

# DECISION POINT

Connecting conservation policy  
makers, researchers and practitioners

Issue #91 / August 2015



## Offsets in the system

Exploring the  
many dimensions  
of biodiversity  
offsets policy



**Funding for threatened  
species as offsets**



**Comparing offset  
methodologies around the  
world**



**Backcasting to save the  
Cumberland Plains  
Woodlands**

### Decision Point

*Decision Point* is the monthly magazine of the Environmental Decisions Group (EDG). It presents news and views on environmental decision making, biodiversity, conservation planning and monitoring. See the back cover for more info on the EDG. *Decision Point* is available free from <http://www.decision-point.com.au/>

### Plus

Offsetting in the context of policy  
Offsetting baselines: locked and loaded  
The importance of science in shaping policy  
Restoring native veg in an agricultural landscape

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## Contents



### Research briefs

- ▶ Orangutans: reintroduction vs habitat preservation
- ▶ Restoring native veg in an agricultural landscape
- ▶ Biodiversity impact of converting farmland to plantation

3

### Offsetting in the context of policy

Megan Evans asks what happens to the theory in the real world

4

### Perverse incentives of offsets policy

Could well-designed offset policies actually increase loss?

6

### Step forward then look back

Ascelin Gordon explains how backcasting can improve offsets policy

8

### Of apples, oranges and offsets

James Trezise on the importance of science in shaping policy

10

### Offset policies don't work

So maybe we should be weighing up the alternatives

12

### Offsets in *Decision Point*

A smorgasbord of offset treats from the past

14

### NGOs on offsets and recovery

Offsets entrench the decline of the Carnaby's black-cockatoo

16



Many people gladly give their time to community plantings. It's an opportunity to 'give back' to the environment. But what if the revegetation work was retrospectively exchanged for an equivalent amount of environmental damage by a developer (used as an offset)? Would people still be happy about donating their time? See page 6 for a discussion on this and other perverse incentives.

## On the point

### Offsets in the system

It's a simple idea that some hold up as the key to sustainable development. Others regard it as opening a Pandora's Box. Offsetting simply involves compensating for the impacts of development in one part of the landscape by doing something in another part of the landscape to ensure there is no net loss of biodiversity. For example, in building a new suburb **over here** you might clear some native vegetation. The offset might involve restoring some native vegetation **over there** so the loss in one place is restored in another – there is no net loss of biodiversity.

Of course, the Devil is in the detail and concepts of baselines, like-for-like, delayed payments and irreplaceability are all major challenges in making biodiversity offsetting work. It's a topic that EDG researchers have been engaging with for some time (see a summary of the key stories that have appeared in *Decision Point* on page 14). Given this involvement over time it might be argued that the EDG is one of the world's leading research networks engaging with biodiversity offsets.

This issue of *Decision Point* again focusses on biodiversity offsets but this time we take a broader view of where and how they fit in. You might call it a systems view. Megan Evans gets the ball rolling with a discussion on the legal, policy and institutional dimensions of offsetting (page 4). Martine Maron and Ascelin Gordon explore the possible perverse flow-on impacts of offsets even if they are well designed (page 6). Georgia Garrard and colleagues examine offsets against other forms of conservation (page 8) whereas Ascelin Gordon explains how the process of backcasting might improve offsets policy. Finally, James Trezise provides a perspective on influencing policy where he discusses the fundamental importance of science to policy and reflects on the experience of developing offsets policy (page 12).

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# DECISION POINT

*Decision Point* is the monthly magazine of the Environmental Decision Group (EDG). The EDG is a network of conservation researchers working on the science of effective decision making to better conserve biodiversity. Our members are largely based at the University of Queensland, the Australian National University, the University of Melbourne, the University of Western Australia, RMIT and CSIRO.

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## Orangutans: reintroduction vs habitat preservation

EDG researchers have established the best strategies for maintaining orangutan populations in Borneo and Sumatra for more than 20 years on a limited budget. They found that protecting the forest homes of orangutans is the most cost-effective way of boosting the great apes' chances of survival in the long-run.

"The International Union for Conservation of Nature (IUCN) has listed the Sumatran orangutan as critically endangered, and the Bornean species as endangered," says Hugh Possingham, a co-author on the study. "Unless we act quickly, most orangutan populations that don't have adequate protection face a dire future."

Currently, the two main strategies to conserve orangutans are rehabilitating and reintroducing ex-captive or displaced animals, and protecting their forest habitat to decrease threats such as deforestation and hunting. In the study, the researchers analysed which strategy or combination of strategies, and under what conditions, is the most cost-effective at maintaining wild orangutan populations.

"Money is limited in conservation, and it is important to know how best to spend it," says Howard Wilson, the lead author of the study. "We found that the choice between habitat protection and rehabilitation depends on the cost of rehabilitation per orangutan and the rate of deforestation.

"If we want to maintain orangutan populations for less than 20 years, then reintroduction is best. But if we're aiming for long-term species conservation, protecting their habitat is by far the best strategy. This is because reintroduction costs twelve times as much per animal compared with protecting its habitat, so rehabilitation is only a cost-effective strategy at very short timescales."

Possingham says the study suggests that the Indonesian and Malaysian governments as well as non-governmental organisations should allocate as much of their resources as possible to protecting orangutan habitats, rather than rehabilitating individual animals. 🍌

### Reference

Wilson HB, Meijaard E, Venter O, Ancrenaz M, Possingham HP (2014). Conservation Strategies for Orangutans: Reintroduction versus Habitat Preservation and the Benefits of Sustainably Logged Forest. *PLoS ONE* 9: e102174. doi:10.1371/journal.pone.0102174  
<http://www.plosone.org/article/info:doi%2F10.1371%2Fjournal.pone.0102174>

## Restoring native veg in an agricultural landscape

Since European settlement, one-third of Australia's woodlands, including 80% of southern temperate woodlands, have been cleared. In many agricultural areas the remaining native vegetation is highly fragmented. In these areas, traditional conservation strategies based on protection of intact landscapes as large individual reserves are difficult to apply.

In heavily cleared agricultural landscapes, declines of biodiversity could be prevented by restoring native habitat. This study is motivated by the need to support decision making by environmental managers and policy makers in Australia who are responsible for meeting or contributing to this restoration. Their decision-making task is challenging for a range of reasons. First, in highly fragmented landscapes, spatial context determines the benefits of landscape restoration. Second, ecological restoration in an agricultural landscape faces high restoration costs and high opportunity costs due to loss of productive land. The public funding available to support restoration is modest, so high-quality prioritization of effort is required. Third, the outcome of ecological restoration depends on a number of factors, including site selection, cooperation of landowners (where restoration is planned on private lands, and predictions of species distributions. The latter requires detailed information that often is not available for many of the target species.

Maksym Polyakov and colleagues have developed a spatially-explicit bio-economic model that attempts to meet these challenges by optimizing ecological restoration of habitat for woodland-dependent birds in Victoria.

