BioBanking

An investigation of market-based instruments to secure long-term biodiversity objectives

Background paper

Department of **Environment and Conservation** NSW

This paper presents background information on biodiversity offsets and BioBanking to support the working paper, *BioBanking – a biodiversity offsets and banking scheme.* For further information on DEC's proposed Biobanking scheme, go to www.environment.nsw.gov.au/threatspec/biobankscheme.htm or email biobanking@environment.nsw.gov.au

Published by:
Department of Environment and Conservation NSW
59–61 Goulburn Street, Sydney
PO Box A290
Sydney South, NSW 1232
Phone: (02) 9995 5000 (switchboard)
Phone: 131 555 (environment information and publications requests)
Phone: 1300 361 967 (national parks information and publications requests)
Fax: (02) 9995 5999
TTY: (02) 9211 4723
Email: info@environment.nsw.gov.au
Website address: www.environment.nsw.gov.au

ISBN 1 74137 779 X
DEC 2006/9
January 2006

Printed on recycled paper

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Executive summary

Australia is facing unprecedented challenges in conserving its biological wealth while encouraging sustainable social and economic development. Current initiatives to conserve biodiversity in NSW use regulation and voluntary incentives outside formally reserved areas. While there have been significant advances in knowledge about biodiversity and many important conservation gains, biodiversity has continued to decline.

Managing development while maintaining and restoring biodiversity is a key challenge for the NSW Government. Development assessment currently involves negotiating and using offsets to minimise impacts on biodiversity, although offsets are usually negotiated on a case-by-case basis leading to uncertainty and delay. The Department of Environment and Conservation NSW (DEC) is proposing to establish a biodiversity offsets and banking scheme to provide a systematic and consistent method for offsets, address the cumulative loss of habitat associated with new development and complement existing initiatives for biodiversity conservation.

This paper presents background information on biodiversity offsets and biodiversity banking to support the working paper, *BioBanking – a biodiversity offsets and banking scheme.* In particular, this background paper:

- describes the tools already used in NSW
- describes other approaches used in Australia and the rest of the world, including background information on biodiversity offsets and banking schemes and ways in which these schemes have developed
- considers options, and recommends the development of a biodiversity offset and banking scheme for NSW
- describes ways in which such a scheme would operate effectively in NSW.

More information about the proposed scheme is available on DEC's website at www.environment.nsw.gov.au/threatspec/biobankscheme.htm.

1 Introduction

1.1 Background

In New South Wales (NSW), managing development while maintaining and restoring biodiversity is a major challenge. Population growth, settlement patterns and the consumption of resources are exerting major stresses on the natural environment. The scale of biodiversity loss has already been substantial—over 80 species of plants and animals are extinct and nearly 1000 species, populations and communities are considered either endangered or vulnerable.

The Department of Environment and Conservation NSW (DEC) recognises the links between development and biodiversity loss through the removal of habitat. In response, DEC proposes to develop a biodiversity offsets and banking scheme to ensure that when development is essential, the effects on biodiversity are minimised by securing and improving biodiversity elsewhere. Biodiversity offsets are positive actions that conserve biodiversity and compensate for biodiversity loss arising from development. The banking of offsets will ensure that they are implemented in the most strategic and effective way.

Currently in NSW, biodiversity offsets are negotiated on a case-by-case basis. There is no consistent framework for these negotiations, resulting in uncertainty for all parties involved and insecurity about the ongoing maintenance of implemented offsets.

The biodiversity offsets and banking scheme will:

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

DEC has developed the concept of the scheme based on studies of:

- approaches used to tackle biodiversity loss in Australia and overseas
- offset programs that address the biodiversity impacts of development in NSW
- biodiversity offset/banking schemes used elsewhere in Australia and internationally
- the system used for Property Vegetation Plans under the NSW *Native Vegetation Act 2003* (see example 3 and Appendix II).

1.2 Purpose of this paper

The purpose of this background paper is to provide the context for developing a biodiversity offsets and banking scheme in NSW.

This paper:

- describes the tools already used in NSW
- describes other approaches used in Australia and the rest of the world, including background information on biodiversity offsets and banking schemes and ways in which these schemes have developed
- considers options, and recommends the development of a biodiversity offset and banking scheme for NSW
- describes ways in which such a scheme would operate effectively in NSW.

This paper presents background information on biodiversity offsets and BioBanking to support the working paper, *BioBanking – a biodiversity offsets and banking scheme.*

1.3 Ways of conserving biodiversity

Stoneham et al (2003) identify three types of policy instrument to protect biodiversity. These are:

- legislative instruments: 'It is against the law to destroy the habitat'
- voluntary agreements: 'Please don't destroy the habitat'
- market-based instruments: 'How much would need to be paid to conserve the habitat?'

A successful strategy will use a combination of tools to deliver its objectives[1]. These may include:

- **regulation** to protect threatened species and habitats from harm
- **purchase of land** to add to the public reserve of national parks and refuges
- **conservation initiatives on private land**—legally binding instruments entered into voluntarily by private landholders and the government to protect biodiversity values through a management plan (see Appendices II and III)
- **biodiversity offsets** (see Appendix IV)
- **market-based instruments** to secure biodiversity actions at least cost—market-based instruments such as taxes and fees, trading schemes, auctions and offset banking schemes, are being increasingly used by policy makers to protect biodiversity (see Appendices V, VI and VII)
- **government-assisted community programs** providing investment in restoration projects
- **education** to encourage greater protection and enhancement of biodiversity.

1.4 Approaches used in NSW

There are a number of approaches used in NSW to protect and enhance biodiversity and land of high conservation value:

- protecting biodiversity through regulation—key NSW legislation includes the *Threatened Species Conservation Act 1995, National Parks and Wildlife Act 1974, Wilderness Act 1987,* and the *Fisheries Management Act 1994* (see 2.1)
- purchasing and nominating additional areas of land with high conservation value for the public reserve—NSW cannot meet its conservation objectives using this approach alone; the acquisition of land for this purpose is expensive and dependent on availability

[1] See Appendix VII for examples of various tools and their advantages and restrictions.

- encouraging conservation initiatives on private land—DEC works with private landholders to secure high conservation values on private land[2]. Programs range from non-binding, temporary agreements, to binding agreements that are attached in perpetuity to the title of the land. Agreements rely on landholder goodwill and government subsidies (see 2.2, and Appendices II and III).
- negotiating biodiversity offsets to address development—DEC may negotiate the use of offsets where a development has a significant effect on biodiversity and the development and its impacts cannot be avoided. Offsets involve securing and managing land of high conservation value. The negotiations take place and are implemented on a case-by-case basis within the framework of the *Environmental Planning and Assessment Act 1997* (see 2.4).
- negotiating offsets to address land-clearing—the NSW government may also negotiate offsets through assessment procedures under the Native Vegetation Regulations 2005 made under the *Native Vegetation Act 2003*[3]. The application of the Act and Regulations is limited to offsetting the clearing of native vegetation in rural and rural residential areas (see example 3).

Market-based instruments (eg, taxes and fees, cap & trade, offsets and banking, auctions) are increasingly recognised as being more efficient ways of meeting the same goals (see 2.3). Market-based instruments provide a flexible way of achieving regulatory outcomes without the need for ongoing government subsidies and are consistent with the principles of ecologically sustainable development

1.5 Biodiversity offsets and banking

Biodiversity offsets originated in the 1960s (see Appendix I). Early schemes required companies to cause no further deterioration in biodiversity and required compensation if this could not be achieved. The offset, often very close to the development, may have involved a financially large investment to protect a small population or habitat. Despite these efforts, the habitat may have remained under threat from the proposed development or other activities.

After gaining more experience in dealing with offsets, policy makers realised that it would be better for the environment if offsets could be pooled to protect other, more important sites. In this way, offsets could be more cost-effective, successful and secure, leading to better conservation outcomes.

The pooling of resources has in some countries been formalised under the framework of biodiversity banking (or conservation banking). The banking of biodiversity offsets allows the most resource effective approach to compensate for unavoidable biodiversity loss while creating larger, consolidated conservation areas.

The development and implementation of offset programs in the USA and elsewhere has demonstrated that this approach can be very effective in securing land of high conservation value, particularly where it is in private ownership, whilst compensating for losses occurring elsewhere (see 3.4).

[2] Freehold land comprises around 40% of the State, Auditor Generals Office NSW 2002
[3] See www.nativevegetation.nsw.gov.au/index.html

In the last two years, DEC has implemented offsets as part of assessment procedures to determine whether substituting offsets for clearing native vegetation maintains or improves environmental outcomes under the *Native Vegetation Act 2003* (see www.nativevegetation.nsw.gov.au/index.html).

The DEC is seeking to expand on existing practices and, based on experiences in NSW and around the world, develop a NSW biodiversity offsets and banking scheme.

2 Biodiversity initiatives, NSW

2.1 Protection of biodiversity (mandatory)

The protection of biodiversity in NSW is regulated by the State and Commonwealth governments. Key legislation includes the *Threatened Species Conservation Act 1995, National Parks and Wildlife Act 1974, Wilderness Act 1987,* and the *Fisheries Management Act 1994*. Biodiversity protection includes applying regulation and policy to:

- recognise species, populations and communities as vulnerable, endangered or critically endangered
- identify processes that threaten protected species and their habitats, and identify actions and plan for their recovery
- allow for the protection of areas of conservation value
- create obligations for developers and authorities to consider threatened species and their habitats during the development assessment process
- establish offences and penalties for harming protected species and their habitats
- confer powers and obligations on DEC.

While there have been significant increases in knowledge of biodiversity and important conservation gains have been made, biodiversity continues to decline.

Currently, where a development activity is proposed on land that is a critical habitat or the development is likely to significantly affect a threatened species, population or ecological community, or its habitat (the test of significance under the NSW *Environmental Planning & Assessment Act 1997*), the developer must prepare a species impact statement (SIS) in accordance with the *Threatened Species Conservation Act 1995* and determine:

- the direct/indirect impacts of the development on biodiversity
- known or potential species that may be affected
- the significance of local populations
- threats
- methods to avoid or minimise, or ameliorate or offset, the impacts of development on habitats or species.

Before granting the approval for the development, the consent authority (usually the local council) must obtain DEC's concurrence. DEC currently receives 10–15 SISs per annum[4] as part of the concurrence process. The conditions of approval often require the developer to provide a biodiversity offset to compensate for loss, sometimes on DEC's recommendation. Offsets may also be required for licensed premises, such as a mine when the activity is modified or under the *Native Vegetation Act 2003* to offset the clearing of native vegetation. Offsets are also identified in the assessment of the development or the environmental assessment of an activity.

[4] Approximately 120,000 development applications are made each year.

2.2 Biodiversity initiatives (voluntary)

Much land with high biodiversity value is privately owned. To date, private landholders have been encouraged to implement voluntary conservation initiatives on their land and wherever possible, establish conservation agreements.

Key private landholder conservation initiatives include establishing Voluntary Conservation Agreements and Wildlife Refuges under the *National Parks and Wildlife Act 1974,* Property Vegetation Plans under the *Native Vegetation Act 2003,* Conservation Trust agreements, and Australian Bush Heritage Fund and Natural Heritage Trust initiatives. These are described further in Appendix II.

