

Science Publications 1997

Science & Research Division
Department of Conservation
P O Box 10-420, Wellington, New Zealand

Cover illustration: Fronds of *Polystichum vestitum*, prickly shield fern, from Lewis Pass, South Island, New Zealand. *Photo: Paula Warren*

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Department of Conservation Science Publications

The Science Publication Unit records the output of DoC science investigations, both those undertaken by the staff, and those contracted to consultants. Research is published as stand-alone books, and as reports in several series, including:

- *Science & Research Series* — a fully reviewed irregular monograph series reporting the investigations conducted by DoC staff. The Series was suspended at the end of 1997, with new texts going to *Science for conservation*.
- *DoC Technical Reports* — instructional guidebooks and data sets, aimed at the conservation officer in the field, reviewed to ensure best-practice standards.
- *Science for Conservation* — a fully reviewed irregular monograph series, reporting on the operational science investigations of staff and contractors.
- *Science & Research Internal Reports* — progress reports on scientific matters on-going in the Department.
- *Conservation Sciences Publication* [Series] — single volumes on conservation matters of national interest.
- *Conservation Science Advisory Notes* — notes in response to specific questions asked by Departmental staff, concerning matters which have arisen in the course of their management duties.

Sale catalogue

This catalogue lists the science investigations which were published by the Department during 1997, and which are available for sale. To order please use a copy of the form provided, or ring and discuss your needs with us.

Kaye Green

Co-ordinator, Scientific Publications, DoC, PO Box 10-420,
Wellington

Ph. (04) 471-0726

Fax. (04) 471-3279

Email. kgreen@doc.govt.nz

Please Note! Science investigations which are published in professional journals are NOT available through our bookshop. Enquiries should be made directly to the journal concerned, or they may be consulted through a library.

Science and Research Series

103. Towns, D.; Stephens, T. 1997. **Island management and commercial sponsorship: the Mercury Islands experience.** *Science & Research Series No. 103.* 25 p. \$12.50 (incl. G.S.T.)
A history of the sponsorship agreement between the Dept. of Conservation and ICI Crop Care Division for the extermination of introduced mammals; covers implementation and results.
102. Shepherd, M.J., McFadgen, B.G., Betts, H.D., Sutton, D.G. 1997. **Formation, landforms, and palaeoenvironment of Matakana Island and implications for archaeology.** *Science & Research Series No. 102.* 102 p. \$23.65 (incl. G.S.T.)
The geological formation and modification of the Holocene sand barrier over the last 6,000 years has been very dynamic. Future management decisions should take this into account.
101. Moore, P.J., Scott, J.J., Joyce, L.J., Peart, M. 1997. **Southern Royal Albatross *Diomedea epomorpha epomorpha* census on Campbell Island, 4 January – 6 February 1996, and a review of population figures.** *Science & Research Series No. 101.* 27 p. \$18-00 (incl. G.S.T.)
Count was 23% higher than in 1995. Number of nests have increased since the first census in Jan.-Feb. 1958. Accurate counts at study areas (1988-1996) show that numbers are currently increasing.
100. Moore, P.J., Waugh, S.M., West, C., Mitchell, G. 1997. **Preliminary results of a Southern Royal Albatross *Diomedea epomorpha epomorpha* census, Campbell Island, 12 January – 10 February 1995.** *Science & Research Series No. 100.* 17 p. \$12-50 (incl. G.S.T.)
Census of breeding counted 6308 nests. Comparisons of different census techniques, and rate of egg loss suggest 6900-7300 pairs were nesting in 1995.

