

# CONCEPTUALISING THE VALUE OF PROTECTED AREAS

A LITERATURE REVIEW OF THE VALUE, FINANCING AND TOURISM POTENTIAL OF AUSTRALIA'S PROTECTED AREAS



# Tourism & Transport Forum

The Tourism & Transport Forum (TTF) is the peak national advocacy body for the tourism, transport and aviation sectors. It is a CEO forum representing the interests of 200 leading Australian institutions and corporations in the private and public sectors.

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**For further information please contact:**

Adele Labine-Romain | Executive Director | E: [alabine-romain@tff.org.au](mailto:alabine-romain@tff.org.au)

Philip Partalis | Manager, Research & Policy | E: [ppartalis@tff.org.au](mailto:ppartalis@tff.org.au)

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# 1.0 Introduction

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Conservation and preservation of the natural environment continue to be one of the greatest challenges facing land managers in the 21st century. Increased focus on natural resources as a source of economic growth in developing and developed countries alike, as well as government funding failing to keep track with increasing designation of lands as protected areas, has made the management of protected areas increasingly difficult from both a financial and human resource perspective. As a consequence of this shortfall, it has become increasingly important to effectively manage visitation and tourism experiences within protected areas in order to maximise the environmental and economic returns from nature-based tourism.

In light of such challenges, it is timely to explore prospective non-government funding sources, governance and management models which can strike an appropriate balance between environmental conservation and economic viability. This paper reviews literature on the valuation and financing of protected areas, drawing on examples of global best-practice to conceptualise a framework for protected areas management. It argues that an economic-based valuation of ecological services is necessary to demonstrate the significance of protected areas to key stakeholders and decision-makers.

The report is underpinned by a comprehensive literature review of Sustainable Tourism Cooperative Research Centre, government and leading academic research on the key themes relating to protected areas and tourism, with a particular focus on developing a typology and taxonomy of protected areas in terms of ecological and visitor services, assessing the economic impact of protected areas, examining management and governance models, and assessing the ability of commercial activities to drive conservation goals.

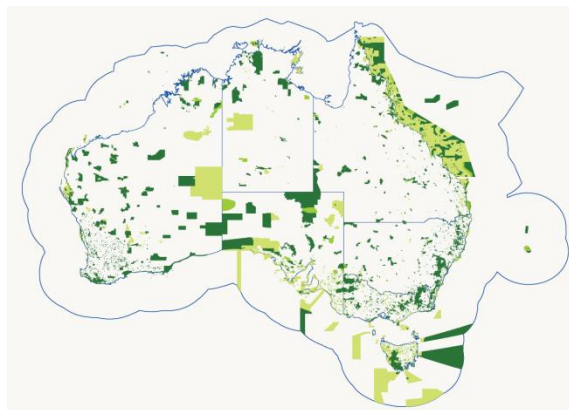
This has been delivered through collaboration between the Tourism & Transport Forum (TTF) and the Centre for Tourism & Services Research within the School of International Business at Victoria University (VU), and builds on TTF's history of advocacy in the nature-based tourism space. It would not have been possible without the groundwork by Prof. Brian King and Paul Whitelaw of VU and the guidance and editorial inputs of Adele Labine-Romain, Carlita Warren and Gerard McCarthy of TTF.

Ultimately, this paper seeks to foster discussion of research opportunities into various aspects of tourism within and adjacent to protected areas. It highlights the contribution tourism can make to the management of Australia's iconic natural estate, arguing that improved tourism and park management has the potential to deliver triple-bottom line returns – economic, environmental and social – to protected areas.



## 2.0 Conceptualising Protected Areas

FIG 1: AUSTRALIA'S IUCN PROTECTED AREAS 2008-09  
(SOURCE: WORLD WIDE FUND FOR NATURE)



Protected areas are defined by the International Union for Conservation of Nature (IUCN) as “clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values”.

With over 9,000 protected areas covering 95 million hectares, Australia has one of the greatest proportions of protected areas to land-mass (11 per cent) in the world.

A wide body of scientific literature exists that details how protected areas can be classified in terms of their environmental value, especially in terms of preserving geological, floral or faunal characteristics of the protected area.

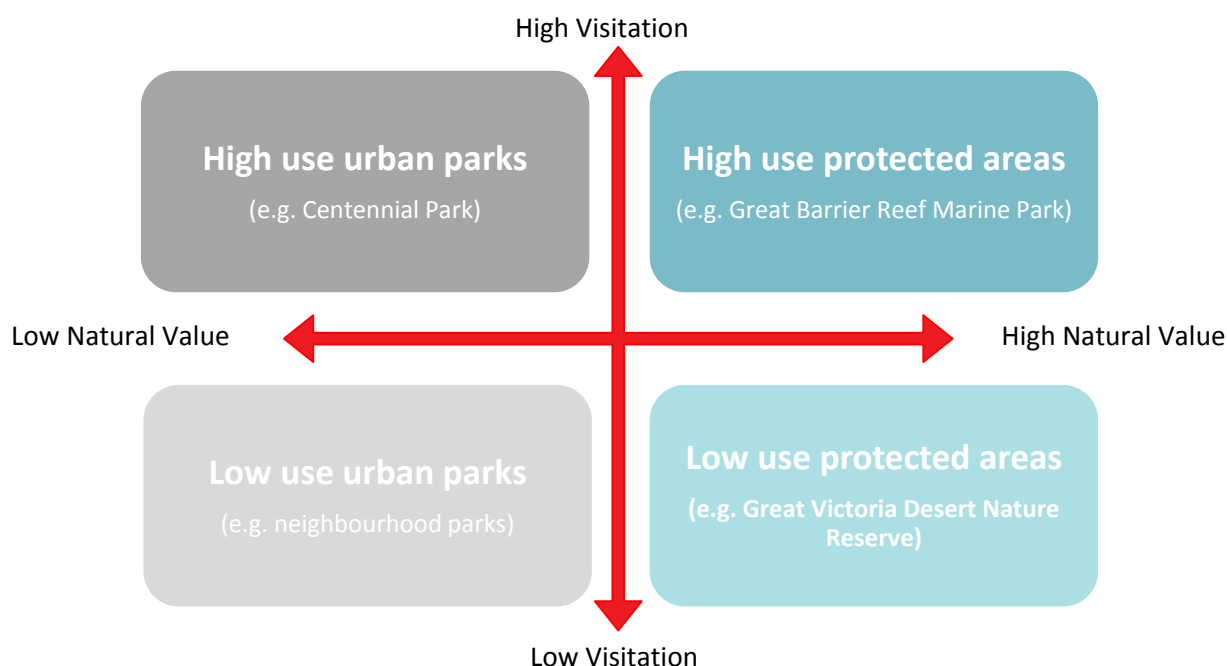
However, no consistent methodology has so far emerged for determining the economic value of preserving the natural environment or the benefits delivered by effective visitor management.

Given that protected areas do not possess uniform ecological values or potential for human interaction and visitor attraction, a typology of park management is useful in determining the type and scale of the protected area, visitation, funding and the environmental, political, as well as social and cultural values of the area (Beyer et al. 2005, Inglis et al. 2005).

Inglis et al. (2005) developed a four-state typology of national parks for management purposes:

- *High Use Urban Parks*, with a high emphasis on servicing visitors and less emphasis on ecological integrity.
- *Low Use Urban Parks*, with a low emphasis on both servicing visitors and ecological integrity.
- *High Use Protected Areas*, with a high emphasis on both ecological integrity and servicing visitors.
- *Low Use Protected Areas*, with a high emphasis on ecological integrity and less emphasis on servicing visitors.

FIG 2: TYPOLOGY OF ECOLOGICAL AND VISITATION VALUES OF PARKLANDS (SOURCE: INGLIS ET AL., 2005)



Within Australia, where officially protected areas are held by the Crown, these have generally been operated centrally through a government agency, usually a state-based agency. More recently, parastatal management such as corporate structures within government which report independently has emerged as a viable governance model (Inglis et al. 2005).

