



THE UNIVERSITY  
OF AUCKLAND

FACULTY OF SCIENCE

2015

## Faculty of Science

Postgraduate Diploma and Masters Degree  
Biosecurity and Conservation



# Welcome



Do you want to play a vital role in protecting New Zealand's natural treasures? Pursue a postgraduate qualification in biosecurity and conservation at a university that is a global leader in biosecurity and conservation education.

You'll undertake advanced training in invasion biology and the science behind current biosecurity and conservation issues alongside leaders in the fields. You'll work on real-life research and management and network with future employers, gaining the confidence and skills to contribute to the rapidly growing fields of biosecurity and conservation.

The qualifications are jointly offered by the School of Biological Sciences and the School of Environment in partnership with Landcare Research through the Centre for Biodiversity and Biosecurity (CBB).

Dr Margaret Stanley  
Programme Director, School of Biological Sciences  
University of Auckland  
Email: [mc.stanley@auckland.ac.nz](mailto:mc.stanley@auckland.ac.nz)  
Web: [www.biodiversity-biosecurity.auckland.ac.nz](http://www.biodiversity-biosecurity.auckland.ac.nz)



# Admission and enrolment procedures

The Postgraduate Diploma in Science (PGDipSci) specialising in Biosecurity and Conservation consists of one year of coursework. If you would prefer to do a Masters Degree, you can do an additional 'research only' year following the PGDipSci (if you meet entry requirements).

## What are the requirements?

Candidates for entry to the PGDipSci in Biosecurity and Conservation must have a BSc (some undergraduate ecology courses preferred) or equivalent experience (subject to approval). Eight courses are required per year for the one year, full time diploma. You can undertake the diploma on a part-time basis, but you must be enrolled in consecutive semesters and complete within four years. Intake is mid-year and end of year.

## To apply:

[www.auckland.ac.nz/apply](http://www.auckland.ac.nz/apply)

## Applying for the Masters

## programme

To undertake the MSc in Biosecurity and Conservation (research only), you must have satisfactorily completed the PGDipSci (at least a B- average in the best 90 points of the PGDipSci, including BIOSCI 761) and have filled in the supervision agreement form found in the School of Biological Sciences postgraduate handbook. You can approach one of our many staff about possible research MSc topics during this time.

## Further information

Faculty of Science Student Centre  
Room G016, ground floor  
Building 303 (Maths/Physics Building)  
38 Princes St  
[pgscience@auckland.ac.nz](mailto:pgscience@auckland.ac.nz)

Dr Margaret Stanley  
Programme Director  
School of Biological Sciences  
Ph: + 64 9 373 7599 ext 86819  
Email: [mc.stanley@auckland.ac.nz](mailto:mc.stanley@auckland.ac.nz)



# Regulations and courses

To gain the PGDipSci in Biosecurity and Conservation, students need to take all three prescribed courses plus five other approved courses.

## Enrolment regulations :

### Postgraduate Diploma in Science in Biosecurity and Conservation

- Prerequisite: An approved BSc or equivalent experience subject to approval.
- Requirement: 8 courses (120 points)
- Three prescribed courses (45 points): BIOSCI 747, BIOSCI 748, ENVSCI 733
- Five additional courses, at least three (45 points) of which must be ENVSCI 701 or BIOSCI 761, BIOSCI 724, BIOSCI 730, BIOSCI 733, BIOSCI 734, BIOSCI 735, BIOSCI 738, BIOSCI 751, ENVMGT 742, ENVMGT 743, ENVMGT 746, ENVSCI 716, ENVSCI 734, ENVSCI 737.

The remaining 30 points: approved 700 level courses in the Faculty of Science.

### MSc in Biosecurity and Conservation

- Prerequisite: PGDipSci in Biosecurity and Conservation (including BIOSCI 761 OR ENVSCI 701 if supervised by School of Environment staff)
- Requirement:
  - 60 points: BIOSEC 796A
  - 60 points: BIOSEC 796B
- Supervision Agreement Form required (see SBS Postgraduate Handbook)

## COURSES

<b>Core (Must take all 3)</b>	
BIOSCI 747	Biosecurity and Invasion Biology
BIOSCI 748	Weed and Pest Management
ENVSCI 733	Biodiversity Management and Conservation
<b>Electives (must take at least 3)</b>	
BIOSCI 724	Marine Ecology
BIOSCI 730	Entomology and Biosecurity
BIOSCI 733	Molecular Ecology and Evolution
BIOSCI 734	Terrestrial Plant Ecology
BIOSCI 735	Advanced Behavioural Ecology
BIOSCI 738	Advanced Biological Data Analysis
BIOSCI 751	Advanced Plant Pathology
*BIOSCI 761	Research Planning and Communication
ENVSCI 716	Aquatic Ecological Assessment
ENVSCI 734	Landscape and Restoration Ecology
ENVSCI 737	Applied Terrestrial Ecology
ENVMGT 742	Social Dimensions of Global Environmental Change
ENVMGT 743	Environmental Policy and Governance
ENVMGT 746	Collaborative Environmental Management

\*Prescribed if intending to apply for the MSc

# Masters research

## Master of Science in Biosecurity and Conservation:

To achieve the Master of Science in Biosecurity and Conservation, you must first successfully complete the Postgraduate Diploma, then complete a one year research project.

