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PRIVATE AND SOCIAL VALUES OF WETLANDS RESEARCH REPORTS

Policies for Wetland Management Change on Private Land: Case studies of wetlands in the Upper South East of South Australia and the Murrumbidgee River Floodplain in New South Wales

By S.M. Whitten and J.W. Bennett

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Abstract

The nature and extent of the values generated for wetland owners and the wider community is largely determined by the management actions of wetland owners. The extent and distribution of the values generated by wetlands in the Upper South East of South Australia (USE) and on the Murrumbidgee River Floodplain in NSW (MRF) were identified in Research Reports 9 and 10. Adopting specified wetland management strategies increases the benefits enjoyed by the wider community but at the expense of wetland owners. The wider community may seek to transfer some of their benefits to wetland owners in order to alter the management decisions they make towards outcomes preferred by society. This can be achieved through a range of different mechanisms. In this Research Report, a framework for assessing alternative policy options for influencing wetland management decisions is developed. This framework is then used to develop policy suggestions for increasing the net benefits to society that are generated by wetlands in the USE and MRF. The policy suggestions developed are categorised according to whether they facilitate, induce or compel wetland management change. Facilitative suggestions are market based while suggestions that compel change are based on a planned outcome enforced by government. Suggestions to induce change are based on altering market outcomes by changing the reward structure to wetland owners. Some of the recommendations for the case study areas can generalised to wetlands Australia-wide (generally those that facilitate and some aspects of those to compel) while the wider applicability of others would require additional analysis.

About the Private and Social Values of Wetlands Research Project

Wetlands generate values enjoyed by their owners and the wider community. Individual wetland owners manage wetlands for income generating purposes such as grazing and in some cases hunting and eco-tourism. These are private values from wetlands. Private owners, through the way they manage their wetlands, can change the availability of their wetlands for recreation benefits or wildlife habitat benefits that the community enjoys. These are social or community values of wetlands. In this project, the trade-offs wetland owners and the community face when making decisions about how to use their wetlands are being examined. This information will help the community to achieve better use of wetland resources on private lands.

There are five main steps to achieving our main goal of better wetland resource use on private land:

1. Model the changes in the physical attributes of wetlands resulting from alternative uses (biophysical modelling);
2. Estimate the community's value of the commercial (private) and non-market (social) outputs of alternative wetland uses (economic valuation);
3. Incorporate the value estimates into the biological modelling framework to establish the value trade-offs of alternative uses (bio-economic modelling);
4. Investigate alternative institutional frameworks that would give private wetland owners incentives to manage their wetlands in ways which maximise net community benefit; and,
5. Generalise the research findings to wetlands Australia wide.

Two case studies in differing locations with differing mixes of alternative wetland uses and wetland values have been selected for analysis:

- The Upper South East (USE) of South Australia; and,
- The Murrumbidgee River floodplain (MRF) between Wagga Wagga and Hay in New South Wales

Prior research reports from the project can be found at: apsem.anu.edu.au/staff/jbennettr.htm

1 Introduction

The goal of bio-economic modelling is the identification of biophysical management strategies that increase net community benefits. Bio-economic models of wetland management in the Upper South East (USE) of South Australia and the Murrumbidgee River floodplain (MRF) in New South Wales detailed in previous Research Reports in this series showed that the welfare of society could be increased by changing the management of wetlands. In both cases, the bio-economic models also show that wetland owners would be worse off if they changed the management of their wetlands to the socially preferred strategy. Hence, wetland owners will not voluntarily alter wetland management sufficiently without additional inducements.[1]

The major policy question is *how?* That is, how to get from the current situation that will result in the 'no change' outcome to the socially desired outcome. The challenge is to identify alternative sets of institutions[2] that will improve wetland management and hence increase the net benefits to society taking into account both the outcomes and the costs of using the institutions.

Appropriate alternative institutional arrangements provide additional inducements to change management. This is achieved by transferring some of the benefits received by non-wetland owners to owners of wetlands. The output of the bio-economic modelling in Research Reports 9 and 10 provides some guidance for developing these new institutions. Specifically, the bio-economic modelling shows the distribution of costs and benefits between wetland and other natural resource owners and the rest of the community over time.

Ways to transfer the broader community benefits through increased private sector contributions are sought by examining the current set of incentives facing wetland managers. These were briefly outlined in Research Reports 1 and 2 (USE) and Research Reports 4 and 5 (MRF). The current set of institutions generates a set of incentives that, in conjunction with the values held by managers, result in the private decisions that are made. Altering the current set of institutions will change the incentive structure facing resource managers, possibly leading to different outcomes. The costs of using differing institutional structures will also vary (such costs are termed transaction costs) and must be taken into account.

The aim in this research report is to develop policy options that could achieve an efficient and effective framework to induce socially desirable changes in wetland management. The report is divided into two parts. In Part A, the policy framework and case study background information is described. In Section 2, a generalised framework for wetland policy development is defined. The structure provided by this framework is then fleshed out with respect to the case study areas in Sections 3 and 4. Specifically, the property right framework is discussed in Section 3, and the level and nature of existing incentives and constraints to altering wetland management are reviewed in Section 4 together with a summary of the justifications for policy action. The development of alternative institutions that address the goal of increasing the net benefits generated to the community is the focus in Part B of this report. Sections 5, 6 and 7 detail suggested policy changes. In Section 5, suggestions common to both the USE and MRF are discussed, while Sections 6 and 7 focus on suggestions specific to the USE and MRF respectively. In each of these Sections, the recommendations on specific policy measures are highlighted. Some policy application issues are discussed in Section 9, including potential cost sharing arrangements, scheduling of policy implementation and the impact of alternative implementation mechanics. The report concludes with an assessment of the scope for generalisation of the proposed policies to wetland conservation in other regions and some concluding comments.

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[1] Wetland owners may also be unaware of the scale of the benefits or have false perceptions about the costs of achieving benefits. An appropriate extension program is called for in this situation.

[2] Institutions are defined as the set of rules (written and unwritten) covering relationships between individuals. These rules include laws and conventions of behaviour including the way in which individuals own assets (property rights) and interact with the assets (property rights) of others.

Part A Policy development framework and background information

2 A framework for policy development

Policy development is the generic term for the design and implementation of institutions to achieve a desired change to outcomes, in this case, the biophysical outputs of wetlands. Policy development:

i) is underpinned by the coordination framework used by society;
ii) must consider the nature of the current and potential incentives faced by each of the participants;
iii) proceeds by manipulating some or all of the incentives faced by participants; and,
iv) is not a single step process, but involves review and readjustment over time to ensure that decision processes are able to meet the objectives of society.

A brief economic analysis of the economics underlying policy development is provided in Appendix 1.

2.1 Which coordination framework should policy makers use?

Wetland policy specifically seeks to influence the institutions or rules within which decisions about wetland management are made. These rules constitute the framework used by society to coordinate the actions of individuals to produce and consume wetlands. Hence, wetland policy seeks to modify this coordination framework (Wills 1997). The institutions or rules generate the signals to wetland owners. These signals also provide the incentives to produce wetland outputs. There are two pure frameworks and a mixed framework that could be used to coordinate wetland outputs from privately owned land:

1. A planned framework: government could purchase the wetlands or directly coerce or influence wetland owners to manage wetlands to produce the outputs it believes the community desires (influences could include direct payments to wetland owners or decrease land costs via reduced rates in return for meeting specified community objectives for example);
2. A market framework: government could provide an institutional framework that enables wetland owners to seek the highest valued use for their wetlands but not provide any direct incentives to wetland owners (that is, no incentive payments or government coercion of wetland owners); or,
3. A mixed framework: government could provide a market framework and supplement this framework with some planned tools including market-based approaches. The aim is to encourage wetland owners to increase the level of wetland outputs beyond the current level.

The choice of the coordination framework has significant implications for the distribution of wetland ownership as defined by their property rights (see Box 1). Under a fully planned system property rights are vested in the state and managed by planners. But because planners cannot monitor and enforce all actions by individuals, a residual set of property rights falls to on-the-spot users of the assets (Wills 1997). Within a market system, individuals have either exclusive rights over a resource or specified rights to a particular attribute of the resource (Wills 1997). Mixed systems are common. Wills uses the example of seating at football games. Some seats are sold in the market place, while the 'football planners' allocate other seats to clubs and individuals. Scalpers may also reallocate some of the planned allocations in an informal (and sometimes illegal) market. Wills also notes that indigenous systems of resource allocation and consumption may play an important part in decision making about some systems.[3]

Government has historically sought to provide the majority of social (wetland) outputs in Australia within a planned framework because they have generally been considered to be 'public goods'. Production of public goods by the private sector is often thought precluded due to 'market failure' (more on this later). However, market failure is often the result of inadequate institutional structures rather than the nature of the goods and services produced. Furthermore, the actions of government

[3] The majority of wetlands in both case study areas are on freehold land. Hence, aboriginal traditions are not likely to impact significantly on wetland management in the case study areas. However, a significant area of land on the MRF is managed by NSW forests and may be subject to native title claims. The impact of indigenous systems of decision making on future wetland management may become increasingly important in such cases where it should be taken into account in the policy making process, for example Kakadu wetlands. The wetlands in the two case study areas are not significantly affected by such indigenous allocation systems hence they are not further considered in this research report. Productivity Commission (2001) contains a discussion of the impact of native title on land management.

aimed at correcting 'market failure' are no guarantee of an improved allocation of resources.[4] Hence, market failure or the existence of public goods may not be a sufficient reason for a planned approach.

Box 1: Property rights

Resource ownership is defined by a set of property rights. Property rights are 'a claim to a benefit (or income) stream that the state will agree to protect' (Bromley 1991, p. 2) or '*the individual's ability, in expected terms, to consume the good (or the services of the asset)* directly or to consume it indirectly through exchange' (Barzel 1997, p.3). Property rights must be excludable, divisible (in both space and scope) and transferable to be effective (Kasper and Streit 1998). These attributes are defined as follows:

- Excludability allows the owner to prevent others from consuming wetland outputs and relies on the practicality of identifying and stopping potential consumers. Consumption of the benefits of some wetland outputs is essentially non-excludable. For example, enjoyment of scenic vistas and flood mitigation.
- Divisibility is the ability to separate the bundle of property rights in space and scope. Divisibility allows property right owners to manage sub components of the resource separately or to divide off and sell excess resources (for example, a single wetland or trees from a wetland or the rights to fish and yabbies in the wetland).
- Transferability grants the ability to sell the property rights to others.

How is production and consumption information generated and used within each coordination framework? [5]

Under all the frameworks considered, information is required by the decision-maker (planner, producer or consumer) about the costs and benefits of producing more wetlands. These include both monetary and non-monetary costs and benefits. These costs and benefits were identified in Research Reports 9 and 10. The framework also needs to generate signals or incentives to wetland owners to act on the information about costs and benefits.

Under the market framework, information and signals are generated via the process of negotiation between buyers and sellers. As sellers negotiate a price at which a product is sold they reveal information about the cost of producing an extra unit of the product. As consumers negotiate a purchase price they reveal information about the value they enjoy from consuming an extra unit of the product. The transfer of money from the buyer to the seller (that makes both better off) provides the incentive to act in the market – this is referred to as the 'gains from trade'. The information about the costs and benefits of production is revealed in the market without any one person knowing enough about supply and demand to be able to arrive at the same outcome independently (Wills 1997).

The actions of buyers and sellers in a market relies on several factors:

1. property rights over the goods traded (the seller can exclude buyers from consumption without purchase and is able to transfer or sell the goods or services);
2. buyers and sellers know what rules constitute a sale;
3. information about the quantity and quality of the goods or services being traded; and,
4. information about what will occur between the sale and delivery of the goods or services.

Hence, there are additional costs in markets associated with:

i. codifying property rights and identifying and enforcing ownership over property rights;
ii. seeking out buyers or sellers of property rights;
iii. negotiating a sale;
iv. measuring the quality and quantity of goods; and,
v. contracting specifications about the transfer of property rights. Contracting issues include when delivery will occur and the uncertainty about any intervening period.

These additional costs of markets are referred to as 'transactions costs'. They are important because they consume resources that could be used for other purposes (Wills 1997).[6]

[4] This is because of problems of 'government failure' (Wills 1997).
[5] The discussion in this section closely follows Wills (1997).
[6] A reviewer points out that market failure may also arise as a result of monopolies, including natural monopolies. These issues are addressed to a lesser degree later in this report.

If transaction costs are sufficiently high they will outweigh the potential 'gains from trade' and markets will not function as a framework for coordinating social decisions – termed 'market failure'. Market failures are generally divided between externalities [7] and aspects of public goods. In both cases the transaction costs of establishing a market outweigh the potential gains from trade.[8] Hence, without a market, people making market decisions do not take externalities into account. For example, if wetlands maintained for duck hunting also provide flood protection downstream, the market for duck hunting will not reflect the benefits of flood protection. Society may seek alternative non-market institutions in order to improve their overall wellbeing because of the high transaction costs and hence the emergence of externalities. These can include:

- behavioural conventions and norms (tradition);
- organisational structures that encompass the externality (central planning within voluntary smaller groupings such as clubs and firms);
- non-voluntary exchanges of rights in courts; and,
- government created signals and incentives (central planning by governments).

Society may also believe that markets are not an appropriate coordination framework because they consider that some assets (or property rights) should be shared (an ethical consideration) or they consider the distribution of property rights that results from the market to be unacceptable (a distributional consideration). Although both possibilities may be important in a democratic society they are not further addressed in this report.

The non-market institutions considered by society may provide a less costly means of signalling the benefits or costs of production and consumption. One option is central planning by government. The planning framework involves elected politicians and bureaucrats making decisions for producers and consumers that would otherwise have been made through market mechanisms (Wills 1997). In order to achieve optimal production and consumption the politicians and planners must know at least as much about the costs of production as resource owners and at least as much about the benefits of consumption as consumers. Concentration of this information requires the diffuse information to pass between more people en-route to the planner. The planner could simply ask producers and consumers to tell them the information they need but there are three major problems with such an approach (Wills 1997):

1. It is very costly to gather such detailed information;
2. Producers and consumers may have an incentive to distort the information they provide in order to gain; and,
3. Opinions change over time and depending on the relevant context.