This typology of management contrasts with existing standardised approaches to protected areas by providing a means of classifying protected areas and recommending appropriate management strategies according to the specific natural values and visitation potential of a park. In turn, certain management strategies lend themselves to particular approaches to revenue generation.

For example, the high-use urban parks can host picnic grounds at which visitors can be charged for a range of visitor services such as car parking, and even low impact self-catering services. In contrast, places with high environmental value, where tight controls are required over visitor movement, can generate revenue by licensing appropriately trained and skilled organisations to conduct guided tours and other activities that are compatible with local ecological sensitivities.

Given its strong tourism and visitor management orientation, this model can assist in advancing management practices that maximise revenue in appropriate zones of protected areas while also protecting the key characteristics of the protected area. According to Eagles and Hillel (2008), private-public partnerships represent a viable option for improving the funding of protected areas and for making better use of tourism spending. This may require greater autonomy for the agencies managing protected areas (Eagles & Hillel 2008).

However, one of the key impediments to fully operationalising the Inglis model is the limitation of methodologies and theories used to value the outputs provided by protected areas relative to other land uses.

## 3.0 Valuing Protected Areas

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Environmental policy-making, especially with regard to conservation, has tended to focus on constraining development in order to preserve the environment. As such, it has resulted in ‘polluter pays’ principles which have led to the imposition of environmental taxes to mitigate negative impacts of business development on protected areas.

A review of current environmental economics literature suggests that an alternative approach, based upon realising the value in preserving the natural estate, is possible. In contrast to the environmental taxation approach, direct and intrinsic revenue schemes have been proposed that use the inherent ecological resources of the protected areas to generate revenue. In this manner, economic benefits can be derived explicitly from protected areas without negatively impacting upon the ecological values and characteristics of the area.

Economic valuation of ecosystem services is one such approach that translates environmental issues into the languages of politics and economics (Gomez-Baggethun & Ruiz-Perez 2011). Ecosystem services in this framework are the benefits that humans obtain from ecosystems such as clean air, agricultural goods or tourism expenditures (Engel et al. 2008, Heal 2007, Liu & Costanza 2010). These ecosystems represent a stock of depletable natural capital which must be preserved so that they continue to deliver dividends (Heal 2007, Norgaard 2010). Valuation of these ecosystem services in a monetary format provides new arguments for conservationists in debates with policy-makers and land managers (Chan et al. 2012).

This section reviews the literature on ‘ecosystem services’ and the implications for valuing the economic and environmental contribution of protected areas:

### 3.1 Ecosystem services theory

The value of nature in and beyond protected areas has been assessed in various ways by economists. Environmental economics is an emerging sub-discipline focusing on the economic valuation of environments using many of the tenets of mainstream neoclassical economic theory (Gomez-Baggethun et al. 2010) and its focus on supply and demand and the rational maximisation of utility and profits.

Environmental economics helps to allocate competitive uses, to design economic instruments for the purposes of management, to monitor the valuation of resources and uses, and to ensure adequate funding for the management of environmental resources (Driml 1997).

The methodology known as ecosystem service (ES) valuation is one of the fastest growing areas of environmental economics (Liu & Costanza 2010). It refers to the provision of monetary incentives for conservation through the use of market mechanisms to manage the benefits and costs associated with protected areas (Norgaard 2010, Gomez-Baggethun et al. 2010, Gomez-Baggethun & Ruiz-Perez 2011).

#### 3.1.1 Benefits and costs of ecosystem services

Within ES valuation, environmental settings within protected areas are viewed as offering consumptive and non-consumptive ‘ecosystem services’ as well as direct, indirect and opportunity costs.

By conducting economic cost-benefit analysis on the inherent functions of protected areas, ecosystem services theory provides a framework to bridge the gap between ecology and economics.

The benefits of protected areas are classified in three ways:

- *Consumptive benefits* (wherein there is a form of consumption of the outputs of the ecosystem – for example, the clean air provided by forests);
- *Non-consumptive on-site benefits* (wherein benefits are derived from being on site, but not actually consuming anything produced by the ecosystem – for example, recreation and tourism activities); and
- *Non-consumptive off-site benefits* (wherein whilst not actually visiting the site, people draw benefit from knowing of the protected ecosystem's existence).

The costs incurred by protected areas can also be valued in three ways:

- *Direct costs* (for example, the establishment or conversion of the site and its on-going maintenance, especially in terms of providing tourism and recreational infrastructure);
- *Indirect costs* (for example, the costs of providing roads to the site); and
- *Opportunity costs* (for example, the costs of not engaging in an alternative economic activity, such as agriculture, on the site).

Such classifications shift the understanding of ecology as a valueless externality to one that internalises the value of the ecosystem, with environmental services being viewed as the benefits that humans obtain from ecosystems (Engel et al. 2008, Heal 2007, Liu & Costanza 2010). By embracing what occurs both within and outside protected areas, several approaches to financing environmental protection are required which depend to varying degrees on the tourism industry and involvement of indigenous caretakers.

### 3.1.2 Consumptive benefits of protected areas

A variety of models have been developed for valuing the benefits which society derives from protected areas and the natural estate more broadly. While the notion of payments for ecosystem services will be discussed later, two schemes are particularly worthy of mention: a carbon abatement system and valuation of scientific discoveries deriving from the natural estate.

#### ***Carbon abatement systems***

Carbon sequestration and abatement schemes such as the European Union's Emissions Trading Scheme (ETS) and Australia's proposed Carbon Emissions Trading Scheme are based on market valuations of the inherent benefits humans derive from the key clean air, carbon sequestration and other environmental services provided by protected areas and their accompanying ecosystems.

In this model, protected areas receive income based upon the amount of carbon sequestered by protected areas. Similar logic of valuing inherent benefits of protected areas underpins Australia's Biodiversity Fund, which supports the preservation of engendered species vital to Australia's native ecosystems.

#### ***Scientific discoveries dividend***

Another method of valuing the benefits which society derives from protected areas is the quantification of scientific research and discoveries that derive from the natural estate. These scientific discoveries, especially those with high commercial value derived from use in marketable pharmaceuticals or discovery of rare flora and fauna species can also provide a method valuing the conservation of protected areas with high natural values.



### 3.1.3 Non-consumptive benefits of protected areas

Tourist spending generated by park entry-fees or park-associated expenditures in the surrounding regions have also been used to model and value the non-consumptive benefits provided by protected areas.

Park-generated spending refers to direct spending which occurs within a park. Park-associated spending refers to all spending which may be attributable to the presence of a protected area and occurs typically within the broader locality of the park, although this occurs usually beyond the immediate location of the protected area. Park-associated spending is broader and is particularly valuable in gaining an understanding of the economic impact of protected areas on their regions in terms of employment and contribution to gross regional product (Driml 2010, Driml & McLennan 2010, ST-CRC 2008).

Two models are of use for calculating the impacts and returns of tourism in protected areas: the Money Generation Model and Tourism Impact Model.

#### ***The Money Generation Model***

The Money Generation Model (MGM) takes into account tourist expenditures, park authority expenditures and regional multipliers. Through input-output modelling, MGM can estimate the economic benefit to the region and also the number of jobs created by tourist activities within the park.

The MGM determines employment generated as a function of total output and employment multipliers (Buultjens & Luckie 2004). The applicable economic impact multiplier may be less than one in cases where leakages occur as result of tourists purchasing from supplies located in other regions. In such cases, tourist expenditure figures will appear to be higher than the real economic impact (Buultjens & Luckie 2004, Cegielski et al. n.d.).