## Masters (MSc) research topics

Our students carry out work on a wide range of biosecurity, biodiversity and conservation topics. For example:

- Foraging ecology and translocation physiology of the mottled petrel (*Pterodroma inexpectata*)
- The space used by the short-tailed bat (*Mystacina tuberculata*) in relation to its nectivorous diet and interactions with *Dactyanthus taylorii*
- The ecological relationship between Cook's scurvy grass (*Lepidium oleraceum s.s.*) and seabirds
- The spatial extent of biodiversity outcomes from mammalian predator pest management
- Impacts of introduced herbivores on sand dune restoration
- The ecology and impact of the introduced eastern rosella in New Zealand
- The importance of invertebrates in decomposing coarse woody debris
- Restoration of pollination and seed dispersal in mainland islands
- Impacts of *Anoplolepis gracilipes* (yellow crazy ant) on invertebrate communities in Samoa
- Response of fruit fly populations to new management tools in mango orchards in Vietnam
- Population dynamics and behaviour of a founder population of house mice
- The potential invasiveness of Moreton Bay fig (*Ficus macrophylla Moraceae*) in NZ
- The feeding ecology of native New Zealand dung beetles
- Trophic interactions between geckos and honeydew-producing scale insects
- Pollination ecology of native New Zealand orchids and the role of introduced species

You can approach one of our many staff in the School of Biological Sciences or School of Environment about possible research MSc topics (see the School websites or the Joint Graduate School website).

## Joint Graduate School (JGS) in Biodiversity and Biosecurity

The University of Auckland and Landcare Research, two of New Zealand's leading research organisations in environmental science and ecology research, joined forces to create the Joint Graduate School in Biodiversity and Biosecurity (JGS) as part of the Centre for Biodiversity and Biosecurity (CBB).

MSc (Biosecurity and Conservation) students are an important part of the JGS. The JGS supports postgraduate students undertaking research to help maintain New Zealand's terrestrial ecosystems and to enable our natural flora, fauna and fungi to flourish.

Postgraduate students at the JGS come from a wide range of backgrounds, cultures and fields of interest.

For more information visit:

[www.biodiversity-biosecurity.auckland.ac.nz](http://www.biodiversity-biosecurity.auckland.ac.nz)

# Career opportunities

Both qualifications prepare students for employment in the biosecurity and conservation sector in organisations such as the Ministry for Primary Industries, local government, research consultancies, private pest-control companies, non-governmental conservation organisations, the Department of Conservation, Crown Research Institutes and the tertiary education sector.

## What employers say

“Auckland Council Biosecurity fully supports the Postgraduate Diploma in Science in Biosecurity and Conservation. Course content is entirely relevant to the biosecurity functions of regional councils and the Department of Conservation. This includes planning, managing and monitoring functions, as well as core technical areas like species identification and control. I have employed graduates and supported staff to gain the diploma. In my view, this diploma offers the best path for a graduate hoping to gain employment in the ever-expanding biosecurity field. This course is also fun.”

Jack Crow, Manager Biosecurity, Auckland Council (2013)

## Where our graduates are

### *In New Zealand*

- Pursuing doctorates
- Department of Conservation
- Auckland Council and other local authorities
- Ministry for Primary Industries
- AsureQuality
- NIWA
- Landcare Research
- University of Auckland
- Te Ngāhere - Native Forest Management
- Environmental Consultancies

### *Overseas*

- Pursuing doctorates
- Department of Energy and Environmental Protection, Connecticut, US
- Fire Island National Seashore, New York, US
- Scottish Natural Heritage, UK
- British Museum, UK
- Discovery Channel, UK
- Department of Agriculture, Vietnam



Photo Credit: Anna Probert

## MEET OUR GRADUATES



**Don McKenzie** is Biosecurity Senior Programme Manager for Northland Regional Council in Whāngārei.

*"I rate this course and the management behind the curriculum as the best in New Zealand. The course directors understand the biosecurity industry and provide a flexible structure so that the diploma can be spread over time. This was important for me as I could only attempt the study part-time.*

*The papers have direct relevance to biosecurity and biodiversity work and have given me a much better understanding of the science behind these two themes. The lecturers are involved in new biosecurity science and the Tamaki campus hosts Landcare Research, which provides a great opportunity to connect with other science students and researchers who are at the leading edge of biosecurity issues."*



**Oriana Brine**, Adviser, Plants and Environment Response, Ministry for Primary Industries

*"Having a PGDipSci in Biosecurity followed by an MSc in Marine Science from the University of Auckland really helped in securing my job with the Ministry for Primary Industries (MPI). My MSc had a marine biosecurity focus and looked at whether biofouling on the hulls of recreational boats kept on swing moorings and marina berths posed a risk of transporting invasive species.*

*Working at MPI is a great opportunity, as it allows me to write about and communicate scientific issues in a manner that the media, members of the public, and Government can engage in to implement new knowledge. I develop readiness*

*and response strategies and plans, contribute to and/or lead responses against pests and diseases, develop response plans and tools, and manage the contracts for the effective delivery of response operations and readiness".*



**Josie Galbraith** is a PhD student in the School of Biological Sciences. She has a MSc in Biosecurity and Conservation.

