

Appendix 1

CHRONOLOGY OF MOKOIA ISLAND

Management, monitoring, research and key events on Mokoia Island.
Information taken from articles.

YEAR	EVENT
Prehistory	150 000 years BP: volcanic eruption forms Mamaku plateau, and resulting caldera (collapse) forms the physical environment for Lake Rotorua. Mokoia and other key domes are formed from subsequent smaller extrusions of lava. Refer to Andrews (1992).
c. 1450	Inhabitation of Mokoia, with burning and associated cultivation, including translocation and use of coastal plants (Clarkson et al. 1991).
1830–1900+	Number of humans inhabiting island steadily declines.
1839	Norway rats (<i>Rattus norvegicus</i>) recorded on island.
1841	Botanist Ernst Dieffenbach visits the island and comments on the shrubs and grasses.
1842	Botanist William Colenso visits the island searching for a rare tree.
1926–1930	Dr L. Grange visits the island to record and describe the geology of Mokoia. Refer to Grange (1937).
1950	Cultivation of kumara and other plants ceases (Dumbell 1998). Subsequent island-wide natural regeneration.
1950s	Approximately 60 acres (24 ha) of vegetation are burnt, almost 20% of the island. Refer to Andrews (1992) and Forrester (1989).
1952	Establishment of Mokoia Island Wildlife Refuge Status: <ul style="list-style-type: none">• Government involvement in Mokoia, Department of Internal Affairs 6-year lease over half of island for rearing of ring-necked pheasant. Caretaker lives on island during summer and autumn months.• Five North Island weka (<i>Gallirallus australis greyi</i>) (from Gisborne) are released onto island.
1956	Ring-necked pheasant rearing operation moves to Ngongotaha. 12 North Island weka released onto island.
1963/4	Earliest record of mice (<i>Mus musculus</i>) on Mokoia, with one trapped (Beveridge & Daniel 1965, 1966).
1970s	Release of two injured North Island brown kiwi (<i>Apteryx mantelli</i>) onto island.
1985	Approximately 20 goats are taken to island to suppress weeds on the flats.
1988	Mokoia Island Trust Board decides to seek eradication of rats from the island.
1989	Department of Conservation starts programme to remove exotic mammals from the island (Jansen 1993): <ul style="list-style-type: none">• Large reduction of mouse numbers occurs, although not eradication.• Eradication of goats off the island.• Pig escapes from pens on the island.

Continued on next page

YEAR	EVENT
1992	Transfer of North Island robins (<i>Petroica australis longipes</i>) onto Mokoia (Jansen 1992, 1993; Lovegrove 1996). North Island saddlebacks (<i>Philesturnus carunculatus</i>) are released onto the island (Armstrong & Craig 1995). 1 April: A rat is sighted on the island by Dave Wilks, Royal Forest and Bird Protection Society, Te Puke Branch, near the toilet behind Hinemoa's Pool. Refer to Owen (2002c). 31 May: A Reporoa couple are found walking their dog on Mokoia.
1993	Speckled skinks (<i>Oligosoma infrapunctatum</i>) are discovered on the island.
1994	Hihi/stitchbird (<i>Nottomystis cincta</i>) translocation. Extensive rat trapping regime.
1994/95	Hihi breeding season is monitored. Refer to Castro et al. (2004).
1995	A rat is sighted on the island. Extensive rat trapping and poisoning regime. Visit by HRH Prince Phillip. Refer to Nicholas (1995).
1995/96	Hihi breeding season is monitored. Refer to Castro et al. (2004).
1996	Last two horses are air-lifted off the island. Aerial distribution of poison. Large reduction of mouse numbers, although not eradication. A rat is sighted on the island (Owen 2002c). A mouse is sighted on the island.
1996/97	Hihi breeding season is monitored. Refer to Castro et al. (2004).
1997	Weed survey (Holland 1997). A rat is sighted on the island.
1997/98	Hihi breeding season is monitored. Refer to Castro et al. (2004).
1998/99	Research on tree fuchsia (<i>Fuchsia excorticata</i>) pollen dispersal (Kelly et al. 1999).
1999	Transfer of North Island robins to Moturoa (Armstrong 2000; Owen & Asquith 2000). Invertebrate monitoring efforts start. Refer to Howard & Christensen (2005).
2000	Threatened plant plantings and transfers. Refer to Cashmore (2000, 2001). Rotorua Botanical Society trip. Refer to Cashmore (2001) and Jane & Ecroyd (2001).
2002	Hihi are removed from the island to Mount Bruce and Kapiti Island (Owen 2002a, b).
2003	Waitangi Day: North Island brown kiwi Moana is released onto the island (Owen 2003a). July: Three North Island brown kiwi, named 'Tutanekai', 'Hinemoa' and 'Tiki' are released onto the island (Owen 2003b). Blood sampling of and ectoparasite collection from saddlebacks, blackbirds and North Island robins.
2003/4?	Transfer of North Island robins to Tuhua (Mayor Island).
2004	Threatened plant plantings and transfers. Refer to Cashmore (2004).
2005	Doug Armstrong carries out research on saddleback density dependence. 23 August: Stoat (<i>Mustela erminea</i>) possibly sighted on island. Mokoia stoat incident action plans (Christensen 2005). Eight or nine weka are transferred from Mokoia to Whirinaki Forest Park (Owen 1997).

References

- Andrews, P. 1992: Mokoia: a brief history. Bibliophil, Rotorua. 60p.
- Armstrong, D.P. 2000: Re-introductions of New Zealand robins: a key component of ecological restoration. *Re-introduction News* 19: 44-47.
- Armstrong, D.P.; Craig, J.L. 1995: Effects of familiarity on the outcome of translocations, I. A test using saddlebacks *Philesturnus carunculatus rufusater*. *Biological Conservation* 71: 133-141.
- Beveridge, A.E.; Daniel, M.J. 1965: Observations on a high population of brown rats (*Rattus norvegicus* Berkenhout 1767) on Mokoia Island, Lake Rotorua. *New Zealand Journal of Science* 8: 174-189.
- Beveridge, A.E.; Daniel, M.J. 1966: A field trial of a new rat poison, compound S-6999, on brown rats. *Proceedings of the New Zealand Ecological Society* 13: 40-43.
- Cashmore, P. 2000: Mokoia Island, Lake Rotorua. *Rare Bits* 38: 5
- Cashmore, P. 2001: Mokoia Island field trip. *Rotorua Botanical Society* 36: 48-49.
- Cashmore, P. 2004: Mokoia Island mistletoe seed translocation. *Rare Bits* 38: 5.
- Castro, I.; Mason, K.M.; Armstrong, D.P.; Lambert, D.M. 2004: Effect of extra-pair paternity on effective population size in a reintroduced population of the endangered hibi, and potential for behavioural management. *Conservation Genetics* 5: 381-393.
- Christensen, B.R. (Comp.) 2005: Mokoia stoat incursion incident action plans (I-IV). Department of Conservation, Rotorua (unpublished reports). I: 20p., II: 20p., III: 19p., IV: 21p.
- Clarkson, B.D.; Smale, M.C.; Ecroyd, C.E. 1991: Botany of Rotorua. Forest Research Institute, Rotorua. 132p.
- Dumbell, G.S. 1998: (Draft) Mokoia island ecological management strategy. Applied Ecology Ltd. Contract report for Department of Conservation, Auckland (unpublished report). 73p.
- Forrester, R. 1989: Good old-days recalled with trout lineup. *The Daily Post*, 8 December 1989.
- Grange, L.I. 1937: The geology of the Rotorua-Taupo subdivision, Rotorua and Kaimanawa divisions. *Geological Survey Branch Bulletin No. 37*. Department of Scientific and Industrial Research, Wellington. 138p.
- Holland, D. 1997: Observations on Mokoia Island (Lake Rotorua): August 18-28 1997. Unpublished report held on file at Bay of Plenty Conservancy, Department of Conservation, Rotorua.
- Howard, M.; Christensen, B.R. 2005: Report on Mokoia and Ngongotaha invertebrate samples ID and analysis. Department of Conservation, Rotorua (unpublished report). 3 p.
- Jane, G.; Ecroyd, C.E. 2001: Additions to the checklist of vascular plants of Mokoia Island (Beadel & Ecroyd 1990). *Rotorua Botanical Society* 36: 50.
- Jansen, W.P. 1992: Introduction and subsequent observations of a population of North Island robin (*Petroica australis longipes*) to Mokoia Island, Lake Rotorua. Department of Conservation, Rotorua (unpublished report). 10p.
- Jansen, W.P. 1993: Introduction of North Island robins to Mokoia Island, Lake Rotorua, and public involvement. *Ecological Management* 1: 39-43.
- Kelly, D.; Ladley, J.; Robertson, A.; Peterson, P.; Merrett, M. 1999: Pollen and dispersal limitation in *Fuchsia excorticata* on the New Zealand mainland. P.30 in Rose, A.B. (Ed.): Proceedings of the New Zealand Ecological Society Annual Conference, 29 June-2 July 1999, Blenheim. Landcare Research.
- Lovegrove, T.G. 1996: Island releases of saddlebacks *Philesturnus carunculatus* in New Zealand. *Biological Conservation* 77: 151-157.
- Nicholas, J. 1995: Royal wave for Rotorua. *The Daily Post*, 22 November 1995.