Spatial optimization identifies strategies that would generate substantially greater environmental benefits than are likely to be achieved in current programs. Greater biodiversity outcomes can be expected where restoration is optimized across multiple species rather than just individual species, and if the program does not require an even distribution of restoration effort among farmers. 🍌

### Reference

Polyakov M, DJ Pannell, M Chalak, G Park, A Roberts & AD Rowles (2015). Restoring Native Vegetation in an Agricultural Landscape: Spatial Optimization for Woodland Birds. *Land Economics* 91: 252–271.  
[http://muse.jhu.edu/journals/land\\_economics/v091/91.2.polyakov.html](http://muse.jhu.edu/journals/land_economics/v091/91.2.polyakov.html)

## The biodiversity impact of converting farmland to plantation

The conversion of agricultural land to pine plantations is a major driver of global land-use change. Forest plantations cover an area of the planet approximately equivalent to half the size of the Amazonian rainforest! What is the impact on biodiversity? To address this issue Alessio Mortelliti and David Lindenmayer conducted a unique, large scale (131 sites distributed in a 30,000 hectare area), long-term (16-year) landscape transformation experiment (with treatment and control sites).

The uniqueness of their study is that they investigated what happens to animal populations when the habitat in which they live remains intact but the surrounding matrix changes (ie, a novel environment is created through the conversion of agricultural land to closed plantation forest).

They found that though overall species richness did not change, emerging pine plantations altered communities, favouring smaller birds that move easily through dense vegetation but reducing the presence of larger species. The long-term implications of plantation-generated landscape transformation could be local scale evolutionary changes.

These results suggest that matrix vegetation types can shape selection in such a way that species and communities within native landscape patches are permanently changed. 🍌

### Reference

Mortelliti A & DB Lindenmayer (2015). Effects of landscape transformation on bird colonization and extinction patterns in a large-scale, long-term natural experiment. *Conservation Biology* <http://dx.doi.org/10.1111/cobi.12523>

## Offsetting in the context of policy

### What happens to the theory when it hits the real world?

By Megan Evans (ANU)

Biodiversity offsetting is a highly topical and increasingly popular approach used to compensate for impacts on species and ecosystems as a result of development, and is the subject of a large and growing body of scientific research. There has been substantial work in developing offset metrics (Miller et al, 2015) which can accurately measure biodiversity losses and gains over time, as well as discussion around the ecological limits of offsetting (Maron et al, 2012). However, there has been comparatively less attention paid to how the policy system as a whole influences the possible environmental outcomes from biodiversity offsetting.

For instance, what are the roles and responsibilities of key organisations involved in offsetting, how do these organisations interact, and do they have sufficient capacity and ‘fit-for-purpose’ information to implement and oversee offset policy? What institutional settings are in place to govern the offsetting process? What legal mechanisms are used to transfer and enforce offset obligations between different participants? Are there appropriately aligned incentives to stimulate market participation and to facilitate monitoring and compliance?

To explore these many dimensions of offsetting policy we brought together fifteen academics and professionals from law, economics, business, ecology and policy for a two day workshop at ANU at the beginning of 2015 (see box on ‘Legal and institutional dimensions of biodiversity offsetting’).

By considering these institutional and organisational dimensions of biodiversity offset markets, in addition to key criteria for the effective implementation of environmental policy, workshop participants were able to identify a range of issues arising from the offset implementation process which may be impeding positive outcomes for biodiversity.

#### From good design to good outcomes

Although it was recognised and agreed that the recently updated Australian environmental [offsets policy guide](#) had introduced scientific rigor and improved transparency in the calculation of offset requirements, this has not necessarily led to improvements in other aspects of policy implementation. For example, it was pointed out that translating the offset requirements calculated at the design phase into on-ground implementation is still a rather complex process.

A better understanding by policy-makers of the challenges that on-ground offset providers can face (such as availability of native seed stock), and the unique insights these practitioners can bring to the table (such as knowledge of new management and restoration techniques), could help to ensure that the biodiversity outcomes that are promised by offset proposals are actually achieved on the ground.

**“What are the roles and responsibilities of key organisations involved in offsetting, how do these organisations interact, and do they have sufficient capacity and ‘fit-for-purpose’ information to implement and oversee offset policy?”**

#### Policy uncertainty

Biodiversity offsetting is a rapidly evolving policy space, which means that government policies have been through a number of changes in a relatively short space of time. For example, the Queensland Government introduced on average, one new offset policy per year over the 2000s. The introduction of new policies may be motivated by a number of reasons:

- a need to provide more guidance or to better address the problem at hand
- to incorporate new information as it comes to light
- to adapt the policy to respond to a variety of interest-group pressures.

The downside is that it continually shifts the goal-posts for businesses who need to comply with such policies when developing environmental impact statements and submitting development applications.

Securing an offset site which can provide adequate compensation for the impacts of a development is a long, complex and expensive process, requiring negotiation with many parties including landholders, banks, brokers, Federal, State and local governments and third-party offset providers. If a policy is changed or re-interpreted during this process, investments of what can sometimes be millions of dollars tied to an offset project may be at risk. This uncertainty can have a very real impact on what outcomes can be delivered by an offset policy.

#### People, culture and relationships

Although the main concern about biodiversity offsetting is of course the species and ecosystems being impacted and compensated for, ultimately it is the individuals and organisations who implement the policy that can influence its effectiveness. For example, if information about what the offset requirements are, what legal mechanisms are needed to secure the offset, or what actions are required for regulatory compliance are not adequately communicated among all participants, this can result in offsets that provide less enduring and effective outcomes for biodiversity.

It’s crucial to recognise that the motivations and objectives of individuals and organisations involved in offsetting will often differ.



Three of the workshop organisers (from the left) Martine Maron, Andrew Macintosh and Megan Evans, capture some of the groups thinking on butchers’ paper.

Identifying where there may be opportunities to better align policy processes in a way that is mutually beneficial could help to improve outcomes for biodiversity through offsetting in the long term.

### More changes are on the horizon

Biodiversity offsetting is certainly an active policy space in Australia. In addition to the recent [Senate inquiry](#), there have been new policies introduced in Queensland and New South Wales during 2014. Concerns have been raised about the relaxation of key policy principles in these new policies, such as the 'like-for-like' principle (ensuring an offset is the same species or ecosystem type as the one impacted), permitting mine rehabilitation (which is already required under the NSW Mining Act) to be counted as an offset, and allowing up to 100% of an offset to be 'indirect' (which is really a change in the definition of the term 'offset').

Although these changes have likely been driven by politics rather than science, this is simply a reality in the making of public policy – which results from an interaction between different values, interests and resources. The role which researchers can take in this process is to do provide the best possible science, while remaining cognisant of this broader contestation of ideas.

### On reflection

The ideas presented in this editorial capture some of the topics which were discussed by workshop participants, which included researchers who specialise in economics, public policy, law and ecology, as well as professionals from Government, business and legal and environmental NGOs. The key outcome arising from the workshop was the identification of a range of non-ecological issues which can influence the ecological outcomes resulting from biodiversity offset policy. 🍷

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(From left) Stuart Whitten, Rachel Walmsley, Alan Key and Ben O'Hara.

