

## Education

- PhD – Environmental Science, Griffith University, Brisbane, 1994
- M. Sc (Hons) – Zoology, University of Auckland, New Zealand, 1987
- B.Sc. – Zoology and Marine Biology, University of Auckland, 1985
- PRINCE2 Practitioner Certificate in Project Management, 2016
- Making Good Decisions: Certification as RMA Decision Maker, 2014; Recertification, 2017
- GradDipT (Secondary) University of Waikato, 2012

## Experience Highlights

- Director, Streamlined Environmental since January 2014
- Almost 30 years' experience working in scientific consultancy, research, management, education and government roles in New Zealand and Australia
- 7 years as Research Programme Leader, NIWA
- 9 years as Group Manager/Scientist (Freshwater Ecology), NIWA,
- 9 months teaching experience at Liggins Institute (University of Auckland)
- 3 years as Principal Scientist, Aquatic Ecology, NIWA Australia, Brisbane,
- 3 years as Principal Conservation Officer (Aquatic Ecology and Planning), Queensland EPA, Brisbane,
- 5 years as a Senior Environmental Consultant, Natural Resource Assessments, Queensland

## Ngaire R. Phillips, PhD.

*Independent Commissioner - Environmental Science Specialist (Freshwater and Estuarine Ecology and Ecotoxicology)*

Dr Phillips is an experienced environmental scientist with specialist expertise in aquatic ecology and environmental toxicology. She has gained this experience through roles in consulting, research, science management, project management and education. She has a wealth of knowledge based on practical and extensive experience in a wide range of scientific disciplines, including freshwater and estuarine ecology, customary fisheries management, water quality and land management associated with rivers, lakes and estuaries. Ngaire has considerable experience in leading and participating in multi-disciplinary teams. She is also a registered RMA Independent Commissioner and is an appointed member of the HSNO Committee. Ngaire is also a PRINCE2 practitioner (project management).

Specialty areas:

*Application of the RMA*  
*Freshwater and estuarine ecology*  
*Ecotoxicology*  
*Ecohealth (human health/environmental health links)*  
*Iwi Resource Management issues, especially customary fisheries*  
*Environmental Impact Assessment*

## Selected Examples of Relevant Experience

### *Experience on Decision Making Committees*

**Independent RMA Commissioner, NRSBU Bell Island Wastewater Treatment Plant reconsenting, Tasman District Council, 2019-2020.** Water quality expert on a 3 person panel considering an application by Nelson Regional Sewerage Business Unit (NRSBU) to renew its discharge consents associated with operation of the Bell Island Wastewater Treatment Plant in Nelson. The principal technical issues considered were water quality discharge limits, odour and duration of consent. Chair: Sharon McGarry.

**Independent RMA Commissioner, Matamata Metals reconsenting, Waikato Regional Council, 2018-2019.** Environmental science expert on a 3 person panel considering an application by Matamata Metals (J Swap) to renew its discharge consents (air quality, water, land) associated with operation of its Matamata quarry. The principal technical issues considered were water quality discharge limits and cultural values. Chair: Murray Kivell.

**Independent Commissioner, Special Tribunal for the Ngaruroro and Clive Rivers, Hawkes Bay, 2017-2019.** I was appointed by the Minister for the Environment to a position on this 5 person Special Tribunal. The purpose of the tribunal was to consider an application for a Water Conservation Order (WCO) under the RMA on Hawke's Bay's Ngaruroro and Clive rivers. The application was made by New Zealand Fish and Game Council, Hawke's Bay Fish and Game Council, Ngāti Hori ki Kohupatiki, Whitewater New Zealand, Jet Boating New Zealand, and the Royal Forest and Bird Protection Society of New Zealand. This was a complex and challenging hearing, with more than 1000 submissions, with 100s wishing to be heard. The decision was made to grant a WCO over the upper part of the river, based on a range of outstanding values (including aesthetic, recreational and fisheries). Chair: Richard Fowler QC.