Table 1: Number of Voluntary Conservation Agreements and Wildlife Refuges in NSW, 2003–2005

	2003–2004		2004–2005		Total[5]	
Voluntary Conservation Agreements	23 sites	2,452.31 ha	23 sites	1,657.25 ha	182 sites	13,603 ha
Wildlife Refuges	11 sites	14,424.34 ha	21 sites	1,083.71 ha	620 sites	1,715,135 ha

Financial incentives for voluntary conservation action vary according to the scheme. Supplementary financial incentives include tax relief and rate exemptions, determined by the type of activity engaged in (see Appendix III).

2.3 Payments for environmental services

Tender and auction processes have been used to achieve the best outcomes and value for money from public funds. Participants are invited to submit a bid, identifying actions they are willing to carry out and the payment that they require to implement those actions. All the bids are assessed on the basis of cost and outcome, and the most cost-effective proposals are then implemented. This approach has been shown to deliver better biodiversity/environmental outcomes per dollar from public funds than conventional grant schemes.

Example 1: Conservation auctions and land management tenders, Liverpool Plains, NSW

The Liverpool Plains Land Management Committee, in partnership with the World Wildlife Fund, introduced natural resource auctions (land management tenders). Funded, binding contracts were offered for proposals that addressed the impacts of clearing native vegetation and changes in land management. Proposals included soil conservation, dealing with dry land salinity, improving water quality and quantity, riparian zone management, floodplain management and protecting biodiversity. The bids were assessed in terms of their achievement of predetermined objectives. Rankings allowed for both a transparent process and equity amongst participants.

As of September 2003, there had been two auctions, 35 projects winning a total of $800,000. For each successful tender, a management program specified how and

[5] DEC 2004b

when the project works were undertaken, generally over a three-year period. Participants received 30% of the total payment on signing the contract and the rest on achieving milestones.

Example 2: Southern Rivers Bush Incentives Scheme, NSW[6]
The Southern Rivers Catchment Management Authority (CMA) recognises the important role landholders play in protecting and maintaining native vegetation across the region. The scheme funds the management of selected sites that support native vegetation communities, particularly those that are officially listed as threatened, have been largely cleared or exist only as small remnant patches in the landscape.

The scheme uses a tender process to identify bids that offer the best value for money in protecting vegetation. Following a site visit, the landholder identifies the services they can provide in a management plan prepared with CMA staff. The landholder then submits a bid, indicating the amount of money required to provide the services outlined in the plan. The bids are assessed by the CMA in terms of dollar value.

2.4 Biodiversity offsets[7]

A biodiversity offset is one or more appropriate actions that are put in place to counterbalance (offset) the impacts of development on biodiversity.

There are different types of offsets, including:

- an **on-site offset**, for example where a mining company secures and improves biodiversity values on another part of the site by providing a buffer zone.
- an **off-site offset**, where the developer secures and improves biodiversity values on another piece of land.
- an **off-site offset through a third party**, for example, a developer purchases credits from or pays a third party to provide an offset either in advance or at the time of the development. The third party then must secure and maintain offsets on their behalf.
- **voluntary action**, where the developer provides an offset although there is no formal requirement for them to do so (see Appendix IV for further information).

Where a range of options exist, the developer may consider which type of offset is most appropriate (this often depends on availability). Offsets ideally should be undertaken before development to provide certainty that they will be effective while ensuring that there is no net loss of biodiversity. The offset should also be located according to biodiversity priorities in the area.

There are three approaches to determining and calculating biodiversity offsets:

- **nominal ratios**, for instance, replace 1 hectare of one ecological community with 4 hectares of another. This approach is undesirable, except where there is no alternative, as it lacks consistency and transparency.

[6] See www.southern.cma.nsw.gov.au/pdf/SRBI-Brochure.PDF and www.southern.cma.nsw.gov.au/pdf/SRBI-QA.PDF
[7] See Appendix VI for examples of biodiversity offsets used around the world.

- **offset ratios calculated using knowledge and understanding of a species' habitat needs but without a consistent scoring system.** This approach is better than the first but lacks credibility as the ratios are not underpinned by consistent scores.
- **offsets calculated using a consistent, scientifically-based scoring system applied equally to losses and gains.** This is the best method as it is scientifically-based, consistent and transparent.

Currently, most offsets in NSW are determined and secured on a case-by-case basis, as there is no State-wide policy for negotiating offsets (except for under the *Native Vegetation Act 2003*). This is an undesirable situation as the lack of consistency and transparency have achieved mixed results. When there has been a high level of communication between stakeholders and a commitment to conservation, biodiversity offsetting has often been successful. In cases where stakeholder expectations have differed and communication has been poor, biodiversity offsets have been less successful.

Example 3: BioMetric and the Threatened Species Assessment Tool—incentives for Property Vegetation Plans under the NSW *Native Vegetation Act 2003*

The *Native Vegetation Act 2003* (NVA) has changed the way native vegetation is managed across NSW, by enabling land under certain circumstances to be cleared of native vegetation in return for offsets. This process is managed through Property Vegetation Plans (PVPs)[8] and guided by tools such as Biometric and the Threatened Species Assessment Tool.

A PVP is a voluntary but legally binding agreement between a landholder and catchment management authority (CMA), consisting of a photomap of a property and a supporting document that details the agreed native vegetation management actions the landholder will perform, negotiated with the CMA.

BioMetric is a tool developed by DEC that, along with separate tools for assessing threatened species, soils, water quality and salinity, guides preparation of PVPs. Through BioMetric, no further clearing is permitted of vegetation types or landscapes that are already over-cleared or listed as threatened nationally or regionally, unless the vegetation is in poor condition. Other native vegetation can only be cleared if losses from proposed clearing can be offset by commensurate long-term gains. Offsets are only permitted through BioMetric if they meet the following three conditions:

- offsets are of vegetation types of equal regional value to or greater regional value than the vegetation proposed for clearing
- improvement in the configuration of vegetation is commensurate with losses from proposed clearing
- improvement in the quality and quantity of vegetation is commensurate with losses from proposed clearing.

The Threatened Species Assessment Tool, also prepared by DEC, supplements BioMetric to cater for the specific needs and sensitivities of affected threatened species. It determines whether threatened species, threatened ecological communities and endangered populations as listed under the NSW *Threatened Species Conservation Act 1995* are maintained or improved through clearing and

[8] see www.dipnr.nsw.gov.au/nativeveg

subsequent offsets. The tool also assesses the impacts of clearing on Commonwealth-listed threatened species and threatened ecological communities.

A central 'bank' of offsets has been proposed for the *Native Vegetation Act 2003*. Procedures and principles have not yet been developed (refer to the Department of Natural Resources for further information).

The following case studies demonstrate the need for a clear and transparent framework for biodiversity offsets in NSW to ensure a consistent outcome for stakeholders and biodiversity, give a market value to biodiversity, provide certainty for stakeholders, and maintain or improve biodiversity values. [9]

Biodiversity offsets case studies

Case study 1: Wallarah Peninsular
Stakeholders: Landowner/developer, local and State government

As an area of natural beauty with easy access to the beach and proximity to Newcastle and Sydney, Wallarah Peninsular is an attractive place to live. The landowner took an innovative and inclusive approach to residential development by working with stakeholders to deliver a sustainable asset to the community, and by ensuring the planning of the development was dictated by the landscape.

A memorandum of understanding was set up between the then Department of Infrastructure, Planning and Natural Resources (DIPNR), the local council and the developer to establish roles, issues and concerns, and identify common ground.

Environmental, geophysical and visual assets were given equal weight, and the site was tested against four possible forms of residential development. DEC provided on the ground expertise. Over 160 areas of ecological significance were detailed and an extra level of assessment was commissioned to map critical vegetation corridors and threatened species. After the conservation area was set aside, a local environmental plan was prepared and a Conservation Land Use Management Plan was attached.

The entire process was characterised by a high level of communication between stakeholders, and a great deal of patience. The rezoning negotiations took three years and the agreed land use outcomes in the statutory masterplan took another two years. Although this kind of land development is costly, the developer recognised the commercial value of the site's natural assets.

Case study 2:Nowra–Nerriga Main Road 92 Upgrade
Stakeholders: Local, State and Commonwealth government

The original proposal to upgrade Main Road 92 would have had a significant environmental impact. It proposed deviating from the existing road alignment by up to 500 m, with a 80 km/h speed limit, and passing through Morton National Park, an area of very high conservation value. Damage to the park would have been substantial and many native animals would have been killed by passing vehicles.

[9] s126G of the Threatened Species Conservation Act 1995

DEC negotiated with the NSW Roads and Traffic Authority (RTA), the Commonwealth Department of Transport and Regional Services and Shoalhaven City Council. It was decided to adjust the upgrade to keep the road close to its existing alignment and minimise intrusions into the park to an area totalling 23 hectares. To compensate for the loss, the RTA purchased land to transfer to the park. This land is slightly larger than the area lost, and has a vegetation type of greater value. It provides habitat for several threatened species including koala, spotted-tailed quoll, powerful owl and pink robin.

In addition, redundant areas of the existing road will be rehabilitated and added to the park.

2.4.1 Biodiversity certification of environmental planning instruments

NSW threatened species reforms are placing more emphasis on land use planning to ensure biodiversity values, including threatened species habitat, are protected and restored. As part of these reforms, the Minister for the Environment can confer biodiversity certification on local environmental planning instruments (EPIs) if satisfied overall that there will be a 'maintain or improve' outcome for biodiversity. Certification includes taking into account conservation outcomes from other initiatives such as entering into a conservation agreement or any other action to secure the land for conservation purposes. Once an EPI has been certified, developments in that area will no longer require a separate threatened species assessment under the *Environmental Planning and Assessment Act 1979*.

Biodiversity banking is being developed to support the certification of new EPIs.

2.4.2 Other offset initiatives

Some local councils are developing biodiversity strategies and have identified the need for or developed a biodiversity offset policy for their local area. This has been done within the constraints of existing legislation and in the absence of any State-wide offset policy framework. Whilst each policy is being developed along similar principles, each uses slightly different means of scoring offsets and approaches. Two examples of policies developed by local Sydney councils follow.

Example 4: Habitat Offsets Policy Framework, Liverpool City Council[10]

The policy was introduced to meet the biodiversity conservation objectives of the Liverpool Biodiversity Strategy. Any offset:

- is calculated according to the habitat multiplier table— this table is based on the conservation classification of the land being impacted on (for example, regional core habitat, local core habitat, support for core habitat) and the type of offset action to be applied to the land (protection, enhancement, creation of habitat)
- must be adjacent to a protected area if the offset is less than 5 hectares in size
- cannot be on land in public ownership or already secured for conservation
- must be located in the ecologically significant lands layer of the local environmental plan and in an area identified in the Liverpool Biodiversity Strategy

[10] Liverpool City Council 2003

- should be of the same ecological community
- is subject to the landowner's consent
- is legally binding
- is supported with resources to develop and implement a management plan.

The policy will be applied to all new developments in areas identified as having high conservation significance or containing an endangered ecological community.

Example 5: Natural Assets Policy, Camden Council [11]

This policy was introduced in May 2003 to ensure the long-term management of natural assets in the area and applies to all development proposals on a voluntary basis. The policy is based on 'no net loss' of biodiversity for ecologically significant land. Depending on the category of land, offsets may or may not be used, for example, development is not permitted on land where species are critically endangered.

