



Information Sources	62
Key Contacts	63
Acknowledgements	65
References	66

SECTION FOUR: Further information

The alpine Cascades gecko, *Mokopirirakau* sp. 'Cascades'. Photo: Trent Bell

Information Sources

Primary Information Sources

Scientific literature is the primary source of information on native lizards. The **NZ Lizards Database** provides a detailed, up-to-date summary of this information, along with photographs of each New Zealand lizard species (<http://nzlizards.landcareresearch.co.nz>). The database also contains an extensive, searchable bibliography dating back to 1769.

A new scientific journal on the New Zealand herpetofauna, *BioGecko*, has recently been launched. Details can be found on the BioGecko website: www.biogecko.co.nz

Popular Literature

A Photographic Guide to Reptiles and Amphibians of New Zealand (Jewell 2008, updated 2011) has keys, accounts and photographs of lizards in a field guide format. It is currently the most up-to-date popular publication, although its treatment of taxonomy is somewhat unconventional. An updated version of this book will be released later this year.

New Zealand Frogs and Reptiles (Gill & Whitaker 2006) is a field guide which has keys to all species as well as colour photographs and brief accounts of the morphology, colour, distribution, habits and habitats of each. It is now considered out of date. *A Field Guide to the Lizards of New Zealand* (Towns 1985) also has keys to species, but is also out of date. Another popular book includes the classic *New Zealand Amphibians and Reptiles in Colour* (Robb 1986).

Magazines such as *Forest & Bird*, and *New Zealand Geographic* also publish occasional articles on native lizards.

Bibliographies

A comprehensive literature source for New Zealand lizards is the searchable **NZ Lizards Database** bibliography (<http://nzlizards.landcareresearch.co.nz>). This provides full bibliographical details, abstracts, annotations and links to digital copies where available, and is query-searchable by any name, place or subject.

'*SRARNZ Notes*', produced by the Society for Research on Amphibians and Reptiles in New Zealand, contains lists of New Zealand herpetological literature, published and unpublished, in each issue. These bibliographies are eventually incorporated into the NZ Lizards Database.



Suter's skink, *Oligosoma suteri*. Photo: Trent Bell.

Distribution Information

The primary source of distribution data on lizards is the **BioWeb HERPETOFAUNA database**. Data from this database were published in map form in the Atlas of the Amphibians and Reptiles of New Zealand (Pickard & Towns 1988), and updated in 2009 by Benno Kappers. It is published online at: <http://doc.govt.nz/conservation/native-animals/reptiles-and-frogs/species-information/atlas-of-the-amphibians-and-reptiles-of-nz/electronic-atlas/>

The **NZ Lizards Database** provides information on distribution, including cross-referencing against both Ecological Regions and Districts and Land Environments of New Zealand (<http://nzlizards.landcareresearch.co.nz>). It also contains summaries of both historical and current biogeography, and translocations.

Key Contacts

Experts who can be contacted on herpetological matters are listed below. If you know of someone who should be on this list or needs to update their details, please contact SRARNZ at srarnz.secretary@gmail.com so they can be included in the next update of this Toolkit.

Department of Conservation

The **Department of Conservation** (www.doc.govt.nz) currently employs four herpetologists (David Towns, Rod Hitchmough, Lynn Adams, and Jo Hoare), along with Benno Kappers, BioWeb HERPETOFAUNA and ATLAS administrator. A number of other DOC staff have detailed knowledge of herpetofauna, including Don Newman, Head Office, Wellington; Rob Chappell, Coromandel; John Heaphy, Tauranga, Peter Gaze, Nelson/Marlborough; James Reardon, Southland and Andy Hutcheon, Otago.

David Towns, dtowns@doc.govt.nz

Rod Hitchmough, rhitchmough@doc.govt.nz

Lynn Adams, ladams@doc.govt.nz

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James Reardon, jreardon@doc.govt.nz

Andy Hutcheon, ahutcheon@doc.govt.nz

Ecological Consultancies

A number of consultants specialise in herpetological work (listed alphabetically below).