Buultjens & Luckie (2004) estimated that 45 per cent of the expenditure in NSW national parks is generated locally. Beyond the immediate economy, the flow-on effects of protected area tourism for the broader economy need to be assessed. Furthermore, it is necessary to know the revenues attributable to tourism activities in the event of removing the resource (i.e. closing the protected area park). In terms of tourism in protected areas, this refers to the tourists that would continue to visit the region in the absence of the protected area.

It is important that local resident expenditures be excluded, since they do not generate an economic surplus. Local resident spending shifts expenditures around the state, rather than creating additional expenditure (Carlsen & Wood 2004, Driml 2010, Lindberg & Denstadli 2004, Mules et al. 2005).

#### ***The Tourism Impact Model***

Visitors to protected areas spend money, but also use resources and facilities, not just within the protected areas, but also beyond in the neighbouring areas. On this basis it is important to take the cost of resourcing these facilities into consideration. The extent to which finances are being allotted to support non-resident and visitor activities and facilities should be assessed.

The Tourism Impact Model (TIM) has been used by local governments for this purpose. TIM calculates visitor numbers, tourism expenditures, population and employment in the area that are attributable to tourism and the economic impact and budgetary impact of an absence of tourism (Hughes et al. 2009). A customised version of TIM is used by Parks Canada to determine government revenues, employment and GDP outcomes associated with government investment in preservation.

## 3.2 The value of economic modelling to stakeholders

The methods outlined above for modelling the consumptive and non-consumptive economic benefits of protected areas may serve stakeholders in different ways. Different methodologies may be appropriate depending on the purpose of study. Driml & McLennan (2010) developed a step-by-step handbook for measuring the economic value of tourism in national parks and interpreting the findings for the purposes of a range of stakeholders.

Studies of tourism impact in Queensland by Lindberg & Denstadli (2004) found that the economic effects of tourism in Queensland generated by protected areas and the government revenue from tourism in protected areas are significantly higher than the government's direct spending on protected areas.

While methodologies and models may vary from study to study, utilising the value of environmental services and tourism attraction to demonstrate to key stakeholders and decision-makers the benefits provided by protected areas is vital to improving decision-making about land-use and development.

## 3.3 Criticism and necessity of the commodity approach

Attempts to commoditise nature through such tools as ecosystem services valuation have been the subject of considerable criticism (Gomez-Baggethun & Ruiz-Perez 2011). It has been argued that interpreting nature through the lens of the services that it provides may impact negatively on how people perceive nature and relate to it because this commoditisation approach removes information about the inherent value of nature in favour of information about the human benefits gained from the services that it provides.

Beyond the philosophical perspective, there are several challenges associated with making decisions about nature conservation based predominantly on its market valuation (Gomez-Baggethun & Ruiz-Perez 2011, Kosoy & Corbera 2010). Firstly, neoclassical economists tend to emphasise the physical constraints of nature as well as the institutional failures of conservation (Slavikova et al. 2010). Next, it is also problematic to assign a single value (price) to ecosystem services, since many of services (e.g. great scenery or knowing that a species will be preserved) are perceived and valued differently by each person. In addition, there are also technical difficulties associated with linking nature to the services that it provides (Gomez-Baggethun & Ruiz-Perez 2011, Kosoy & Corbera 2010). Ecosystem services projects are also highly contextualised and the variables used for decision-making vary between projects (Norgaard 2010). Finally, each ecosystem is unique and valuing two ecosystems for the purposes of scientific comparison may be near impossible.

Despite limitations in valuation theory and methodologies, studies of resource management by decision-makers suggest that quantifying the economic impacts associated with protected areas can significantly improve choices made about land-use and financing of parks agencies. Whereas traditional conservation methods have had limited success in changing economic behaviours towards sustainable practices, Dreschler & Wätzold (2007) have found that including economic costs and benefits derived from ecological systems improves management decision-making and can reduce conservation costs by up to 80 per cent. Valuations of ecosystem services and economic impacts provided to society by protected areas are therefore vital for achieving conservation and land-management best-practice.

An economic impact methodology developed by Parks Canada represents international best practice in valuing of protected areas. Parks Canada's measures the economic impact generated by protected areas by analysing the contribution of these areas to GDP, labour income, employment in full-time equivalent positions and tax revenues at federal, provincial and municipal level. Meanwhile, visitor spending categories analysed include transportation, accommodation, food and beverage, entertainment and other miscellaneous expenditures (Outspan Group 2011).



The most recent study completed in April 2011 examined spending figures attributable to each of the Parks Canada program areas (National Parks, National Historic Sites and National Marine Conservation Areas). Through a complex impact model and the commissioning of new data sets, the study found that Parks Canada had expended over \$587 million on all three program areas in 2008-09. Meanwhile, \$2.7 billion had been generated by visitors on goods and services directly related to visits to Parks Canada locations – 45 per cent of which was made by international visitors.

This spending resulted in the creation of \$2.988 billion GDP in 2008-09 and 41,720 full-time jobs across Canada, delivering tax revenues of \$217.9 million to Canadian governments (Outspan Group 2011; i).

## 4.0 Financing Protected Areas

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Despite improvements in methodologies for valuing the consumptive and non-consumptive benefits of protected areas, the natural estate across the globe continues to be confronted by the dual challenges of declining government funding for operations and a limited suite of acceptable self-financing opportunities.

Aside from direct government funding, and user pays models, a suite of unconventional funding mechanisms have been proposed within existing environmental economics literature. Reid-Grant and colleagues (2009) identified a range of opportunities to fund ecosystem services in protected areas, including:

- Debt swaps;
- International agencies;
- Bio-prospecting (investment of private companies in hope of finding new resources);
- Donations;
- Corporate sponsorship and corporate social responsibility programs;
- Environmental taxes;
- Environmental mortgages; and
- User fees.

Furthermore, private companies, local communities, trusts and royalties are other ways of increasing funding to protected areas. In many cases these initiatives would require changes to protected area legislation (Inglis et al. 2005). The following discussion will address some of the key approaches.

### 4.1 Environmental taxes and subsidies

Environmental taxes are one way of financing protection of the consumptive benefits provided by protected areas. These typically involve a tax base comprising physical units of a substance that has a proven and specific negative environmental impact. Environmental taxes may include energy taxes, transport taxes, pollution taxes and resource taxes. Environmental subsidies are also used to induce behaviour, which results in less use of physical units with negative effects on the environment (Palm & Larsson 2007) thus producing a mutually beneficial outcome.

However, despite the inherent logic, there is no explicit imperative that revenue raised via “environmental taxes” must be spent on protected areas. The environmental taxes approach places the protected area as a beneficiary of a taxation program without necessarily contributing to the raising of the taxation revenue. As such, this approach can be politically contentious. Subsidies, once in place, are also difficult to remove as consumers and businesses come to expect them, locking in another on-going expense stream.

### 4.2 Payment for ecosystem services

Houdet et al. (2012) suggest that a large proportion of businesses have viewed the protection of the environment as a constraint on their business operations. This has occurred because environmental policy-making has tended to focus on constraining development in order to preserve the environment. As such, it has resulted in ‘polluter pays’ principle which has led to the imposition of environmental taxes to mitigate negative impacts of business development on the environment which has already been discussed. An alternative approach based on the realisation of the value in preserving the natural estate is needed.

The expression ‘ecosystem services’ was originally used as a metaphor to help understand the importance of natural assets and processes. Twenty years after its introduction, the term ‘valuation of ecosystems’ emerged as a means of providing monetary incentives for conservation through the use of market mechanisms (Norgaard 2010, Gomez-Baggethun et al. 2010, Gomez-Baggethun & Ruiz-Perez 2011).

In contrast to the environmental taxation approach, ecosystem services theory allows for the creation of direct, intrinsic revenue schemes which use the inherent ecological resources of the protected areas to generate revenue. In this manner, economic benefits can be derived explicitly from protected areas without negatively impacting upon the inherent values and characteristics of the area.

