NIWA
Taihoro Nukurangi

Capability Development for Surveys of Non-indigenous Marine Organisms in Vanuatu

Vanuatu Baseline Port Surveys

Prepared for Vanuatu Government

July 2015

Prepared by:
Graeme Inglis

For any information about this proposal please contact:

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NIWA Proposal No: PCHC2015-025
NIWA Project:

Quality Assurance Statement		
	Reviewed by:	Michelle Kelly
	Formatting checked by:	Tracy Webster
	Approved for release by:	Charles Pearson

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1 Introduction

1.1 Background

The Vanuatu Government has, with support from the Japan International Cooperation Agency (JICA), initiated a project to refurbish and expand Lapetasi Wharf in Port Vila (Port Vila Lapetasi International Multi-Purpose Wharf). The aim is to increase the country's capacity to deal with international freight and cruise ship tourism. The development entails construction of a new multi-purpose wharf facility of ~200 m that is capable of berthing two large vessels (cruise ships or container ships) at the same time. Engineering work for the project has begun and the new facility is expected to be completed in 2016.

1.2 Our understanding of your requirements

To support environmental management of the Lapetasi International Wharf development, the Vanuatu Government has requested a proposal from NIWA to provide training and assistance to local personnel to undertake a port biological baseline survey (PBBS) for non-indigenous marine species in Port Vila. The aim is to create local capability and resources to facilitate future monitoring for non-indigenous marine species in Vanuatu.

The specific deliverables requested by the Vanuatu Government are to provide:

- training in the design and implementation of surveys for non-indigenous marine species to the Vanuatu NISTAC (Invasive Species Committee) and staff from the Vanuatu Fisheries Department,
- a survey design and templates to enable implementation of the survey,
- assistance with identification of collected specimens,
- purchase and delivery of a suitable binocular microscope, and
- assistance with reporting on the survey.

1.3 Scope of the project

Preliminary discussions about the proposal with staff from the Vanuatu Government and the Secretariat of the Pacific Regional Environment Programme (SPREP) have indicated that the expectation is **not** that NIWA will undertake a full biological baseline survey, but that it will provide training and assistance to personnel within Vanuatu to allow them to implement a survey. With this in mind, we have budgeted for an in-country visit of 5 days by a 3 person project team from NIWA with expertise in: (i) the design and implementation of surveys for non-indigenous marine species, (ii) taxonomy of tropical marine organisms, and (iii) training and supervision of scientific diving. The research team will provide classroom and hands-on training in survey design, sample collection, identification and vouchering of specimens. It will also assist with specimen identification and preparation of a survey report.

The client has also requested that NIWA purchase a binocular microscope for use in the survey, which would be retained by the Vanuatu Government on completion of the training. We have provided a price for purchase of the following equipment:

- Nikon SMZ745T stereomicroscope

  http://www.nikoninstruments.com/Products/Light-Microscope-Systems/Stereomicroscopes-and-Macroscopes/Stereomicroscopes/SMZ745

The microscope is equipped with a magnification range of 6.7x to 50x.

Also included in our price are:

- a 0.5x lens and extension ring to enable lower magnification to approximately 3.4x magnification, and
- a TS-TruChrome HDMI **Colour Microscope Camera** with USB to laptop capability. The microscope camera will allow in-country personnel to take high quality images of specimens, which they may then relay to international experts for identification by email or in real-time, using Skype or other two-way internet video. On-line microscopes are a useful tool for taxonomic training and collaboration with international experts. NIWA will provide assistance in the set-up of the camera and training in its use during the field survey.

1.4 Purpose

This proposal is provided solely for the purpose of demonstrating to you NIWA's ability to provide the services and for no other purpose. The proposal may not be used by or distributed to a third party for any other purpose without NIWA's prior written consent.

2 Methods

The NIWA project team will deliver:

- 1 day of classroom training and exercises that will cover:
  - the design and implementation of marine pest surveys,
  - reporting of marine pest surveys.
- 4 days of practical, hands-on training in:
  - the survey methods,
  - handling, photographing, labelling and preservation of specimens,
  - use of taxonomic guides and other resources to identify specimens to the highest possible level.
- assistance with identification of specimens and reportin

2.1 Classroom training

The classroom training exercises will cover:

- the different types and purposes of marine pest survey
- methods for defining the survey area

- methods to identify the types of sites to be sampled and how they are prioritised
- methods to determine the type and number of samples to be taken
- procedures for handling, identifying and archiving specimens,
- Health & safety management, including for divers,
- Methods for data analysis and reporting, including:
  - Scoping the content and format, and
  - Sources of information.

