From systems understanding to governance improvements in the Tasmanian Midlands

The biodiversity features of the Tasmanian Midlands face an uncertain future. However, with our ability to plan, take action and anticipate the future, we can navigate a way through the uncertainties, taking advantage of new opportunities and minimising the loss of things that we value.

The ‘biodiversity managers’ taking up this challenge include landholders, whose properties contain native grasslands, and government and non-government agencies providing conservation programs.

We developed a new process to test options for improving governance arrangements for biodiversity conservation. The process involves developing scenarios based on a detailed understanding of the key drivers of change affecting biodiversity features of the Tasmanian Midlands. These scenarios are then used to test alternative governance arrangements aimed at enhancing the effectiveness of biodiversity plans and programs.
Summary for policymakers, planners and managers

- This document summarises the application of a process to the Tasmanian Midlands context, where proposed governance improvements are assessed using systems analysis and scenarios.
- We present a systems analysis for Tasmanian Midlands biodiversity features (pages 2–3). This systems analysis then forms the basis for developing a range of future scenarios (pages 4–5). These scenarios are then used to test the effect of proposed governance reforms (pages 6–7).

Key terms

**Landscape-scale biodiversity** — a shift in policy away from individual species protection alone towards broader appreciation of the function, structure and composition of the surrounding landscape.

**Social-ecological system** — a place-based representation of how humans and nature interact with each other as part of one co-evolving system. See pages 2–3.

**Scenario** — a narrative describing a plausible future. See pages 4–5.

**Governance** — the processes through which people share power and responsibilities as decisions are made: by whom, for whom, and in whose interests. See pages 6–7.

Social-ecological systems analysis

Social–ecological systems analysis involves identifying the key drivers of change affecting a particular issue in a particular place.

For the Tasmanian Midlands social–ecological systems analysis, the issue is the condition and extent of native grassland ecological communities in the region.

We present our analysis as a system diagram that traces how drivers of change affect biodiversity outcomes (see below).

What is new?

What is new about our approach to social–ecological systems analysis is the inclusion of the key governance influences on system dynamics. Not only are key social and biophysical drivers identified, but we also explore how these interact with governance influences such as the design of conservation programs and their longevity, and the effectiveness of landholder engagement processes. These governance influences interact with social drivers, such as level of trust between actors, to enhance landholder engagement in conservation practices.

As we expect the system to undergo rapid change, we also explored governance attributes that would help biodiversity managers adapt their responses, and if necessary deal with a transforming environment.

By improving our understanding of complex system interactions, we can identify new ways to govern the system that are likely to enhance biodiversity outcomes.

Tasmanian Midlands social–ecological system model
Key features of our approach
- focuses on identifying the key drivers of change
- encourages greater awareness and incorporation of key social drivers of change
- encourages greater awareness and incorporation of key governance influences on system dynamics
- reveals governance attributes that can support adaptation and/or negotiate system transformation
- is context specific, but the process can be applied to other contexts and enable testing of a range of alternative governance arrangements

What we’ve learned
Developing a social–ecological system model is an efficient and effective method to identify and understand key drivers of change. The model reveals interactions between governance influences, socio–economic and biophysical drivers, and how together these shape biodiversity outcomes. Importantly, the model can be progressively adjusted and improved as our knowledge increases.

Focus on one issue
It is important to first identify a specific issue on which to focus, and then define a related focal scale for the system. In our case, the focal issue was the condition and extent of native grasslands in the Tasmanian Midlands. Of course, it is also critical to identify how factors external to the focal system (such as climate change and national legislation) affect biodiversity outcomes in the focal system.

Identify key drivers
From all the drivers of change affecting the focal issue, a key step is to identify the most important. This is because there are so many drivers and interactions that the complexity becomes overwhelming, leading to confusion rather than understanding.

Filtering to identify the most important drivers is an iterative process involving literature reviews and consultations with scientists and managers.

Further reading
Plausible scenarios for 2030

Developing scenarios can be an effective way to identify the breadth of future possibilities and help people prepare for these futures. To contribute to planning, these scenarios need to be plausible, and not too far off into the future. It is also useful to develop a diverse range of scenarios. This allows policymakers, planners and managers to develop strategies that consider scenarios ranging from worst case to best case.