For example, a carbon pricing scheme based on aforementioned valuing of the carbon abatement capacity of a protected area can generate income directly for a protected area without degrading its inherent natural values. In fact, the capacity to generate such revenue is contingent on keeping these areas in their natural state. In these situations, the raising of such revenue can be readily linked to investments in maintaining the natural value of the protected area. This approach is more broadly known as paying for ecosystem services (PES).

This approach is known as the ‘beneficiary pays’ approach, wherein markets positively remunerate the providers of biodiversity and ecosystem services. The payments could be tied to opportunity costs (foregone revenues) (Gross-Camp et al. 2012), or they can be tied to the benefits the economy derives from protecting environmental areas.

The perceptions of businesses could be shifted from viewing biodiversity and ecosystem services as a constraint to looking for business opportunities by using biodiversity and ecosystem services (Houdet et al. 2012). The following table highlights the differences in these perspectives:

**FIG 3: PAYMENT OPTIONS FOR BIODIVERSITY AND ECOSYSTEM SERVICES**

	<b>BENEFICIARIES PAY</b>	<b>POLLUTERS PAY</b>
<b>ECOSYSTEM SERVICES</b>	<b>Direct Payment for Ecosystem Services</b> Beneficiary pays for ES that flow to them. ES are not wholly public, but can be captured to some degree by paying beneficiaries (bilateral arrangements — eg. payments for watershed services). Polluter pays for damage they have done by buying an offset/credit. The beneficiaries are the population that receive the ES and are usually different from the population that is paying (bilateral/market arrangement — eg. water quality trading, forest carbon)	<b>Ecosystem Services Markets</b> Polluter pays for damage they have done by buying an offset/credit. The beneficiaries are the population that receive the ES and are usually different from the population that is paying (bilateral/market arrangement — eg. water quality trading, forest carbon)
	<b>Indirect Payment for Ecosystem Services</b> Consumers of final goods and services pay a premium for the sustainable ecosystem management practices in the supply chains (eg. organic food)	
<b>BIODIVERSITY</b>	<b>User fees</b> Beneficiary pays for access to/use of in situ biodiversity. Direct use biodiversity benefits accrue to those who pay for access (single payments — eg. eco-tourism, hunting licenses)	<b>Mitigation markets</b> Developer pays for damages they have done to biodiversity (habitats, species) by buying an offset/ credit (bilateral/market arrangement eg. biodiversity offsets/banks, tradable fishery quotas)



The mainstream payment for ecosystem services (PES)-related research involves Coasean theory, which suggests that if transaction costs are low, a market bargaining process will be able to achieve the social optimum regardless of initial property rights allocations including management rights. This suggests that direct government involvement may be unnecessary. In practice, however, PESs are often implemented and regulated by governments, rather than by market mechanisms, with governments often represented as either providers or buyers of ecosystem services (Muradian et al. 2010, Pascual et al. 2010).

Moreover, since ecosystem services represent public or common goods, PES theory should resemble public payments (Vatn 2010). It may be more appropriate to examine how institutions and markets can be more efficient in working together to achieve sustainability, considering the historic failures of both institutions and markets (Norgaard 2010, Slavikova et al. 2010).

Indeed, Gomez-Baggethun and Ruiz-Perez (2011) and Vatn (2010) have suggested that broad national political and economic processes are often overlooked, when market tools for conservation are debated. The Coasean approach also requires full information to be available for effective decision-making, which is often not the case in many ecosystem services projects. Unfortunately, the additional research that may be required to discover more information about a particular ecosystem and the different influencing factors may render many PES schemes infeasible (Muradian et al. 2010, Pascual et al. 2010).

PES would have little effect in circumstances where the owner of the ecosystem cannot be identified, the owner of ecosystem has no authority for ecosystem management, the ecosystem belongs to nobody or if the state cannot enforce rules. Carefully designed property rights, credit availability and raising awareness among the private landholders are all central to establishing successful PES schemes (Börner et al. 2010, Engel et al. 2008).

It is challenging to monitor the effectiveness and efficiency of a PES on ecosystem services (Wunder et al. 2008). If PES is to be effective and efficient, their performance needs to be monitored in four key areas:

- Firstly, the environmental service must genuinely arise as consequence of the protected area (Engel et al. 2008). That is, the lack of causal relationship analysis between land use and ES provision may result in projects that do not lead to improved ecosystems.
- Next, beyond monitoring of landholder convergence to preferred land use, the actual performance of the ecosystem service also needs to be monitored.
- Thirdly, non-compliance must be sanctioned (Wunder et al. 2008). PES compliance is often poorly monitored which results in 'goodwill' payments, rather than appropriately structured payments that directly link value derived with payment made.
- Finally, leakages from the land enrolled in PES and the permanence of the contractual obligations may be also included in the monitoring process (Asquith et al. 2008, Muradian et al. 2010, Pascual et al. 2010, Wunder et al. 2008, Wünscher et al. 2008).

## 4.3 Environmental mortgages and derivatives

Beyond macro taxation and payment for ecosystem services, sophisticated financing arrangements can also be adopted, especially for those communities that are closely engaged with a protected area, such as an indigenous community. One of these off-set approaches is environmental mortgages (Donlan, Mandel, & Wilcox 2009).

In a 2009 study, Mandel, Donlan, & Armstrong argued shortcomings of the US Endangered Species Act have led to inefficient use of conservation dollars in that it only provides conservation protection to distressed or rapidly declining species and it does not take full advantage of the market to reduce costs in conservation.

Donlan et al suggested that new, derivative-based insurance products (financial instruments designed to allow the commoditisation and sale of risk) can be used to allow investors to insure risk in exchange for fixed payments and support micro financiers who provide access to capital, training and savings accounts. Modifications to these financial derivatives, which are used to distribute risk and stabilise forecasts across many corporate and social scenarios, could allow purchasers to take preventative action to simultaneously protect their investment and decrease the likelihood of the insured event.

Applied to protected areas and species, Donlan et al proposed that governments issue modified derivative contracts to sell species' extinction risk to market investors and stakeholders. Using the endangered red-cockaded woodpecker (*Picoides borealis*) in the US as an example, they showed how a biodiversity derivatives program can proactively generate new funding, resulting in more cost-effective conservation, alignment of stakeholders' interests, and creation of incentives for private conservation efforts.

However, such arrangements do not have to commence in situations where the threat of extinction is imminent. Businesses and communities whose economic well-being is tied to the health of a protected area could access such funding mechanisms to support sustainable development. Through the mortgages, a community can access collateral capital that will provide opportunities to improve their facilities such as visitor infrastructure while preserving their natural environment. The loan is explicitly linked to the environmental outcomes in the area, for example, through interest rate management.

If the environmental condition improves, the community or business receives loans at lower interest rates. However, if the ecosystem is negatively impacted, the interest rate increases. Environmental mortgages are tied to environmental outcomes and have the potential to stimulate environmentally friendly behaviour within the tourism industry (Heyniger, & Donlan 2012).



Pagopor Servicios Ambientales (PSA) is a country-wide PES program in Costa-Rica, which charges users of water, biodiversity and carbon sequestration services. Four environmental services provided by forests are recognised in Costa Rica by law: mitigation of greenhouse gas emissions; hydrological services, including provision of water for human consumption, irrigation, and energy production; biodiversity conservation; and provision of scenic beauty for recreation and ecotourism.

Landowners are contracted for the provision of these services. The PSA program has been partly funded by the World Bank and the Global Environment Facility. In 2005, a fixed environmental fee was introduced in the national water tariff. 25 per cent of these revenues are channelled through the PSA program and the rest is divided between the Ministry of Environment and Energy's Water Department and protected areas.

The PES for water services are calculated in \$US per ha per year and any payments must be negotiated with potential service buyers. Biodiversity grants are typically one-off provisions and have been used to encourage the purchase of forestry contracts and subsequent planting and rehabilitation of native species on deforested lands.