The training will draw upon materials developed by NIWA for other, similar courses on marine pest surveys (Inglis 2009; Inglis 2010; Inglis and Floerl 2008), but will have a specific focus on the risks to Port Vila and Vanuatu from invasive marine species.

2.2 Field survey and training

2.2.1 Field survey

We anticipate that the practical survey component will incorporate three general approaches:

- targeted dive searches for identified high-risk marine pest species ('target species'),
- video and quantitative sampling of fouling assemblages at high risk locations within Port Vila, including near the Lapetasi wharf development and,
- if time and resources allow, demonstration of survey methods for natural habitats (e.g., reefs, seagrass habitats and soft-sediments) within the environments of Port Vila.

2.2.2 Specimen collection and identification

The laboratory component of the training will involve:

- Use of taxonomic keys, photographic guides and other resources to identify specimens collected in the survey to the highest level possible.
- Labelling, preservation and archiving of specimens for future reference.

2.3 Reporting

NIWA will provide a report template for the survey that outlines the information that should be contained in each section of the report. The contents of the report and the methods for obtaining the information will be covered in the classroom training sessions.

NIWA will provide assistance to the NISTAC members to prepare and review a draft report on the outcomes of the survey.

2.4 Our understanding of your contributions to the project

To facilitate the work, we anticipate that the Vanuatu Government will provide the following in-country assistance to the NIWA project team:

2.4.1 Personnel

- **Project Liaison** to assist NIWA with in-country logistics in advance of, and during, the visit by NIWA staff
- **Scientific divers** - a minimum of **two** qualified divers from the Vanuatu Fisheries Department or other suitable agency
- **Boat skipper** – a qualified boat skipper from the Vanuatu Fisheries Department or other suitable agency

NIWA has not budgeted for the time and expenses of the in-country personnel and we assume they will be provided as in-kind assistance to delivery of the project.

2.4.2 Facilities & equipment

- Training / classroom facilities large enough to accommodate the NISTAC members, NIWA team and others involved in the survey or training
- A research vessel large enough to accommodate at least 3 divers, a boat skipper and dive equipment. The vessel should be fitted with:
  - a VHS radio or an alternative means of communicating with the Vanuatu Harbour Master and shipping
  - a visible dive flag.
- 1 hand-held or fixed GPS
- Laboratory facilities, including:
  - wet areas to sort the samples,
  - 1 light microscope
  - Sorting trays and forceps
  - Buckets and bins to carry equipment
  - Paper towels

2.4.3 Transport

NIWA has budgeted for hire of a single rental car for the 5 day visit to Vanuatu. We have not budgeted for transport of in-country personnel to the laboratory or field site.

2.4.4 Permissions

We anticipate that the in-country **Project Liaison** will obtain any necessary permits or consents for the field work to proceed. These may include permissions to:

- collect biological material or water samples
- dive and operate a vessel within the area of operations of the port and shipping facilities. The Port Vila Harbourmaster and shipping operations staff will need to be notified of the survey. Contact details will need to be provided to the field team to

ensure that the survey does not interfere with shipping movements and that the field personnel are not endangered by shipping

- access to restricted areas around the Lapetasi International Wharf development, where there is a need to sample nearby marine environments.

3 What we will deliver

3.1 Outputs

- Practical and classroom training in the design of port surveys for non-indigenous marine species and in the collection, identification and vouchering of specimens.
- Survey guides and taxonomic resource materials
- Templates for:
  - Sample labelling and tracking
  - Health & Safety compliance
  - Reporting the outcomes of the survey
- Purchase and delivery of a binocular microscope for laboratory work (to be retained by the Vanuatu Government on completion of the project),
- NIWA will assist the NISTAC members to complete the report by providing guidance and access to relevant information, methodologies and taxonomic expertise.

4 Timing and progress reports

Provided that this proposal is accepted and a contract signed by both parties by 31 August 2015:

- NIWA anticipates delivery of the training and survey in Port Vila in late September-early October 2015, although the timing is dependent on the availability of in-country staff within Vanuatu.
- The timing of delivery of the draft report will depend on any survey work undertaken by in-country personnel following the NIWA visit. A provisional date of 30 June 2016 will be subject to negotiation with the **Project Liaison**
- NIWA will keep the Vanuatu Government informed of progress by email and telephone communication.
- NIWA anticipates being able to complete the project and provide the Vanuatu Government with the project deliverables by 30 June 20[illegible]f this cannot be achieved for whatever reason, NIWA will discuss with you the reasons for this and work with you to agree an appropriate adjusted timeframe.