The policy establishes planning requirements for developments regarding their proximity to bushland, streams, wetlands or other natural features. The offset provisions allow for the protection and enhancement of land with biodiversity values, but not the creation of new habitats, to ensure land with biodiversity values is not lost. Each offset proposal includes:

- a restoration plan
- an offset bond covering the cost of restoration, project management and trust management
- security details
- the location of the offset in the sub-catchment.

The offsets are scored based on the class of affected habitat (for example, regional core habitat, local core habitat, support for core habitat) and the class of the offset (for example, protection of regional/local core habitat, restoration of corridors and riparian buffers).

See Appendix V for examples of other instruments used in NSW.

[11] Camden Council 2002

3 Biodiversity initiatives elsewhere in Australia and worldwide

3.1 Protection of biodiversity (mandatory)

The protection of biodiversity around the world is regulated by international, national and regional policy and legislation. Key international agreements include the *Ramsar Convention 1971* (wetlands), *Bern Convention 1979* (European wildlife and natural habitats), and the *United Nations Convention on Biodiversity 1992*.

International agreements are transposed into national and State legislation, the provisions of which are similar to the legislation outlined in 2.1.

3.2 Biodiversity initiatives (voluntary)

Voluntary instruments for biodiversity conservation are used successfully around the world. Examples are included in Appendices V and VI.

3.3 Payments for environmental services

Tender and auction processes are used to achieve the best outcomes and value for money from public funds (see 2.3). They have been used successfully to secure environmental outcomes at least cost.

3.3.1 BushTender trial[12], Victoria, Australia

The BushTender trial began in 2001 and has been conducted across two regions of Victoria (in the north central/north eastern area of the State and in Gippsland). The trial uses an auction to allocate public funds to conservation and to assess the effectiveness of management agreements with private landholders. The trial focuses on actions rather than outcomes due to the complexity of survey work required to determine improvements.

Landholders prepare expressions of interest to manage areas of environmentally significant land. The Victorian government surveys the land to assess vegetation status and landscape priority, resulting in a biodiversity score that is not disclosed to the landholder. The government outlines possible management options that could be considered in formulating a bid. Landholders consider these options, and prepare bids. The bids are then ranked based on the biodiversity score of the actions divided by cost. Contracts are awarded to the highest score until the budget is exhausted. The amount of money paid out per hectare ranges from $127–$475 across the two trial areas (the average cost per hectare per year is $301). In both areas, payments are made annually on the provision of an annual report rather than as a lump sum. Sites are monitored, with non-performance resulting in the withdrawal of payments.

The value in not disclosing the biodiversity value or score to the landholder has been questioned. A better understanding of the value of the land may provide the landholder with more impetus to engage in conservation actions.

[12] DEC 2004c

The Victorian Government allocated $600,000 to BushTender, $400,000 of which was earmarked for landholder payments; the rest was used to fund project development and management, regional officer visits to properties, communication and evaluation.

The BushTender system demonstrates the cost-effectiveness of operating a tender as opposed to a fixed price system. In the case of one trial, it was estimated that if a fixed price was used as opposed to auctioning, the scheme would require almost seven times the budget to operate at the same level. Society benefits from conserving land at least cost while the landowner can capitalise on the environmental value of their land. The trials have been 90%–100% successful in achieving their goals.

To date, in perpetuity agreements are not standard in the BushTender scheme and developers do not provide funding.

3.4 Biodiversity offsets (bilateral)[13]

The International Union for Conservation of Nature and Natural Resources – The World Conservation Union (IUCN), defines biodiversity offsets as:

> 'conservation actions intended to compensate for the residual, unavoidable harm to biodiversity caused by development projects, so as to ensure no net loss of biodiversity. Before developers contemplate biodiversity offsets, they should have first sought to avoid and minimise harm to biodiversity'.

Biodiversity offsets require developers to mitigate any residual impact from their activities to maintain biodiversity values. The quantification and calculation of offsets required by the developer and provided by private landholders varies in each case. The most documented offsets in use are the USA Wetland Mitigation Banking Scheme and the USA Conservation Banking Scheme (see below). Other examples are detailed in 2.4, and in Appendices V and VI.

3.4.1 Wetland Mitigation Banking Scheme, USA

The Wetland Mitigation Banking Scheme was established under the *Clean Water Act 1972 (USA)*. In 1995, the USA Army Corps of Engineers issued *Federal guidance for the establishment, use, and operation of mitigation banks*, clarifying the way in which mitigation banks may be used.

The USA currently mitigates between 4–6 percent[14] of all wetland impacts. The scheme establishes an obligation for developers to offset any unavoidable impact on wetlands through one of a number of means:

- an offset developed bilaterally between a landholder (offset provider) and a developer
- an offset developed between a landholder and a group of developers
- an offset developed independently of developers' needs, credits then being sold to developers bilaterally.[15]

[13] See Appendices V and VI for examples of biodiversity offsets used around the world. See Appendix I for details of the evolution of biodiversity offsets.
[14] Source: USA National Mitigation Banking Association website, www.mitigationbanking.org
[15] Landholders may spend up to 6% of the project cost on marketing to sell credits, (Craig Denisoff, USA National Mitigation Banking Association)

In most States, developers negotiate the purchase of credits from individual wetland banks rather than through a central bank/scheme manager.

In-lieu Fee Mitigation Scheme
The USA also developed an In-lieu Fee Mitigation Scheme as part of the Wetland Mitigation Banking Scheme, through which a developer may provide funds to a third party to provide mitigatory or compensatory actions off-site on their behalf. In-lieu fee mitigation was developed to address concerns about ecological failure of on-site mitigation projects and for areas where there was an absence or insufficient supply of mitigation bank credits.

Such offsets are not typically implemented in advance of the biodiversity loss and may result in temporal loss. Some third parties spend collected fees within one year of receipt, whilst others take significantly longer. Reports of some cases suggested only one-third of revenues raised had been spent on mitigation works. This may reflect the lack of availability of potential offset sites.

Review of mitigation banking
A critical review and evaluation of mitigation banking was published in 2001 by the National Academy of Science and the General Accounting Office, identifying that the 'no net loss' goal was not being met, and that in-lieu fee mitigation lacked many of the safeguards and standards required to ensure ecological success. Other issues included:

- a lack of oversight and enforcement
- problems with record keeping
- impacts not being fully compensated for
- wetlands being created in places that were not naturally wetland areas.

The scheme also initially suffered from a long approval process (3–6 years).

The agencies responsible for mitigation banking drafted a 17-point mitigation action plan to address the areas of concern. Recommendations included:

- improving data collection and availability, performance standards and accountability
- integrating mitigation into the watershed approach, ensuring offsets were appropriately located
- amending the legislation to address the misuse of on-site mitigation, removing the competitive advantages of lesser forms of mitigation such as construction of new wetlands in places where wetlands do not naturally occur. [16]

Despite the criticism, the scheme has been relatively successful in delivering large-scale wetland restoration projects using wetland banks, and generating offset credits that may be purchased by developers. [17]

[16] *National Wetlands Mitigation Action Plan* (www.mitigationactionplan.gov), interagency document
[17] See www.epa.gov/owow/wetlands/facts/fact16.html and www.sws.org/wetlandconcerns/banking.html

3.4.2 Conservation Banking Scheme, USA

Conservation banking for Federally-listed species has evolved from wetland mitigation banking. First introduced in California in 1995, conservation banks are properties managed to provide permanent conservation benefits to listed species to compensate for adverse impacts on those species elsewhere. The focus of the scheme is to preserve existing habitat rather than create or restore habitat.

The scheme is managed by the Fish & Wildlife Service (FWS). The FWS awards landowners with credits in proportion to their conservation accomplishments; the credits may then be sold to developers. The credit price varies according to species, quality of habitat and conservation outcomes. For example, credits for the golden-cheeked warbler at the Hickory Pass Ranch conservation bank are priced at US$5000 per credit (1 credit = 1 acre) with a requirement to set aside US$250/credit for a maintenance fund. [18]

Despite successes in California, elsewhere measures were often inadequately conceived, poorly executed and infrequently monitored.

In 2003, the FWS issued guidance on conservation banking, introducing a requirement for banks to meet the conservation needs of one or more listed species, address the needs of species recovery plans, award credits on the basis of outcomes rather than management actions, and require an in perpetuity agreement and a banking agreement.

The new guidelines should foster national consistency by standardising essential components of establishment and operational criteria.

Example 6: Tradeable/Transferable Development Rights, USA[19]

Tradeable Development Rights (TDRs) were initially developed to compensate landowners for heritage buildings on their sites that prevented them from developing upwards.

TDRs use a 'sending zone'—area to be protected from development—and a 'receiving zone'—area where the community desires more development. Landowners in sending zones are allocated a number of credits which can be sold to developers, speculators or the community. In return for selling credits, the landowners agree to place a permanent conservation easement on the land. Meanwhile, the purchaser can develop at a higher density than would otherwise have been allowed on the property.

TDRs have been used in various ways in the USA, for example, for urban development and agricultural development (Montgomery County), and in preservation areas (Pine Barrens, New York; Pinelands, New Jersey; Collier County, Florida). Their application has had mixed results. Landowners in sending zones are often not compensated adequately for their loss of development rights (there have also been issues of constitutional rights in the USA). In addition, density issues are often addressed in existing zoning and cannot be changed. In reality, planning and conservation issues are not clear cut—it is not simply a matter of land that must be protected and land that can be developed; compromises are necessary.

[18] Bauer M. et al 2004

[19] See www.1000fom.org/lctools5.htm and www.asu.edu/caed/proceedings00/BREDIN/bredin.htm

3.5 Biodiversity offsets (banking)[20]

Biodiversity offset banking, or BioBanking, ensures that offsets are implemented consistently and strategically and that funds achieve the best possible outcome for biodiversity.

Where a landholder develops an offset and enters into an agreement to implement management actions in return for credits, the landholder is then authorised to sell credits to developers on the open market. Demand for credits may be low or the market may be saturated, so the landholder may have difficulty recovering costs. Alternatively, developers may be unable to meet their offset obligations when there is insufficient supply or the credit price is high.

BioBanking has evolved to facilitate the development of offsets to address local conservation priorities and development needs, and facilitate the purchase and sale of credits.

Example 7: Ecosystem Enhancement Process (EEP), North Carolina, USA

The Ecosystem Enhancement Process (EEP) was established in North Carolina in 2003[21] in response to growing delays in implementing large infrastructure projects. The scheme represents a shift from project-by-project mitigation to a programmed, watershed-wide, ecosystem enhancement program that provides compensatory mitigation where it provides the most benefit. The scheme is a joint initiative of the North Carolina Departments of Transport, and Environment & Natural Resources, and is funded by the Department of Transport.

EEP personnel develop mitigation projects to help the Department of Transport offset residual impacts of their infrastructure projects. The EEP can buy credits from offset providers, reducing the risk of providers being unable to sell credits (for many offset providers in the USA, 6% of their costs may be spent on marketing the sale of credits).

The process has:

- eliminated delays in implementing development projects
- been cost-effective and comprehensive
- improved the effect of compensatory mitigation through long-term management of mitigation sites
- facilitated partnerships to maximise efficiencies
- implemented mitigation measures before the impacts of development arise
- led to improved biodiversity outcomes.

Project personnel have also noted that mitigation measures are easier to implement as participants are not involved in the project impact discussions and are therefore less emotive about the process.

