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Biodiversity offsets: Practice and promise

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Biodiversity offsets are a tool to compensate for biodiversity losses, and to protect and maintain biodiversity values in alternative locations. Offsets normally apply where biodiversity loss cannot be avoided, mitigated or minimised in development proposals, and represent an often controversial decision-making innovation at the intersection of science, law, politics and economics. Biodiversity conservation underpins ecologically sustainable development and has become an important consideration in land-use planning. This article outlines what offsets are, how they work, and identifies issues for their application into the future. It provides background on how offsets have evolved and reviews policy and practice in Australia, especially in New South Wales. Biodiversity offsetting practice across Australia is inconsistent, complex and confusing. The article discusses the application of offset principles, legislative and policy frameworks, and links to land-use planning processes. Improvements to current offsetting approaches are also suggested.

INTRODUCTION

Continuing loss of biodiversity is a significant national environmental issue.¹ Pressure on biodiversity continues with little evidence of any change to negative trends leading to irreversible loss of many biodiversity components. Biodiversity and threatened species issues are increasingly recognised as important considerations in land-use planning and the determination of development proposals.

An often contentious issue in contemporary decision-making and land-use planning is assessing and determining the importance of loss of natural biodiversity and ecosystems arising from development. While for centuries it has been acceptable for biodiversity to be replaced with development, compensating for loss of biodiversity with replacement measures to protect biodiversity is new. With loss of biodiversity and ecosystem values mostly irreversible and development often considered inevitable, biodiversity offsets have increasingly come into favour as a planning tool allowing development to occur while at the same time providing an expectation of biodiversity gains linked to the extent of the impact.

This article reviews the framework for biodiversity offsetting in Australia and offsetting practice, especially in New South Wales. It demonstrates widespread acceptance of the principles of offsetting, but indicates that the practice is confusing and inconsistent. Despite promising advances in this area, including Biobanking in New South Wales,² the current legislative and administrative frameworks governing offsetting are inadequate and likely to prevent its widespread application without key reforms. With practice throughout Australia evolving rapidly, the article provides a snapshot of the contemporary offsetting landscape and key issues for the successful implementation of biodiversity offsetting arrangements.

BIODIVERSITY OFFSETS IN DECISION-MAKING

Since the concept of ecologically sustainable development (ESD) has been incorporated in decision-making processes, through both government policy and legislation, biodiversity has been recognised as a legitimate matter to be assessed and balanced against a range of other matters for consideration. ESD or its principles are included in objectives or provisions in a range of Australian

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¹ State of the Environment 2011 Committee, *Australia State of the Environment 2011: Independent Report to the Australian Government Minister for Sustainability, Environment, Water, Population and Communities* (DSEWPoC, 2011).

² New South Wales Government, *BioBanking Scheme* (Department of Environment, Climate Change and Water), <http://www.environment.nsw.gov.au/biobanking>.

legislation relating to land-use, including the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPA Act), *Environmental Planning and Assessment Act 1979* (NSW) (EPA Act), *Protection of the Environment Administration Act 1991* (NSW), *Planning and Development Act 2007* (ACT), *Sustainable Planning Act 2009* (Qld), *Development Act 1993* (SA) and *Land Use Planning and Approvals Act 1993* (Tas).

Biodiversity offsetting is a response to loss of biodiversity that can be attributed to developments or actions. It represents a planning and decision-making tool that both recognises and places a value on biodiversity and provides for the mitigation of impacts, normally as part of land-use planning processes. Offsetting allows areas to be protected and/or managed for biodiversity where onsite protection would not be possible or feasible.

Biodiversity offsets have developed from the more general concept of environmental offsets. Typically, these have been applied in the pollution context, with the objective to implement economic tools to influence the carrying out of businesses to reduce external environmental impacts. Offsets are a mechanism to influence the appropriate pricing of natural resources, are one of four ESD principles and have been promoted by government environmental agencies throughout Australia and internationally and enshrined in international agreements and legislation.

Biodiversity offsets form part of a hierarchy of measures to mitigate adverse impacts formalised in the *United Nations Convention on Biological Diversity* in 1992 and applied in the United States and Germany as policy since the 1970s. This hierarchy is a sequential assessment process whereby impacts are avoided, minimised, then mitigated, and residual impacts are offset.³

Biodiversity offsets enable the development of land with biodiversity values or carrying out of activities affecting biodiversity where protection or mitigation of adverse impacts would otherwise not be possible. An "offset" means actions taken outside or within a development site to compensate for the direct, indirect and/or consequential effect of that development on native vegetation and biodiversity. Definitions of biodiversity offsets vary, and some examples are as follows:

- "Biodiversity offsets are conservation activities intended to compensate for the residual, unavoidable harm to biodiversity caused by development projects."⁴
- "Measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development and persisting after appropriate prevention and mitigation measures have been implemented. The goal of biodiversity offsets is to achieve no net loss, or preferably a net gain, of biodiversity on the ground with respect to species composition, habitat structure and ecosystem services, including livelihood aspects."⁵
- "Measures that compensate for the residual adverse impacts of an action on the environment. Offsets provide environmental benefits to counterbalance the impacts that remain after avoidance and mitigation measures."⁶
- "An action that is taken at a location away from an impacted site that aims to replace the biodiversity values lost at the impacted site."⁷

Many terms and definitions are used in conjunction with offsets, and have a significant bearing on the interpretation and communication of the scope and intention of offsets with significant practical implications. For example, there can be a distinction between "onsite" and "offsite" offsets, "restoration" and "protection" offsets, and "direct" and "indirect offsets". Issues arising from this confusion are discussed below.

³ The Biodiversity Consultancy, *Independent Report on Biodiversity Offsets* (prepared for ICMM and IUCN, 2012).

⁴ ten Kate K, Bishop J and Bayon R, *Biodiversity Offsets: Views, Experience, and the Business Case* (IUCN and Insight Investment, 2004).

⁵ Business and Biodiversity Offsets Programme, *Biodiversity Offset Design Handbook* (BBOP, 2009).

⁶ Australian Government, *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy* (Department of Sustainability, Environment, Water, Population and Communities, 2012).

⁷ New South Wales Transport, *Guideline for Biodiversity Offsets* (Roads and Maritime Services, 2011).



In Australia, biodiversity offsets primarily relate to impacts of development proposals on threatened species or endangered ecological communities, probably because legislative frameworks exist that require consideration of these matters by approval agencies. Normally an offset would apply only after options to avoid, minimise or mitigate adverse impacts have been fully considered, and where actions to avoid adverse biodiversity impacts are not feasible. The purpose of offsets is not to facilitate development that would otherwise have a significant effect on threatened species and biodiversity but rather to compensate for unavoidable impacts.

A range of types of biodiversity offset measures are potentially available, including:

- balancing biodiversity losses such as purchasing and protecting equivalent habitat, or rehabilitating alternative degraded habitat;
- improving the security of biodiversity on a development site or elsewhere;
- carrying out management programs or actions that lead to improvements in biodiversity values; and
- indirect improvements such as financial arrangements for biodiversity improvement programs, scientific programs, education, or other non-biodiversity-related but socially valuable contributions.

EVOLUTION OF BIODIVERSITY OFFSETS

Environmental offsets provide a market-linked mechanism to reduce adverse impacts and have been canvassed for some decades, mostly within the context of environmental impact assessment.⁸ While the offset concept has primarily been used to manage pollution and to provide an incentive to reduce emissions or other externalities, it has also been increasingly applied to loss of biodiversity in recent years.

Biodiversity offsets are widely seen as a useful tool for managing the adverse impacts of development activities on biodiversity with many benefits for a range of stakeholders. Above all, they provide the attraction of allowing development to occur that might otherwise not be possible. The basic approach is an avoid, minimise, mitigate hierarchy with offsets as a last resort option.

Sheahan reviewed conservation banking in the United States and its applicability to New South Wales, describing legislatively-based biodiversity credit trading programs in place since the mid-1980s.⁹ International organisations such as the United Nations Environment Program (UNEP), the International Union for the Conservation of Nature and Natural Resources (IUCN) and business organisations have been evaluating and promoting biodiversity offsets to reduce environmental impacts, promote ESD, and to facilitate business opportunities and investment.¹⁰ Market-based biodiversity trading has attracted considerable interest as a method for balancing development and biodiversity outcomes.¹¹

Brodbeck reviewed the use of offsets in land-use planning, providing a number of examples of their use in New South Wales and overseas, and noting the lack of a policy framework for applying offsets in New South Wales.¹² Guidelines for the design of offset proposals and calculation of offsets are included in the Business and Biodiversity Offsets Programme handbook based on case studies of

⁸ New South Wales Environment Protection Authority, *Green Offsets for Sustainable Development* (2002).

⁹ Sheahan M, *Credit for Conservation – a Report on Conservation and Mitigation Banking in the USA, and its Applicability to New South Wales* (Winston Churchill Memorial Trust of Australia, 2001).

¹⁰ ten Kate et al, n 4; International Council on Mining and Metals, *Biodiversity Offsets – A Briefing Paper for the Mining Industry* (2005). PricewaterhouseCoopers, *Biodiversity Offsets and the Mitigation Hierarchy: A Review of Current Application in the Banking Sector* (a study completed on behalf of the Business and Biodiversity Offsets Programme and the UNEP Finance Initiative, 2010); The Biodiversity Consultancy, n 3.

