Avoiding and offsetting biodiversity loss

Case studies

Department of **Environment and Conservation** NSW

Introduction

The Department of Environment and Conservation NSW (DEC) often negotiates with landholders and developers to minimise the impact of development on biodiversity. If impacts are unavoidable, bodiversity offsets can be used to achieve environmental outcomes. A biodiversity offset is one or more appropriate actions that are put in place to counterbalance (offset) the impacts of development on biodiversity.

The following three case studies illustrate how DEC has worked with stakeholders to avoid, minimise or offset biodiversity losses:

- Wallarah Peninsula – avoiding and minimising impacts
- Karuah Bypass – offsetting habitat loss
- Federal Highway upgrade – offsetting impacts on threatened species.

The Wallarah Peninsula case study demonstrates a case where impacts could be avoided and minimised without resorting to biodiversity offsets. The developer recognised that biodiversity was an asset to the area and established an environmentally sensitive residential development.

In the case of the Karuah bypass, the Roads and Traffic Authority (RTA) acknowledged that it could not avoid, minimise and mitigate all the impacts on biodiversity on-site. The RTA provided 89 hectares of compensatory habitat to offset the loss.

In the Federal Highway upgrade project, the RTA purchased a property with a known population of Striped Legless Lizards and protected this land from development, to offset impacts on a smaller population at another location.

Whilst these case studies demonstrate good outcomes, negotiating biodiversity offsets on a case-by-case basis can be resource intensive and slow, and there is potential for inconsistency in the process and outcome.

DEC proposes to develop a biodiversity offsets and banking scheme to:

- address the impacts of development on biodiversity values
- recognise the market values of biodiversity
- create new opportunities for conservation management on privately-owned land, to complement the State's national parks and other protected areas
- provide transparent, consistent assessment procedures and defined ecological principles for offsetting.

Table 1: A comparison of case studies

Project	Positive outcomes	Negative issues
Wallarah Peninsula	Developer worked collaboratively with government and the community to establish a sustainable residential development with minimal biodiversity impact.	Lengthy planning process
Karuah bypass	As well as measures to minimise and mitigate biodiversity impacts, 89 ha were added to Karuah Nature Reserve to offset 47 ha of lost habitat. The added area created a larger contiguous block of habitat.	
Federal Highway upgrade	RTA purchased a property with a known population of Striped Legless Lizards to offset the highway upgrade impacts on a smaller population.	Little information on the species was available. Possible genetic variations from smaller populations could be lost.

Case study 1: Wallarah Peninsula

Wallarah Peninsula features approximately 600 ha of near undisturbed bushland. Its natural beauty and easy access to the beach and lake, along with its close proximity to Newcastle and Sydney, make it a very attractive place to live.

The landowner gained rezoning approval to develop the land as a residential area, by working with stakeholders to preserve the natural environment and maintain biodiversity.

The main stakeholders in the development process were the landowner and developer, the then NSW Department of Infrastructure, Planning and Natural Resources (DIPNR)[1] and Lake Macquarie City Council. The National Parks and Wildlife Service (NPWS, now part of DEC) assessed Aboriginal heritage and the ecological values of the site.

The land determines development

After negotiating, stakeholders agreed on issues concerning biodiversity, social equity, public access and commercial land development. A memorandum of understanding was drafted to define roles, recognise different interests and agree to transparency.

The developer’s vision was to create a collection of villages where the lifestyle of the residents and the health of the environment had equal priority. The principles guiding development were ecological health, sustainable settlement, community lifestyle, and environmental stewardship.

Planning was dictated by the landscape rather than by a master planning document. The site was assessed to determine its capability to support different forms of development. In this sense, planning was literally from the ground up.

The environmental, geophysical and visual assets of the site were evaluated and development scenarios constructed. Maps were drawn showing areas where critical vegetation corridors and threatened species were located, areas that were generally

1 Now the NSW Department of Planning and NSW Department of Natural Resources

suitable for development, areas that were suitable if various issues were managed, and areas that were unsuitable for development.

While there were patches of critical habitat all over the site, a boundary was defined that would consolidate a sustainable habitat. DEC officers evaluated the site and agreed that there was a long-term biodiversity outcome that could be protected in perpetuity within the boundaries.