However, the program is not without its challenges. Lack of recurrent investment is proving to be problematic. Carbon payments are raised from both taxes on hydrocarbon fuels and the sale of the Certifiable Tradeable Offset (CTO), which represented an externally certified 1-tonne net reduction in carbon emissions. Landscape payments from hotels and other tourism operators have also proven problematic given the absence of a single dominant user and the difficulties in negotiation with a disparate industry.

Costa Rica is also a participant of the carbon emissions trade through sales of carbon dioxide equivalents. The received payments are used for reforestation and afforestation projects. No agreements have been reached yet for payments for landscapes and scenic beauty. The PSA program is largely a supply driven program, since there is lack of demand from the users of services.

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**CASE STUDY 3: ENVIRONMENTAL MORTGAGES FOR THE PROTECTION OF THE RED-COCKADED WOODPECKER IN THE U.S.**

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In the US, a retrospective examination of the case of the red-cockaded woodpecker suggests that biodiversity derivatives or 'environmental mortgages' may be an effective tool (Donlan, Mandel & Armstrong 2010). Costs to the government simply for creating recovery plans can run into millions of dollars. In 2007, the government spent more than \$250,000 to provide preliminary research for a conservation plan in one region of Arkansas, one of eleven states where the woodpecker is known to inhabit (US FWS 2007).



Had the government issued biodiversity derivatives 10-20 years prior to listing this species, the necessary capital would now be available for an outlay of somewhere between \$7,000 per year (priced according to a prior probability of listing of 1 per cent per year) and \$717,000 per year (assuming a probability of listing of 50 per cent per year) per designated population (Donlan, Mandel, & Armstrong 2010).

These derivative structures demonstrates how biodiversity mortgages could proactively generate new funding and create incentives for more cost-effective conservation and alignment of stakeholders' interests through private conservation efforts.

## 5. Tourism and Protected Areas

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As an industry which depends to a large extent on the non-urban experiences offered by protected areas for attracting domestic and international visitors, tourism offers a variety of means for financing environmental services. Many protected areas have become important tourist destinations as nature-based and eco-tourism businesses have grown (Dharmaratne et al. 2000).

However, increasing numbers of visitors are putting pressure on park managers to provide more and better facilities and activities in protected areas. Further, these demands should not undermine the established conservation objectives of protected areas (Brown et al. 2006, Buckley & Sommer 2001, Cegielski et al., Darcy et al. 2010, Inglis et al. 2005, Lindberg & Denstadli 2004, Moore et al. 2009, ST-CRC 2008). Consequently, these pressures call for innovative funding mechanisms for protected areas (Nielsen et al. 2008b).

Lease agreements are one way of reducing the financial and management burden on park authorities (Nielsen et al. 2008b). Some protected areas agencies now run commercial tour operations (Buckley & Sommer 2001), though others rely on visitor-based fee systems and, to a lesser extent, licensing. This section introduces these revenue streams and outlines the role of tourism development in boosting the non-consumptive benefits of protected areas.

### 5.1 Tourism revenue sources

There is on-going debate about the appropriateness of levying visitor fees in protected areas, since they represent public goods that notionally should be funded through taxation. However, Eagles & Hillel (2008) have argued that those visiting protected areas receive exclusive recreational benefits compared with the general public; that international visitors are excluded from the taxation system; and that since visitors may impact negatively on protected areas, mitigation can be costly – as such, visitor fees can be justified.

Direct use of protected areas can be valued through the levying of fees (Driml 1997, Edwards 2009, Thur 2010). The levying of fees may be considered for a variety of reasons including cost recovery, funding conservation activities, supporting local business opportunities, providing learning, interpretation and appreciation services, and managing visitor numbers (Lindberg & Halpenny 2001).

There is an option to include a fee within the tour or permit price or be collected at the entrance to the protected area. Hughes and his colleagues (2008) reviewed user pays systems in Australia. They found that user-pays systems have been adopted in most protected areas in Australia, however the costs and benefits of these systems have been poorly understood and as a result the implementation of such fees is inconsistent across the country.

Some states levy no fees, whereas in other cases, uniform prices are implemented across all parks in the one state, and in others fees vary according to the popularity of the park. Fees are usually payable at information centres, shops, park entrances or to rangers who tour the park collecting fees from visitors amongst their other duties. When fees are reviewed, the main considerations for striking a particular fee are:

- cost of living adjustments;
- cost recovery;
- comparison with other Australian park agencies and private sector campgrounds;
- visitor demand; and
- quality of the visitor experience.

### 5.1.1 Licensing fees

Commercial tours and photography represent the two most commonly encountered licences for operations in protected areas, providing a source of revenue beyond visitor fees (Buckley et al. 2001b). The process of obtaining a licence should be simple. Ideally, only one licence sourced from a single agency should be required, though it should be acknowledged that licensing procedures are often fragmented and different activities need licensing from different agencies.

Licensing is aimed primarily at the enforcement of sustainable behaviours in protected areas on the part of tour operators and their clients. Licence fees do not appear to have been viewed as funding opportunities. Indeed, there is generally no separation in the budget process between expenses attributable to administration of licensing and compliance and raising visitor fees. It is generally unknown overall how much park agencies spend on licensing procedures and whether these are covered by licence revenues.

Raising revenue through an accreditation requirement of licence holders is another opportunity. However, protected area authorities do not engage in accreditation for these purposes (Buckley et al. 2001b, Buckley & Sommer 2001).

Other innovative funding opportunities include licensing intellectual property and park names, park images. While a cost defraying mechanism rather than a revenue generating activity, volunteer support and community work can also help support park management (Inglis et al. 2005).

### 5.1.2 Improving park management

Many user-pays and licensing programs are not working to their full potential. Currently, user fees account for only a tiny proportion of the maintenance budgets of most Australian protected areas. However, due to the aforementioned funding constraints, protected areas will be increasingly reliant on user fees. User-pays systems can be evaluated according to three criteria: cost effectiveness, positive public attitude and improved park management.

There are also a variety of approaches to channeling funds raised from park fees. This income may be retained either: by the generating park, district, directorate or regional administrative entity; by the head office of the relevant parks agency; by the State or Territory treasury, or in a trust fund (Buckley et al. 2001a).

The need to provide greater autonomy for parks agencies to implement visitor management strategies implies that these funds should be returned back to the specific park from which they are raised, with a proportion returned to the agency responsible for management of protected areas more broadly.

#### ***Cost effectiveness***

When assessing cost effectiveness, the costs need to include the establishment, installation and maintenance of systems that facilitate fee collection including the employment and training of fee collecting staff. The fee should be not so low that it fails to cover the cost of operating the system. However, it should also not be so high that it does not unduly deter tourist demand or give rise to equity issues, as these can incur social costs.

According to Hughes and his colleagues (2008) the success of user-pays systems appears to rely on the following factors:

- public and operator attitude towards the parks management state agency;
- the effectiveness of parks agency public relations campaigns and level of public support for park user-pays;
- geographical area and dispersion of parks within particular states;



- balance between revenue from compliance and cost of enforcement;
- proportion of international and interstate visitors compared to local visitors;
- efficiency of user-pays system, including adoption of new technology and complexity of fees structure;
- financial management skill level and motivation of parks staff; and
- staff culture in relation to support for user-pays and willingness to apply such systems in their parks.

### ***Strategic park management***

In terms of improved park management, the disciplines involved in setting visitor fees and then spending such fees requires a high level of strategic thinking on the part of park management. The discipline of strategic management thus forces park managers to carefully consider visitor numbers, the impact of these numbers on the park resources, the likely revenue to be generated, spending properties for this revenue and more generally, the nexus between visitor fees and the quality of the visitor experience.

Griffin et al. (2010) have suggested using the survey methodology developed by Parks Victoria. As Higginbottom et al. (2010) note, Parks Victoria's "State of the Park" evaluation systems provides high quality information on parks performance across a variety of measures and should be considered as a national benchmark.