As Wills notes, it is less costly to gather less detailed information via opinion polls, voting or lobbying but such information is blunt and unlikely to be representative. Furthermore, planners face a similar range of costs to the transaction costs in the market. These costs are incurred in identifying stakeholders, measuring production and consumption and defining and enforcing planners' property rights (Wills 1997). The planner must then impose the decision on producers and consumers. This requires exclusive property rights over production as a minimum. In addition, the politicians' and planners' own incentives must correspond directly with the desires of society. Hence, a centrally planned outcome requires the same information as a market concentrated in a planning entity, additional assumptions about the planners' and politicians' incentives and faces similar costs to the transaction costs in markets (including more onerous information costs).

What incentives are generated from the coordination framework?

It is important to consider the efficiency and effectiveness of the incentives that are generated under each framework before a preferred coordination framework can be identified. The efficiency and effectiveness of the incentives generated dictates how likely the framework is to generate the outcome that society desires.

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[7] Externalities occur when one person's actions affect another person's wellbeing and the relevant costs and benefits are not reflected in market prices (Industry Commission 1998). A more technical analysis of the impact of externalities on wetland conservation is provided in Heimlich et.al. (1998, and available on the Internet at www.econ.ag.gov).

[8] Public goods are a specific extreme class of externalities where the transaction costs of exclusion are prohibitive and the good exhibits non-rivalry in consumption. Non-rivalry in consumption means that consumption by one individual leaves no less of the good for others to consume.

A market system generates an outcome in which the benefits to consumers and producers are maximised because buyers are motivated to purchase as cheaply as possible and sellers to sell as dearly as possible.[9] Hence, although sellers would like to sell more dearly than the market price they cannot, as there would be no buyers and vice-versa. In spite of their own incentives to move to a point that would reduce the net benefit of society they cannot, because to do so would reduce their own welfare. However, the assumptions required to generate this incentive mix infer the possibility of 'market failure' where they are violated, and, cast doubt on the likelihood that the market framework leads to the outcome desired by society.

A planned framework is reliant on sufficient information about the benefits and costs of alternative options and the incentives of the planners and politicians who cannot be assumed to act entirely benevolently (Wills 1997). Within a fully planned system, by definition only the incentives of planners and politicians matter. This is because, as a minimum, exclusive property rights over production are required to enforce a planned outcome. The incentives of politicians are expected to include benevolence and other factors such as re-election and career rewards (for example, ministerial positions). Similarly, the incentives of bureaucrats include their legislative instructions and career prospects, among others. Wills (1997) notes that the structure of democratic governments reflects the presence of other incentives by restricting the actions of both politicians and bureaucrats and subjecting them to a series of checks and balances. Finally, the political and bureaucratic processes are also highly inflexible and slow to respond to changing conditions. Together with the distortions created by taxation systems these factors give rise to what is generically referred to as 'government failure'. These aspects of potential government failure must be traded off against the advantage that government has – its' coercive powers.

The extent of government failure inherent in the taxation system is an important element in whether the community is better off if government contributes money to achieving wetland management change. It is often assumed that a dollar contributed by government is equal to a dollar contributed by the private sector but this ignores the welfare costs of tax collection in the economy (Alston and Hurd 1990). Estimates of the scale of costs vary. In an Australian context the most recent estimates are by Campbell and Bond (1997), who suggest that the net present value of the benefits must be at least 1.19 to 1.24 times the cost for a project to 'break-even'. Findlay and Jones (1982) calculate a similar estimate and suggest that the net present value of the benefits of government spending must be 40 percent greater than the costs. Hence, the costs of market failure would have to exceed at least 20 percent before government transfers should be considered.

The appropriate policy framework

The preceding discussion demonstrates that neither a market nor a planned policy framework is always likely to achieve the outcomes that are desired by the community. The market framework is underpinned by the actions of government to establish appropriate institutional structures (for example, property rights) and organisations to monitor and enforce these structures (for example, police forces and the judiciary). Market frameworks are likely to fare better where property rights are well defined, excludable and traded (that is, where transaction costs are low). Planned outcomes may generate superior outcomes where institutional arrangements are inadequate, the costs of information collection are relatively low and the incentives generated transparent and open to low-cost monitoring. That is, planned outcomes may be superior where the costs of planned outcomes are lower than the transaction costs in markets. Hence, a mix of market and planned policy outcomes offers the potential to generate an outcome superior to that achieved by either alone.

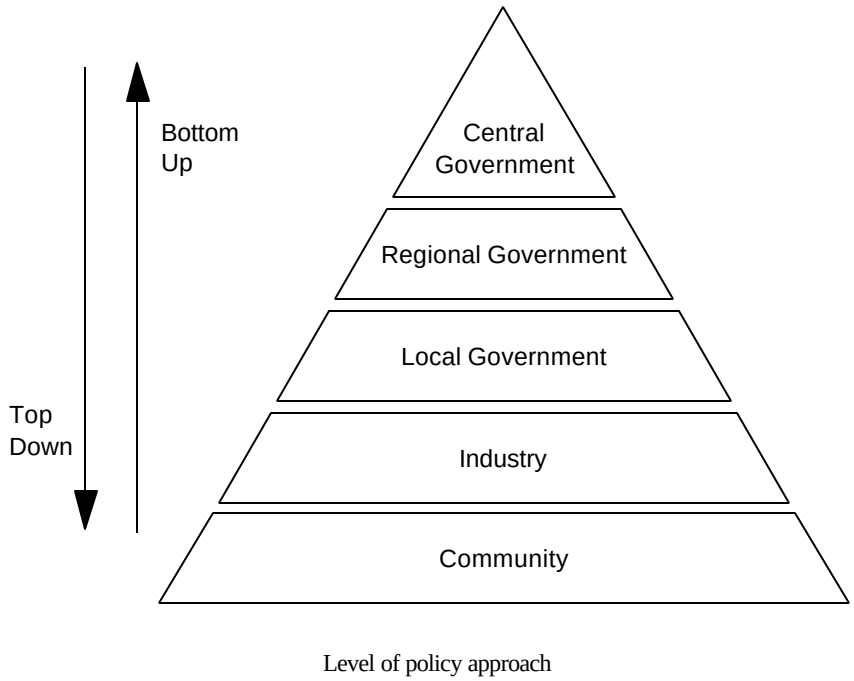
Markets, in most cases, generate information and incentives far more cheaply than under a planned framework. Hence, a market framework should be preferred unless the costs of their failure (market failure) outweigh the costs of achieving the outcome via a planned solution (government failure). As Stroup and Shaw (1989) write 'we need to compare the problems stemming from imperfect property rights with the "solutions" put into effect by imperfect government'. That is, a planned framework should only be used when it is clear that the consequences and likelihood of market failure outweigh the consequences and likelihood of government failure.

[9] A more complete assessment of the incentives generated within the market system is beyond the scope of this research report but a short summary is useful for assessing policy generation. A more complete discussion is provided in Wills (1997).

Bromley (1997) defines three levels of a mixed approach, policies that facilitate, induce or compel management change. The facilitative level refers to purely market based policies directed at establishing an institutional framework for market based provision of outputs, for example refining the allocation of property rights. The inducive level refers to a mixed incentive framework whereby government directly influences market outcomes, often retaining a basic focus on market mechanisms. Policies that compel change result from application of planned outcomes using government's coercive powers. Bromley (1997, p. 51) further notes that policies that compel tend to alienate producers (as they abrogate their property rights) and may require a very high level of enforcement costs.

Policy approaches are also sometimes categorised within a 'top-down' or 'bottom-up' framework as shown in Figure 1 (Young and Gunningham 1997). Market based approaches are usually 'bottom up' in their day to day operations. The associated policy arrangements regarding distribution of property rights and market regulations are usually 'top down' to some extent. Planned economic systems are rarely 'bottom up'. Facilitative and inducive policy structures are more likely to be 'bottom up' driven while coercive policies are more likely to be 'top down' in nature. Policy mixes that include 'bottom up' facilitative and inducive elements are more likely to be efficient and effective because of a greater reliance on market allocation mechanisms. Hence, they are less likely to rely on coercive approaches that may be resisted by wetland managers.

Figure 1: Major types of policy arrangements



Source: Adapted from Young and Gunningham (1997). Note that informal incentives are not shown. They are driven from within the society itself.

The advantages of each framework and some key assumptions regarding the costs and benefits of alternatives have been discussed. The costs and benefits of the alternative policy options can be used as a basis for choosing an appropriate mix of market and planned outcomes that will approach most closely the outcome desired by society.

2.2 Policy and wetland owners

In this section, the decisions faced by wetland managers are placed in the context of the theoretical framework developed in Section 2.1. The general extent and causes of market failure are identified and contrasted against the potential for government failure by examining the incentives of the owners of

wetland resources. The potential causes of market and government failure are then identified as areas for the possible development of policies to improve wetland management.

Wetlands require the combination of several resources including land, water, flora and fauna. These resources are unlikely to be owned by a single individual. Hence, the incentives of all resource owners are important in determining the production of wetland outputs (Bennett 1999, Adger and Luttrell 2000). Resource owners are assumed to seek to maximise their net benefits from the management of the natural resources they own. These net benefits include both monetary and non-monetary benefits and costs.

The non-monetary benefits include indirect impacts on monetary outputs and enjoyment by resource owners. Non-monetary benefits may include leaving a bequest to future generations, the opinions of peers and the 'duty of care' recognised by the landowner as well as the owners consumption of wetland outputs (see for example Research Reports 2 and 5).

The monetary benefits generated from selling wetland outputs, including food and fibre, recreation and other outputs, are determined by the wetland owner's 'relationships' with:

1. the consumers of natural resource outputs;
2. the owners and managers of other resources required to produce outputs; and,
3. those harmed if the resources were reallocated to other uses.

These relationships define the nature and limits of market-based information and incentives available to wetland owners. The relationships are augmented by the extent to which planners determine the incentives facing owners. Hence, these relationships are market-based in some cases while in others they are planned.

In the remainder of this section, each of these relationships is briefly examined to identify potential areas for policy development. In the next subsection, it is assumed that there is a single owner of all resources combined to produce the outputs. Similarly, it is assumed in the first two subsections that no restrictions exist as to how the manager can use these resources. Both assumptions are relaxed in the third subsection. These assumptions allow a focus to be drawn on the foundations of policy.

The relationship between natural resource owners and consumers of the outputs

The resource owner is assumed to seek to maximise their net benefits from the resources. They will seek to answer three questions about their portfolio:

1. which outputs are produced by which natural resource system?
2. who consumes these outputs? and,
3. can a fee be negotiated and collected for the goods and services consumed?

The linkages between particular wetlands and the outputs it produces are poorly defined for many wetlands. For example, in many cases current knowledge and information is inadequate to measure the effectiveness of individual wetlands in providing flood mitigation or water quality outputs (Scodari 1990). The implication is that a producer may not be able to identify which outputs are produced by their wetlands in order to ensure continued production and therefore sales of the product.

The physical outputs produced by wetlands at a regional level were identified and defined in Research Reports 3 (USE) and 6 (MRF). It was not possible to quantify the output for some outputs (for example, carbon sequestration in recreated wetland systems). More information about the outputs produced by wetlands would be required to sell such products at present. Other benefits such as biodiversity and option benefits are concealed by the difficulties of predicting the future.[10] Hence, it is complex and costly to estimate the quantity of these outputs produced by the wetlands.

The reverse problem occurs where a wetland output can be identified and quantified but the specific consumer of the output cannot. Identifying consumers is simplified if thought of in two parts: the location of consumption, and whether individual consumers can be identified (and hence, excluded if no payment is made for consumption). Consumers of goods and services that are consumed at the physical location of the wetland are generally readily identifiable with the exception of passers-by who

[10] Where an unknown quantity of a defined product is produced an expected value can be quantified and traded (as in option and insurance markets).

enjoy aesthetic benefits. Where the location of consumption can be identified it may still be impossible to identify individual consumers. However, in many cases identification may be technically possible but prohibitively expensive – that is, the transaction costs are too high. The implication is that a potential producer may not be able to identify the consumer with whom a contract can be negotiated to cover the costs of production. A list of potential wetland outputs and consumers is shown in Table 1.

Table 1: Linking consumers to producers (wetland owners)

Benefit / harm	Location to which output supplied	Identifiable consumer	Defined link to wetland *	Type of good #
Wetland Benefits				
Waterfowl hunted	Wetland	Waterfowl hunter	End product	Private
Trapping/hunting	Wetland	Trapper/hunter	Yes	Private
Birds seen and identified	Wetland	Birdwatcher	End product	Private
Fish and crustaceans	Wetland	Fishers	End product	Private
Fish and crustacean nursery	Water linked areas	Future fishers	No	NPG
Timber	Wetland	Timber harvester	Yes	Private
Scenic vista	Wetland	Land owner and passers-by	No	NPG
Recreation	Wetland	Wetland visitors	Yes	NPG
Pest control	Surrounding areas	Neighbouring farmers	Sometimes	Local public
Erosion control	Downstream	People downstream	Sometimes	D–public
Flood mitigation	Downstream	People downstream	Sometimes	D–public
Grazing input	Wetland	Land owner	Yes	Private
Fire break	Wetland	Land owner and neighbours	Yes	Local public
Ground water supply	Aquifer	Land owners within aquifer	Sometimes	Private
Water supply	Wetland	Land owner	Yes	Private
Improved water quality	Downstream	People downstream	Sometimes	D–public
Unknown future benefits	Unlimited	The wider community	No	Public
Future alternative wetland uses	Unknown	The wider community	No	Public
Existence of natural areas	Unlimited	The wider community	No	Public
Wetland harms				
Nuisance and disease vectors	Surrounding areas	Local community	Yes	Local public
Weeds	Downstream	Downstream farmers	Sometimes	D–public
Feral and pest animals	Surrounding areas	Land owner and neighbours	Yes	Local public
Reduced productivity	Surrounding areas	Land owner and neighbours	Yes	Local public
Fire danger	Surrounding areas	Land owner and neighbours	Yes	Local public
Bogged livestock	Wetland	Land owner	Yes	Private
Foul odours	Surrounding areas	Local community	Yes	Local public
Access difficulty	Wetland	Land owner	Yes	Private
Subject to regulation	Wetland	Land owner	Yes	Private

Note: Beneficiaries can and often do include the landowner.

* 'Yes', if the benefit can be linked to wetlands that produce the benefit.
'No', if the benefit cannot be linked to a particular wetlands.
'Sometimes' where some benefits can be linked and not in others.
'End product' where only the final output can be linked to the wetland.