- **Bioresearches** (www.bioresearches.co.nz)

Dylan van Winkel, dylan.vanwinkel@bioresearches.co.nz

Chris Wedding, chris.wedding@bioresearches.co.nz

- **Boffa Miskell** (www.boffamiskell.co.nz)

Simon Chapman, simon.chapman@boffamiskell.co.nz

Jonathan Ruffell, jonathan.ruffell@boffamiskell.co.nz

- **EcoGecko Consultants** (www.ecogecko.co.nz)

Trent Bell, trent@ecogecko.co.nz

Sarah Herbert, sarah@ecogecko.co.nz

- **Fauna Finders**

Marieke Lettink, marieke_kakariki@clear.net.nz

- **Golder Associates** (www.golder.co.nz)

Katherine Muchna, kmuchna@golder.co.nz

- **Ryder Consulting** (www.ryder.co.nz)

Marcia Dale, m.dale@ryderconsulting.co.nz

- **Tonkin & Taylor** (www.tonkin.co.nz)

Graham Ussher, gusser@tonkin.co.nz

Matt Baber, mbaber@tonkin.co.nz

- **Whitaker Consultants**

Tony Whitaker, whitaker@ts.co.nz

- **Wildland Consultants** (www.wildlands.co.nz)

Tim Martin, tim.martin@wildlands.co.nz

Mandy Tocher, mandy.tocher@wildlands.co.nz



Duvaucel's gecko, *Hoplodactylus duvaucelii*. Photo: Trent Bell.

Landcare Research

The Crown Research Institute **Landcare Research** (www.landcareresearch.co.nz) is New Zealand's foremost environmental research organisation. Grant Norbury, Deb Wilson, and Dianne Gleeson are often involved in herpetological research. Recent herpetofaunal projects have included surveying and monitoring, management planning, developmental scientific research, taxonomy, and curation of the NZ Lizards Database (<http://nzlizards.landcareresearch.co.nz>).

Grant Norbury, norburyg@landcareresearch.co.nz
Deb Wilson, wilsond@landcareresearch.co.nz
Dianne Gleeson, gleesond@landcareresearch.co.nz

Universities

Some of New Zealand's universities have particular research interests in New Zealand's herpetofauna, while others have occasional herpetofaunal projects. Staff and students usually have several research projects in the herpetology field each year.

- **Lincoln University** (www.lincoln.ac.nz)
- **Massey University** (www.massey.ac.nz)
- **Victoria University of Wellington** (www.vuw.ac.nz)
- **University of Auckland** (www.auckland.ac.nz)
- **University of Otago** (www.otago.ac.nz)

Societies

The **Society for Research on Amphibians and Reptiles in New Zealand** (SRARNZ) (www.srarnz.org.nz) has particularly knowledgeable and active members, and produces an annual newsletter ('SRARNZ Notes') which provides up-to-date information on current research and discoveries in herpetology.

The **New Zealand Herpetological Society** (NZHS) (www.reptiles.org.nz) is an incorporated society of amateur herpetoculturists and other interested people. Their main interests are raising awareness and interest in amphibians and reptiles and their conservation, encouraging the study of, and the captive maintenance and breeding of this fauna. NZHS produce a quarterly newsletter called 'Moko'.

Museums

The **Museum of New Zealand Te Papa Tongarewa** (www.tepapa.govt.nz) is the national repository for all indigenous reptile specimens (curator Colin Miskelly).

The **Auckland War Memorial Museum** (www.aucklandmuseum.com) has an interest in Pacific herpetofauna (curator Brian Gill).



Nelson green gecko, *Naultinus stellatus*. Photo: Trent Bell.

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Rod Hitchmough
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We hope you have found this resource useful.

Kia ora

Peter, Trent, Simon & Keith



References

Cited Literature

Amstrup SC, McDonald TL, Manly BFJ. 2005. *Handbook of capture-recapture analysis.* Princeton University Press. 313 p.

Collen R, Cromarty P. 2011. *Translocation guide for community groups. The translocation process from the idea to reporting.* (Version 1: Approved 12 April 2011). DOC/DM-363788 unpublished internal document. Department of Conservation, Wellington, New Zealand.

DOC 1999. *Recovery plan for reptiles in Southland Conservancy.* Southland Conservancy, Department of Conservation, Invercargill.

DOC 2010. *Jewelled gecko/moko-kakariki management plan. A community-based plan for Otago Peninsula.* Department of Conservation, Wellington. 30 p.

Gill B, Whitaker T. 2006. *New Zealand frogs and reptiles.* Bateman Field Guides, Auckland. 112 p.

Harris, R (ed.) 2004. *Handbook of Environmental Law.* Wellington. Royal Forest and Bird Protection Society of New Zealand Inc. ISBN 0-9597851-8-3.

Hitchmough RA, Hoare JM, Jamieson H, Newman D, Tocher MD, Anderson PJ, Lettink M, Whitaker AH 2010. Conservation status of New Zealand reptiles, 2009. *New Zealand Journal of Zoology* Vol. 37 (3): 203-224.