The EEP also provides mitigation for the general public under an in-lieu fee program (see 3.4.1 for more information on in-lieu mitigation).

[20] See Appendices V and VI for examples of biodiversity offset banking used around the world. See Appendix I for details of the evolution of biodiversity offset banking.

[21] See a presentation given by Dave Franklin (USA Army Corps of Engineers) at the 8th National Mitigation & Conservation Banking Conference, 'The Corps' perspective on the Ecosystem Enhancement Program (EEP)', April 20 2005 on the EEP website, www.nceep.net

Experience with implementing the scheme has highlighted the need for more accurate forecasting of impacts and greater transparency. The program could improve its operational efficiency and product effectiveness, and continues to rely on offset providers.

3.5.1 BushBroker, Victoria, Australia[22]

The Victorian Government recognised that it is sometimes difficult to provide on-site offsets, or there are circumstances where the developer has no interest in native vegetation management. The proposed BushBroker program will provide a native vegetation credit registration and trading system that will make it easier for developers to obtain offset areas and help willing landholders to provide the offsets.

BushBroker will maintain a State-wide database of native vegetation credits for landholders who generate native vegetation credits on their land. Potential buyers of credits will be able to search the database for credits that match the characteristics they require. The proposed BushBroker scheme will link to the BushTender scheme (see 3.3.1) and sell credits generated from that program, as well as from other programs.

[22] Department of Natural Resources and Environment, Victoria 2002

4 Business case for using biodiversity offsets and BioBanking in NSW

4.1 Objectives

DEC recognises that existing mechanisms cannot prevent the further loss of biodiversity in NSW resulting from urban development, or encourage increased biodiversity conservation to address that loss. Any new mechanism should:

- be firmly established on ecological principles
- eliminate the net negative impacts of development on biodiversity by obliging developers to mitigate the effects of development or provide offsets
- allow the use of biodiversity offsets when:
  - development is a high priority for social and economic reasons
  - the effects of the development cannot be mitigated on-site or mitigation is not the best outcome for biodiversity; there may be times when development cannot proceed because offsets cannot improve or maintain biodiversity
- ensure that offsets are secured before development to minimise any time-lag effect
- secure better outcomes from offsets negotiated through strategic planning
- secure offsets in perpetuity
- lead to improved biodiversity outcomes
- build on tools developed for the *Native Vegetation Act 2003* (see example 3).

4.2 Options

Possible options to promote conservation initiatives with developers and private landholders are:

1. Do nothing—utilise existing conservation initiatives and require offsets on a case-by-case basis
2. Develop financial incentives for existing conservation initiatives
3. Formalise the offset requirement of developers
4. Implement a biodiversity offset banking scheme, including a biodiversity offset methodology.

Option 1: Do nothing, utilise existing conservation initiatives

Few developers have obligations to mitigate the effects of their activity on biodiversity. Small to medium-sized developments rarely attract offset obligations, even though the cumulative outcomes of those developments could have a significant negative impact on biodiversity.

The offsets that are provided are negotiated on a case-by-case basis. The lack of NSW policy and guidelines for negotiating biodiversity offsets make it difficult for developers to know what time and financial commitments are expected from them, create an uneven playing field between developers and make assessment and agreement of offsets difficult for the authorities concerned. Some councils have started to develop their own local

biodiversity offset policies—see 2.4.2. However, these policies do not cover projects that involve more than one council, for example infrastructure projects.

To date, the provision of offsets has often involved the purchase of land, an approach that may not be the most economical or practical approach to securing biodiversity values. These offsets have not always been provided in advance of the development.

Initiatives to conserve biodiversity on private land are voluntary, and their cost is often met by the landholder or by the public through State or Commonwealth sponsored schemes.

By taking the 'do nothing' approach, the impact of development remains a threat to biodiversity, and existing conservation initiatives rely on government funding or the voluntary actions of private landholders.

Option 2: Develop tax and other financial incentives

Tax/rate relief, and performance-based payments for land subject to conservation agreements—see 2.2—could be further developed to give private landholders more incentive to conserve biodiversity values.

Tax incentives are effective when generous. Tax incentives are also subject to change and are hence not a reliable source of funding for landholders to secure conservation values indefinitely.

The cost of providing tax or other financial incentives would need to be met by the general public unless a specific tax was also placed on the development of land with conservation values or revenue was generated elsewhere. In addition, as the incentives for loss and gain are not linked, any increase in the uptake of conservation agreements would be unlikely to parallel the increase in biodiversity loss.

Option 3: Formalise offset requirement of developers

A policy determining offset requirements for developers will remove the ambiguities of individual offset negotiations. Each developer may then either directly provide the offset (on-site or off-site) or find a suitable third party to meet the obligations. The requirement to provide an offset would be contained in the development consent and would be required before project implementation.

This approach may encourage developers to reduce their impact on land of high biodiversity value or, where development still goes ahead, will require them to reduce their impact on biodiversity by providing an offset.

The cost of providing individual offsets may be high due to, for example, having to pay for experts with knowledge of biodiversity issues, the lack of available land, or not enough landholders being able to provide services. Experience in NSW to date has shown that developers often purchase land of high biodiversity value to deliver the offset rather than engage with private landholders to provide services on their behalf, despite the fact that land acquisition may double the cost of providing the offset[23]. Investment in

[23] In the USA, land acquisition can be up to 56% of the cost of providing the offset (information from email correspondence with Bill Gilmore, Director, Ecosystem Enhancement Program, I August 2004)

biodiversity is not necessarily strategically targeted, and there may also be a missed opportunity to maximise resources by coordinating or pooling them.

Option 4: Implement a biodiversity offsets and banking scheme

A carefully designed biodiversity offset and banking scheme, including a standard approach to determine offset requirements, will help maintain and improve biodiversity by:

- securing high conservation values on private land
- ensuring that where development is necessary, and the impact on biodiversity cannot be avoided or mitigated on-site, offsets are secured strategically and in the most cost-effective way.

The scheme should include conservation agreements to protect and maintain land with conservation values to maintain those values in perpetuity. Private landholders willing to secure conservation values on their land should continue to benefit from tax/rate deductions but should also be recompensed for the costs of restoration and conservation activities by developers purchasing offset credits from them.

4.3 Conclusion: Implementing option 4—BioBanking

It is recommended that DEC pursues option 4 as outlined above, that is, develop a biodiversity offset and banking scheme to reduce the impact of development on biodiversity through conserving and improving biodiversity values on private land.

The anticipated benefits to stakeholders are outlined in table 2.

Table 2: Benefits to biodiversity and stakeholders through adopting a biodiversity offsets and banking scheme

Benefits for biodiversity	▪ Reduced threat to biodiversity posed by development. ▪ Maintenance and improvement of biodiversity on private land encouraged. ▪ Where offsets are used, biodiversity outcomes maximised. ▪ A better environmental outcome achieved when the impact and offsets are assessed using the same methodology, and offsets are strategically implemented and secured in perpetuity. ▪ Biodiversity values in NSW increased, by targeting biodiversity offsets more strategically and by pooling funds to achieve a better outcome. ▪ Piecemeal approach avoided by developing a strategy for conservation investment that enhances habitat connectivity and takes advantage of economies of scale.
Benefits for the general public	▪ Reduced cost to the public from securing biodiversity on private land.
Benefits for developers	▪ A transparent and consistent approach provided. ▪ Liability can be transferred to a third party, reducing delays in implementing projects. Without a banking facility, developers may have difficulties

	in locating suitable offsets and negotiating timely, satisfactory deals with offset providers.[24] ▪ Cost of implementing an offset may be reduced where previous offsets involved buying and managing land.
Benefits for private landholders	▪ Investment in conservation on private land increased without affecting ownership. ▪ Biodiversity recognised as a positive rather than negative value on the land. ▪ Additional value may be added to land that cannot be developed due to conservation issues—potential offset site.
Benefits for DEC and other agencies	▪ Efficiency savings through a transparent, consistent approach. ▪ Cheaper implementation than current way of implementing projects on a case-by-case basis. ▪ Clear rules for determining offsets rather than through negotiation. ▪ Scheme would run on a cost recovery basis. ▪ Easier to monitor and enforce.

4.4 Considerations for the design of the scheme

The experience of using offsets to address biodiversity loss has varied. Early schemes in the USA had problems but have since developed into effective programs to offset development and promote conservation actions. Other schemes have been developed on the basis of lessons learned from experiences in the USA, and have been adapted to meet local needs.

In designing the scheme, DEC is aware that:

- a biodiversity offsets and banking scheme should complement tax and financial incentives, reservation of land and other strategies that conserve and restore biodiversity.
- the scheme can only address impacts on biodiversity from new development. The scheme cannot reverse overall declines in biodiversity from historical activities.
- biodiversity offsets must be on a like-for-like or better basis.
- assessment of biodiversity values is a complex and evolving field. The assessment methodology used to estimate biodiversity gains/losses will need to be updated as a better understanding of measuring biodiversity is gained.
- more knowledge about the science of restoration is needed. The scheme should include mechanisms to minimise the failure of restoration actions, and where failure occurs, include contingencies to ensure the credibility of the scheme overall.
- availability of offset sites depends on private landholders. DEC will therefore encourage private landholder participation through existing channels and new partnerships, and where possible, design the scheme to encourage participation.
- the scheme needs to be user-friendly.

[24] Proceedings of the 6th Annual AARES National Symposium 2003

Appendices

Appendix I: Evolution of biodiversity offsets and banking

The following table summarises the development of biodiversity offsets and biodiversity banking instruments over time.

Date	Instrument	Why/how used	Progress
1965	Brazilian Forest Code	The code establishes a legal requirement for setting aside at least 20% of the area as a forest reserve if the property is in an area originally covered by the Atlantic Rainforest, 50% if it is in the Cerrado, and 80% if it is in the Amazon Rainforest. Moreover, these forest reserves must be comprised of native species, thus not including industrial plantations of exotic species such as pine and eucalyptus. If the land is not set aside, the owner must purchase other land for this purpose. The code establishes units of complete protection and units of sustainable use.	▪ The law requires that if the set aside area is outside the micro-region, the requirement increases by 30%. ▪ Industry must also contribute where the activity will have a significant environmental impact, calculated as a percentage of investment costs. ▪ The code allows States to protect sensitive areas and their buffer zones/ecological corridors. ▪ The code was largely ignored in the past, but there is a recent trend for environmental agencies to enforce the law, largely as a consequence of non-government organisation and press vigilance. ▪ The powerful land lobby of Brazil has fought to ease the code's requirements.
1971	Ramsar Convention on Wetlands	This convention, signed in Ramsar, Iran, in 1971, is an inter-governmental treaty that provides the framework for national action and international cooperation to conserve, and protect the use of, wetlands and their resources.	There are presently 146 contracting parties to the convention, with 1458 wetland sites, totalling 125.4 million hectares, included in the Ramsar List of Wetlands of International Importance.
1972	Enactment of s 404 of the Clean Water Act (USA)	The Act (until 1977 called the Federal Water Pollution Control Act) establishes a requirement to restore and maintain the chemical, physical, and biological integrity of the nation's waters, including wetlands. The Act restricts the development of wetlands.	The Act (and subsequent amendments) provides the framework for wetland mitigation banking (see 3.4.1, and, further in Appendix 1, 1977, 1990a and b, 1993, 1995a and b, 2000).
1973	Endangered Species Act (USA)	The purpose of the Act is to conserve the ecosystems endangered and threatened species depend on, and conserve and recover listed species. Under this Act, all Federal agencies must protect listed species and preserve their habitats.	The Act provides the framework for conservation banking (see 3.4.2, and, further in Appendix 1, 1995b)