¹¹ Mead D, "History and Theory: The Origin and Evolution of Conservation Banking" in Carroll N, Fox J and Bayon R (eds), *Conservation and Biodiversity Banking – A Guide to Setting Up and Running Biodiversity Credit Trading Systems* (Earthscan, 2008).

¹² Brodbeck S, *Green Offsets* (New Planner, Planning Institute of Australia NSW, 2005) pp 13-15.

practice around the world,¹³ including proposed standards.¹⁴ A review by Tanaka identified 50 countries that had mandatory biodiversity offset programs based on a policy of no net loss or net gain.¹⁵ These policies were mostly based on systems used in the United States and could be grouped into four general methods depending on whether they were “direct” or “indirect” offsets, “primary” offsets resulting in habitat creation or restoration or supporting “secondary” offsets.

Madsen et al reviewed biodiversity markets and offset programs from around the world, noting their widespread use in many countries, especially the United States, Canada, Europe, Asia and Australia.¹⁶ Twelve active programs were identified in Australia, with others under development.

In some countries legislation requires offsetting actions for damage caused by development projects to certain ecological characteristics such as wetlands, catchments, species and ecosystems. In other countries, including Australia, biodiversity offsets are voluntarily negotiated as part of planning and environmental impact assessment processes, or as a condition of resource access.

It is evident that there is increasing use of biodiversity offsets around the world, although there are many inconsistencies in the way these are applied. By facilitating business access to natural resources, and with increased global urbanisation and growth pressures and concurrent recognition of the importance of protecting biodiversity values, it is likely that development pressure on biodiversity will continue and interest in offsetting will grow. In particular, the mining industry has taken an active interest in the issue and advocates the development and application of biodiversity offset measures.¹⁷

PRINCIPLES FOR APPLYING OFFSETS

Principles for applying biodiversity offsets have been prepared by a number of organisations and for a range of different purposes. These include the New South Wales Department of Environment, Climate Change and Water (DECCW; now the New South Wales Office of Environment and Heritage (OEH)), the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPAC), the Business and Biodiversity Offsets Programme (BPOP), the Queensland Department of Environment and Resource Management (DERM), and the Western Australian Environmental Protection Authority (EPA).

These sets of principles differ in detail and emphasis, but have many elements in common. The principles are useful to consider in the context of preparing and implementing biodiversity offsets policy. Table 1 summarises offset principles identified in policy and practice. Comparison between the principles shows that offsets can normally be used only where measures to avoid, minimise or mitigate impacts are first applied, are an additional development requirement, and are intended to result in a permanent ecological benefit.

TABLE 1 Summary of offset principles applied in policy in Australia

Biodiversity offset principle	DECCW (2008)	OEH (2013)	SEWPAC (2012)	BPOP (2009)	DERM (2011)	EPA (2006)
WHEN OFFSETS APPLY						
Impacts must be avoided first by using prevention and mitigation measures	Yes	Yes	n/a	Yes	Yes	Yes
All regulatory requirements must be met, and offsets must be over and above existing arrangements	Yes	Yes	Yes	n/a	Yes	Yes

¹³ Business and Biodiversity Offsets Programme, n 5.

¹⁴ Business and Biodiversity Offsets Programme, *Standard on Biodiversity Offsets* (BBOP, 2012).

¹⁵ Tanaka A, “Novel Biodiversity Offset Strategies: Satoyama Banking and Earth Banking” (paper presented at the *International Association for Impact Assessment Conference*, Geneva, 6-11 April 2010).

¹⁶ Madsen B, Nathaniel C, Daniel K and Bennett G, *Update: State of Biodiversity Markets* (Forest Trends, 2011).

¹⁷ Minerals Council of Australia, *Biodiversity Offsets Policy* (2012).



TABLE 1 continued

Biodiversity offset principle	DECCW (2008)	OEH (2013)	SEWPAC (2012)	BPOP (2009)	DERM (2011)	EPA (2006)
CALCULATING OFFSETS						
Offsets must be underpinned by sound ecological principles and science	Yes	Yes	Yes	Yes	n/a	n/a
Offsets should aim to result in a net improvement in biodiversity over time, and at least no net loss	Yes	Yes	Yes	Yes	Yes	n/a
Offsets must be enduring – they must offset the impact of the development for the period that the impact occurs	Yes	Yes	Yes	Yes	Yes	Yes
Offsets must be quantifiable – the impacts and benefits must be reliably estimated	Yes	Yes	n/a	n/a	n/a	n/a
Offsets must be like-for-like or better	Yes	Yes	n/a	n/a	Yes	Yes
Suitable offsets must be built around direct offsets but may include other compensatory measures	n/a	n/a	Yes	n/a	n/a	Yes
Offsets must account for and manage the risks of the offset not succeeding	n/a	n/a	Yes	n/a	n/a	Yes
IMPLEMENTING OFFSETS						
Offsets should be agreed prior to the impact occurring	Yes	n/a	n/a	n/a	n/a	n/a
Offsets must be located appropriately, and in the same general area as the development	Yes	n/a	n/a	Yes	n/a	n/a
Offsets and their actions must be enforceable through development consent conditions, licence conditions, conservation agreements or a contract	Yes	n/a	Yes	n/a	Yes	Yes
Offsets must never reward ongoing poor performance	Yes	n/a	n/a	n/a	n/a	n/a
Offset negotiations must include stakeholder participation	n/a	n/a	n/a	Yes	n/a	n/a
Offsets should be designed and implemented in an equitable and transparent manner	n/a	n/a	Yes	Yes	n/a	Yes
Supplementary measures can be used in lieu of offsets	n/a	Yes	n/a	n/a	n/a	n/a
Offsets can be discounted where significant social and economic benefits accrue to New South Wales as a consequence of the proposal	n/a	Yes	n/a	n/a	n/a	n/a

Sources: New South Wales Government, *Principles for the Use of Biodiversity Offsets in NSW* (Department of Environment, Climate Change and Water, 2009); New South Wales Government, *NSW Offset Principles for Major Projects (State Significant Development and State Significant Infrastructure)* (Office of Environment and Heritage, 2013); Australian Government, *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy* (Department of Sustainability, Environment, Water, Population and Communities, 2012); Business and Biodiversity Offsets Programme, *Biodiversity Offset Design Handbook* (2009); Queensland Government, *Queensland Biodiversity Offset Policy (Version 1)* (Department of Environment and Resource Management, 2011); Western Australian Government, *Environmental Offsets Policy – Position Statement No 9* (Environment Protection Authority, 2006).

A review of current offset principles indicates that the key common principles are as follows:

1. Biodiversity offsets will be used as a last resort, after consideration of alternatives to avoid, minimise or mitigate impacts.
2. Offsets must be based on sound ecological studies and principles.
3. Offsetting must achieve benefits in perpetuity.
4. Offsets must be based on the principle of “net gain”.
5. Offset arrangements must be enforceable.

At present, offset principles have not been implemented within Australian legislation, and there is no firm commitment by governments to biodiversity offsetting or to specific principles. The specific

wording of principles varies widely across jurisdictions and together with their inconsistent use hinders their application in both policy and practice.

New South Wales Land and Environment Court (LEC) cases have reviewed the application of offset principles and criteria. The court has accepted that offsets represent a “strategic means to ameliorate environmental impacts”,¹⁸ that the key principle of offsetting should be “no net loss”,¹⁹ and commented on the process for giving weight to biodiversity and offset considerations.²⁰ The LEC took into account principles of ESD and the DECCW’s 2008 biodiversity offset principles, noting that these principles can be applied as a framework in which to consider offsets as a mitigating measure.²¹

THE SCIENCE BEHIND BIODIVERSITY OFFSETS

Biodiversity offsets are primarily a policy instrument and a decision-making tool, yet offset approaches are often represented as scientific or objective. Scientific methods and data are generally used to calculate the size and acceptability of offsets based on conceptual frameworks that are often poorly defined. The key issue is to determine ecological equivalency and the extent of compensation for biodiversity loss.

Biodiversity offset assumptions, approaches and methods of calculating offsets have been controversial,²² although it is arguable that the introduction of offsets has avoided loss of biodiversity.²³ Much controversy surrounds the notion that biodiversity loss will be accepted in return for uncertain gain. Maron et al propose that current policy expectations for restoration to achieve ecological equivalence are often unsupported by evidence and that offset policies relying on ecological restoration are problematic.²⁴

The following assumptions underpin the application of most biodiversity offsets:

1. Habitat losses today will be offset by a future biodiversity gain, and time lags are not important.
2. Biodiversity values can be effectively measured and losses and gains can be compared.
3. Restoration and management of degraded biodiversity will lead to improvement, and the extent of the improvement can be predicted.
4. Risks and uncertainties associated with future management are known and acceptable.
5. Ecological equivalence of lost habitat and offset sites can be established.
6. Reduction in biodiversity extent can be regarded as equivalent to improvements to biodiversity quality or other parameters elsewhere.