\# Goods are defined as public purely on the basis that they are non-rival and non-excludible. Hence local public goods are non-rival and non-excludible within an area surrounding the wetland and downstream public goods (D-public) are non-rival and non-excludible downstream of the wetland.
'NPG' = Near public goods are a form of impure public goods that are non-rival but are excludible and may be subject to congestion.

It may not be possible to negotiate a payment even when the consumers of wetland outputs can be identified. This is because the goods and services produced by wetlands range from pure private goods (for example grazing for livestock) through impure public goods (for example pest control) to pure public goods (for example existence values) (see Box 2 for more information about public goods). That is, wetland outputs commonly violate one of more of the assumptions required to achieve an ideal market. Wetland outputs are categorised between classes of goods in Table 1.

Box 2: Public goods, impure public goods and private goods

Public goods are characterised as exhibiting non-rivalry and non-exclusion in consumption. *Excludability* relates to the technical impossibility, or lack of cost-effective exclusion, of non-paying consumers. In contrast to pure private goods, public goods are completely *non-rival* in consumption, meaning that the consumption of one individual leaves no less for others to consume. For example, a wetland produces a scenic vista to passers-by. The wetland owner cannot prevent passers-by from enjoying the view (*non-excludability*) and the enjoyment of the view by one passer-by leaves no less view to be enjoyed by later passers-by (*non-rivalry*).

Impure public goods are characterised as exhibiting some aspects of either rivalry or excludability. Rivalry may be in the form of congestion. Congestion occurs where additional consumers beyond a limit increasingly reduce the benefits to existing consumers. Excludability may include regional excludability (for example, the public good is confined to a local government area) or technical excludability (for example, property rights could exist but do not at present).

Private goods are characterised as exhibiting complete *rivalry* and *excludability*. For example, if A owns an apple, A can prevent B from consuming it (*excludability*) and once A has consumed the apple nothing remains for B to consume (*rivalry*).

The writings of Olson (1965) and Cornes and Sandler (1996) are pessimistic about the potential for private sector production of public goods, but they do provide a theoretical framework within which production of impure public goods can occur. OECD (2001) suggest that the characteristics of most impure public goods may lead to inefficient production by the private sector that must be traded off against the inefficiencies of the public sector. Entrepreneurs and local communities (see for example Ostrom 1990 and Glaeser and Shleifer 2001) also find ways of excluding consumers from goods that were previously non-excludable. Some ways that public goods are produced include:

- The owner may receive sufficient incentive from personal consumption of outputs.
- The owner may receive sufficient voluntary payments in combination with their personal consumption of outputs.
- Using institutional structures that reduce otherwise prohibitive transaction costs. For example, in some cases property rights could be strengthened to ensure that owners are able to sell the output. An example is organisations that act as franchises for consumers seeking to purchase outputs by attaching their 'brand name' thus reducing the asymmetric information between consumers and producers and reducing the free-rider problem such as The Nature Conservancy in the US or Wetland Care Australia and Bush Heritage in Australia.

As discussed in OECD (2001), policies designed to assist in the production of public good wetland outputs often need only be sufficient to ensure one of the above criteria are met, not the full costs of production.

OECD (2001) also discusses the potential for public goods to be jointly produced with other private good outputs. For example, biodiversity outputs may be jointly produced with wetland conservation to provide habitat for game waterfowl species. Hence, a policy option may exist to encourage production of pure public goods jointly with impure public goods or private goods.

The relationships between owners of natural resources

Ownership of the resources combined in wetland systems is usually divided and may be subject to differing levels of regulation and corresponding property rights held by private owners. For example, owners of land and water resources will be subject to differing rights structures. Resource ownership is also often further subdivided into differing classes with differing rights attached. For example, flora and fauna can be subdivided into indigenous and non-indigenous species, then between endangered and non-endangered species (among others). Hence, the benefits to the owner of owning each resource class may differ and may even be negative. The institutional framework defines the relationship where multiple owners hold different resources.

Ostrom and Schlager (1996) divide levels of property rights into five ownership status types. Each type is then classified according to:

- Access: The right to enter a defined physical area and enjoy non-subtractive benefits (eg hike, canoe, sit in the sun);
- Withdrawal: The right to obtain the resource units or 'products' of a resource (eg catch fish, appropriate water etc.);

- Management: The rights to regulate internal use patterns and transform the resource by making improvements. Hence, management is a special sub class of Kasper and Streit's (1998) divisibility;
- Exclusion: The right to determine who will have an access right, and how that right may be transferred; and,
- Alienation: The right to sell or lease either or both of the access and withdrawal rights.

Other owners or the government may hold rights that are not held by various categories such as 'authorised users'. For example, duck hunters essentially acquire a withdrawal right (via registration and purchase of a licence) with respect to specific waterfowl and the status of authorised users on specified public game reserves (such as Bool Lagoon in South Australia).

Table 2: Bundles of rights associated with positions

	Ownership status				
	Owner	Proprietor	Claimant	Authorised user	Authorised entrant
Access	X	X	X	X	X
Withdrawal	X	X	X	X	
Management	X	X	X		
Exclusion	X	X			
Alienation	X				

Source: Ostrom and Schlager (1996, p. 133)

Private access to some wetland has been reduced or removed by the state thus reducing ownership status and increasing the property rights held by politicians and planners. For example, land clearance regulations (in most Australian States) and banning duck hunting (in New South Wales) remove access to the associated benefit streams from timber harvesting and access for waterfowl hunting. Other benefits are inalienable or owned by others. For example, many potential benefits from ranching native fauna are retained by the state (such as: sale as pets, for game production or to restock areas where they have become extinct).

The fact that governments have changed the ownership of property rights indicates that the structure of property rights is not permanent (further supported by Bromley 1997, Bromley and Hodge 1990 and Colby 1995 among others). In Australia, property rights over wetlands are usually split between the holder of the land title and government, while other private owners may also hold specified property rights. The property rights division determines which aspects of wetland management are determined in markets and which by government. Hence, the division of rights determines the interface between market decision making and government decision making in wetland management.

The agreements between owners of differing property rights required to facilitate production of wetland outputs are often costly and includes exchanges within and between individuals, firms, governments, clubs, families and non-profit organisations.[11] Alternative institutions may reduce the size of these transaction costs. Governments have sometimes sought to create institutions that further reduce the transaction costs by concentrating decision-making or granting specific organisation structures a competitive advantage. Organisations also reduce transaction costs via facilitating consumer or contributor ownership of some or all production resources. Organisations that are able to meet threshold requirements for taxation incentives have reduced internal costs and so gained a major competitive advantage.

The relationship between natural resource owners and access to benefit streams

Individuals are not privileged with free and unfettered access to all potential benefit streams that ownership of the resources combined in wetlands could provide. Access to benefit streams is restricted by two main constraints:

[11] The costs of contracting between these parties may well be significantly different. For example, discussions with non-profit and government officials undertaken by the principal author suggest that contracts between government and individuals are more costly than between individuals and non-profit organisations. Direct analysis of this issue is beyond the scope of this research report, but is important in determining the relative extent of government and market failure.

1. the right to freedom from wrongful harms as traced from common law precedents, in particular from the English Court system; and,
2. regulation imposed as a result of government legislation.

Common law precedents have evolved differently over time in Australia compared to other countries where the system is retained (for example the United States). Common law is based on the maxim 'use your own property so as not to harm another's' and is often referred to as a 'duty of care' with respect to use of property. "The maxim reflects a balance under the common law between the rights of neighbours to both *use* and *enjoy* their property; in using one's property, another's enjoyment must not be compromised" (Brubaker 1995, p. 40).[12] Common law remains a powerful tool to protect individuals from harmful impacts where wetland use has been changed, but has been over-ridden by government regulations in many cases.[13] Common law can also increase the obstacles to natural resource restoration where this creates a potential harm to others. Bates (2001) notes that many instances of a 'statutory duty of care' are now being imposed that can effectively extend the range of activities that are regarded as imposing harms.

Legislation that results in regulations constrains the freedom of contract. Individuals are denied the opportunity to contract to have their rights imposed-upon. These changes have generally been premised on one or more of the following:

1. the 'public good' outweighs the harm to individuals;
2. attempts to reduce the transaction costs associated with litigation in the courts by replacing it with a regulatory structure; or,
3. shifting the cost, or burden of proof, from those harmed (as is the case under common law) to those who are potentially harming.

'Public good' regulation has two main impacts:

1. beneficiaries receive a 'free good', while imposing harms without compensation on others. This is generally referred to as a 'taking' (Brubaker 1995); and,
2. this changes the incentive structure of both the beneficiary and those harmed.

Where the government uses regulation to attempt to enforce the production of environmental outputs (for example land clearing restrictions) costs are imposed on current resource owners instead of the wider community that would benefit from the changes. As Wills (1997) notes, regulation is effectively a transfer of property rights, usually from the current owners to the planners. For example, land clearing laws generally restrict the withdrawal rights to on-farm uses only while other rights remain unaffected.

The costs of accessing court structures remain high for most individuals. Additional disincentive is provided by the possibility of having to pay both parties legal costs where the action is lost. Hence, government has often replaced common law rights with regulated outcomes but this effectively results in 'compulsory takings' at the arbitrator's price and may be subject to 'capture' by interest or industry groups leading to inefficient outcomes. Furthermore, because the regulators have a captive market, they have few incentives to keep transactions costs low, as there are no alternative mechanisms for complainants. In some cases, self-regulation arrangements, or devolved licensing arrangements can reduce the costs of compliance and policing.

The precautionary principle may be warranted in some cases (such as inherently dangerous activities), but where compensation is available, and damage is reversible, it is difficult to justify. For example, it may be warranted to impose the precautionary principle on marina developments that may cause acid sulphate soil discharges that are now known to damage potentially large parts of estuaries.

2.3 Other policy considerations

Three further issues should also be explicitly considered in policy development:

i) additional efficiency and effectiveness issues

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[12] The right to freedom is only from specified harms that are determined to be wrongful. For example, a new shopkeeper opening next to an existing store may well harm that store's owner. However, such harms are a legitimate part of business and shopkeepers are not usually entitled to protection from competition.

[13] Maintaining a wetland in its natural state cannot normally be regarded as imposing a harm on others but recreating a wetland may be regarded as imposing a harm even if the harm existed historically due to a wetland in its natural state.

ii) cost sharing of between producers and consumers of wetland outputs; and,
iii) the sequence in which policies should be applied.

Most efficiency and effectiveness issues have been discussed in Section 2.1. Two further issues of importance are how to facilitate innovation in wetlands management and how to reduce perverse incentives to wetlands destruction or disincentives to wetlands management. Flexibility in applying the policy developed should be emphasised in order to maximise the potential for innovation in wetland management. The incentive regimes should be targeted towards outputs rather than inputs and aim to allow wetland owners to experiment in the mix of inputs (land, labour and capital) that they use to manage their wetlands. Encouraging innovation and entrepreneurial behaviour, at both an applied policy and on-ground management level, expands the pool of knowledge about wetland policy and management and helps the discovery of lower cost ways of achieving conservation outputs (see for example Boyd, Caballero and Simpson 1999 and Binning and Young 1997).

The regulatory environment should minimise the disincentives to wetland owners of either changing to, or continuing, wetland management to produce environmental outputs. Regulations should seek to minimise incentives that may lead to 'shoot, shovel and shut-up' behaviour by wetland owners. Where wetland owners recreate wetlands, or change wetland management, the change to management should not automatically be irreversible. For example, once a wetland is recreated the owner should not be legally prohibited from re-draining the wetland. By making the management change irreversible the associated risk increases and reduces the incentives to wetland owners to change management.[14]

Sharing of the costs of achieving the benefits to society of wetland management change needs to be considered. Hutchinson (1997) suggests that where current outcomes are below the reference level, compulsion based policies are appropriate to achieve the reference level (that is, no compensation is paid for changing management or producers must internalise the externality). Application of such policies is generally termed as the 'polluter pays' principle. Where outcomes above the reference level are sought, the beneficiaries are expected to pay either directly or via government – that is, application of the 'beneficiary pays' principle.

The reference level is defined as the distribution of property rights between private entities and the state that is regarded as equitable by society. Hutchinson (1997) defines the reference level by the 'responsibilities or duties associated with land ownership', in this case wetland ownership. The reference level cost sharing basis is similar to that drawn in Australia by Aretino et al. (2001) in developing a conceptual framework for biodiversity cost sharing. Where outcomes above the reference level are desired, inducive policies are suggested as more appropriate. Hence, shifts in the reference level effectively result in reduced property rights for wetland owners as the incentive structure shifts from inducive to compulsion. Inducive payments should not be made below the reference level as this can politically reinforce claims to property rights that are not held by the owner (Bromley 1997 and Aretino et al. 2001).[15,16] Shifts in the reference level that result in compulsion also have the potential to create perverse incentives for resource owners whereby they create an incentive to remove the resource rather than face the increased costs of management that are imposed. Such perverse incentives may result in behaviour sometimes termed as 'shoot, shovel and shut-up'.

Bromley (1997) notes the difficulty in identifying the reference level, pointing out that producers of wetland outputs are likely to argue for a lower reference level than consumers or government. Furthermore, a shift in the property rights structure is not costless (Bromley and Hodge 1990, Bromley 1997, Colby 1995 and Aretino et al. 2001). For example, as Wills (1997) demonstrated, a shift from a market-based system to a planned system may incur significantly larger transaction costs in gathering information and generating incentives. Hence, an uncompensated shift in property rights should not automatically occur because the equity condition is violated. Aretino et al. and Bromley note that

[14] Where significant government resources are input there are grounds for requiring that management change be permanent or continue for a specified period.
[15] Such payments can also induce perverse behaviour whereby landowners destroy the resource in order to access to payments in the future can be received. For example, an owner of a forest may harvest the timber and seek to access assistance to revegetate the forest area. The assistance to revegetate the area effectively increases the net return to the landowner from timber harvesting thus creating a perverse incentive to destroy the resource.
[16] Some special cases exist where payment may be justified as will be discussed later in the paper. For example, rights claimants may be financially unable to alter significantly their production of wetland outputs due to the large capital cost of rehabilitating or recreating wetlands.

frequent shifts in property rights create uncertainty that increase the transaction costs of producing outputs.

