

Climate Change Adaptation Research Grants Program

- Freshwater Biodiversity Projects

Project title:

Contributing to a sustainable future for Australia's biodiversity under climate change: conservation goals for dynamic management of ecosystems.

Principal investigators:

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Lead organisation:

CSIRO Climate Adaptation Flagship

Objectives:

The objectives of this project are to:

1. Review existing conservation and NRM goals and objectives in Australia as set out in legislation, policies, strategies, plans and other documents relevant to national, state and territory, and regional scales and how these inform investment in conservation.
2. Explore the implications of climate change for the effectiveness of existing goals based on the underpinning conservation and ecological theory and observed and projected climate and ecological changes (using available existing environmental and ecological projections).
3. Identify existing, revised and new goals and objectives that might be achievable under climate change to conserve Australia's terrestrial and freshwater biological heritage and ecosystem services, through prioritised, focused case studies with relevant conservation agencies (policy and management), NRM bodies and private organisations (i.e., that may reflect contrasting values for biodiversity).
4. Communicate the outcomes of the research to these stakeholders and provide tools (e.g., conceptual models, adaptation guidelines) for decision- and policy-makers who are preparing to act on the implications of climate change by transforming goals and objectives.

Project design and methods

The research conducted to address the objectives listed above is designed to: facilitate understanding of the shortcomings and strengths of existing conservation goals and objectives under climate change; help formulate thinking and support the analysis, discussion and development of conservation goals that meet adaptation requirements; and underpin the development of a conceptual framework and tools to support conservation agencies and NRM bodies assess and modify policies, strategies and objectives to better accommodate climate change. The project will focus equally on developing conservation goals for terrestrial and freshwater biodiversity, though the level of detail in some analyses may vary depending on availability of information and interests of project partners. We will also seek to identify opportunities for learning across terrestrial and freshwater practice.

Activities

1. Review and assess existing conservation objectives in Australia

A broad and representative sample of policies, strategies, legislation, plans and other documents will be chosen from relevant national, state and territory, and regional scales. These will be analysed to identify the conservation objectives described in the documents. The analysis will seek to identify the reasons and justification behind the inclusion of the various objectives; for example have they been included because they represent aspects of biodiversity that are valued in their own right (ends) or because they inform planned management steps towards meeting the ends (means)-using a hierarchy of objectives (e.g. visions, goals, objectives, targets and actions). Where possible the scientific rationale and the assumptions behind the conservation and NRM objectives will be noted (e.g. ecological requirements of Individuals or populations, umbrella and surrogacy concepts, redundancy, representativeness), particularly whether climate change was identified as a factor in the choice of the objective (i.e., the ecological and conservation theories and literature will be used to create a typology of objectives that will structure and guide this analysis). A critical aspect to this assessment will involve comparing and contrasting the terrestrial and freshwater approaches, with carefully selected conservation policy agencies and conservation management agencies familiar with both, to explore commonalities, unifying principles, key differences and constraints to their adoption.

2. Explore the implications of climate change for the effectiveness of existing goals

This activity will include:

- i. Developing a set of ecological-change scenarios for how the dimensions of biodiversity valued by society (e.g., species, communities, ecosystems, ecosystem services) might respond to climate change. This will draw on literature and previous and through consultation with other specialists. These scenarios will aim to capture the spread of possible ecological futures including uncertainties in both the nature of ecological change types and the magnitude.
- ii. Developing criteria for assessing the effectiveness or achievability of conservation goals and objectives under climate change. These criteria will represent various 'realities' of climate impacts and adaptation, covering ecological changes, socio-economic factors (e.g., changing values; distributional equity, institutions), and emerging lessons from adaptation science. The criteria will explicitly include evaluations of the sensitivity of the goals and objectives to uncertainties in climatic and socio-economic drivers of change, as well as ecological responses. These will include testing different goals against a range of scenarios spanning the possible range of ecological outcomes and social drivers.
- iii. Assessing the goals and objectives identified in Activity 1 against the criteria, and classifying them depending on their likely effectiveness or feasibility under climate change, their sensitivity to uncertainty, and identifying the conditions under which they may be effective.

3. Four case studies with conservation agencies and NRM bodies to identify goals that better accommodate climate change and to develop support tools to inform policy and planning processes

The case studies will involve two phases: 1) the agencies will identify goals and objectives on a chosen topic and assess these - based on the criteria and scenarios developed in Activity 2 - with specialists in a workshop or focus-group setting to determine their likely effectiveness in the face of high levels of, but uncertain, ecological change; 2) the agencies then, over a period of several months and in discussion with specialists, develop responses relevant to their contexts and capabilities. Where necessary revisions to goals, objectives, and targets will be scoped and reviewed with the project team. The partner conservation agencies and NRM bodies in each case study will be finalised once the project has been confirmed. A national level, two state-level and a regional-level agency are likely to be chosen. The focus of the case studies will vary depending on the partners and their needs, and could cover all biodiversity or specific issues (e.g., vegetation management, invasive species), and we will ensure both terrestrial and aquatic issues are covered.

4. Identify conservation goals that might be achievable under climate change

This activity will draw on the broad desk-top analysis and the agency case studies to develop a set of potential conservation goals that accommodate the inevitable dynamics of biodiversity and other social and institutional aspects of managing biodiversity under climate change. The activity will explore goals that consider multiple perspectives within the broad mandate of conserving Australia's biological heritage. This will include existing goals that prove to meet adaptation requirements, revisions of existing goals, and where needed, new goals. It will consider objectives and implementation processes that are effective under a range of levels of climate change and ecological changes, as well as processes that can respond to emerging information. This will be done within 'working examples' with partners currently assessing existing strategies and plans, and although the focus will be on ends that might be achievable under climate change, the subsidiary objectives, targets, and actions to achieve these ends will be scoped.

5. Synthesis and communication

The findings and lessons from Activities 1 to 4 will be integrated in a final report. This will include

- a refined set of criteria for assessing the effectiveness or achievability of conservation goals and objectives under climate change, covering ecological and socio-economic factors;
- a description of the set of goals and associated objectives that meet adaptation requirements;
- a summary of lessons learnt and tools to support conservation agencies, NRM bodies and private organisations in assessing and modifying their policies, strategies and objectives to better accommodate climate change considerations. The design of the tools will depend on the content and identified need of end-users; they may include conceptual frameworks, decision trees, multi-dimensional tables.

The report will be drafted and finalised in consultation with NCCARF and the advisory panel and if appropriate briefings of findings to priority non-partner organisations during this period will be given.