



Analysing how social and ecological systems interact provides clues for improving conservation outcomes. Photo: Suze Gaynor

Methods for identifying better ways to govern biodiversity

We developed a new process to identify and test options for improving governance arrangements for biodiversity conservation.

Governance encapsulates the processes through which people share power and responsibilities as decisions are made: by whom, for whom, and in whose interests. These processes create the formal and informal rules that frame and direct human action, including the actions of land managers as they respond to the multiple challenges of conserving biodiversity.

Nothing like this approach exists elsewhere. Nobody has previously developed a process for comparing potential future outcomes from current and alternative governance arrangements.

Summary for policy makes, planners and managers

This document summarises the tools and techniques we used to identify the strengths and weaknesses of current governance arrangements for supporting desirable biodiversity outcomes.

We consider how these arrangements could be improved, and how to test the extent that such proposed improvements could make a difference into the future.

These tools and techniques use systems analysis and were developed through trials with biodiversity management stakeholders in two contrasting landscapes – the Australian Alps and the Tasmanian Midlands.

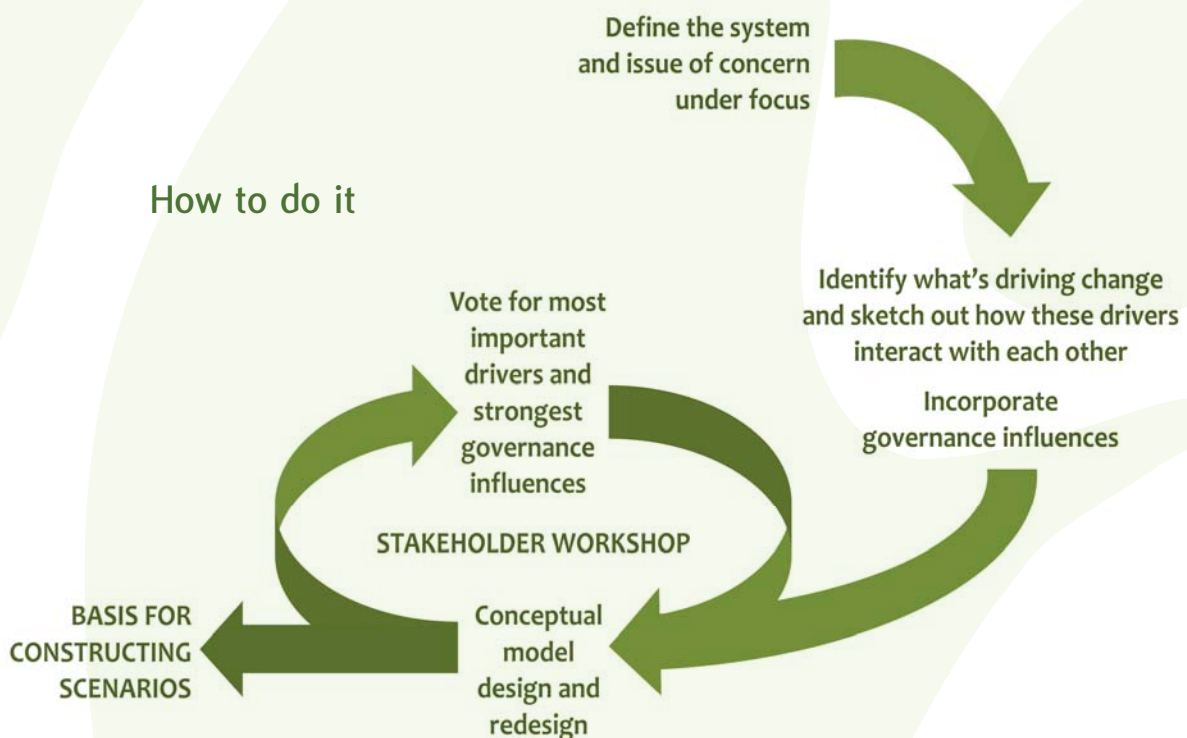


Developing a social-ecological system model

Why do it?

To identify better ways to govern biodiversity, it helps to first understand how system dynamics affect biodiversity outcomes, and the influence of governance on those dynamics. Strategies for biodiversity conservation require understanding the structure, function and composition of ecosystems at a landscape scale. The way these ecological systems change is inextricably linked to changes in social systems, and problems facing ecological systems require action by society. So analysing how social and ecological systems interact with each other provides clues for intervening in the system to improve conservation outcomes.