DoC Technical Series

13. Powlesland, R.G. 1997. **Protocols for monitoring New Zealand robins (*Petroica australis*).** *Department of Conservation Technical Series No.13.* 14 p. \$12.50 (incl. G.S.T.)
Releases of robins need to be monitored to determine their fate and the cause(s) of any failures. Covers monitoring to estimate individual mortality, nesting success, population and ecosystem health.
12. Ringer, M.; O'Brien, M. 1997. **Building relationships with participants in Department of Conservation programmes: Effective management of Experiential groups in the outdoors.** *Department of Conservation Technical Series No.12.* 28 p. \$12.50 (incl. G.S.T.)
Staff can influence the pro-conservation behaviours of participants in their programmes by using the framework of experiential learning. The report expands on interpersonal behaviours that can aid this process.
11. Harding, J.S.; Winterbourn, M.J. 1997. **New Zealand eco-regions: A classification for use in stream conservation and management.** *Department of Conservation Technical Series No.11.* 26 p. \$12.50 (incl. G.S.T.)
Developed from mapped data on six macro-environmental variables: vegetative cover, bedrock geology, soils, relief, rainfall normals, and Meteorological Service Climate Regions.

Science for Conservation

67. Smith, M., Bentley, N. 1997. **Underwater setting methods to minimise the accidental and incidental capture of seabirds by surface longliners. Report on a prototype device developed by MS Engineering.** *Science for Conservation: 67.* 9p. \$12.50 (incl. G.S.T.)

Several concepts of bait placement devices were evaluated by MS Engineering. Two methods were selected for further in-depth evaluation. The design concept of a transportation capsule which clamps the baited snood until the capsule reaches its determined depth proved successful.

66. Barnes, P., Walshe, K.A.R. 1997. **Underwater setting methods to minimise the accidental and incidental capture of seabirds by surface longliners. Report on a prototype device developed by Akroyd Walshe Ltd.** *Science for Conservation: 66.* 21 p. \$12.50 (incl. G.S.T.)

Trials on two U tube devices developed by Akroyd Walshe Ltd are described. A backward-facing U tube succeeded in flushing bait in all trials to the setting depth of 1.5 m.

65. Cessford, G.R. 1997. **Visitor satisfactions, impact perceptions and attitudes toward management options on the Tongariro Circuit Track.** *Science for Conservation: 65.* 56p. \$22.50 (incl. G.S.T.)

Walkers were surveyed as part of a wider study of Great Walks track users. Visit evaluations on this track were highly positive, with little dissatisfaction or need for urgent management action.

64. Cossee, R.O. 1997. **Report on bird banding in New Zealand 1993/1994.** *Science for Conservation: 64.* 24p. \$12.50 (incl. G.S.T.)

During this banding year 18,559 birds of 101 species were banded, and 226 previously banded birds were rebanded.

63. Hunter, G.G., Scott, D. 1997. **Changes in tussock grasslands, South Island high country, 1973–1993.** *Science for Conservation: 63.* 69 p. \$22.50 (incl. G.S.T.)
Part 1 covers trends in plant frequency at photoplots in eastern Waitaki steeplands. Part 2, changes in central Waimakariri River basin from 1980.
62. Spurr, E.B.; Powlesland, R.G. 1997. **Impacts of aerial application of 1080 on non-target native fauna: Review and priorities for research.** *Science for Conservation: 62.* 31 p. \$12.50 (incl. G.S.T.)
Impacts on birds, bats, lizards, frogs, and invertebrates are reviewed. Priorities for further research are recommended. A Research Coordinating Group should be established.
61. Jensen, C.A., Webster, R.J., Carter, D., Treskonova, M. 1997. **Succession in tussock grasslands: implications for conservation management.** *Science for Conservation: 61.* 45 p. \$22.50 (incl. G.S.T.)
Vegetation changes were investigated on Otago, Canterbury, and Marlborough high country land, generally tall tussock grassland, retired from stock grazing since the late 1970s.
60. Gumbley, W. 1997. **Archaeological mapping of pa in four Taranaki Historic Reserves.** *Science for Conservation: 60.* 14 p. \$12.50 (incl. G.S.T.)
The earthworks of Tapuinikau, Puketarata, Urenui, and Okoki Pa were mapped at large scale using tape and compass methods. A plan of each pa was produced.
59. Perriman, L. 1997. **Blue penguins (*Eudyptula minor*) at Taiaroa Head and the Otago Peninsula, 1993–95.** *Science for Conservation: 59.* 22 p. \$12.50 (incl. G.S.T.)
Sixty-nine pairs were monitored over the 1993/94 season, and 87 during the 1994/95 season. A minimum of 284 breeding pairs were along the outer coast of Otago Peninsula during 1994/95.
58. Sanders, M.D. 1997. **Food supplies at black stilt nest sites.** *Science for Conservation: 58.* 16 p. \$12.50 (incl. G.S.T.)