What is new about this approach?

We developed scenarios using the social-ecological system model described on the previous page. This systems approach to developing scenarios enables us to imagine the most diverse range of scenarios in a consistent way. Having such a diverse range of scenarios ensures robust testing of alternative governance arrangements. The proposed governance reforms would need to make a positive difference for biodiversity under the full range of scenarios.

What is also new is that initial scenario narratives were developed assuming that current governance arrangements persist largely unchanged. It is then possible to compare these 2030 scenarios with how they might appear under alternative governance arrangements. That is, we can assess whether the alternative governance arrangements would improve outcomes, and if so, how, and to what extent.

What we’ve learned

For a scenario planning approach to be effective, it is important that the intended beneficiaries of the approach, in our case the biodiversity planners and land managers of the Tasmanian Midlands, are engaged throughout the process. This helps ensure they have a belief in and sense of ownership of the scenario narratives.

The scenario narratives developed for the Tasmanian Midlands case study were based on initial work by key stakeholders participating in a one-day workshop in 2013. They were then further developed in consultation with experts. This was a useful exercise to push boundaries in thinking as well as enhance the scientific validity of the scenarios and the anticipated outcomes for biodiversity.

Our scenario development process resulted in four scenarios for 2030, constructed around two critical uncertainties: farmer profitability and human and social capital (see diagram on next page). Detailed narratives were developed for each scenario, each describing a plausible future in terms of the future states of key system drivers and associated outcomes for biodiversity.

Key features of our approach

- scenario development draws on region-specific social-ecological system understanding
- the most critically uncertain drivers are used to create a diverse range of scenarios from worst case to best case extremes
- the scenarios are plausible and within a planning time horizon
- by creating scenarios assuming governance arrangements do not change, it is possible to assess the impact of proposed alternative governance arrangements

Workshop participants used sticky dots to indicate how important they think each system driver is in terms of its effect on native grasslands (Campbell Town, Tasmania, March 2013)

Further reading

Plausible Biodiversity Outcomes under the 2030 Scenarios

**Death by a Thousand Cuts**
- **Native Grasslands Extent**: Small increase in area
- **Native Grasslands Condition**: Poor to very poor
- **Dependent Species**: Small decline in populations, small contractions and shifts in distributions

**Cha Ching**
- **Native Grasslands Extent**: Large decline in area, and non-existent in lowland areas
- **Native Grasslands Condition**: Remaining grasslands along the foothills are in poor to moderate condition
- **Dependent Species**: Large decline in populations, large contractions and shifts in distributions

**People’s Republic of Northern Midlands**
- **Native Grasslands Extent**: Small increase in area
- **Native Grasslands Condition**: Poor to good
- **Dependent Species**: Small decline in populations, small contractions and shifts in distributions

**Marvellous Midlands**
- **Native Grasslands Extent**: Initial small decline in area, then stable by 2030
- **Native Grasslands Condition**: Good but altered condition given climate change impacts on grassland composition
- **Dependent Species**: No change in populations, some contractions and shifts in distributions

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Testing governance improvements

Global concern about the consequences of expected environmental, social and economic change, including climate change, has led researchers to consider the kind of governance arrangements that might help planners, policymakers and managers be more adaptive. However, it is proving difficult to convert such theoretical ideas into pathways towards improved governance arrangements, and there is no effective means to test whether proposed governance reforms are likely to have practical benefits.

What is new about our approach

Our approach uses scenario planning to assess the extent that proposed governance reforms would result in improved outcomes, which in this case study are related to biodiversity outcomes. Our approach also uses social–ecological system analysis as the basis for a staged series of workshop activities.

The logic behind the staged approach is to:

1. explore the effect of the governance improvements on key drivers of change, and then
2. assess how any changes to the action of drivers as a result of governance reforms might affect the scenarios, and finally
3. come to some conclusions about whether the reforms can reasonably be expected to improve biodiversity outcomes.

We summarise below the proposed governance reforms used for our case study. To understand how they were developed, see separate summary: Understanding and designing fit–for–purpose institutions for conserving biodiversity.