An independent consultant assessed the site under a brief prepared by the council and the assessment studies were reviewed by stakeholders to ensure that the methodology was fair and reasonable.

Development with care

After the conservation area was identified and set aside, there was a need to establish conservation principles so the rest of the land would be treated equitably. A local environmental plan (LEP) was prepared to set out subdivision planning. Ecologically significant areas, threatened species and habitat protection areas were all mapped to determine where development could occur. A Conservation Land Use Management Plan was also attached to the land. All requirements were in a statutory package, giving the council and the community certainty about development outcomes.

Working together

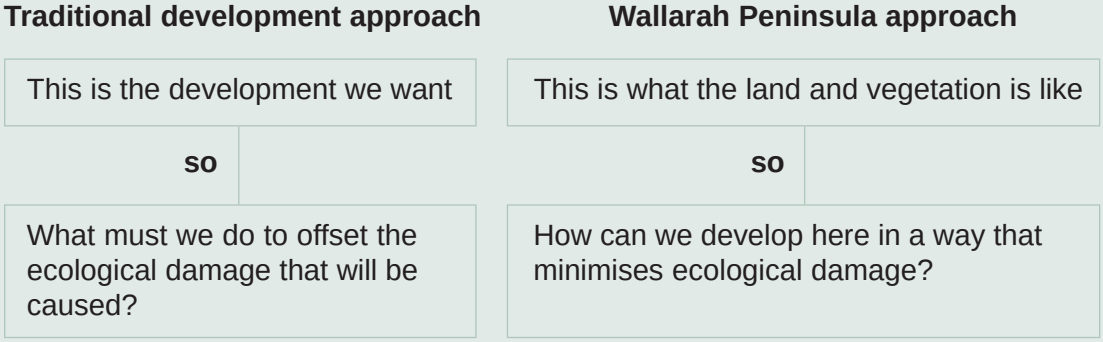
While the development provided clear environmental benefits, it also protected the interests of the landowner. The developer carefully researched comparable developments and consumer choices to establish the commercial value of Wallarah Peninsula.

The rezoning negotiations took three years and the final agreed land use outcomes, captured in the statutory masterplan, took another two years. Although the planning process was costly, the developer recognised that the land included valuable assets from which to build commercial value.

The personal communication skills and patience of the people involved were also a major asset. Through collaboration, the stakeholders demonstrated that development and conservation outcomes can both be achieved and support each other. Together, the stakeholders created a niche development to generate acceptable returns.

The developer, DEC and the local council are continuing to work together on long-term environmental management, bushfire management, habitat protection, tourist facilities, access for services and educational programs.

Figure 1: Development philosophy for Wallarah Peninsula



Case study 2: Karuah bypass

Karuah bypass

Photograph supplied courtesy of NSW Roads and Traffic Authority (RTA)—see the project website http://karuah.thiess.com.au for more information

As part of the Pacific Highway upgrade program, the RTA proposed to construct a 9.8 km section of dual carriageway around the town of Karuah.

The preferred route for the bypass was selected to avoid or minimise environmental impacts. Nevertheless, the environmental and species site assessments identified several potential environmental impacts. These included the removal of 47 hectares of vegetation, 16 of which were from the Karuah Nature Reserve which surrounds the town.

Land transferred to compensate for habitat loss

The RTA acknowledged that it could not avoid all the impacts on habitat or threatened species and a compensatory habitat package was developed. The NPWS (now DEC) sought an offset that would deliver an outcome of overall ecological gain rather than applying specific habitat ratios.

An 89 ha block of privately owned land was identified near the proposed road alignment. It contained similar vegetation and many threatened species affected by the road upgrade. The property had a shack on it and was being moderately grazed.

The NPWS agreed to incorporate the land into the adjacent Karuah Nature Reserve. The property would fill in a missing block and, because it would be in the reserve, could be managed simply and inexpensively.

The RTA purchased the land to transfer it to DEC. For the RTA to acquire the land, an Act of Revocation under the *National Parks and Wildlife (Adjustment of Areas) Act 2001* had to be approved by Parliament.