Composition and biomass of the aquatic invertebrate community at nine sites adjacent to nests in the Upper Waitaki Basin. A basis for evaluating food supplies in constructed/modified wetlands.

57. Miller, C. 1997. **Occurrence and ecology of the Open Bay Islands leech, *Hirudobdella antipodium***. *Science for Conservation: 57*. 16 p. \$12.50 (incl. G.S.T.)

This terrestrial leech is endemic to these islands. Extensive searches failed to find any remnant populations other than that discovered in 1987. Options for protection are discussed.

56. Constantine, R.; Baker, C.S. 1997. **Monitoring the commercial swim-with-dolphin operations in the Bay of Islands**. *Science for Conservation: 56*. 59 p. \$22.50 (incl. G.S.T.)

Observations of encounters, and dolphin responses to swimmers. Future research should attempt to determine the dolphins' home range, habitat use, and the impact of environment changes.

55. Dugdale, J.; Hutcheson, J. 1997. **Invertebrate values of kanuka (*Kunzea ericoides*) stands, Gisborne Region**. *Science for Conservation: 55*. 30 p. \$12.50 (incl. G.S.T.)

Records increasingly complex community structure and numbers of species from pasture to old kanuka and primary forest. Recommends old kanuka be classed with forest in land-use evaluations.

54. Mew, G.; Ross, C.W.; Davis, M.R.; Langer, E.R. 1997. **Rehabilitation of indigenous forest after mining, West Coast**. *Science for Conservation: 54*. 60 p. \$22.50 (incl. G.S.T.)

Past performance on a range of mining sites. Forest description and establishment of natives on mine overburden at Giles Creek. Fertilizer response of *Coprosma* and *Notofagus* seedlings.

53. Macky, G. 1997. **Changes in stream morphology at two mining sites near Reefton**. *Science for Conservation: 53*. 33 p. \$12.50 (incl. G.S.T.)

Giles Creek and Slab Hut Creek were monitored by photographs and survey in a 5-year study. Observations are related to recent research results on channel morphology and erosion.

52. Rogers, G. 1997. **Trends in health of pahautea and Hall's totara in relation to possum control in central North Is-**

land. *Science for Conservation: 52.* 49 p. \$22.50 (incl. G.S.T.)

Highlights the palatability of pahautea, and vulnerability of Hall's totara to prolonged defoliation. Defoliation, dieback, and collapse of both are widespread in montane forests.

51. Miles, J.R.G., Potter, M.A., Fordham, R.A. 1997. **Northern brown kiwi (*Apteryx australis mantelli*) in Tongariro National Park and Tongariro Forest — ecology and threats.** *Science for Conservation: 51.* 23 p. \$12.50 (incl. G.S.T.)

Findings from a 14 month study of calling behaviour, range size, roost choice, feeding ecology, and threats to conservation. Recommendations for the management of areas containing kiwi.

50. Nugent, G., Fraser, K.W., Sweetapple, P.J. 1997. **Comparison of red deer and possum diets and impacts in podocarp-hardwood forest, Waihaha Catchment, Pureora Conservation Park.** *Science for Conservation: 50.* 61 p. \$22.50 (incl. G.S.T.)

A 1990-1993 study of the density, diet, and forage use of these two species. Assessments of forage availability and impacts on regeneration. Recommendations for further research.

49. Allen, R.B.; McIntosh, P.D. 1997. **Guidelines for conservation of salt pans in Central Otago.** *Science for Conservation: 49.* 46 p. \$22.50 (incl. G.S.T.)

24 salt pan sites are described and ranked for rarity of habitat, biota represented, and degree of threat to each site. Contains site-by-site descriptions and guidelines for conservation management.

48. Gibbs, G.; McIntyre, M. 1997. **Abundance and future options for wetapunga on Little Barrier Island.** *Science for Conservation: 48.* 24 p. \$12.50 (incl. G.S.T.)