5 Fees, expenses, and payment schedule

This project has been planned and priced according to NIWA's standard rates. We have minimised our fees and expenses as far as is practical, consistent with achieving high operational efficiencies and delivering the project's outputs to the highest professional standard. The personnel assembled for this project have been chosen to ensure that the project's technical requirements, timeliness, safety and quality will be satisfied at the lowest practical cost taking into account all reasonably practical steps.

The estimated fees and expenses for the project total **$NZ 71,370 (excluding GST)**.

A breakdown of these fees and expenses is shown in Table 1. The price is quoted as a fixed sum in New Zealand dollars ($NZ). Table 1 also provides a comparison of the fee breakdown in United States dollars ($US) at the rate current for 3/08/02015.

Table 1: Fees and expenses summary.

Task	$NZ	*$US
Planning and logistics	$2,135	$1,407
Survey training and implementation	$56,480	$37,211
Assistance with reporting	$8,907	$5,868
Other disbursements – Purchase of a Nikon SMZ745T stereomicroscope and TS-TruChrome HDMI Colour Microscope Camera	$3,848	$2,535
Total (excluding GST)	**$71,370**	**$47,021**

*Calculated using a $NZ:$US exchange rate of 0.66 at 3/08/2015

The proposed payment schedule is shown in Table 2.

Table 2: Payment schedule proposed.

Payment/milestone	Fees and expenses ($NZ)	Payment date
Contract signed	$7,500	30 September 2015
Survey training completed	$54,963	20 December 2015
Final report completed	$8,907	30 June 2016
Total (excluding GST)	**$71,370**	

Following usual business practice, NIWA will invoice as milestones are achieved, with invoices falling due in accordance with the payment schedule.

5.1 Costs excluded from our pricing

The above fees and expenses **include** peer reviews by NIWA staff as part of our safety and quality management practice. There is no provision for external review of the sampling plans, data analyses and statistical methods, models and technical or final reports by other parties. Any revision to incorporate external feedback is likely to involve additional fees.

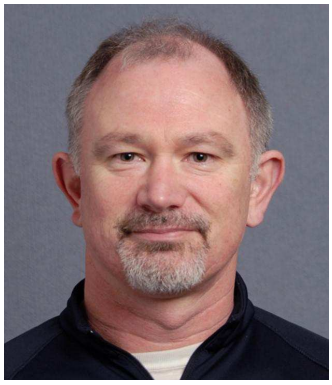
The costs provided in these budgets exclude GST and any costs associated with obtaining any necessary resource or other regulatory consents or approvals, unless specified above. Any such consents or approvals either will be arranged by the Vanuatu Government, or NIWA will obtain them and charge the client for this work based on actual time and expenses.

The fees and expenses are calculated based on the services agreed on acceptance of this proposal. Any change in the services may result in a change in the fees and expenses accordingly. We are happy to provide further estimates on request.

6 The project team and responsibilities

6.1 Project Manager

Dr Graeme Inglis



Dr Inglis is a Principal Scientist and leads NIWA's Marine Biosecurity research programme. He is a member of the IUCN Invasive Species Specialist Group, a Technical Advisor to the GEF/UNDP/IMO Global Ballast Water Management Programme and a member of the advisory committee for implementation of New Zealand's Biosecurity Surveillance Strategy. He has been project manager for more than 40 separate Port Biological Baseline surveys for non-indigenous marine species and has developed and delivered regional training programmes on marine pest surveys and management in Asia (Vietnam - 2004), the Red Sea and Gulf of Aden (Egypt - 2006), the Mediterranean (Turkey - 2008) and Pacific (Fiji – 2010, Vanuatu - 2010).

Dr Inglis' role as Project Manager is to manage and lead the project on a day-to-day basis, to NIWAsafe standards, deliver contracted outputs (deliverables) on time, within budget, within scope and to the required quality, and maintain a good business relationship with the customer.

The **Project Director** will be Charles Pearson.

The project director's role is to maintain a higher level overview of this project (and others) to ensure that the objectives are met to your satisfaction, and contracted outputs (deliverables) are delivered on time, within budget, within scope and to the required safety and quality.

