



MESSAGE FROM THE DIRECTOR

Welcome to our first edition of the CEBRA newsletter for 2014. It has been a busy summer for everyone here at CEBRA and I'm delighted to bring you this update.

In February we held our annual research planning meeting which sets out our next twelve months of work. We have agreed on a new suite of projects including topics on data mining and profiling, spatial mapping of potential habitat for invasive pests, tests for incentive based inspection, foot and mouth surveillance, illegal logging, unmanned vehicles in biosecurity surveillance, and the compilation of national-level farm demographic data for emergency response preparedness.

Deputy Director Andrew Robinson has completed work on a project for the Defence Science and Technology Organisation based on the appropriateness of some standard assumptions for life-cycle assessments. Andrew is now preparing a publication from this work and we are all looking forward to seeing how that takes shape over the coming months.

We warmly welcome Dr Tracey Hollings to the CEBRA team while Jess Holliday is on maternity leave. Dr Hollings completed her PhD on the disease epidemiology and ecological implications of facial tumor diseases in Tasmanian Devils. We are looking forward to working with Dr Hollings on a number of projects this year.

The Intelligence Gathering and Analysis project has shown some recent success. The project is ahead of schedule

delivering the consolidation of the software into a single platform and launching the new animal and plant sites in September 2013. In October 2013 CEBRA held workshops in Wellington to induct the staff of the Ministry for Primary Industries New Zealand to the new intelligence gathering and analysis software. We have received positive feedback from this workshop which gives us confidence that the new site will be effective for all users.

The Plant-Product Pathways project and the Continuous Sampling Plan have already generated significant benefits in terms of practical operational adjustments. The team has increased the speed of CSP simulations – from days down to minutes. The project team has also compiled data on some higher risk pathways which will be analysed shortly. We will update you on the findings in the coming newsletters.

There is also work being done by our CEBRA team with other agencies including their involvement in a continuation of the Tasmanian Forests Agreements, staff discussions with APVMA on developing a risk based screening protocol, staff contributions to a critical assessment of a risk analysis for the Northern Prawn Fishery and discussions of the potential for exploring pathways associated with vessels, with AFMA.

Special mention to Andrew Robinson and Owen Jones from the Department of Mathematics and Statistics at the University of Melbourne who have also been helping the Department of Agriculture with their move to consolidate



their post-quarantine entry operations into one site just outside Melbourne.

As I said, it has been a busy summer and the team has been working hard. It's a great start to 2014 and I look forward to seeing the benefits of the collaboration between the Department of Agriculture, the Ministry of Primary Industries and CEBRA over the next 12 months.

Mark Burgman

Managing Director, Centre of Excellence for Biosecurity Risk Analysis

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2013 ROYAL SOCIETY OF VICTORIA RESEARCH MEDAL

CEBRA's Professor Mark Burgman has been awarded the 2013 Royal Society of Victoria Medal for Excellence in Biological Sciences (Non-human).

The 'Medal lecture' was presented by Mark Burgman to the Society after the presentation, titled: *Confidence, scientific judgement and the intelligence game*.

The society's most prestigious medal is based on demonstration of the candidate's excellence and leadership in scientific research.

Professor Burgman accepted his award from The Hon Alex Chernov AC QC, Governor of Victoria and Patron of the Society at a ceremony in December last year.



LEFT TO RIGHT Dr Mark Williams, Prof Pauline Ladiges, Dr Bill Birch (President) Governor Hon Alex Chernov AC QC, Prof Mark Burgman, Ms Claire Layman, Prof Lynne Selwood, Mr Norman Kennedy.

A vignette of Professor Burgman's research work:

"Because they lie at the interface of science and public policy, environmental decisions often depend on the preferences of vocal stakeholders and opinion makers. In highly charged political and social debates, scientists provide the technical understanding, data, expert judgments and prediction of outcomes for alternative scenarios. Inevitably, differences of opinion arise among experts when they estimate facts or make predictions. Our methods help scientists to find kernels of fact even in contentious situations"

PROJECT UPDATE

The Biosecurity Research Steering Committee endorsed five final reports from ACERA during a meeting held on 27th November, 2013. These included:

- 1101C Plant Quarantine Inspection and Auditing Across the Biosecurity Continuum
- 1101E Sampling Interceptions for Identification
- 1102C Comparing Multi-Criteria Analysis and Cost Benefit Analysis for Biosecurity
- 1206B TRACE: An R-package to Trace Pest Spread via Multiple Dispersal Mechanisms
- 1206F Analysing New Pathways and Data-Mining of Fruit Data



DESIGNING WEED CONTAINMENT STRATEGIES: An approach based on feasibilities of eradication and containment

CEBRA is very pleased to have been able to support Oscar Cacho and Dane Panetta with a research project that aimed to refine strategies for the containment of weed invasions.

In an environment where budgets are increasingly contestable, it is critical that land managers are able to allocate resources in the most efficient and effective manner.

This project set out to demonstrate the benefits of deploying both theoretical and semi-quantitative approaches to assessing the feasibility of different responses to the presence of a range of weed species.

“Our ultimate aim is to equip decision makers with a tool that can inform more efficient resource allocation that is targeted and evidence based”

By taking a semi-quantitative approach to what is a highly complex and variable environmental problem, we have been able to develop decision models that can be used as a powerful tool for land managers when assessing weed populations and deploying resources to manage them.

In particular the project focussed on when barrier zones should be employed as a containment strategy for a core weed infestation and when eradication of outlying infestations should be attempted. For case studies, the project used a number of weed species that represented different combinations of growth form, dispersal and biological impedance to eradication.

Case studies also included a variety of successful and failed eradication programs. From known examples and theoretical assumptions a number of inputs were able to be approximated.

From this we were able to establish a decision model that incorporated inputs such as dispersal characteristics, seed persistence and the consequential environmental and biodiversity impact.

The model can then be used to support decision makers to assess the best response to an infestation – whether that be establishing barrier zones for containment, and/ or seeking to eradicate the weed.

Our ultimate aim is to equip decision makers with a tool that can inform more efficient resource allocation that is targeted and evidence based.

Through better understanding the characteristics of an infestation, its likely spread and response to containment,

this tool will be able to help land managers design better, more effective and more cost efficient strategies.

Professor Oscar Cacho
Professor, Graduate School of Business; UNE Business School



MAIN CONCLUSIONS

A structured approach to the development of weed containment strategies will help to promote the efficient use of limited resources. Targeted species vary according to both the relative ease with which core populations can be contained and outlier populations eradicated – containment strategies should be designed accordingly. This study shows that semi-quantitative models can be powerful adjuncts to their theoretical counterparts in support of decision-making for the management of weed invasions.