A survey over 40 nights (November 1994 to May 1995) suggests the species may have declined. Includes preliminary results from monitoring and recommends a predator-free enclosure to build up numbers.

47. Fraser, K.W.; Speedy, C.J. 1997. **Hunting pressure, deer populations, and vegetation impacts in the Kaimanawa**

Recreational Hunting Area. *Science for Conservation: 47.* 47 p. \$18.00 (incl. G.S.T.)

There were distinct gradients in hunting pressure, density, and deer condition, related to access. Condition decreased with increases in density, altitude, and a decrease in palatable forage. Ecological costs are summarised, and a range of management options presented.

46. Davis, A.; Aikman, H. 1997. **Establishment of shore plover (*Thinornis novaeseelandiae*) on Motuora Island.** *Science for Conservation: 46.* 53 p. \$18.00 (incl. G.S.T.)

Parts 1 and 2 on the second and third releases of captive-bred birds on the island. Predation by moreporks and site-fidelity were two major problems. Monitoring and fate of birds is discussed.

45. Atkinson, I.A.E. 1997. **Problem weeds on New Zealand islands.** *Science for Conservation: 45.* 58 p. \$18.00 (incl. G.S.T.)

Data (from published and unpublished sources) on the distribution of alien plant species established on offshore islands, that are, or could become problem weeds, (with recommendations).

44. Allen, Rob; Allan, Cathy 1997. **Mountain beech forest dynamics in the Kaweka Range and the influence of browsing animals.** *Science for Conservation: 44.* 23 p. \$12.50 (incl. G.S.T.)

Assesses the impact of browsing deer on the regeneration of mountain beech, including changes over 15 years to forest structure, and evaluation of canopy replacement.

43. Spurr, E.B., Harris, R.J., Drew, K.W. 1996. **Improved bait for wasp control.** *Science for Conservation: 43.* 15 p. \$12.50 (incl. G.S.T.)

Alternatives to freezing as a method of storing bait for wasp control. Shelf-life, attractiveness, palatability, and toxicity, after re-canning, bottling, vacuum-packing, irradiation, or the use of preservatives, were investigated.

42. Jamieson, C.D. 1997. **The grasshopper *Sigaus minutus* in Central Otago: a pilot study.** *Science for Conservation: 42.* 21 p. \$12.50 (incl. G.S.T.)

Distribution, abundance, and ecology of this endangered grasshopper are discussed. Very isolated populations of less than 100 individuals are restricted to remnant patches of mostly native habitat.

40. Morgan, D.R., Innes, J., Ryan, C., Meikle, L. 1996. **Baits and baiting strategies for multi-species pest control and feral cats.** *Science for Conservation: 40.* 27 p. \$12.50 (incl. G.S.T.)

A 2-year study investigated the feasibility and effectiveness of multi-species pest control. Cat aversion to 1080 led to tests using brodifacoum and alphachloralose for feral cat control.

Conservation Advisory Science Notes

(Priced at \$2.25, incl. GST, except where marked)

169. Pierce, R.J.; Sporle, W. 1997. **Causes of kiwi mortality in Northland.** *Conservation Advisory Science Notes: 169.* 6 p.
168. Ecroyd, C.E.; Jones, C. 1997. **Possum monitoring plots in Waione Block, Tongariro Forest.** *Conservation Advisory Science Notes: 168.* 8 p.
167. McLennan, J. 1997. **Ecology of brown kiwi and causes of poulation decline in Lake Waikaremoana catchment.** *Conservation Advisory Science Notes: 167.* 25 p.
166. Walls, G.; Baird, A. 1997. **Holes in the fence: The vegetation of Chatham Island reserves, 1990–1996.** *Conservation Advisory Science Notes: 166.* 30 p. **\$12.50 (incl. G.S.T.)**
165. Walls, G. 1997. **Where water meets land: Ecological values and conservation management of driftwood.** *Conservation Advisory Science Notes: 165.* 7 p. **\$5.00 (incl. G.S.T.)**
164. Cawthorn, M.W. 1997. **Meat consumption from stranded whales and marine mammals in New Zealand: Public health and other issues.** *Conservation Advisory Science Notes: 164.* 23 p.
163. McKinlay, B. 1997. **Changes in Cromwell Terrace vegetation and soils.** *Conservation Advisory Science Notes: 163.* 5 p.
162. Collier, K.J. 1997. **Changes in substrate and diet of blue duck on Tongariro River after the 1995 Mt Ruapehu eruption.** *Conservation Advisory Science Notes: 162.* 30 p. **\$12.50 (incl. G.S.T.)**
161. Beggs, J.; Rees, J. 1997. **Honeydew abundance in two areas at St Arnaud.** *Conservation Advisory Science Notes: 161.* 4 p.