6.2 Team members

Dr Michelle Kelly

Dr Kelly is a marine biologist and senior taxonomist within NIWA's biosystematics group. She has extensive experience in the collection, inventory, documentation, identification and description of sponge biodiversity in the Indo-Pacific and southwest Pacific region, and a strong working knowledge of other invertebrates from the region.

Dr Serena Wilkens

Dr Wilkens is the NIWA Project Manager for the Marine Invasives Taxonomic Service (MITS), a diagnostic and identification service for suspect marine organisms that is delivered under contract to the New Zealand Ministry for Primary Industries. She is also a Worksafe New Zealand accredited Occupational Diver, ADAS (Australian Diver Accreditation Scheme) Scientific Diver and PADI Instructor.

7 Project management, terms and conditions

7.1 NIWA's project management system and quality assurance system

As with all NIWA projects, this project will be managed within our comprehensive Project Management System. This controls progress, expenditure, hazards, quality and delivery.

The Project Management System also includes NIWA's in-house quality assurance system. NIWA is a member of the New Zealand Quality Foundation and part of the NZQF quality self-assessment accreditation programme.

NIWA's quality assurance system was developed specifically for its science-based activities. It utilises a rigorous peer-review quality assurance process. This process is integral to developing project proposals, reports and other deliverables. Review steps for each project include:

- at least one peer review of the proposal especially methods, approach, data management, analyses and resourcing;
- progress reviews, notably hours worked against total hours and milestone achievement, and
- review of project documents (e.g., technical or progress reports) prior to release.

The project management system is also integrated with NIWA's personnel performance & development management system. In addition NIWAsafe is central to successful project management with hazard management activity at each stage of the project's management.

7.2 Safety and Wellbeing Pathways to Zero Harm

NIWAsafe: Pathway to zero harm is the 2013 – 2016 Strategy to improve safety systems, leadership and behaviour as well as curative and preventative care in all NIWA business activity. Our aspiration is a zero harm safety target. We continuously strive to achieve this through: (1) improving our safety leadership, (2) focusing on personal decision making, and (3) proving excellence in safety and wellbeing management.

NIWAsafe is a central mechanism around which our project management work is planned and implemented. We maintain and actively update comprehensive safety information on our intranet which is linked to our Project Management System.

NIWAsafe policies, procedures, standards and guidelines are focussed on meeting all legislative and regulatory requirements of Maritime, Aviation, Hazardous Substance and Health and Safety in Employment safety concerns. This includes duties of care and responsibility to employees and contractors. We further strive to meet all client expectations of improved safety requirement over and above these legislative and regulatory requirements.

Information regarding NIWAsafe: Pathway to zero harm including critical risk safety management controls is available by contacting the relevant regional manager [insert name] at: [email]

All NIWA boating activities will operate under the NIWA Boating Code of Practice, which has the overall goal of achieving 'Safe and Successful Boating Operations' during the course of carrying out NIWA's research activities on NIWA-owned or NIWA contracted vessels. NIWA staff using boats hold commercial boating qualifications approved by Maritime NZ and have extensive field-based

expertise. In addition to this, all NIWA boats are assessed in terms of their fitness for purpose and are operated within an approved Safe Ship Management System (SSMS).

Underwater diving has been identified by Work Safe NZ as a hazardous activity and all NIWA divers have undergone full training and hold recognised certification for Occupational Scientific Diving. All authorised NIWA diving projects are conducted according to protocols laid down in the NIWA Code of Scientific Diving Practice (Diving Safety and Standards Manual). A copy of this code is registered with Work Safe NZ.

7.3 Insurance

NIWA carries comprehensive equipment and liability insurance cover.

7.4 Intellectual property

Intellectual property originating from either party prior to the commencement of the contract, including that which is used for the purposes of providing the services, and all developments, adaptations thereof, shall remain the exclusive property of the party introducing that intellectual property.

Reports produced during the course of the project, and paid for by Vanuatu Government, will be owned by the client.

Diagrams used in this report must not be reproduced without permission from the originator.

NIWA and the Vanuatu Government will reach an agreement between them regarding ownership and use of any models and other outputs or deliverables including intellectual property arising from or pursuant to the project and other relevant consultancy services. Generally NIWA expects to retain ownership of any models or significant data sets used as part of its operations, or developed by it in order to perform the services, and all modifications, developments, or additions to those.

7.5 Terms of engagement

Reflecting standard business practice, unless otherwise agreed, NIWA will undertake the work pursuant to NIWA's standard terms and conditions. Where appropriate a copy of these is attached to this proposal.

