Science for Saving Species

Research findings factsheet

Project 5.1 Better offsets for threatened species

Threatened Species Recovery Hub

National Environmental Science Programme

Estimating the benefits of offsetting: Expert elicitation

Biodiversity offsets

The use of biodiversity offsets for addressing impacts on biodiversity driven by development has become increasingly common worldwide. At least 69 countries currently have biodiversity offset policy in place or in development. Offsets are frequently used in regulatory conditions of approval for urban, mining and infrastructure projects that impact threatened species and ecological communities.

In Australia, the Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy (2012) requires many developments to use biodiversity offsets to compensate for environmental impacts that cannot be avoided or mitigated. The aim is to deliver an "improve or maintain" outcome for biodiversity impacted by development.

The science of biodiversity offsetting has not, however, kept pace with the rate of its adoption as a policy by governments worldwide – and offsetting presents a highly complex challenge for a country like Australia with over 1800 threatened species and ecological communities protected under the EPBC Act.

Good decisions are based on good evidence

Effective offsets policy requires data on the costs and benefits of on-ground management actions to be readily available to decision makers. However, a key challenge of estimating the benefits of offsets is that this information is often difficult to obtain. Very few historical offset projects in Australia have been evaluated to determine the resulting benefit.

Even for other types of conservation projects, data on actual biodiversity outcomes (rather than the inputs, such as the number of trees planted) are frequently lacking. One reason for this lack of information upon which to base decisions is that significant funding is required to monitor and evaluate conservation actions, over the longer-term.

Expert elicitation

An increasingly common technique for filling knowledge gaps where ecological data are not available is expert elicitation. Experts can represent a quick and relatively inexpensive source of information that can inform better environmental decision-making. Expert elicitation has not yet been used to estimate the conservation benefits of offsets, but as it promises to provide an inexpensive and fast solution to supply information needed for offset decision-making, it is being investigated in this project.

For the malleefowl, biodiversity offsets that manage grazing, predators and fire over large areas are likely to be more beneficial than reserving habitat, but this makes it is less clear how to quantify conservation gains. Photo: Donald Hobern CC2.0

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Table 1: Government agencies that work on biodiversity offsets and environmental approvals have helped identify the species, species groups and ecological communities most in need of information to support decision making.

Species/subspecies

Greater bilby
Northern quoll
Malleefowl
Night parrot
Tasmanian devil
Spotted-tail quoll
Wedge-tailed eagle (Tasmanian)
Australian grayling
Striped legless lizard
Pink-tailed worm-lizard
Spiny rice flower
Wallum sedge frog
Baudin's cockatoo
Orange-bellied parrot

Species group

Migratory shorebirds
Small-bodied woodland birds
Cryptic orchids

Ecological community

Littoral rainforest and coastal vine thickets of eastern Australia
Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest
Brigalow (Acacia harpophylla dominant and co-dominant)
Banksia Woodlands of the Swan Coastal Plain

Brigalow.
Photo: Mark Marathon CC BY SA 3.0.

Who is an expert?

Often, when we think of "experts" we think of highly regarded, high status individuals. However, research has found that expert status is a poor indicator of performance. The most reliable estimates are actually derived from the average estimate of a group of experts. The power of these estimates comes from group diversity, anonymous estimates and facilitated discussion.

Good expert performance involves:

- Having a holistic understanding of the subject matter
- Always seeking the truth
- Knowing the limitations of your knowledge
- Successfully practising your expertise.

Estimating offsetting under challenging circumstances

Research into the best strategies for estimating offsets for threatened species and ecological communities listed under the EPBC Act has a focus on the following three challenging scenarios:

1. Where data are limited and insufficient to reliably inform offset strategies. In this case investment in targeted research may be an appropriate offset;
2. Where offsets are difficult to identify or very expensive; and/or
3. Where habitat protection may be of limited benefit. A typical approach for delivering offsets is to legally protect habitat and to equate the conservation gain to the area of land protected; however, some species are better protected by management activities such as predator control, fire management or weed control, and it is less clear how to quantify conservation gains when this is the case.

Aims and methods

The research draws on processes of formal expert elicitation with groups of key experts, and analysis of the cost-effectiveness of the offsetting strategies. Its short-term goal is to provide better data on the costs and benefits of conservation management actions that can inform development approvals that involve offsets for threatened species and ecological communities. The medium-term goal is to deliver a protocol for expert elicitation that can be used by stakeholders to inform offset priorities for a broader range of threatened species and ecological communities.

Species, species groups and ecological communities most in need of information to support decision making were identified in collaboration with federal and state government agencies that work on biodiversity offsets and environmental approvals. The resulting priority list is provided in Table 1.

Elicitation process

The project will consist of at least five elicitation processes, each one drawing on a separate group of 10 to 20 participants with expertise in the conservation and management of one or more of the priority species or communities. The expert participants will include conservation scientists and managers from state government agencies, non-government organisations and species recovery teams that work on the priority species and communities.

A snowball approach will be used to recruit participants, where the first experts identified and approached can suggest additional experts. This approach has previously been found to increase the diversity of the participants, and diverse groups have been found to improve the performance of expert elicitation processes.