Aretino et al. (2001), Industry Commission (1997) and Young et al (1996) all recognise the current inadequacy of property right definition with respect to natural resources including wetlands. Hence, a precondition to assessing cost sharing is to define more clearly the ownership of resources needed to produce wetland outputs (and hence facilitate improved information and incentives in markets). Furthermore, it is important to consider the impact on transaction costs that will result from any shifts in perceived or actual property rights.

Finally, once a decision about the appropriate set of policies is made based on their relative efficiency and effectiveness, decisions need to be made about the sequence in which policies are applied and the appropriate mixture of policies. As noted, policy development is not a single step process but involves review and readjustment over time. Many policies are based on a set of underlying property rights and institutions. Hence, the initial phase of policy application should focus on ensuring the adequacy of the underlying property rights and institutions. The importance of an appropriate property right framework for implementing cost sharing arrangements was noted previously in this section. Once a policy approach is in place, policies should be implemented in order of their expected efficiency. That is, all policy options are costly in terms of the resources required to implement and monitor them and all policy options generate an exp ected stream of benefits over time. Those policy options expected to generate the highest net benefit to the community should be implemented firstly, followed by less effective options. No further policy options should be implemented once the expected benefits become lower than their alternative uses.

3 Current property right framework in the USE and MRF

Policy seeks to alter the management decisions made by wetland owners. Hence, all policy is based on changes to the pay-off structure generated by the current underlying property right structures. As noted, the pay-off structure can be altered by policies facilitating, inducing or compelling wetland management change. Each type of policy option is founded on the existing underlying property right framework. Hence, these rights are the central institution to incentives for action. The property rights held by wetland owners and by other individuals or groups in the private sector are detailed in Table 3 for the USE and MRF case study areas. Residual property rights (those not held by wetland owners or other private sector owners) are held by the state.[17] Residual property rights include resumption for specified purposes, escheat, police powers and other such rights.

[17] The state includes local, state and federal government. Each of these levels of the state holds differing property rights. The majority of residual property rights are vested at the level of the states.

Table 3: Current property rights to wetlands

Resource	Rights held by land owner in USE and MRF	Property rights restrictions common to USE and MRF (not held by the state)	Property right restrictions specific to USE	Property right restrictions specific to MRF
Land	Freehold title notionally grants the largest possible bundle of property rights. However, exercising the full bundle of rights is subject to the rights held over resources that are currently packaged with the land. For example, freehold title over land covered by native vegetation may not permit unpackaging the bundle by clearing the land. Other restrictions on property rights may be imposed by zoning laws that can only be accessed via application. Partial alienation may also require application for a development permit. Restrictions on landuse or resource bundling and unbundling options may also be imposed by conservation covenants and management agreements with the state.	Some rights such as mineral or rights may be held by other individuals. In some cases, an easement may grant access or other rights to other individuals. Management rights of land within a specified distance of stream banks are restricted.	Unpacking native vegetation from land is constrained by the *Native Vegetation Act 1991*. Zoning laws imposed via the *Development Act 1993* and the *Local Government Act 1934)*. In some cases, reduced rights also reduce the corresponding responsibilities – for example, Heritage Agreements in SA are not subject to rates. Rights to graze can also be removed under the *Pastoral Land Management and Conservation Act 1989*. A requirement to mitigate degradation can be imposed under the *Soil Conservation and Land Care Act 1989*.*Government Act 1934*. Conservation covenant restrictions can be imposed by Heritage Agreements held and monitored by National Parks and Wildlife SA.	Unpacking native vegetation from land is constrained by the *Native Vegetation Conservation Act 1997*. Zoning laws imposed via the *Environmental Planning and Assessment Act 1979* and the *Local Government Act 1993*. Rights can also be severely constrained under the *Threatened Species Conservation Act 1995* and to a lesser extent the *Soil Conservation Act 1938*. All individuals can generally access lands managed State Forests NSW. Conservation covenants can be held by the National Parks and Wildlife Service (Voluntary Conservation Agreements) or the Department of Land and Water Conservation (Registered Property Agreements).
Surface water	Landowners have access, domestic use withdrawal and some management rights to water within their wetlands.	Rights to water can be obtained by a licence. Historically riparian land was required to which the licence would be linked. Reforms now allow rights to be held by non-land owners. For example, the NSW Murray Wetlands Working Group has some rights to water, which are used to flood some wetland systems.	The water resource in the wetlands is not currently scarce or expected to become scarce in the near future due to water quality (salinity) constraints to potential competing uses. Some management rights over surface water are removed under the *South Eastern Water Conservation and Drainage Act 1992*. Superior withdrawal rights are held to some water by upstream irrigators where water is of sufficient quality.	All other water rights are vested in the State and access can be obtained via the purchase of an access licence and payment of access and consumption fees. Rights to access water for other uses including irrigation are currently being redefined under the *Water Management Act 2000*. The right to combine the water with other resources must be acquired via a use licence (for example, to fill wetlands or irrigate crops or pasture). The water resource available for use in MRF wetlands is

				constrained by management for competing irrigation uses.
Groundwater	Groundwater rights are vested in the state and are not currently clearly defined. Landowners generally have access and withdrawal rights where they have historically been exercised. These rights are currently being reviewed and clarified which may increase the bundle held by landowners currently exercising access and withdrawal rights.	Other landowners may also possess access and withdrawal rights to the same common pool resource.	None	None
Domestic livestock (including non-domesticated game species)	Landowners may or may not own livestock on the land because they can sell or lease the access, withdrawal, management and exclusion rights to others.	Livestock owners possess the full bundle of property rights to livestock and the corresponding duty to provide for them.	None	Grazing rights to publicly owned wetland areas (usually State Forests NSW land) can be acquired on a leasehold basis.
Other non-native species (feral animals)	Landowners possess the full bundle of rights to most non-native species on their lands. There is not usually a demand for these species and they are not usually 'scarce' hence there is no need for stronger property rights. Withdrawal rights to some species (such as deer in Victoria) must be gained via a licence.	Non-landowners are often able to gain access and withdrawal rights from landowners at no or minimal charge. Withdrawal rights to some species (such as deer in Victoria) must be gained via a licence and negotiating access rights to property.	Rights may be limited or responsibilities imposed via the *Animal and Plant Control Act 1986*.	Rights may be limited or responsibilities imposed via the *Rural Lands Protection Act 1989*.
Native fauna (game species)	Landowners possess access rights and the right to determine who has withdrawal rights on their land resource. They also have alienation rights over the access and withdrawal rights over their land resource.	Withdrawal rights to game species are accessed via purchase of the appropriate hunting licence. Withdrawal rights on private land are gained by negotiation with landowners. Withdrawal rights to superabundant game (pests) can be obtained via a withdrawal permit or	None	Some withdrawal rights may be obtainable over non-superabundant species where a management plan specifies the corresponding duty to the landowner. Withdrawal rights to superabundant species can be accessed under the *National Parks and Wildlife Act 1974*. An open season for specific waterfowl hunting is not currently declared in NSW, hence no withdrawal rights are available.

		licence.		
Native fauna (non-game)	Landowners possess alienation rights over access and usually over any withdrawal rights. Some withdrawal rights may be obtainable over non-superabundant species where a management plan specifies the corresponding duty to the landowner.	None.	The relevant legislation governing access to withdrawal rights is the *National Parks and Wildlife Act 1972*.	The relevant legislation governing access to withdrawal rights is the *National Parks and Wildlife Act 1974*.
Non-native flora	Landowners possess the full range of property rights over domesticated flora.	Arrangements such as a '*profit a prendre*' may grant access and withdrawal rights to other individuals.	Responsibilities may be imposed relating to pest species under the *Animal and Plant Control Act 1986*.	Responsibilities may be imposed relating to weed species under the *Noxious Weeds Act 1993*.
Native flora	Historically landowners possess the full range of rights to native vegetation. However, most commercial withdrawal rights and many management rights have been removed by vegetation clearance restrictions. In some cases, some rights can be accessed where a permit is granted.	None.	The relevant legislation governing restrictions on vegetation clearance is the *Native Vegetation Act 1991*.	The relevant legislation governing restrictions on vegetation clearance is the *Native Vegetation Conservation Act 1997* (NVCA). In NSW there are currently a large number of exemptions to the NVCA which apply to rural landowners. In other cases, some rights can be accessed where a permit is granted. Rights to timber are unclear as the NVCA excludes timber harvesting to a large degree. It is also unclear whether the timber harvesting requires a permit from the National Parks and Wildlife Service (pertaining to the *National Parks and Wildlife Act 1974*). Timber harvesting is likely to be allowed where a management plan incorporating sustainable harvesting objectives has been prepared.

Note: Property right bundles are categorised following Ostrom and Schlager (1996) as shown in Section 2.2.

3.1 Property right distribution and equity considerations

The concept of a reference level of property rights associated with ownership was discussed in Section 2.2. This reference level is the underlying distribution of property rights that is considered equitable by society as a whole (Hutchinson 1997). Bromley (1997) notes that the reference level perceived as appropriate will differ between wetland owners and the wider community. Furthermore, the appropriate reference level is likely to differ for different wetland attributes and the corresponding property rights. Hence, it is not possible to identify a specific reference point that is perceived as the optimal distribution of property rights that would need to underlie an ideal market as discussed in Section 2.1. However, the results from several questions in the choice modelling survey reported in Research Report 8 provide some information about whether the current distribution in the USE and MRF is near the point considered equitable by respondents. The results of these questions are reported in Table 4.

Table 4: Evidence of respondent's preferences about compensation for property right changes in the USE and MRF

Should farmers be paid compensation if they are made worse of by changes to wetland management?	Yes	No	Maybe
USE	368	45	125
	68.1%	8.7%	23.1%
MRF	496	65	166
	68.2%	8.9%	22.8%

The results from the both the USE and MRF surveys indicated that over two thirds of respondents consider that farmers should be paid compensation if they are forced to change their wetland management by adopting a series of specified wetland management practices. The wetland management practices specified included fencing to exclude stock, restoring natural wetting and drying, revegetation and controlling weeds and feral animals. This result indicates that the changing the property right structure to coerce management changes is not favoured by respondents over retention of the current property right structure in either the USE or MRF. Rather, respondents support compensation where additional management actions are required of wetland owners. It is not clear that respondents would support compensation for any lost rights that may allow ongoing degradation of wetlands in the USE or MRF.

4 The case for additional incentives and a review of current incentives in the USE and MRF

4.1 The case for additional incentives

Net benefits from changing USE wetland management

In Research Report 9, the net benefits that would result from changing wetland and remnant vegetation management were compared against the option of 'business as usual' (BAU) in the USE and reported for a set of alternative options.[18] These options were based on changing the land management of a small portion of the USE to improve the health of existing areas and create additional areas of wetlands and remnant vegetation. Five alternative wetland and remnant management options for the USE were considered along with BAU. Hence, the six options are:

1. Wetland retention: improved management of existing wetlands not improved under the 'Wetlands Waterlink' program to return them to a healthy condition.
2. Pro-wetlands: improved wetland management of existing areas plus restoration of additional areas of wetlands.
3. Wetlands and remnants: improved wetland management of existing wetland areas and remnant vegetation plus restoration of additional areas of wetlands and remnant vegetation (especially as linkages between existing areas).

[18] If more information is required, the Research Reports are available in electronic form at: apsem.anu.edu.au/staff/jbennettr.htm or by contacting the authors.

4. Cumulative farm forestry: the wetlands and remnants strategy plus an area of farm forestry and deep-rooted perennial pasture to return to a healthy condition wetlands outside the dryland salinity and flood management scheme drainage area but within the USE study area.
5. Farm forestry alone: use of farm forestry and deep-rooted perennial pasture to return to a healthy condition wetlands outside the dryland salinity and flood management scheme drainage area but within the USE study area.
6. Business as usual (BAU): completion of the drainage component of the USE dryland salinity and flood management plan, including completion of wetland conservation works under the 'Wetlands Waterlink' incentive program.

Of the wetland management options assessed in Research Report 9, only 'wetland retention' generated a positive net social benefit to the community under the conservative estimates of the non-monetary benefits. A less conservative estimate of the non-monetary values shows that adoption of all change options except 'farm forestry alone' generate a net social benefit to society relative to continuation of BAU. These results are shown in Table 5. The results demonstrate that there is a demand for policy to change USE wetland management.

Table 5: USE aggregate cost-benefit analysis of management strategies

Cost or benefit	**Wetland retention**	**Pro-wetlands**	**Wetlands and remnants**	**Cumulative farm forestry**	**Farm forestry alone**
Monetary costs to wetland owners	-$4,170,000	-$13,500,000	-$40,527,000	-$44,672,000	-$3,927,000
Other monetary costs (may also be to wetland owners)	$ 0	$ 0	$ 0	$ 4,595,000	$4,595,000
Monetary benefits to wetland owners	$ 17,000	$ 43,000	$ 46,000	$ 50,000	$ 5,000
Other monetary benefits (may also accrue to wetland owners	$ 750,000	$ 1,836,000	$ 2,367,000	$ 2,367,000	$ 0
Net monetary benefits	*-$3,403,000*	*-$11,621,000*	*-$38,114,000*	*-$37,661,000*	*$ 673,000*
Non-monetary benefits (conservative estimates)*	$8,645,000	$ 9,312,000	$22,947,000	$22,507,000	-$3,958,000
Total net benefits (conservative)	*$5,242,000*	*-$ 2,309,000*	*-$15,168,000*	*-$15,154,000*	*-$3,285,000*
Non-monetary benefits (less conservative estimates)*	$17,432,000	$17,664,000	$50,562,000	$49,288,000	-$12,341,000
Total net benefits (less conservative)	*$14,029,000*	*$ 6,043,000*	*$12,448,000*	*$11,627,000*	*-$11,668,000*

Note: Values are net present values of benefit and cost streams over 30 years using a 7% discount rate of changing wetland or remnant management.

* Conservative non-monetary benefit estimates assume survey non-respondents hold zero values and only extrapolate according to the survey response rate and only to SA residents. Less conservative assumptions extend the response rate to Victorian residents at 50 percent of the values held by SA residents (however, the underlying assumptions remain conservative). For more information see Research Report 9.

