

## SHELLEY McMURTRIE Aquatic Ecology Scientist (principal)



### QUALIFICATIONS

**Master of Science** (Zoology, 1st class hons); University of Canterbury, NZ, 2001

**Bachelor of Science** (Dbl major in Zoology and Plant & Microbial Sciences); University of Canterbury, NZ, 1995

### AFFILIATIONS

Member, New Zealand Freshwater Sciences Society

Member, Environment Institute of Australia & New Zealand (EIANZ)

Member, Cashmere Stream Care Group

Chairperson, Fifty Degrees South Trust



### FIELDS OF SPECIAL COMPETENCE

Shelley McMURTRIE is a director and principal scientist at EOS Ecology, with 15 years combined research and consulting experience specialising in aquatic ecosystems. Her expertise lies in urban ecology; including the impacts of urbanisation and land use change on aquatic fauna, the rehabilitation of aquatic systems, and biotic and abiotic factors governing aquatic fauna. In her current position she is responsible for undertaking research and commercial work pertaining to freshwater and estuary systems throughout New Zealand, project managing a wide range of freshwater and estuary programmes, and maintaining quality assurance standards for the science team.

Her commercial career has seen her authoring and peer reviewing a large number of consent-related reports (AEEs, SARs, NORs), auditing consent applications on behalf of Regional Councils, and presenting expert witness evidence at hearings pertaining to infrastructure, power generation, developments and stormwater. She has also developed and managed long-term monitoring programmes and ecological investigations; and authored and edited key publications on aquatic systems and their management on a catchment-wide basis. She has researched the effects of fish and habitat interactions on abundance of invertebrate species; the impact of food contamination on invertebrate mortality; developed specialised sampling protocols for assessing aquatic populations inhabiting natural and manmade systems; monitored the effects of stormwater, restoration initiatives, and earthquake effects on aquatic biota; and designed waterway enhancements and overseen their implementation.

Her experience in urban ecology and waterway restoration is evidenced by her role as the ecology technical lead for the largest urban waterway enhancement programme in New Zealand, where she was tasked with improving the health of the Avon River for a 3.2 km section through the city. She is also the project lead and head designer tasked with creating long-fin eel habitat in the Halswell River catchment through the design of riffle habitats.

Her management and research skills are most evident in her coordinating the largest multidisciplinary research expedition to Campbell Island in over 20 years, developing the expedition's output programme, leading the freshwater research team for the 14 week expedition in 2010–2011 ([www.campbellisland.org.nz](http://www.campbellisland.org.nz)) and the multi-year post-expedition outputs for the freshwater ecology team.

Based in Christchurch since the early 90s, she is a trusted advisor for both government-based authorities and commercial

companies, and is renowned for the practical application of her scientific knowledge. She is highly regarded by peers and industry partners for her local knowledge of aquatic systems, high standard of work, professional integrity, and ability to connect with the general public on ecology matters.

Shelley also donates her own time to support local community initiatives (such as the Cashmere Stream Care Group, of which she is a member), and donates her professional time and company time to provide advice and presentations on ecological matters. She is also Chairperson of the 50 Degrees South Trust, established to further research and education on New Zealand's Subantarctic Islands (around 50°S latitude), and to support the preservation and management of these World Heritage ecosystems.

### CAREER HISTORY

2001 to current	EOS Ecology Aquatic Scientist (Principal)
2000 to 2001	Christchurch City Council Freshwater Ecologist
1997, 1999	NIWA Freshwater Technician
1997 to 1998	North Canterbury Fish and Game Assistant Environmental Officer

### RECENT AWARDS

- University of Canterbury Inspirational Alumni Award, April 2015.

### EXPERIENCE

- Principal scientist responsible for overseeing and managing a science team of seven staff, incorporating scientists, technicians and science support specialists.
- Ecology lead for the Avon River Precinct (ARP) and Northern/Eastern Frame Anchor projects – the key rebuild projects tasked with revitalising Christchurch city in the aftermath of the 2011 Christchurch earthquakes. Responsible for ensuring ecological input as a cornerstone of the design process, the key integration of ecology with urban and landscape design, and integrating critical habitat and stormwater management features to ensure the restoration of the river's health along with the creation of an outdoor multi-use space essential to a modern city.
- In-River detailed design and construction for the Avon River Precinct (ARP), Christchurch. Design leader and lead ecologist overseeing the construction phase for the in-river component of the ARP involving over 3km of urban river channel. Responsible

for the detailed design of inchannel works, sediment mapping and removal methodology development, riparian planting aimed to restore river processes and improve habitat. Also responsible for overseeing construction of all in-river works (as engineer to contract) to ensure ecological success.