**Independent RMA Commissioner, Silver Fern Farms reconstenting, Waikato Regional Council, 2016.** Environmental science expert on a 2 person panel considering an application by Silver Fern Farms to renew its discharge consents associated with operation of its Te Aroha meat processing plant. The principal technical issues considered were water quality discharge limits. Chair: Craig Shearer.

**Independent RMA Commissioner, Fonterra-Tirau reconstenting, Waikato Regional Council, 2016.** Environmental science expert on a 2 person panel considering an application by Fonterra to renew its discharge consents associated with operation of its Tirau dairy facility. The principal technical issues considered were water quality and ecology, as well as duration of consent. Chair: Rob Van Voorthuysen.

**HSNO Committee member 2015-current** - I am an appointed member of the Hazardous Substances and New Organisms (HSNO) Committee, which makes decisions on applications under the Hazardous Substances and New Organisms (HSNO) Act 1996. Decision Making Committees (DMC) are formed from a pool of 8 decision makers for each individual application. The types of resource management issues that I have been required to consider include the proposed introduction of biocontrol agents for pest or disease control, the registration for use of a range of pesticides and fungicides, and the approval of alternative, more environmentally-friendly chemicals, such as vehicle heat transfer fluids. These are evaluated for potential risks to the environment, human health, the relationship of Māori to the environment, society, community, and to the market economy. Currently I am involved in several nationally significant applications associated with the timber industry.

### ***Application of the RMA***

**Methanex Ltd, Reconstenting of wastewater discharge consents for Motenui and Waitara Valley plants, Taranaki (2020-current).** Aquatic (marine and freshwater) ecology and ecotoxicology expert, responsible for scoping and conducting scientific investigations and producing a report that will contribute to an Assessment of Ecological Effects report.

**Ravensdown Fertiliser, Reconstenting of wastewater discharge consents for Ravensdown Napier plants, Napier (2020-current).** Freshwater ecology and ecotoxicology expert, responsible for scoping and conducting scientific investigations and producing a report that will contribute to an Assessment of Ecological Effects report.

**Oji Fibre Solutions, Kinleith Mill reconstenting, Tokoroa (2019-current).** Project manager and freshwater expert for reconstenting Kinleith Mill's waste water discharge consents, coordinating investigations on mixing dynamics, stream ecology, water quality and contaminants in sediment and eel tissue. Responsible for drafting an Ecological Effects Report. Philip Millichamp

**Healthy Rivers Plan Change 1, Expert Witness on Shallow lakes, Hamilton, for Department of Conservation (2019).** Prepared and presented evidence on the department's submission on the implications of the proposed plan change for the management and sustainability of Waikato's shallow lakes. Angus Grey agray@doc.govt.nz

**Provision of support to s42a officer on potential ecological effects of expansion of Martha Mine, Waihi, for Waikato Regional Council (2019).** Project included peer review of assessment of effects report submitted as part of resource consent applications, production of a report to assist development of the section 42a report. Also includes attendance at hearing to provide technical support to the Hearings Panel and contribution to consent conditions.

**Provision of support to s42a officer on potential ecological effects of accidental and overflow discharges of untreated sewerage to the Waimea Estuary, Nelson, for Nelson City Council (2017 – 2018).** Project included peer review of assessment of effects report submitted as part of resource consent applications, expert conferencing and production of a report to assist development of the section 42a report. Also includes attendance at hearing to provide technical support to the Hearings Panel and contribution to consent conditions.

**Okura development proposal, Expert Witness, Okura Holdings Ltd, 2017.** Presented expert evidence on ecological values of the freshwater systems of a development area north of Auckland, including predictions in changes in values associated with the proposed development.

**Healthy Rivers 1 (Waikato/Waipā) - implications for Port Waikato, Waikato Regional Council, 2016.** Think piece on the potential implications of decisions made through the Waikato Healthy Rivers Plan on the estuarine environment at Port Waikato.

