

Environmental and Animal Sciences / Biosecurity:

Research Partnership Capabilities



www.unitec.ac.nz

Purpose

To provide an overview of the capabilities of the Unitec Institute of Technology's Environmental and Animal Sciences Pathway and the Biosecurity Research team, and to explore potential opportunities for research partnerships.

Who are we?

The Environmental and Animal Sciences Pathway delivers a range of programmes including in taxonomy, genetics, ecology, botany, zoology, microbiology, plant pathology, geographic information systems, communication and advocacy. In addition, we host the Applied Molecular Solutions Research Focus, one of Unitec's two Strategic Research Foci. Our research focuses on using existing technologies and developing new approaches to address problems and questions facing our industry stakeholders and community with a focus on:

- Biodiversity assessment
- Detection of pest species and pathogens and the diagnosis of disease
- Studying the underlying genetic causes of diseases and their spread
- Assessment of animal welfare

What can we offer?

The Biosecurity team is looking to broaden the range of industries and disciplines we engage with. Unitec has the capability in biodiversity and biosecurity research to partner with industry and client organisations in a cost-efficient and mutually beneficial manner.

We are keen to engage and discuss your research needs with you, and investigate opportunities for us to provide you with appropriate bespoke solutions.

Background

Unitec Institute of Technology's Environmental and Animal Sciences group has taught in the fields of biodiversity and biosecurity for 15 years. Graduates of our Bachelor of Applied Science (Biodiversity Management) degree have moved into employment with a range of organisations including the Ministry of Primary Industries, the Department of Conservation, Auckland Council and a number of environmental consultancy firms.

Our strengths in the education space allowed for the formation of a strong research team in 2016, Applied Molecular Solutions, and the development of a range of in-house facilities and capabilities as part of Unitec's Research and Enterprise Office.

EXPERTISE AREA 1 - Taxonomy and genetics of invasive species

KEY STAFF:

- Dr Andrew Veale (*Molecular approaches to wildlife management*)
- Associate Professor Mark Large (*vascular plants including ferns*)
- Associate Professor Dan Blanchon (*vascular plants and fungi*)
- Dr Peter de Lange (*vascular plants*)
- Erin Doyle (*invertebrates*)
- Associate Professor Stephane Boyer (*invertebrates*)
- Dr Marie-Caroline Lefort (*invertebrates*)

SELECTED PUBLICATIONS:

Veale A.J., Holland O., McDonald R.A., Clout M.N., Gleeson D.M. (2015). An invasive non-native mammal population conserves genetic diversity lost from its native range. *Molecular Ecology*, 24, 2156 – 2163.

Lefort, M.-C., Barrat, B., Marris, J., & Boyer, S. (2013). Combining molecular and morphological approaches to differentiate the pest *Costelytra zealandica* (White) (Coleoptera: Scarabeidae: Melolonthinae) from the non-pest *Costelytra brunneum* (Broun) at the larval stage. *New Zealand Entomologist* (Vol. 36).

Large, M. F., & Farrington, L. (2016). The *Nephrolepis* cv. Boston fern complex (including *Nephrolepis exaltata* L. Schott), Nephrolepidaceae, naturalised in New Zealand. *Unitec ePress Perspectives in Biosecurity Research Series* (Vol. 2(2016)).

Heenan, P.B, de Lange, P.J., Cameron, E., Parris, B. S. (2008). Checklist of dicotyledons, gymnosperms, and pteridophytes naturalised or casual in New Zealand: Additional records 2004–06. *New Zealand Journal of Botany* 46(2):257-283

EXPERTISE AREA 2 - Ecology and impacts of invasive species

KEY STAFF:

- Dr Mel Galbraith
- Dr Diane Fraser
- Dr Andrew Veale
- Associate Professor Nigel Adams
- Associate Professor Dan Blanchon
- Graham Jones
- Erin Doyle

SELECTED PUBLICATIONS:

Waters, J., Fraser, D., Adams, N. J., Blackie, H., & MacKay, J. (2017). Increasing possum interaction rates with chew cards using new formulation lures. *New Zealand Journal of Zoology*, 44(2), pp.91-98. doi:10.1080/03014223.2016.1257494

Fraser, D., Galbraith, M., Adams, N., and Blanchon, D. (2014). Range expansion of the spur-winged plover (*Vanellus miles novaeohollandiae*) in New Zealand. *Notornis*. 61: 49-53.