- Owen, K. 1997: Transformation of an inland island (Mokoia Island) now home to endangered species. Pp. 74-87 in Johnson, T.; Boyes, P. (Eds): New Zealand Conservation Management Group Annual Conference Proceedings, 1997, Rotorua.
- Owen, K. 2002a: Hihi transfer Mokoia to Kapiti: report to Wellington Conservancy. Department of Conservation, Rotorua (unpublished report).
- Owen, K. 2002b: Hihi transfer Mokoia Island to National Wildlife Centre: report to Wellington Conservancy. Department of Conservation, Rotorua (unpublished report).
- Owen, K. 2002c: Transformation of an inland island (Mokoia Island) now home to endangered species. Department of Conservation, Rotorua (unpublished report). 14p.
- Owen, K. 2003a: Mokoia Island. *Rare Bits* 49: 23.
- Owen, K. 2003b: North Island brown kiwi releases: Mokoia. *Rare Bits* 50: 7.
- Owen, K.; Asquith, P. 2000: Transfer of toutouwai (*Petroica australis longipes*) from Mokoia Island to Moturoa Island. New Zealand. *Ecological Management* 8: 61-64.

Appendix 2

VASCULAR PLANT SPECIES LIST

Compiled from Beadel (1989), Beadel & Ecroyd (1990), Jane & Ecroyd (2001), and Perrott & Armstrong (2000).

This species list is based on visits by B.R. Clarkson and C. Ecroyd in March 1982; S.M. Beadel in May 1989; S.M. Beadel and C. Ecroyd in May 1990, April 1990 and June 1990 (Rotorua Botanical Society Field Trip); G. Jane and C. Ecroyd in August 2000; D.P. Armstrong, J.K. Perrott and others in 1995; and D. Holland in 1997. It also incorporates a current revision of the list by J. Hobbs, and includes common names where found.

Key: * = adventive species, CE = recorded by B.R. Clarkson and C. Ecroyd in March 1982, B = Beadel May 1989, P = planted, NZFRI = Forest Research Institute Herbarium, Rotorua, JE = G. Jane & C. Ecroyd August 2000, PA = J.K. Perrott and D.P. Armstrong in 1995. Includes subsequent identifications by P. Cashmore (Cashmore 2000, 2001), and John Hobbs (JH).

SPECIFIC NAME	COMMON NAME	NOTES
INDIGENOUS PLANTS		
Gymnosperms		
<i>Dacrycarpus dacrydioides</i> (P, CE)	Kahikatea	
<i>Podocarpus totara</i> (natural and planted)	Totara	
Monocot trees		
<i>Cordyline australis</i>	Ti or cabbage tree	
<i>Rhopalostylis sapida</i> (P)	Nikau	
Dicot trees		
<i>Alectryon excelsus</i> (P, CE)	Titoki	
<i>Aristotelia serrata</i>	Makomako or wineberry	
<i>Beilschmiedia tawa</i>	Tawa	W.P. Jansen NWIU (18451)
<i>Corynocarpus laevigatus</i>	Karaka	
<i>Dysoxylum spectabile</i>	Kohekohe	
<i>Entelea arborescens</i>	Whau	Although now naturalised on the island, the parent(s) may have been planted
<i>Fuchsia excorticata</i>	Kotukutuku or tree fuchsia	
<i>Griselinia littoralis</i> (PA)	Broadleaf	
<i>Knighitia excelsa</i> (B)	Rewarewa or New Zealand honeysuckle	
<i>Kunzea ericoides</i> var. <i>ericoides</i> (B)	Kanuka	
<i>Litsea calicaris</i>	Mangeao	W.P. Jansen, pers. comm.
<i>Melicytus ramiflorus</i> ssp. <i>ramiflorus</i>	Mahoe or whiteywood	
<i>Metrosideros excelsa</i>	Pohutukawa	
<i>Metrosideros robusta</i> (B)	Northern rata	
<i>Metrosideros excelsa</i> × <i>M. robusta</i> (B)	Pohutukawa–northern rata hybrid	
<i>Myrsine australis</i>	Mapou	
<i>Nothofagus menziesii</i>	Silver beech	
<i>Pittosporum tenuifolium</i> ssp. <i>tenuifolium</i>	Kohuhu	

