CSIRO SUSTAINABLE ECOSYSTEMS

Research Briefing Note

A case study of minimum dataset requirements and tools for identifying priority areas for biodiversity monitoring in the central Australian rangelands

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BACKGROUND

At a technical workshop for rangelands biodiversity monitoring (Smyth et al. 2003), it became clear that, with the development of the national Natural Resources Management Monitoring and Evaluation Framework (NRM), regions throughout Australia will be required to develop regional biodiversity monitoring programs as part of assessing their progress towards improved natural resource condition. While being affordable and feasible, these programs must support the overall NRM objectives to assess the state of biodiversity (e.g., ecosystems and its components) and provide information from which to draw inferences about changes in state over time for the purpose of tracking environmental performance in response to management action. These objectives will need to be met within and probably across regional boundaries but more importantly they do explicitly imply that regional committees will be able to:

- capitalise on existing data;
- effectively identify biodiversity hotspots and target those at most risk from present land use pressures for monitoring and reporting at the regional scale; and
- apply standard protocols for the scale, design, intensity and reporting features of a biodiversity monitoring program.

The Commonwealth hopes that regional programs will be in place within five years but, if any of these conditions cannot be met, then it will be difficult for regions to develop a biodiversity monitoring system within the Commonwealth's expected timeframe, or to follow the principles of monitoring systems that underpin their effectiveness.

AIM

Management

1. Identification of biodiversity hotspots under most pressure as priority areas.
2. Identification of the minimum dataset requirements for developing a sampling design for monitoring biodiversity.
3. Development of guiding principles and a "How to" manual for applying the tools and techniques.

Scientific

Test the hypotheses that

1. Natural refugia and areas of high resilience to present land uses will be biodiversity hotspots.
2. These hotspots will vary patchily among land types in response to differences in environmental predictors of topography, geology, soils condition, vegetation associations and dynamics, local climate and land use pressures both past and present.
3. Datasets of environmental and land use pressure predictors will need to be comprehensive, seamless and have the capacity to support identification of biodiversity hotspots and priority areas.
4. Biotic attributes used to identify biodiversity hotspots are expected to be a limiting factor of existing datasets and only those that can be summarised at the ecosystem level (e.g. species diversity, endemism, dominance) will be readily available and these are expected to vary in their appropriateness for assessing hotspots.
5. Priority areas at most risk will be 'less-pressured' areas that support numbers of 'inflexible species' that have a reduced ability to survive where different intensities of pressure adversely affect habitat requirements.

OUTCOMES

- Shared understanding of the capacity of existing NRM datasets to identify priority areas for monitoring biodiversity at a regional scale in the rangelands.
- A range of new and enhanced tools for mapping priority areas for site selection and potential conservation agreements for NRM regional planners that are relevant, easy to use and affordable.
- Demonstration of the value of existing satellite, GIS and biodiversity datasets, tools and techniques to underpin the identification of priority areas for selection of a set of sites for monitoring biodiversity.
- Demonstration of the practicality of integrating datasets with disparate spatial and temporal resolutions for planning regional biodiversity monitoring systems.
- Application of new generic species-habitat predictive models together with selection tools involving target criteria for conservation agreements.

IMPLICATIONS

This research will provide a long overdue assessment of the capacity of an existing comprehensive dataset to support planning for biodiversity monitoring programs at a regional scale in the arid rangelands. Most importantly, it will deliver a quantitative basis for identifying priority areas for monitoring biodiversity, identify the deficiencies and new improvements for existing regional datasets and highlight key guiding principles for designing programs for rangeland biodiversity monitoring.

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