<table>
<thead>
<tr>
<th>Current governance arrangements</th>
<th>OPTION 1: Landholder–Driven Regional Program of Action</th>
<th>OPTION 2: Midlands Alliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimentation in giving landholders responsibility to direct achievement of biodiversity outcomes is undermined by insufficient support for monitoring and advice.</td>
<td>Landholders are encouraged to direct government and non–government agencies on the kind of support they need to achieve enhanced biodiversity outcomes on their properties.</td>
<td>Landholders work with supportive government and non–government agencies to determine and secure the support needed to achieve collectively determined biodiversity outcomes on their properties.</td>
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<tr>
<td>Landholder traditional knowledge about native grasslands grazing management is being lost due to market forces driving landholders to explore more lucrative agricultural pursuits.</td>
<td>Landholders are encouraged to develop their own program of action to combine agricultural development initiatives with native grassland conservation.</td>
<td>Landholders work with other interested organisations to create markets for rural goods and services that combine native grassland conservation with thriving rural communities.</td>
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<tr>
<td>Reduced government funding has resulted in non–governmental organisations taking a leadership role in conservation programs on private land and in finding alternative sources of funding.</td>
<td>Organisation providing biodiversity conservation programs allow landholders to identify their own facilitators and a program of action to achieve expected biodiversity outcomes.</td>
<td>Landholders work with other interested organisations to identify a process for determining region–specific biodiversity objectives and a program of action to achieve them.</td>
</tr>
<tr>
<td>Insufficient financial support results in inadequate accountability for biodiversity conservation on privately owned land, leading to ineffective and unwanted use of penalty measures.</td>
<td>Landholders need to determine the process of accountability to meet national and international expectations for biodiversity protection in the Tasmanian Midlands.</td>
<td>Accountability procedures are determined through the process of forming the Midlands Alliance, including setting objectives for the alliance, and a process to report publicly on performance against those objectives.</td>
</tr>
</tbody>
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Results from the workshop to assess proposed governance reforms for the Tasmanian Midlands

Workshop participants judged that the reforms would affect the ways in which some of the key drivers of change act within the system, and that these effects would be better for biodiversity (see table below).

However, participants had difficulty in making connections between the effect of the reforms on these drivers and how these effects translated into changes to the scenarios and improved biodiversity outcomes. It was also difficult for participants to ‘play the game’ of imagining futures under the governance options.

While our approach showed considerable promise as a method to test options for governance reform, refinements are needed to ensure participants better understand and have more ownership of each stage of the process.

<table>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Effect on Drivers</strong></td>
<td><strong>Effect on Scenarios</strong></td>
</tr>
<tr>
<td>Better for biodiversity:</td>
<td>Minor effect on scenarios:</td>
</tr>
<tr>
<td>On average, workshop participants considered Option 1’s impact on most governance influences and social drivers as better for biodiversity. However, most participants thought the impact on biophysical drivers would be worse for biodiversity.</td>
<td>Option 1 was not seen as being able to counter the loss of human and social capital in the two scenarios so affected. Most participants had little confidence in the prospect of landholder–driven governance arrangements receiving the necessary resources and support from government.</td>
</tr>
<tr>
<td>Minor effect on scenarios:</td>
<td>Option 2 was seen as being marginally better for those scenarios affected by low human and social capital given the benefits of external alliances. Prospects improved for landholder influence and engagement as they were seen as having a seat at the decision–making table.</td>
</tr>
</tbody>
</table>

Further reading

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

Key findings

- Social–ecological systems models are a powerful way to represent and understand system dynamics.
- Scenarios developed on the basis of social–ecological systems understandings allow managers to plan for a range of plausible futures.
- The system model, scenarios and staged workshop approach provided a method to test options for governance reform.
- New strategies are needed to conserve native grassland biodiversity in the Tasmanian Midlands – strategies that enable continuous adaptation to changing social and environmental conditions. Governance arrangements that give land managers responsibility for determining strategies to achieve a duty of care for biodiversity, better integrate biodiversity conservation with rural enterprise profitability, improve collaboration between stakeholders and across property boundaries, and diversify funding sources are likely to improve biodiversity outcomes.

Who are the researchers involved?

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