Continued on next page

SPECIFIC NAME	COMMON NAME	NOTES
<i>Pseudopanax arboreus</i>	Fivefinger	
<i>Schefflera digitata</i>	Pate or seven finger	
<i>Sophora microphylla</i> (P, CE)	Kowhai	
<i>Sophora tetraptera</i> (P, CE)	Kowhai	
<i>Weinmannia racemosa</i>	Kamahi	
Dicot shrubs		
<i>Brachyglottis repanda</i> var. <i>fragrans</i> (P, CE)	Rangiora	
<i>Brachyglottis repanda</i> var. <i>repanda</i>	Rangiora	
<i>Coprosma grandifolia</i>	Kanono	
<i>Coprosma repens</i>	Taupata	M.D. Wilcox, pers. comm.; probably planted
<i>Coprosma robusta</i>	Karamu or glossy karamu	
<i>Coriaria arborea</i> var. <i>arborea</i>	Tutu	
<i>Dodonaea viscosa</i>	Akeake	
<i>Gaultheria antipoda</i> (B)	Bush snowberry	
<i>Gaultheria oppositifolia</i> (B)	Niniwa or snowberry	
<i>Geniostoma rupestre</i> var. <i>ligustrifolium</i>	Hangehange	
<i>Hebe stricta</i> var. <i>stricta</i>	Koromiko	
<i>Ileostylus micranthus</i> (P, Cashmore 2001)	Small-flowered mistletoe	
<i>Leptospermum scoparium</i>	Manuka	
<i>Leucopogon fasciculatus</i> (B)	Mingimingi	
<i>Macropiper excelsum</i> var. <i>excelsum</i>	Kawakawa	
<i>Tupeia antarctica</i> (P, Cashmore 2001)	White mistletoe	
<i>Urtica ferox</i>	Ongaonga or stinging nettle	NZFRI MW911
Monocot lianes		
<i>Ripogonum scandens</i>	Supplejack	W.P. Jansen, NZFR118450
Dicot lianes		
<i>Clematis cunninghamii</i>		
<i>Clematis</i> sp. (possibly <i>C. paniculata</i>)	White clematis	
<i>Metrosideros diffusa</i> (CE)	Rata	
<i>Metrosideros fulgens</i>	Scarlet rata or rata	
<i>Metrosideros perforata</i>	Akatea	
<i>Muehlenbeckia australis</i>	Puka or large-leaved <i>Muehlenbeckia</i>	
<i>Rubus cissoides</i>	Tataramoa or bush lawyer	
Psilopsids and Lycopods		
<i>Lycopodium varium</i> (B)	Iwituna or hanging clubmoss	
<i>Lycopodium volubile</i> (B)	Climbing clubmoss	
<i>Tmesipteris elongata</i>	Fork fern	
<i>Tmesipteris tannensis</i> (JE)	Fork fern	
Ferns		
<i>Adiantum cunninghamii</i>	Maidenhair	
<i>Anarthropteris lanceolata</i> (B)	Lance fern	
<i>Asplenium bulbiferum</i> ssp. <i>bulbiferum</i>	Hen and chickens fern	
<i>Asplenium flaccidum</i> ssp. <i>flaccidum</i>	Hanging spleenwort	
<i>Asplenium gracillimum</i> (B)		
<i>Asplenium oblongifolium</i>	Shining spleenwort	
<i>Asplenium polyodon</i>	Sickle spleenwort	
<i>Blechnum</i> sp. "black spot"		

Continued on next page

SPECIFIC NAME	COMMON NAME	NOTES
<i>Blechnum chambersii</i>	Nini or lance fern	
<i>Blechnum discolor</i>	Crown fern	Small plant established from earlier plantings
<i>Blechnum filiforme</i>	Thread fern	
<i>Blechnum novae-zelandiae</i>	Kiokio	
<i>Blechnum vulcanicum</i> (JE)	Korokio	
<i>Cyathea cunninghamii</i> (CE)	Gully tree fern	
<i>Cyathea dealbata</i>	Silver fern	
<i>Cyathea medullaris</i>	Mamaku	
<i>Dicksonia fibrosa</i>	Wheki-ponga	
<i>Dicksonia squarrosa</i>	Wheki	
<i>Diplazium australe</i>		
<i>Doodia media</i> ssp. <i>australis</i>	Rasp fern	
<i>Histiopteris incisa</i> (B)	Water fern	
<i>Hymenophyllum demissum</i>	Irirangi	
<i>Hymenophyllum dilatatum</i> (B)	Filmy fern	
<i>Hymenophyllum flabellatum</i>	Filmy fern	
<i>Hymenophyllum flexuosum</i> (CE)	Filmy fern	
<i>Hymenophyllum multifidum</i> (CE)	Filmy fern	
<i>Hymenophyllum rarum</i> (B)	Filmy fern	
<i>Hymenophyllum sanguinolentum</i>	Piripiri	
<i>Hymenophyllum scabrum</i> (CE)	Filmy fern	
<i>Hypolepis ambigua</i>	Pig fern	
<i>Hypolepis dicksonioides</i>	Giant hypolepis	
<i>Lastreopsis glabella</i>	Smooth shield fern	
<i>Leptolepia hymenophylloides</i>	Heruheru	
<i>Microsorium pustulatum</i>	Hound's tongue	
<i>Microsorium scandens</i>	Fragrant fern	
<i>Paesia scaberula</i>	Lace fern	
<i>Pellaea rotundifolia</i>	Tarawera	
<i>Pneumatopteris pennigera</i>	Gully fern	
<i>Polystichum richardii</i>	Common shield fern	
<i>Polystichum richardii</i> × <i>P. vestitum</i> (CE)		NZFRI19057
<i>Polystichum vestitum</i> (JE)	Prickly shield fern	
<i>Pteridium esculentum</i>	Bracken	
<i>Pteris macilenta</i>	Sweet fern	
<i>Pteris tremula</i>	Taraera or Australian bracken	
<i>Pyrrosia eleagnifolia</i>	Leather-leaf fern	
<i>Rumobra adiantiformis</i> (JE)	Leathery shield fern	
<i>Trichomanes venosum</i>	Veined filmy fern	
Orchids		
<i>Corybas micranthus</i>	Spider orchid	M.D. Wilcox, pers. comm.
<i>Drymoanthus adversus</i> (CE)	Green fleshy orchid	
<i>Earina autumnalis</i> (B)	Raupeka	
<i>Earina mucronata</i>	Weka-a-waka or New Zealand bamboo orchid	
<i>Ichthyostomum pygmaeum</i>	Piripiri or bulb-leaf orchid	
<i>Microtis unifolia</i>	Maikaika or onion orchid	
<i>Nematoceras macranthum</i>		M.D. Wilcox, pers. comm.

Continued on next page

SPECIFIC NAME	COMMON NAME	NOTES
<i>Pterostylis</i> sp.		Probably <i>P. graminea</i> ; <i>P. cardiostigma</i> does not flower until October (JE)
<i>Winika cunninghamii</i>	Winika	
Grasses		
<i>Cortaderia fulvida</i>	Toetoe	
<i>Deyeuxia avenoides</i>	Mountain oat grass	
<i>Dichelachne crinita</i> (CE)	Patiti or plume grass	
<i>Isachne globosa</i>	Swamp millet	
<i>Lachnagrostis</i> sp. (<i>L. filiformis</i>) (CE)	New Zealand wind grass	
<i>Microlaena stipoides</i> (B)	Meadow rice grass	
<i>Rytidosperma gracile</i> (B)		
Sedges		
<i>Carex breviculmis</i> (B)	Grassland sedge	
<i>Carex dissita</i>	Flat-leaved sedge	
<i>Carex maorica</i>	Cyperus sedge	
<i>Carex secta</i>		
<i>Carex solandri</i>	Solander's sedge	
<i>Carex testacea</i> (CE)	Speckled sedge	
<i>Carex virgata</i>	Swamp sedge	
<i>Carex</i> sp. (<i>C. geminata</i> agg.)	Rautahi	
<i>Cyperus ustulatus</i>	Toetoe or coastal cutty grass	
<i>Eleocharis acuta</i>	Sharp spike sedge or club rush	
<i>Isolepis nodosa</i>	Wiwi or knobby clubrush	
<i>Schoenoplectus validus</i>	Lake clubrush	
<i>Uncinia uncinata</i>	Kamu or hook grass	
Rushes		
<i>Juncus gregiflorus</i>	Wiwi or leafless rush	
<i>Juncus planifolius</i>	Flat-leaved rush	
<i>Luzula picta</i> var. <i>limosa</i>	Woodrush	
Monocots (other than orchids, grasses, sedges and rushes)		
<i>Astelia solandri</i>	Kahakaha, kowharawhara	
<i>Collospermum bastatum</i>	Kahakaha	
<i>Cordyline pumilio</i> (JE)	Ti rauriki or dwarf cabbage tree	
<i>Dianella nigra</i>	Turutu or inkberry	
<i>Lemna minor</i>	Karearea or common duckweed	
<i>Phormium tenax</i>	Harakeke or flax	
<i>Typha orientalis</i>	Raupo or bulrush	
Composites		
<i>Anaphalioides trinervis</i> (JE)		On rock at shore
<i>Gnaphalium gymmocephalum</i>	Creeping cudweed	
<i>Leptinella dispersa</i>		
<i>Pseudognaphalium</i> sp. (<i>P. luteoalbum</i>)	Pukatea or jersey cudweed	
<i>Senecio glomeratus</i>	Pukatea or Australian fireweed	
<i>Senecio minimus</i>	Australian burnweed	
Dicot herbs (other than composites)		
<i>Acaena novae-zelandiae</i> (JE)	Bidibid	
<i>Cardamine</i> sp. (<i>C. debilis</i> agg.)	Panapana or New Zealand bitter cress	