Bekessy et al argue that such assumptions are undermining the potential benefits of offset approaches and are likely to result in further loss of biodiversity. They suggest that improvements to biodiversity value should be demonstrated before they can be used to offset biodiversity losses.²⁵

Doubts about the effective application of offsets have also been expressed by Quetier and Lavorel, who highlight problems with governance and lack of methods for determining offset requirements and

¹⁸ *Gerroa Environment Protection Society Inc v Minister for Planning and Cleary Bros (Bombo) Pty Ltd* [2008] NSWLEC 173; *Gerroa Environment Protection Society Inc v Minister for Planning and Cleary Bros (Bombo) Pty Ltd (No 2)* [2008] NSWLEC 254.

¹⁹ *Motorplex v Port Stephens Council (No 3)* [2008] NSWLEC 1280.

²⁰ *Bulga Milbrodale Progress Assn Inc v Minister for Planning and Infrastructure and Warkworth Mining Ltd* (2013) 194 LGERA 347.

²¹ *Hunter Environment Lobby v Minister for Planning & Ulan Coal Mines Ltd* [2011] NSWLEC 221.

²² Bull JW, Suttle KB, Gordon A, Singh NJ and Milner-Gulland EJ. “Biodiversity Offsets in Theory and Practice” (2013) 47(3) *Oryx* 369.

²³ Gibbons P. “The Case for Biodiversity Offsets. Keep in Mind the Net Gain and the Status Quo” (2010) 39 *Decision Point* 2.

²⁴ Maron M, Hobbs RJ, Moilanen A, Matthews JW, Christie K, Gardner TA, Keith DA, Lindenmayer DB and McAlpine CA. “Faustian Bargains? Restoration Realities in the Context of Biodiversity Offset Policies” (2012) 155 *Biological Conservation* 141.

²⁵ Bekessy SA, Wintle BA, Lindenmayer DB, McCarthy MA, Colyvan M, Burgman MA and Possingham HP. “The Biodiversity Bank Cannot Be a Lending Bank” (2010) 3 *Conservation Letters* 151.



suggest approaches to establishment of ecological equivalence.²⁶ An example of the requirement for achieving a no net loss standard of offset shows that extensive habitat creation may be required in addition to an extensive monitoring program.²⁷

While science plays an important role in offsetting, a number of important issues are evident. The first is whether offset principles are scientifically based and supported by evidence. Secondly, principles set the framework and applicable standard for what is to be achieved and appropriate scientifically based ecological methods are needed to support these standards. Finally, there is also a need for scientific evidence to demonstrate the validity of the assumptions used in applying offsets, and for reliable ecological data and methods for actual offset calculations.

The scientific limitations outlined above do not appear to have been effectively recognised in policy approaches to date.

AUSTRALIAN POLICY AND LEGISLATIVE CONTEXT

The practice of offsetting in Australia has been driven by policy and legislation at the State and Commonwealth levels. A policy framework for biodiversity offsetting first appeared in Victoria and New South Wales with the introduction of the vegetation clearing approval processes and assessment methodologies for rural areas. Prior to this there were a limited number of individual development proposals where offsets were negotiated on a case-by-case basis or where measures were applied as consent conditions.

Commonwealth

At the Commonwealth level, biodiversity offsets are used in administering the EPA Act. There is no legislative requirement for offsets, and these are negotiated with development proponents on a case-by-case basis where approvals are required. Commonwealth legislation operates independently from related State legislation, often resulting in multiple project approval requirements.

In 2007, the Commonwealth introduced a draft Policy Statement on the Use of Offsets under the EPA Act,²⁸ now replaced by the EPA Act Environmental Offsets Policy.²⁹ Offsets are recognised as an additional tool that can be used during the environmental impact assessment process.

Commonwealth policy relates to protected matters under the EPA Act and most frequently applies where there are impacts on listed threatened species and ecological communities, migratory species protected under international agreements, and wetlands of international importance listed under the Ramsar Convention. It primarily aims to ensure that the administration of offsets is consistent, transparent, based on appropriate science, and to guide implementation. The policy includes principles to apply in determining the suitability of offsets and an associated assessment guide has been prepared to calculate offset requirements. Offsets are now widely applied in Commonwealth approvals as can be observed in many recent approval conditions.

States and Territories

States and territories have prepared a range of policies, strategies and legislative frameworks relating to biodiversity, as summarised in Table 2. These provide policy directions and, in some cases, legislative frameworks supporting offsets exist. The concept of offsets has not been incorporated in legislation or regulatory requirements. Changes in government priorities mean many policies are subject to review, or have not been implemented. They do, however, provide a context for the increasing interest in biodiversity offsetting and its application.

²⁶ Quetier F and Lavorel S, "Assessing Ecological Equivalence in Biodiversity Offset Schemes: Key Issues and Solutions" (2011) 144 *Biological Conservation* 2991.

²⁷ Pickett EJ, Stockwell MP, Bower DS, Garnham JJ, Pollard CJ, Clulow J and Mahony MJ, "Achieving No Net Loss in Habitat Offset of a Threatened Frog Required High Offset Ratio and Intensive Monitoring" (2013) 157 *Biological Conservation* 156.

²⁸ Australian Government, *Draft Policy Statement: Use of Environmental Offsets under the Environment Protection and Biodiversity Conservation Act 1999* (Department of the Environment and Water Resources, 2007).

²⁹ Australian Government, n 6.

TABLE 2 Summary of State and Territory policies and strategies relevant to biodiversity offsetting

	Examples of State and Territory legislation, strategies and policies	Comments and references to biodiversity offsetting
ACT	Nature Conservation Strategy 1997.	Refers to offsetting as a mechanism to mitigate development impacts. The Strategy is under review.
NT	Draft strategies for terrestrial and coastal/marine biodiversity.	Strategies were prepared but never endorsed.
NSW	1999 NSW Biodiversity Strategy. <i>Native Vegetation Regulation 2005</i> (NSW). NSW Biobanking and Offsets Scheme 2007. <i>Threatened Species Conservation (Biodiversity Banking) Regulation 2008</i> (NSW). Interim Policy on assessing and offsetting biodiversity impacts of Part 3A, State significant development and State significant infrastructure projects, NSW Office of Environment and Heritage 2011. NSW State Plan 2011 has a priority action to develop a common set of offsetting principles and to align offsetting practices.	Draft biodiversity strategy exhibited in preparation to update earlier strategy. Linked to environmental outcomes and assessment methodology and regulation. A legal and financial framework for a market-based offsetting system for development proposals, linked to the EPA Act. Intended to provide consistency for major projects and also to align New South Wales and Commonwealth assessment processes. Adopts use of the Biobanking Assessment Methodology, but not the scheme.
QLD	Marine Fish Habitat – Mitigation and Compensation for Works or Activities causing Marine Fish Habitat Loss (2002). Koala Habitat – Offsets for Net Benefit to Koalas and Koala Habitat (2006). Vegetation Management – Policy for Vegetation Management Offsets (2009). Biodiversity Strategy for Queensland 2011. Queensland Biodiversity Offset Policy (Version 1) (Qld Department of Environment and Resource Management, 2011). This is an offset policy under the Queensland government Environmental Offsets Policy 2008.	Applies to approvals under the <i>Vegetation Management Act 1999</i> (Qld). Policy applies seven principles applying to environmental offsets in Queensland. Applies only to areas with State significant biodiversity values, and for these seeks to ensure “no net loss”. Includes criteria and processes for offsets and specifies offset ratios for threatened species. Also, Balance the Earth Trust was established in 2009 to enable financial offset contributions.
SA	Nature Conservation Strategy for SA 2007-2017.	Native vegetation clearing offsets are recognised. Biodiversity strategy is part of State strategy.
TAS	Tasmania's Nature Conservation Strategy 2002-2006, supported in part by Tasmanian Government.	No references to offsetting.
VIC	State Biodiversity Strategy completed 1997, as required by the <i>Flora and Fauna Guarantee Act 1988</i> (Vic). Native Vegetation Management – A Framework for Action (2002). Reforms to Victoria's native vegetation permitted clearing regulations (2013).	Bush Broker scheme and habitat hectares offsetting approach used in rural areas. Aimed to reverse long-term vegetation decline leading to net gain. Changes focus from native vegetation to biodiversity, reduces offsetting equivalence requirements, and moves to no net loss standard.
WA	Draft Biodiversity Conservation Strategy prepared in 2007. Environmental Offsets, Position Statement No 9 January 2006, Environmental Protection Authority.	Strategy not finalised. Proposed preparation of specific biodiversity offsets policy and guidelines. Has a goal of achieving “net environmental benefit” in environmental impact assessment processes. Includes offset principles, but applies more broadly than just biodiversity.

Offsetting practice is most developed at the State level in New South Wales, Queensland and Victoria, as discussed below.

New South Wales government offset framework

The New South Wales government has a policy of maintaining or improving native vegetation in the State and this is being implemented in legislation including the *Native Vegetation Act 2003* (NSW) and the *Threatened Species Conservation Act 1995* (NSW) (TSC Act).