*"I have always been fascinated by the natural world, by things that crawl, fly and walk, and how they interact with their environment. I completed an MSc in Biosecurity and Conservation, studying the ecology and impact of an introduced parrot, the eastern rosella, focusing on competition with native species for cavity nest sites, the capacity for rosella to act as reservoirs of disease, and factors affecting rosella detection during surveys.*

*This research, along with postgraduate classes, has equipped me with a sound knowledge of ecological theory and a broad set of practical field skills. It has also provided the opportunity to refine my scientific writing skills and share my research with the wider community through public talks. These skills are a strong foundation for my research endeavours, particularly my current PhD research on the impact of supplementary feeding on the success of introduced bird species."*



**Jennifer Waite** is a ranger on the Kākāpō Recovery Project. She has a MSc in Biosecurity and Conservation.

*"Growing up, I loved the outdoors and wanted to work in conservation. I completed my MSc in Biosecurity and Conservation, looking at the effects of vertebrate pest management on plant reproduction, trying to establish whether pest management alone is able to restore these processes for the endemic nikau palm.*

*Since leaving university, I have worked for the Department of Conservation firstly as a ranger at the Rotoiti Nature Recovery Project and currently as a seasonal ranger on the Kākāpō Recovery Project. My postgraduate studies gave me good theoretical conservation knowledge as well as skills like critical thinking and problem-solving that I have found very useful."*



**Rob Dunn** has a MSc in Biosecurity and Conservation.

*"The Joint Graduate School in Biodiversity and Biosecurity was friendly and inviting, and I received support and guidance in every aspect of my research and related extra-curricular interests. I benefited most from the networking opportunities with my peers and colleagues from within the university itself, other universities, research institutes and conservation organisations.*

*In the 2013 Northern Hemisphere summer, I was employed by the National Trust for Scotland to design and implement a monitoring programme to follow seabird population and productivity trends on the island of Mingulay, in the Outer Hebrides.*

*The 911ha island had no running water, no toilet or electricity and only the occasional visitor. With volunteers, I took repeat counts throughout the season of Atlantic puffins, black-legged kittiwakes, common guillemots, common terns, European shags, great skuas, northern fulmars and razorbills along the island's 20km of coastline. I watched the daily hustle and bustle of seabird life on land as I followed the status of 1500 nests with the aid of annotated photographs and a high-powered telescope. "I am now considering pursuing a PhD."*



**Debbie Geddes**, Quarantine Inspector for the Ministry for Primary Industries

*"As an undergraduate, I always knew that working in the biosecurity sector was what I wanted to do. After graduation I lived abroad for a few years, then returned to New Zealand and university. It was nerve-wracking returning to study after so long, but I knew this course was the one for me. There was no need to be nervous, as the course structure and lecturers made my transition back to study feel relaxed and natural. I found the papers were very relevant, preparing me extremely well for a career in the biosecurity sector.*

*Today, I work as a Quarantine Inspector for the Ministry for Primary Industries and am absolutely loving it. The job is extremely versatile and incredibly busy, spanning passenger and cargo pathways with no two days ever being the same. It is so*

*satisfying practising such raw biosecurity, knowing that I am making a difference helping to protect New Zealand's precious industries."*



**Gonzalo Avila** is a PhD candidate. He has a MSc in Biosecurity and Conservation.

*"During my undergraduate studies in forestry I became really passionate about forest entomology, and especially the detection, monitoring and control of forestry pests. I completed my MSc in Biosecurity in 2012, working in the biological control program against the gum leaf skeletoniser which is causing serious damage to eucalyptus species in New Zealand.*

*My study has not only provided me with all the necessary skills to develop in the field of forest biosecurity and biological control of arthropods, but has been of great help to develop as a scientist. I am now doing a PhD on the behavioural ecology and host-parasitoid interactions of the recently introduced biological control agent *Cotesia urabae*."*

Cover image: Andreas Ross



**THE UNIVERSITY  
OF AUCKLAND**

**FACULTY OF SCIENCE**

School of Biological Sciences

## Contact

Faculty of Science Student Centre, The University of Auckland  
Private Bag 92019, Auckland 1142, New Zealand

Phone: 0800 61 62 63 | Email: [pgscience@auckland.ac.nz](mailto:pgscience@auckland.ac.nz)

Web: <http://www.science.auckland.ac.nz/en/about/subjects-and-specialisations/subjects-and-specialisations-at-postgraduate-level/biosecurity.html>