Continued on next page

SPECIFIC NAME	COMMON NAME	NOTES
<i>Epilobium alsinoides</i>		
<i>Epilobium nerteroides</i>		
<i>Epilobium nummularifolium</i>	Creeping willowherb	
<i>Epilobium pedunculare</i>	Long-stalked willowherb	
<i>Galium propinquum</i>	Mawe	
<i>Geranium potentilloides</i> ssp. <i>potentilloides</i>		
<i>Geranium solanderi</i> “coarse hairs”	Matua-kumara or turnip-rooted geranium	
<i>Glossostigma elatinoides</i>		
<i>Haloragis erecta</i> ssp. <i>erecta</i>		
<i>Hydrocotyle heteromeria</i>	Waxweed	
<i>Hydrocotyle hydrophila</i>		
<i>Hydrocotyle moschata</i>	Hairy pennywort	
<i>Hydrocotyle novae-zeelandiae</i> agg.		
<i>Lilaeopsis</i> sp. (<i>L. rutbiana</i> ?)		
<i>Limosella lineata</i>	Mudwort	
<i>Myriophyllum propinquum</i>	Common water milfoil	
<i>Pelargonium inodorum</i>	Pukupuku	
<i>Polygonum salicifolia</i>		
<i>Pratia angulata</i>	Panakenake	
<i>Ranunculus reflexus</i>	Kopukapuka or hairy buttercup	
<i>Rorippa divaricata</i> (P)	Matangoa (Cashmore 2001)	
<i>Rorippa palustris</i>	Hanea, marsh yellow cress	
<i>Stellaria parviflora</i> (incl. <i>S. decipiens</i> and <i>S. minuta</i>)	New Zealand chickweed	
<i>Wahlenbergia</i> sp.		
NON-INDIGENOUS PLANTS OR ADVENTIVE SPECIES		
Gymnosperms		
<i>Pinus pinaster</i>	Maritime pine	
Dicot trees		
<i>Alnus glutinosa</i>	Alder	
<i>Eucalyptus</i> sp. (JH)	Gum tree	
<i>Ficus carica</i> (CE)	Fig	
<i>Fraxinus excelsior</i> (CE)	European ash	
<i>Paraserianthes lophantha</i> (PA)	Brush wattle	
<i>Populus nigra</i> ‘Italica’ (P)	Lombardy poplar	
<i>Prunus domestica</i> (CE)	European plum	
<i>Prunus persica</i> (CE)	Peach	
<i>Quercus robur</i>	English oak	
<i>Robinia pseudoacacia</i> (CE)	False acacia	
<i>Salix cinerea</i>	Grey willow	
<i>Salix fragilis</i>	Crack willow	
Dicot shrubs		
<i>Artemisia absinthium</i>	Wormwood	
<i>Buddleja davidii</i>	Buddleia	
<i>Buxus sempervirens</i>	Common boxthorn	
<i>Crataegus monogynya</i> (JH)	Hawthorn	
<i>Crocsmia</i> × <i>crocsmiiflora</i>	Montbretia	
<i>Cyphomandra betacea</i> (JH)	Tamarillo	

Continued on next page

SPECIFIC NAME	COMMON NAME	NOTES
<i>Cytisus scoparius</i>	Broom	4 April 2004: all plants found were removed.
<i>Ligustrum sinense</i>	Chinese privet	All located plants were removed.
<i>Lupinus luteus</i> (PA), or <i>Lupinus arboreus</i> (JH)	Tree lupin	
<i>Ricinus communis</i> (JE)	Caster oil plant	
<i>Rosa rubiginosa</i>	Sweet brier	
<i>Telina monspessulana</i>	Montpellier broom	
<i>Ulex europaeus</i>	Gorse	
Dicot lianes		
<i>Clematis vitalba</i> (PA)	Old man's beard	
<i>Hedera helix</i>	Ivy	
<i>Humulus lupulus</i> (CE)	Bine or hop	
<i>Lonicera japonica</i>	Japanese honeysuckle	
<i>Rubus</i> sp. (<i>R. fruticosus</i>)	Blackberry	
<i>Vinca major</i>	Periwinkle	
Grasses		
<i>Agrostis capillaris</i>	Browntop bent, browntop, bent grass	
<i>Agrostis stolonifera</i>	Creeping bent	
<i>Anthoxanthum odoratum</i> (JE)	Sweet vernalgrass	
<i>Arundo donax</i>	Giant reed	
<i>Bromus catharticus</i> (CE)	Rescuegrass	
<i>Bromus willdenowii</i> (JE)	Rescuegrass	
<i>Cynodon dactylon</i>	Couch or bermuda grass	
<i>Dactylis glomerata</i>	Cocksfoot	
<i>Digitaria sanguinalis</i>	Dummer grass	
<i>Festuca arundinacea</i>	Tall fescue	
<i>Glyceria maxima</i> (B)	Reed meadow grass	
<i>Holcus lanatus</i>	Yorkshire fog	
<i>Lolium perenne</i>	Perennial ryegrass	
<i>Oplismenus imbecillis</i>	Creeping beard grass	
<i>Paspalum dilatatum</i>	Paspalum	
<i>Paspalum distichum</i>	Paspalum or mercer grass	
<i>Pennisetum clandestinum</i> (JE)	Kikuyu grass	
<i>Pennisetum macrourum</i>	African feather grass	
<i>Sporobolus africanus</i> (CE)	Ratstail	
Unknown sp.	Bamboo	
<i>Vulpia bromioides</i> (JE)	Vulpia hair grass	
Sedges		
<i>Cyperus eragrostis</i> (CE)	Puketangata or umbrella sedge	
Rushes		
<i>Juncus acuminatus</i>	Sharp-fruited rush	
<i>Juncus effusus</i> (B)	Common rush	
<i>Juncus tenuis</i>	Track rush	
Monocots (other than orchids, grasses, sedges and rushes)		
<i>Kniphofia</i> sp.	Red hot poker	
Dicot herbs (other than composites)		
<i>Amaranthus powellii</i> (CE)	Redroot, Powell's amaranth	
<i>Anagallis arvensis</i>	Scarlet pimpernel	

