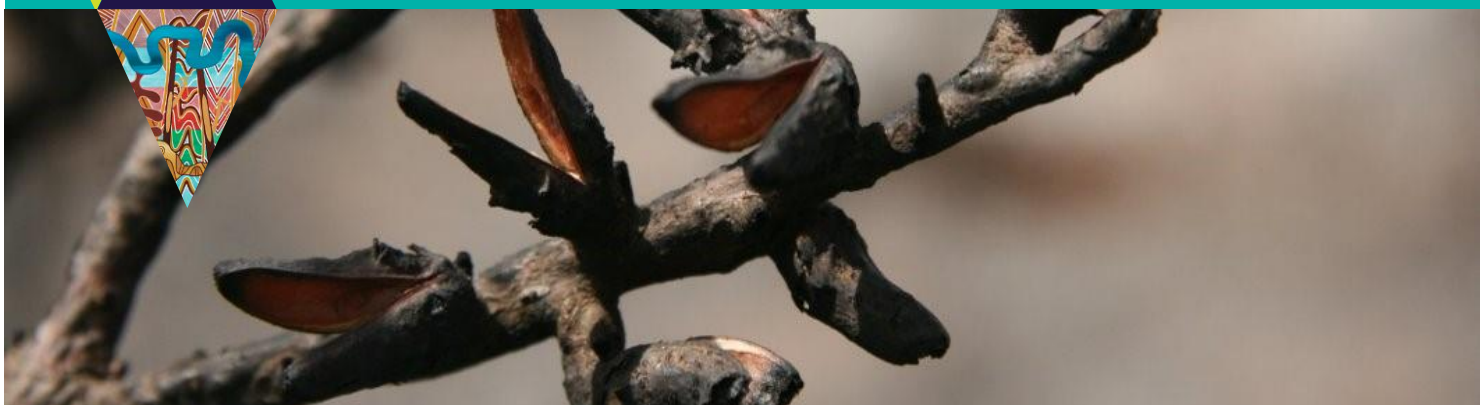
Biodiversity Knowledge Framework

Summary



Context

Protecting Victoria's Environment - Biodiversity 2037 is Victoria's twenty-year plan for the future of biodiversity in the state. It aims to stop decline and achieve a net improvement in the outlook across all species by 2037, while sustaining a strong economy. The *Biodiversity Knowledge Framework* contributes to the strategic stage of the Biodiversity 2037 implementation cycle. Supporting this cycle, the *Biodiversity 2037 Monitoring, Evaluation, Reporting and Improvement Framework (MERF)* facilitates continuous improvement in planning and implementation through new tools and techniques, while responding to emerging issues.

This report describes a method which uses causal models to identify knowledge gaps in biodiversity conservation management. This allows prioritisation of research investments which best facilitate delivery of the outcomes and vision of *Biodiversity 2037* (Figure 1).

The report and method have been developed by The Department of Environment, Land, Water and Planning (DELWP) Biodiversity Division in collaboration with The Arthur Rylah Institute for Environmental Research (ARI) and University of Melbourne.

The *Biodiversity Knowledge Framework* uses improved knowledge acquisition to:

1. Improve decision making and effectiveness of actions

Targeted data collection facilitates evidence-based decision making. Integrating knowledge across all environments, the whole-of-ecosystem approach considers the complex and interdependent nature of