In the event of any inconsistency between those terms and conditions and this proposal, the terms and conditions shall prevail.

If those conditions are not acceptable to [insert client name], then NIWA may negotiate alternative contractual terms on a case-by-case basis.

For the avoidance of doubt this proposal, even if accepted by [insert client name] does not constitute a contract and NIWA will not be bound to provide the services until a formal contract has been entered into.

Any changes to the services, fees or agreed personnel during the course of providing the services must be agreed to in writing.

- NIWA has not budgeted for external or peer reviews of the technical reports or final report by parties other than NIWA or the client.

7.6 Dependencies

NIWA's delivery of the proposed services and deliverables is dependent on:

- Weather conditions being suitable to undertake the survey.
- Obtaining consents / approvals to undertake the survey work (see Section 2.4.4).
- Obtaining the support requested from the Vanuatu Government in Section 2.4.

8 Validity

The proposal is valid for acceptance for 15 days from date of issue.

9 Confidentiality

This proposal, and the information it contains, is and shall remain the property of NIWA, and is to be treated as confidential. The information contained here may only be used (or disclosed) as reasonably necessary to assess NIWA's offer of services, for the inclusion of documentation for the engagement of NIWA, and for no other purpose. The proposal or any related information may not be disclosed to any third party without first receiving NIWA's express written consent.

10 Professionalism and ethical standards

NIWA prides itself on the professionalism of all of its staff. Staff operate under NIWA's Code of Professional Conduct, which, among other things, specifies open, honest and constructive communication (while respecting needs for confidentiality), and treating others with courtesy and respect. This code also values diversity, requiring respect for different cultures, and recognition that our diverse workforce and stakeholders are part of NIWA's strength. While this code does not specifically address bribery and corruption, it reflects New Zealand's high ethical standards within which bribery and corruption are very rare, as well as illegal.

NIWA's Gifts of Disclosure Policy ensures that no NIWA staff member may accept any gift, entitlement or physical token of appreciation that is given or offered by any current or potential customers or suppliers to any NIWA staff member without express approval from her/his regional manager.

At all times NIWA staff are required to register any actual and potential conflicts of interest. Staff are required to declare any project specific conflicts of interest before commencing work on a project or as soon as they emerge as the project develops. Any ethical or cultural issues and any conflicts of interest will be addressed immediately by the project manager and project director and, as appropriate, raised with the client. Where deemed unresolvable, another similarly skilled team member may be required to undertake the work.

NIWA staff adopt for their work the Environment Court of New Zealand's Expert Witnesses Code of Conduct, which includes directions that: "5.2.1 An expert witness has an overriding duty to assist the Court impartially on relevant matters within the expert's area of expertise." and "5.2.2 An expert witness is not, and must not behave as, an advocate for the party who engages the witness. Expert witnesses must declare any relationship with the parties calling them or any interest they may have in the outcome of the proceeding".

11 Contact us

For more particulars, including discussion and/or negotiation on methods, price or deliverables, please contact:

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Principal Scientist
Marine Biodiversity & Biosecurity

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12 References

Inglis GJ (2009) Final Report: GloBallast / SPREP Training Workshop on Port Biological Baseline Surveys NIWA Client Report No. CHC2009-052 prepared for the Secretariat of the Pacific Regional Environment Programme (SPREP), Christchurch, New Zealand, p 11

Inglis GJ (2010) Reconnaissance Survey for Introduced Marine Pests at Star Wharf, Port Vila, Vanuatu NIWA Client Report No. CHC2010-025 prepared for EcoStrategic Consultants Ltd, Christchurch, New Zealand, p 38

Inglis GJ, Floerl O (2008) Training Course on Port Biological Baseline Surveys Draft course notes prepared for a training course on Port Biological Baseline Surveys, Istanbul (Gebze), Turkey, 21-24 October 2008. NIWA, Christchurch, New Zealand, p 94

Appendix A CVs of relevant staff

Dr Graeme Inglis

Marine Biologist and Biosecurity Scientist

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10 Kyle Street, Riccarton, Christchurch 8011
PO Box 8602, Christchurch 8440
New Zealand
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graeme.inglis@niwa.co.nz

Qualifications

1992	PhD, Experimental Marine Ecology, University of Sydney, Australia
1987	BSc (Hons) First Class, Zoology, University of Canterbury