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Maron M, RJ Hobbs, A Moilanen, JW Matthews, K Christie, TA Gardner, DA Keith, DB Lindenmayer & CA McAlpine (2012). Faustian bargains? Restoration realities in the context of biodiversity offset policies. *Biological Conservation* 155: 141-148. <http://dx.doi.org/10.1016/j.biocon.2012.06.003>  
[Plus see the discussion on this paper in [Decision Point #63](#)]

Miller KL, JA Tresize, S Kraus, K Dripps, MC Evans, P Gibbons, HP Possingham & M Maron (2015). The development of the Australian environmental offsets policy: from theory to practice. *Environmental Conservation*. <http://dx.doi.org/10.1017/S037689291400040X>  
[Plus see the discussion on this paper in [Decision Point #69](#)]

## Legal & institutional dimensions of biodiversity offsetting

### A joint CEED and CSIRO workshop (ANU, January 2015)

Over two days in January, fifteen academics and professionals from law, economics, business, ecology and policy came together to discuss biodiversity offsetting with a multi-disciplinary twist. Held at the Fenner School of Environment and Society (ANU), and organised by Megan Evans (ANU), Stuart Whitten (CSIRO), Andrew Macintosh (ANU) and Martine Maron (UQ), the overall goal of the workshop was to look at biodiversity offsetting from a range of different perspectives, and to try and understand how such policies can effectively deliver positive environmental outcomes.

Biodiversity offsetting is an increasingly popular approach used around the world to compensate for the environmental impacts of development activities. A lot of good research, including the work of researchers in the Environmental Decisions Group, has provided insights into how to best calculate the losses and gains of biodiversity that occurs through development and offsetting activities. Although biodiversity offsetting policy has been in place for around 20 years in Australia and internationally, little is known of what environmental outcomes are being delivered by these policies in practice.



*Discussions on offsetting can sometimes lead to heated confrontation. While the interactions at this workshop were spirited, we're happy to report the confrontation pictured here was staged for the camera. Engagement was cordial throughout the event. From left to right are: Alan Key, Ben O'Hara, Andrew Macintosh, Megan Evans sparring with Martine Maron, Graeme Bartrim, David Takacs, Rachel Walmsley, Anthea Coggan, James Trezise and Stuart Whitten. (Present but not in photo: Karen Hussey, Jason Cummings and Miranda Lello.)*

# Could well-designed offset policies actually increase loss?

## Perverse incentives may yield unintended biodiversity outcomes

By Martine Maron (University of Queensland) and Ascelin Gordon (RMIT University)

The idea of biodiversity offsetting is that impacts on biodiversity from development are compensated for by actions elsewhere in the landscape. It's a simple idea but one that is generating a lot of controversy. Despite the noble-sounding goal of 'no net loss' of biodiversity, many are sceptical about how realistic this is, and for many reasons.

The pressures for development – be it for new suburbs, mines or farms – are powerful. In the past the impacts on biodiversity from development have often simply been 'written off' as the inevitable price of progress. Offsetting is an attempt to compensate for these impacts. Surely we can at least agree that offsetting, for all its imperfections, is probably better than nothing. Or is it?

In a recent paper we authored with Joe Bull (Imperial College London) and Chris Wilcox (CSIRO), we discussed how introducing biodiversity offsetting into the conservation policy mix can create incentives that might actively make things worse for biodiversity, potentially without us even realizing it (Gordon et al, 2015). This can occur even if the offset policy is rigorously implemented and the offsets successfully achieve their intended biodiversity gains.

### Perverse incentives

So how could requiring developers to offset their environmental impacts actually be worse than not requiring it at all? Well, we identified four ways that could happen:

#### 1. Exacerbating declines in baseline biodiversity trends

To determine what is required of an offset in order to achieve 'no net loss' of biodiversity, a baseline trend in biodiversity must be established from which to measure losses and gains. When a development takes place, the impact causes a drop in biodiversity. The aim of the offset is that, over time, biodiversity gains accrue at an offset site, with the net result of the impact and offset being a return to the baseline trend. The crucial point here is that if this baseline represents a declining trend in biodiversity (which is often the case here in Australia), then the offset gains, when added to the impact losses, are only required to maintain this declining trend.

Because of this, the selected baseline becomes 'locked in' by the offset policy: at best the offset gains result in maintaining the assumed baseline. In other words, it becomes a self-fulfilling prophecy across the impact and offset sites. If an unrealistically steep baseline of decline is used due to uncertainty or an incentive to exaggerate it (see below), this steeper rate of decline is then, perversely, made real by the policy. (See box 'Baselines: locked and loaded')

#### 2. Winding back non-offset conservation actions

Offsets can usually achieve biodiversity gains in two ways: by actively generating new biodiversity, for example through restoration or revegetation; or by 'averted loss'—averting biodiversity losses

that would have otherwise been likely to occur without the offset in place. The steeper the baseline of decline is assumed to be, the more credits a given offset site can generate, because more loss is assumed to have been averted.

Avverted loss offsetting is often less-expensive and easier than generating new biodiversity. So some parties involved in the offset exchange might have the incentive to assume a steeper baseline of decline than is justified from available information on biodiversity trends.

In addition, government-mandated offset schemes often state an intention to use offsets to 'reduce green tape' and ensure offset credits can be obtained at reasonable cost. Yet any conservation action done outside the offset policy effectively competes within the offset market, reducing opportunities for buyers of credits.

For example, the designation of land 'for conservation' extinguishes the potential for these areas to be used as offsets. This argument was used against increasing the protection of parts of Cape York under the Wild Rivers legislation in Queensland – protections that subsequently were removed. Thus where the policymaker has an interest (direct or indirect) in facilitating development, there could be an incentive to reduce other conservation activities and maintain these steep baselines of decline, or even to worsen them.



*Many people gladly give their time to community plantings. It's an opportunity to 'give back' to the environment. But what if the revegetation work was retrospectively exchanged for an equivalent amount of environmental damage by a developer? Would people still be happy about donating their time?*

“If people react to discovering they're doing work that will be negated by biodiversity impacts elsewhere to generate profit for someone else, they might just withdraw their volunteer labor.”



*Out on a limb: Most people would support funding being made available to community groups to restore habitat for threatened species like the Carnaby's cockatoo. But what if that funding is part of an offset for habitat loss. Suddenly it's not about adding value to environment so much as allowing the loss of equivalent environmental value. (Photo by Leonie Valentine)*

### 3. Crowding out of conservation volunteerism

Lots of us spend our spare time volunteering with various organisations to plant trees, control weeds, and generally doing good environmental work. What would you think if you found out that the work you were doing was actually part of a legally required offset for a large corporation? Or worse still – what if revegetation work you contributed to over many years was retrospectively exchanged for an equivalent amount of environmental damage by a developer? You'd probably be pretty annoyed – and maybe less likely to volunteer for environmental work in the future.

Sound far-fetched? Think again. In one recent infamous example, Canberra residents learned that their volunteer work to revegetate a local park was subsequently used to 'offset' the loss of nearby woodland for urban development. And, increasingly, funding is being made available to community groups to do restoration work for threatened species, like Carnaby's black-cockatoo, but the fine print reveals that the funding is part of an offset for habitat loss.

So, if people react to discovering they're doing work that will be negated by biodiversity impacts elsewhere to generate profit for someone else, they might just withdraw their volunteer labour, causing declines in environmental volunteerism and the benefits that it generates. This is referred to as 'crowding out'.

### 4. False public confidence in environmental outcomes

In some cases the outcomes of the offset are celebrated in isolation to the damage they aim to offset. So when a newly restored wetland is opened, or a newly protected bit of rainforest announced, the focus is on this positive outcome. Who can blame governments or developers for that? But of course, we shouldn't celebrate an environmental gain in these cases – the outcome is linked to biodiversity impacts elsewhere and, at best, achieves no net loss of biodiversity. In other words, the biodiversity impact is neutral.