## **5.2 Boosting tourism yield**

Many protected areas have a very low visitor to hectare ratio and, by implication, a low revenue opportunity per hectare. Most overnight visitors use accommodation located outside the protected area, or relatively low cost campgrounds when they opt to stay within the protected area. Accommodation expenditures are highly variable according to whether the visitor stays in a lodge, hotel or campground (Hughes 2009). This suggests that higher per visitor yields would be achieved if more high quality accommodation facilities were to be made available within protected areas.

Inglis and her colleagues (2005) have subsequently proposed that tourism development and marketing should form part of an integrated approach which funds conservation of protected areas with high ecological values by maximising the economic, social and environmental returns from visitor attraction. This is especially true if tourism is viewed as a non-consumptive benefit which does not necessarily detract from use of the land for other consumptive purposes of the natural estate such as viticulture or carbon sequestration.

### **5.2.1 Supporting tourism development**

Studies of the value of tourism to protected areas and surrounding regions outlined above highlight that the function of protected areas as tourist attractions impacts well beyond the legal boundaries of a specific national park. There is often a possibility for tourism to be developed as an important economic driver in neighbouring districts as businesses emerge to service the needs of those visiting the protected areas. However, in many states in Australia, land use regulations restrict the capacity for tourism investment within the protected area.

The adoption of flexible policies and discussions with multiple stakeholders can help maximise the benefits of tourism for protected areas and adjacent lands. Changes to land use zoning may be required, particularly if tourism activities are to be accommodated in or adjacent to protected areas.

## 5.2.2 Marketing of protected areas

Shifting the role of protected areas to expand the provision of leisure and recreational opportunities for visitors also requires the incorporation of tourism-specific marketing strategies.

The literature acknowledges that demand creation and conservation are sometimes in conflict. In high use urban parks, for example, the role for marketing to generate increased demand and stimulate visitor expenditures is usually more prominent. In contrast, in protected areas where high visitation affects biodiversity negatively a 'demarketing' approach may be applicable (Inglis et al. 2008).

To that end, marketing can fulfil two key roles by using both promotional activities and the price mechanism. Firstly, by pricing and charging for the visitor experience, the protected area can generate an income stream to offset costs of preservation. Secondly, judicious use of price can also help manage visitation levels wherein a low price can stimulate demand whilst increasing visitor charges can reduce demand.

Reid and his colleagues (2008) reviewed a variety of marketing-related issues. They noted that there is scope to improve pre-visit communications and assist prospective visitors to plan their trips. Strategic communications (e.g. through vision and mission statements) have improved in recent years. However, connections with external stakeholders and integration are lacking. Visitor connectivity, which is represented by organisational knowledge about customer preferences, is another area of weakness.

Marketing activities were found to be generally under-resourced. Social marketing and advances in telecommunications technology provide scope for improvement in educating and informing visitors prior to their arrival in protected areas. Despite a plethora of tourism based segmentation paradigms employed in Australia, protected area authorities rarely undertake meaningful segmentation analysis of their visitors.

This gap may have arisen because of the lack of available visitor data or a lack of integration. A segmentation matrix can be used to develop products (protect areas and protected area activities) targeted directly at particular visitor segments. Improving the marketing function may require protected area managements to undertake organisational changes that allow for more effective pre-visit communications and onsite visitor monitoring.

Stronger collaborations are required between park authorities and tourism organisations at a national, state and regional level. At a fundamental level, clearer articulation is required about marketing responsibilities in protected areas (Griffin & Vacaflores 2004, Inglis et al. 2005, Reid et al. 2008, ST-CRC 2008).

## 5.3 Governance and management

### 5.3.1 Visitor management strategies

The issues outlined above provide an analytical framework for classifying protected areas and determining appropriate management strategies.

Some of the visitor management strategies discussed readily lend themselves to revenue generation activities that can help finance conservation activities. For example, the high use urban parks could be converted into picnic grounds at which visitors are charged for a range of services including car parking, self-catering facilities and low impact catering services.

In contrast, places with high environmental value where tight controls are required over visitor movement can generate revenue by licensing appropriately trained and skilled organisations to conduct guided tours and other activities that are compatible with high-value protected areas. Importantly, this typology also facilitates

supporting the development of indigenous tourism in protected areas as well as the development of appropriate commercial tourism activities in protected areas.

In contrast to Inglis model (Fig 2), the provision of ecological services can be drawn from any area within the typology. The critical point is that the more pristine the area, the higher quality the ecological service, and thus the higher payment for ecosystem services (PES) price to be generated. In this sense the typology gives rise to an income matrix that relates fee for service visitor fees with high quality PES. There are four related points to note:

In the first instance, given the nature of these settings, there is scope for some form of PES in each quadrant - although the price paid will be a function of the quality of the environmental setting and thus benefit derived.

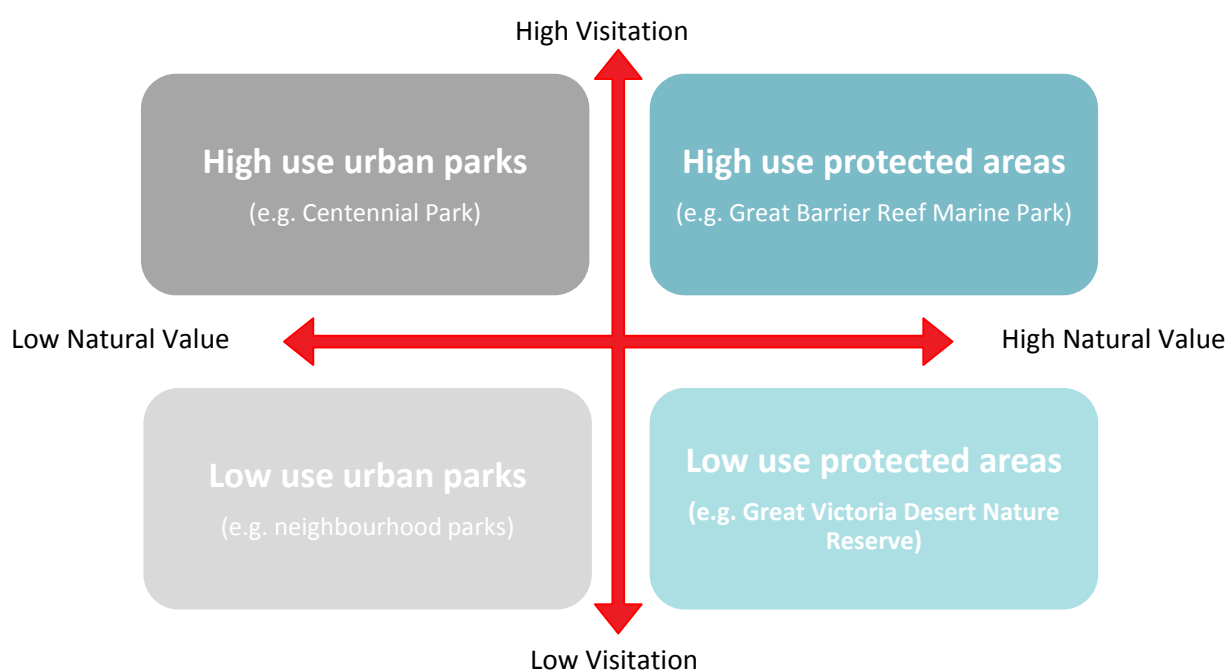
Secondly, the PES can operate at two levels independent of visitors and visitation:

1. A functional level. For example, in the provision of carbon abatement and sequestration, high quality water and other ecological outcomes, including scientific discoveries for medical research. Importantly, the quality of these outcomes, and thus the prices paid, are a function of the environmental quality of the setting and its outputs.
2. An intrinsic level. For example, where there is a particularly rare and pristine setting that produces benefits simply for its own sake.