The results of the bio-economic modelling (shown in Table 5) show that the costs to wetland owners of changing management outweigh the benefits to wetland owners. Hence, a transfer would be required from the non-monetary beneficiaries of changed wetland management to wetland owners in order to achieve a change in USE wetland management. That is, policy must enable such a transfer in order to achieve changes to wetland management. In Table 5 it is shown that a transfer would be required to achieve the minimal changes to wetland management proposed under the 'wetland retention' strategy because the net monetary benefits to wetland owners are negative $3.4m. That is, a transfer from individuals living away from the wetlands to those owning wetland property rights is required.

The non-monetary values of farmers were not included in the estimates of aggregate values reported in Research Report 9. As indicated in Research Report 2 these values can be significant and play an important part in the trade-offs made by wetland owners when deciding how to manage their wetland areas. These values will increase if the wetland quality or quantity is increased. Hence, the transfer from beneficiaries of non-monetary benefits from wetland conservation to wetland owners needed to achieve changes to wetland management will be less than the monetary cost imposed on wetland

owners. That is, the transfer need only be sufficient to induce wetland owners to change management when added to their own values.

Net benefits from changing MRF wetland management

A similar analysis of wetland management options in the MRF was reported in Research Report 10.[19] Four alternative wetland and remnant vegetation management options for the MRF were analysed and compared against the option of 'business as usual'. These options were based on changing the management of a small portion of grazing, timber and water management on the MRF to improve the health of wetlands. Hence, the five options considered were:

1. *Water management:* changing water management in some individual wetlands and across part of the floodplain.
2. *Grazing management:* changing grazing practices in some wetlands.
3. *Timber management:* changing timber harvesting practices in some wetlands.
4. *Combined strategies:* changing grazing, timber and water management in order to induce synergistic responses in wetlands on the floodplain.
5. *Business as usual (BAU):* management continues as usual leading to some continued degradation of floodplain wetlands.

Of the wetland management options reported, only 'grazing management' generated a positive net social benefit to the community under the all cases examined in the sensitivity tests. A less conservative estimate of the non-monetary values than the base case analysis showed that adoption of all change options generate a net social benefit to society relative to a continuation of BAU. These results are shown in Table 6. The net benefit demonstrates that there is a demand for policy to change MRF wetland management.

Table 6: MRF aggregate cost-benefit analysis of management strategies

Cost or benefit	**Water management**	**Grazing management**	**Timber management**	**Combined strategies**
Monetary costs to wetland owners	-$ 1,717,000	-$ 5,578,000	-$4,678,000	-$12,292,000
Other monetary costs (may also be to wetland owners)	-$13,189,000	$ 0	$ 0	-$13,189,000
Net monetary benefits	-$14,906,000	-$ 5,578,000	-$4,678,000	-$25,481,000
Non-monetary benefits (conservative estimates)*	$ 9,201,000	$11,053,000	$3,016,000	$14,911,000
Total net benefits (conservative)	-$ 5,706,000	$ 5,475,000	-$1,661,000	-$10,570,000
Non-monetary benefits (less conservative estimates)*	$26,602,000	$29,302,000	$7,093,000	$38,696,000
Total net benefits (less conservative)	$11,695,000	$23,724,000	$2,416,000	$13,215,000

Note: Values are net present values of benefit and cost streams over 30 years using a 7% discount rate.

* Conservative non-monetary benefit estimates assume survey non-respondents hold zero values and only extrapolate according to the survey response rate and only to residents of the Murrumbidgee catchment (including the ACT). Less conservative assumptions extend the response rate to NSW residents at 25 percent of the values held by survey respondents (however, the underlying assumptions remain conservative). For more information see Research Report 10.

The results of the bio-economic modelling reported in Table 6 show that the costs to wetland owners of changing management outweigh the benefits to wetland owners for all options. Hence, a transfer would be required from the non-monetary beneficiaries to wetland owners in order to achieve a change in MRF wetland management. Table 6 shows that a transfer would be required to achieve even the low risk option of changing 'grazing management' because the net monetary costs to wetland owners of doing so are $5.6m. That is, a transfer from individuals living away from the wetlands to those owning wetland property rights is required to cover this cost.

[19] If more information is required, the Research Reports are available in electronic form at: apsem.anu.edu.au/staff/jbennettr.htm or by contacting the authors.

The non-monetary values of farmers were not included in the estimates of aggregate values reported in Research Report 10 but their importance was indicated in the analysis of farmer perceptions reported in Research Report 5. The transfer from beneficiaries of non-monetary benefits from wetland conservation to wetland owners needed to achieve changes to wetland management would be less than the monetary cost imposed on wetland owners once these values are considered.

4.2 Review of current USE and MRF incentives

Current incentives for USE wetland owners

A survey of the perceptions of USE wetland owners that was reported in Research Report 2 identified the incentives currently received for wetland management in the USE.[20] The results showed that only one third of wetland owners received any direct incentives for wetland management. A very low proportion of the wetland owners surveyed claim 'Landcare tax rebates' or 'land degradation tax deductions' on management inputs to wetland conservation (just one wetland owner in the USE sample claimed a land degradation tax deduction). Direct support of wetland owners is more common with six landowners claim rate rebates, eight drainage levy rebates and eight have received grants or materials towards wetlands management (including as Landcare demonstration projects). However, many owners may have received assistance from multiple sources. Five wetland owners have received free management advice from government agencies.

The number of wetland owners receiving direct incentives has increased since the survey as many wetland owners accessed grants to undertake capital works. These grants are available to wetland owners in the USE under the 'Wetlands Waterlink' and 'Salt 2 Success' programs. These grants would increase the number of respondents receiving materials, management advice and other direct assistance to rehabilitate wetlands. Owners of existing wetlands are able to apply for funding to fence or rehabilitate wetland areas under the Wetlands Waterlink program. Applications that meet the criteria for 'Conservation Asset Wetlands' are awarded a higher rate of fencing funding than other wetlands (termed 'Revegetation-Rehabilitation Wetlands'). Strategic works have also been undertaken to improve the hydrology of wetlands under the program. As of May 2000, 47 wetland owners had received $573,000 towards protecting 3,893 ha (Upper South East Dryland Salinity and Flood Management Plan 2000). As noted previously, the projected outcomes of the 'Wetlands Waterlink' program were incorporated in the analysis and all policy suggestions are in addition to this scheme.

A similar program targeting remnant vegetation in the USE, called 'Salt 2 Success', has also been available to landowners. The 'Salt 2 Success' program offered partial or full cost of fencing (including labour) to fence existing remnant vegetation areas. Full costs including labour are only available where the landowner is willing to place a Heritage Agreement (HA) over the fenced area (that is, they must be willing to reduce their property rights). Areas placed under a HA are also eligible for advice from a regional extension officer. Landowners can also apply (often with the assistance of the extension officer) for up to $2,000 per year to assist with completing management plans or implementing actions beyond the landowners normal responsibilities that suggested in the management plan. The impacts of the 'Salt 2 Success' program were not included in the modelling reported in Research Report 9. Hence, the quantity of land (and costs) fenced by this program should be removed from any subsidy program offered.

Current incentives for MRF wetland owners

A similar survey of the perceptions of MRF wetland owners was undertaken and reported in Research Report 5. The results showed that only 20 percent of wetland owners surveyed received any direct incentives for wetland management. A very low proportion of the wetland owners surveyed use 'Landcare tax rebates' or 'land degradation tax deductions' on management inputs to wetland conservation (just two wetland owners in the MRF sample claimed a Landcare related tax incentive). A similar number of respondents reported receiving materials and free advice in the MRF.

Some additional incentives have become available in the MRF since the wetland owner survey was undertaken. Owners of existing wetlands are able to apply for funding to fence wetland areas under a

[20] The survey was undertaken in February and March 1998, after the inception of the 'Wetlands Waterlink' program but prior to any wetland management incentives being offered to landholders.

Greening Australia program. Landholders must agree not to graze the fenced area in order to receive materials but there is no legally binding agreement. In the upper (eastern) end of the study area, some assistance is also available to wetland owners under the 'Bidgee Banks' program. However, the 'Bidgee Banks' program is primarily targeting nutrient control via bank erosion issues. Therefore, the program is not generally applicable to wetland owners.

A program targeting conservation covenants on remnant vegetation across NSW is being undertaken by The Department of Land and Water Conservation and the National Parks and Wildlife Service in NSW. Both programs offer fencing and management assistance in return for a conservation covenant. However, both programs are or have been oversubscribed, and these programs only apply to wetlands of high significance (which may not include all MRF wetlands).

The Murrumbidgee Wetlands Working Group (MWWG) is undertaking several inter-linked wetland rehabilitation projects in the MRF. The majority of these projects are being carried out on public lands and no programs are currently being offered to owners of privately owned wetlands. Grants in the region have also recently been made available by Wetland Care Australia under the 'National Living Wetlands Project'.

4.3 Review of constraints to wetland management

Potential policies designed to achieve changes to wetland management need to address the perceived constraints of wetland owners and their wishes regarding the future management and viability of their landholding. These constraints are briefly reviewed in this section.

Constraints to wetland management facing USE landowners

The constraints to wetland owner adoption of management strategies were assessed in Research Report 2. Table 7 repeats the results from Research Report 2 relating to the constraints to adoption of a series of management strategies.

Table 7: Constraints to adoption of wetland management practices in the USE

Management practice	AA	C or P	TC	KC	NA	
Exclude stock from wetland	33%	45%	2%	0%	37%	
Manage grazing access to wetland	33%	25%	2%	0%	29%	
Facilities to water stock away from wetland	37%	12%	0%	0%	39%	
Maintain native vegetation around wetland	53%	22%	2%	4%	22%	
Maintaining a tree/vegetation filtering strip around wetland area	27%	22%	4%	6%	25%	
Directing saline drainage away from wetland	16%	20%	6%	6%	41%	
Facility to restore natural wetting and drying of wetland	27%	12%	4%	6%	39%	
Control of feral animals in wetland	45%	6%	6%	2%	33%	
Control of weeds in wetland	45%	2%	4%	2%	35%	
Revegetation using local native species	31%	25%	12%	0%	43%	
Fire prevention/control around wetland	14%	2%	8%	4%	53%	
Management advice on specific problems such as dying trees	18%	4%	6%	8%	47%	
Preparing a list of plants and animals observed in/near wetland	27%	2%	20%	10%	39%	
Farm management plan incorporating wetland conservation initiatives	25%	12%	16%	12%	33%	
Restoring wetland basins/habitats	22%	20%	8%	4%	39%	92%
Measures to encourage native wildlife	33%	6%	8%	8%	39%	94%
Drains to manage dryland salinity impacts on wetlands	25%	16%	4%	6%	29%	80%

Note: Percentages do not sum to 100 because many wetland owners own multiple wetlands and ticked multiple boxes while others did not respond to the question.

Key:
AA = Already adopted
C or P = Cost or profit constraint
TC = Time constraint
KC = Knowledge constraint
NA = Will not adopt as either not interested or not applicable

The proportion of wetland owners who are not interested or do not consider the strategy applicable exceeds 25 percent for all but two strategies (maintaining native vegetation and a filtering strip around wetlands). Where owners consider the management practices applicable and are interested in applying them, many management practices have already been adopted by wetland owners on one or more of their wetland areas (approximately 50 percent of wetland owners for maintaining native vegetation and pest and weed control). Alternatively, a higher net monetary return may be required to generate the interest of wetland owners. For example, one third of the wetland owners already exclude stock from at least one wetland they own but the main constraint to further action is the cost or profit constraint. Similarly, the main constraint to adoption of most strategies (once they are considered applicable and the owner is interested) is the cost or impact on profits. For some strategies the main constraint is time (farm management plan and preparing a list of plants and animals observed in or near the wetland) or to a lesser extent knowledge (seeking advice on specific problems).

The high levels of 'not applicable' or 'lack of interest' suggests that many wetland owners do not perceive the linkage between wetland management and the monetary and non-monetary values generated. Hence, an extension program may be necessary before other facilitative or inducive programs proceed.

Wetland owners were also asked to suggest what additional incentives would be most useful. The most desired incentives were:

- Financial assistance (30%);
- Federal or local tax breaks (28%);
- Fencing assistance (25%);
- Completion of regional dryland salinity and flood management scheme (20%);
- Wetland or property management training/assistance (16%); and ,
- Revegetation Assistance (12%).

Constraints to wetland management facing MRF landowners

The constraints to adoption of wetland management strategies were assessed in Research Report 5. Table 8 shows the major constraints to adopting a list of wetland management strategies in the MRF. For many strategies, over one third of wetland owners do not believe the management strategies to be applicable or they are not interested in applying them. Importantly those not interested or considering the practice non-applicable approaches 50 percent for some key management practices such as managing stock access to wetlands and providing facilities to water stock away from wetlands. Where owners consider the management practices applicable and are interested in applying them, many practices have already been adopted by wetland owners on one or more of their wetland areas. For example, 41 percent of the survey respondents already manage grazing access to wetland areas to at least one wetland they own. The main constraint to adoption of many strategies (once they are considered applicable and the owner is interested) is the cost or impact on profits (excluding grazing for one third of wetland owners). For some strategies the main constraint is time (preparing a list of plants and animals observed in or near the wetland) or to a lesser extent knowledge (seeking advice on specific problems and measures to encourage native wildlife). The high levels of 'not applicable' or 'lack of interest' suggests that an extension program may be necessary before other facilitative or inducive programs can proceed.

Wetland owners were also asked to suggest what additional incentives would be most useful. The most desired incentives were:

- Financial assistance (26%);
- Free or low cost water for wetlands (26%)
- Fencing assistance (18%);
- Wetland or property management training/assistance (23%); and ,
- Revegetation or feral/nuisance animal control assistance (13%).

Table 8: Constraints to adoption of wetland management practices in the MRF

Management practice	AA	C or P	TC	KC	NA
Exclude stock from wetland	18%	32%	4%	0%	42%
Manage grazing access to wetland	41%	23%	3%	4%	32%
Facilities to water stock away from wetland	n.a.	19%	0%	0%	41%
Maintain native vegetation around wetland	36%	11%	7%	3%	26%
Maintaining a tree/vegetation filtering strip around wetland area	22%	15%	5%	3%	27%
Directing saline drainage away from wetland	15%	8%	3%	3%	46%
Facility to restore natural wetting and drying of wetland	25%	11%	0%	5%	31%
Control of feral animals in wetland	33%	1%	3%	1%	39%
Control of weeds in wetland	44%	15%	0%	1%	30%
Revegetation using local native species	32%	12%	5%	4%	30%
Fire prevention/control around wetland	34%	3%	3%	1%	32%
Management advice on specific problems such as dying trees	10%	5%	3%	9%	45%
Preparing a list of plants and animals observed in/near wetland	8%	3%	18%	9%	41%
Farm management plan incorporating wetland conservation initiatives	23%	12%	9%	9%	30%
Restoring wetland basins/habitats	10%	15%	5%	8%	34%
Measures to encourage native wildlife	21%	8%	5%	12%	31%

Note: Percentages do not sum to 100 because some wetland owners own multiple wetlands and ticked multiple boxes while others did not respond to the question.