Environmental activism and public pressure are undeniably powerful in improving environmental controls and investment by governments. But if 'no net loss' offsets are celebrated in isolation of gains it may create the perception that true biodiversity gains are being achieved, which may in turn reduce the public pressure for governments to do more for conservation – we start to hear these good news stories all the time, so it sounds like all is well.

## Averting the perversities

These are just four of the perverse outcomes that we risk if we are not cautious about how offset policies are designed and how they interact with other environmental policies and behaviours. So what can we do about it?

We have identified a range of measures that could reduce the risk of these perverse outcomes. These include:

- (i) being transparent about the baselines from which offset gains are calculated, and the wider biodiversity trends from which they are drawn
- (ii) making sure there are processes in place for clear and publicly visible accounting of the gains and losses associated with the offset and impact; and
- (iii) better education and outreach regarding offset policies to help increase public understanding that offset activities are not 'conservation gains', but are neutral at best because they are making up for losses elsewhere.

Whether you like offsets or not, it looks like they are here to stay. And offsets that work could be crucial to balancing development and conservation. But the rush by many governments to embrace them has left the door open for all sorts of problems.

It's important, therefore, we ensure that not only are our offsets policies sound, but that they don't unintentionally undo the benefits of other policies. 🍎

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### Reference

Gordon A, JW Bull, C Wilcox & M Maron (2015). Perverse incentives risk undermining biodiversity offset policies. *Journal of Applied Ecology*. 52: 532–537 doi: 10.1111/1365-2664.12398

**Baselines: locked and loaded**

- Determining whether an offset can compensate for a given impact requires assumptions about the counterfactual scenario—that which would have happened without the offset—against which the gain at an offset site can be estimated. Where this counterfactual scenario, or 'crediting baseline', assumes a future trajectory of biodiversity decline, the intended net outcome of the offset trade is the maintenance of that declining trajectory. If the rate of decline of the crediting baseline is greater than what is actually occurring, biodiversity offset trades can actually exacerbate biodiversity decline. We examined crediting baselines used in offset policies across Australia, and compared them with recent estimates of decline in woody vegetation extent. All jurisdictions permitted offset credit generated using averted loss—implying an assumption of background decline—but few were explicit about their crediting baseline. We did the calculations and found that the crediting baseline assumed up to 4.2% loss (of vegetation extent and/or condition) every year. On average, the crediting baselines were greater than 5 times steeper than recent rates of vegetation loss. Based on this we conclude that the crediting baselines used in Australian offset schemes actually risk making biodiversity loss worse.
- Maron M, JW Bull, MC Evans & A Gordon (2015). Locking in loss: Baselines of decline in Australian biodiversity offset policies. *Biological Conservation*. <http://dx.doi.org/10.1016/j.biocon.2015.05.017>.

# Step forward then look back

## Using 'backcasting' to improve conservation and offsets policy

By Ascelin Gordon (RMIT University)

Understanding the long-term impacts of different conservation policies is a massive challenge. For starters, there are long delays (potentially decades) between policy implementation and the resulting conservation gains or losses. And sometimes measuring those gains or losses can be difficult or even impossible because it's expensive to monitor outcomes at the large temporal and spatial scales required and thus adequate data are often unavailable for this purpose. Poorly defined objectives of a policy also often make it unclear as to what would be required to assess whether the policy objectives have been met. While all these issues are relevant to conservation policy in general, they are particularly relevant to one policy area with important conservation implications – biodiversity offsetting – because offsets tend to trade off permanent immediate impacts on biodiversity with uncertain future biodiversity gains.

Because of these challenges, it can be difficult to work out how best to structure a new conservation policy, or refine an existing one. Researchers have suggested that scenario analysis, adaptive approaches and resilience thinking may all be useful tools in this context. I'd like to propose another approach – 'backcasting' – as a valuable means for improving conservation policy. Backcasting has been used in many fields such as energy policy and sustainable development (see the box 'A brief history and overview of backcasting'), but has rarely been applied to the setting of targets in conservation. And in cases where it has, the applications have been of a qualitative nature.

### Choose a future

So what is backcasting? It can be thought of as the opposite to forecasting. While forecasting is about predicting the likely future given current trends, backcasting is about choosing a future, and working out the multiple pathways to reach this future from our current state. Put simply, backcasting is about working out how to reach a future we want, rather than the forecasting approach of determining the futures that are most likely.

I recently demonstrated how the backcasting approach can be applied in setting quantitative conservation targets involving biodiversity offsets. To illustrate the value of the approach I explained how it might be used in a case study based on policy to manage the growth of Sydney into a threatened ecological woodland community (Gordon, 2015).

### A brief history and overview of backcasting

'Backcasting' was first used as an alternative to forecasting in the early 1980s for developing energy policy. However the origins of backcasting go back further to the 1970s when Amory Lovins proposed a 'backwards-looking-analysis' to overcome difficulties in long-term energy forecasting. An interesting aspect of backcasting is that it is an explicitly normative approach in that it involves defining a desired future state as a target, and then determining multiple pathways to traverse from the current state to the future state. One of the strengths of the backcasting approach is that it is explicitly based on searching out multiple pathways to meet future objectives, and can thus encourage a broader view of relevant factors, leading to the systematic consideration of options that may not otherwise be considered 'feasible'.

The community in question is the 'Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest' (which I'll refer to hereafter as the 'Cumberland Plains Woodlands'). This community is listed as critically endangered under the EPBC Act with less than 10% of its original pre-1750 extent remaining. (See the box 'Shadow of a once common woodland')

The woodlands face a range of issues. One major threat is pressure from urban development involving clearing to accommodate the growth of Sydney. Urban development inside two new nearby 'Growth Centres' is expected to eventually provide residential areas and employment opportunities for approximately 500,000 people! Other threats to the Cumberland Plains Woodlands include the legal and illegal clearing of vegetation on private land outside the Growth Centres, and declines in ecological condition of the community due to invasive plant species such as the African olive and African love grass.

### Modelling the future

With help from NSW and Federal Government agencies, a model was developed to predict changes in the remaining area Cumberland Plains Woodlands over time in response to the most important processes affecting the threatened community. These comprise:

- (i) declines in ecological condition from invasive species;
- (ii) legal clearing for development;
- (iii) illegal clearing for development; and
- (iv) the implementation of biodiversity offsets to compensate for legal clearing of the woodlands.

Each of these processes was controlled by a parameter in the model. As a range of real-world policy interventions could alter the processes impacting the extent of the Cumberland Plains Woodlands, a policy based on limiting the loss of these woodlands could be characterized by these four model parameters.

To implement the backcasting process, a future target of retaining 60% of the current Cumberland Plains Woodland in 50 years' time was used. The backcasting analysis then involved running the model thousands of times and searching for all combinations of these policy parameters that would result in the extent of woodlands achieving or exceeding this target in 50 years from now.

### Pick a pathway

Of the 11,616 combinations of policy parameter values investigated, 4,637 (or 40% of the combinations) met the backcasting target. The challenge was then working out how to present these 4,637 parameter combinations in a way that was meaningful for policy

**“While forecasting is about predicting the likely future given current trends, backcasting is about choosing a future, and working out the multiple pathways to reach this future from our current state.”**



“Backcasting, as quantitatively implemented here, provides a structured way to explore the outcomes of offsets between different combinations of policy interventions that would allow desired future targets to be met.”

development. This was achieved using a statistical technique from machine learning called a ‘classification tree’, which enabled the 4,637 combinations of policy parameters to be grouped into six general classes, or policy options, where each class represented similar implications for policy.