Jewell T. 2008. *A photographic guide to reptiles and amphibians of New Zealand.* New Holland, Auckland. 144 p.

King CM 2006. *The Handbook of New Zealand mammals.* Second edition. Oxford University Press.

Knox CD 2011. Habitat requirements of the jewelled gecko (*Naultinus gemmeus*): effects of grazing, predation and habitat fragmentation. Msc Thesis, University of Otago.

Lettink M, Knox C 2011. *Looking after jewelled geckos and their habitats - a practical guide for landowners.* Canterbury Conservancy, Department of Conservation.

Mackenzie, D.I., Royle, J.A., Pollock, K.H., Bailey, L.L. and Hines, J.E. 2006. *Occupancy estimation and modeling.* Elsevier Academic Press. 324 p.

Norbury G, Reardon J, McKinlay B. 2006. *Grand and Otago skink recovery plan 2006-2016.* Department of Conservation, Wellington.

Norton DA, Roper-Lindsay J 2004. Assessing significance for biodiversity conservation on private land in New Zealand. *New Zealand Journal of Ecology* 28: 295-305.

Norton DA, Roper-Lindsay J 2008. Assessing significance under the RMA — moving forwards: a reply to Walker et al. (2008). *New Zealand Journal of Ecology* 32 (2): 238-239.

Pickard CR, Towns DR 1988. *Atlas of the amphibians and reptiles of New Zealand.* Department of Conservation. Conservation Science Publication No. 1.

Robb J. 1986. *New Zealand amphibians and reptiles in colour* (2nd edition, revised). Collins, Auckland.

Towns DR 1985. *A field guide to the lizards of New Zealand* (2nd edition). New Zealand Wildlife Service, Occasional publication No. 7.

Towns DR 1999. *Cyclodina spp. skink recovery plan: 1999-2004.* Threatened species recovery plan No. 27. Department of Conservation.

Towns DR, Neilson KA, Whitaker AH 2002. *North Island Oligosoma spp. skink recovery plan 2002-2012.* Threatened Species Recovery Plan No. 48. Department of Conservation, Wellington. 60 p.

Townsend AJ, de Lange PJ, Duffy CAJ, Miskelly CM, Molloy J, Norton D. 2008. *New Zealand Threat Classification System manual.* Wellington, Department of Conservation. 35 p.

Walker S, Brower AL, Clarkson BD, Lee WG, Myers SC, Shaw WB, Stephens RTT 2008. Halting indigenous biodiversity decline: ambiguity, equity, and outcomes in RMA assessment of significance. *New Zealand Journal of Ecology* 32 (2): 225-237.

Whitaker AH 2008. *Conservation of lizards in Canterbury Conservancy*. Department of Conservation, Canterbury Conservancy. 130 p.

Whitaker AH, Gaze PD 1999. *Conservation of lizards in Nelson/Marlborough Conservancy*. Department of Conservation, Nelson/Marlborough Conservancy. Occasional Publication No. 44.

Whitaker AH, Tocher MD, Blair T. 2002. *Conservation of lizards in Otago Conservancy*. Department of Conservation, Wellington.

Whitaker T, Lyall J. 2004. *Conservation of lizards in West Coast/Tai Poutini Conservancy*. Unpublished report, Department of Conservation, Wellington.

Recommended Literature

Cree A 1994. Low annual reproductive output in female reptiles from New Zealand. *New Zealand Journal of Zoology* 21: 351-372.

Hoare JM, Adams LK, Bull LS, Towns DR 2007. Attempting to manage complex predator-prey interactions fails to avert imminent extinction of a threatened New Zealand skink population. *Journal of Wildlife Management* 71(5): 1576-1584.

Hoare JM, Pledger S, Nelson NJ, Daugherty CH 2007. Avoiding aliens: behavioural plasticity in habitat use enables large, nocturnal geckos to survive Pacific rat invasions. *Biological Conservation* 136: 510-519

McInnes K. 2010. *Wildlife health management standard operating procedure*. DOC/DM-442078 unpublished internal document. Department of Conservation, Wellington, New Zealand.

Miller KA, Chapple DG, Towns DR, Ritchie PA, Nelson NJ 2009. Assessing genetic diversity for conservation management: a case study of a threatened reptile. *Animal Conservation* 12: 163-171.

Miller KA, Towns DR, Allendorf FW, Ritchie PA, Nelson NJ 2011. Genetic structure and individual performance following a recent founding event in a small lizard. *Conservation Genetics* 12: 461-473.

