	0	Wassilieff, M.	R27537972	
Kaukau, Wellington		Wellington	0		R27594954	
Korokoro Stream Bush		Wellington	0	Ecological Sites database (Department of Conservation)	R27	
Oteranga Head Forest		Wellington	0	Ecological Sites database (Department of Conservation)	R27	
Tawa (Redwood Bush)		Wellington	0	Lewington, R.	R27623016	
7 Findlay Street, Wellington		Wellington	0	Coulter, I.		
Tinakori Hill		Wellington	0		R27580913	

SITE Macro:	SITE Micro:	ECOLOGICAL DISTRICT:	DATE:	REF:	GRID REF:	COMMENTS:
Hutt Road Scarp		Wellington	0	Ecological Sites database (Department of Conservation)	R27	
North Makara Bush A		Wellington	0	Ecological Sites database (Department of Conservation)	R27	
Spooky Catchment shrubland		Wellington	0	Ecological Sites database (Department of Conservation)	R27	
Waiariki Bush West		Wellington	0	Ecological Sites database (Department of Conservation)	R27	
Oteranga Stream Bush		Wellington	0	Ecological Sites database (Department of Conservation)	R27	
Matiu/Somes Island		Wellington	0	de Lange, P. J.	R27663925	
Lizard Reserve, Pukerua		Wellington	0	Ogle, C.C.	R26679179	
Bartons Bush (Trentham memorial)	N161 56-40-	Wellington	0	Druce, A.P.	R27804065	
Makara Estuary		Wellington	0	Ecological Sites database (Department of Conservation)	R27	
Thorndon		Wellington	0	Hughes, P.	R27591909	
Jubilee Park, Hutt Valley		Wellington	0		R27688983	
Ngauranga Gorge to Petone Overbridge		Wellington	0	Ogle, C.C.	R27630949	
Wairaka Coast Bush		Wellington	0	Ecological Sites database (Department of Conservation)	R26	
Thorndon		Wellington	0	Hughes, P.	R27588905	
Ngaio Gorge Bush		Wellington	0	Ecological Sites database (Department of Conservation)	R27	
Thorndon		Wellington	0	Hughes, P.	R27592908	
Ngaio Gorge, Wellington		Wellington	0		R27587928	
Thorndon		Wellington	0	Hughes, P.	R27591912	
Owhiro Quarry to Karori Stream		Wellington	0	Ecological Sites database (Department of Conservation)	R27	
Whitireia Park		Wellington	0	Ecological Sites database (Department of Conservation)	R26	
Pukerua Coastal Scarp		Wellington	0	Ecological Sites database (Department of Conservation)	R26	
Khandallah Reserve		Wellington	0		R27597947	
Miramar Peninsula		Wellington	1872	Buchanan, J.	R27628847	
Korokoro Stream, Petone		Wellington	1949	Oliver, W.B.	R27660970	
Johnson Hill Reserve		Wellington	1968	Chinnock, R.J.	R27557910	

SITE Macro:	SITE Micro:	ECOLOGICAL DISTRICT:	DATE:	REF:	GRID REF:	COMMENTS:
Papakowhai Bush		Wellington	1973	Wellington Botanical Society	R27665084	
Transmission Gully		Wellington	1973	Wellington Botanical Society	R26743174	
Newlands (Gully to Hutt Road)		Wellington	1974		R27642962	
Wellington		Wellington	1974	Mead, A.		
Tawa		Wellington	1975	Gabites, Alington, Edmonson and Bagnall	R27623016	
Kaumanga Point, Porirua		Wellington	1977	Stephenson	R27617084	
Ngarauanga Gorge to Petone Overbridge	coastal strip	Wellington	1977	Ogle 1994	R27640957	
Owhiro Bay, Wellington		Wellington	1977	McQueen and Macdonald	R27570833	
Plimmerton (Motuhara Road)		Wellington	1978	MacDonald, M.	R26665134	
Elsdon Reserve		Wellington	1980	Wellington Botanical Society	R27632068	
Pukerua Bay Reserves		Wellington	1980	Ogle, C.C.	R26680179	
Mount Wainui	N160 517-583	Wellington	1980	Ogle, C.C. and Wellington Botanical Society	R26762208	
Pukerua Bay Reserves		Wellington	1980	Ogle, C.C.	R26675179	
Elsdon Scenic Reserve		Wellington	1980	Ogle, C.C.	R27630070	
Paekakariki		Wellington	1981	Ogle, C.C.		
Papakowhai Bush	N160 422 527 - 434 532	Wellington	1984	Clelland, D.	R27665083	
Pukerua Bay (to Wairaka Point)	N160 442 530-	Wellington	1984	Clelland, D.	R26681179	
Otari, Wiltons Bush		Wellington	1984	Reid, J.S.	R27573920	
Khandallah Park, Wellington		Wellington	1985	Myers, S.	R27595949	
Huntleigh Park, Wellington		Wellington	1985	Myers, S.	R27577936	
Ngaio Gorge, Wellington		Wellington	1985	Myers, S.	R27585928	
Wellington Botanic Gardens		Wellington	1985	Myers, S.	R27578899	
Plimmerton		Wellington	1985	Ogle, C.C.	R26667126	
Pukerua Bay		Wellington	1985	Ogle, C.C.	R26675179	
Huntleigh Park, Wellington		Wellington	1985	Myers, S.	R27578935	
Wellington Coast		Wellington	1986	Freegard and Weeber		
Percy Scenic Reserve		Wellington	1986	Wassilieff, Clark and Gabites	R27674973	
Karori Reservoir, Wellington		Wellington	1986	Sherratt, D. and Lewington, R.	R27560880	
Ward (Makaro) Island		Wellington	1986	Freegard and Weeber	R27667887	
Wilfred Mexted Scenic Reserve		Wellington	1986	Wassilieff, Clark and Gabites	R27647032	
Holdaway Scenic Reserve		Wellington	1986	Wassilieff, Clark and Gabites	R27674983	
Matiu/Somes Island		Wellington	1986	Freegard and Weeber	R27664927	