Jones, G., Fraser, D., Lallu, U., & Fenwick, S. J. (2016). *Perceptions and Impacts: An Observational Pilot Study of the Effects of Argentine Ants on Honey Bees in New Zealand*. Unitec ePress Perspectives in Biosecurity Research Series (Vol. vol 1). <http://hdl.handle.net/10652/3420>

Veale A.J. McMurtrie P., Edge K-A., Clout M.N. (2015) The effects of mice on stoats in southern beech forests. *Austral Ecology*. 40, 32-39

Nessia, H. R., Dale, A. R., Perrott, J. K., Waipara, N.W., Aguilar, G.D., and Blanchon, D. J. (2014). Comparison of species richness and frequency cover of forest floor plants and lichens in sites invaded and uninvaded by the invasive club moss *Selaginella kraussiana* (Kunze) A. Braun. *Plant Protection Quarterly*, 29(2): 66-70.

Blanchon, D., Pusateri, J., Galbraith, M., and Thorpe, S. (2011). Sampling indigenous ground-living beetles in a stand of non-native tree privet (*Ligustrum lucidum*) in New Zealand raises new management questions. *Ecological Management and Restoration*. 12(3): 234-236.

EXPERTISE AREA 3 - Mapping and modelling current and potential future distributions of invasive species, remote sensing

KEY STAFF:

- Dr Glenn Aguilar

SELECTED PUBLICATIONS:

Slingsby-Jones, C., Galbraith, M., and Aguilar, G. (2011). *Potential impact and distribution of the common house gecko Hemidactylus frenatus in New Zealand.* New Zealand Biosecurity Institute National Education and Training Seminar 2011, Takapuna, Auckland

Aguilar, G. D., Blanchon, D. J., Foote, H., Pollonais, C. W., & Mosee, A. N. (2017). *A performance based consensus approach for predicting spatial extent of the Chinese windmill palm (Trachycarpus fortunei) in New Zealand under climate change.* *Ecological Informatics*, 130, pp.130-139. doi:<https://doi.org/10.1016/j.ecoinf.2017.04.004>

Aguilar, G., and Farnworth, M. (2013). *Distribution characteristics of unmanaged cat colonies over a 20-year period in Auckland, New Zealand.* *Applied Geography*, doi: 10.1016/j.apgeog.2012.11.009 (Vol. 37).

Aguilar, G., Blanchon, D., Foote, H., Pollonais, C., & Mosee, A. (2015). *Queensland Fruit Fly Invasion of New Zealand: Predicting Area Suitability Under Future Climate Change Scenarios.* *Unitec ePress Perspectives in Biosecurity Research Series (Vol. 2).*

Fraser, D., Aguilar, G., Nagle, W., Galbraith, M., & Ryall, C. (2015). *The House Crow (Corvus splendens): A Threat to New Zealand?* *International Journal of Geo-Information (Vol. 4(2)).*

EXPERTISE AREA 4 - Surveying for potential naturally-occurring biological control agents within New Zealand (including mycoherbicides)

KEY STAFF:

- Associate Professor Dan Blanchon
- Associate Professor Stephane Boyer
- Dr Marie-Caroline Lefort
- Dr Judy Nicholson
- Erin Doyle

SELECTED PUBLICATIONS:

McClymont, M.; Waipara, N.; Nessia, H; Blanchon, D. J. (2013) *First record of Phoma selaginellicola on Selaginella kraussiana (African clubmoss): an invasive plant species in New Zealand.* *Plant Pathology and Quarantine* 3: 140-143.

McClymont, M.; Nessia, H.; Waipara, N.; Blanchon, D. J. (2013) *First report of Pestalotiopsis clavisporea from Selaginella kraussiana (African club moss): an invasive plant species in New Zealand.* *Australasian Plant Disease Notes* 8: 79-80.