**Assessment of Ecological Effects on the receiving environment from the discharge of treated wastewater from the Omaha WWTP, Watercare Services Ltd, 2016.** Undertook field and desktop investigations to determine the potential effects of population growth on nutrient levels reaching the sensitive Whangateu Harbour, which was integrated into an AEE for resource consent applications by Watercare Services.

**Chatham Rock Phosphate deep sea mining proposal, Expert Witness, Ngai Tahu, 2014.** Ecotoxicology expert on a submission by Ngai Tahu (as submitter) on the application to mine phosphorite nodules on the Chatham Rise. Provided an assessment of potential ecotoxicity associated with the proposal, as well as a review of methods employed by the applicant to determine toxicity.

**Waikato Byproducts Re-consenting, Graeme Low Corporation, 2014-2015.** Ecology, water quality and ecotoxicology expert for the re-consenting of Waikato Byproducts discharge permit. Prepared an assessment of the current status of the receiving environment, the effects environmental health associated with the plant (including an assessment of mixing zone characterization) and proposed consent conditions, for integration into the AEE.

**Te Kahu Mine, Department of Conservation (DOC), 2014-2015.** Ecology/ecotoxicology expert on a proposed coal mine west of Westport, which includes a requirement obtain a concession and an easement on DOC land. Reviewed applicants AEE, especially in relation to freshwater ecology, water quality and water management strategies. Advised DOC on other legislative implications.

## ***Freshwater and estuarine ecology***

**Te Awarua-o-Porirua Collaborative Modelling Project, Greater Wellington Regional Council, 2017-2018.** Leading the development of Bayesian Belief Networks and narrative descriptions to use in making predictions of freshwater and estuarine attributes under different development scenarios. The project outputs will support the implementation of the Porirua Whaitua process.

**Okura Freshwater Assessment, Okura Holdings Ltd, 2017.** Undertook field assessment using the Stream Ecological Valuation (SEV) method to assess ecological functioning under existing and proposed development options.

**Kaipara Sediment Mitigation Study, for Northland Regional Council, 2016-2017.** Project Manager and contributor to a study involving a consortium of researchers that has developed a model of Kaipara Harbour and its catchment for assessing costs and benefits of sediment mitigation. The model predicts the extent to which various objectives framed in terms of sediment “attributes” may be achieved by different sediment mitigation strategies, and the associated costs to the public, landowners and sector groups.

**River Ecology Status and Trends, Auckland Council, 2013.** Undertook data analysis and reporting of temporal trends in macroinvertebrate indices derived from Auckland Council’s River Ecology Monitoring Programme.

**Biological traits: application to regional monitoring programmes, Waikato Regional Council/Auckland Council, 2011.** Led an investigation into the response of macroinvertebrates metrics and traits to a gradient of pastoral development (% pastoral) for Waikato streams and in comparison to Auckland streams. Also investigated the potential use of traits as a mechanistic tool.

**Interactions between heavy metals, sedimentation and cockle feeding and movement, Auckland Regional Council, 2008-2009.** Part of a team examining the effect of cockle feeding and movement on sediment resuspension in heavy metal-impacted estuaries. Undertook field and lab-based experiments to examine the interactions between these components

## ***Ecotoxicology***

**Interactions between heavy metals, sedimentation and cockle feeding and movement, Auckland Regional Council, 2008-2009.** Part of a team examining the effect on feeding and movement estuarine bivalves (cockles) on sediment resuspension in heavy metal-impacted estuaries. Undertook field and lab-based toxicity experiments to examine the interactions between these components. Contributed to the development of a complex systems model.

**Intergenerational responses to stormwater contamination, Auckland Regional Council, 2007 – 2009.** This project aimed to provide a tool for detecting the effects of chronic, low-level contamination in streams on multiple generations of aquatic biota, using changes in genetic structure as a marker. Combining field and laboratory experiments ranging from acute (4 days) to chronic (38 days) exposure periods, the effects on both adult and juvenile populations of a “model” organism (the freshwater clam *Sphaerium novaezelandia*) were examined. Significant chronic effects of stormwater contamination on aquatic organisms were identified.