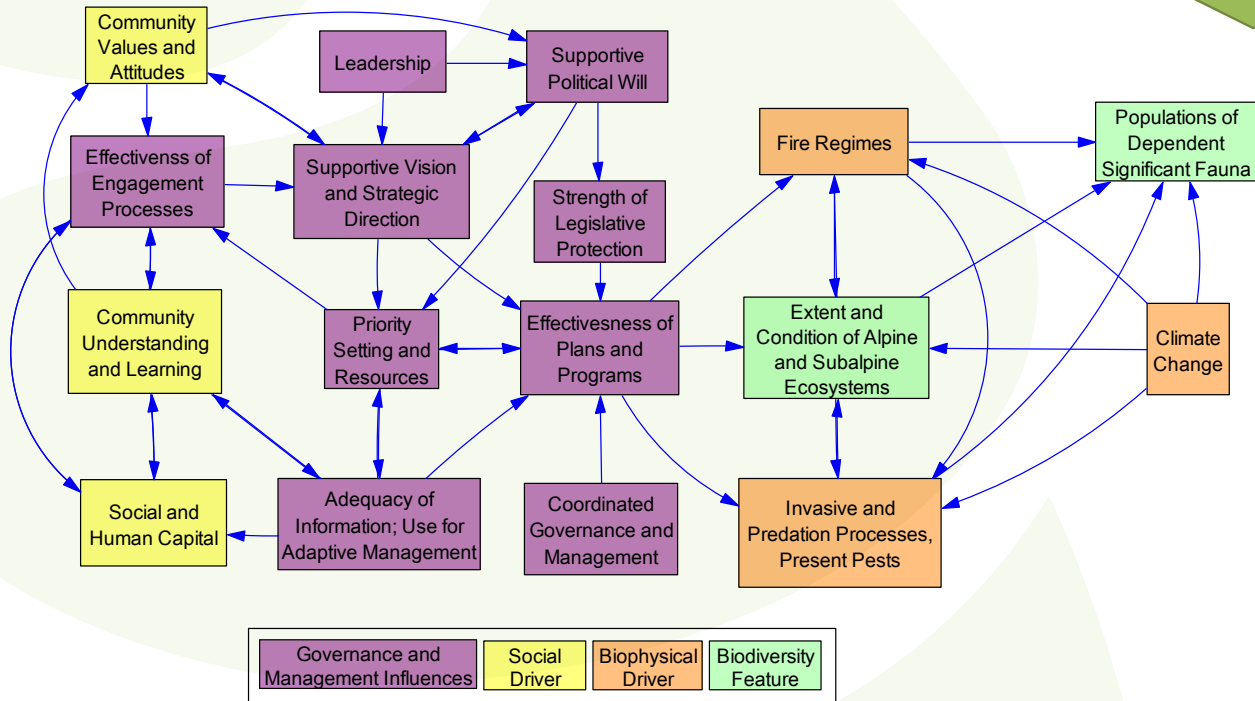
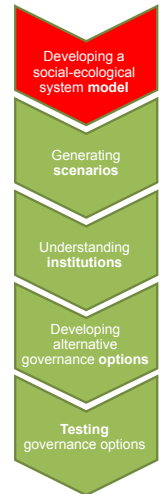
Conceptual modelling is a technique often used to explore these interactions. The technique helps focus on the most important drivers of change, and provides a means to explore interactions between these drivers in terms of their effect on a particular outcome – in our case, the condition and extent of specific biodiversity features. Our contribution is the inclusion of governance influences. These influences are drawn from contemporary ideas about aspects of governance that help build adaptive capacity. By incorporating such influences into the conceptual model, we can systematically explore the effect of proposed governance interventions on the system and its outcomes.



Developing a social-ecological system model

The figure below shows a simplified version of the conceptual model created for the Australian Alps case study.

The social and biophysical drivers of change in the model are those that were voted as most important by workshop participants, and the governance influences included are those participants considered as having the strongest influence on system dynamics. Each arrow represents a logical connection of significant importance in terms of its eventual effect on the biodiversity features as our focal concern of interest. These conceptual models are malleable, and can be adjusted as new ideas or information arise.



The social-ecological system analysis provides the basis for identifying a range of scenarios:

A workshop voting exercise can be undertaken to identify two ‘critical uncertainties’. These are identified from among the most important drivers. Participants vote for those drivers whose future state by the time of the future scenarios seems most uncertain. These critical uncertainties create the scenario spaces, while the scenario narratives are derived from all the drivers identified as part of the social-ecological systems analysis.