Biodiversity and threatened species offsets have been accepted as an important tool to meet the objective of maintaining or improving native vegetation. Offsets have been incorporated in the *Native*



Vegetation Regulation 2005 (NSW) through the adoption of an Environmental Outcomes and Assessments Methodology, which incorporates an offsetting mechanism. Where developments seeking approval under the EPA Act are likely to have a significant impact on threatened species, the New South Wales Office of Environment and Heritage generally seeks to negotiate offsets to mitigate or compensate for biodiversity loss where it has an approval role.

The New South Wales government established a Biobanking Scheme to create a biodiversity offsetting system with a market for biodiversity credits and biobank sites managed in perpetuity to protect and improve biodiversity values. The approach is based on that used for implementing the *Native Vegetation Act*, which aims to "maintain or improve" native vegetation within the State.

The Biobanking Scheme uses a Biobanking Assessment Methodology to calculate biodiversity credits used to determine offset requirements for site-specific development projects. This scheme was established under the TSC Act and is directly linked to the EPA Act through its requirement to consider threatened species in development approvals. A legislative and administrative framework has been established for biobanking, allowing for market-based trades in biodiversity credits.³⁰

Although this scheme has been in existence for about five years, it is voluntary and relatively complex and there is currently no functioning market for biodiversity credits. As a consequence, it is not clear whether this will become a realistic biodiversity offset alternative. Many developers are providing offsets independently and an ad hoc system of negotiated offsets applies in practice. Biobanking is the last resort for developments that would otherwise be refused for reason of their adverse impact on threatened species.

The TSC Act also provides for the biocertification of environmental planning instruments. Based on the Biobanking Assessment Methodology, a revised assessment method has been developed for biocertification of plans that seeks to provide a strategic approach to the consideration of threatened species and endangered ecological communities in the preparation of land-use plans. In supporting guidelines for biocertification of local environmental plans, the DECCW framed principles for the use of biodiversity offsets in New South Wales.³¹ These 13 principles are relevant to the framing of a local offset policy, and differ substantially from the 10 principles used by the Commonwealth. Importantly, the principles require quantifiable offsets and "like-for-like or better" conservation outcomes. More recently, separate offsetting policy and principles have been developed for State significant development projects in New South Wales.³² The New South Wales government has also announced the establishment of a fund for biodiversity offsets, with details not yet determined.

Although legislation allowing biocertification of LEPs has been in place for some years, only a small number of biocertified plans have been finalised.³³ The potential benefit of biocertification is that in assessment of development applications under Pt 4 of the EPA Act, assessment of threatened species impacts is no longer required. The Western Sydney Growth Centres SEPP was biocertified and LEPs for Wagga Wagga and Albury are the only examples of biocertified LEPs. The requirements for biocertification are currently under review.

Overall, biodiversity offsets are now commonly applied in New South Wales in the approval of major projects impacting on biodiversity values. One New South Wales government agency involved in development has an offset guideline,³⁴ replacing much earlier compensatory habitat guidelines,³⁵ and is an active offset provider. The guideline outlines the process of determining whether biodiversity

³⁰ Grosskopf T, Kannane A and Seidel J, "Experiences in Biobanking: Lesson for Practitioners" (2011) June *Australian Environment Review* 118.

³¹ New South Wales Government, *Principles for the Use of Biodiversity Offsets in NSW* (Department of Environment, Climate Change and Water, 2009).

³² New South Wales Government, *NSW OEH Interim Policy on Assessing and Offsetting Biodiversity Impacts of Part 3A, State Significant Development (SSD) and State Significant Infrastructure (SSI) Projects* (Office of Environment and Heritage, 2011). New South Wales Government, *NSW Offset Principles for Major Projects (State Significant Development and State Significant Infrastructure)* (Office of Environment and Heritage, 2013).

³³ Connolly I and Fallding M, "Biocertification of Local Environmental Plans – Promise and Reality" (2009) 26 *EPLJ* 128.

³⁴ New South Wales Transport, n 7.

offsets are required, establishes offsetting principles, and reviews options for implementing offset measures. It also requires the agency to maintain a register of offset areas.

Queensland government offset framework

The Queensland Biodiversity Offset Policy has been developed under the broader framework of an environmental offsets policy that commenced in 2008.³⁶ Under this policy, certain development activities requiring approvals under a range of legislative provisions trigger the requirement for a biodiversity offset where residual impacts on an area with State significant biodiversity values cannot be avoided or minimised.

Offsets can be provided either as land or through an offset payment to a trust fund, known as the Balance the Earth Trust, which has been established to add to the State's protected areas. A range of mechanisms is used to support the offsetting process and to secure offsets. These include offset area management plans, a biodiversity planning assessment methodology, and standardised fauna survey guidelines.

The Queensland offsetting framework is only intended for major projects requiring State approvals, and is not directly linked to the planning and approval processes under the *Sustainable Planning Act*. In practice, it is probably the case that the offsetting policy is primarily used as a tool to facilitate project approvals, and together with regulatory requirements applying to native vegetation is under review.

Victorian government offset framework

The use of offsets in Victoria has been applied in the regulation of native vegetation removal, and is applied through the planning system.³⁷ An overall policy of net gain in the extent and quality of native vegetation was applied in 2002. The State planning policy framework is a component of Victorian planning schemes, provides principles for planning and approvals and recognises that offsets are an option where impacts on native vegetation cannot be avoided and after the impacts are minimised.

Although there is no State biodiversity policy or principles, where clearing of native vegetation requires planning approval, offsets may be required to provide a gain in the quality or extent of native vegetation elsewhere. A calculator has been developed to quantify the extent of offset required and the establishment of a Bushbroker scheme assists in sourcing offsets where no suitable onsite offsets can be provided.³⁸

The Victorian government is currently reforming native vegetation clearing regulations and administrative processes, with offsets one of the priority areas of reform.³⁹ Offsets will continue as an important consideration in regulating clearing, a program for updating the system of native vegetation credits is being implemented, and a revised offset calculator has been prepared for determining native vegetation gain.⁴⁰ This will implement a no net loss offsetting standard and is expected to simplify assessment processes based on vegetation modelling, reduce consideration of threatened species impacts, and reduce offsetting requirements.

³⁵ New South Wales Roads and Traffic Authority, *Interim Compensatory Habitat Policy and Guidelines, Providing Compensatory Habitat as Amelioration for Impacts on Habitat Resulting from Road Development* (2001).

³⁶ Queensland Government, *Queensland Biodiversity Offset Policy (Version 1)* (Department of Environment and Resource Management, 2011); Queensland Environmental Protection Agency, *Queensland Government Environmental Offsets Policy* (2008).

³⁷ Victorian Government, *Native Vegetation Policy and Planning* (Department of Sustainability and Environment, 2010).

³⁸ Victorian Government, *Native Vegetation – Scoring Gain from an Offset – DSE Gain Calculator User Instructions* (Department of Sustainability and Environment, 2006).

³⁹ Victorian Government, *Reforms to Victoria's Native Vegetation Permitted Clearing Regulations* (Department of Environment and Primary Industries, 2013) "Overview".

⁴⁰ Victorian Government, *Native Vegetation Gain Scoring Manual (Version 1)* (Department of Environment and Primary Industries, 2013).



LOCAL GOVERNMENT OFFSETTING APPROACHES

A high proportion of developments are approved at the local level under local planning and approval frameworks, and local governments have key responsibilities for land-use decision-making. Commonwealth and State legislation and policy provide the context for applying biodiversity offsets at the local government level. Some councils have found the need to develop their own policy frameworks for biodiversity offsetting, largely in response to community pressure and conflicts between development demands and the protection of biodiversity within their areas.

One important reason why local governments have developed biodiversity offsetting policy and practice is the lack of appropriate offset frameworks at the State level, especially links with the land-use plans and development approval processes, and inconsistent application of offsets by State and Commonwealth governments. Local governments also have a direct interest in offsets because many are the managers of significant lands with biodiversity values and can be the long-term custodian of offset lands. Examples of local government offsetting policy are shown in Table 3.

TABLE 3 Examples of local government biodiversity offsetting

<p><u>Camden Council (NSW)</u> Natural Assets Policy 2003 included a native vegetation offsetting framework. The policy applied the principle of no net loss to the total extent, quality, ecological integrity and security of biodiversity values of the whole of the Camden area and is based on mapping of ecologically significant land. Included a multiplier to quantify the extent of the offset. Most of Camden's Urban Release areas are in the Sydney South West Growth Centre, and there is an order that confers biodiversity certification on the State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (see NSW GG No 182). This order sets out requirements for offsetting and now largely supersedes the council policy.</p>
<p><u>Liverpool Council (NSW)</u> Habitat Offsets Policy Framework (2003). Adopted as Part C of the Liverpool City Council Biodiversity Strategy in 2004.</p>
<p><u>Hornsby Council (NSW)</u> Green Offsets Policy 2007 The policy applies at the development application stage. It aims to replace the native vegetation removed from a development site. The size of the offset is calculated using tables in the policy.</p>
<p><u>Coffs Harbour Council (NSW)</u> Priority Habitats and Corridors Strategy 2010-2030. The strategy maps priority habitats and corridors and five environmental categories of land. Offsets are recognised, and biobank sites and land purchase are encouraged in priority habitats and corridors.</p>
<p><u>Lake Macquarie City Council (NSW)</u> Draft Biodiversity Offsets Policy 2011. Proposed principles for offsets and a calculator for determining the extent of offset requirement. Not finalised.</p>
<p><u>Hills Shire Council (NSW)</u> The council has used the New South Wales Biobanking Scheme to facilitate its residential developments and to manage biodiversity on council retained land. No specific policy position on offsets.</p>
<p><u>Brisbane City Council (Qld)</u> Draft Offsets Planning Scheme Policy prepared, proposed in 2008 to form part of City Plan.</p>
<p><u>Logan City Council (Qld)</u> Environmental Offsets Policy prepared in 2011 as Planning Scheme Policy No 8 Environmental Offsets. Includes principles for offsets. Draft policy relating to ecological assessment reports and environmental offset standards also under consideration.</p>
<p><u>Kingborough Council (Tas)</u> Biodiversity Offsets Policy prepared in 2010. Identifies offsetting options and replacement ratios for loss of vegetation and threatened species habitat.</p>
<p><u>Yarra Ranges Council (Vic)</u> Biodiversity Offsets Program. The council participates in the native vegetation offset market by requiring offsets for approved developments that affect native vegetation. Program commenced 2012.</p>

Offsets are applied by local government authorities in a range of different ways, reflecting their broad legislative and social responsibilities, including strategic planning, development approvals, and land management activities.