Key:

AA	=	Already adopted
C or P	=	Cost or profit constraint
TC	=	Time constraint
KC	=	Knowledge constraint
NA	=	Will not adopt as either not interested or not applicable

Part B Policy suggestions for wetland conservation

Policy suggestions can be divided between those that facilitate, induce or compel wetland management change as discussed in Section 2.1. The policies must also be divided according to the most appropriate jurisdiction in which they should be applied. Hence, the suggestions are discussed at the local, state and federal government levels in turn and subdivided between those that would facilitate, induce or compel change within each jurisdiction. Governments determine the range over which the market framework will apply via the definition and policing of property rights. Hence, while reforms relate to the division between market and planned outcomes, this division is the result of government action or inaction. Some policy structures are not confined to a single level of government. These structures may be activated at different levels or require cooperation between levels of government. Some of these policies along with other policy considerations are combined in the final component of each of the following sections. Policy recommendations are highlighted for ease of reference within the following sections.

There is a large overlap between many of the policy suggestions for the USE and MRF. The suggestions that are common to both the USE and MRF are reported in Section 5, followed by suggestions specific the USE in Section 6 and the MRF in Section 7. To aid readers in identifying the full range of policy suggestions summary tables of the policies suggested in each case study region are provided in Appendices 1 and 2. Scheduling issues are briefly discussed in Section 8. The report concludes with a discussion of the potential for the policy suggestions to be generalised to other Australian wetland systems and concluding statements.

5 Policy suggestions common to both case study areas

5.1 Local policy suggestions com mon to the USE and MRF

The USE wetlands lie within four local government areas (Coorong, Tatiara, Kingston and Naracoorte/Lucindale). The MRF wetlands lie within seven local government areas (Wagga Wagga, Narrandera, Leeton, Griffith, Murrumbidgee, Carrathool and Hay). The incentives discussed in this section are generic in that they would apply to all local government areas. However, application and relative costs may differ between local government areas as some have more resources than do others largely due to population differences.

Facilitate

Some local government areas restrict access to partial alienation (sales) of land via restrictions on the size of parcels of land that can be sold (for example, the *Development Act 1993* in SA). These restrictions may require a minimum land parcel size (usually an entire section) or restrict subdividing partial sections. The restrictions are ostensibly in place to prevent fragmentation of the landscape among multiple owners and help maintain viable farming units. Application of these principles to sales designed to improve management of lands of conservation importance is difficult to justify. Initial land surveying often paid little or no attention to natural resource units with the exception of major streams, lakes and coastline. Hence, a wetland system may encompass parts of several surveyed units. The implication is that a farmer may only be able to sell a minimum size area to a conservation group that wishes to purchase the wetlands, or may need to proceed through a development application process. This reduces the incentives to both the farmer and the conservation group. Farmers may be required to sell areas they are using for agricultural production along with the wetlands or proceed through a development process while conservation groups may be forced to purchase and manage additional non-wetland areas. A related restriction may zone areas for primary production, technically precluding purchase primarily for conservation.

In both cases, a facilitative incentive would allow sales to conservation organisations to bypass minimum size and development application constraints. Land sales should also bypass the development application process if the parcel is covered by a conservation covenant (more discussion on conservation covenants later). Similarly, for clarification purposes conservation should be designated as an allowable primary land-use in all areas zoned primary production. In SA, development applications must be made to the Development Assessment Commission at the State level (and fees charged at that level) but applications are assessed against local government development plans.[21] Development applications in NSW are processed at the local government level.

Recommendation: Streamline local government processes to facilitate sales of wetlands to conservation groups.

Many local governments sponsor or directly run a business development program within their boundaries. Facilitative programs could be designed to assist wetland owners with information on how to access and develop alternative business opportunities, particularly those targeted at niche markets. Specific information relating to how to develop eco-tourism markets could be very useful in the USE and to a lesser extent in the MRF.

Recommendation: Provide information sources to wetland owners interested in developing compatible alternative enterprises (particularly targeting high value niche tourism markets).

Induce

Local government rates are not payable on lands covered by a Heritage Agreement in SA and in NSW lands covered by a Voluntary Conservation Agreement between the land owner and the relevant

[21] Some sales in SA have received preferential treatment including title transfers to Wetlands and Wildlife in the USE of SA.

National Parks and Wildlife Service.[22] There are currently no rate exemptions or rebates for Registered Property Agreements between the Department of Land and Water Conservation and landowners in NSW. Local councils and hence other ratepayers bear the cost of reduced rates (but there is no net change in tax collections). A rate exemption avoids the costs of collection and redistribution of taxes, while a rate rebate program does not (as monies are collected and repaid). The inducement of no land rates reduces the cost of producing conservation outputs. It is recommended that all lands managed primarily for conservation purposes (as defined in an approved management plan) are eligible for the rate rebate.[23]

To gain approval, a management plan would need to specify the area of the land, the conservation objectives for which it is to be managed, designate performance criteria and provide for monitoring as appropriate. Approved management plans should include other forms of conservation covenants such as Registered Property Agreements (with the Department of Land and Water Conservation in NSW) or with the Nature Conservation Trust in NSW.[24] This concept is equivalent to that covering the drainage levy rebate offered by the South Eastern Water Conservation and Drainage Board in the USE region (covering the levy to fund the landholder contribution to the USE Dryland Salinity and Flood Management Plan). It is recommended that the rate rebate extend to catchment management levies (specifically the South East Catchment Water Management Board's Catchment Environment Levy) in SA and to Rural Lands Protection Board Rates in NSW.[25]

Recommendation: Extension of rate exemptions to all wetlands managed for conservation outcomes. Rate exemptions should also include catchment levies and Rural Lands Protection Boards rates.

The cost of a rate rebate can be estimated for each case study area. In the USE an estimate can be made using a simple average of rate rebates in the USE region at $10.21 per hectare for Heritage Agreements where rate rebates were paid in 2000 (as opposed to a notional value). The present value cost of a rate rebate over the next thirty years to council is estimated at between $1.1m (Wetlands Retention) and $5.4m (Cumulative Farm Forestry). However, experience with Heritage Agreements indicates that not all landowners claim the rebate and so these estimates may be too high.

The cost of rate exemptions in the MRF depends on whether a partial rate exemption is offered on lands where only grazing or timber harvesting is precluded or only the area of land from which both are excluded. The total area of land from which grazing and timber harvesting would be precluded after changing management is unknown. The cost of a rate rebate or deduction for a sample large property on the MRF is $11.55 per hectare. Hence, if a rate rebate or deduction is paid on a maximum of 10,000 hectares (a likely scenario under the 'combined strategies' option), the cost to local government would be a present value of approximately $1.0m over the next 30 years. Again, this may be an overestimation as experience with Heritage Agreements in SA indicates that not all landowners claim the rebate.

Compel

An alternative method of reducing the costs of wetland management resulting from local government charges is via special low rate zoning districts for areas with high conservation value. Such districts would require ministerial approval in both SA and NSW. The use of zoning to encourage conservation is a one-size-fits-all approach as it does not distinguish between conservation oriented landowners and other landowners. Zoning can also potentially be used to compel landowners by reducing their

[22] The mechanism for a reduction in rates differs between landowners. Initial Heritage Agreement landowners (approximately the initial 80 agreements) must pay the local government rates and then apply for a rate rebate that will be automatically granted. The value of the Heritage Agreement land is removed from the ratable land value of more recent Heritage Agreement landowners thus reducing the ratable value of their land.

[23] A reviewer notes that a rate exemption provides little value to a landowner of land already encumbered by a conservation covenant. However, the principle of competitive neutrality is important. That is, why should landholders practicing similar conservation management strategies and generating similar outcomes to society face differential costs?

[24] Where a conservation covenant over a wetland used for both timber harvesting and grazing removes only one of these rights a partial rate exemption may be warranted.

[25] This, as with all other measures, would need to be budgeted and sources of funds sought. Funds could either be via immediate cross-subsidisation (raising rates in this case) or from other levels of government (thus raising taxes and fees elsewhere).

property rights, for example by precluding future management options. A disadvantage of zoning is that it is high cost in terms of the planning input and approvals process and may be subject to regulatory capture. A zoning approach may be useful where a well defined, high value wetland system faces a development threat. The approach is less useful where wetlands are scattered across an agricultural landscape and would be equally protected from overt development action by state laws. Hence, zone based approaches at the local government level are not recommended for either case study areas.

5.2 State policy suggestions common to the USE and MRF

The USE and MRF wetlands each lie entirely within a single state simplifying the range of policies that the State government can introduce. Part of the catchment area for USE the wetlands lies in Victoria but potential management changes are not likely to be sufficient to impact significantly on wetlands in the USE. A complicating factor in the MRF is also that part of the catchment area for the wetlands lies in ACT and the Federal government has withdrawal rights to several important tributaries of the Murrumbidgee. However, significant management changes are not proposed for the ACT or to Federal rights at present, nor are they likely to be within the current environmental framework.

Facilitate

State government jurisdictions covering both study areas should consider employing four facilitative tools:

1. education and extension advice about wetland ecosystems and management;
2. signalling devices to identify wetland importance and values;
3. broadening private sector access to partial property rights tools such as conservation covenants; and,
4. granting additional property rights in return for conservation outcomes.

The target population of education and extension advice about wetlands can be subdivided between wetland owners who have adopted, or are considering adopting, conservation oriented wetland management strategies and those who are not (not interested or perceived as not applicable). Three quarters of USE wetland owners have adopted at least one wetland management strategy designed to maintain the values their wetlands generate, as have nearly two-thirds of MRF wetland owners.[26] Many of these wetland owners are also considering implementing other strategies as shown in Section 3.1. Implementing a scheme similar to the Land for Wildlife scheme in Victoria would serve three purposes.[27] Firstly, admitting wetland owners to such a scheme would recognise their achievements in producing environmental outputs. Not all USE and MRF wetland managers who actively managing their wetlands should automatically qualify for full membership. Some would qualify for lower levels of membership to encourage continued improvement in wetland management and differentiate recognition. Secondly, membership of the scheme would facilitate rapid access to the experience of other members and to extension information about improving their wetland management. Young et al. (1996) indicate that most environmentally damaging behaviour arises from ignorance rather than other rewards. Finally, the combination of recognition of their achievements together with enhanced knowledge about wetland management may motivate wetland owners to improve wetland management further, even in the absence of additional inducements.

The cost of operating such a wetland owners club would be relatively high (per wetland owner and per hectare) if only operated in the case study areas but would be relatively low if operated State or Australia wide. For example, the Victorian Land for Wildlife scheme now has over 5,000 registered properties and twelve half-time extension officers. The operation of such a scheme could also be performed by a private sector group such as Wetland Care Australia.[28]

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[26] Many wetland owners in the USE and MRF have adopted only relatively simple strategies. Many also own more than one wetland and may only be actively managing those wetlands they find most attractive. Hence, the figures may overestimate the true rate of adoption across all wetlands.

[27] The Land for Wildlife scheme is a voluntary membership based program in Victoria (and several other states). The program provides extension and information support to member landholders who may be full members or working towards full membership.

[28] Wetland Care Australia has recently instituted 'Wetland Carers' where landowners that join receive concessional membership arrangements. This program is intended to be Australia wide and could provide one

Recommendation: Sponsor a wetland owners 'Land for Wildlife' type program, potentially as part of the Wetland Care Australia 'Wetland Carers' group.

The second group of wetland owners targeted by an education and extension program are those who are not currently managing wetlands for any conservation goals. These wetland owners consider additional wetland management strategies either not applicable or they are not interested. According to Young et al. (1996), education strategies targeted at these wetland owners are likely to achieve success because they are often able to motivate self-interest in maintaining values that are enjoyed by wetland owners. There is also evidence that suggests individuals are more likely to act and contribute additional resources when they understand the threats and consequences of non-action (Young et al. 1996). The proportion of wetland owners who are actively managing wetlands in the USE is likely to be relatively high due to wetland management activities associated with construction of a dryland salinity and flood management scheme in the USE region. Hence, the difficulty and cost of accessing additional wetland owners is likely to be higher than other education schemes in the USE and such a scheme may be relatively more successful in the MRF.

Recommendation: Education and extension programs targeted at wetland owners not currently interested in conservation oriented management of wetlands.

Encouraging farmers to complete farm management plans to the detail required to achieve accreditation for tax purposes is likely to generate private and public benefits and address both types of wetland owners. The course would also need to be structured to include 'wetland management' modules. It is recommended that a course in farm planning is offered on demand (but with participants actively sought and encouraged), preferably located in the nearest local community hall or centre. Such courses could act as an important base for generating sufficient motivation to act on facilitative incentives or access inducive incentives. Useful leverage could also be applied through the banking sector recognising and supporting the importance of farm planning to farm viability. Bank sector support could encourage or require farm management business plans to support larger loan applications.

Recommendation: Encourage and assist farmers to complete farm management courses and plans.

The second facilitative action suggested is to recognise the importance of the wetland ecosystems in the case study regions. (White 1997) documents the evidence supporting Ramsar nomination of the Watervalley Wetlands (USE) as wetlands of international importance and the willingness of the wetland owner to cooperate.[29] White also indicates that other USE wetlands meet the Ramsar criteria, either individually or in conjunction with the Watervalley Wetlands.[30] However, the South Australian Government has refused to assess Ramsar nomination prior to completion of the drainage and flood management scheme that is under construction in the region. USE wetlands would also meet the requirements for listing as a shorebird site under the East Asian – Australasian Shorebird Site Network.[31] Privately owned wetlands which form part of the Gwydir Marshes in northwest NSW and the Macquarie Marshes in the central west of NSW have already been Ramsar listed with the support of The World Wide Fund for Nature (WWF) and NSW National Parks and Wildlife Service (Webb nd). Wetlands which are not of international importance may be of national or regional significance.