In other words, for the chosen target, the backcasting analysis resulted in six general policy options involving different combinations of interventions that impact on how the area of woodland changes over time. For example one policy option showed that if declines in ecological condition from invasive species could be kept low, and the rates of clearing (both legal and illegal) were not too high, then even a weak offset policy would allow the future target to be met.

In contrast, another option showed that as long as the offset policy is adequate (ie, offsets were large enough), and there were only small amounts of illegal clearing, the targets could be met even if little is done to control invasive species and there are large amounts of legal clearing.

## Exploring outcomes

Thus backcasting, as quantitatively implemented here, provides a structured way to explore the outcomes between different combinations of policy interventions that would allow a desired future target to be met. The approach also allows policy makers to examine other factors such as the potential robustness to uncertainty of a given policy option, or the extent to which they foreclose future policy options (which is described in more detail in my paper).

For this particular case study, it appeared the most viable way of achieving the desired future target for the Cumberland Plains Woodlands was to ensure the offset policy is adequate (large enough offsets) and properly enforced (low rates of illegal clearing). If this was not feasible, the analysis shows that controlling invasive species provides the greatest potential for keeping other policy options open into the future.

While backcasting is not a panacea, I argue it provides a useful addition to the conservation policymaker’s toolbox, providing a structured way to explore and develop a range of policy options that allow desired conservation targets to be met. 🍷

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## Reference

Gordon A (2015). Implementing backcasting for conservation: determining multiple policy pathways for retaining future targets of endangered woodlands in Sydney, Australia. *Biological Conservation* 181: 182–189. doi: 10.1016/j.biocon.2014.10.025

## Shadow of a once common woodland

- Before European settlement, the Sydney region was covered by a range of forest, woodland and heathland ecological communities. The Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest was the most common type of native vegetation in the area now occupied by western Sydney, including towns such as Blacktown, Campbelltown, Camden, Fairfield, Liverpool, Penrith, Richmond and Windsor.
- As a consequence of clearing and weed invasion, the ecological community is now restricted to relatively small and fragmented bushland patches nestled among a largely urban to peri-urban environment. Less than 10% of its original pre-1750 extent remains.

The Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest has great importance in the landscape, being a key example of a coastal grassy woodland. It is nationally unique.

The preservation of woodland remnants, such as the ecological community, will contribute to native vegetation corridors that will improve quality of life as the area becomes increasingly urbanised. It will also help to maintain valuable connectivity among native vegetation remnants that are essential to retain the fauna that live or migrate through the region. For example, birds and bats, including some threatened species, use the ecological community to move from north to south through western Sydney and beyond, and from east to west across the Great Dividing Range to the coast, as seasons change.

**More info:** <http://www.environment.gov.au/resource/cumberland-plain-shale-woodlands-and-shale-gravel-transition-forest>



*Kangaroos graze in a remnant of the once mighty Cumberland Plains Woodlands. (Photo by Penny Watson)*

# Of apples, oranges and offsets

## And the importance of scientific advocacy in shaping long-term policy

By James Trezise (Australian Conservation Foundation)

.....  
• Everyone wants to influence policy to protect those values they care most about. However, everyone goes about 'influencing' in different ways. So far in this series on 'influencing policy' we have heard views from a psychology researcher, a research policy officer, an NGO science manager and a conservation scientist. In this instalment we hear a perspective from James Trezise, a policy coordinator with the Australian Conservation Foundation. James works on issues from across the conservation spectrum but has a particular interest in biodiversity offsets. Prior to joining ACF, James worked in public policy on offsets, engaging with, among others, researchers from the Environmental Decision Group. Through his work on policy development and conservation he has developed a strong commitment to the input of good science into policy. Here he asks what are the conditions necessary for this to occur.  
.....

There has been much written about bridging the science-policy divide – often referred to as the implementation gap. Books, journals and conferences have been devoted to figuring out the social, institutional and political structures needed to ensure decision making is based on sound science. Given this, why is it we seem to miss the evidence-led policy boat so often, particularly when it comes to environmental problems? What are the key elements that need to be in place for science to inform and drive policy? Where has it worked (and where is the evidence for this)? The answers to these questions, like most things, depend almost entirely on context.

In his [recent speech](#) to the Academy of Science, the Secretary of the Australian Government Department of the Environment, Dr Gordon De Brouwer, outlined how science informs the work of his Department in numerous ways. One of the topics Gordon De Brouwer touched on was that of biodiversity offsets.



James Trezise out in the field. This field, however, is part a paddock providing habitat for the threatened legless lizard - and it's up for proposed development. James (on the right) is explaining to a group of biodiversity-conservation students from the Australian National University how the EPBC Offsets mechanism deals with this type of proposal.

“Apples aren't oranges. And there is no room for flexibility when species are faced with extinction. If a proponent cannot find an offset and cannot restore a site to an equivalent level, surely this is the market telling us that we should not be losing any more of that species or its habitat.”

### Science and offsets

The development of the Australian offsets policy is a good example of science-led policy. The approach was consulted on widely, scientific input was incorporated into the policy design and was used to develop a 'calculator' to estimate future offsets (See [Decision Point #69](#), page 10). The calculator and policy principles were put to peer review.

But it isn't all good news. Whilst the process in developing the policy was one that relied on the science, the twist in the tale of biodiversity offsets comes in the implementation.

The EPBC Act offsets policy was designed to bring decision making 'out of the black box', increasing transparency and accountability, giving business certainty whilst delivering environmental outcomes. Unfortunately many of these aims remain unrealised and after 15 years of implementing offsets at the federal level (almost 3 under a formal policy framework), the environmental gains being delivered are still uncertain. A Senate references inquiry released in 2014 probed many of these issues. The [160-page report](#) is a good read for those who wish to wrap their head around the issue of offsets.

To give just a taste of the conundrum with biodiversity offsets, a quick scan of the limited information available shows that we are still seeing extensive loss of habitat for species like the endangered Carnaby's black-cockatoo. Analysis of 18 months' worth of approval data shows that we lost 3,340 ha of habitat, with replanting of 1,100 ha and protection of an additional 8,612 ha (see page 16).

In and of itself, this seems rather straightforward. Offsets have traditionally relied on protecting habitat to avert a future loss. But we need to look at where these offsets are, what value they provide, the future loss they avoid, the ability to improve the carrying capacity of the site, the time over which this will all occur and the certainty that this will happen. Thinking about these questions we should then turn our mind to any

“If science is to better inform environmental policy, both in development and also in implementation, there are a few key elements for it to work effectively: trust, transparency, resourcing, access, opportunity and advocacy.”

scientific advice provided for the species in question, in this case the recovery plan, which states that “if additional clearing of large areas of habitat critical to survival is continued and if there is not significant success in replacing important habitat approved for development it is likely there will be further reductions in the population.”

The science is telling us, clearly and unambiguously, that we should not be losing any more habitat for the species unless we commit to replacing it. To do so entrenches its decline. But, replanting habitat is exceptionally expensive. In situ conservation on the other hand, is comparatively cheap. Business, obviously, has an express preference for the least cost model. Like water, it seeks the path of least resistance.