Further reading

Lockwood M, Mitchell M, Moore SA & Clement S (2014) Biodiversity governance and social-ecological system dynamics: transformation in the Australian Alps. *Ecology and Society* 19(2): 13.

Mitchell M, Lockwood M, Moore SA & Clement S (in press) Incorporating governance influences into social-ecological system models: a case study involving biodiversity conversation. *Journal of Environmental Planning and Management*.

Generating scenarios

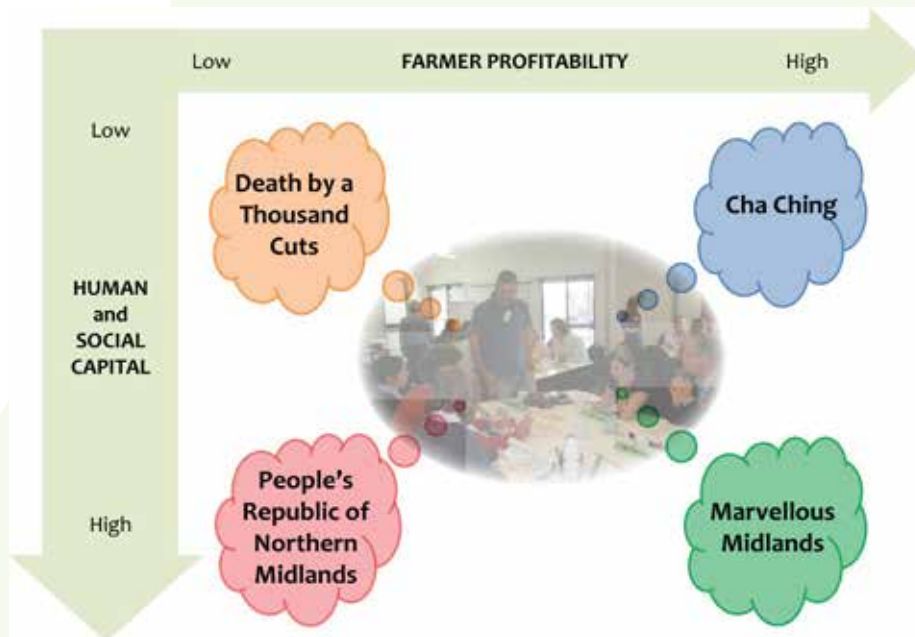


Why do it?

Scenarios can help plan for or imagine futures in the context of high uncertainty. They are used to determine preferred futures (often using visioning exercises), probable futures (often using trajectory modelling) and/or possible futures.

In our case, we are using scenarios to open our minds to new possibilities – possible futures within the extremes of plausibility. Such an approach is widely used by business to help them prepare for the unexpected, and to be aware that they need to be able to quickly adapt to unexpected change.

Below is an example of the scenarios developed for the Tasmanian Midlands case study, where participants determined that farmer profitability and human and social capital were critical uncertainties.



How to do it:

1. Determine a date for the future scenarios that is within a reasonable planning horizon – i.e. no more than 10-15 years
2. Identify two critical uncertainties from the social-ecological system analysis – in the example above for the Tasmanian Midlands, these were identified as farmer profitability and social and human capital
3. Create four scenario spaces at the extreme ends of the two critical uncertainties
4. Engage stakeholders in crafting plausible narratives for each scenario (assume governance arrangements do not change)
5. Expand narratives by detailing future states for all key drivers under each scenario, and by consulting relevant experts
6. Determine outcomes under each scenario for the focal biodiversity features

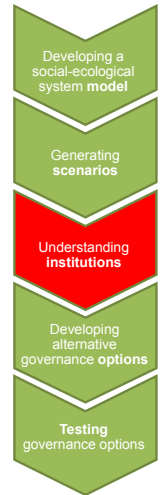
Further reading

Mitchell M, Lockwood M, Moore SA & Clement S (2014) *Australian Alps: an overview of plausible scenarios in 2030*. Landscapes and Policy Hub, University of Tasmania, Hobart.

Mitchell M, Lockwood M, Moore SA & Clement S (2014) *Tasmanian Midlands: an overview of plausible scenarios in 2030*. Landscapes and Policy Hub, University of Tasmania, Hobart.