Date	Instrument	Why/how used	Progress
1977	Executive Order 11990 (USA Army Corps of Engineers)	This order minimises the destruction, loss or degradation of wetlands. It applies to Federal agencies and Federal land, but not to private landholders or activities by private parties.	
1979	The Convention on the Conservation of Migratory Species of Wild Animals (CMS or Bonn Convention)	This convention aims to conserve terrestrial, marine and avian migratory species and their habitats throughout their range. It is an inter-governmental treaty, concluded under the aegis of the United Nations Environment Programme.	Since the convention has been in force, its membership has grown steadily to include 91 parties (as at 1 July 2005) from Africa, Central and South America, Asia, Europe and Oceania.
1985	European Commission Environmental Impact Assessment Directive (amended in 1992)	This Directive requires developers to mitigate and compensate for areas of land with high biodiversity values lost due to development.	The biodiversity requirement of the Directive was inadequate so it has been made more explicit in the Habitats Directive (see further in Appendix 1, 1992b).
1989	Electricity Act (UK) (Sch 9)	The Act requires generators and suppliers to preserve the natural beauty, flora and fauna, and geological or physiographical features of sites of special interest, buildings, and objects of architectural, historic or archaeological interest. They must mitigate any effect which their proposals would have on these features.	
1990a	Memorandum of Agreement (MOA) between USA Army Corps and USA Environment Protection Authority	The MOA establishes the sequence of **avoiding** and **minimising** impacts first, then **compensating** for wetland losses (restoring wetlands, constructing wetlands, enhancing wetlands, or preserving high quality wetlands to offset wetland loss) caused by permit issuance. The core objective is 'no net loss'	Although wetland banking was established in 1990, uptake was poor. To clarify the manner in which mitigation banks could satisfy the requirements of s 404 of the Clean Water Act, USA authorities published *Federal guidance for the establishment, use and operation of mitigation banks* in the Federal Register in November 1995 (see 3.4.1). Wetland banking has now become more popular.
1990b	Town & Country Planning Act (UK)	This Act allows authorities to restrict the use of land or require specific conservation actions to be carried out on it. Section 106 agreements have been used to require developers to undertake compensatory conservation activities.	▪ Agreements can be initiated by either the developer or the consent authority. ▪ Compensatory conservation activities can be carried out either on- or off-site.

Date	Instrument	Why/how used	Progress
1992a	UN Convention on Biodiversity	This convention establishes the requirement to assess the impacts of projects that are likely to affect biodiversity, and use incentives to help guide actions, and promote conservation and the sustainable use of resources.	
1992b	European Commission Habitats Directive (incorporating the Birds Directive 1979)	This Directive establishes a legal requirement for biodiversity offsets and compensatory activities. Any compensatory activity must be additional to the offset but may include recreating a comparable habitat or improving a substandard habitat. The overall objective is to maintain the integrity of the Natura 2000 network (see Appendix VI).	▪ The Directive has been criticised for being inflexible in that compensation should be at or near the site in question. Compensation should be in the same biogeographical region and provide the same function. The Directive has also been criticised for being bureaucratic and expensive to implement.
1993	USA Army Corps regulatory guidance letter 93–2 on mitigation banking	This guidance establishes that mitigation banking can be used whenever the Corps believes that the use of mitigation bank credits provides acceptable compensatory mitigation (s 404b(1)).	
1995a	Joint Federal guidance for the establishment, use, and operation of mitigation banks, USA	This guidance was issued by the USA Army Corps of Engineers, Environment Protection Authority, Natural Resources Conservation Service, USA Fisheries and Wildlife Service and National Marine Fisheries Service. It addresses how mitigation banks will be established and used to provide compensation for adverse impacts on wetlands and other aquatic resources in the context of the s 404 permit program and the wetland conservation provisions of the Food Security Act.	▪ For every hectare of wetland destroyed, a comparable or greater area of wetland must be restored or recreated. ▪ Mitigation banks have consolidated single-project mitigation lands into large and biologically meaningful reserves. ▪ Projects have often been carried out as close as possible to the development they are offsetting. It is politically easier to carry out like-for-like offsets. ▪ The guidance has received criticism as it may be easier to agree to mitigation than to say ‘no’ to development. ▪ There has been a low success rate of bank sites (some claim as low as 15% in Florida, 46 % in Massachusetts). ▪ The guidance is generally used to recreate rather than restore or enhance existing wetlands.
1995b	Conservation Banking, USA State of California	Conservation banking for Federally-listed species has its roots in wetland mitigation banking. In 1995 the State of California established a policy to promote regional conservation by encouraging a second generation of mitigation banks, called conservation banks, to preserve existing habitats as opposed to restoring them (see 3.4.2). Credits are transacted on a species-specific basis.	The Fish & Wildlife Service began approving conservation banks in cooperation with other Federal agencies and the State of California. Between 1995 and 2003, approximately 60 conservation banks were approved, most of them in California.

Date	Instrument	Why/how used	Progress
2000	Guidance on the use of in-lieu fee arrangements, USA	Issued by the USA Army Corps of Engineers for compensatory mitigation under s 404 of the Clean Water Act, this guidance presents the option to provide funds to an in-lieu fee sponsor instead of completing project-specific mitigation, or purchasing credits from a mitigation bank that has been approved under the banking guidance (see 3.4.1 and 1995a above).	
2003	The USA Fish & Wildlife Service—Federal guidelines for conservation banks.	The Federal guidelines are designed to promote conservation banks to mitigate adverse impacts on species listed as endangered or threatened under the Endangered Species Act. The guidance fosters national consistency through standardising essential components of establishment and operational criteria.	
2005	NSW BioMetric and Threatened Species Assessment Tool to offset clearing under the *Native Vegetation Act 2003*	These tools determine whether clearing can improve or maintain environmental outcomes for biodiversity, including through the use of offsets (see example 3). BioMetric and the Threatened Species Assessment Tool were developed to: ▪ provide for, encourage and promote the management of native vegetation on a regional basis in the social, economic and environmental interests of the State ▪ prevent broadscale clearing unless it improves or maintains environmental outcomes ▪ protect native vegetation of high conservation value having regard to its contribution to issues such as water quality, biodiversity, the prevention of salinity or land degradation ▪ improve the condition of existing native vegetation, particularly where it has high conservation value ▪ encourage the revegetation of land, and the rehabilitation of land, with appropriate native vegetation.	The NSW Native Vegetation Regulations and Assessment Methodology were gazetted as legal instruments in December 2005. They are operational. Most feedback to date has been positive.

Appendix II: Private land initiatives, NSW

Private land initiatives already in operation in NSW at a national or State level—that is, not including local council initiatives, include the following:

- **[Voluntary] Conservation Agreements**[25]**,** established under the *National Parks and Wildlife Act 1974* (ss 69A–69K), aim to protect the natural or cultural conservation values of private land in a given timeframe or in perpetuity (although they may be terminated). The agreement can be attached to the title of the land and may restrict the use of the land or require the owner to carry out conservation management activities. Resources such as technical assistance, finance or tax deductions may be available to help implement the objectives.

- **Wildlife Refuge Agreements**[26] are non-binding agreements attached to the property title created under the *National Parks and Wildlife Act 1974* (s 68). The landholder may nominate all or part of their property, which has native wildlife values, to be managed for wildlife conservation and conservation of the natural environment. This can lead to the recovery of local wildlife species, the restoration of natural environments, the study of wildlife and natural environments and the creation of simulated natural environments.

- **Land for Wildlife**[27] is a national voluntary property registration scheme. By registering in the scheme, landholders show their interest in managing areas for wildlife on their property alongside their other land management objectives. The Land for Wildlife scheme is free to join and is not legally binding. On sale of the property, the registration ceases, although the new owners can join the scheme if they wish. Registration will not change the legal status of the property.

- **Trust agreements**[28] are established under Part 3 of the *NSW Nature Conservation Trust Act 2001* (ss 30–38), to manage land to protect its natural heritage. Whilst binding on the parties for the time period specified in the agreement, a Trust agreement may be terminated by agreement of all parties concerned. The Nature Conservation Trust also operates a rolling fund whereby it may purchase land, attach a covenant and sell or lease that land subject to the covenant. The Trust may provide financial or other assistance to landholders.

- **Property Vegetation Plans** (PVPs) under the *Native Vegetation Act 2003* (NVA) enable landholders to effectively manage vegetation. The NVA sets a framework for ending broadscale clearing unless clearing improves or maintains environmental outcomes. Through PVPs, landholders rehabilitate land and revegetate it with native vegetation, and are rewarded for good land management—the government has allocated $430 million to support landholders who improve native vegetation management. An approval for broadscale clearing requires offsets, calculated using the PVP Developer (a four-part assessment tool for water quality, land degradation, salinity and biodiversity).

[25] see www.nationalparks.nsw.gov.au/npws.nsf/Content/Voluntary+conservation +agreements
[26] see www.nationalparks.nsw.gov.au/npws.nsf/Content/Wildlife+refuges
[27] see www.nationalparks.nsw.gov.au/npws.nsf/Content/Land+for+Wildlife
[28] see www.naturetrust.org.au

- **The Australian Bush Heritage Fund**[29] involves purchasing land with outstanding biodiversity value for permanent protection. Bush Heritage is a national, independent, non-profit organisation committed to preserving Australia's biodiversity. Since 1990, Bush Heritage has been raising money from the community to create a network of reserves across Australia. This has been achieved by buying land of high conservation value and then ensuring its long-term protection.

- The **Natural Heritage Trust (NHT)**[30] was set up by the Australian Government in 1997 to help restore and conserve Australia's environment and natural resources. Since then, thousands of community groups and organisations have received funding for environmental and natural resource management projects. The NHT supports activities that:
  - protect and restore the habitat of threatened species
  - reverse the long-term decline in the extent and quality of Australia's native vegetation
  - improve the condition of the natural resources that sustain resource-based industries
  - encourage the development of sustainable and profitable management systems for application by landholders and other natural resource managers and users
  - provide landholders, community groups and other natural resource managers with understanding and skills to contribute to biodiversity conservation and sustainable natural resource management.

- The **Commonwealth Biodiversity Hotspots Program**[31] comprises a national biodiversity stewardship component and a voluntary land acquisition component:
  - The national biodiversity stewardship component pays private landholders or leaseholders in hotspot regions to undertake conservation activities to deliver specific biodiversity outcomes, and to secure the conservation management of their properties in perpetuity through *Environment Protection and Biodiversity Conservation Act 1999* conservation agreements. Investments are determined on the basis of a competitive tender process, where the 'best value for money' conservation services to deliver the specified biodiversity outcomes are purchased. Two of the 15 hotspot areas are in NSW, in Brigalow and the Border Ranges**.**
  - The voluntary land acquisition component targets high biodiversity value properties that meet the program criteria and priorities, and where reservation is the most appropriate approach. Funding is provided to registered charitable organisations that demonstrate organisational capacity and prior extensive property acquisition and management experience. These organisations manage the properties for conservation in perpetuity.