Employment

2004 to present	Principal Scientist – Marine Ecology, NIWA, Christchurch
2000-2004	Scientist, NIWA, Christchurch
1993-2000	Senior Lecturer in Environmental Science, James Cook University, Townsville, Australia (50%) Research Associate, Co-operative Research Centre for Ecologically Sustainable Development of the Great Barrier Reef Marine Park (50%)
1992-1993	Environmental consultant, The Ecology Lab Pty Ltd, Sydney, Australia

Professional specialty skills and experience:

- Programme Leader of NIWA's marine biosecurity research.
- Extensive experience in the design and implementation of marine pest surveys (early detection, baseline inventory, and delimiting), environmental monitoring and impact assessment
- Extensive field and laboratory experience, including diving, boating, collection and processing of specimens, data collection and analysis and preparation of manuscripts or publications.
- Have worked and published on the ecology of human impacts on a range of temperate and tropical marine ecosystems
- PADI Rescue Diver and have held New Zealand OSH Certified Occupational Diver (Scientific), TDI Nitrox Diver, DAN Oxygen Provider, Commercial Scuba Diver (AS.2815.1), CMAS Basic SCUBA Diver qualifications.

Experience of working on development projects and initiatives:

- Has worked extensively with stakeholders (government and non-government) in New Zealand, Australia, Asia and the Pacific and have developed and delivered a range of training courses in marine resource management.
- Has developed and delivered regional training programmes in marine pest surveys and management in Asia (Vietnam - 2004), the Red Sea and Gulf of Aden (Egypt - 2006), the Mediterranean (Turkey - 2008) and Pacific (Fiji – 2010, Vanuatu - 2010). Each of these programmes was delivered in collaboration with the GEF/UNDP/IMO Global Ballast Water Management Programme (GloBallast) and regional partner organisations.

- While at James Cook University, I coordinated and delivered undergraduate and post-graduate courses on tropical Coastal Management, Environmental Impact Assessment and Marine Park Management. In particular, I worked closely with the External Services Division of the Great Barrier Reef Marine Park Authority and the Queensland Department of Environment & Heritage to provide training courses on marine park planning and management to professional students from government agencies in Asia, the Pacific and Africa.

Selected relevant publications:

Inglis, G.J., Morrisey, D., Woods, C., Sinner, J., Newton, M. (2013) Managing the domestic spread of harmful marine organisms Part A: Operational tools for management. NIWA Client Report No. CH2013-150, Prepared for the Preparedness & Partnerships Directorate, Ministry for Primary Industries. NIWA, Christchurch. 160 p.

Inglis, G. J. (2013) Proposed Management of the Mediterranean Fanworm in Whāngārei. NIWA Client Report No. CHC2013-127, Prepared for Northland Regional Council, pp. 29. NIWA, Christchurch.

Inglis, G.J., Smith, M., Buckthought, D., Wilkens, S. (2013) Biosecurity Surveillance Work-stream. NIWA Client Report No: CHC2013-060, Prepared for Bay of Plenty Regional Council - Rena Long Term Recovery Programme: 34.

Inglis, G.J., Seaward, K. (2012) Survey design for delimiting Sabella spallanzanii in Whangarei Harbour. A report prepared for Envirolink Small Advice Contract ELF13206: 4 + maps.

Inglis GJ (2010) Reconnaissance Survey for Introduced Marine Pests at Star Wharf, Port Vila, Vanuatu NIWA Client Report No. CHC2010-025 prepared for EcoStrategic Consultants Ltd, Christchurch, New Zealand, p 38

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Inglis, G.J.; Schimanski, K.; van den Brink, A.; Kospartov, M.; Gust, N.; Peacock, L.; Bradley, A.; Cox, S.; Nelson, W.; Ahyong, S.; Read, G.; Kelly, M. (2009) Port of Bluff: Second baseline survey for non-indigenous marine species. Biosecurity New Zealand Technical Paper No: 2009/XX. Prepared for Biosecurity New Zealand Post-clearance Directorate for Project ZBS2005-18. 163 pp. + Appendices.

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Inglis GJ, Floerl O (2008) Training Course on Port Biological Baseline Surveys Draft course notes prepared for a training course on Port Biological Baseline Surveys, Istanbul (Gebze), Turkey, 21-24 October 2008. NIWA, Christchurch, New Zealand, p 94

Inglis, G.J., Hurren, H., Oldman, J., Haskew, R. (2006). Using habitat suitability index and particle dispersion models for early detection of marine invaders. Ecological Applications 16: 1377-1390.