Members of Parliament agreed that the 89 hectares being added to the nature reserve was of equivalent or better value than the 47 hectares of habitat being lost, that creating a larger contiguous block of habitat had significant biodiversity benefits, and that the management benefits of taking over the private block were worthwhile.

The RTA also agreed to contribute $15,000 towards initial management costs such as weed control and active rehabilitation.

Koala using a fauna underpass

Photograph supplied courtesy of NSW Roads and Traffic Authority (RTA)—see the project website http://karuah.thiess.com.au for more information

Offsetting mangrove damage

The road project also affected mangroves and saltmarsh in Karuah River. The RTA negotiated with NSW Fisheries and the NSW Department of Planning for a compensatory habitat package which included protecting mangrove areas and cleaning up old oyster leases which were creating debris.

Mitigation measures used on the project

The RTA also installed mitigation measures to reduce the long-term impact of the upgraded highway, including:

- several dedicated fauna underpasses as well as combined drainage and fauna underpasses
- dry passage access for fauna under major bridge crossings
- floppy top fauna exclusion fencing along the boundary of Karuah Nature Reserve
- retaining native vegetation in the median strip to allow for glider access
- installing experimental rope ladder/tunnel ‘glider crossings’ at some points (video monitoring shows brush tailed possums and squirrel gliders investigating the structures, but it is unclear if they are using them to cross the road)
- replanting disturbed areas with native species
- installing fencing round threatened flora species to protect against accidental damage during construction.

Working with a construction contractor

During road construction, the contractors needed to use a small section of the newly acquired offset land for machinery storage and stockpiles. As compensation, the contractor agreed to use their labour and machinery to remove the shack on the property, some internal fencing, fruit trees and some old tyres. This cost the contractor very little, but provided a significant logistic benefit to them. It also assisted the NPWS by reducing the work needed to incorporate the property into the reserve.

Case study 3: Federal Highway upgrade

In 1997, the Federal Highway between Sutton and the ACT border required upgrading from a single to dual carriageway to deliver a safer road and reduce travel time between Sydney and Canberra.

The RTA conducted a flora and fauna assessment of the land proposed for the new development and found the vulnerable Striped Legless Lizard (*Delmar impar*) within the proposed road alignment, suggesting a larger population was likely to be in the area.

NPWS (now DEC) advised that destroying this habitat could have dire consequences for the population, and possibly push the Striped Legless Lizard to endangered status.

The RTA investigated options to avoid, minimise and mitigate potential impacts. Not proceeding with the upgrade was not an option for the community, and realigning the road would have been too expensive. As the loss of habitat was likely to have a significant impact on the surveyed population of lizards, offsetting was the last option.

Lizards found elsewhere

The aim of the offset was to compensate for unavoidable impacts on the local Striped Legless Lizard population and help maintain the viability of the species overall.

The only opportunity for an offset came from the results of a flora and fauna survey conducted for the Eastern Gas Pipeline. The survey discovered a large population of the lizards on a property near Cooma. It was the only other population found in NSW. The property was used for occasional sheep grazing and was of good quality native grassland. It also supported other threatened species such as the Grassland Earless Dragon (*Tympanocryptis pinguicolla*).

NPWS officers examined this property more closely and found a far larger population of lizards in this location than at the highway site. They were confident that protecting this property against development would be a highly effective offset arrangement because it would protect a known and apparently healthy population of the lizards.

The RTA bought the property to offset the impact of the road upgrade and passed it to the NPWS. Although this resulted in an ongoing management cost to the NPWS, the high biodiversity value made it worthwhile. However, the location of the offset is a considerable distance from the area impacted on by the highway and some genetic variation between populations in different locations may now be lost to the species.

A biodiversity benefit

Although a small area of habitat was removed by the development of the highway, the associated biodiversity offset enabled a larger more viable population of the Striped Legless Lizard to be protected elsewhere.

The biodiversity benefit was only possible because of the simultaneous discovery of a population of Striped Legless Lizards at a site unrelated to the highway project. It highlights the importance of sharing environmental information widely.

Published by Department of Environment and Conservation NSW (DEC)
2006/78 ISBN 1 74137 838 9
February 2006