Understanding Institutions

Institutions are the rules, norms, and strategies that shape the decision-making of individuals and organisations



A Framework for diagnosing institutions

What is it?

We have created an original framework for diagnosing institutions in terms of how well they fit the purpose of biodiversity conservation.

The framework offers an approach for analysing institutions and identifying misfits – such as when institutions provide a short-term solution to a long-term problem.

The approach is like a doctor diagnosing a patient. It involves asking questions about conditions in order to prescribe an appropriate course of treatment. The approach leads to suggestions and does not assume any single institutional design is ‘best’.

How to use it:

The framework includes a set of questions that can be used as part of a series of interviews. These questions are organised into themes exploring the extent that institutions are nimble and responsive enough to cope with change.

The questions are designed to start the conversation. Interviewers will be able to identify appropriate follow-up questions that dig deeper or are more specific. Once a series of interviews have been undertaken, the transcribed text or notes from the interviews can be analysed to identify themes. That analysis can provide the diagnosis.



Institutional Grammar Tool

What it is and how to use it:

Identifying institutions as rules, norms and strategies can also be done through document analysis. The Institutional Grammar Tool involves analysing policy documents at the level of words in sentences.

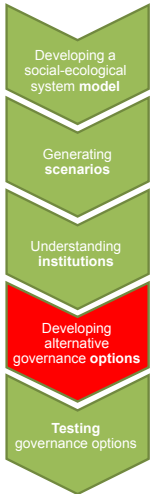
By examining particular categories of words, it is possible to determine if the statement involved is a rule, strategy, or norm. The tool provides an objective method to analyse the principles and processes contained in policies, providing insight into what they actually mean.

Example

This is a statement from the *Environment Protection and Biodiversity Conservation Act 1999* that has been coded using the Institutional Grammar Tool. In this case there is no ‘or else’ component to indicate punitive action would be taken if a rule is not adhered to. So the statement is a norm – meaning it relies on shared perceptions of what is proper and improper behaviour.

| | | | |
|---------------------------------|---|----------------|--|
| <i>The minister</i> | <i>may</i> | <i>approve</i> | <i>the taking of an action or a class of actions</i> |
| attribute | deontic | aim | object |
| <i>subject to Subdivision C</i> | <i>in accordance with an endorsed policy, plan or program</i> | | |
| condition 1 | condition 2 | | |

Developing alternative governance options



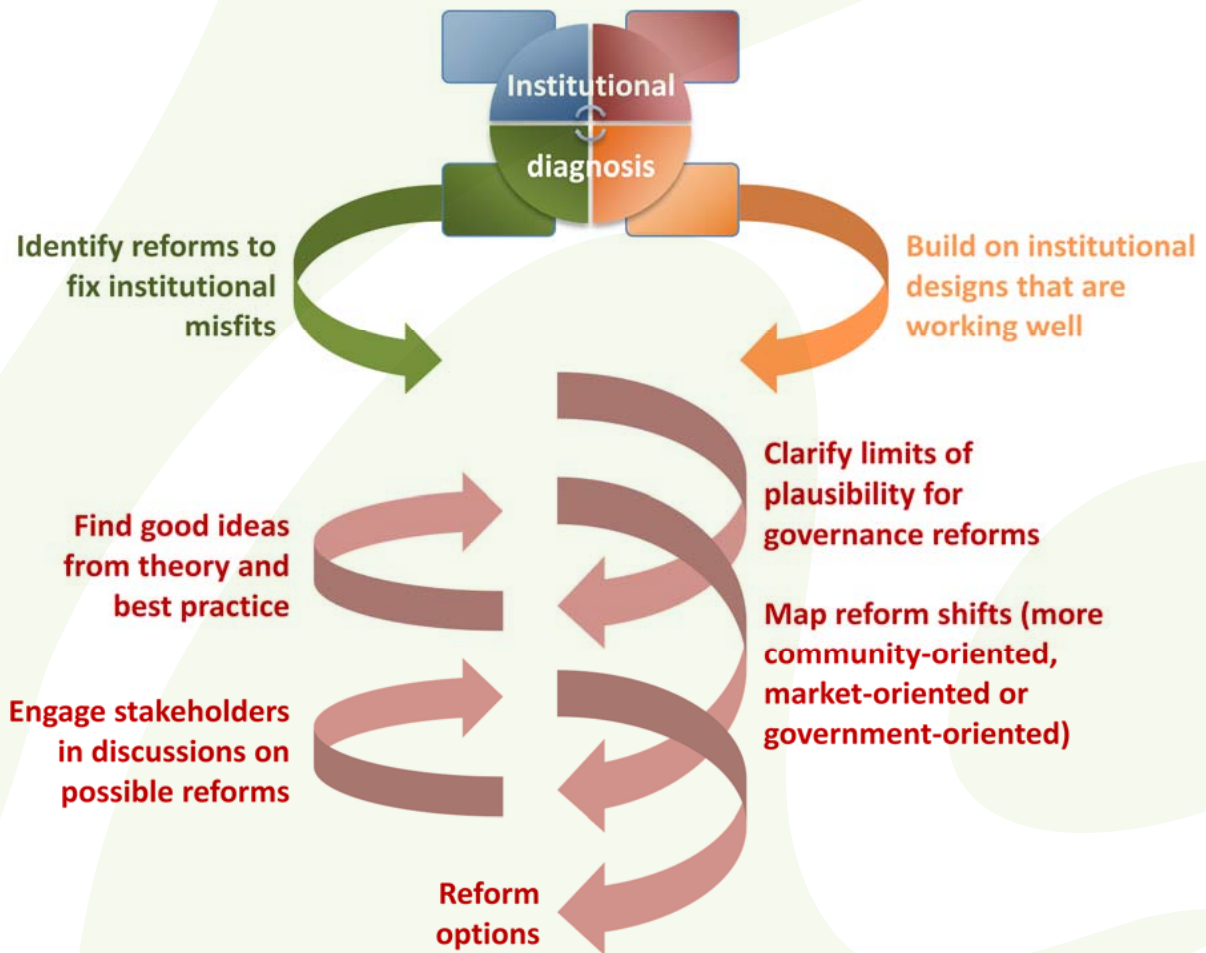
Why do it?