Gust, N.; Inglis, G.J. (2006). Adaptive multi-scale sampling to determine an invasive crab's habitat usage and range in New Zealand. Biological Invasions 8: 339-353.

Hayes, K. R., Cannon, R., Neil, K., Inglis, G.J. (2005). Sensitivity and cost considerations for the detection and eradication of marine pests in large commercial ports. Marine Pollution Bulletin 50: 823-834.

Dr Michelle Kelly

Marine Biologist and Taxonomist

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Private Bag 99940, Auckland 1149
New Zealand
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Qualifications

2013	DSc, University of Auckland, in Science
1991	PhD, University of Auckland, in Zoology
1987	MSc (Hons), University of Auckland, 1st Class Honours in Zoology
1988	1983 BSc, University of Auckland

Languages

First language	English
Second language	Tok Pisin (PNG)

Employment

1999 to present	Marine Biologist, NIWA, Auckland
1997–1998	Lottery Research Fellow, NIWA, Auckland
1993–1997	Research Scientist, Zoology Department, Natural History Museum, London
1992–1993	Postdoctoral Fellow, Harbor Branch Oceanographic Institution, Florida

Professional specialty skills and experience:

- Extensive experience in the collection, inventory, documentation, identification and description of sponge biodiversity in the Indo-Pacific and southwest Pacific region, and have a working knowledge of other tropical invertebrates
- Sensitivity to different cultural contexts, particularly those in the Pacific, due to childhood and young adulthood spent in Kavieng, Papua New Guinea, carrying out research for a MSc in Zoology, at Motupore Island Research Department, UPNG (1983-1986), and subsequent professional and personal experiences throughout the Pacific including Papua New Guinea, New Caledonia, Fiji, Niue and Tonga, Guam, Palau, Pohnpei and Hawaii
- Professional integrity, pragmatism, flexibility, responsiveness and enthusiasm are visible skills

Experience of working on development projects and initiatives:

- Taxonomic consulting to a range of international university and pharmaceutical industry groups, which included field collection, identification and documentation of marine sponges throughout the Indo-Pacific. Clients include National Cancer Institute (USA), Coral Reef Research Foundation, Palau, Hawaii East-West Centre (USA), U. Hawaii, U. Mississippi, U. Oklahoma, U. South Pacific (Fiji), U. Guam, U. Ryukus
- Initiated and taught 6 international sponge taxonomy training workshops, training local students and resource managers in biodiversity identification, inventory, and documentation (Florida, 1992;

South Africa, 1995; Guam, 1996; Hawaii, 1996; Natural History Museum, London, 1997; Fiji 1999, U. Mississippi, 2001)

- Worked with Bishop Museum, Hawai'i on identification and documentation of invasive sponges in Pearl Harbour (1996)
- Working with Coral Reef Research Foundation, Palau, in the discovery on tropical marine invertebrates throughout the Indo-Pacific, the production of field guides for local communities as guides to resource knowledge for management.

Selected relevant publications:

Kelly, M. 2005. Sponges, In: Arnold, A. (ed.), Shining a Spotlight on the Biodiversity of New Zealand's Marine Ecoregion. WWF-New Zealand, Wellington, 85 pp.

Kelly, M. 2007. Sponges. Pp. 27-46, In: Tracey, D. M.; Anderson, O. F.; Naylor, J. R. (Eds). A guide to common deep-sea invertebrates in New Zealand waters. Second Edition. New Zealand Aquatic Environment and Biodiversity Report No. 10: 282 pp.

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Kelly, M.; Edwards, A. R.; Wilkinson, M. R.; Alvarez, B.; Cook, S. de C.; Bergquist, P. R.; Buckeridge, J. S.; Campbell, H.; Reiswig, H. M.; Valentine, C.; Vacelet, J. 2009. Chapter 1. Phylum Porifera sponges. In: Gordon, D. P. (Ed.). New Zealand Inventory of Biodiversity Volume 1. Kingdom Animalia: Radiata, Lophotrochozoa, and Deuterostomia. Canterbury University Press: pp. 23-46.

Kelly, M.; Hooper, J. N. A.; Paul, V. J.; Paulay, G.; van Soest, R.; de Weerdt, W. 2003. Taxonomic inventory of the sponges (Porifera) of the Mariana Islands. The Marine Biodiversity of Guam and the Marianas, Micronesica. Supplement 6(35-36): 100-120.