Newman DG 1994. Effects of a mouse, *Mus musculus*, eradication programme and habitat change on lizard populations of Mana Island, New Zealand, with special reference to McGregors skink, *Cyclodina macgregori*. *New Zealand Journal of Zoology* 21(4): 443-456.

Norbury G 2001. Conserving dryland lizards by reducing predator-mediated apparent competition and direct competition with introduced rabbits. *Journal of Applied Ecology* 38(6): 1350-1361.

Thomas BW, Whitaker AH 1995. *Translocation of the Fiordland skink *Leiopisma acrinasum* to Hawea Island, Breaksea Sound, Fiordland, New Zealand*. pp. 91-95 in: SERENA, M. (ed.). *Reintroduction Biology of Australian and New Zealand Fauna*. Surrey Beatty, Chipping Norton (Aust.). 264 p.

Tocher MD 2006. Survival of grand and Otago skinks following predator control. *New Zealand Journal of Zoology* 70(1): 31-42.

Towns DR. 2002. *Interactions between geckos, honeydew scale insects and host plants revealed on islands in northern New Zealand, following eradication of introduced rats and rabbits*. pp. 329-335 in: Veitch CR, Clout MN (ed.). *Turning the Tide: The Eradication of Invasive Species*. IUCN Invasive Species Specialist Group, IUCN

Towns DR, Daugherty CH 1994. Patterns of range contractions and extinctions in the New Zealand herpetofauna following human colonization. *New Zealand Journal of Zoology* 21(4): 325-339.

Towns DR, Daugerty CH, Cree A 2001. Raising the prospects for a forgotten fauna: a review of 10 years of conservation effort for New Zealand reptiles. *Biological Conservation* 99(1): 3-16.

Towns DR, Ferreira SM 2001. Conservation of New Zealand lizards (Lacertilia : Scincidae) by translocation of small populations. *Biological Conservation* 98(2): 211-222.

Towns DR, Parrish GR, Westbrooke I. 2003. Inferring vulnerability to introduced predators without experimental demonstration: case study of Suter's skink in New Zealand. *Conservation Biology* 17(5): 1361-1371.

Whitaker AH 1978. *The effects of rodents on reptiles and amphibians.* pp. 75-88 in: Dingwall PR, Atkinson IAE, Hay C. (ed.). *The Ecology and Control of New Zealand Nature Reserves.* New Zealand Department of Lands and Survey Information Series No. 4. 237 p.

Whitaker AH 1987. The roles of lizards in New Zealand plant reproductive strategies. *New Zealand Journal of Botany* 25(2): 315-328.

Worthy TH 1987. Osteological observations on the larger species of the skink *Cyclodina* and the subfossil occurrence of these and the gecko *Hoplodactylus duvaucelii* in the North Island, New Zealand. *New Zealand Journal of Zoology* 14: 219-229.

Worthy TH 1991. Fossil skink bones from Northland, New Zealand, and description of a new species of *Cyclodina*, Scincidae. *Journal of the Royal Society of New Zealand* 21(4): 329-348

Chapple DG, Ritchie PA, Daugherty CH 2009. Origin, diversification, and systematics of the New Zealand skink fauna (Reptilia: Scincidae). *Molecular Phylogenetics and Evolution* 52: 470-487.

Nielsen SV, Bauer AM, Jackman TR, Hitchmough RA, Daugherty CH. 2011. New Zealand geckos (Diplodactylidae): Cryptic diversity in a post-Gondwanan lineage with trans-Tasman affinities. *Molecular Phylogenetics and Evolution* 59: 1-22.

Internet links

Biodiversity New Zealand
www.biodiversity.govt.nz

Biosecurity New Zealand
www.biosecurity.govt.nz

Department of Conservation
www.doc.govt.nz

Landcare Research
www.landcareresearch.co.nz

Landcare Trust
www.landcare.org.nz

Local Government
www.lgnz.co.nz

Ministry for the Environment
www.mfe.govt.nz

New Zealand Biodiversity Strategy
<http://www.biodiversity.govt.nz/picture/doing/nzbs/index.html>

New Zealand Lizards Database
<http://nzlizards.landcareresearch.co.nz>

New Zealand Herpetological Society
www.reptiles.org.nz

Parliamentary Commissioner for the Environment
www.pce.parliament.nz

Royal Forest & Bird Society
www.forestandbird.org.nz

Sanctuaries of NZ
www.sanctuariesnz.org

Society for Research on Amphibians and Reptiles in New Zealand
www.srarnz.org.nz

