

## Concept Plan SP 2019-069

# Structured Decision Making to support threat management for biodiversity conservation in the Kimberley

Ecoinformatics

### Project Core Team

|                       |              |
|-----------------------|--------------|
| Supervising Scientist | Megan Barnes |
| Data Custodian        | Megan Barnes |
| Site Custodian        |              |

### Project status as of March 11, 2020, 2:34 p.m.

New project, pending concept plan approval

### Document endorsements and approvals as of March 11, 2020, 2:34 p.m.

|                |          |
|----------------|----------|
| Project Team   | required |
| Program Leader | required |
| Directorate    | required |

# Structured Decision Making to support threat management for biodiversity conservation in the Kimberley

## Biodiversity and Conservation Science Program

Ecoinformatics

### Departmental Service

Service 6: Conserving Habitats, Species and Communities

### Background

The benefits of integrated landscape management are variable across threatened taxa, which have variable susceptibility to threats and responses to management. Priority Threat Management identified introduced predator control, introduced herbivore control, weed management and fire management as cost-effective actions for managing DBCA assets in the Kimberley (Cawardine 2012, Cons Letters 5(3)196:204). Feral herbivore control was identified as a cost-effective threat management strategy for conserving many threatened and endemic species in the Kimberley, particularly its small mammal fauna, but the current program is not optimised spatially, rather regional staff annually design a logistically efficient approach within the existing budget.

Efficiency and cost-effectiveness could be increased by optimising delivery of this high cost process to maximise biodiversity benefits through two key improvements: (1) characterisation of utility thresholds (i.e. the thresholds at which efficiency and impact decrease below a useful level) to inform “how much shooting is enough”, and (2) impact focused spatial action planning, to identify spatially explicit management strategies that balance the conservation needs of multiple species while accounting for other funds and opportunities in that timestep.

Structured Decision Making (SDM) is a formal collaborative process designed to facilitate decision making in multi objective, value-laden contexts characterized by limited resources, uncertainty, and difficult trade-offs such as these (Gregory 2012). Recurring decisions can be supported by optimisation to inform adaptive management, embedded within the SDM framework. Elements of management that are (i) recurring, (ii) uncertain, (iii) affect multiple threatened species, (iv) entail high costs, and (v) are likely to involve diverse management objectives are particularly suitable to the application of structured decision making. Challenges in the Kimberley that met these criteria were collaboratively identified with Kimberley region staff. Emerging from this process domains of management that would benefit from the application of structured decision making were identified.

### Aims

The aim of this research is to apply Structured Decision Making collaboratively with the Kimberley region and district fauna managers, BCS scientists, and stakeholders to:

- (1) evaluate the costs and benefits of existing and proposed herbivore control strategies
- (2) understand and characterise synergies and trade-offs among alternative management strategies for herbivore control
- (3) identify 'decision triggers' - thresholds at which the preferred management strategy changes.

To do this I will (i) Conduct collaborative workshops to identify, document and incorporate the full suite of objectives, constraints and barriers, incorporate diverse values, and collaboratively design feasible alternative management strategies, (ii) identify cost-effective strategies for multiple taxa using a spatially explicit Multi-Criteria Decision Analysis, and (iv) conduct trade-off analysis to identify synergies and trade-offs of strategies across multiple taxa using existing monitoring data.

### Expected outcome

The project will identify opportunities for improved cost-effectiveness of herbivore management, define decision triggers for changing management approaches, identify high-value information (and in so doing inform monitoring and research), and support transparency and accountability in the Kimberley landscape management portfolio.

## Strategic context

This project will inform priority threat management implementation by integrating risk, prospects for success and cost-effectiveness, as outlined in Corporate Guideline No. 35 (section 5.5.1), while directly meeting Biodiversity and Conservation Science program goals of conducting excellent “outcome driven” science that directly supports Regional needs and management outcomes (Science Strategic Plan 2017-21). Structured Decision Making and the planned outcomes (e.g. control charts, trade-off analysis, optimal management strategies) also support clearer processes to justify decision making, as specified in the Auditor General's 2017 Report (*Rich and Rare: Conservation of Threatened Species Follow-up Audit*).

## Expected collaborations

Ben Corey, Regional Nature Conservation Leader, Kimberley  
 Brett Mitchell (CDU) – small mammal data  
 Vanessa Adams (University of Tasmania)

## Proposed period of the project

Dec. 6, 2019 – Dec. 6, 2021

## Staff time allocation

| Role         | Year 1 | Year 2 | Year 3 |
|--------------|--------|--------|--------|
| Scientist    | 0.4    | 0.4    |        |
| Technical    | 0.1    | 0.1    |        |
| Volunteer    |        |        |        |
| Collaborator | 0.1    | 0.1    |        |

## Indicative operating budget

| Source                    | Year 1 | Year 2 | Year 3 |
|---------------------------|--------|--------|--------|
| Consolidated Funds (DBCA) | 3000   | 3000   |        |
| External Funding          |        |        |        |