

**Australian Alps Science Management Forum
Jindabyne, 12-14 November 2012**



Australian Alps Science Management Forum

Workshop Summary

What: *'Planning and Managing for Biodiversity – how do we make it happen at a landscape scale? The Australian Alps Case Study'*

Where: Jindabyne, NSW

When: Monday 12 November 2012 – Wednesday 14 November 2012

Workshop Background: In 2011, the Australian Alps Liaison Committee formed a strategic partnership with the Landscapes and Policy Hub to assist in their research aim to develop tools and policy options to better integrate biodiversity into landscape scale planning. The purpose of the workshop was to form small collaborative teams of Alps staff and Landscapes and Policy Hub researchers to focus on key topics related to landscape scale management of biodiversity. This proved a unique opportunity for Alps staff to collaborate with researchers on topics of direct relevance to management. For hub researchers, it was an opportunity to refine research questions and make progress toward collaborative research that can be completed within 18 months as part of the Landscapes and Policy Hub's research program.

Workshop Participants: 22 hub researchers and 25 alps managers from NSW, Victoria, ACT and the Australian Government agencies worked in seven smaller focus groups to develop or refine research questions, goals, methodology, data needs and deliverables.

Workshop Outcomes: The seven groups produced a research plan to address key questions (as outlined on following pages). The feedback and evaluation of the workshop was very supportive.

Responses from participants to the evaluation question: **How has your knowledge about the Landscapes & Policy Hub / Australian Alps changed as a result of the workshop?**

Some comments from Alps Managers:

- *The Hub's work is critical and timely, and I would advise that the status of the Alps as Protected Areas should always be respected (including their plans of management) as part of the work.*
- *There are definitely synergies between groups and subject matter that will be relevant across groups, gaps and opportunities.*
- *Great program! Love it. Should result in tremendous learnings and benefits for the Alps, as well as long-term collaborations. Thanks for involving us.*
- *Appears to be some useful collation, modelling and analyses planned and will look forward to having input into some of this work e.g. horse modelling, bog modelling.*

Some comments from Hub Researchers:

- *I think the two days were great. I appreciated enormously the effort put into the field trip.*
- *Very helpful to discuss issues face-to-face with managers.*
- *What was most useful was the opportunity to modify our research plans in response to practical advice and to see and build enthusiasm for our planned research agenda.*
- *I have a clear idea of the type of outputs we can provide to assist managers. I also see the need to coordinate a collaborative modelling tool. A combination of all groups' "models".*

Where to from here?

The Australian Alps Liaison Committee and the Landscapes & Policy Hub are keen to see the collaboration evident at the workshop continue. It is hoped that the Alps staff that attended the workshop, plus others that may not have been able to attend, will remain engaged through ongoing discussions around land management issues, current agency research, technical advice and field data acquisition (if practical). The Hub Social & Institutional Futures Project investigating *Governance Reforms & Social Conditions for Adaptive Landscape-scale Biodiversity Planning & Management* may also seek your expertise via further workshops and surveys. In addition to the Hub Project Leaders (names above beside projects) and researchers, there are a number of people that can assist in keeping everyone in touch with the projects and progression of this research.

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Working Group Research Questions

The research questions generated by the seven working groups are as follows:

Governance Reforms & Social Conditions for Adaptive Landscape-scale Biodiversity Planning & Management

Social & Institutional Futures Project Leaders Sue Moore S.Moore@murdoch.edu.au (Murdoch University) Michael Lockwood Michael.Lockwood@utas.edu.au (UTAS)

Research question

What reforms will enhance biodiversity governance at a landscape scale in context of ongoing change?

Research objectives

1. Develop a social-ecological systems understanding of the Alps?
2. Evaluate the current situation and arrangements.
3. Explore new governance possibilities and implications. Key consideration - How do we construct collaborative arrangements across the scales of relevance?

PhD research question - How do institutions and actors enable and constrain collective actions to conserve **biodiversity at a landscape scale?**

Governance issues - Minority view driven politics, push for green tape solutions, collaboration at different scales, short-term politics of crises (reactive vs strategic governance).

Management issues - Horses, fire, invasive species, tourism, climate.