**Estuarine Ecodiagnostics, New Zealand Foundation for Research, Science and Technology, 2006-2010.** Co-led a project that aimed to develop a suite of tools based on multiple levels of biological organisation and used to determine resilience of estuarine communities from contaminant exposure. Undertook field and lab-based toxicity experiments in the Auckland region to examine genetic responses to contaminant exposure in estuarine bivalves.

**Ngakawau River Chronic Ecotoxicity Testing, Solid Energy, 2005.** Designed and conducted acute and chronic toxicity tests on fingerling Rainbow Trout and stream invertebrates (mayflies, snails) using naturally acidic field-derived water samples. Calculated a site-specific trigger value for aluminium based on these results.

## Selected Peer Reviewed Publications

- Cyr H, Phillips N, Butterworth J (2017) Depth distribution of the native freshwater mussel (*Echyridella menziesii*) in warm monomictic lakes: towards a general predictive model for lakes. *Freshwater Biology* 62, (8) 1487–1498.
- Verburg P, Hickey CW, Phillips N 2014. Mercury biomagnification in three geothermally-influenced lakes differing in chemistry and algal biomass. *Science of the Total Environment* 493C:342-354.
- Phillips NR, Stewart M, Olsen G, Hickey CW (2014) Human health risks of geothermally-derived metals and other contaminants in wild caught food. *Journal of Toxicology and Environmental Health Part A, Current Issues* 77(6): 346-365.
- Clearwater S, Wood S, Phillips N, Parkyn S., Van Ginkel, R, Thompson, K (2014) Toxicity thresholds for juvenile freshwater mussels *Echyridella menziesii* and crayfish *Paranephrops planifrons*, after acute or chronic exposure to *Microcystis* sp. *Environmental Toxicology* 29(5): 487-502.
- Wood SA, Phillips NR de Winton M, Gibbs M (2012) Consumption of benthic cyanobacterial mats and nodularin-R accumulation in freshwater crayfish (*Paranephrops planifrons*) in Lake Tikitapu (Rotorua, New Zealand. *Harmful Algae* 20: 175-179.
- Wood S, Kuhajek J, de Winton M, Phillips N (2012) Species composition and cyanotoxin production in periphyton mats from three lakes of varying trophic status. *FEMS Microbiology Ecology* 79: 312-326
- Stewart M, Phillips NR, Olsen G, Hickey CW, Tipa G (2011) Organochlorines and heavy metals in wild caught food as a potential human health risk to the indigenous Maori population of South Canterbury, New Zealand. *Science of the Total Environment* 409, 2029-2039.
- Doledec S, Phillips N, Townsend C (2011) Invertebrate trait community responses to land use effects at a broad spatial scale: a case study in New Zealand. *Freshwater Biology* 56(8):1670-1688.
- Wagenoff A, Townsend CR, Phillips N, Matthaei CD (2011) Subsidy-stress and multiple-stressor effects along gradients of deposited fine sediment and dissolved nutrients in a regional set of streams and rivers. *Freshwater Biology*, 56(9):1916-1936.
- Reid DJ, Chiaroni LD, Hewitt JE, Lohrer DM, Matthaei CD, Phillips NR, Scarsbrook MR, Smith BJ, Thrush SF, Townsend CR, van Houte-Howes KSS., and Wright-StowAE (2011) Sedimentation effects on the benthos of streams and estuaries: a cross-ecosystem comparison. *Marine and Freshwater Research* 62, 1201–1213.
- Magbanua FS, Townsend CR, Blackwell G L, Phillips N, Matthaei CD (2010) Responses of stream macroinvertebrates and ecosystem function to conventional, integrated and organic farming. *Journal of Applied Ecology*, 47:1014–1025.
- Phillips NR, Hickey CW (2010) Genotype-dependent recovery from acute exposure to heavy metal contamination in the freshwater clam *Sphaerium novaezelandiae*. *Aquatic Toxicology* 99, 507-513.
- Stark J, Phillips N (2009) Seasonal variability in the Macroinvertebrate Community Index: are seasonal correction factors required? *NZ J Mar FW Res* 43: 867-882.