Continued on next page

SPECIFIC NAME	COMMON NAME	NOTES
<i>Aster subulatus</i>	Saltmarsh aster	
<i>Barbarea intermedia</i>	Early wintercress	
<i>Bidens frondosa</i>	Devil's beggartick	
<i>Cardamine hirsuta</i>	Hairy bittercress	
<i>Carduus nutans</i>	Nodding plumeless thistle	
<i>Centaureum erythraea</i> (B)	Centauray	
<i>Cerastium glomeratum</i>	Sticky chickweed	
<i>Chenopodium album</i> (CE)	Hua inanga or fat-hen, lamb's quarters	
<i>Cirsium arvense</i>	Californian thistle	
<i>Cirsium vulgare</i>	Pungitangita or Scotch thistle	
<i>Conyza albida</i> (JH)	Broad-leaved fleabane	
<i>Coronopus didymus</i>	Lesser swinecress	
<i>Cucurbita</i> sp.		
<i>Datura stramonium</i>	Jimsons weed or thornapple	
<i>Digitalis purpurea</i> (JE)	Foxglove	
<i>Elodea canadensis</i> (CE)	Oxygen weed	
<i>Epilobium cinereum</i>	Willowherb	
<i>Euphorbia pepus</i>	Kaikaiatua or milkweed	
<i>Galium aparine</i>	Cleavers	
<i>Galium palustre</i>	Marsh bedstraw	
<i>Geranium molle</i>	Dove's foot	
<i>Geranium robertianum</i>	Herb Robert	
<i>Gnaphalium spicatum</i>	Purple cudweed	
<i>Hypochoeris radicata</i>	Spotted cat's ear	
<i>Lactuca virosa</i>	Acrid lettuce	
<i>Lapsana communis</i> (JE)	Nipplewort	
<i>Leontodon taraxacoides</i>	Hawkbit	
<i>Lepidium africanum</i>	Peppergrass	
<i>Lotus pedunculatus</i>	Lotus	
<i>Ludwigia palustris</i> (CE)	Water purslane	
<i>Lycium barbarum</i>	Chinese boxthorn (vine)	
<i>Lycium hyssopifolia</i>	Hyssop looserife	
<i>Malva parvifolia</i>		
<i>Mentha × piperita</i>	Peppermint	
<i>Microtis uniflora</i> (JE)		
<i>Mimulus guttatus</i>	Monkey musk	
<i>Modiola caroliniana</i>		
<i>Mycelis muralis</i>	Wall lettuce	
<i>Myosotis scorpioides</i>	Water forget-me-not	
<i>Myosotis sylvatica</i>	Forget-me-not	
<i>Oenothera glazioviana</i> (CE)		
<i>Orobancha minor</i> (JE)	Broomrape	
<i>Oxalis</i> sp.	Wood sorrel	
<i>Physalis peruviana</i> (CE)	Cape gooseberry	
<i>Phytolacca octandra</i>	Dyeberry	
<i>Plantago australis</i>	Swamp plantain	
<i>Plantago lanceolata</i>	English plantain	
<i>Plantago major</i>	Broad-leaved plantain	
<i>Poa annua</i>	Annual poa	
<i>Polygonum hydropiper</i>	Water pepper	

Continued on next page

SPECIFIC NAME	COMMON NAME	NOTES
<i>Polygonum persicaria</i> (CE)	Willow weed	
<i>Prunella vulgaris</i>	Self-heal	
<i>Ranunculus repens</i>	Creeping buttercup	
<i>Rorippa nasturtium-aquaticum</i>		
<i>Rumex acetosella</i>	Sheep's sorrel	
<i>Rumex obtusifolius</i>	Paewhenua or broad-leaved dock	
<i>Rumex pulcher</i>	Fiddle dock	
<i>Sagina procumbens</i>	Spreading pearlwort	
<i>Senecio bipinnatisectus</i>	Australian fireweed	
<i>Senecio jacobaea</i>	Ragwort	
<i>Stigesbeckia orientalis</i>	Punawaru or Indian weed	
<i>Silene gallica</i>	Catchfly	
<i>Sisymbrium officinale</i>	Hedge mustard	
<i>Solanum americanum</i> (JE), (JH)	Raupeti or small flowered nightshade	
<i>Solanum nigrum</i>	Raupeti or black nightshade	
<i>Sollia sessilis</i>	Onehunga weed	
<i>Sonchus asper</i>	Kautara or prickly sow thistle	
<i>Sonchus oleraceus</i>	Puha or common sow thistle	
<i>Stellaria media</i>	Kohukohu or chickweed	
<i>Taraxacum officinale</i> (CE)	Tawao or dandelion	
<i>Tradescantia fluminensis</i>	Wandering willie	
<i>Trifolium campestre</i>	Hop trefoil	
<i>Trifolium dubium</i>	Suckling clover	
<i>Trifolium pratense</i>	Red clover	
<i>Trifolium repens</i>	White clover	
<i>Urtica dioica</i> ssp. <i>gracilis</i> (CE)	Nettle	NZFRI12446
<i>Verbascum virgatum</i>	Moth mullein	
<i>Veronica persica</i> (CE)	Speedwell	
<i>Vicia sativa</i> (CE)	Vetch	
<i>Wahlenbergia marginata</i>	Harebell	
<i>Wahlenbergia</i> sp.	Harebell	
<i>Zantedeschia aethiopica</i> (JE)	Arum lily	In flower when washed up on the shore

References

- Beadel, S.M. 1989: Vascular plants of Mokoia, 20 May 1989. Department of Conservation, Rotorua (unpublished). 8 p.
- Beadel, S.M.; Ecroyd, C. 1990: Checklist of vascular plants of Mokoia Island. *Rotorua Botanical Society* 20: 18–23.
- Cashmore, P. 2000: Mokoia Island, Lake Rotorua. *Rare Bits* 38: 5.
- Cashmore, P. 2001: Mokoia Island field trip. *Rotorua Botanical Society* 36: 48–49.
- Jane, G.; Ecroyd, C. 2001: Additions to the checklist of vascular plants of Mokoia Island (Beadel & Ecroyd 1990). *Rotorua Botanical Society* 36: 50.
- Perrott, J.K.; Armstrong, D.P. 2000: Vegetation composition and phenology of Mokoia Island, and implications for the reintroduced hihi population. *New Zealand Journal of Ecology* 24: 19–30.

Appendix 3

PLANTINGS ON MOKOIA ISLAND

Repeated in full from Wilcox (1990). Additional species planted are noted from Beveridge & Daniel (1965). Includes subsequent plantings and translocations led by P. Cashmore.