Local governments potentially play a very important role in implementing biodiversity offsets because of their local planning responsibilities and the fact that the majority of development impacting on biodiversity is not of State significance and mostly does not require Commonwealth approval. They may therefore be able to effectively respond to the cumulative impacts of biodiversity loss within their areas. As shown in Table 3, some local government authorities have innovative programs in place for protecting biodiversity, and are also actively managing offset land for long-term conservation. This demonstrates the scope for biodiversity initiatives at the local level, but risks inconsistent practice in the absence of an appropriate State framework.

REVIEW OF OFFSETTING PRACTICE

There are many examples of biodiversity offsets of different types and scales. These include individual development projects, long-term urban development programs, strategic plans and major mining or infrastructure projects. A small number of developments have utilised the New South Wales Biobanking Scheme but in practice most offsets are negotiated between development proponents and approval authorities, probably because this offers greater flexibility and lower cost.

Offsets are mostly applied at the development approval stage of the development process, although it is recognised that it is more effective to plan for biodiversity at the earliest stages of the process prior to the zoning of land and the establishment of definite development expectations.⁴¹ Some local governments seek to resolve biodiversity offset requirements early in strategic planning processes, including Lake Macquarie City Council, which has a policy of requiring appropriate ecological surveys and determining guidelines for biodiversity prior to the preparation of plans to rezone land for development. However, apart from the rarely-used methodology associated with biocertification of local environmental plans, most consideration of biodiversity and offsetting occurs at the development stage.

The complexity of offset arrangements is partly a result of the complex assessment and approval pathways for development under the EPA Act combined with the links between this legislation and the TSC Act under which the New South Wales Office of Environment and Heritage also has responsibilities. Separate to this framework are Commonwealth approval responsibilities under the EPBC Act with its different lists of threatened species and endangered ecological communities and distinct criteria for determining the significance of impacts on these and other matters of national environmental significance.

Some major developments, such as mines, have specific biodiversity offset strategies. One of the longest in operation is the Mount Owen Mine at Ravensworth in the New South Wales Hunter Valley.⁴² Other examples include the New South Wales Transport Infrastructure Development Corporation⁴³ and the BHP Billiton Mitsubishi Alliance.⁴⁴ Such private offset arrangements are normally prepared as part of environmental impact assessment processes or to comply with approval conditions as part of a process managed by State governments.

Many urban development programs impacting on biodiversity values may have offset arrangements in place as part of approval processes. Two important examples are the Western Sydney Growth Centres and the Melbourne Growth Areas, which have been subject to strategic assessments under the EPBC Act.

The Sydney Region Growth Centres State Environmental Planning Policy 2006 was the first biocertified planning instrument in New South Wales. As a condition of the biocertification of this policy a conservation fund was established to purchase land primarily for biodiversity conservation purposes (\$530 million in 2005/2006). This is funded by a State infrastructure contribution based on a

⁴¹ Fallding M, "Planning for Biodiversity – Can We Do It better" (2004) 41(4) *Australian Planner* 45.

⁴² Charnock N, *Mt Owen Mine – Biodiversity Offset Strategy* (Hunter Valley Coal Corporation, 2005).

⁴³ New South Wales Transport Infrastructure Development Corporation, *Sydney Turpentine Ironbark Forest Offset Strategy – Sutherland Shire, Information for Residents and Businesses* (2008).

⁴⁴ BHP Billiton Mitsubishi Alliance, *Appendix A2: Biodiversity Offset Strategy, Caval Ridge Project – Environmental Impact Statement – Supplement* (2009).



per lot levy on development. The conservation fund is administered by the New South Wales Treasury with funds allocated by the New South Wales Environmental Trust. Using funds from the fund, land is being purchased on the open market for conservation purposes.

The Melbourne Growth Areas strategic assessment reviewed unavoidable clearing of endangered native grassland outside the urban growth boundary, which is to be offset by two new reserves with an area of 15,000 ha to retain 20% of listed endangered ecological community (EEC). A public acquisition overlay will be gazetted to trigger State government acquisition processes. There is also an environmental significance overlay on plans for each key vegetation community, thresholds for practical minimum areas (eg 150 ha for natural grasslands) and offsets for each listed EEC. Long-term protection targets are established for key species to guide precinct structure planning. Offsets are based on the habitat hectares method.⁴⁵ Offset ratios used are both 1.5:1 and 2:1 for individual trees with the numerical value of the offsets always being higher than that of what is being replaced by the offset. Offsets are to be approved and secured prior to the commencement of the associated clearing and are calculated at a base date. Extra threatened species offsets are in addition to habitat hectares offsets, but only for one species, not multiple species.

In practice, offset arrangements are specific to a development project and their ecological context, with each being unique. Often offset arrangements are complicated because of fragmented land ownership patterns and an inability to find suitable offset land. This makes applying generic offset policies difficult in the absence of a long-term strategic planning framework that includes offsets.

Offsets are often expressed as a ratio of the area gained to the area lost and range from a 1:1 ratio ("no net loss") up to 10:1 or more (replacement ratio). Examples of benchmark replacement ratios currently applied in practice are a minimum 2:1 for key fish habitat and 10:1 for wetland offsets in New South Wales,⁴⁶ between 2:1 and 5:1 for vegetation management offsets in Queensland,⁴⁷ between 5:1 and 7:1 for typical Hunter Valley coal mining operations,⁴⁸ between 3:1 and 8:1 using the New South Wales Biobanking Assessment Methodology, and typically between 6:1 and 10:1 for offsets required by the Commonwealth government under the EPBC Act.

Issues that have arisen with the governance and implementation of offset arrangements for specific programs or projects include:

- Inconsistent and changing legislative frameworks do not provide guidance for either offset principles or calculations and are often contradictory.
- Different levels of government have varying offset requirements. The responsibility for determining these requirements is often not clear, especially the offset quantum (most commonly a replacement ratio).
- Approval processes often fail to apply the "avoid, minimise or mitigate" principle, which requires offsets to be a last resort option when there are no other alternatives.
- Offset standards applied in different jurisdictions vary and are often not clearly expressed or recognised in land-use plans (eg no net loss, like-for-like, net gain, and maintain or improve).
- Offset requirements are highly variable and often inconsistent because most are negotiated.
- Experience indicates that offset mechanisms work on large sites or for large development proposals, but are difficult to implement for small proposals and land in multiple ownerships.
- In some cases, land subject to an offset agreement has been used for more than offset over time or has been subject to a subsequent development proposal. This reflects lack of registers of offset sites and approval requirements.

⁴⁵ Victorian Government, *Vegetation Quality Assessment Manual – Guidelines for Applying the Habitat Hectares Scoring Method (Version 1.3)* (Department of Sustainability and Environment, 2004).

⁴⁶ New South Wales Government, *Fisheries NSW Policy and Guidelines for Fish Habitat Conservation and Management* (Department of Primary Industries, 2013).

⁴⁷ Queensland Government, *Policy for Vegetation Management Offsets (Version 2.4)* (Department of Environment and Resource Management, 2009).

⁴⁸ Mark Nolan (Manager-Project Approvals, Rio Tinto Coal Australia), personal communication, 2012.

- There is generally no strategic planning framework for applying biodiversity offsets, because biodiversity issues are considered poorly in strategic plans. The location of site-based offsets may not be appropriate in the long term.
- Many biodiversity processes and values operate over large geographic scales, particularly in relation to migratory and nomadic species. An offsets framework needs to recognise this by providing a strategic biodiversity planning context.
- Different approaches are also required between urban release areas, and sites where infill development results in biodiversity loss.
- The wide range of potential mechanisms to implement offsets is confusing and difficult to administer in practice. Current biodiversity offsetting mechanisms are problematic to apply and not effectively used in land-use planning processes. It is also not clear whether offset considerations are an assessment requirement in planning systems or not, particularly where financial contributions represent a more practical approach than land-based offsets.
- It may be necessary to identify sites suitable for acquisition for biodiversity offsets, and also land where more secure land tenure is desirable.
- Land-use planning processes operate over long time periods. Some of the different offset approaches available may only work on different timescales.
- Monitoring compliance of offset requirements and commitments is difficult in practice.
- Offsets for linear infrastructure, such as roads or pipelines, are a problem as methods for quantifying biodiversity impacts do not work well.
- The financial implications of administering offsets, acquiring land and managing land in the future need to be fully recognised in offset decisions and mechanisms.