All Season Tourism

Economic Futures Project Leader John Tisdell (UTAS) John.Tisdell@utas.edu.au

Research questions

1. What is the historical (1997 - 2012) relationship between natural and artificial snow depths and visitor numbers for the six Victorian resorts (Falls Creek, Mt. Buller, Mt. Hotham, Lake Mountain, Mt. Baw Baw and Mt. Stirling) and the four NSW resorts (Perisher, Thredbo, Charlotte Pass and Selwyn)?
2. How do the 2003 CSIRO snowfall projections compare to the last 9 years of record for each resort?
3. What are the projected impacts of future snowfall scenarios from fine scaled climate projections on visitor numbers and aggregate revenue for Alpine resorts?
4. What is the projected number of viable days for artificial snow making from fine scaled climate projections on visitor numbers for Alpine resorts?
5. How have extreme temperatures and fire activity influenced visitor numbers to Alpine National Parks historically, and how are these parameters projected to change under future climate scenarios (case study based on Mt Buffalo and NSW parks visitor numbers)
6. Given the likely impacts of declining winter snowfall on visitor numbers, and the need to retain resort economic viability, increased summer use may fill a partial shortfall. What range of visitor experiences are likely to emerge in Alpine resorts based on international experience in areas where summer use is not culturally traditional (e.g. NZ, Canada and USA) (with Sue Moore?)
7. What are the likely impacts of these changing patterns of visitor activity on MNES? (with Brendan?)
8. What sort of infrastructure investment strategy would be required to balance the impacts of visitors with impacts on MNES? (management response question)

Research objective

To identify likely influences of a changing climate on visitor use patterns and environmental impacts

Application of fine-scaled climate information

Project Leader Nathan Bindoff (UTAS) Nathan.Bindoff@utas.edu.au

Research questions

1. Shifting distribution of communities and species (i.e. bogs and species) and new ones that might become threatened or currently on the brink.
2. Invasive species – weeds, movement of non-alpine animals into Alps. Alpine island – isolation reduced by change to surroundings.
3. Species interactions – competition, phenological mismatch.
4. Temperature and precipitation mean changes over south-eastern Australia.
5. Changing distribution of rainfall – extreme events, duration, frequency.
6. Climate indices – snow cover, frost, runoff.
7. Changes to synoptic conditions - position of Hadley Cell, extension of east Australian current and influence on rainfall.
8. Verification and validation of model response using observed data.
9. Detecting and attributing climate change signal above variability.

Invasive Species

Project Leader Chris Johnson (UTAS) C.N.Johnson@utas.edu.au

Major research goals:

1. Create a trophic network model for vertebrate species in the alps, incorporating interactions of invasive species and threatened species (or communities) as targets of management [deer, horse, pig, dogs, fox, cat, small mammals]. Develop management scenarios based on:
 - mountain pygmy possum
 - long-footed potoroo
 - broad-toothed rat
 - moss bed communities
 - threatened skinks
2. Horses (current & potential distributions):
An analysis of cost-effectiveness of alternative strategies of removal of horses will utilise distribution/movement model of horses, with spatially explicit modelling of management actions, incorporating cost and effectiveness of actions:
 - removal by passive trapping, (potentially) ground and aerial shooting, fertility control, fencing
 - alternative or complementary methods of removal
 - spatial distribution of management, trade-offs
 - social attitudes to horses, and responses to horse management
3. All of the above on deer...including analysis of effectiveness of recreational hunting.
4. Pigs in snowy catchment – consider current and potential distribution of pigs, and model scenarios of management to prevent spread into alpine areas.

Other research topics discussed:

- Effects of climate change on threatened vertebrates - broad-toothed rat, skinks, frogs
- Habitat suitability/abundance models for macropods/wombats in sub-alpine and alpine habitats.
- Analyse potential effect of horse increase on macropod distribution (compile evidence/expert knowledge of competitive effects of horses on macropods). Link this in to our trophic model for the alps.
- Competitive/facilitative interactions of horses, pigs and deer
- Other species of concern – European wasps? Invasion potential?
- A risk analysis of diseases of economic concern in deer and horse populations?
- Synergies with fire ecology – how do invasive large herbivores affect fire potential?