SITE Macro:	SITE Micro:	ECOLOGICAL DISTRICT:	DATE:	REF:	GRID REF:	COMMENTS:
Trentham Scenic Reserve		Wellington	1986	Wassilieff, Clark and Gabites	R27803073	
Porirua Scenic Reserve		Wellington	1986	Wassilieff, Clark and Gabites	R27630065	
Wellington Botanic Gardens		Wellington	1987	Myers, S.	R27580900	
Whitireia Peninsula		Wellington	1988	Hughes, P.	R26654113	
Whitireia Reserve		Wellington	1988		R26656109	
Pauatahanui Inlet	Motukaraka Point	Wellington	1989	Atkinson, I.A.E.	R26698108	
Wellington Town Belt		Wellington	1992	Wassilieff, M.		
Wellington (Southwest peninsula)		Wellington	1992	Mitcalfe, B. and Horne, C.		
Otari, Wiltons Bush		Wellington	1992	Marjot, Y.	R27570920	
Makara (Hawkins Gully Stream)		Wellington	1993	Horne, C. and Mitcalfe, B.	R27552971	
Glenmore Street, Wellington		Wellington	1993	Mitcalfe, B.	R27576900	
Ohariu Valley		Wellington	1993	Horne, C. and Mitcalfe, B.J.	R27574971	
Makara (Post Office Bush)		Wellington	1993	Horne, C. and Mitcalfe, B.	R27526956	
Upper Karori Reservoir		Wellington	1993	Horne, C.	R26558882	
Paekakariki Hill		Wellington	1993	Gabites, I.	R26735213	
West Wairaka Point		Wellington	1994	Gabites, I.	R26675177	
Pikarere Homestead North		Wellington	1994	Gabites, I.	R27617076	
Meeking - Stewart South		Wellington	1994	Gabites, I.	R26298175	
Plimmerton (Track Bush)		Wellington	1994	Gabites, I.	R26665135	
Pauhatanui Hill Road		Wellington	1994	Gabites, I.	R26735213	
Ngauranga - Petone scarp		Wellington	1994	Ogle, C.C.	R27636952	
Airlie Road, Plimmerton		Wellington	1994	Gabites, I.	R26665146	
Horokiwi Landfill, Wellington		Wellington	1994	Horne, C. and Mitcalfe, B.	R27643969	
Clarke Reserve B		Wellington	1994	Gabites, I.	R26739215	
Waiariki Stream		Wellington	1994	Mitcalfe, B. and Horne, C.	R27487878	
Clarke Reserve A		Wellington	1994	Gabites, I.	R26739215	
Waipapa Stream, Wellington		Wellington	1994	Horne, C. and Mitcalfe, B.	R27539829	
Warrens Bush		Wellington	1994	Mitcalfe, B. and Horne, C.	R27507875	
Ngauranga - Petone scarp		Wellington	1994	Ogle, C.C.	R27632948	
Ngauranga - Petone scarp		Wellington	1994	Ogle, C.C.	R27626944	
Ngauranga - Petone scarp		Wellington	1994	Ogle, C.C.	R27622942	
Ngauranga - Petone scarp		Wellington	1994	Ogle, C.C.	R27639956	
Miramar Peninsula, Wellington		Wellington	1995	Horne, C. and Mitcalfe, B.	R27620837	
Trellisick Park, Wellington		Wellington	1996	Horne, C.	R27583927	

SITE Macro:	SITE Micro:	ECOLOGICAL DISTRICT:	DATE:	REF:	GRID REF:	COMMENTS:
Makaro (Ward Island), Wellington harbour		Wellington	1996	de lange, P.J. and Sawyer, J.W.D.	R27667887	
Wilton House Bush, Wellington		Wellington	1996	Enright, P. et al.	R27575919	
Tawa (Peterhouse St/Larsen Crescent)		Wellington	1996	Cutler, A., Horne, C. and Mitcalfe, B.	R27623013	
Huntleigh Park, Wellington		Wellington	1996	Mitcalfe, B.	R27577934	
Wadestown (Scout hall to Weld Street)		Wellington	1996	Mitcalfe, B. and Horne, C.	R27585920	
Kaiwharawhara Park		Wellington	1996	Mitcalfe, B. and Horne, C.	R27600927	
Makaro (Ward island), Wellington harbour		Wellington	1996	Cox, Sherrat and Horne	R27667887	
Long Gully Farm, Wellington West		Wellington	1996	Horne, C., Logan, R., Mitcalfe, B. and Sawyer, J.	R27547866	
Huntleigh Park (private property), Wellington		Wellington	1996	Mitcalfe, B. and Horne, C.	R27580934	
Oete Bush (Haukopua Scenic Reserve)	N149 37-30-	Woodville	0	Druce, A.P.	T24560864	

* The printout from the database shown in Appendix 1 only gives grid references for some records. The remainder have NZMS 260 map numbers. Grid references may be obtained from Wellington Conservancy.