ARGUMENTS FOR AND AGAINST BIODIVERSITY OFFSETS

Widely different views of biodiversity offsets are held, and these opinions are often dependent on the circumstances of individual proposals. Based on a review of literature and practice, the main pros and cons of offsets are summarised below.

Arguments for:

- Offsets place a value on biodiversity, which provides an economic incentive to avoid loss.
- Offsets are better than maintaining the status quo where biodiversity loss is unquestionably accepted.
- Offsets have the potential to facilitate both conservation and development outcomes that would otherwise not happen.
- Standardised methodologies for assessing and quantifying biodiversity impacts have resulted in unacceptable projects not proceeding, thereby preventing biodiversity loss.
- Offsets are a last resort option to be considered only where measures to avoid or mitigate impacts on biodiversity are not feasible.

Arguments against:

- Accepting loss of biodiversity in exchange for uncertain gain is inappropriate.
- Many areas created as biodiversity offset sites are already protected and offsetting increases biodiversity loss.
- Offsets are unethical because they provide an inducement for development to be approved.
- Offsetting is not based on scientific evidence, especially where rehabilitation and habitat restoration is undertaken in exchange for biodiversity losses.
- Offsetting does not take account of time lags between immediate losses and long-term gains.
- Offsets assume improved management of land. This is unproven and fails to properly account for the risks and costs of long-term management.
- Offsets are geographically inequitable, with local losses offset by protection elsewhere.
- Offsets are an inequitable burden on landowners and developers.
- Offsets add unnecessarily to the cost of development and are difficult to implement.

Little evidence is available to support these arguments except for anecdotes and case studies. This is primarily because no comprehensive studies or reviews have been undertaken, offsetting practice is new and relatively few examples exist, and consequently no data is available.



REVIEW OF KEY ISSUES

An effective system of biodiversity offsets needs to satisfactorily address all the complex issues identified above. Two key matters of importance are: the application of offsets as a planning and decision-making tool; and the ongoing management arrangements for offset land. This review focuses on the former, but appropriate management is the essential test of whether offset expectations are met over time.

Biodiversity offsets require an appropriate governance framework. Broad issues for consideration in successfully applying offsets are:

1. identifying whether consideration of offsets is part of land-use planning processes or an alternative legislative framework;
2. determining when offsets will apply (ie objectives, standards thresholds) and whether they should be determined individually for each project approval or at the strategic and landscape scales;
3. calculating the quantum of offsets (an offsets calculator); and
4. establishing an appropriate method of offset transfer (including financial and administrative arrangements to secure and manage offset land).

The specific issues below have become evident in the application of offset practice in New South Wales and indicate limitations in current approaches. With the evolution of practice and the current review of the New South Wales planning system and legislation relating to biodiversity and native vegetation, it is timely to consider how, and the extent to which, offset practice should be recognised within a legislative framework and linked to land-use planning processes. Currently most offset arrangements are undertaken in isolation from a guiding strategic land-use planning framework, but this is something that may need to evolve into the future to improve practice.

Objectives for biodiversity offsets

While biodiversity offsets have become accepted practice as compensation for biodiversity impacts on development, specific objectives of implementing an offsets program are rarely articulated.

For land-use planning, it is important to consider whether applying offsets is only to compensate for unavoidable biodiversity losses, or whether it is intended to contribute to long-term protection of natural ecosystems in strategic locations, to implement a land-use or development program, or to ensure appropriate management of protected areas. Alternatively, the main objective may simply be to place a value on biodiversity, thereby influencing development expectations.

Objectives of applying an offsets policy might include:

- maintaining or improving the extent and condition of native vegetation;
- ensuring that biodiversity values are taken into account in development (including a price for biodiversity);
- protecting conservation land in appropriate locations;
- achieving strategic biodiversity planning objectives (such as habitat connectivity or reserving land);
- linking to land-use plans and development objectives;
- providing a clear process for development approval;
- balancing biodiversity against other social and economic objectives; and
- outlining offset standards to be met.

It is desirable for offset programs to set out clear objectives as this provides the overall framework for decision-making, and facilitates their concurrent integration with other objectives.

Ethical and philosophical dilemmas

It is generally accepted that offsets are a last resort measure. As discussed above, arguments have been put forward that offsets are wrong in principle and contribute to continuing biodiversity loss. They can be regarded as a convenient way to allow inappropriate development or a mechanism to allow removal of biodiversity at a local level while protecting biodiversity elsewhere, which may be unlikely to be impacted upon by development or already be afforded some protection from loss. Therefore, the

question arises as to whether biodiversity offsets are an ethical response to resolving land-use conflict, and to what extent they can improve biodiversity values.

Gibbons argues that biodiversity offsets are better than maintaining the status quo based on a review of the benefits of the approach in New South Wales for native vegetation. This has meant that much biodiversity loss has been avoided, risks of clearing and biodiversity loss are acknowledged, many proposals are rejected because they do not meet the standard set, and there are quantifiable rules.⁴⁹ In addition, biodiversity now has an economic value for developers.

In many situations it is assumed that offsets will compensate for biodiversity losses through restoration approaches or improvements to biodiversity values. A review by Maron et al. however, shows that there is little evidence that restoration and revegetation will replace lost biodiversity, and that defining and measuring biodiversity values is a significant difficulty.⁵⁰ This has the potential to undermine the credibility of offsetting.

It is also argued that biodiversity offsetting schemes represent too much risk, and that the offset should be created prior to losses being permitted.⁵¹ This approach is problematic in practice because of the time delays involved and uncertainty associated with establishing sites to offset development that may or may not occur.

The proximity of offset sites to development sites is also an important consideration. Where an offset is geographically distant from a development site, it can be argued that it not a suitable compensatory measure, especially where biodiversity may already be well conserved in the vicinity of the offset site, but is not in the vicinity of the location of the loss. This concern provides an argument for a transparent planning framework for determining suitable offset locations, a matter generally not considered when determining the quantum of offsets.

Thresholds when offsets can apply

Although generally accepted in statements of principle, no detailed framework or method exists for determining how the avoid, minimise, mitigate hierarchy should be applied to specific development proposals. Given that whether impacts can be avoided could be regarded as a key test to be applied in every offset situation, clear criteria and guidelines would be appropriate.

This question was considered in *Bulga Milbrodale Progress Assn Inc v Minister for Planning and Infrastructure and Warkworth Mining Ltd* [2013] NSWLEC 48 at [162], where it was found that no measures to avoid impact had been taken. The judge also found that a package of proposed biodiversity offset measures would not provide sufficient, measurable conservation gain to compensate for removal of endangered ecological communities, and that other compensation measures would not add sufficient benefits to achieve the outcome of improving or maintaining the viability of the affected ecological communities.⁵²

Other LEC cases have also determined that a biodiversity offset is an appropriate mitigating measure,⁵³ although an offset distant from the development site with a different ecological community was refused.⁵⁴ While each case is different, the review shows that biodiversity offsets are regarded as a legitimate consideration in the determination of development applications and an acceptable approach to mitigating adverse biodiversity impacts. Conditions of consent relating to offsets have been considered appropriate and in a number of cases revised conditions have been applied to improve the certainty of offset outcomes.

⁴⁹ Gibbons, n 23.

⁵⁰ Maron et al, n 24.

⁵¹ Bekessy et al, n 25

⁵² *Bulga Milbrodale Progress Assn Inc v Minister for Planning and Infrastructure and Warkworth Mining Ltd* [2013] NSWLEC 48 at [202].

⁵³ *Hunter Environment Lobby v Minister for Planning & Ulan Coal Mines Ltd* [2011] NSWLEC 221. *Ironstone Community Action Group Inc v NSW Minister for Planning and Duralie Coal Pty Ltd* [2011] NSWLEC 195.

⁵⁴ *Sanctuary Investments Pty Ltd v Baulkham Hills Shire Council* (2006) 153 LGERA 355.



Biodiversity offset principles, terminology and concepts

Definitions used in applying offsets are not clearly expressed. In particular, different jurisdictions use different terminology and concepts – this is partly a result of the legislative requirements and past practice. In New South Wales offset principles differ between State significant development and other developments. This is unhelpful, particularly where the same development may need to meet differing local government, New South Wales government and Commonwealth government requirements – common terminology and concepts would be beneficial.

Given the similarities with the application of ESD principles, and that it could be argued that offsets represent a subset of ESD principles, it may be useful for offset principles to be similarly defined in relevant legislation. As outlined above, five essential offset principles are generally agreed as follows and include key terms for which standards and guidelines for acceptable biodiversity offset practice are required:

1. Biodiversity offsets will be used as a last resort, after consideration of alternatives to avoid, minimise or mitigate impacts.
2. Offsets must be based on sound ecological studies and principles.
3. Offsetting must achieve benefits in perpetuity.
4. Offsets must be based on the principle of “net gain”.
5. Offset arrangements must be enforceable.