The MRF wetlands are listed as nationally important as a system in the Directory of Important Wetlands in Australia (Environment Australia 2001). It is unlikely they could be Ramsar listed individually but a group of the wetlands may meet Ramsar criteria. The NSW State Government may be reluctant to support listing because this would automatically grant the Federal Government powers under the *Environment Protection and Biodiversity Conservation Act 1999*.

Recognising the importance of wetlands increases the knowledge of wetland owners about the importance of their valuable wetlands and their management. In addition, Ramsar or national listing of

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suitable vehicle for such a wetland owners club. Wetland Care Australia has also recently awarded one private wetland owner the 'Wetland Owner Champion' award.

[29] The wetland owner is 'Wetlands and Wildlife' a non-profit nature conservation group which owns and conserves over 10,000 hectares of wetlands in the USE region.

[30] Personal communication, Janice White (Wetlands and Wildlife and The University of South Australia).

[31] Comments from the SA government.

wetlands grants some leverage in decisions beyond the farm gate that would impact on wetlands (Webb nd). For example, Ramsar listing of the Gwydir wetlands increases the likelihood that sufficient water will be provided to maintain wetland health. This additional protection is provided by way of the Federal *Environment Protection and Biodiversity Conservation Act 1999*.

A related signalling device is the use of 'regional land management plans' that include wetland management objectives.[32] Management plans are an important information source as they contain the information that planners use to prioritise the allocation of scarce resources to wetland management activities. Less detailed plans that identify the historical and current usage of wetland areas provide an important facilitative tool to the private sector. Gathering basic underlying land use and basic financial information is often a by-product of other information requirements of government (for example environmental monitoring and taxation). Presentation of land use and other information in a format that can be used by the private sector (maps and geographic information systems (GIS)) draw on areas that government is already experienced in providing (either in-house or via consultants). Without government cooperation it would be difficult for private sector organisations, particularly small local groups, to access and effectively use such information that would allow the groups to prioritise it's activities according to the demands of it's supporters. Furthermore, encouraging private sector groups to form and act on such information reduces the potential for government failure in identifying and acting on community preferences. A by-product of planning is that it can help to define the property rights associated with wetland ownership (Binning 1997). Hence, planning can help to define the reference level of the duty-of-care associated with wetland ownership.

In the USE most aspects of a regional wetland management plan have been developed within aspects of the Dryland Salinity and Flood Management Plan. In the MRF the opportunity exists for a groups such as the Murrumbidgee Wetlands Working Group to develop a 'regional wetland management plan' in conjunction with other regional planning initiatives (such as vegetation management plans). Regional planning initiatives would support individual and community action. A potential disincentive associated with signalling devices that should be considered is that wetland owners may destroy the natural resource in order to avoid current or future regulation. Hence, signalling devices are more likely to be effective when used in conjunction with incentives to induce management change.

Recommendation: Signal the importance of wetlands via designation as Ramsar sites, Wetlands of National Importance or East Asia – Australasian Shorebird Site Network where appropriate and incorporation of wetland conservation objectives in regional land management plans.

Recommendation: Compile and facilitate access to GIS databases of relevant land management information.

Most property rights covering the resources that are combined in wetlands are policed under State government laws (with the exception of local government zoning regulations). Conservation covenants are one such mechanism that could facilitate private sector ownership of partial property rights. Heritage Agreements (HA) in SA and Voluntary Conservation Agreements (VCA) and Registered Property Agreements (RPA) in NSW are examples of conservation covenants held by the state. The state holds the right to prevent landowners from using their land in ways that are specified as precluded in the covenant. For example, landowners are prevented from clearing or grazing HA lands. At present private sector organisations cannot write, own or enforce conservation covenants in SA or NSW.[33]

Wetland owners may be reluctant to enter a conservation covenant with the government or government appointed body because they may not trust the government. They may prefer to deal with non-

[32] This approach is suggested by (Binning and Cripps 1998). They suggest that regional planning be facilitated by State Government but some aspects of planning and application be delegated to local government through accredited regional action plans. The outcome of this process is intended to be that 'All land use planning will be integrated into a single coordinated land use framework that will form the basis of the regional action plan' (Binning and Cripps 1998, p. 77). They recognise that some tension will arise between state and local government. It is not recognised that another significant level of tension is likely to arise as a result of aspects of government failure by planners in designing and implementing such plans.

[33] A new statutory organisation, The Nature Conservation Trust of NSW, has recently been created in NSW with the ability write and monitor conservation covenants. While the trust is to be managed by an independent board, it remains legislatively linked to government and can currently only write and enforce VCA and RPA agreements.

government organisations. In addition, governments are generally unable to vary substantially the terms of such agreements (although the RPAs in NSW are quite flexible) or pay for the property rights conceded. Non-government organisations are generally able to act as agents in brokering conservation covenants. However, they are not able independently to police the covenant thus reducing their ability to protect their efforts into the future. Likewise, they are not able to hold the covenant as a recognised asset to demonstrate their achievements because the covenant is between the wetland owner and government. Hence, there are several advantages to facilitating private sector ability to independently negotiate and police conservation covenants:

- the opportunity for innovation in designing conservation covenants to achieve a wide range of environmental outcomes while maintaining the incentives for private management is increased by removing the restriction to HA in SA and VCA and RPA in NSW;
- the opportunity for innovation in competing for suitable incentives to conclude a conservation covenant with wetland owners. Suitable incentives may not necessarily include monetary remuneration but may rely on differing ways of gaining confidence and rewarding landowners for conservation covenants (for example, an agreement to provide weed control and fence maintenance on an annual basis);[34] and,
- the added incentive being able to act directly to protect their investment in conservation and report their achievements as direct assets of the group.

The ability to enact conservation covenants would increase the incentives to private sector groups to act by reducing the cost of achieving their desired outcomes. Flexibility in covenanting arrangements could also reduce the cost to landholders and the community of achieving permanent conservation outcomes. This is because such groups would only need to negotiate to acquire the property rights required to ensure continued production of the conservation outputs rather than the full set. Boyd, Caballero and Simpson (2000) suggest that conservation covenants also reduce the cost of conservation to society as a whole by allowing conservation compatible activities to continue and by retaining management expertise of conservation compatible activities. Conservation covenants have been particularly successful in achieving conservation goals in some parts of the US. Boyd, Caballero and Simpson (2000) specify the components of an easement in the US. These components are very similar to those required in a covenant in Australia and are adapted to Australia in Table 9.

The range of activities potentially covered by conservation covenants differs between the USE and MRF because of the relative scarcity and value attached to differing wetland inputs. For example, in the MRF, conservation covenants could specifically seek to address water and timber management issues, while in the USE duck hunting could be a focus issue. Conservation covenants (also known as easements) are commonly used in the US to ensure environmental harms from forestry activities are minimised by specifying harvest attributes such as:

- minimum time periods between harvests;
- defining tree species or sizes that can be taken;
- the time of year harvesting operations can occur;
- coup harvest strategies[35]; and,
- buffers from waterways or other environmentally sensitive areas.

Similar conservation covenants could be used in the MRF to cover comparable timber harvesting attributes as well as other attributes such as quantities of fallen timber that must remain. Conservation covenants could also be used in the MRF to restrict water licenses to benefit rivers or wetlands. Attributes of water licences that conservation covenants could restrict include:

- time of water harvest;
- reach of river from which water is harvested;
- maximum or minimum stream flow constraints; and,
- water end usage (for example water can only be used to flood wetlands).

[34] A reviewer notes that Heritage Agreements have a competitive advantage over any potential non-government scheme as they grant access to government assistance for fencing and other management activities.

[35] Coup harvest strategies include how large an area is harvested at one time and how long before adjacent areas are harvested.

Table 9: Description and explanations of the components of a covenant contract

Contract terms	Explanation
Descriptive elements	A description of the property, its ecological conditions, known environmental hazards, and often a broad 'statement of purpose' delineating conservation goals.
Auditing requirements	Usually at least an assessment of whether any hazardous waste or other contaminants or pollutants are present on the property. The audit will also identify and correct any other encroachments on the property (such as a building, fence line or road that is constructed or used without legal right).
Limitations on use	Limitations on the grantor's ability to develop the land commercially or residentially, or alter existing land uses.
Rights reserved by the grantor	A description of potential land uses that the grantor can pursue, such as subdivision.
Land management requirements	Agreement to meet certain standards for managing the property and agricultural, forestry or other practices; often described by "best management practices". This section is often included via a land management agreement signed in conjunction with the covenant.
Right of access	Right of conservator to enter the property and to observe ecological conditions and confirm compliance with the contract's conservation and management provisions.
Ownership	Demonstration that the property has no attached liens. Liens are a right to retain possession of another's property pending discharge of a debt.
Remedies for breach of contract	Provisions entitling parties to sue for monetary damages or remedial actions from a breaching party. A preference for arbitration, the responsibility for legal fees, and specification of a jurisdiction for resolution are often included.
Limitations on liability of the conservator	Provision giving conservator indemnification against existing and future liabilities associated with the property, including third-party claims and tax liabilities.
Statement of the covenant's transferability	A statement binding all subsequent owners of the property in perpetuity, and requiring that the conservator be notified. Often the conservator is given right of first refusal in the event the property is sold.
Sale-related provisions	Responsibilities, deadlines, and payments associated with the original easement sale, including responsibility for commissions and fees associated with the sale, audits, timing or surveys, and form of payment.

Source: Adapted from Boyd, Caballero and Simpson (2000).

The cost of conservation covenants (which could include additional HA) in USE wetlands and remnants would differ depending on the types of uses that are restricted and their relative value to the landowner. The major cost to production for wetland owners is the lost agricultural productivity because wetlands are no longer available for grazing. A sample average cost of changing wetland management via an inducive policy to purchase grazing rights is shown in Table 10.

Table 10: Net cost to USE wetland owners of removing grazing

Cost description	Wetland retention	Pro-wetlands	Wetlands and remnants	Cumulative farm forestry	Farm forestry alone
Total changes to GM's	-$1,166,000	-$5,672,000	-$18,332,000	-$24,265,000	-$5,934,000
Pasture cost savings	$ 0	$2,462,000	$ 4,963,000	$ 7,153,000	$2,189,000
Farm forestry	$ 0	$ 0	$ 0	$ 4,595,000	$4,595,000
Net total	*-$1,166,000*	*-$3,210,000*	*-$13,368,000*	*-$12,517,000*	*$ 851,000*
Hectares rehabilitated (wetland and remnant vegetation areas)	13,000 ha	25,000 ha	80,000 ha	83,000 ha	3000 ha
Average per hectare cost	$92.00	$127.00	$168.00	$151.00	$269.00

Source: Adapted from Research Report 9.

Note: Costs are net of pasture improvement costs saved and income from farm forestry. Costs do not include any wetland rehabilitation costs.

As shown in Table 1, the average cost of grazing lost increases from $92 to $269 as land that has higher agricultural productivity is converted or rehabilitated. These costs do not take into account the additional non-monetary benefits that wetland owners would receive from wetlands or remnant vegetation, nor do they include direct monetary and non-monetary costs of changing management. Costs also do not include the costs of negotiating such agreements and policing them into the future. Hence, assuming no other costs of restoration and without any non-monetary benefits to wetland

owners a conservation covenant would cost approximately $92 per hectare or $1.2m for covenants over all rehabilitated wetlands under the 'pro-wetlands' strategy. The actual cost of covenants could be considerably lower when non-monetary benefits enjoyed by landowners are included.

The cost of conservation covenants for MRF wetlands depends on the types of uses that are restricted and their relative value to the landowner. The major costs to production for wetland owners are lost grazing or timber production. Grazing restrictions costs can be split between lost future income and capital costs of fencing and watering points to enable stock exclusion. Costs can also be split between the cost to private wetland owners and the cost of lost grazing in State Forests NSW land. The split between private and public wetland owners is shown in Table 11. The costs shown in Table 11 assume that the mix of grazing regimes in State Forests NSW land and private land are very similar after the adoption of the 'grazing management' and 'combined strategies' options.

Table 11: Net cost to landowners of changing grazing and timber harvesting practices in MRF wetlands

Cost description	Water management	Grazing management	Timber management	Combined strategies
Total cost of changing management on private and public lands				
Total change to grazing margin	$ 0	-$2,729,000	$ 0	-$2,729,000
Costs of adopting 'grazing management'	$ 0	-$1,508,000	$ 0	-$1,508,000
Total change to timber margin	$ 0	$ 0	-$4,678,000	-$4,678,000
Net total	*$ 0*	*-$4,238,000*	*-$4,678,000*	*-$8,915,000*
Cost of changing management on public lands*				
Total change to grazing margin	$ 0	-$1,065,000	$ 0	-$1,065,000
Costs of adopting 'grazing management'	$ 0	-$ 443,000	$ 0	-$ 443,000
Total change to timber margin	$ 0	$ 0	-$1,415,000	-$1,415,000
Net total	*$ 0*	-$1,508,000	-$1,415,000	-$2,923,000
Percentage of total cost		36%	30%	33%
Costs of changing management on private lands				
Total change to grazing margin	$ 0	-$1,664,000	$ 0	-$1,664,000
Costs of adopting 'grazing management'	$ 0	-$1,066,000	$ 0	-$1,066,000
Total change to timber margin	$ 0	$ 0	-$3,263,000	-$3,263,000
Net total	*$ 0*	*-$2,730,000*	*-$3,263,000*	*-$5,993,000*

* Split between private and public land estimated using:

- grazing in State Forests NSW is assumed to be managed as for private lands (from a differing starting point);
- assumed proportionate private and public changes by wetland area tenure for watering points and fencing; and,
- timber harvesting split using proportionate changes in management on public and private lands.

Source: Adapted from Research Report 10.