## Selected Consultancy Reports

Phillips, N.; Borman, D., Eivers, R and Hill, R. (2019) Pukorokoro/Miranda Catchment Prioritisation Project. Report DOC1801-1, Streamlined Environmental, Hamilton, 41pp.

Phillips, N. and Smith, B. (2018) New Zealand Freshwater Macroinvertebrate Trait Database. NIWA Client Report 2018079HN, April 2018. 25pp.

Stewart, M. and Phillips, N. (2017). Risk assessment of antiscalant chemicals at Ohaaki, Wairakei and Tauhara Power Stations. CON1601-FINAL, Streamlined Environmental, Hamilton, 49 pp.

Neale, M.W., Moffett, E.R., Hancock, P., Phillips, N and Holland, K (2017). River ecology monitoring: state and trends 2003-2013. Auckland Council technical report, TR2017/011.

Phillips, N. (2017) Okura Freshwater Assessment. Report TOD1602-1, Streamlined Environmental, Hamilton, 35 pp.

Stewart, M., Cooke, J., Phillips, N., Freeman, M. (2017) Literature review of the risks and adverse effects from discharges of stormwater, wastewater, industrial and trade waste, and other hazardous substances in Otago. Report ORC1601-FINAL-v2, Streamlined Environmental, Hamilton, 153 pp.

Green, M.O., Phillips, N.R., Cornelisen, C.D., Stewart, M. and Dunsmuir, A.K. (2016) Contaminants in New Zealand Estuaries: Effects, Sources, Current State, Management and Research Needs. Report WRC1601-1, Streamlined Environmental, Hamilton, 210 pp.

James, M., Stewart M., Phillips N, Cooke, J (2016) Assessment of Ecological Effects on the receiving environment from the discharge of treated wastewater from the combined Snells Beach and Warkworth WWTPs. Prepared for Watercare Services Ltd, May 2016.

Cooke, J and Phillips N (2016) Literature review of options for potential reduction of heat and mercury from cooling water discharged from Wairakei Power Station 2014-2016. Prepared for Contact Energy, March 2016.

James, M., Stewart M., Phillips N, Cooke, J (2016) Assessment of Ecological Effects on the receiving environment from the discharge of treated wastewater from the Omaha WWTP. Prepared for Watercare Services Ltd, January 2016.

James, M and Phillips N (2015) Ecological significance of changes in macroinvertebrate communities downstream of Tasman Mill discharge. Prepared for Carter Holt Harvey Pulp and Paper, Norske Skog Tasman and Bay of Plenty Regional Council. CHH1502, August 2015.

Cooke J., Cox T., Stewart M., Phillips N., Pandey S. (2015) Rotokauri ICMP – Phase 2 Broad scale Water Quality Assessment. Prepared for Hamilton City Council.

Phillips, N. (2015) Review of Freshwater Solutions 2015 Tarawera River Ecological Monitoring Report. Prepared for AES, July 2015.

Phillips, N (2014) Graeme Lowe Protein Assessment of Effects on the Receiving Environment. Prepared for Environmental Management Systems, October 2014.

Storey, R.G., Neale, M.W., Rowe, D.K., Collier, K.J., Hatton, C., Joy, M.K., Maxted, J. R., Moore, S., Parkyn, S.M., Phillips, N. and Quinn, J.M. (2011) Stream Ecological Valuation (SEV): a method for assessing the ecological function of Auckland streams. Auckland Council Guideline Document 2011/001.