Court reviews of biodiversity offsets suggests little disagreement with general offset principles, although there does appear to be little certainty about the meaning of some of the terms and how principles should be applied in practice. Inconsistent use of offset terminology between and within jurisdictions in Australia also suggests that it would be helpful to establish a legislative framework or guidelines to support the increasing application of offsets in decision-making processes.

Offset standards

Different offset standards are used in different jurisdictions, and have the potential to substantially affect detailed offset requirements. In particular, these affect the key issue of determining how ecological equivalency of offsets will be determined, and consequently the adequacy of compensatory measures. Commonly applied standards relating to biodiversity values are:

- *Net gain* – this approach underpins most offsetting practice, including in Australia. The use of this standard raises the question of how much gain is adequate, and what sort of gain is appropriate.
- *No net loss* – another commonly used standard is one that seeks to maintain the status quo. While gains and losses are difficult to quantify, it represents a lower standard than a net gain or benefit requirement.
- *Improve or maintain* – this is used in the *Native Vegetation Act* and methodology used in implementing this Act. It also applies to the BioBanking Assessment and Biocertification Methodologies, which have subsequently evolved in the TSC Act. The standard is, however, applied differently, with the former seeking to improve or maintain “environmental outcomes” while the latter seeks to improve or maintain “biodiversity values”. Tools to quantify acceptable losses and gains have been developed for these different approaches.
- *Like-for-like* – this concept is applied to losses and gains relating to specific biodiversity values (eg vegetation communities or species habitat) and seeks to establish ecological equivalence between losses and gains. It may represent a standard in its own right, or be used as a way to assess the extent to which other standards can be met.
- *Beneficial impact* – this concept is used in the administration of the EPBC Act. It is similar to net gain.

Offset standards are important to the quantification of losses and gains, and the consequential impact on development proposals and approval processes. Despite the adoption of various standards in legislation, it appears that little consideration has been given to the consequences of using alternative approaches, and the need to clearly define the criteria underpinning each standard. Given the complexity of biodiversity and the fact that it changes over time, it is difficult to quantify what these concepts mean in practice, and how they may be applied in land-use planning objectives and in the assessment of individual development projects.

Although not specifically addressing biodiversity offset standards, the review of the EPBC Act considered impact assessment standards and recommended that the Australian government apply an "improve or maintain" test in the Act, and that a national biodiversity banking system and standards be developed.⁵⁵

Calculating the quantum of offsets (calculators and scientific methods)

Biodiversity offset principles generally accept that ecologically sound methods are required to determine biodiversity losses and anticipated gains, and should underpin calculations.

A range of approaches have been used to determine the size of offsets, and suitable methods for applying agreed standards. In practice, the quantum of offset has been determined as part of project approval processes, either by negotiated ad hoc arrangements, or as set out in policy documents. In practice, the determination of the offset quantum is often controversial and inconsistent.

A number of LEC cases have reviewed the adequacy of the size and nature of a biodiversity offset, demonstrating considerable variation in approach, some of which have refused to accept offsets as adequate or increased the offset requirement.⁵⁶ *BTG Planning v Blacktown City Council* [2008] NSWLEC 1500 determined that a revegetation offset and translocation of the Cumberland Plain Land Snail was inadequate. *Bulga Milbrodale Progress Assn Inc* concluded that direct offsets and other compensatory measures were not adequate to compensate for the impacts, and significant weight should be given to this matter in determining whether the proposal should proceed.

Methods currently used in Australia to quantify offsets are:

1. *Replacement (or offset) ratios* – this is a relatively arbitrary quantum to express the relative extent of losses and gains, normally for vegetation types rather than for individual species, habitat or habitat characteristics. It is commonly used primarily because it is simple to apply, and many offset policies and strategies (eg Queensland and Kingborough Council) have taken this approach.
2. *Scientific methodologies* – these have been applied in New South Wales through regulatory instruments under the *Native Vegetation Act* (Environmental Outcomes and Assessment Methodology) and the TSC Act (Biobanking Assessment Methodology and Biocertification Methodology). They represent standardised repeatable computer-based approaches specifically designed to include scientific survey and assessment methodology and support administrative processes supporting legislative requirements. These are generally highly complex.
3. *Calculators* – these outline a process for assessing offset proposals, and also matters that need to be considered. Examples are the Commonwealth calculator, recent Victorian practice, and the draft calculator proposed by Lake Macquarie City Council. They represent a tool for assessors to consistently review offsets and provide guidelines rather than specific numerical criteria, although they apply elements of both other methods. Importantly, they allow flexibility to take into account the specific circumstances of any case, including social and economic considerations, and may integrate strategic planning considerations in addition to ecological matters.

It is commonly argued that transparent methods for calculating offsets are required. Whether or not a method is acceptable or ecologically appropriate is dependent on a range of considerations and in practice more than one method may be used as part of negotiated arrangements. For example, it is common to use the Biobanking Assessment Methodology to review a project proposal in isolation from the calculation of offsets available, and where there is no linkage to the Biobanking Scheme for the transfer of offset credits.

Offset calculations are a crucial element of offsetting practice, because they have a direct effect upon the final development and offset outcome, and provide the basis for whether offsetting will

⁵⁵ Hawke A, *The Australian Environment Act – Report of the Independent Review of the Environment Protection and Biodiversity Conservation Act 1999* (Department of the Environment, 2009) p 95.

⁵⁶ *Gales Holdings Pty Ltd v Tweed Shire Council* [2008] NSWLEC 209; *Newcastle & Hunter Valley Speleological Society Inc v Upper Hunter Shire Council and Stoneco Pty Ltd* [2010] NSWLEC 48; *Newcastle & Hunter Valley Speleological Society Inc v Upper Hunter Shire Council and Stoneco Pty Ltd (No 2)* [2010] NSWLEC 104; *Glendinning Minto Pty Ltd v Gosford City Council* [2010] NSWLEC 1151; *Hunter Environment Lobby v Minister for Planning & Urban Coal Mines Ltd* [2011] NSWLEC 221.



achieve its objectives. The quantum of offset and required method is often controversial because it directly affects the economic viability of many development projects.

Strategic planning and governance arrangements for offsets

In practice, biodiversity offsets are primarily used as a land-use planning tool for facilitating development outcomes. It therefore follows that consideration should be given to providing a strategic planning framework for applying offsets. This is particularly the case if arguments that current practice is inconsistent and ad hoc are accepted.

Offsets without a strategic land-use planning framework to accompany them are unlikely to be successful in the long timeframes that are necessary for them to work. This has been recognised in the increased attention given to strategic assessments under the EPBC Act by the Commonwealth over recent years.

Administrative mechanisms are required for offsets to work, including registers of offsets, legal agreements and covenants. While planning and land title legislation enables the use of these mechanisms, they tend to be complex and difficult to use, and not integrated with land-use plans. At the local government level, it has often been the case that offset arrangements have not been successful as a result of the complexity and time required to implement necessary administrative procedures.

There currently is little or no formal link between offset arrangements and strategic plans, although both the Melbourne Western Corridor and Sydney Growth Centres programs are examples of a strategic approach to biodiversity offsets, linked to a strategic assessment process under the EPBC Act. This Act provides a legislative framework for offsetting to happen, but only through complementary State or Territory government measures, sometimes also involving local government as land managers.

At the State level, biodiversity offsets practice has primarily been initiated through relevant environmental agencies and policies applying to major development proposals or that require approvals by that agency or under legislation for which it is responsible. Offsets have not been linked to land-use planning with the exception of New South Wales and the biocertification of planning instruments. In practice, this approach has been little used, primarily because there is little incentive for local government to biocertify plans as this makes planning processes more complex, is not compulsory, potentially costly, and brings relatively no direct benefit to approval authorities. Being implemented under the TSC Act, it focuses primarily on threatened species and not all biodiversity values that may exist, and is applied separately from Commonwealth legislation.

Strategic planning arrangements can potentially resolve conflicts between offsets required at different decision-making levels and different geographic scales, which is a significant criticism of current offsetting practice. However, the question of which level of government is best suited to working out biodiversity offsetting arrangements will continue as long as inconsistent or contradictory legislative and policy arrangements apply at different levels of government, and until offset objectives are clearly expressed in planning documents.

Offset implementation and governance arrangements

Although the offset principles discussed above outline generally when offsets may be considered, in practice this needs to be clearly expressed, and a framework for governance must be established. Requirements for governance are new and have been poorly developed or implemented to date. Establishment of an appropriate method of offset transfer including financial and administrative arrangements is necessary, as is a framework for managing offset land.

A range of different approaches are available for transferring biodiversity offsets, which can link with land-use planning processes in different ways. Different types of approach that may be available include the following:

- *Planned approach* – with a defined planning area, clear objectives, implementation standards, an administrative framework and identified offset sites. Offsets can be considered in a similar way to built infrastructure, where financial contributions are already recognised in planning legislation.

