DISCOVER — ENGAGE — IMPACT

A CALCULATED APPROACH

A team of UQ researchers has developed a biodiversity offset assessment calculation approach that mitigates the toll that development takes on our environment – which is now being used around the world.

Australia is one of the most biodiverse countries in the world, but as urban and industrial demands push development further into natural environments, our biodiversity has undergone the largest documented decline of any continent over the last 200 years.

Environmental offsetting, which involves restoring biodiversity at one site to compensate for losses at another, has been used by developers with varying effectiveness for decades. Done well, it offers a win-win solution – but achieving that perfect balance is a controversial issue that involves complicated questions.

Determining what and how much can be replaced, and estimating how long it will take to restore what's been lost, can be difficult to establish, and in the past, decision-makers often did not have the tools needed to address these issues. So, historically, environmental offsetting has been largely inconsistent and therefore mostly ineffective.

In late 2012, Associate Professor Martine Maron, Dr Megan Evans and Professor Hugh Possingham from UQ's Centre for Biodiversity and Conservation Science, set out to find a solution by developing a calculation approach that determines effective environmental offsets for impacted habitats.

Their approach has resulted in an approach now being used by major governments, regulatory bodies and development corporations in Australia and around the world.

Best intentions lead to ineffective offsets

Australia was a relatively early adopter of environmental offsetting, with the best of intentions to compensate for areas affected by development. Federal and state governments have been enthusiastic about environmental offsetting for the past 20 years, seeing it as a positive way to sustain the environment while meeting the demands of an expanding economy – a win for sustainability and for public perception of development.

However, with no guidelines or formal decision support tools to manage offsetting effectively, many offsets do not do nearly enough to counterbalance the actual impact of development. For example, some early offsets replaced established plant species by planting easier to grow alternatives – which had a devastating effect on animals that relied on those established species to survive.

Associate Professor Maron was determined to find a more effective approach to offsetting, in part because of her own experience.

"I was working in the field with threatened species who were losing ancient, old growth habitat that was essential for their survival," she says.

"It was being legally cleared on the condition that a few trees, which were unsuitable for the species, were planted in their place – not a like-for-like replacement for what they were losing".

Calculating the solution

Associate Professor Maron, Professor Possingham and Dr Evans set about creating a more consistent, easily understood approach to offsetting to improve the process in future.

The project's initial funding came from the National Environmental Research Program (NERP), when the Department of Environment approached the team about creating a scientific approach to calculating environmental offsets.

Drawing from their past work on offsets, the team developed a step-by-step approach to identifying the required gain to counterbalance a biodiversity loss, and the likely outcomes from an offset. It combined novel elements with well-established principles on estimating benefit from conservation actions.

This was translated into the Australian Government's Offset Assessment Guide – a decision-support tool that calculates what conservation actions are required to offset a development's impact on threatened species.

The guide deals with species that have vastly different ecological requirements, and applies the concept of 'time discounting' – penalising offsets that take too long to yield benefits, thus disincentivising long delays that threaten near-extinct species.

"Our tool integrates the unique requirements of different species and ecological communities with a transparent treatment of risk, time delays, and alternative future scenarios, all of which are inherent factors of offsetting," Professor Possingham says.

The guide offers rapid, transparent, robust and flexible decision support to developers,

which benefits them by ensuring the significant time and resources they invest in offsets are spent effectively and are of benefit to the environment.

"The approach makes sense from a business and government perspective, so stakeholders required to use it are generally comfortable with it" says Dr Megan Evans.

"There has been good acceptance of the logic of the approach, and I think that the really close collaboration that we had with our federal government colleagues over the course of the guide's development has produced an enduring outcome."

Consistent change for lasting sustainability

The guide has already been used to support decisions for more than 270 major development proposals across the mining, infrastructure and property sectors in Australia since 2012, influencing many millions of dollars invested in environmental offsets each year.

Thanks to the work and influence of Associate Professor Maron and her team, Australia is now a leader in environmental offsetting research and practice.

"Our research has been adapted by international bodies such as the International Union for Conservation of Nature (IUCN), as well as by governments and industry internationally," Associate Professor Maron says.

The offsetting decision-support tool has influenced the New Zealand Biodiversity Offsets Accounting System, IUCN biodiversity offsets policy, United Nations Convention to Combat Desertification (UNCCD) Land Degradation Neutrality conceptual framework, and was used as a guide in developing the Reef Trust Offsets Calculator, all of which Associate Professor Maron helped to develop.

Associate Professor Maron's research has seen a change in the rigor, transparency and consistency of environmental impact assessment in this country and better responses to the impacts of development on biodiversity.

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Progress to date:

2001: Australia starts to implement biodiversity offsetting as conditions of development approval under the Environment Protection and Biodiversity Conservation Act (EPBC)

2007: Draft offset policy is developed to guide decision making about what constitutes a suitable offset for impacts

2011: Funded by the NERP Environmental Decisions Hub, Associate Professor Maron and the UQ Centre for Biodiversity and Conservation Science team, along with Australian National University's Associate Professor Philip Gibbons, begin work on making a more consistent tool for assessing the impact of development and sustainably applying environmental offsets to mitigate the impact

2012: Australian Government's Offset Assessment Guide is released and starts being used to implement the EPBC Act Environmental Offsets Policy

2015: A paper, jointly authored with Australian Government Department of the Environment policy makers, charting the joint development of the guide, is published: 'The development of the Australian environmental offsets policy: From theory to practice'

2016: UCN's Biodiversity Offsets Policy, influenced by the research behind the Guide, endorsed at the World Conservation Congress

2017: The UNCCD Land Degradation Neutrality Conceptual Framework, influenced by the research behind the guide, is endorsed and is trialled in more than 100 countries

2017: The guide influences development of the New Zealand Biodiversity Offsets Accounting System

2018: The Reef Trust Financial Contributions Calculator, influenced by the guide, launched by the Australian Government

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