SPECIES	SOURCE	PLANTER	DATE PLANTED
<i>Agathis australis</i>			Early 1960s
<i>Alectryon excelsus</i>	Commercial stock		14 July 1968
<i>Aleusomia macrophylla</i>			
<i>Asplenium polyodon</i>	Local		14 July 1968
<i>Beilschmiedia tawa</i>			Early 1960s
<i>Blechnum</i> 'black spot'	Pukapuka Rd, Kaingaroa.		11 Jan 1969
<i>Blechnum cbambersii</i>	Whakarewarewa Forest		21 Dec 1968
<i>Blechnum colensoi</i>	Mt Tauhara		Aug 1968
<i>Blechnum discolor</i>	Pukapuka Rd, Kaingaroa		11 Jan 1969
	Whakarewarewa Forest		21 Dec 1968
<i>Blechnum fluviatile</i>	Pukapuka Rd, Kaingaroa		11 Jan 1969
<i>Blechnum fraseri</i>	Te Hapi Stream, Tairua		11 Jan 1969
	Waipoua Forest, Northland		Sept 1968
<i>Blechnum minus</i>	Mt Tauhara		Aug 1986
	Pukapuka Rd, Kaingaroa		11 Jan 1969
<i>Blechnum penna-marina</i>	Kaingaroa		21 Dec 1968
<i>Blechnum vulcanicum</i>	Mt Tauhara		Aug 1968
	Pukapuka Rd, Kaingaroa		11 Jan 1969
<i>Cardiomanes reniforme</i>	Pillar of Hercules		Aug 1968
<i>Chiloglottis cornuta</i>	Kaingaroa		21 Dec 1968
<i>Cyathea smithii</i>	Mt Pihanga		Aug 1968
<i>Dactylanthus taylorii</i>		P. Cashmore	2000
<i>Histiopteris incisa</i>	Auckland		30 June 1968
	FRI grounds, Rotorua		11 Jan 1969
	Pukapuka Rd, Kaingaroa		11 Jan 1969
<i>Hymenophyllum scabrum</i>	Local		14 July 1968
<i>Hypolepis ambigua</i>	FRI grounds, Rotorua		11 Jan 1969
<i>Hypolepis rufobarbata</i>	Pukapuka Rd, Kaingaroa		11 Jan 1969
<i>Ileostylus micranthus</i>		P. Cashmore	2000
<i>Lastreopsis bispidata</i>	Te Whetu, Mamaku		14 July 1968
	Te Hapi Stream, Tairua		11 Jan 1969
<i>Lastreopsis microsora</i>	Coromandel coast		11 Jan 1969
<i>Leptopteris hymenophylloides</i>	Pukapuka Rd, Kaingaroa		11 Jan 1969
	Whakarewarewa Forest		21 Dec 1968
<i>Leptopteris superba</i>	South Rd, Mamaku		18 Jan 1969
<i>Libocedrus plumosa</i>	Peter Wakefield		30 June 1968
<i>Loxsoma cunninghamii</i>	Waipoua Forest, Northland		Sept 1968
<i>Lygodium articulatum</i>	Te Hapi Stream, Tairua		11 Jan 1969
<i>Paesia scaberula</i>	Pukapuka Rd, Kaingaroa		11 Jan 1969

Continued on next page

Appendix 3—continued

SPECIES	SOURCE	PLANTER	DATE PLANTED
<i>Notbofagus menziesii</i>			Early 1960s
<i>Pellaea rotundifolia</i>	Local		14 July 1968
<i>Polystichum vestitum</i>	Kaingaroa		30 June 1968
	Pukapuka Rd, Kaingaroa		11 Jan 1969
<i>Pseudopanax ferox</i>	Commercial stock		5 April 1970
<i>Pteris comans</i>	Coromandel coast		11 Jan 1969
<i>Pteris tremula</i>	Mokoia Island		18 Jan 1969
<i>Rorippa divaricata</i>		P. Cashmore	2000
<i>Sticberus cunninghamii</i>	Tarawera		Aug 1968
	Pillar of Hercules		Aug 1968
<i>Sticberus flabellatus</i>	Waitakere Range		18 Jan 1969
	Waitangi, Northland		Sept 1968
<i>Tupeia antarctica</i>		P. Cashmore	2000

References

- Beveridge, A.E.; Daniel, M.J. 1965: Observations on a high population of brown rats (*Rattus norvegicus* Berkenhout 1767) on Mokoia Island, Lake Rotorua. *New Zealand Journal of Science* 8: 174-189.
- Wilcox, M.D. 1990: History of plantings on Mokoia. *Rotorua Botanical Society* 20: 24-25.

Appendix 4

VERTEBRATE FAUNA SPECIES LIST

Species name and removal/transfer details. Species marked with an asterisk are generally considered not to be present. Information has been taken from Andrews (1992), Holland (1997), Owen (1997) and other sources. List follows Turbott (1990) and King (2005).

A4.1 Indigenous and coloniser species

Birds

North Island brown kiwi *Apteryx australis mantelli*

- Since 2003, North Island brown kiwi have been released onto the island from Whirinaki Forest and Ohope Scenic Reserve (Owen 2003a, b).

Black shag *Phalacrocorax carbo novaebollandiae* kawau

Little black shag *Phalacrocorax sulcirostris*

Little shag *Phalacrocorax melanoleucos brevirostris* kawaupaka

Black swan *Cygnus atratus*

Grey duck *Anas superciliosa* parera

New Zealand scaup *Aythya novaeseelandiae* papango

Australasian harrier *Circus approximans* kahu

Southern black-backed gull *Larus dominicanus dominicanus* karoro

Red-billed gull *Larus novaebollandiae scopulinus* tarapunga

Black-billed gull *Larus bulleri*

New Zealand pigeon *Hemiphaga novaeseelandiae novaeseelandiae* kereru

Shining cuckoo *Chrysococcyx lucidus lucidus* pipiwharauora

Morepork *Ninox novaeseelandiae* ruru

New Zealand kingfisher *Halcyon sancta vagans* kotare

Welcome swallow *Hirundo tabitica neoxena*

Grey warbler *Gerygone igata* riroriro

North Island fantail *Rhipidura fuliginosa placabilis* piwakawaka

Silvereye *Zosterops lateralis* tauhou

Bellbird* *Anthornis melanura melanura* korimako

Tui *Prosthemadera novaeseelandiae novaeseelandiae*

North Island tomtit *Petroica macrocephala toitoi* miromiro

North Island rifleman* *Acanthisitta chloris granti* titipounamu

North Island weka *Gallirallus australis greyi*

- In the 1950s (1952, 1956), weka were transferred onto Mokoia (Axbey 1994).
- In 2005, weka were released from Mokoia into the Whirinaki Forest (Owen 1997, 2002).

North Island robin *Petroica australis longipes toutouwai*

- 1991: Robins were released onto the island (Jansen 1992, 1993; Lovegrove 1996).
- 1999: Robins were transferred from Mokoia to Moturoa Island, Northland (Owen & Asquith 2000).
- 2003: Robins were transferred to Tuhua (Mayor Island) (Heaphy 2003).
- 2005: Robins were transferred to the Waitakere Ranges (the Ark in Park project).

North Island saddleback *Philesturnus carunculatus tieke*

- 1992: North Island saddleback from Tiritiri Matangi were released onto the island (Armstrong & Craig 1995).

Stitchbird *Nottomystis cincta hihi*

- 1994: Hihi from the one wild population on Hauturu/Little Barrier Island were released onto the island (Owen 1997; Armstrong et al. 1999).
- 2002: The hihi population was removed to Kapiti (Island) and Mount Bruce (Owen 1997, 2002).

Australian magpie *Gymnorhina tibicen*

Lizards

Speckled skink *Oligosoma infrapunctatum*

A4.2 Introduced species

Birds

Mallard *Anas platyrhynchos platyrhynchos*

Ring-necked pheasant* *Phasianus colchicus*

- 1952: Ring-necked pheasants were raised on Mokoia until 1956 when the programme (with birds) was moved to Ngongotaha (Perrot & Armstrong 2000).

Skylark *Alauda arvensis*

Hedge sparrow *Prunella modularis*

Song thrush *Turdus philomelos*

Yellowhammer *Emberiza citrinella*

Redpoll *Carduelis flammea*

Blackbird *Turdus merula*

Chaffinch *Fringilla coelebs gengleri*
Greenfinch *Carduelis chloris chloris*
Goldfinch *Carduelis carduelis britannica*
House sparrow *Passer domesticus domesticus*
Starling *Sturnus vulgaris*
Indian myna *Acridotheres tristis*
White backed magpie *Gymnorhina hypoleuca*

Mammals

Norway rat *Rattus norvegicus*

- 1839: Norway rats were first recorded on the island.
- 1990s: Rats were eradicated, although incursions occurred in 1996 and again in 2001 (Owen 1997, 2002).