- Expert panel member to assign sites of ecological significance in the Banks Peninsula area, relating to aquatic ecology.
- Specialist Ecology Technical Advisor for CERA regarding the ARP and Canterbury Earthquake National Memorial.
- Ecology lead for the Dudley Creek flood remediation programme, Christchurch.
- Project coordinator for, and driver of, the multidisciplinary 14-person research expedition to Campbell Island in Dec 2010–Feb 2011, involving research and investigations encompassing botany, freshwater ecology, terrestrial invertebrates, and human history, and with post-expedition research outputs spanning three years. Also responsible for the communication strategy during the expedition and post-expedition output strategy.
- Research leader of a three-person freshwater ecology team undertaking the most comprehensive study of Campbell Island's freshwater systems during an 11 week expedition in Dec 2010–Feb 2011. Development and implementation of the field programme and post-expedition research outputs including the 2014 publication of identification keys for the freshwater invertebrate taxa of the island.
- Presenter at professional workshops, seminars and conferences relating to freshwater ecology and management, and public presentations regarding aquatic ecology matters.
- Project manager for a broad range of research projects, monitoring programmes, and consent-related environmental assessment programmes within the freshwater and estuary fields.
- Lead ecologist for waterway channel diversion and naturalisation projects, with the aim to improve instream values and biodiversity. Included providing habitat and biological design requirements to project landscape architects and engineers, reviewing design documents and plans, and on-site ecological management of the construction phase.
- Author and peer reviewer of consent-related reports (AEEs, SARs, NORs) on freshwater and estuary ecology to support resource consent applications relating to various land use practices, including water abstraction, hydro schemes, land development (urban subdivisions, integrated catchment management plans), sewage discharges, stormwater discharges, infrastructure (roading, motorways, bridges, culverts, and sewers), and coastal works. Presentation of expert evidence at consent hearings relating to these matters.
- Advice and reporting on catchment management planning designed to protect and enhance waterways in urban and rural catchments.
- Independent auditing and provision of expert advice on resource consent applications on behalf of Regional Councils, pertaining to aquatic ecology and stormwater discharges.
- Author of multiple client-oriented reports on the health of urban and rural waterways systems and estuaries, incorporating spatial and temporal comparisons and their potential for ecological enhancement. Research looking at the effects of heavy metal and PAH contamination of biofilms on aquatic invertebrate grazers.
- The design and implementation of long-term monitoring programmes for assessing the success of restoration projects, long-term changes to ecosystem health, resource consent monitoring programmes, and for community monitoring groups.

- Designing and overseeing the implementation of stormwater monitoring programmes to test the efficiency of stormwater treatment systems, identify the problem and source of sediment entering river systems, catchment monitoring of stormwater from different land use types and stormwater systems.
- Research and design input into stormwater treatment systems with the aim to reduce mosquito breeding habitat. Research into the use of city sumps and stormwater treatment systems as potential mosquito breeding habitat.
- Editor and author of a national guide for the management and restoration of waterways and wetlands, design of stormwater treatment systems, and drainage issues (e.g., the CCC's 'Waterways, Wetlands and Drainage Guide'). Developed for use by a broad range of practitioners dealing with waterway and drainage design; from project managers to engineers.
- Development (in conjunction with NIWA) of the Christchurch River Environment Assessment Survey (CREAS) protocol and waterway impact score, designed to assist the Christchurch City Council in their management of the city's waterways.
- Natural history photographer, including underwater photography and experience as an expedition photographer and videographer.

## REPORTS, PUBLICATIONS & CONFERENCE PAPERS (SELECTION FROM 2011-2015)

- McMurtrie, S. 2015. Heavy metals in fish and shellfish: 2014 survey. EOS Ecology, Christchurch, New Zealand. EOS Ecology Report No. 08002-ENV01-04. 15 p.
- McMurtrie, S.A., Sinton, A.M.R., & Winterbourn, M.J., 2014. *Lucid identification key to the freshwater invertebrate taxa of Campbell Island*. Includes associated information sheets. EOS Ecology, Christchurch.
- McMurtrie, S.A., Sinton, A.M.R. & Winterbourn, M. J., 2014. *Lucid identification key to the freshwater Chironomidae of Campbell Island*. Includes associated information sheets. EOS Ecology, Christchurch.
- McMurtrie, S. & Suren, A. 2014. Proposed Waitaha hydro scheme assessment of environmental effects: Benthic ecology of the Waitaha catchment. EOS Ecology, Christchurch. EOS Ecology Report No. 06003-ELE01-02. 148 p.
- Drinan, T. & McMurtrie, S. 2014. Proposed Waitaha hydro scheme assessment of environmental effects: Fish of the Waitaha Catchment. EOS Ecology, Christchurch. EOS Ecology Report No. 06003-ELE01-03. 111 p.
- McMurtrie, S. 2014. Five steps to restoring and protecting waterways in urbanising catchments. EOS Ecology, Christchurch. One Day Symposium - Life on the Edge: Managing our rural/urban fringe environments. Novatel, Christchurch, March 2014.
- McMurtrie, S., James, A. & Meurk, C. 2013. Avon River Precinct, North & East Frames ecology report: turning aspiration into action. EOS Ecology, Christchurch. EOS Ecology Report No. 12033-OPU01-01. 82 p.
- McMurtrie, S. & James, A. 2013. Cashmere Stream: Reducing the pressures to improve the state. EOS Ecology, Christchurch. EOS Ecology Report No. 10049-ENV01-01. 49 p.
- McMurtrie, S & Kennedy, S. 2012. Exploring an Estuary: A Field Guide to the Avon-Heathcote Estuary/Ihutai Christchurch. Avon-Heathcote Estuary Ihutai Trust, Christchurch. 50 pp.
- McMurtrie, S. 2011. Christchurch February earthquake - Effect on invertebrates of the lower rivers. EOS Ecology, Christchurch. EOS Ecology Report No. 11013-CIV01-01. 9 p.