### Implementation in a contested arena

Enter the government as a regulator. While it is equipped with scientifically robust tools to inform decisions, it is often swayed by other forces. Where decisions are not necessarily based on science or where there are significant departures from policy or practice, the justification is often that the social and economic benefits far outweigh the environmental harm. The opportunity cost of altering or constraining development is politically unappetising. The problem of the future extinction of species is deferred to the next government.

One only needs to look at the reporting of the over-estimation of the jobs and economic benefits purported to be associated with Adani’s Carmichael coal mine in Queensland to get a sense of how flawed these ‘economic benefit’ escape clauses are when stepping away from science-based decision making.

### Shifting policy approaches: apples and oranges

The new dimension in the policy discussion around biodiversity offsets is focussed on establishing markets, creating greater liquidity and improving flexibility. Under these banners there is a general trend toward relaxing policy requirements, opting for models that channel funds into some form of offsets trust and relaxing ‘like-for-like’ provisions, which mean proponents don’t have to target the species or ecosystem subject to an impact.

But moving to greater flexibility could be jumping the gun. Biodiversity offsets are as much an economic instrument as they are a biodiversity conservation tool. Normally they operate like a barter system. Someone will take an apple, provided that they give you an apple or plant some apple trees in return.

Offsets enable the market to put a value on biodiversity. This is usually determined based on its rarity and the likelihood it will be impacted. Scarcity is central to economic theory – the more difficult an offset is to find, such as for endangered species, the more expensive it is likely to be. Relaxing like-for-like provisions (where you can offset your apple by providing some much cheaper, or easier to find oranges) is often driven by proponents frustrated by a lack of available options in the market place.

But here is the case for like-for-like offsets – and it is a very simple one. Apples aren’t oranges. And there is no room for flexibility when species are faced with extinction. If a proponent cannot find an offset and cannot restore a site to an equivalent level, surely this is the market telling us that we should not be losing any more of that species or its habitat.

### Who speaks for the long term?

Election cycles at our national level run in three year increments – it is well-known and often lamented that long-term policy thinking gets sucked in to the triennial campaigning cycle. Throw into the mix powerful and vested lobbying groups and you see distortion of policy agendas, short-termism and polling that dictate policy direction rather than science and evidence.

If science is to better inform environmental policy, both in development and also in implementation, there are a few key elements for it to work effectively: trust, transparency, resourcing, access, opportunity and advocacy.

Relationships matter and trust is critical, across individuals and institutions in the public and scientific sectors. Transparency and accountability of our public sector is also vital, it counters the make-it-up-as-you-go-along approach to policy that is easily driven by the political cycle.

### Advocacy and scientific expertise

There also needs to be opportunity and resources to support science-led policy, continual improvement cycles and open access to data. Programs like the National Environmental Science Programme (NESP) are vital for creating a reactive and engaged scientific community, building relationships and establishing trust. Publications like Decision Point and The Conversation play their part too, distilling complex research into easy-to-understand policy language. Alongside all of this there needs to be freedom of expression, but this is where we are starting to get a little unstuck.

Positive environmental policies have often come on the back of high profile environmental campaigns (see Martin Taylor’s [editorial](#) on NGOs influencing policy). Many of which have been fought on the basis of scientific rigour and a vocal scientific community.

Unfortunately, advocacy is a dangerous word in Canberra at the moment. The right to publically advocate for the environment is being scrutinised by a House of Representatives Inquiry into environmental organisations, its intentions are questionable and its outcomes should be a concern for anyone interested in the protection of our environment. It is imperative that such forces do not stifle or stymie debate and public advocacy for the environment, both by institutions and individuals.

The role of the scientific community should be a positive and a vocal one in guiding long-term policy thinking in Australia. There must be sufficient appetite within government at the highest of levels to support this role, provide open and transparent administration and accept those inconvenient truths that science often tells us. 🍎

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Offsets are not saving critical habitat for the Carnaby’s black-cockatoo. See page 16 for more details on this story. (Photo by Leonie Valentine)

# Offset policies don't work

## So maybe we should be weighing up the alternatives

By Georgia Garrard (RMIT University), Sarah Bekessy (RMIT University) and Brendan Wintle (University of Melbourne)

Biodiversity offsetting policies are in place across Australia, administered by both state and federal authorities, to ensure that there are no net losses of native vegetation. Readers might be alarmed then to learn that in 2014, almost 300,000 hectares of native vegetation was cleared in Queensland. That's an area bigger than the Australian Capital Territory, and more than 3.5 times as much as was cleared in 2010.

What's going on? Why is the rate of native vegetation clearing increasing when we have policies designed to stop it? And, given the history of extensive land clearing in Australia, are offsetting policies the best option, or should we be considering alternatives?

### They don't stop vegetation loss

An increasing body of evidence suggests that biodiversity offset policies will struggle to achieve goals of no net loss, let alone net gain. In fact, biodiversity offset policies may result in a number of perverse incentives that lock in biodiversity loss (consider the story on perverse incentives on page 6).

Changes in land tenure or protection of existing assets (such as unprotected remnant vegetation) are the most common forms of offsets. By definition, these result in net loss or depletion of biodiversity (Bekessy et al, 2010). Any lag that occurs between habitat loss and the establishment of new habitat or recovery means a net loss is guaranteed in the medium term.

Indeed, there are very few conditions under which offsets policies can deliver no net loss (Gibbons & Lindenmayer, 2007; Maron et al, 2012). Restoration of currently degraded sites is the only way to achieve true net gain, but there are pitifully few examples of where this has actually occurred, and many scientists are extremely sceptical about the potential for restoration to generate legitimate offsets.

Evaluation of the effectiveness of offset policy is rare; however, in the cases where accounting has been done, the evidence suggests that a net loss is occurring. For example, Victoria's [Native Vegetation Net gain accounting first approximation](#) report found a net loss of more than 4,000 habitat hectares per year. This result was six years after offset provisions were introduced into vegetation clearing regulations.

### They are difficult to implement and poorly monitored

When designing and implementing an offsets policy, regulators must determine how to measure biodiversity, what baseline should be used to assess losses and gains, and what constitutes an offset. Uncertainty is present in each of these steps – whether it is associated with variation or error in environmental measurements or multiple ways of assessing them – and different approaches will result in very different outcomes.

**“Why is the rate of native vegetation clearing increasing when we have policies designed to stop it? And, given the history of extensive land clearing in Australia, are offsetting policies the best option?”**



*A new age of offsets policy does not seem to be stopping land clearing. Should we be looking to other alternatives?*

### Assessing equivalence

Every policy requires some method for measuring environmental equivalence of losses and offsets. Metrics employed for this purpose – such as Habitat Hectares and BioMetric – are subject to a range of uncertainties, including variation in measurement of environmental attributes and inconsistencies in the way individual attributes are combined to produce an overall score. Observer variation in attribute measurement can lead to vastly different habitat scores for the same site.

### Baselines & counterfactuals

The success of offset policies in arresting vegetation loss will vary depending on which baseline – or counterfactual – is used (Bull et al, 2015). Assuming that everything is at risk of being cleared in the absence of offsetting policies is one approach, but is likely to overestimate the 'net gain' achieved. Further, selecting a baseline that assumes high rates of losses from biodiversity decline creates a perverse outcome in which those losses are 'locked in' by the policy (see page 6).