Kelly, M.; Hooper, J. N. H. 2008. Sponges in Baine, M.; Harasti, D.: The Marine Life of Bootless Bay, Papua New Guinea. Motupore Island Research Centre (MIRC), School of Natural and Physical Sciences, University of Papua New Guinea, PIRION Pty, 130 pp.

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Kelly-Borges, M. and P. L. Colin. 1995. Sponges. In Tropical Pacific Invertebrates (Eds, P. L. Colin, C. Arneson). Coral Reef Press: 304 p.

Kelly-Borges, M.; Bergquist, P. R. 1988. Sponges from Motupore Island, Papua New Guinea. Indo Malayan Zoology 5(2):121-159.

Kelly-Borges, M.; Valentine, C. 1995. The Sponges of the Tropical Island Region of Oceania: A Taxonomic Status Review. Marine and Coastal Biodiversity in the Tropical Island Pacific Region: Volume I - Species Systematics and Information Management Priorities (eds. Maragos, J. E.; Peterson, M. N. A.; Eldredge, L. G.; Bardach, J. E.; Takeuchi, H. F.). East-West Centre, Honolulu, Hawai'i: 83-120.

Longakit, M.B.A., Sotto, F.B. and Kelly, M. 2005. The shallow water marine sponges (Porifera) of Cebu, Philippines. Science Diliman Journal 17(2):52-74.

Longakit, M.B.A., Sotto, F.B. and Kelly, M. 2006. Distribution of shallow water marine sponges (Porifera) of Cebu Island, Philippines. Journal of Aquatic Science 3:31-40.

Vacelet, J.; Kelly-Borges, M. 1998. Hadromerida. Sponges of the New Caledonia lagoon (ed. Levi, C.). Edition de l'Orstom. Collection Faune et flore tropicales n. XXXIII. Paris, 1998: 87-93.

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Qualifications

2004 PhD Biological Sciences, University of Auckland
2000 MSc Biological Sciences (First Class Honours), University of Auckland
1998 BSc Biological Sciences, University of Auckland

Employment

2005 - Presently NIWA
2004 - 2005 Harbour Branch Oceanographic Institute, Florida
1998 - 2004 University of Auckland

Professional and Research Experience

- Currently managing a nationwide identification and diagnostic service responsible for the identification and reporting of all samples collected under biosecurity contracts in New Zealand.
- Leading a multi-collaborator research project investigating the effects of vessel noise on the settlement of biofouling larvae.
- New Zealand Worksafe Occupational Scuba Diver with experience in biosecurity surveys, scientific diving, vessel inspections, full face communication AGA masks, DAN Oxygen Provider, TDI Nitrox certified.
- Australian Diver Accreditation Scheme (ADAS) Scientific Diver
- Emergency First Response Instructor
- PADI Scuba Instructor
- Skilled in crustacean identification (parataxonomy)
- Extensive field and laboratory experience, including diving, boating, collection and processing of specimens, preservation and museum curation of specimens, microscope use, data collection and analysis and preparation of manuscripts or publications.
- Extensive experience with planning and delivering lectures, laboratory tutoring, and implementing training workshops.

Relevant Publications and Client Reports

Woods, C., Seaward, K., Johnston, O., Carter, J., Read, G., Peacock, L., Morrisey, D., van den Brink, A., Cox, S. (2008). Additional sampling for the Mediterranean fanworm Sabella spallanzanii (Gmelin, 1791), in the Port of Lyttelton. Biosecurity New Zealand Technical Report No 2008/.

Floerl, O., Cox, S., Ahyong, S. (2009). Biosecurity inspection of the cruise vessel Clipper Odyssey. NIWA Client Report ISS10501 prepared for ISS-Shipping Ltd. New Zealand, 11 p.

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Floerl, O., Wilkens, S., Inglis, G. (2010). Development of a template for vessel hull inspections and assessment of biosecurity risks to the Kermadec and sub-Antarctic Islands region. NIWA Client Report CHCH2010-086 prepared for the Department of Conservation, 55 p.

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Ahyong, ST., Wilkens, S.L. (2011) Aliens in the Antipodes: Non-indigenous marine crustaceans of New Zealand and Australia. In: Galil, B., P.F. Clark, Carlton, J.T. (Ed.) In the wrong place: alien marine crustaceans: distribution, biology and impacts. Springer, Dordrecht ; New York, pp. 451-485.

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Wilkens, SL., Stanley, JA., Jeffs, AG. (2012). Induction of settlement in mussel (*Perna canaliculus*) larvae by vessel noise. Biofouling 65-72.

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