Analyses such as those on the previous page often show that improvements can be made to current governance arrangements.

Further, they can also identify specific areas for improvement. To take advantage of this information, the next step is to formulate concrete and plausible options for consideration.

How to do it:

First, it is important to identify any boundaries to the reform, such as being consistent with Constitution. Second, examples of what has worked elsewhere can be used to generate a series of options. Third, these options can be considered by focus groups of key stakeholders to refine those that show promise and reject those that might be impractical or of little benefit.



Further reading

Clement S, Mitchell M, Lockwood M & Moore SA (2014) *Australian Alps: options to improve biodiversity governance arrangements*. Landscapes and Policy Hub, University of Tasmania, Hobart.

Clement S, Mitchell M, Lockwood M & Moore SA (2014) *Tasmanian Midlands: options to improve biodiversity governance arrangements*. Landscapes and Policy Hub, University of Tasmania, Hobart.

Testing governance options

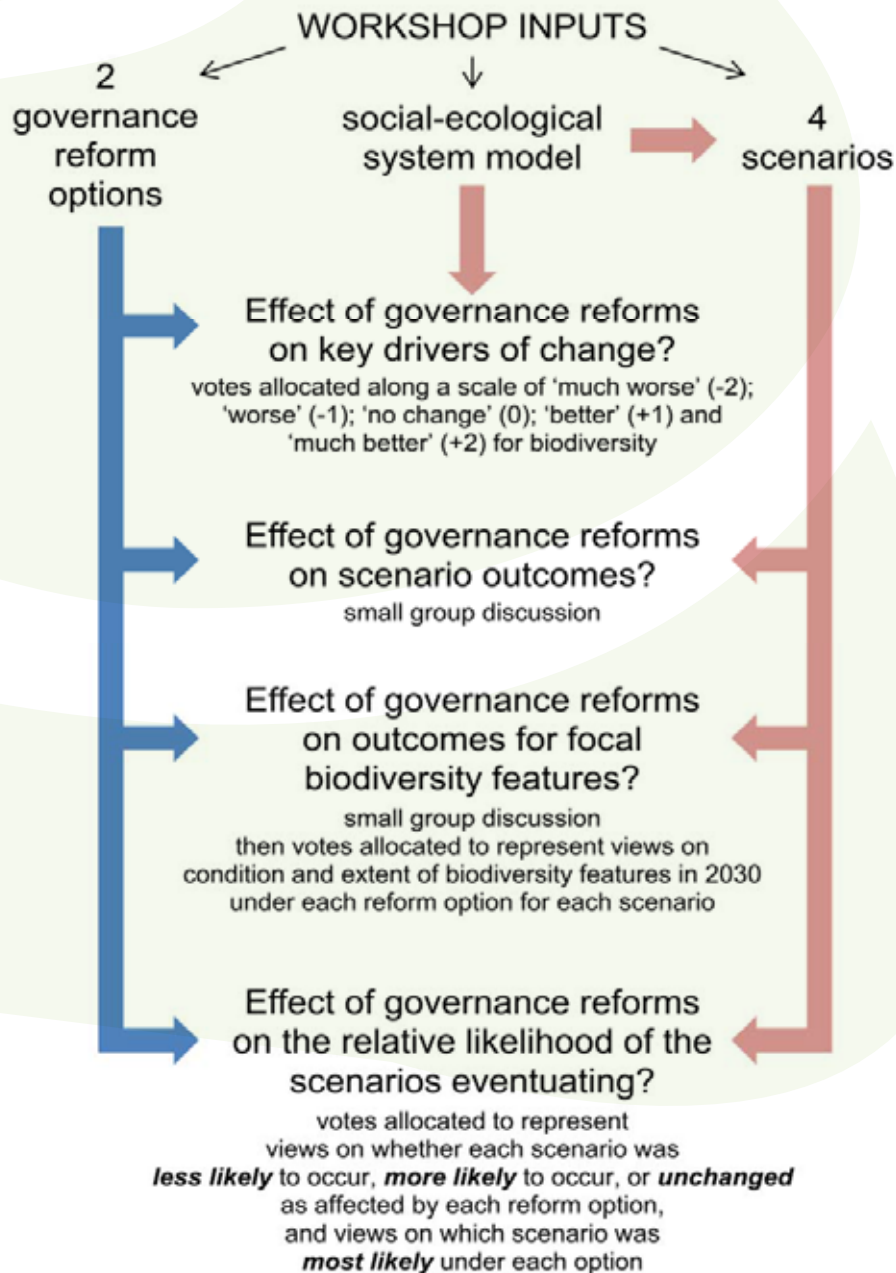
Why do it?

It can be easy for academics to criticise current governance arrangements. Some offer suggestions for improvements, and some of these suggestions are practical. However, we are not aware of a process for testing proposed governance to see if options might improve outcomes.

Our strategy involves working with policy makers and other stakeholders to compare future scenarios under current governance arrangements with how they might appear under alternative governance arrangements.



How to do it:



Applying the methods?

The tools and techniques presented here have been used as part of a process to improve landscape-scale biodiversity policy and planning in two specific locations in Australia. Feedback from participants confirms these techniques could be usefully applied in other landscapes. With some modifications, the overall process could also be applied to test governance reform options involving other focal issues of concern.