### Mitigation hierarchy

In their original conception, offsets were supposed to be considered in the context of the [mitigation hierarchy](#), whereby offsets were used as the last resort when all options to avoid and mitigate the impacts were exhausted. However, there is little science to support policy and standards to demonstrate that adequate attention has been paid to avoidance and mitigation before offsets can be pursued. There is a significant research opportunity in developing and testing standards for application of the mitigation hierarchy.

### Monitoring offsets

Assessing success or otherwise of offset policies is not difficult in theory; it is limited only by a lack of resources dedicated to offset evaluation and monitoring. In some instances, individual losses and gains have been monitored by local land managers but these data are usually inadequate for program evaluation without augmentation with other data on the outcomes of offsetting. The move towards [strategic offsets](#) means that offset gains can no longer be linked directly to a loss, making it impossible to measure whether the loss has been successfully offset. Though there remains the opportunity to assess how well the program is going overall, this costs money to do properly.



Urban sprawl chipping away at native vegetation on the Swan Coastal Plain, WA. (Image Google Earth)

### They are susceptible to policy creep

Policy creep is the gradual process by which policies change over time, often with undesirable consequences. As noted by Megan Evans in her Editorial (see page 4), some updates and changes have resulted in improvements in the rigour of offsets policies. However, on the whole, incremental changes have led to a general weakening of the capacity for offset policies to reverse or halt native vegetation loss.

The 2012 overhaul of Victoria's native vegetation clearing rules – the first in over a decade – provides an example of this. The most significant was the change to the stated goal of the policy. When it was introduced in 2002, the objective of Victoria's native vegetation clearing regulations (of which the offsets policy was a part) was to achieve "a reversal, across the entire landscape, of the long-term decline in the extent and quality of native vegetation, leading to a net gain". Following the overhaul, the goal was for "no net loss in the contribution made by native vegetation to Victoria's biodiversity".

Another significant change was the relaxing of the offsets hierarchy, which dictates that offsetting should only occur when it is not possible to avoid or mitigate onsite losses. As part of Victoria's streamlining of native vegetation policies, landholders are now permitted to clear and offset vegetation without conducting a site assessment or demonstrating an attempt to avoid or mitigate onsite vegetation loss across vast areas of the state. The requirement for like-for-like trading was also substantially diluted.

### But there are alternatives

Alternatives to biodiversity offsetting exist. One obvious, but rarely mentioned, option is to simply prohibit the clearance of native vegetation. This must be managed well in order to avoid the types of pre-emptive clearing noted prior to previous changes to native vegetation protection policy.

Prohibiting native vegetation clearance has a number of advantages:

1. **Provides certainty:** It would provide – once and for all – certainty for landholders and industry about what is and isn't permitted.
2. **Promotes innovation:** By emphasising the value of remnant native vegetation as something that cannot be simply recreated somewhere else, it would encourage innovative approaches to development.
3. **Serves the majority:** The majority of Australians benefit from vegetated landscapes. Apart from aesthetic and cultural benefits, vegetation provides numerous and substantial services, such as salinity and erosion control and carbon sequestration. In cities the services are equally compelling; temperature reduction, air quality improvement, and numerous benefits to health and well-being.
4. **Protects threatened species:** It would reduce the number one threat to Australia's endangered species and communities. Vegetation clearing is noted as an ongoing threat to 26 of Australia's 29 nationally-listed Critically Endangered ecological communities, and the majority of listed flora and fauna species. In response to the listing of vegetation clearance as a threatening process under the EPBC Act, the [Threatened Species Scientific Committee](#) was "strongly of the view that land clearance has been the most significant threatening process in Australia since European settlement".
5. **Provides clarity:** It's simple and logical and restores an important ethical roadblock to the removal of vegetation that offsetting negates.

### So let's put it to the test

In the spirit of evidence-based policy development, an important first step is to measure and evaluate the outcomes of 15 years of offset policies around Australia and internationally. Ideally this evaluation would allow comparison of offsetting with other policy and regulatory instruments such as prohibiting land-clearing in terms of how well they achieve environmental, social and economic outcomes. Program evaluation is a major challenge to researchers and policy makers alike; a challenge well suited to EDG researchers and policy partners. 🍷

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### References

Details on all four references below be found on page 14.

Bekessy SA, BA Wintle, DB Lindenmayer, MA McCarthy, M Colyvan, MA Burgman & HP Possingham (2010). The biodiversity bank cannot be a lending bank. *Conservation Letters* 3: 151-158. And see [Decision point #41 \(p10-12\)](#)

Bull JW, A Gordon, EA Law, KB Suttle & EJ Milner-Gulland (2014). Importance of baseline specification in evaluating conservation interventions and achieving no net loss of biodiversity. *Conservation biology* 28: 799-809. And see [Decision Point #85](#)

Gibbons P & DB Lindenmayer (2007). Offsets for land clearing: No net loss or the tail wagging the dog? *Ecological Management & Restoration* 8: 26-31. And see [Decision Point #39 \(p2,3\)](#)

Maron M, RJ Hobbs, A Moilanen, JW Matthews, K Christie, TA Gardner, DA Keith, DB Lindenmayer & CA McAlpine (2012). Faustian bargains? Restoration realities in the context of biodiversity offset policies. *Biological Conservation* 155: 141-148. And see [Decision Point #63](#)

## Offsets in Decision Point

### A smorgasbord of offset treats

The Environmental Decision Group contains some of the world's leading thinkers and researchers on the subject of biodiversity offsets. That expertise is on display in this issue of *Decision Point* but it's also been highly visible in issues gone by. Here is a selection of stories that have appeared in *Decision Point* on biodiversity offsets over the years. They cover a range of topics explored by a diverse group of researchers.

### Comparing offset methodologies around the world

There are at least 45 'biodiversity offset' programs and policies currently in place around the world. Since the basic goal of all of these methodologies is the same – that is, no net loss – one might hope that they would give similar answers if they were applied to a common case study. **Joe Bull**

and colleagues tested this approach and it turns out they don't. Their analysis highlights how different the philosophy behind biodiversity offsetting in different countries can be.

[\*Decision Point\* #85](#)



### Offsetting marine & coastal development

When **Megan Saunders** and colleagues examined the Australian Government's environmental legislation underpinning the offsets policy under a legal lens they found that it may not adequately protect vulnerable marine ecosystems. Without amendments to the offsets policy, iconic habitats such as coral reefs, seagrass and mangroves, could all pay a heavy toll.

[\*Decision Point\* #77](#)



### The EPBC Act offsets-assessment guide

The EPBC Act policy permits up to 10% of the impact to be compensated for with a cash contribution to research or education – termed 'other compensatory measures'. The amount of this payment is scaled to the cost of the direct offset component, but in a non-linear way, so the last 10% of the offset costs much more than 10% of the direct offset. This reflects that the cost of delivering conservation outcomes increases nonlinearly as the cheaper options are taken up. If it all sounds like a lot of work, that's because genuine offsetting is a challenging process. However, when done with rigor, offsetting can reduce the chance that declines will become steeper. It can also reveal the replacement cost of biodiversity. In most cases, that cost is more than we might think.