EXPERTISE AREA 5 - Other control methods

KEY STAFF:

- Associate Professor Nigel Adams
- Dr Lorne Roberts
- Associate Professor Dan Blanchon
- Associate Professor Mark Large
- Dr Kristie Cameron
- Dr Diane Fraser

SELECTED PUBLICATIONS:

Blanchon, D. J., Elliott, C. E. A., Ennis, I. L., Lewthwaite, J. R., Large, M. F., and Bussell, W. T. (2011). *Biosecurity in the floriculture industry: The use of herbicide dipping as a devitalisation method for imported cut roses and horsetails*. New Zealand Biosecurity Institute National Education and Training Seminar 2011. Takapuna, Auckland.

Large, M. F., Blanchon, D. J., Angus, M. L. (2006) *Devitalisation of imported horsetail (Equisetum hymale L.) (Equisetaceae)*. *New Zealand Journal of Crop and Horticultural Science* 34: 151-153.

Blanchon, D.; Ennis, I.; Lewthwaite, J.; Large, M.; Bussell, W. (2012) *Improved methods of the devitalisation of imported horsetail (Equisetum hyemale)*. *New Zealand Journal of Crop and Horticultural Science* 40: 21-30.

Orr-Walker, T., Adams, N.J., Roberts, L., Kemp, J. R., and Spurr, E.B. (2012). *Effectiveness of the bird repellents anthraquinone and d-pulegone on an endemic New Zealand parrot, the kea (Nestor notabilis)*. *Applied Animal Behaviour Science* (Vol. 137).

Waters, J., Fraser, D., Adams, N. J., Blackie, H., & MacKay, J. (2016). *Increasing possum interaction rates with chew cards using new formulation lures*. *New Zealand Journal of Zoology* (Vol. 0(0)).

Cameron, K. E., Adams, N. J., Wassenaar, R. J., Bistricher, A., Brown, K. J., Halliday, A. D., Lodge-Osborn, K., Robson, E. A., Jones, G., Salinsky, J. R., & Fraser, D. L. (2016). *The effectiveness of a commercially available bird repellent on house sparrows (Passer domesticus)*. *Annual Science Week Australian and New Zealand College of Veterinary Scientists, Gold Coast, Australia*.

EXPERTISE AREA 6 - Communication, advocacy, public attitudes and policy

KEY STAFF:

- Associate Professor Nigel Adams
- Unitec Marketing and Communications Departments
- Dr Diane Fraser

SELECTED PUBLICATIONS:

Neverman, C., Lardner, J., Shields, B., Waipara, N., Adams, N., & Fraser, D. (2017, August). *Biosecurity awareness of ferry passengers travelling to selected islands in the Hauraki Gulf*. Paper presented at New Zealand Biosecurity Institute (NETS) Conference, Wellington, New Zealand.

Graham, C., Dabb, H., Cook, J., Waipara, N., Adams, N., & Fraser, D. (2016). *Getting the message out: Managing & promoting biosecurity awareness in the Hauraki Gulf Marine Park*. New Zealand Biosecurity Institute NETS Conference, Auckland, New Zealand.

Farnworth, M.J., Watson, H., and Adams, N.J. (2014). *Understanding Attitudes Toward the Control of Nonnative Wild and Feral Mammals: Similarities and Differences in the Opinions of the General Public, Animal Protectionists, and Conservationists in New Zealand (Aotearoa)*. *Journal of Applied Animal Welfare Science* (Vol. 17).

Hall, C. M., Adams, N. J., Bradley, J. S., Bryant, K. A., Davis, A. A., Dickman, C. R., Fujita, T., Kobayashi, S., Lepczyk, C. A., McBride, E. A., Pollock, K. H., Styles, I. M., van Heezik, Y., Wang, F., & Calver, M. C. (2016). *Community attitudes and practices of urban residents regarding predation by pet cats on wildlife: an international comparison*. *PLOS ONE* (Vol. 11(4)).