- **Catchment Management Authorities (CMAs)** undertake natural resource management, including biodiversity conservation, soil conservation, riparian management, wetlands management, and

[29] see www.bushheritage.asn.au
[30] see www.nht.gov.au
[31] see www.deh.gov.au/biodiversity/hotspots/national.html

vegetation management and conservation in their catchment management areas.

Appendix III: Tax incentives for private conservation (NSW)

- **Exemption from rates under the *Local Government Act 1993* (s 555)**—this Act states that land that is the subject of a Conservation Agreement or is vested in, owned by, held on trust by or leased by the Nature Conservation Trust, is exempt from rates.

- **Tax deductions for donations**—donations of land valued at over $5000, or financial donations greater than $2 to a 'deductible gift recipient' endorsed by the Tax Office which may include environmental and heritage organisations, are tax deductible. A deduction can be claimed over a five-year period.

- **Tax incentives for entering into a conservation agreement** (*Income Tax Assessment Act 1997*):
  - Conservation covenant concessions apply to permanent agreements registered on the land title, allowing a landowner who receives some capital proceeds for entering into a conservation covenant to qualify for concessions capital gains tax.
  - A landowner who does not receive any material benefit from entering into a conservation covenant may be eligible for an income tax deduction on the decrease in value of the land (where the value of the land decreases more than $5000 due to the covenant) and concessional capital gains tax treatment if the land was owned for at least 12 months before the grant of the conservation agreement (ss 31–35).

- **Landcare operations tax concessions**—tax deductions are available for capital expenditure associated with land care and water facilities, under certain conditions, under the *Income Tax Assessment Act 1997* (s 40G, 40–630); land care works include eradicating or exterminating animal and plant pests and preventing land degradation (except fences). Note that **this deduction is only available if the land is used for a primary production business or concerns a business using rural land for a taxable purpose**. ABARE (1996) found 39% of broadacre farms claimed this deduction.

To help engage landholders in conservation initiatives, other tax incentives could be developed and promoted.

Please note that this list does not include all State or Commonwealth incentives to encourage private land conservation. See DEC website[32] or the Australian Government Department of Environment and Heritage website[33] for further information.

[32] See www.nationalparks.nsw.gov.au/npws.nsf/Content/Conserving+nature+outside+national+parks

[33] See www.deh.gov.au/biodiversity/programs/index.html

Appendix IV: Types of offset and their advantages/ disadvantages

Type of instrument	Advantages (for biodiversity, regulator and developer)	Disadvantages (for biodiversity, regulator and developer)
On-site offset (ie, on another part of the site, not simply mitigation of the impact)	▪ Integrates conservation with development planning. ▪ Retains integrity of habitat network and biodiversity values for the locality, that is, like-for-like. ▪ Benefits reputation of the project developer, particularly with local stakeholders.	▪ Other conservation actions may be more worthwhile or a higher priority. ▪ Not always successful; trying to balance conflicting land uses. Development activity may still impact on compensation area, however well it is protected. ▪ Expensive, not always best value for money.
Off-site offset without banking (Bilateral offsets)	▪ More worthwhile conservation targets may be targeted off-site. ▪ New source of biodiversity financing. ▪ May target like-for-like offsets. ▪ Potentially lower cost of compliance and less risk of non-compliance than on-site compensation, when carried out in advance of development. ▪ Allows critical projects to go ahead that may not have otherwise been possible (for example, if on-site compensation not possible). ▪ Benefits reputation of the project developer.	▪ Small parcels of offsets not always successful and are difficult to implement and enforce. ▪ High cost of like-for-like offsets. ▪ High upfront costs where biodiversity offsets implemented in advance of development. ▪ Projects that should not necessarily go ahead for conservation reasons may be given leverage through off-site compensation. ▪ Requires agreement between the developer, offset provider and authorities. ▪ Bilateral offset agreements may require the developer to provide further financing if the offset does not meet its intended objectives, ie, the liability remains with the developer.

Type of instrument	Advantages (for biodiversity, regulator and developer)	Disadvantages (for biodiversity, regulator and developer)
Off-site offset *with* banking The offset may be delivered by investing in smaller projects or like-for-like projects, or by pooling resources to target larger or higher priority areas. The most effective use of offset banking is where offsets are prioritised and resources are pooled to deliver cost-effective outcomes. *This approach is not currently used in NSW.*	▪ More worthwhile conservation targets may be targeted. ▪ Allows pooling of resources and action on a larger scale (may be more successful). ▪ Potentially lower cost of compliance and less risk of non-compliance for the operator as biodiversity offset conducted by third party and in advance of development. ▪ Benefits reputation of the developer. ▪ The developer pays a fixed cost and the liability of meeting the objectives remains with the offset provider.	• Does not always deliver like-for-like projects, as these may not be available. The scheme manager may monitor the types of habitat destroyed and those protected and enhanced, and may target credit purchases accordingly. ▪ Requires a form of bilateral agreement in terms of the number of biodiversity offset credits required. ▪ Requires third party to deliver 'credits' for biodiversity offset. ▪ Companies fear criticism for shirking responsibility for their actions, ie, buying a solution. ▪ The company does not necessarily determine or agree on the biodiversity offset project. ▪ High upfront costs for the developer when biodiversity offsets implemented in advance of development projects. ▪ Demand for credits driven by urban development.
In-lieu arrangements for contributions to an offset scheme In contrast to the banking approach, funds are provided in-lieu to offset the impacts of development and will be used when offset projects become available or enough resources are pooled to invest in a larger offset. *This approach is not currently used in NSW.*	▪ Only relevant where offset projects are not readily available. ▪ In the USA, in-lieu arrangements are often used for minor impacts and when the affected area is relatively small. Therefore, they allow the authority to consolidate funds from a number of sources to provide a larger offset.	▪ No advantages over immediate biodiversity offsets or advance biodiversity offsets, but additional disadvantages. ▪ Biodiversity offset occurs after damage has been done, and this delay may be significant. ▪ Conservation objectives may not be clear. ▪ The price of achieving the offsets required may increase, leaving the scheme manager with a shortfall of funds/offsets. This may be compensated for by paying a higher fee than the one payable under a direct offsite scheme.

Type of instrument	Advantages (for biodiversity, regulator and developer)	Disadvantages (for biodiversity, regulator and developer)
Voluntary action A developer may provide a voluntary offset.	▪ Companies recognise benefits without regulation.	▪ Not clear about obligations. ▪ Likely to suffer due to budgetary constraints.

Appendix V: Examples of market-based biodiversity initiatives and offset schemes in Australia

Please note that some of the following projects are current and some have already been completed. Contact the relevant organisation for more information.

Commonwealth

- **The National Heritage Trust (NHT) National Reserve System Program** (Commonwealth), [34] in operation since 1996, provides some acquisition funding and all ongoing management costs for the purchase of land with a biodiversity value. A strict legal contract binds the landowner to a conservation management agreement.

New South Wales

- The ***Native Vegetation Act 2003*** incorporates Property Vegetation Plans (PVPs)[35] that provide incentives for maintaining or improving biodiversity on private land, by providing funding for the scored increase in biodiversity from long-term, secure actions that increase the condition, connectivity and habitat value of vegetation of high conservation significance. PVPs also allow clearing that improves or maintains biodiversity through offsets. Offsets are scored using the same methodology as calculating the loss in biodiversity from clearing.

- **Southern Rivers Catchment Management Authority Bush Incentives Scheme.** [36] This scheme funds the management of selected sites that support native vegetation communities, particularly those that are officially listed as threatened, have been largely cleared across the region, or exist only as small remnant patches (see example 2).

- **The West2000 Plus Enterprise Conservation Scheme**[37]**,** established by the then Department of Infrastructure, Planning and Natural Resources and the Commonwealth for Western Division, recognises that it is economically and environmentally beneficial to conserve rather than rehabilitate habitat. The scheme is at an early development stage. The pilot program provides annual payments over a five-year period for landholders to actively manage part or all of their property for conservation. As it is a pilot program, the agreements are not binding and there is no penalty for leaving the scheme early.

  The scheme is funded jointly by State and Commonwealth governments at a cost of $766,000 with $500,000 for payments for relevant land and

[34] See www.nrm.gov.au
[35] See www.nationalparks.nsw.gov.au/npws.nsf/Content/BioMetric
[36] See www.southern.cma.nsw.gov.au/pdf/SRBI-Brochure.PDF and www.southern.cma.nsw.gov.au/pdf/SRBI-QA.PDF
[37] DEC 2004c

$266,000 for on-ground works. Payments for land are made annually on the basis of landholders meeting specific conservation targets. Funding for on-ground works requires matching funding from the landholder. The average cost per hectare per year is $2.60.

Bids are assessed on the basis of proposal merits, biodiversity value (from a biodiversity benefits index) and cost per hectare of land conserved. Although the payment appears small, the land is of relatively low value. A gross margin of between $3 and $5 makes payments under the scheme a viable alternative to production. The scheme is relatively simple and has been well received by landholders.

- **The Liverpool Plains Projects**[38] (NSW Liverpool Plains Land Management Committee) are three trial projects involving International Organisation for Standardisation (ISO) 14001, a catchment-based grants project, and auctions and environmental benefits. As part of the auctions and environmental benefits project, trial auctions have been conducted ($800,000 over two rounds) that prioritise and fund actions which improve salinity and biodiversity (see example 1).

- **The Liverpool City Council Habitats Offset Policy Framework** was introduced to address the inadequacies of mitigation measures under the current planning process and meet the objectives of the Liverpool Biodiversity Strategy. The strategy proposes the use of offsets to address impacts on biodiversity from development activities (see example 4).

- **The Camden Council Natural Assets Policy** was introduced to ensure long-term management of natural assets in the area. The policy is based on a principle of no net loss for ecologically significant land and introduces offset provisions where a developer cannot meet this obligation on-site. The offset scheme is voluntary (see example 5).

- **Managing offsetting in the Georges River Catchment**[39] (not implemented) is a guideline drafted by DEC on behalf of the then Department of Infrastructure, Planning and Natural Resources to complement the regional strategy for the Georges River Catchment. The guideline establishes a hierarchy of actions to be considered before using an offset, and a methodology for calculating biodiversity debits/credits based on regional management areas and type of biodiversity (core, support, enhancement). Offsets are a conservation covenant or reservation, conservation zoning and conservation registration. The restoration works include an implementation plan and performance bond. The guideline supports the regional environmental plan, neither of which have been implemented to date.

- **Offsetting development in the Cumberland Plains**[40], is a guideline developed to offset the residual impact of development in the Cumberland Plain area. The guidelines are based on a **retention hierarchy for biodiversity** with a priority of habitat retention, followed by impact minimisation, impact mitigation and the consideration of offsets as a last resort. Offsets may be proposed either as part of a local environmental plan or as a component of a development consent.

[38] Rural Industries Research and Development Corporation 2004
[39] DEC 2002c
[40] DEC 2002a

The required offset is calculated using a ratio dependent on vegetation type lost and gained. Five offset actions are then required:

- a conservation covenant, running with the land
- conservation zoning (relating to the local environmental plan)
- conservation registration (with the DEC to ensure registration includes a detailed plan, details of ownership, copies of the conservation covenant, etc)
- implementation of restoration works (undertaken for five years from commencement of construction, and must include fencing to avoid grazing and human disturbance)
- a performance bond held by the consent authority, amounting to twice the cost of restoration and an inspection and bond management fee—the bond is released on successful delivery of the five-year objectives.