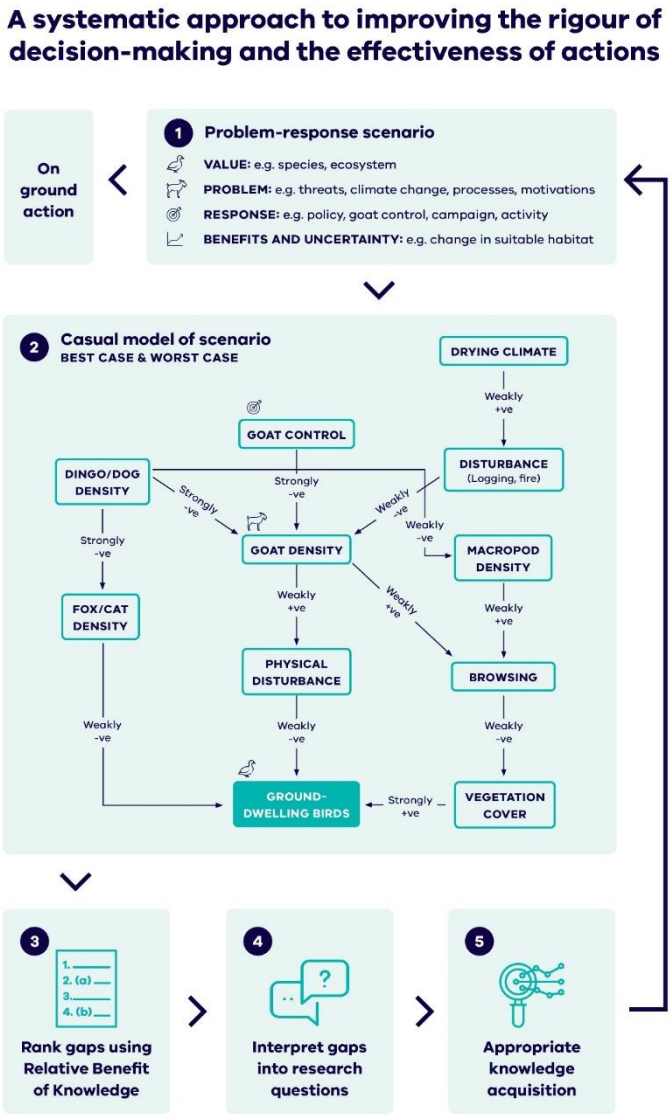


Figure 1: A systematic approach to improving the rigour of decision-making and the effectiveness of actions

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Victoria's ecosystems, as well as the changeable nature of biodiversity conservation investment. This ensures we are able to test our assumptions and understand the consequences of climate change, management and human land use, to plan effective, broad thinking action.

While many knowledge gaps exist, the impacts of uncertainty in conservation are not all equal. Relative Benefit of Knowledge is an index for identifying which gaps are likely to be critical to effective management, thereby ranking research priorities.

2. Guide research to address these gaps

Victoria is biologically and socially diverse. Therefore, it can be difficult to reach consensus on research priorities. Identifying, comparing and prioritising knowledge gaps across interventions, environments and systems allows us to assess proposals for effectiveness and provide future project concepts. This approach acknowledges that gaps may be resolved through varied methods including Traditional Knowledge, social research, monitoring, surveys, data synthesis or a multi-disciplinary approach.

Highly ranked knowledge gaps identified by the first set of causal models have been translated into the following research projects:

- Does fox control reduce fox densities to a point where there can be substantial benefit for small to medium sized ground dwelling mammals? What circumstances influence the success of fox control (e.g. disturbances, alternative prey availability)?
- To what extent do dogs/dingos take fox bait? What are the broader ecosystem implications of reduced dog/dingo densities?
- Does deer control reduce deer densities to a point where the following taxonomic groups substantially benefit: native grasses and forbs and/or native trees and shrubs and/or frogs and reptiles and/or macropods and/or small to medium sized mammals?

Developing causal models

Causal models describe our shared understanding of a threat or disturbance process to a species or ecosystem. They may also be adapted to assess barriers to human behavioural change. Using them, we are able to identify options for intervention, policy or management, and predict their potential impacts. Three principals guide the production of causal models:

- High uncertainty in the impact of landscape scale interventions on particular species groups (guilds) coupled with potentially high benefits for these groups
- Priorities identified due to emerging threats, changes to land use, policy or legislation
- The imperative to develop a shared understanding of an ecosystem, and the values, threats, and uncertainties identified by different interest groups.

The original problem response scenarios are identified through the Strategic Management Prospects tool (SMP), with causal models developed for scenarios with the greatest uncertainty. To create models, experts predict plausible best- and worst-case associations in terms of management effectiveness. The contrasting links and pathways between these two models represent knowledge gaps.

Online Knowledge Portal

Partners and stakeholders are encouraged to participate in an online interactive portal by contributing or updating causal models, or by identifying and including projects that are helping to address knowledge gaps.

This will soon be developed and accessible at https://www.environment.vic.gov.au/biodiversity/knowledge-framework

Accessibility

If you would like to receive this publication in an alternative format, please telephone the DELWP Customer Service Centre on 136186, email customer.service@delwp.vic.gov.au, or via the National Relay Service on 133 677 www.relayservice.com.au. This document is also available on the internet at www.delwp.vic.gov.au.