- *Negotiated approach* – with agreements between developers, landowners and approval authorities on an ad hoc case-by-case situation.
- *Market approach* – using market mechanisms such as biobanking in New South Wales.
- *Broker approach* – with a third party intermediary (eg a trust or catchment management authority) organising offsets for a commission or other benefit.
- *Levy approach* – to raise money using a fixed financial contribution based on criteria such as land area, value or lot yield. In New South Wales, the State infrastructure contribution provides an example of such an approach. Special council rates are another example of this type of approach using local government legislation.

Financial payments to a fund are increasingly favoured for biodiversity offsets, such as the Balance the Earth Trust in Queensland, and a proposed fund is currently under consideration in New South Wales. While financial payments have the advantage of facilitating development approvals, they may be controversial because there is unlikely to be a direct link between a development impact and a specific offset, and there is likely to be a significant delay between the loss of biodiversity and any future gains. An important issue is who administers a fund, and how payments from the fund are allocated.

Court reviews in New South Wales have considered governance arrangements with the LEC accepting planning agreements under the EPA Act as an appropriate mechanism for applying offsets in perpetuity.⁵⁷ Another case of interest in the context of offsets and strategic planning decisions is *Gwandalan Summerland Point Action Group Inc v Minister for Planning* (2009) 75 NSWLR 269, where a review of actions of the Minister and pre-existing agreements with developers regarding environmental land offsets was held to give rise to a reasonable apprehension of bias in decision-making.

Management and monitoring

Offsets are expected to improve, protect and manage land to at least retain its biodiversity values and depend on land management. The success of management can only be judged in the medium to long term, and is largely dependent on good planning and an appropriate level of funding.

To date, there is little evidence of review and monitoring of offset practice to determine effectiveness and whether offsets achieve their objective. Given that offsetting principles are not requirements, may not be applied in decision-making practice, and often offset objectives are either not stated or not clear, effective monitoring may be difficult.

Offset land may be managed by a range of private and public organisations, and their responsibilities and legal obligations vary considerably. To date, the effectiveness of administrative practice and consequent adequacy of management of offset sites is not known. Land management practice will be strongly influenced by the adequacy of funding. While some mechanisms provide for in perpetuity management funding such as biobanking in New South Wales, this is not generally the case. As a result, the adequacy of offset land management is uncertain over the long term.

Practical problems with offsets

Notwithstanding legislative and administrative processes enabling offsetting to be implemented, a range of practical problems mean that offsetting is not as widely used in practice as could be the case.

For example, key complaints expressed by the development industry are that replacement ratios are too high, there is a lack of supply of suitable offsets, multiple offset policies apply at different levels of government, and there is an expectation that in perpetuity management costs be paid for upfront rather than paid in stages as development occurs. In recent years, the industry has generally accepted offsets as a cost of doing business, provided that offset land can be transferred to another party or agency for long-term management.

⁵⁷ *Sanctuary Investments Pty Ltd v Baulkham Hills Shire Council* (2006) 153 LGERA 355; *Stanton Dahl Architects v Penrith City Council* [2009] NSWLEC 1204.



However, security of offsets is a significant issue, particularly when it is a widely accepted principle that offset arrangements should be in perpetuity and enforceable. A review by Solomon found that New South Wales offset mechanisms favoured planning approval processes rather than long-term biodiversity protection.⁵⁸

Some of the key practical problems with implementing sustainable, efficient and equitable biodiversity offsetting practice include the following:

- Nowhere in Australia is biodiversity offsetting compulsory, and negotiated outcomes are generally regarded as preferable because of their flexibility.
- It is unlikely that there will be sufficient land available for suitable offsets in appropriate locations in the future due to development patterns. This is a strong argument for a strategic planning approach rather than a market-based approach.
- Offsetting on small sites is a problem where the quantum of offset required is likely to be small, and cost of finding and establishing an offset site is economically not feasible.
- Often the urgent timing associated with approval of development projects means it is difficult to make necessary offset arrangements within the required timeframes.
- The security and long-term management of offset land may be doubtful, because of the timeframes involved and changes in circumstances, and as a consequence offset commitments may never be realised in practice.
- Minimum size thresholds may be required for offset land, as below these acquiring offset land is unlikely to be cost effective and small sites are unlikely to be ecologically beneficial due to impacts from surrounding land-uses, including edge effects.
- Vegetation mapping is often used to calculate the standard and quantum of offset required. There has been considerable scientific debate about the accuracy, scale and quality of available vegetation mapping to enable mapping to be used adequately for this purpose.

It is clear that offsetting is a complex area of public policy and administration and faces many challenges. A suitable framework is required that effectively integrates offsetting within planning and decision-making processes.

MAKING OFFSETS WORK EFFECTIVELY – FUTURE DIRECTIONS AND REFORM PROPOSALS

It is proposed that biodiversity offsetting needs to be incorporated into a comprehensive framework to guide administrative practice within the Australian context. Reviews of both the EPBC Act⁵⁹ and EPA Act have been undertaken, which have considered biodiversity offsetting and provide an opportunity for improvement to current practice.⁶⁰ In particular, clarity between the assessment and approval responsibilities of the three different levels of government is essential.

Legislation relating to land-use planning and to processes for assessing and determining development or actions affecting the environment could benefit by incorporating provisions to provide a framework for biodiversity offsets. Offset practice is site and case specific and any decision-making framework must support improvements to practice over time. An offset may be applied at any stage of the development process and at any level of decision-making, which may be appropriate in the circumstances of the case.

A range of offsetting measures is used in practice, and usually these measures are used in combination. These measures include: dedication of land to an appropriate public conservation land management agency; improving the conservation security of land with biodiversity values through

⁵⁸ Solomon E, "Security for Biodiversity Offsets in New South Wales" (2011) 28 EPLJ 92.

⁵⁹ Commonwealth of Australia, *Operational Review of the Threatened Species Conservation Act 1995 (NSW), the Environmental Planning and Assessment Act 1979 (NSW) and the Environment Protection and Biodiversity Conservation Act 1999 (Cth) – Final Report* (2009). Hawke A, *The Australian Environment Act – Report of the Independent Review of the Environment Protection and Biodiversity Conservation Act 1999* (2009).

⁶⁰ New South Wales Government, *A New Planning System for NSW – White Paper* (2013).

legal agreements or other means; implementing management actions on land with conservation values; and other measures, including financial contributions or scientific research.

It is suggested that:

1. Principles for biodiversity offsets should be included in legislation, consistent with Australian and international practice and the application of ESD. At a minimum, these principles will provide for offsets to:
 - (a) be used only where options to avoid, minimise or mitigate impacts are not feasible;
 - (b) apply sound ecological studies and principles;
 - (c) provide benefits in perpetuity;
 - (d) be based on a principle of net gain in area of native vegetation and biodiversity values; and
 - (e) ensure offset arrangements are enforceable.
2. Biodiversity offsets should be able to be applied at both the strategic planning and project development approval stages, and linked to the strategic land-use planning framework, with local offset policy to be able to be incorporated in local plans, and enabling offset objectives to be included in these plans.
3. A range of types of offsets should be provided for, not only financial contributions. Therefore, contributions of land, management actions, and improving the conservation status of land should be recognised as legitimate measures to be applied.
4. The quantum of biodiversity offset should be based on the impact of the development, and be proportional to the extent of the impact and the risks involved. Policies for determining the requirements for offsets apply in a number of jurisdictions, such as New South Wales where methodologies have been developed for offset arrangements under the *Native Vegetation Act* and *TSC Act*, with the latter linked to land-use planning arrangements under the *EPA Act*.
5. The methodology for defining the type and quantum of offsets should not be mandatory at this time until an appropriate approach can be agreed that is compatible between Commonwealth, New South Wales and local governments, and workable at the local level.
6. A comprehensive register of offset commitments and agreements and associated administrative practice requirements should be maintained and provided for in legislation to ensure biodiversity offsets are properly managed over time.
7. Where financial biodiversity offset contributions are made or levies apply, the establishment of an independently managed fund is required, together with a linked statutory strategic land-use planning process to identify biodiversity conservation, land acquisition and management priorities.
8. Arrangements should provide for in perpetuity funding for management of offset land such as provided for under the New South Wales Biobanking Scheme. Local government agencies may be well placed in future to manage many offset sites.

The priorities outlined above would provide the basis for the establishment of an effective approach to biodiversity offsets in Australia, addressing both the need to assess, protect and manage biodiversity values, while at the same time facilitating project development approvals.

CONCLUSIONS

Biodiversity offsets are a decision-making tool used to balance development and conservation, and are mainly used in land-use planning processes. They are globally recognised as an important policy response to an ecological crisis, and an economic tool that ensures biodiversity is valued. In practice, they are used as a way of facilitating development and economic outcomes.

Biodiversity offsets are a reality now, and are generally accepted even though details can be controversial and contested. The trend for increased offsetting can be seen as part of a transition to a more ecologically sustainable future. Measures to compensate for biodiversity loss may take a range of forms, and a number of different standards exist. However, there is no certainty, practice is changing quickly, and there is currently no legislative framework setting out principles and implementation requirements.



Unless an agreed and workable framework of principles and administrative arrangements can be sorted out, then it is likely that offsets will fail to deliver, and will be seen as inequitable, unreasonable and a method to facilitate development that has unacceptable impacts. Given the long timeframes involved, to be effective offsets must be linked to a strategic land-use planning framework and to ongoing active land management.