Queensland

- **The Bushland Preservation Levy (Queensland)** is a resident levy paid to the council via rates, that is used to acquire land parcels that connect protected ecosystems.

- **Voluntary Conservation Agreements (VCAs) offered by Brisbane City Council** are classified as 'general VCAs' that last until property is sold and 'higher VCAs' that reclassify land as a conservation area, and last after property is sold. In December 2002, the council had signed 41 agreements covering 237 hectares with a value over $50 million. The agreements cost $15000/year to maintain and $200/hectare to manage.

- A pilot study, **Establishing East-West Landscape Corridors in the Southern Desert Uplands, Burdekin–Fitzroy**, will investigate using auctions to create biodiversity corridors. It will pilot the use of payments distributed via an auction format that accounts for the interdependence of bids from neighbouring properties. That is, the value of alternative vegetation corridors will depend on strategic cooperation between landholders. This project will use as a case study the Southern Desert Uplands, a bioregion where rapid land development is placing pressure on the landscape.

South Australia

- **The Banrock Station Wine Environmental Labelling Project** allows customers to purchase certain goods where a percentage of the price is used to sponsor wetland rehabilitation in Australia and around the world.

- **The cost sharing with risk ranking and cooperative action pilot**[41] focuses on developing a cost-effective way to allocate funds for works, by using tendering by catchment management boards in the Mount Lofty Ranges and Greater Adelaide regions. It builds on innovative biodiversity and water quality risk assessment methodologies already in use in the area. The tendering rules encourage cooperation among landholders (and between landholders and volunteers).

- **Catchment Care—developing an auction process for biodiversity gains and water quality outcomes (Onkaparinga catchment)** will

[41] Rural Industries Research and Development Corporation 2004

test a low cost biodiversity and water quality assessment and auction tool for use by regional natural resource management bodies. It will also test how measures for risk reduction and actions that cross property boundaries can be included in assessing bids. The pilot is aiming to develop units or 'metrics' for measuring biodiversity and water quality outcomes, thus facilitating wider adoption of the best features of the Victorian-based BushTender program (see 3.3.1).

Tasmania

- **The Wildlife Credits Fund** is a proposal based on the trade in wildlife credits which would be purchased either to attain a marketing advantage as a wildlife-friendly company or relinquished in lieu of activities which impact on other ecological values. Landowners managing wildlife habitat for its biodiversity value would earn credits.

- **The Private Forest Reserves Program** is a voluntary program under the Tasmanian Regional Forest Agreement. The program uses market-based instruments to establish private land reserves to conserve forest habitats that cannot be adequately protected on public land. The program relies on the philanthropy of private landowners as the scheme is under-funded.

Victoria

- **The BushTender trial** began in 2001 and has been conducted across two regions of Victoria. The trial tests the use of an auction to allocate public funds to conservation and assess the effectiveness of management agreements with private landholders (see 3.3.1).

- **The BushBroker proposal** recognises the need to facilitate and oversee the exchange of offset credits between offset providers (for example, participants in the BushTender scheme) and developers (see 3.5.1).

- **The pilot Auction for Biodiversity Conservation Project** aims to conserve highly valuable habitat on private land. A bidding process identifies the most cost-effective portfolio for biodiversity gain. Successful bidders sign individual management agreements and receive payments based on performance.

- **EcoTender**[42] is a scheme whereby landholders receive financial support to improve the environmental health of their catchment area. The $500,000 pilot project uses a tender-based system to allocate funds to reduce salinity, and improve biodiversity and water quality. Landholders are invited to submit bids based on an agreed plan of management actions. Successful bids offer the best value for money based on environmental outcomes, the value of assets, effects and cost. The scheme is based on the BushTender trials (see 3.3.1). Other trials include the Southern Victoria BushTender project, Plains Tender, River Tender and Bush Returns.

- **Market-based instruments for ecosystem services**[43] use development offsets to alleviate future development pressures on ecosystems while providing flexibility to developers. The scheme will

[42] see www.dse.vic.gov.au
[43] Rural Industries Research and Development Corporation 2004

involve defining suitable offsets that would apply to specified impacts on, for example, water quality and biodiversity. Development will only be undertaken once the required credits are obtained and a development permit is issued. These outcomes may be achieved more cheaply than restricting management options to on-site actions.

- **Land for Wildlife and Trust for Nature**. Private landholders participate in these programs because of their personal interests in conservation. The programs establish voluntary non-binding agreements with landholders to manage land for biodiversity conservation. Over 5,000 properties are now participating, covering 125,000 hectares of habitat.

- **Trust for Nature covenants** are voluntary, legally-binding agreements (registered on the property title) regarding the use of land. The Trust has operated a 'revolving fund' since 1989. Under this scheme, land is purchased then resold with a covenant. The proceeds are used to purchase further properties. Voluntary but binding agreements may also be made under the *Conservation, Forests and Lands Act 1987* and the *Wildlife Act 1975*.

- **Sustainability Covenants**[44] are voluntary agreements through which the Environment Protection Authority in Victoria and a company, group of companies or an industry sector, can explore new commercial opportunities by reducing the environmental impact of products and services. Through sustainability covenants, businesses can assess the impacts of products and services through their lifecycle, from production to use and disposal. The environmental benefit achieved through sustainability covenants will be far reaching, extending beyond the site of a company's operations.

- **The Sustainability Fund**[45] supports projects that foster the environmentally sustainable use of resources and best practices in waste management. The fund helps build the capacity of Victorian business, local government, non-government organisations and the broader community.

West Australia

- **The Auction for Landscape Recovery Project**[46] involves evaluating auctions used to improve landscape recovery through a government-community partnership coordinated through the Avon Catchment Council. The project will compare two alternative bid selection methodologies, an environmental benefits index and a systematic conservation planning approach.

Appendix VI: Examples of market-based biodiversity initiatives and offset schemes worldwide

Please note that some of the following projects are current and some have already been completed. Contact the relevant organisation for more information.

[44] see www.epa.vic.gov.au/sustainability_covenants/default.asp
[45] see www.epa.vic.gov.au/government/sustainabilityfund/default.asp
[46] Rural Industries Research and Development Corporation 2004

The United States

- **Wetland Mitigation Banking,** established under the *Clean Water Act 1972 (USA),* establishes a requirement for developers to minimise the impact of development on wetlands and where there is a residual impact, to offset it by investing in restoring or creating wetlands elsewhere. Wetland mitigation banking and in-lieu mitigation programs were developed to deliver offsets in accordance with broader watershed management goals (see 3.4.1).
  - In the case of wetland mitigation banking, biodiversity offset banks are run by private business, non-profit organisations or government. Most banks are privately run.
  - In the early 1990s, nearly 75 percent of the nation's banks were single user banks sponsored by State or local governments with only one private commercial bank in operation. Today, of the 214 approved banks analysed, 135 are private commercial banks and 61 are single user banks.[47]
  - Currently 87 active in-lieu-fee programs in 27 States are administered by the Army Corps, or by State or local government. However, a significant number of in-lieu fee programs fail to adequately document their activities.[48]

- **Conservation Banking** aims to preserve, rather than restore, the existing habitat of Federally-listed species. Conservation banking was initially developed in California by the Habitat Conservation Planning Branch of the California Department of Fish and Game based on wetland mitigation banking. Credits are traded for different types of species or habitat (see 3.4.2).

- **The North Carolina Ecosystem Enhancement Process (EEP)** is a joint initiative between the Department of Transport and the Department of Environment and Natural Resources to establish biodiversity offsets in advance of large transport and infrastructure projects. The EEP also provides an in-lieu service to other developers (see example 7).

- **Independent biodiversity-offset initiatives**: The North Carolina Herpetological Society is paying landowners who are willing to protect the habitat of endangered bog turtles on their land.

- **The USA Conservation Reserve Program** (CRP)[49] is a voluntary program where agricultural landowners can voluntarily retire land from agricultural use, install conservation measures and receive annual payments.

- **The Private Stewardship Grants Program** provides grants and other assistance on a competitive basis to individuals and groups engaged in local, private, and voluntary conservation efforts that benefit Federally-listed, proposed or candidate species, or other at-risk species. It is available to private landowners and their partners. The program was initiated during 2002: in 2004 it awarded more than $7 million in Federal funding. A ten percent (10%) match of cash or in-kind contributions is required.

[47] www2.eli.org/wmb
[48] www2.eli.org/wmb
[49] DEC 2004c

- **The Nature Conservancy (TNC) Conservation Easements Program**[50] has been operating for four decades to conserve environmentally valuable land. Easements, acquired through donations or private sales, are placed on the land, and the landowner sells or donates certain rights associated with the land to the TNC. Typically, this involves relinquishing rights to build on or cultivate the land. Agreements are legally binding and last in perpetuity. The TNC is responsible for ensuring that the terms of the easement are adhered to.

- **Ducks Unlimited (DU)** [51] has been operating since 1937 and is the world's largest private waterfowl and wetlands conservation organisation. DU conserves, restores and manages wetlands and associated habitats for waterfowl across the world through easements. The easements are monitored and managed by DU and the landowner.

- **American Conservation Real Estate (ACRE) Consulting Services**[52] facilitate the development of conservation easement plans on private land in Montana, Idaho and Wyoming. The company provides a brokerage service.

- **The Environmental Quality Incentives Program (EQIP)**[53] is a voluntary program that helps farmers facing threats to their natural resource base. Contracts of 2–10 years provide cost sharing and incentive payments for conservation practices in site-specific conservation plans. The scheme allows for a payment of up to 75% of the cost of the conservation practices. The average cost per hectare per year is $US34. There are proposals to remove the bidding system and prioritisation, and include shorter and multiple contracts. Whilst encouraging enrolment, this may lead to a shift from optimal conservation to where there is the greatest benefit to landowners.

- **The USA Wetland Reserves Program**[54] seeks to conserve and restore wetlands. Landowners can enter into a 10-year cost share restoration agreement, a 30-year conservation easement or a permanent easement (average cost of $US446 per hectare).

Europe

- **The Habitats Directive** 92/43/EEC (on the conservation of natural habitats and of wild fauna and flora) and **Birds Directive** 79/409/EEC establish the Natura 2000 network of protected habitats and species (see Appendix I, 1992b). Article 6 of the Habitats Directive requires an assessment of projects that may have an impact on a Natura 2000 site. Where on-site mitigation cannot be carried out, only projects with an imperative reason of overriding public interest may be authorised and only where compensation measures are put in place. Compensation measures should be additional, contribute to the Natura 2000 network within the bio-geographical region and be implemented before the loss occurs.

- **The EIA Directive** 85/337/EEC as amended by 97/11/EC establishes the requirements for an environmental impact assessment, including

[50] DEC 2004c
[51] DEC 2004c
[52] DEC 2004c
[53] DEC 2004c
[54] DEC 2004c

environmental studies which include requirements for biodiversity assessment, and mitigation and compensation plans.

- **The Environmental Liability Directive** establishes a framework based on environmental liability to ensure that environmental damage is prevented or remedied. Environmental damage includes damage to species and natural habitats protected at European Union (EU) level under the Habitats and Birds Directives (see Appendix I, 1992b). There will be no retrospective effect.