Mouse *Mus musculus* or *M. domesticus*

- Mid-1960s: Mice were recorded on the island with one mouse caught in a trap (Beveridge & Daniel 1965).

Stoat *Mustela erminea*

- 2005: A possible incursion of a stoat on the island (Christensen 2005).

Cat *Felis catus*

- Mid-1960s: Cats were recorded on the island (Beveridge & Daniel 1965).

Horse *Equus caballus*

- Mid-1960s: Horses were recorded on the island (Beveridge & Daniel 1965).
- 1996: The last two horses were removed to the mainland (Owen 1997).

Feral pig *Sus scrofa*

- Mid-1960s: A few pigs were recorded on the island (Beveridge & Daniel 1965).

Feral cattle *Bos taurus*

- Mid-1960s: Cattle were recorded on the island (Beveridge & Daniel 1965). Cattle were found to have roamed over the island, judging from a skeleton found away from the flat southeastern part of the island (Wallace 1993).

Feral goat *Capra hircus*

- Mid-1960s: Two tethered goats were recorded on the island (Beveridge & Daniel 1965). Goats were brought to the island to control blackberry (Owen 1997) on the eastern flats of the island in 1985; however, they escaped into the surrounding bush (Perrot & Armstrong 2000).
- Goats were culled from in the island in 1989 (Owen 1997).

A4.3 References

- Andrews, P. 1992: Wildlife on Mokoia. Unpublished report, held on file at Bay of Plenty Conservancy, Department of Conservation, Rotorua (Old File RWL-025). 2p.
- Armstrong, D.P.; Castro, I.; Alley, J.C.; Feenstra, B.; Perrott, J.K. 1999: Mortality and behaviour of hihi, an endangered New Zealand honeyeater, in the establishment phase following translocation. *Biological Conservation* 89: 329-339.
- Armstrong, D.P.; Craig, J.L. 1995: Effects of familiarity on the outcome of translocations, I. A test using saddlebacks *Ptilosturnus carunculatus rufusater*. *Biological Conservation* 71: 133-141.
- Axbey, B. 1994: The bird hunters. The Halcyon Press, Auckland. 146p.
- Beveridge, A.E.; Daniel, M.J. 1965: Observations on a high population of brown rats (*Rattus norvegicus* Berkenhout 1767) on Mokoia Island, Lake Rotorua. *New Zealand Journal of Science* 8: 174-189.
- Christensen, B.R. (Comp.) 2005: Mokoia stoat incursion incident action plans (I-IV). Department of Conservation, Rotorua (unpublished reports). I: 20p., II: 20p., III: 19p., IV: 21p.
- Heaphy, J. 2003: Transfer of NI robin from Mokoia to Tuhua in May 2003. Unpublished report, held at Tauranga Area Office, Department of Conservation, Tauranga (file NHE-03-51-01). 21p.
- Holland, D. 1997: Observations on Mokoia Island (Lake Rotorua): August 18-28 1997. Unpublished report held on file at Bay of Plenty Conservancy, Department of Conservation, Rotorua.
- Jansen, W.P. 1992: Introduction and subsequent observations of a population of North Island robin (*Petroica australis longipes*) to Mokoia Island, Lake Rotorua. Department of Conservation, Rotorua (unpublished report). 10p.
- Jansen, W.P. 1993: Introduction of North Island robins to Mokoia Island, Lake Rotorua, and public involvement. *Ecological Management* 1: 39-43.
- King, C.M. 2005: The handbook of New Zealand mammals. Oxford University Press. Auckland.
- Lovegrove, T.G. 1996: Island releases of saddlebacks *Ptilosturnus carunculatus* in New Zealand. *Biological Conservation* 77: 151-157.
- Owen, K. 1997: Transformation of an inland island (Mokoia Island) now home to endangered species. Pp. 74-87 in Johnson, T.; Boyes, P. (Eds): New Zealand Conservation Management Group Annual Conference Proceedings, 1997, Rotorua.
- Owen, K. 2002: Transformation of an inland island (Mokoia Island) now home to endangered species. Department of Conservation, Rotorua (unpublished report). 14p.
- Owen, K. 2003a: Mokoia Island. *Rare Bits* 49: 23.
- Owen, K. 2003b: North Island brown kiwi releases: Mokoia. *Rare Bits* 50: 7.
- Owen, K.; Asquith, P. 2000: Transfer of toutouwai (*Petroica australis longipes*) from Mokoia Island to Moturoa Island. New Zealand. *Ecological Management* 8: 61-64.
- Perrott, J.K.; Armstrong, D.P. 2000: Vegetation composition and phenology of Mokoia Island, and implications for the reintroduced hihi population. *New Zealand Journal of Ecology* 24: 19-30.
- Turbott, E. G. 1990: Checklist of the birds of New Zealand and the Ross Dependency, Antarctica. Random Century, Auckland.
- Wallace, S.W. 1993: Establishment of four permanent vegetation plots on Mokoia Island. Department of Conservation, Rotorua (unpublished report). 39p.

Index

A

- Akers, K., 14
Allen, D.G., 26
Alley, J.C., 20
Alley, M., 14, 15
Anderson, S., 54
Andrews, P., 15
Animal Conservation, 66
Anthornis melanura, 20, 70
Apteryx
 australis, 41, 59
 oweni, 18
Armstrong, D.P., 20, 21, 22, 23,
 24, 25, 27, 28, 30, 38, 42, 55,
 63, 64, 66
Armstrong; D.P., 26
Asquith, P., 60
Avery, M., 30
Axbey, B., 31

B

- Beadel, S.M., 31, 32
bellbird, 20, 70
Beveridge, A.E., 32, 33
biodiversity, 39, 43, 49, 51
Biological Conservation, 20, 22,
 37, 42, 56
Bird Conservation International,
 49
birds, 66
bird song, 20, 70
botany, 39
Bowyer, R., 34
Boyd, S., 34
Brejaart, R., 36
Brunton, D.H., 35, 37, 70
Buchanan, L., 25, 34

C

- Cashmore, P., 35, 36
Castro, I., 14, 20, 21, 22, 24, 28,
 30, 34, 35, 36, 37, 38, 65, 70
Chalcites lucidus, 34
Christensen, B.R., 39, 50
Clarkson, B.D., 39
Cleghorn, M., 40
climate, 56
coastal plants, 39
Colbourne, R., 40
Conservation Advisory Science
 Notes, 36, 56

- Conservation Biology*, 27
Conservation Genetics, 38, 54
conservation management, 14, 15,
 16, 17, 18, 19, 20, 21, 22, 23,
 24, 25, 26, 27, 28, 29, 30, 34,
 35, 37, 38, 39, 40, 41, 42, 43,
 44, 46, 47, 48, 49, 50, 51, 52,
 53, 54, 55, 56, 57, 58, 59, 60,
 62, 63, 64, 65, 66, 67, 68, 70
Craig, J.L., 22, 26, 54

D

- Daniel, M.J., 32, 33
Davidson, R.S., 23, 24, 25, 41, 42
Department of Conservation
 Technical Series, 55
development, 56
Dimond, W.J., 24
DOC Research & Development
 Series, 40
DOC Science Internal Series, 40
Dumbell, G.S., 43

E

- Ebert, B., 37
Ecological Management, 53, 60
ecological restoration, 19
ecology, 14, 15, 20, 21, 22, 23,
 24, 25, 26, 27, 28, 29, 30, 33,
 34, 35, 36, 37, 38, 39, 42, 43,
 44, 48, 49, 51, 52, 53, 54, 55,
 56, 57, 58, 60, 62, 63, 64, 65,
 66, 70
Ecroyd, C.E., 32, 39, 52
environmental education, 69
Ewen, J., 22
Ewen, J.G., 24, 25