Thirdly, beyond PES there is considerable scope to generate income driven by tourism activity. In this situation, the relationship between the volume of visitation and the inherent market quality (attractiveness) of the setting will shape the style of services levied and level of prices charged visitors.

Lastly, there is an opportunity to connect PES systems with tourism operators who deliver environmental services beyond indirect financing through visitor fees or lease arrangements. For instance, eco-lodges or tour operators which deliver environmental services to a protected area through pest and weed eradication or planting of native species on that site or on others should receive carbon credit equivalents on a per hectare basis. The linking of tourism and PES in this way would help to create an additional incentive for investment in eco-tourism product and development of innovative and sustainable tours which inform visitors of the conservation values of their surrounds.

**FIG 3: TYPOLOGY OF ECOLOGICAL AND VISITATION VALUES OF PARKLANDS (SOURCE: INGLIS ET AL., 2005)**



### 5.3.2 Governance of park commercialisation

Within the Australian jurisdiction, where officially protected areas are held by the Crown, various governance models provide a means of enhancing stakeholder engagement in the on-going management of protected areas. However, protected areas are not uniform and should be viewed within the relevant contextual environment. The applicability of an appropriate governance system will depend on the type and scale of the protected area, visitation, funding and the environmental, political, as well as social and cultural considerations, (Beyer et al. 2005, Inglis et al. 2005).

Traditionally, protected areas have been operated centrally through a government agency, usually a state-based agency. More recently, parastatal management (such as corporate structures within government which report independently), has been emerging as a viable governance model (Inglis et al. 2005).

Eagles and Hillel (2008) find that private-public partnerships also represent a viable option for improving the funding and management of protected areas. Regardless of parks management model, however, it is vital that greater autonomy is provided to agencies managing protected areas to ensure the introduction of business logic and implementation of visitor management strategies aimed at financing and delivering environmental services (Eagles & Hillel 2008).

### 5.3.3 Community support for tourism in parks

Several attempts of various governments to introduce business management techniques or construct upscale tourist facilities in national parks have encountered public opposition from community groups.

According to Buckley & Sommer (2001), such opposition is associated with four main perceptions:

- that since national parks are public areas private commercial activities should be excluded;
- that government agencies should not be involved developing and operating commercial enterprises within park boundaries;
- that public funds should not be spent on facilities that are not open to the general public; and
- that such development changes the existing character of parks.

The legitimacy of these perceptions is undermined by the ability of aforementioned management practices to create new incentives and revenue streams for preservation through maximisation of the non-consumptive benefits associated with tourism.

In the context of diminishing government funding per hectare of protected area in Australia, it is pivotal that parks agencies establish new ways of financing environmental services through commercial operations and the industry and community groups begin to recognise the triple-bottom line returns associated with tourism in national parks.

**FIG 4: VISITOR MANAGEMENT STRATEGIES**

PARK	GOVERNANCE	VISITOR MANAGEMENT	MARKETING
<b>HIGH USE URBAN PARKS</b>	These may be operated most effectively as autonomous corporative entities reporting to a Business or Tourism style Ministry, rather than to an Environment Ministry. The term ‘parastatal model’ has been applied and whilst definitions and conceptualisation of the term, semi-professional independent boards with a commercial charter appear to be common forms of governance in the case of such parks.	The key focus is on providing an entertaining and satisfying experience for visitors within a clean, attractive and safe environment. They tend to require high investment in infrastructure and operating assets to provide human comforts. Similar to staffing, the level of the service offer will vary between peak and off-peak periods. Temporary infrastructure will also be required (eg. portaloos, marquees) to ensure human comfort levels are maintained and risk is appropriately managed. Often this may involve a cooperative arrangement with one or more commercial partners.	Marketing has a strong consumer orientation, utilising traditional marketing principles, with the aim of maximising visitor expenditure in the Park. Marketing activity is generally highly visible in the form of brochures and web-based distribution, informing potential visitors of products, activities and events that have the potential to generate revenue.
<b>LOW USE URBAN PARKS</b>	These examples are often under the supervision of a local volunteer committee of management which may, with some support from local government, be granted limited autonomy to maintain the park (eg. mowing the lawns) and to undertake minor infrastructural developments (eg. installing flower beds and building picnic tables)	Their lack of visitation and environmental significance suggests that these parks tend to have a very minimalist level of management intervention. The ‘bare minimum’ will be spent on basic infrastructure and low level recreation facilities (eg. seating, picnic areas) to meet the basic needs of users by keeping the park clean, tidy and safe as much as a ‘duty of care’ to manage risk. If any further investment in facilities is forthcoming, it is likely to be generated by local community and volunteer organisations	A minimalist approach to marketing with basic information provided through local government publications and web sites as well as newsletters of community organisations in relation to any community events held in these Parks. There is unlikely to be a ‘park brochure’ as such.
<b>HIGH USE PROTECTED AREAS</b>	These may operate most effectively as semi-autonomous corporative entities with a high degree of operational independence (Phillip Island Nature Park is an example of this approach). Having both an environmental and a commercial charter, they need to report to a professional board of management for major policy decisions under the auspices of an Environmental Ministry, rather than to a more Business-oriented Ministry. The board would consist of professionals with commercial and environmental expertise.	High levels of visitation competing with high ecological values clearly indicates that visitor management practices must protect the visitors and the environment but also provide for high levels of visitor satisfaction in an attractive environment. This will require a high level of service effort to provide interpretation that is both entertaining and educational whilst proactively managing physical risk to humans. Accordingly, investment in infrastructure will be strategic to conserve the natural environment, provide an acceptable level of human comfort within environmental constraints and minimise risk.	Marketing has a strong ‘societal’ emphasis to ensure that the organisation’s mission of environmental integrity is pursued. Whilst park brochures, notes and web sites contain information about products, activities and services, some of which are of a commercial nature, there is an underlying theme to inform visitors and tour operators of conservation values and positively influence their behaviour towards the environment once in the park. Where the environmental values and human usage are high, more resources are required to effectively communicate this message
<b>LOW USE PROTECTED AREAS</b>	Because of their environmental significance, these are best operated under the direct auspices of a centralised protected area management agency with limited devolved operational autonomy. Devolved management may occur in conjunction with one or more specialist interest groups with expertise in the area or habitat. An Executive Management Group within an Environmental Ministry would determine overall policy, drawing upon specialist (co-opted) environmental and administrative expertise as required.	As ecological integrity overrides all other considerations, ideally the main emphasis should be on educating visitors about conserving and preserving the natural assets, whilst providing minimal infrastructure to ensure visitor safety. However, with a diminishing funding base for investment in assets, rather than try to pursue an infeasible service promise, in some cases park managers may simply reduce or remove the service promise altogether and attempt to quarantine areas from visitation through enforcement.	In these settings, park managers may restrict access through limits on visitor activities or capacity, or simply by advising people not to visit, informing visitors of the rationale for such policies. This notion of ‘demarketing’ is likely to become more prevalent as park agencies have more areas to manage but with relatively less funding, determining some parks as ‘non-operational’



#### CASE STUDY 4: WILLINGNESS-TO-PAY SURVEYS AROUND THE WORLD



While some Australian parks agencies have begun to conduct willingness to pay surveys in selected protected areas, fee regimes at most of Australia's iconic protected areas are historically based on guesswork, rather than research determining the willingness of visitors to pay or the associated opportunity costs (Thur 2010).