The expert elicitation follows the IDEA Protocol (Identify, Discuss, Estimate, Aggregate) – a flexible and transparent approach for deriving quantitative estimates from expert judgement. It is quick, accessible, repeatable and robust. It involves surveys of around 20 questions followed by group discussion, which may be online, over the phone or in person. After the group discussion, participants are given an opportunity to revise their estimates in a second survey. Research has found that those who update their estimate in light of evidence and reasoning presented from Round 1 and the discussion usually move in the direction of the truth. All of the steps in the elicitation process are outlined in Figure 1.

Tasmanian Government guidelines for offsets for Tasmanian devils recommended financial contributions to devil research as more suitable than setting aside habitat, but is this the best option? Photo: Mike Lehmann CC BY-SA 2.5

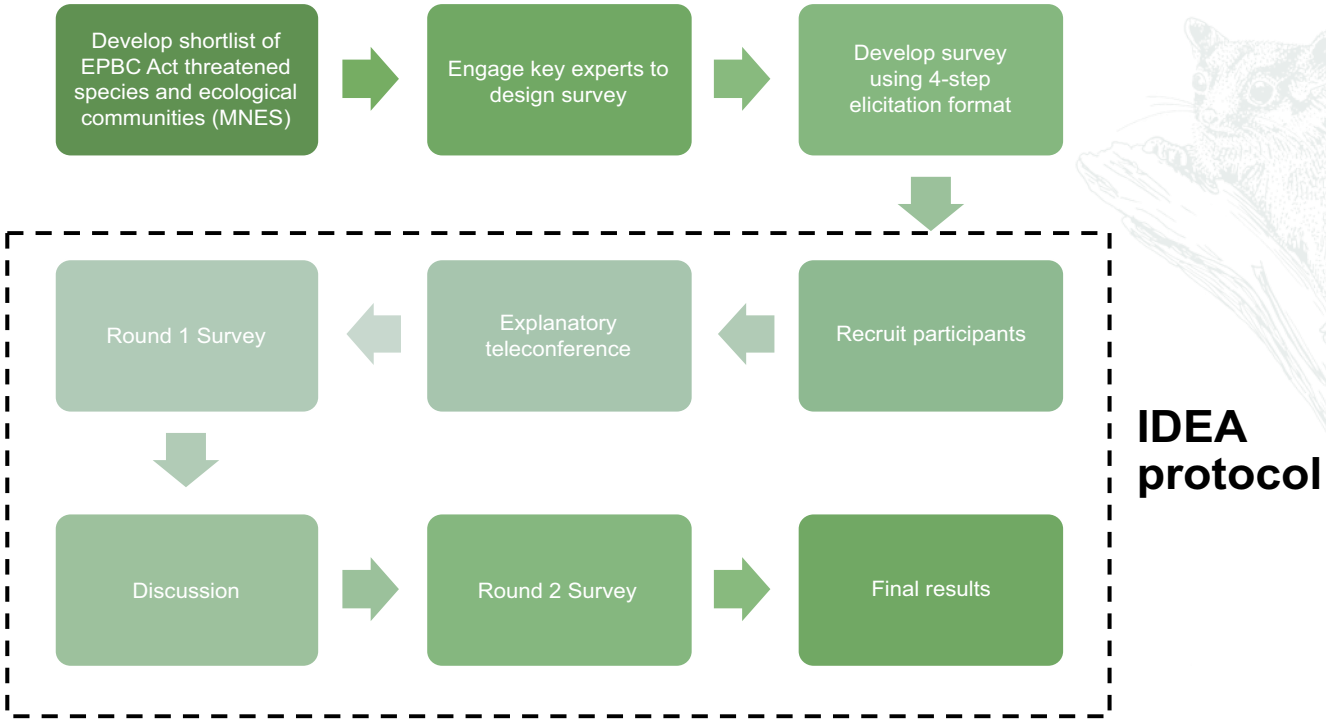

Figure 1: The expert elicitation process, which utilises the IDEA protocol.

Expert elicitation: The way of the future?

Expert elicitation is in the early stages of investigation as a method for estimating the benefits and costs of offsetting. It has the advantages of being a relatively fast and inexpensive process, and it could also be used for further purposes such as recovery planning. More case studies are needed to fully assess its viability and accuracy, although the indications so far are that it holds great promise as an important and valuable tool in the offsetting space.

Elicitation process (continued)

For each species or ecological community addressed, the process will identify key benefits and threats, and identify possible offset strategies, using a four-step elicitation format:

1. Realistically, what do you think is the lowest plausible value for X?
2. Realistically, what do you think is the highest plausible value for X?
3. Realistically, what is your best guess for X?
4. How confident are you that your estimated range could capture X? Provide confidence as a percentage.

'X' can represent any variables such as the number of individuals of a species under different scenarios. It is also important that the elicitation assumes no additional human development impacts (e.g., a mine) which would in themselves trigger action under the EPBC Act. The elicitation must also specify the time period. For example: imagining a site with 20 hectares of suitable habitat, without any additional management, and ignoring the possibility of additional human development impacts, realistically, what do you think the lowest plausible number of malleefowl will be in 20 years?

Feral predator control could be an effective offset action for many species, but the benefit would be hard to estimate. Photo Northern Territory Government

Conserving rocky habitat on agricultural land could be an effective offset for pink-tailed worm-lizards, but there is little existing data to guide estimation of the anticipated benefit. Photo Damian Michael

Further Information

For more information about this TSR Hub research, contact Assoc Prof Martine Maron - m.maron@uq.edu.au or visit our website at http://www.nespthreatenedspecies.edu.au/

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