The purpose of applying these techniques is to identify practical pathways and options for improving the governance arrangements affecting how society interacts with the natural environment. The process is intended to bring about positive change for society and the environment.

Adopting the following approaches to applying the techniques will help ensure the results have an influence on decisions:

- Stakeholder engagement over time
- Action research (where stakeholders collaborate with researchers in determining the purpose, delivery and outcomes of the research)
- Social learning (where stakeholder groups are encouraged to learn from each other through constructive dialogue in ways that challenge their underlying assumptions)

Who are the researchers?

Professor Susan A Moore



Susan is a researcher in the environmental and conservation sciences at Murdoch University, WA.

E: s.moore@murdoch.edu.au

Dr Michael Lockwood



Michael is an environmental social scientist at the University of Tasmania.

E: Michael.Lockwood@utas.edu.au

Dr Michael Mitchell



Michael is a social researcher who specialises in the social dimensions of natural resource management.

E: Michael.Mitchell@utas.edu.au

Sarah Clement



Sarah is a human ecologist studying her PhD, focusing on the social and institutional dimensions of environmental problems.

E: s.clement@murdoch.edu.au

About the NERP Landscapes and Policy Hub

The Landscapes and Policy Hub is one of five research hubs funded by the National Environmental Research Program (NERP) for four years (2011–2014) to study biodiversity conservation.

We integrate ecology and social science to provide guidance for policymakers on planning and managing biodiversity at a regional scale. We develop tools, techniques and policy options to integrate biodiversity into regional-scale planning.

The University of Tasmania hosts the hub.

www.nerplandscapes.edu.au



National Environmental Research Program



ANTARCTIC CLIMATE & ECOSYSTEMS CRC



Australian National University



Murdoch UNIVERSITY



Griffith UNIVERSITY



Charles Sturt University