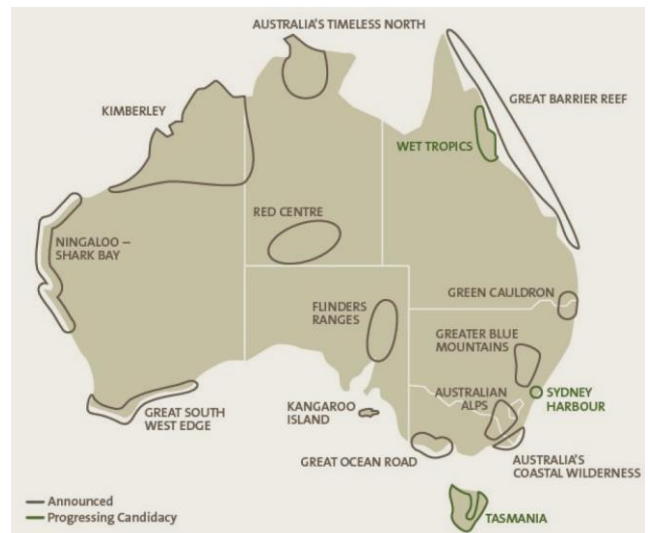
A study of scuba divers by Thur (2010) investigated the willingness to pay for diving in Bonaire National Marine Park. It reported an annual mean of US\$60.98, much higher than the currently levied fee of US\$10. Fewer than 6 per cent of the respondents would be unwilling to scuba dive if the entry fee was US\$20.

#### CASE STUDY 5: BOOSTING TOURISM YIELD IN AUSTRALIA'S NATIONAL LANDSCAPES

Australia's National Landscapes Program, developed by Tourism Australia and Parks Australia, provides a best-practice example of destination development, industry cooperation and tourism promotion in Australia.

Aimed at promoting the best of Australia's nature-based tourism experiences to international visitors, the program includes a focus on delivering iconic visitor experiences in nature through appropriate development of supporting destination infrastructures.

Experience Development Strategies and branding strategies are developed by each destination to guide infrastructure development and visitor experiences based on the unique attributes of each landscape. This strategic approach to destination management is vital to raising awareness of conservation value of these areas through iconic experiences in nature.



In Canada, 68 per cent of federal Crown lands are managed co-operatively with indigenous communities, while the Aboriginal Consultative Committee (ACC) advises Parks Canada at a national level. Indigenous communities thus play an important role in delivery of pest and weed eradication, back-burning and other activities as well as delivery of tourism experiences.

In June 2009, the Government of Canada released the '*Federal Framework for Aboriginal Economic Development*', which emphasises strengthening entrepreneurship, enhancing the value of Aboriginal

assets, and forging new and effective partnerships to maximise the economic development potential of Aboriginal Canadians.

Specialised programs have been established to cultivate aboriginal enterprises. A four year Aboriginal Leadership Development program operates with support from Parks Canada and is aimed at developing a cadre of Aboriginal leaders within Parks Canada. Of the Parks Canada workforce, 8.4 per cent are Aboriginal which makes it a leading Aboriginal employer. Meanwhile, banks provide specialised banking services, credit schemes, publications, and managerial training for indigenous people. Such practices are uncommon in Australia (Whitford & Ruhanen 2009).

In collaboration between the Department of Aboriginal Affairs and Northern Development Canada, Parks Canada is also developing 'authentic' Aboriginal cultural tourism projects and aims to provide authentic interpretation to park and heritage site visitors. Over the past year, Aboriginal Affairs and Northern Development Canada have contributed over \$5 million to 63 Aboriginal businesses for economic development purposes.

During 2010, Parks Canada contracted 251 Aboriginal businesses for the procurement of goods and delivery of services.



## 6. Conclusions

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It is widely acknowledged that protected areas need to be managed more innovatively (Cegielski et al., Inglis et al. 2005, Lindberg & Denstadli 2004, Schmiechen 2006). As is the case in other parts of the world, funding for protected areas in Australia has not kept pace with growing use and activities that occur within these areas, thereby threatening wildlife habitats, undermining the quality of facilities and leading to poor maintenance of infrastructure. The management of Australia's protected areas must shift from an exclusively ecological focus to a more complex interplay between conservation, recreation, tourism and education.

Alternative models to a centralised revenue, command and control model may provide a better option for managing some protected areas in this changing environment. Various joint management options could lead to private sector investment, the active involvement of adjacent communities, and opportunities to raise finance environmental services through tourism operations.

Extensive research has already been undertaken to develop visitor monitoring and evaluation models (Brown et al. 2006). Though challenging, it is important to integrate visitor, social and ecological information to develop a holistic approach to protected area management, considering that a protected area also has an impact on adjacent lands. An integrated management model that is recognised nation-wide has to be flexible, adaptable and to the extent possible should not require extensive human and financial resources.

Land managers around Australia should be encouraged to establish the total economic value attributable to protected areas. To do so involves going beyond seeing economic value exclusively through the lens of park entry or licensing fees. Investigations should include recognition of the environmental services delivered by eco-lodges and eco-tour operators through macro ecosystem schemes such the Australian Carbon Emissions Trading Scheme or Biodiversity Fund, possibly through the provision of carbon credits on an equivalent per hectare basis.

Improving park management and assessing in greater depth visitor willingness to pay also merits greater attention. The formation of foundations for each park may provide a means of attracting additional funding from interested citizens who wish to contribute to the development of their preferred park. Such park 'existence value' merits further exploration, since it could lead to imbalances between the funding of popular and less popular parks. While tour operator licencing exists in certain places, pricing of these payment systems has not been established through marketing research thus creating the potential for market failure, especially in terms of using price to manage demand. User-pay systems also offer the prospect of providing opportunities for the management of visitor numbers.

Finally, the management of protected areas should not be viewed in isolation, but in the wider context of complex ecosystems. Tourism, as a valuable industry which relies heavily on intact biodiversity and ecosystem services, provides an opportunity for park management to embrace market-influenced and outcome-based approaches for environmental protections which incentivise place-based environmental stewardship (Herniger 2012).

## 6.1 Funding options

The proceeding discussion readily identifies a range of income models for protected areas in Australia.

- 1 *A resource and revenue model.* In this model, government can generate revenue streams from the existence of protected areas in Australia to ensure their on-going protection. Some ready examples are:
  - a. A water quality charge wherein those downstream of protected areas pay a levy which is used to ensure that the protected area is kept in pristine condition;
  - b. A carbon sequestration and abatement system (possibly within the national carbon abatement scheme) wherein protected areas receive income based upon the amount of carbon dioxide sequestered by protected areas; or
  - c. A scientific research dividend wherein scientific discoveries, especially those with high commercial value (such as medicines), provide a funding stream to protected areas.
- 2 *An intrinsic value model.* In this model, the community at large pays a level to ensure that protected areas receive funding because of their inherent natural values.
- 3 *A visitor management model.* In this model, fees are levied on visitors in a manner that generates net income for the protected area for subsequent reinvestment in further protecting protected areas.

A combination of each and all of these mechanisms can be coordinated and applied to boost and more accurately value the benefits provided by protected areas across Australia.

## 6.2 Future research

A case study approach can be adopted to investigate each of the key issues outlined. However, the cases should reflect the diversity of protected areas in Australia. The research approach should be capable of being replicated for purposes of comparison. The approach adopted by Inglis et al. (2005) to the classification of protected areas may be more applicable for case study-based research concerning the formal IUCN typology.

The research should not be confined to one-off activity and it is notable that considerable visitor, economic and environmental impact information should be collected on an on-going basis and carefully evaluated in light of the goals for protected areas.

A common thread through all key issues is the need for attention and resourcing from key stakeholders and decision-makers. Establishing the economic value attributable to protected areas would improve decision-making around land-use, funding and development. As such, quantifying the value of protected areas in the neoclassical economic language of policymakers should be viewed as the leading priority in future research agenda.

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8TH FLOOR  
8-10 LOFTUS STREET  
SYDNEY NSW 2000  
PO BOX R1804  
ROYAL EXCHANGE NSW 1225

T +61 2 9240 2000  
F +61 2 9240 2020  
[contact@ttf.org.au](mailto:contact@ttf.org.au)  
  
[www.ttf.org.au](http://www.ttf.org.au)

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