F

- fauna, 14, 15, 18, 20, 21, 22, 23,
 24, 25, 26, 27, 28, 29, 30, 31,
 34, 35, 37, 38, 39, 42, 43, 44,
 48, 49, 51, 52, 53, 54, 55, 56,
 58, 59, 60, 62, 63, 64, 65, 66,
 70
Feenstra, B., 20
Field, D., 43
Field, K., 44
fire, 45
Fitzgerald, B.M., 56
flora, 31, 32, 36, 52, 54, 63, 68,
 69
Forrester, R., 44
Fuchsia excorticata, 54

G

- Gallirallus australis greyi*, 31, 37
Geological Survey Branch Bulletin, 45
geology, 46, 48, 56
geothermal activity, 69
Geothermics, 69
Gerygone igata, 20, 34
Grange, L.I., 45
grey warbler, 20, 34
Griffiths, R., 21, 24, 37, 38, 40, 46, 47, 65
Gummer, H., 47

H

- Healy, J., 48
Heaphy, J., 48
high schools, 69
hihi, 14, 15, 21, 22, 24, 26, 27, 28, 29, 30, 34, 35, 37, 38, 39, 44, 47, 51, 58, 60, 62, 63, 66, 70
history, 15, 43, 44, 45
Holland, D., 49
honeyeaters, 70
Hooson, S., 49
Howard, M., 50
Hunter, J.E.B., 14
Hunt, K., 51

I

- Ihaka, J., 51
inventory, 39, 43, 49, 51
invertebrates, 46, 50, 57
island biosecurity, 18, 47

J

- Jakob-Hoff, R., 51
Jamieson, I.G., 49, 66
Jane, G., 52
Jansen, W.P., 52, 53
Journal of Animal Ecology, 25
Journal of Applied Ecology, 21
Journal of Biogeography, 24

K

- Kelly, D., 54
King, T., 54
kumara garden, 39

L

- Ladley, J., 54
Lake Rotorua, 69
Lambert, D.M., 38, 54

- Lander, R., 47
Lettink, M., 55
little spotted kiwi, 18
Livingston, A., 54
Lovegrove, T.G., 26, 56

M

- mammals, 56
Maori, 15
Maori cultivation, 39
mark-recapture, 55
Mason, K.M., 37, 38
McEwan, W.M., 56
Meads, M.J., 56
Merrett, M., 54
mice, 30, 40, 43, 47, 57, 64, 65
Minot, E.O., 64
Mokoia Island Trust Board, 43
Mokoia Island Wildlife Refuge, 39, 43, 51
monitoring, 68
Moorcroft, G., 57
morepork, 44, 64, 65
Mt Ngongotaha, 50
Mus musculus, 30, 40, 43, 47, 57, 64, 65
Mustela erminea, 39

N

- New Zealand Biological Resources Centre Publication*, 56
New Zealand Journal of Ecology, 23, 30, 63, 64
New Zealand Journal of Science, 32
New Zealand Science Monthly, 68
New Zealand Veterinary Journal, 14, 15
Nicholas, J., 58
Ninox novaeseelandiae, 44, 64, 65
North Island brown kiwi, 41, 59
North Island robin, 19, 20, 23, 48, 52, 53, 60, 65, 66
North Island saddleback, 15, 20, 23, 24, 25, 26, 34, 42, 43, 49, 55, 56, 66
Norway rats, 16, 20, 25, 33, 34, 43, 53, 57, 63, 67
Notiomystis cincta, 14, 15, 21, 22, 24, 26, 27, 28, 29, 30, 34, 35, 37, 38, 39, 44, 47, 51, 58, 60, 62, 63, 66, 70
Notornis, 34

O

- Owen, K., 36, 58, 59, 60

P

Pacific Conservation Biology, 25
Perrott, J., 28
Perrott, J.K., 20, 22, 24, 25, 27,
30, 60, 61, 63
pest management, 14, 16, 20, 25,
30, 33, 34, 39, 40, 42, 43, 47,
53, 57, 64, 65
pest plants, 19, 49
Peterson, P., 54
Petroica australis longipes, 19,
20, 23, 48, 52, 53, 60, 65, 66
pheasant management, 45
phenology, 63
Philesturnus carunculatus
rufusater, 15, 20, 23, 24, 25,
26, 34, 42, 43, 49, 55, 56, 66
plantings, 19, 31, 32, 69
population bottlenecks, 55
Proceedings of the New Zealand
Ecological Society, 33
Prosthemadera novaezeelandiae,
70

R

Rare Bits, 35, 36, 59
Rattus norvegicus, 16, 20, 25, 33,
34, 43, 53, 57, 63, 67
recovery plan, 66
Re-introduction News, 20, 27, 34
research
bird song, 20
hihi, 14, 15, 21, 22, 38, 62
mice, 40
North Island robin, 20
North Island saddleback, 15, 23,
49
phenology, 63
translocations, 23
vegetation, 63
wildlife disease, 14, 15, 21, 22
Robertson, A., 54
Rotorua Botanical Society, 31,
32, 36, 52, 69
Rotorua Geothermal Field, 69
Rotorua Review, 68
Roygard, J., 25

S

Shepherd, L.D., 54
shining cuckoo, 34
Simberloff, D., 63
Smale, M.C., 39
soils, 56
Stamp, R., 38

Stephenson, B.M., 64
stitchbird, 14, 15, 21, 22, 24, 26,
27, 28, 29, 30, 34, 35, 37, 38,
39, 44, 47, 51, 58, 60, 62, 63,
66, 70
stoat, 39
Sumich, J., 65

T

Taupo Volcanic Zone, 48
Taylor, J., 24
Taylor, R.H., 67
Taylor, S.S., 65, 66
The Daily Post, 16, 17, 18, 19,
30, 44, 51, 58
The New Zealand Herald, 18, 19,
44
Thomas, B.W., 67
threatened plants, 36
threatened species, 66
Threatened Species Recovery Plan,
65
topography, 56
toutouwai, 19, 20, 23, 48, 52, 53,
60, 65, 66
translocations, 18, 19, 20, 21, 22,
23, 24, 25, 26, 27, 28, 29, 30,
31, 34, 38, 39, 41, 42, 43, 44,
47, 48, 49, 51, 52, 53, 55, 56,
58, 59, 60, 63, 65, 66, 70
tree fuchsia, 54
tui, 70
Twentyman, C., 14, 15

V

vegetation, 31, 32, 39, 56, 63, 68
visitor use, 18
volcanicity, 48

W

Wallace, S.W., 67, 68
Watson, C., 68
weed management, 19, 49
Weekender, 14, 17
weka, 31, 37
West, M., 68
Whakatane Beacon, 17, 18
Whiteford, P.C., 69
Wilcox, M.D., 69
wildlife disease, 14, 15, 24, 29,
52, 62, 66, 70
Wilson, L.R., 69
Withers, S., 70
WWF New Zealand, 17

DOC Research & Development Series

DOC Research & Development Series is a published record of scientific research carried out, or advice given, by Department of Conservation staff or external contractors funded by DOC. It comprises reports and short communications that are peer-reviewed.

Individual contributions to the series are first released on the departmental website in pdf form. Hardcopy is printed, bound, and distributed at regular intervals. Titles are also listed in the DOC Science Publishing catalogue on the website, refer www.doc.govt.nz under Publications, then Science & technical.