160. Freeman, A.; Wilson, K.J. 1997. **Results of the Westland petrel satellite tracking programme 1995 season.** *Conservation Advisory Science Notes: 160.* 4 p.
159. Hosking, G. 1997. **Black Maire (*Nestegis cunninghamii*) decline in the Haurangi Forest Park.** *Conservation Advisory Science Notes: 159.* 17 p.
158. Turner, S.J.; Hewitt, J.E. 1997. **Effects of Gallant for *Spartina* control.** *Conservation Advisory Science Notes: 158.* 16 p.
157. Allen, R.B. 1997. **Conservation values and significance of kanuka forest at East Taieri, coastal Otago.** *Conservation Advisory Science Notes: 157.* 6 p.
156. Spurr, E.B.; Hough, S.J. 1997. **Instructions for using poisoned hen eggs for control of stoats (*Mustela erminea*).** *Conservation Advisory Science Notes: 156.* 14 p.
155. Ogle, C.; West, C. 1997. **Some revegetation options for Lake Horowhenua, Levin.** *Conservation Advisory Science Notes: 155.* 18 p.
154. Hedley, M.D. 1997. **An assessment of risks associated with the use of CCA-treated timber in sensitive environments and options for its substitution with alternative timber materials.** *Conservation Advisory Science Notes: 154.* 37 p.
153. Dijkstra, L.H.; McDowall, R.M. 1997. **Electrophoretic identification of whitebait species.** *Conservation Advisory Science Notes: 153.* 13 p.
152. Townsend, J.I. 1997. **An insect survey of Paengaroa Scenic Reserve, Mataroa.** *Conservation Advisory Science Notes: 152.* 9 p.
151. Spurr, E.B. 1997. **Assessment of the effectiveness of Transonic[®] ESP and Yard Gard[®] ultrasonic devices for repelling stoats (*Mustela erminea*).** *Conservation Advisory Science Notes: 151.* 4 p.
150. Simpson, P. 1997. **Natural pohutukawa in Taranaki.** *Conservation Advisory Science Notes: 150.* 9 p.
149. Espie, P.R. 1997. **Tekapo Scientific Reserve: Ecological restoration.** *Conservation Advisory Science Notes: 149.* 26 p. (colour figures, special price \$5.00)

148. Lawlor, I. 1997. **Inspection of Motukoruenga and Motukoranga Islands, Whitianga, Coromandel Peninsula, 28 January 1995.** *Conservation Advisory Science Notes: 148.* 9 p.
147. Comfort, J.A.; Single, M.B. 1997. **Literature review on the effects of seawalls on beaches.** *Conservation Advisory Science Notes: 147.* 8 p.

Internal Reports

158. Green, K. (Comp.) 1997. **DOC ongoing Science Project summaries — 1995/1996.** *S & R Internal Report No. 158.* 280 p. \$29.25 (incl. G.S.T.)

Executive summaries of ongoing science projects for the financial year, arranged by key outputs, and indexed by locality and researcher.

157. Cessford, G.R. 1997. **Impacts of visitors on natural and historic resources of conservation significance. Part 2 — Research and information needs.** *S & R Internal Report No. 157.* 29 p. \$18.00 (incl. G.S.T.)

A synthesis of research and information needs derived from a workshop on impacts of visitors on natural and historic resources. A basis for developing a research action plan for addressing visitor impacts.