- **EU set aside**[55] was introduced in 1988 as a mechanism to manage surplus cereal production. Farmers enter into agreements for short- or long-term set asides of land (five-year minimum to 20 years). Payments range from $US191 to $US789 per hectare, covering the cost of income loss, expected environmental benefits and an incentive component. A set-aside forestry scheme encourages the afforestation of agricultural land. Contracts are for up to 20 years with incentive payments paid annually covering planting and maintenance, and supplementing landowner income whilst the timber is growing. Initial costs may range from $US3,156–$US6,312 depending on species, maintenance of $US237 to $US789 per hectare for the first five years of maintenance and a final payment of $US947 per hectare for income loss. If the landholder chooses to harvest the timber, the scheme is of little long-term benefit. Set-aside schemes can be an effective means of conserving biodiversity, depending on how the sites are managed.

- **The Dutch Emissions Reduction Units Procurement Tender Program** (ERUPT/CERPUT)[56] is a successful reverse tender process that the Dutch Government has employed to meet its carbon reduction obligations under the Kyoto Protocol. The program can be summarised as follows:
  - the funds and tender period are agreed to
  - expressions of interest are sought, limited to a certain area and technology
  - the expressions of interest are evaluated and some parties are invited to make a proposal
  - the proposals are evaluated, and an offer is made on a price per tonne basis
  - both parties enter into a contract to deliver credits to the Dutch government for the agreed price.

  The program has a minimum project size (number of credits generated) but allows the bundling of smaller projects of the same technology. The program may provide 50% of the credit value in advance for the developer to meet the high cost of the project proposal. A third party validates the credits.

- **The Swiss Land Diversion Program**[57] originated in 1990 to reduce supply pressures caused by increasing production. The scheme includes an ecological compensation measure. Measures such as converting from cropping to pasture should be implemented for a minimum of six years, with land of a high ecological significance

[55] DEC 2004c
[56] Whilst the Dutch ERUPT/CERUPT program concerns carbon rather than biodiversity, it is an excellent example of the reverse tender process used to ensure best value/outcomes for natural resources.
[57] DEC 2004c

attracting a premium rate. Subsidies range from $US254 to $US1,015 per hectare with ecologically significant land attracting a premium of $US2,537 per hectare per annum (average cost per hectare per year is $US614). All forms of spraying are prohibited and native seeding is encouraged. This program shows evidence of conserving biodiversity value.

- Section 106 of the ***Town and Country Planning Act 1990*** has been used to require developers to undertake compensatory conservation activities.

- **The Environmental Stewardship Scheme** is an agri-environment scheme that funds farmers and other land managers in England who deliver effective environmental management on their land. Its primary objectives are to conserve wildlife, maintain and enhance landscape quality and character, protect the historic environment and natural resources, promote public access and understanding of the countryside, and protect natural resources.

- **The Environmentally Sensitive Areas Scheme**[58] offers incentive payments to maintain and enhance the landscape, wildlife and historic value of each area by encouraging beneficial farming practices. The scheme is targeted to areas of high value in terms of landscape, wildlife and historic characteristics. Landholders sign ten-year management agreements and receive an annual payment on each hectare of land. A five-year termination clause is available with the agreement of both parties. There are different tiers of entry and each tier requires different agricultural practices to be followed. Payments range from GBP15–500 per hectare per year across the four tiers, with an average of GBP83 per hectare per year.

- **The Landfill Tax Credit Scheme** encourages and enables landfill operators to support a wide range of environmental projects by giving them a 90% tax credit against their donations to environmental bodies, capped at 6.8% of the landfill operator's tax liability. Credits may be used for a number of objectives, including, as of 2003, the delivery of biodiversity conservation for UK species and habitats. Biodiversity projects remain a small component of overall landfill tax credit expenditure, however, 159 projects have been programmed since its introduction, including purchasing land as a buffer to a site of special scientific interest (highest provision relating to biodiversity).

- **The Royal Society for the Protection of Birds (RSPB)**[59] purchases and manages wildlife areas. Since its inception, the RSPB has purchased 127,000 hectares of land for conservation and created nature reserves, accessible to the public for a fee (no fee for members) at an average cost of GBP800 per hectare per year.

Canada

- **No net loss of fisheries habitat policy**[60]—based on the guiding principle of 'no net loss', habitat conservation and protection guidelines have been developed to allow development to take place whilst conserving and protecting aquatic habitat. There is a legal requirement

[58] DEC 2004c
[59] DEC 2004c
[60] see www.dfo-mpo.gc.ca/canwaters-eauxcan/infocentre/guidelines-conseils/guides/fhmcons/fishac_e.asp

for developers to specify mitigation and compensation measures proposed to alleviate potential impacts, and to compensate for any loss in the capacity of the habitat to produce fish.

Columbia

- **The Columbian Green Plan** (CGP) provides incentives for providing watershed ecological services through direct payments to farmers that undertake reforestation and restoration of critical ecosystems, under ten-year agreements. The plan is financed from domestic sources.

Appendix VII: Examples of different biodiversity policy instruments

Type of instrument	Example of instrument in use	Comments, including restrictions of use
Market-based instruments		
Taxes and fees	▪ Tariff (fee or tax) for activities that impact on biodiversity.	▪ Can create revenue. ▪ High risk for biodiversity loss. There will always be parties willing to pay rather than adopt the preferred behaviour.
Funded and unfunded incentives	▪ Some government conservation initiatives provide direct payments (funded incentives) for services on private land, while others offer information and encouragement as incentives for private landholders to take actions without payment.	▪ Direct financial payments are the most attractive and popular type of incentive for conservation action by private landholders. ▪ This approach is also favoured by authorities as it is cheaper than purchasing land for the national reserve and the cost of maintaining the values on the land fall to the landholder. However, governments have limited funds and this approach does not implement the polluter-pays principle.
	▪ The NSW Nature Conservation Trust operates a revolving fund, a fixed pool of funds dedicated to purchasing properties with significant native habitat or of cultural value, and then reselling the land with a conservation agreement attached to the land title. (The Victorian government has a similar scheme in place)	▪ The advantage of a revolving fund is the ability to recycle the funds many times over as lands are progressively purchased and resold with a conservation covenant attached. ▪ The disadvantage of the scheme is that it relies on the voluntary action of the landowner. Developers do not automatically contribute to the scheme. In addition, finance is required to establish the rolling fund and the value of that fund may decrease over time.

Type of instrument	Example of instrument in use	Comments, including restrictions of use
Cap and trade	▪ Some biodiversity offset schemes follow the principles of cap and trade. A policy of no net loss of biodiversity establishes a cap (biodiversity loss to date) whilst offsetting requires developers to trade loss with gain elsewhere.	▪ In many areas it may be unacceptable for biodiversity to remain at current levels. The cap would therefore have to be lowered periodically to ensure net gain. This creates uncertainty for developers, as while they may be aware of their obligations today, they may not be aware of their obligations for future years.
Offsets	▪ Property Vegetation Plan tools – BioMetric and the Threatened Species Assessment Tool under the *Native Vegetation Act 2003* only permit clearing that improves or maintains environmental outcomes, including for biodiversity. ▪ BushBroker, Victoria (Australia) is a proposal to provide a native vegetation credit registration and trading scheme to simply the process for developers to source offsets and willing landholders to provide offsets (see 3.5.1). ▪ Wetlands Mitigation Banking (USA) and Conservation Banking (USA) establish principles for offsetting like-for-like in terms of habitat type and species (see 3.4.1 and 3.4.2).	▪ Experience of biodiversity offsets around the world varies. While the principles and rules for requiring and implementing offsets are excellent, their implementation has not always been satisfactory. ▪ The success of offsets has been high when monitoring and enforcement provisions are implemented.

Type of instrument	Example of instrument in use	Comments, including restrictions of use
Auctions	▪ Southern Rivers Catchment Management Authority Bush Incentives Scheme (see example 2) ▪ BushTender, Victoria (Australia) is a trial where landholders submit bids for native vegetation management activities. Bids are ranked by value for money and accepted until the budget is exhausted (see 3.3.1). ▪ Other examples include the USA Conservation Reserve Program (see Appendix VI).	▪ Using auctions, the government gets better value for money by maximising outcomes using an environmental benefits index. Using an auction system may provide the best value for money for government subsidies as well as other funds. ▪ Bids outline specific actions the landholder will take.
Eco-labels	▪ Banrock Station wine labelling (Australia) allows customers to purchase wine where a proportion of the sale goes towards the financing of wetland rehabilitation projects (see Appendix V).	▪ Market price/cost information is needed. ▪ Relies on the voluntary actions of consumers, often linked to philanthropy.
Other	▪ A performance bond or a forest guarantee bond paid by timber leaseholders and returned if the agreement is not violated (Philippines).	
Direct regulation (command and control)		
Defines species and habitats that require protection and establishes obligations and penalties.	▪ NSW conservation legislation establishes penalties relating to harming protected species and their habitats.	▪ Mandate behaviour. ▪ High cost of enforcement.

Type of instrument	Example of instrument in use	Comments, including restrictions of use
Requires mitigation and compensation measures.	▪ The European Habitats Directive (applicable to all 25 Member States) requires offsets where the project is of overriding public interest, otherwise development cannot go ahead. Compensation should be additional, contribute to the Natura 2000 network and be implemented before biodiversity loss occurs (see Appendix VI). ▪ In NSW, the planning legislation is that where there is a significant effect on biodiversity (determined through the test of significance), the project will require a species impact statement, and mitigation/amelioration/ offset measures may be required (see 2.1). Offsets are also used to ensure there will be no significant effect.	▪ Offset often relates to development, that is, providing like-for-like at or near the site of development, rather than considering the overall biodiversity strategy. The development may still impact on the offset site. ▪ Currently **the only means to require the developer to provide an offset in NSW**. However, offsets are not negotiated systematically (due to absence of offset policy and guidelines) and are consequently expensive and time consuming for the developer and the authorities concerned. ▪ **Allows strategic approach to conservation initiatives.** ▪ Requires developer to pay. ▪ Requires offset providers. A scheme manager may need to encourage the development of offsets. Depends on rules and systems.
Establish quotas	Quotas may be established for fishing, culling, game shooting, etc.	▪ Less flexible than market measures.
Voluntary agreements		
Property rights tools, eg, conservation agreements such as easements, covenants and stewardship agreements	▪ Voluntary action to change property rights, usually with financial compensation. ▪ In NSW there are several voluntary initiatives in place to add conservation agreements to land titles, for example Voluntary Conservation Agreements, Wildlife Refuges and Land for Wildlife agreements.	▪ Remains mostly voluntary. ▪ Requires commitment from landowner with little compensation. Requires nothing of developers.
Other		
Education/ technical assistance	▪ Education programs may offer broad benefits in terms of preventing further loss of biodiversity.	▪ Benefits are difficult to measure, making the cost difficult to justify.

Type of instrument	Example of instrument in use	Comments, including restrictions of use
Administrative streamlining	▪ The NSW government proposes biodiversity certification of planning instruments (see 2.4.1).	▪ Development activities permitted in different areas according to conservation values. ▪ **Requires a mechanism for the offset**.
Tax relief	▪ Tax relief may be given for conservation activities on-site. This may relate to income tax (eg, reduced income due to set-aside) or property tax (reduced value of the land). Other tax relief may be available from donations to third parties (see Appendix III).	▪ Tax benefits are difficult to maintain as they are usually under a different legislative framework. They are an incidental benefit and not necessarily part of the biodiversity strategy design.

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