[\*Decision Point\* #69 \(p10,11\)](#)



### Balancing biodiversity offsets with restoration reality

Australia is among the most advanced countries in terms of its biodiversity offset policy regime with most states and territories, and the Australian Government, having some form of offset policy. However, although this approach is being increasingly applied, when **Martine Maron** and colleagues reviewed the literature on the effectiveness of restoration for biodiversity offsets they found there is little evidence that it can work.

[\*Decision Point\* #63](#)



## Biodiversity offsets you can bank on

There are serious flaws in schemes that allow habitat losses today being offset by biodiversity gains achieved at sometime in the future. In effect, this type of biobanking is operating like a lending bank, but it's a loan in which the general public is carrying the risk, and the return on the investment will inevitably be a loss. If an offset is supposed to result in no net loss of biodiversity then these schemes are simply unacceptable. **Sarah Bekessy** explains that

if you're going to use biobanking for offsets then the approach needs to be based on a savings bank model in which biodiversity assets are first built up before a withdrawal is made from the biodiversity balance.

[Decision point #41 \(p10-12\)](#)



## The case for biodiversity offsets

This *Decision Point* editorial looked at the impacts of one of the earlier offset schemes introduced in NSW. The assessment methodology introduced with the NSW Native Vegetation Act in 2005—which included offsets—resulted in an 80% reduction in the area approved for clearing in rural NSW relative to the area approved for clearing under the previous policy, which did not include offsets. **Phil Gibbons** explains that there were four reasons why the introduction of biodiversity offsets in NSW resulted in considerable avoided loss in biodiversity.

[Decision Point #39 \(p2,3\)](#)



## Dbytes

*Dbytes* is EDG's internal eNewsletter. It gets sent to members and associates of EDG each week, and consists of small snippets of information relating to environmental decision making. They might be government documents, research articles, blogs or reports from other research groups. Here are six bytes from recent issues. If you would like to receive the *Dbytes* eNewsletter, email [David.Salt@anu.edu.au](mailto:David.Salt@anu.edu.au)

### 1. 20 mammals by 2020

Department of the Environment issues 'Threatened Species Strategy Action Plan 2015-16 - 20 mammals by 2020'

<http://www.environment.gov.au/biodiversity/threatened/publications/factsheet-threatened-species-strategy-action-plan-2015-16-20-mammals-by-2020>

### 2. Australian Life

A Green Agenda essay by John Woinarski and Margaret Blakers on threatened species, conservation and extinction in Australia. Also covers the topics of conservation triage, the national reserve system and government responsibility.

<http://greenagenda.org.au/2015/07/australian-life/#more-757>

### 3. TEEB for Agriculture & Food'

Led by the UNEP TEEB Office (TEEB=The Economics of Ecosystems & Biodiversity), this project brings together economists, business leaders, agriculturalists and experts in biodiversity and ecosystems to provide a comprehensive economic evaluation of the 'eco-agri-food systems' complex.

<http://www.teebweb.org/agriculture-and-food/>

### 4. Using Markets to Conserve Natural Capital

A Wentworth Group of Concerned Scientists' report; describes opportunities to mobilise people and markets at the scale needed to create a healthy environment with a productive economy.

<http://wentworthgroup.org/2015/06/blueprint-paper-1-using-markets-to-conserve-natural-capital/2015/>

### 5. The role of science in Aust environment policy

Australia's Chief Scientist, Ian Chubb and Gordon de Brouwer, Secretary of the Environment Department.

<https://www.youtube.com/watch?v=Qa83pw67Uf&list=PLwAZt5Hlhuhdy13K29Mwj71Gq3CpEKny&index=1>

### 6. Qld Audit Office on Great Barrier Reef management

<https://www.qao.qld.gov.au/report-20-2014-15>

### 7. Interdisciplinary and transdisciplinary research

A report written by Michael Mitchell on interdisciplinary and transdisciplinary research in the NERP Landscape and Policy Hub.

[http://www.nerplandscapes.edu.au/publication/hub\\_evaluation\\_report](http://www.nerplandscapes.edu.au/publication/hub_evaluation_report)

## NGOs on offsets & recovery

Three of Australia's preeminent environmental non-government organisations (the Australian Conservation Foundation, BirdLife Australia and Environmental Justice Australia) have just released an analysis on recovery planning for threatened species that reveals that recovery plans designed to prevent Australia's most endangered species from extinction are failing to protect habitat. The report, *Recovery planning - Restoring life to our threatened species*, finds that of Australia's 120 most endangered animals, only 10% had plans that placed any clear limits on the future loss of habitat. The NGOs say that habitat protection must be a focus of threatened species recovery if we are to secure the future of Australia's threatened biodiversity.

One case study presented in the report warns that the focus on offsets to compensate for habitat loss is actually entrenching the decline of Carnaby's black-cockatoo, a theme discussed by Martine Maron and Ascelin Gordon on page 6.

Below is an excerpt from *Recovery planning - restoring life to our threatened species*. Or download the whole report from:

<http://www.acfonline.org.au/news-media/media-release/habitat-protection-must-be-focus-threatened-species-recovery>



## Offsets entrench the decline of Carnaby's black-cockatoo

*Carnaby's black-cockatoo is one of Western Australia's most loved and recognised threatened species. This charismatic cockatoo, voted as Western Australia's favorite bird in BirdLife Australia's 2013 poll, lives across the south-west and has lost substantial tracts of its foraging and breeding habitat to land clearing for urban and industrial development, mining, forestry and agriculture. The species is long-lived and the population is ageing. It also suffers from an 'extinction debt', meaning the amount of habitat currently available is not sufficient to support the current population into the future.*

*The national recovery plan for this species contains a clear warning to decision makers. In relation to the future clearing of Carnaby's black-cockatoo habitat, it states unequivocally that: "If additional clearing of large areas of habitat critical to survival continues and if there is not significant success in replacing important habitat approved for development it is likely there will be further reductions in the population of Carnaby's Cockatoo."*

*Despite this warning and the stated aim to improve or maintain Carnaby's black-cockatoo habitat, our analysis of approvals under the EPBC Act over an 18-month period shows the Australian Government continues to approve projects that are destroying Carnaby's habitat.*

*From January 2013 to June 2014 eleven projects were approved under the EPBC Act that allowed companies to clear 3,340 hectares of important Carnaby's habitat. To compensate for this loss, 1,100 hectares of habitat was required to be planted or rehabilitated as offsets, leaving an overall loss of 2,240 hectares during this period.*

*While these approvals also required 8,612 hectares to be placed under covenant or gazetted as protected areas, protection of existing habitat does not increase the total amount of habitat available.*

*In addition to these approvals, more than 1000 ha of foraging habitat is currently being cleared every year and has not been referred to the Australian Government for assessment*

*This means that in spite of the clear advice of the species recovery plan, Carnaby's downward trajectory has been allowed to continue. Crucially, the focus on providing offsets through the protection of existing habitat has entrenched, if not exacerbated, this decline. If the recovery plan had specified limits to the loss of critical habitat the substantial net loss of habitat may have been avoided.*



The Environmental Decision Group (EDG) is a network of conservation researchers working on the science of effective decision making to better conserve biodiversity. Our members are largely based at the University of Queensland, the Australian National University, the University of Melbourne, the University of Western Australia, RMIT and CSIRO.

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To contact the EDG please visit our websites at: <http://ceed.edu.au/> or <http://www.nerpdecisions.edu.au/>