156. Cessford, G.R.; Dingwall, P.R. (Editors) 1997. **Impacts of visitors on natural and historic resources of conservation significance. Part 1—Workshop proceedings.** *S & R Internal Report No. 156.* 109 p. \$23.65 (incl. G.S.T.).

Agenda, participants, and a summary of proceedings of a workshop convened by Science and Research Division and Visitors Services Division of the Department of Conservation, in Wellington, 2–4 July 1996.

155. Timmins, S.M. 1996. **Report on the 11th Australian Weeds Conference, 30 September–3 October 1996, Melbourne, Victoria.** *S & R Internal Report No. 155.* 10 p. \$6.75 (incl. G.S.T.).

Includes notes on selected papers from the conference, and a list of papers delivered in the Public Lands and Forest Sessions.

Conservation Sciences Publication [Series]

7. Williams, P.A. 1997. **Ecology and management of invasive weeds.** *Conservation Sciences Publication: 7.* 67 p. \$22.50 (incl. G.S.T.)

Provides an understanding of the overall nature of weeds, their relationship with native vegetation, and the importance of weed biology when considering control measures.

6. Allibone, R.M.; McDowall, R.M. 1997. **Conservation ecology of the dusky galaxias, *Galaxias pullus* (Teleostei: Galaxiidae).** *Conservation Sciences Publication: 6.* 48 p. \$22.50 (incl. G.S.T.)

Habitat, distribution, abundance in tributaries of the Taieri River, Otago, is outlined. Threatened species status, threats to survival, and conservation actions are canvassed.

Miscellaneous S&R publications

McFadgen, B.G. 1997. **Archaeology of the Wellington Conservancy: Kapiti–Horowhenua. A prehistoric and palaeoenvironmental study.** 43 p. \$22.50 (incl. G.S.T.)

Archaeological sites are dated by their stratigraphic relationship with dune-building phases, and by oral tradition. Two cultural periods, an early and a late, are recognised.

Timmins, S.M. 1997. **Environmental Weeds Research Plan 1997–2006.** 28 p. \$12.50 (incl. G.S.T.)

Establishes the priorities for the Environmental Weeds Research Programme for DoC for the next decade.

Simpson, P. 1997. **Ecological restoration in the Wellington Conservancy.** 112 p. \$20.00 (incl. G.S.T.)

General opportunities for restoration are described for both protected and unprotected land. Buffer areas, roadside and riparian corridors, and farm and production forest management possibilities are raised. Linking major ecological features is a priority.

Parkes, J.; Baker, A.N.; Ericksen, K. 1997. **Possum control by the Department of Conservation: Background, issues, and results from 1993 to 1995.** 40 p. \$10.00 (incl. G.S.T.)

A summary survey of the Department's objectives and operations in possum control.

de Lange, P.J.; Norton, D.A. (Editors) 1997. **New Zealand's loranthaceous mistletoes.** *Proceedings of a workshop hosted by Threatened Species Unit, Department of Conservation, Cass, 17 - 20 July 1995.* 220 p. \$20.00 (incl. G.S.T.)
Plus \$3.00 p+p within New Zealand

Past and present distribution of New Zealand mistletoes, with papers on ecology, threats, current status, and management options. Contains an annotated Bibliography of New Zealand mistletoes.

Biodiversity Recovery Unit Publications

23. Department of Conservation. 1997. **New Zealand Fairy Tern (Tara-iti) *Sterna nereis davisae* Recovery Plan: 1997–2002.** *Threatened Species Recovery Plan No. 23.* 33 p. \$15.00 (incl. G.S.T.)
22. Department of Conservation. 1997. **Blue Duck (Whio), *Hymenolaimus malacorhynchos* Recovery Plan.** *Threatened Species Recovery Plan No. 22.* 38 p. \$15.00 (incl. G.S.T.)
- Sim, J.; Saunders, A. (Editors) 1997. **Predator workshop 1997.** *Proceedings of a workshop held 21 - 24 April 1997, St. Arnaud, Nelson Lakes.* 135 p. \$22.50 (incl. G.S.T.)

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