Fire & Vegetation Change

Project Leader David Bowman (UTAS) David.Bowman@utas.edu.au

Research Questions

1. Are the recent mega fires in the Alps unprecedented? (in historical and prehistorical contexts)
2. What's the relationship between fire and: land tenure; vegetation; fuel age; 100 year rainfall and drought history
3. What are the management implications of the fires

Freshwater Ecosystems

Project Leader Peter Davies (UTAS) P.E.Davies@utas.edu.au

Research Questions

1. What is the long term viability of bog/fens in the Alps (with/without intervention) given threats operating?
 - a. What are the impacts of reduced precipitation and higher temperatures on bogs/fens and biota?
 - How will bog/fen condition be impacted by climate change?
 - How will exotic fauna respond to climate change?
 - b. What is the impact of increasing UV on bogs/fens and biota?
 - c. What are the long term impacts of large herbivores on alpine bogs/fens?
 - d. How do bogs/fens recover from fire / disturbance?
 - e. What are the impacts of weeds on bogs/fens (e.g. willows)? Are weeds a major issue?
2. What is the dependence of various EPBC species on bogs/fens?
3. How do we prioritise bogs for restoration after fire/disturbance and which will recover adequately without intervention?
4. What are the key threats to threatened aquatic fauna e.g. trout, didymo? How are these going to change under climate change?
5. What inputs do we need for a model to integrate it all?
6. What is the current condition of alpine bogs in the Alps?

Research Objectives

1. No further loss of current extent of bogs in functional condition from now to 2100.
2. Maintain or improve the health/condition of waterways.
3. Maintain or enhance populations of riverine and wetland aquatic fauna and flora.

Photo: The Freshwater Ecosystems Working Group

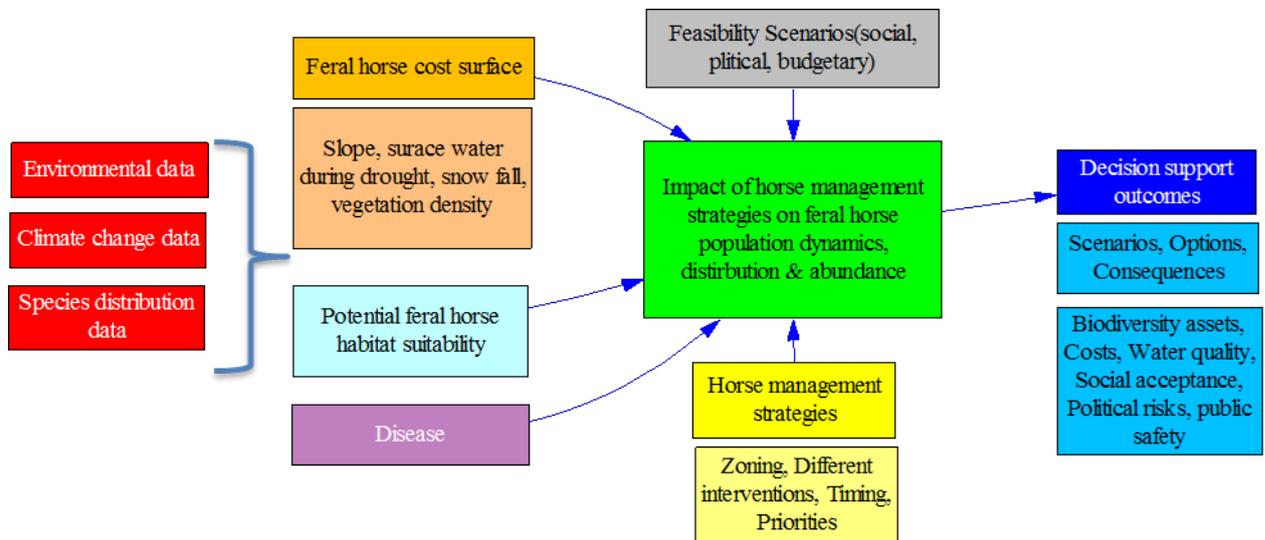


Interactions & Integration across all groups

Bioregional Futures Project Leader Brendan Mackey (Griffith Uni) B.Mackey@griffith.edu.au

Research Questions

1. How can evidence based modelling provide decision makers with information which is useful over different planning time scales (1, 5 and 10 year planning) about the consequences and associated risks of options for managing threats to biodiversity assets under a changing climate?
2. In the context of #1, and taking feral horses as a case study, design and test a decision support system for producing information on options for feral horse management and their consequences for protection of biodiversity assets, costs, other natural values, political implications, and social acceptability.
3. Where are there refugia/refuge habitat locations in the case study region and what are their conservation management requirements, and the implications for management planning?
4. Given climate change projects and predicted impacts, what changes are amenable to and warrant management interventions?
5. How does offset policy differ between NSW and Victoria and what are the implications for park management and off-reserve conservation?



Flowchart: An example of hub project integration using wild horses as a case study

Photo: The Interactions & Integrations Working Group interacting with the Invasive Species Working Group

