

Concept Plan SP 2022-038

Optimising the effectiveness of biodiversity monitoring in Western Australia

BCS Fire Science

Project Core Team

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Project status as of July 17, 2023, 2:43 p.m.

X X New project, pending concept plan approval

Document endorsements and approvals as of July 17, 2023, 2:43 p.m.

X X
Project Team granted
Program Leader required
Directorate required

Optimising the effectiveness of biodiversity monitoring in Western Australia

Program

BCS Fire Science

Departmental Service

Service 6: Conserving Habitats, Species and Communities

Background

The department undertakes biodiversity monitoring to better understand biodiversity responses to environmental threats and responses to management practices designed to ameliorate those threats. However, designing monitoring programs that can effectively detect temporal responses to threats or management separately from natural temporal changes in biodiversity is challenging. This is especially pertinent for arid zone ecosystems where natural annual fluctuations due to rainfall can potentially be orders of magnitude greater than the changes due to threats or management. Furthermore, monitoring fauna, whose mobility can result in many false negatives during monitoring, only adds to the challenge of identifying temporal responses to threats or management. Given these challenges, it is important that the department evaluates the rigour of its monitoring program to assess its ability to detect temporal responses to threats and management practices.

This evaluation will improve the efficiency of the department's monitoring activities in several ways. Firstly, it will look for duplication and overlap between individual programs and see how they can be combined to provide greater rigour. Secondly, it will evaluate the ability of individual programs to detect a change due to the threat or management practices examined to see whether the rigour of the program can be improved or whether a different approach is required to detect changes. Lastly, we will explore a multitude of new and existing approaches to interpreting temporal monitoring data to assess the value of each approach for specific monitoring programs with the aim of increasing the power of individual monitoring programs to detect the changes they were designed to detect.

Aims

The project has multiple aims:

- To assess monitoring activities conducted by the department to identify where efficiency can be made by reducing duplication and overlap
- Evaluate the ability of individual monitoring programs to detect temporal changes and suggest improvements to the design or approach of required
- Explore a range of approaches for interpreting monitoring data and implement them to suit individual monitoring programs
- Explore future advances in monitoring techniques and analyses to ensure that both are incorporated as required into the department's monitoring to maintain its rigour and efficiency

Expected outcome

The expected outcome of the project is that it will significantly increase the ability of the department to conserve biodiversity. It will achieve this by increasing the efficiency of individual monitoring programs leading to time savings for personnel and financial savings. One benefit of the increased efficiency is that personnel will be able to potentially increase the replication in the monitoring program leading to increase rigour through an improved ability to detect changes, which will lead to better management practices to ameliorate threats. Another benefit is that it may free up personnel to engage in other monitoring or management activities, which would potentially lead to additional conservation benefits. Another outcome from this project is an improvement in the interpretation of monitoring results, which will increase the ability of the department to identify temporal changes due to threats and, consequently implement management actions to ameliorate those threats. Lastly, an expected outcomes is an enhanced ability of the department to incorporate advanced in monitoring technology, methodology and analysis into current and future monitoring programs. Incorporation if these advances will improve the efficiency of monitoring programs with consequent biodiversity conservation benefits.

Strategic context

This project will address many of the strategies outlines in the department's Strategies Directions 2022-25 and the Science Strategic Plan 2018-21. This project will contribute towards the following 5 strategies from

the department's Strategic Directions: (1) Conserve, restore and manage plants and animals, ecosystems and landscapes using world-recognised science and best practice management; (2) Manage threats to maintain and enhance biodiversity and cultural values; (3) Use world-recognised science to build and share biodiversity knowledge to support evidence-based management; (4) Collate, manage and share data to support effective decision making and conservation; and (5) Develop adaptive management tools to promote ecosystem resilience to the impacts of climate change and other threats. The project will also contribute towards the following 9 strategies from the Science Strategic Plan: (1) Assess conservation status of species and ecological communities; (2) Provide scientific basis for monitoring of threatened species and ecological communities; (3) Assess threats of invasive species and pathogens; (4) Improve effectiveness of monitoring and management of invasive species and pathogens; (5) Understand the pressures and threats acting on ecosystems, including altered fire and hydrological regimes, fragmentation, recreational activities, commercial operations, pollution, habitat loss, and grazing pressure; (6) Undertake research and monitoring to advance knowledge on the vulnerability of species and ecosystems to climate change; (7) Undertake research and monitoring to address gaps in biodiversity knowledge and support decision-making; (8) Identify and realise opportunities for adoption of technical advances and innovative approaches for conservation; and (9) Understand effects of variation in fire regimes on species, ecosystems and landscapes.

In addition to addressing these strategic aims of the department, this project will also have significant management implications for the department. As described previously, by improving the rigour, power and efficiency of the department's monitoring, it will enable the department to invest in management that maximises conservation benefits. The project will also enable better evaluation of the value of management practices for biodiversity conservation, which will result in improved management and improved conservation outcomes.

Expected collaborations

This project will require extensive collaboration between various sections of the department but it is not envisaged that there will be collaboration with organisations outside the department.

Proposed period of the project

July 20, 2022 – June 30, 2025

Staff time allocation

to	X	X	X	X
Role	Year 1	Year 2	Year 3	
Scientist	0.8FTE	0.8FTE	0.8FTE	
Technical				
Volunteer				
Collaborator				

Indicative operating budget

to	X	X	X	X
Source	Year 1	Year 2	Year 3	
Consolidated Funds (DBCA)	11000	8000	3500	
External Funding				