A sample average cost of changing wetland management via an inducive policy to purchase grazing rights is shown in Table 11. The present value of the costs of lost grazing earnings is approximately $1.7m for private lands, or about $215 per ha. Costs to wetland owners increase to a total of $2.7m or $294 per ha if half of the capital costs of changing management are included (half of capital costs are assumed wetland owner contribution as labour). As for the USE estimates, these costs do not take into account non-monetary benefits to wetland owners or the costs of negotiation and policing. Hence, assuming no other costs of restoration and without any non-monetary benefits to wetland owners, a conservation covenant program would cost approximately $215 per hectare or $1.7m for covenants over all additional privately owned wetlands from which grazing is excluded under the 'grazing management' and 'combined strategies' options. The actual cost of covenants could be considerably lower when non-monetary benefits enjoyed by landowners are included. The cost for a similar conservation covenant to remove timber harvesting would vary according to the time until harvest and expected yield. The average monetary cost of lost income to wetland owners for a portfolio with some sections recently harvested and others due for harvest is $955 per hectare assuming sustainable harvesting practices and $2,292 per hectare if maximum yield harvesting practices are followed.

Recommendation: Allow incorporated conservation groups to negotiate and monitor conservation covenants (including agreements similar to HA, VCA and RPA).

Recommendation: Ensure a wide degree of flexibility in covenanting requirements to facilitate innovation in protecting natural resources including the ability to covenant timber, water and fauna harvesting practices.

Induce

State governments are more able than local governments to offer inducements to wetland owners due to their larger revenue raising capacity. Three potential areas for incentive development are:

- fee relief for sales and donations to conservation organisations;
- capital grants to cover part or all of capital costs of changing wetland use; and,
- ongoing subsidies to the management of wetlands for conservation outputs.

State governments generally charge stamp duty on transfers of land. Stamp duty is mainly intended as a revenue raising measure rather than as cost recovery of maintaining a list of titles (stamp duty rates in SA and NSW are reported in Appendix 4). Removing stamp duty from donations to conservation groups and purchases by conservation groups effectively reduces the costs to conservation groups and donors.[36] For example, if a SA wetland owner donated a wetland with a market value of $200,000 to a conservation group they would need to raise $5,490 for stamp duty. If they intended to purchase the wetland it would effectively cost $205,490. The additional cost to such groups must either be raised from their constituency or by reducing the resources they have available for management or purchases elsewhere. Similarly, if a NSW wetland owner donated a wetland with a market value of $200,000 to a conservation group, the group would need to raise $6,830 for stamp duty. This would raise the effective purchase price to $206,830.

Stamp duty is not currently applied to the notional value of conservation covenants and should not be applied in the future. It is also recommended that any processing or registration fees attached to conservation covenants filed by conservation groups holding tax deductible status should be waived. The stamp duty exemption should also be extended to revolving fund sales – revolving funds are discussed in Section 5.4.

Recommendation: Stamp duty exemption for sales and donations to non-profit conservation groups and on revolving funds sales.

Properties owned for charitable purposes are not generally subject to Land Tax, however if the property is used to conduct a business they may be. It is suggested that the law is clarified to specifically exclude non-government organisations with charitable status where the business conducted is in line with the charitable purpose (for example, entry to reserves etc.).

If the land donated or purchased for conservation requires subdivision of land titles, for example where parts of several titles are donated or sold, the administrative costs of subdivision can be significant. In SA, a minimum fee of $645 (per additional title) to the Development Assessment Commission applies. Additional fees may be required for public notification, advertisement and referrals to other government departments. Once approval for subdivision is granted, a minimum fee of $600 will apply if the land has not been surveyed. If the land that is subdivided is currently a crown lease the transaction becomes substantially more complicated and usually involves a minimum cost of $1,500 to convert title to freehold before subdivision can occur. Smaller additional fees (approximately $100) are required to conduct title searches and registration. Similar costs apply in NSW. The minimum fee is $650 for each section that is split while title search and registration fees are $100 per title. These cost estimates for SA and NSW do not include the costs of surveying and conveyancing paid to private sector service providers. Hence, purchasers of conservation land that requires subdividing from other parcels face significant transactions costs that reduce the incentive to manage land for conservation. The total costs of these measures could be very small given the likely extent of land transfers but could act as an important signal in such cases.

[36] The SA government has removed the Stamp Duty payable on donations of land to Wetlands and Wildlife but has yet to institute a policy of removing stamp duty from all similar donations.

Recommendation: All State Government fees are waived for subdivisions for the purpose of conservation (defined by conservation organisation or revolving fund purchases, or to facilitate a conservation covenant).

Many wetland owners face a trade-off between monetary agricultural values and non-monetary wetland values when considering wetland management strategies (as discussed in some detail in Research Reports 2 and 5). The decision is often complicated by the one-off monetary cost for capital infrastructure that would be required to rehabilitate the wetland comprising of fencing, restoring wetting and drying and revegetation. Although the relative components of the capital cost differ between the USE and MRF, the constraint imposed by the capital costs is significant in both areas.

In the USE, the up-front capital cost of many strategies exceeds fifty percent of total monetary costs. For the 'wetlands and remnants' and 'cumulative farm forestry' strategies they amount to nearly $15m as shown in Table 12.

Table 12: Costs of changing wetland and remnant management in the USE

Cost description	**Wetland retention**	**Pro-wetlands**	**Wetlands and remnants**	**Cumulative farm forestry**
Capital costs of changing wetland management				
Capital costs to improve management of existing wetlands	$ 253,000	$ 253,000	$ 250,000	$ 262,000
Capital costs to recreate wetlands	$ 0	$ 518,000	$ 518,000	$ 518,000
Capital costs to re-establish wet land vegetation	$ 0	$3,864,000	$3,864,000	$3,864,000
Capital costs to re-establish native vegetation	$ 0	$ 0	$6,761,000	$6,761,000
Capital costs of fencing wetlands	$ 621,000	$1,331,000	$1,486,000	$1,642,000
Capital costs of fencing remnants	$ 0	$ 0	$1,729,000	$1,729,000
Subtotal	*$ 874,000*	*$5,955,000*	*$14,596,000*	*$14,763,000*
Proportion of total costs	29%	58%	54%	54%
Labour costs of changing wetland management				
Labour costs of fencing wetlands	$ 516,000	$1,105,000	$1,234,000	$1,362,000
Labour costs of fencing remnants and revegetation	$ 0	$ 0	$1,435,000	$1,435,000
Subtotal	*$ 516,000*	*$1,105,000*	*$2,668,000*	*$2,797,000*
Proportion of total costs	*17%*	*11%*	*10%*	*10%*
Total costs of changing management	***$1,390,000***	***$7,059,000***	***$17,265,000***	***$17,561,000***
Costs of ongoing wetland management				
Maintenance costs of fencing wetlands	$ 15,000	$ 31,000	$ 35,000	$ 39,000
Maintenance costs of fencing remnants	$ 0	$ 0	$ 41,000	$ 41,000
Materials cost of wetland maintenance	$ 172,000	$ 345,000	$ 358,000	$ 369,000
Labour cost of wetland maintenance	$1,427,000	$2,855,000	$2,968,000	$3,058,000
Materials cost of remnant vegetation maintenance	$ 0	$ 0	$4,652,000	$4,652,000
Labour cost of remnant vegetation maintenance	$ 0	$ 0	$2,558,000	$2,558,000
Total costs of ongoing management	***$1,614,000***	***$3,231,000***	***$9,894,000***	***$9,999,000***
Proportion of total costs	*28%*	*13%*	*16%*	*16%*
Total	**$3,004,000**	**$10,891,000**	**$28,478,000**	**$28,879,000**

Source: Adapted from Table 9, Research Report 9.
Note: All numbers are present values for costs incurred over the next thirty years. 'Farm forestry alone' is not shown.

The owner labour component is unlikely to exceed fifteen percent of the total costs even if some of the labour component of revegetation is included in the labour component. Hence, the initial monetary cost to wetland owners of changing wetland management can be large in absolute terms and as a proportion of total monetary costs. Revegetation costs form a major component of the costs of changing management and in Research Report 9 it was shown that total costs were relatively sensitive to the revegetation component. Hence, a review of the scale of revegetation required should precede any subsidies to change management. A similar problem applies in the MRF. Up-front capital costs

are between 67 percent (water management) and 23 percent (combined strategies) of total monetary costs but are over $2.8m for the 'combined strategies' option as shown in Table 13.

Table 13: Non grazing and timber costs of changing wetland management in the MRF (excluding water acquisition costs)

Cost description	Water management	Grazing management	Timber management	Combined strategies
Total capital costs of changing wetland management (including owner labour)				
Capital costs of watering-points	$ 0	-$ 192,000	$ 0	-$ 191,000
Capital costs to improve management	-$1,151,000	$ 0	$ 0	-$1,151,000
Capital costs of fencing wetlands	$ 0	-$1,261,000	$ 0	-$1,261,000
Capital costs to revegetation	$ 0	-$ 209,000	$ 0	-$ 209,000
Total costs of changing management	*-$1,151,000*	*-$1,661,000*	*$ 0*	*-$2,813,000*
Costs of ongoing wetland management				
Maintenance costs of wetlands (includes fence maintenance, weed and pest control and other costs)	-$ 566,000	-$1,187,000	$ 0	-$2,072,000
Total (non timber and grazing) costs of changing wetland management	-$1,717,000	-$2,849,000	$ 0	-$4,889,000

Source: Compiled from Research Report 10, present values for costs incurred over the next thirty years.

The disincentive created by monetary costs or profit impacts is a significant constraint to adoption for many USE and MRF wetland owners as shown in Tables 7 and 8. This disincentive could be addressed by a subsidy designed to facilitate a one-off change in wetland management. Such a subsidy also meets the criteria noted by Binning and Young (1999 p. 4) as the size of the grants would require 'strong interaction and negotiation between the funding organisation and the grant recipient'. Furthermore, the contribution of significant subsidies would require a guarantee that the management change is permanent via an alteration in property rights (for example using a covenant).

The Wetlands Reserve Program (WRP) in the United States (US) is one program that has been used in part to address the costs of changing management. A pilot program commenced for the WRP in 1992 and the restoration and protection of 395,000 hectares by 2002 has now been targeted. The program is currently targeting wetland restoration and protection via three avenues: purchase of permanent conservation easements, purchase of 30-year easements and restoration cost-share agreements.[37] A permanent covenant is required where 75-100 percent of the costs of changing management are paid, or a 30-year covenant if 50 to 75 percent are paid. No permanent protection is required for less than 50 percent cost-sharing (although a ten-year agreement is usually required for any government contribution). The easement purchase programs also contribute to restoration costs. The WRP is termed an auction program because it uses a mechanism designed to reveal landowner information about their true costs and benefits of changing management. This mechanism is further discussed in Section 8. Similar programs are operated by some other US government departments with a differing focus. A similar scheme, but covering management costs only, is also about to be trialed by the Department of Natural Resources and Environment in Victoria for the protection of remnant vegetation (Department of Natural Resources and Environment Victoria 2001).

A similar scheme is already operating in the USE under the USE Dryland Salinity and Flood Management Scheme. The 'Wetlands Waterlink' incentive program offered incentives to owners of existing wetlands of conservation value in the USE to assist with the costs of fencing and water management. The impacts of the scheme were taken into account in the analysis and the recommendations in this section are beyond that currently offered through the scheme.[38] Hence, extension of this scheme is recommended in the USE to induce further wetland management change in the USE region. It is recommended that the scheme cover part or all of the non-labour capital costs of changing management shown in Table 12. It is recommended that a similar scheme be instigated to cover part of the non-labour capital costs of changing management in the MRF as shown in Table 13.

[37] Conservation covenants are termed conservation easements in the US.

[38] The impacts of the 'Salt 2 Success' program were not included. Hence, any contributions under this scheme should be subtracted from the recommendations made.

It is likely that such a scheme would need to be government funded in order to access sufficient resources over the near future. However, care should be taken that government contributions do not crowd out the potential for private sector groups such as Wetland Care Australia to be involved. Crowding out should be particularly avoided in the MRF where a significant area of wetlands are located on State Forests NSW land. Hence, partnership arrangements could be the optimal way to encourage private and public expertise and contributions. Several other points about such a scheme should be noted:

- Although such a scheme is likely to be largely government funded, it could be managed and delivered by the private sector. For example, Greening Australia has managed large government grants designed to achieve fencing of remnant vegetation. Similarly, Wetlands Care Australia has recently received significant government funding to be distributed via its 'Living Wetlands' program. Devolution of delivery could reduce the potential for government inefficiencies in delivery and increase the potential for non-farm private sector contributions.
- Significant technical assistance to help landholders apply for the program would be required. It is suggested that along with traditional extension officers, non-government organisations active in the area be accredited to apply on behalf of landholders or to act as agents for landholders.
- Although the nature of the scheme suggested and the main constraints to changing management are broadly similar across the two case study areas, the specific constraints targeted and the delivery and monitoring mechanisms may differ significantly between the two areas.

A potential problem with payments to change management and conservation covenants is that landowners perceive they are no longer responsible for the land (see for example (Binning and Young 1997).[39] Hence, it is important to achieve ownership of the values generated via contributions from landowners. It is suggested, that the minimum contribution of landholders should be a significant labour input to fencing and where appropriate to other capital improvements such as revegetation.[40] Funding agreements of materials or capital works should also specify that ongoing day-to-day management is the responsibility of the landholder. It is anticipated that sufficient monetary and non-monetary benefits will be generated to the landowner to cover initial labour and ongoing day-to-day management contributions.

To ensure accountability to taxpayers, large contributions from government (either in absolute terms or as a proportion of total costs) should secure long-term protection via a conservation covenant. Smaller contributions from government should secure a minimum of a shorter term of protection (for example between 10 and 30 years). Other factors such as the willingness of the landowner and the significance of the wetland should also be taken into account in determining the appropriate length of a protection agreement.

Other inducive strategies that could be employed as part of such a scheme include subsidies of the following inputs:

- plants for revegetation projects;
- technical advice for rehabilitation projects and management planning;
- low technology equipment loans such as tree planting machinery; and,
- assistance for volunteers and community groups wishing to assist with management. Labour assistance could be particularly valuable in completing labour intensive rehabilitation or management tasks such as revegetation and weed control.

Recommendation: Capital grants to cover part (or all) of the capital costs of changing wetland use (sometimes in exchange for temporary or permanent conservation covenants).

Recommendation: Subsidise inputs to changing wetland management such as revegetation, management advice, equipment and labour inputs.

[39] An alternative argument is that the covenant has excluded all rights of value to the owner. Hence, care should be taken to ensure conservation covenants cover the minimum parcel of rights to achieve the desired conservation outcome and that sufficient incentives for management remain with the landowner.

[40] A reviewer raised the issue of accountability where wetland owners do not use the materials or grants for the specified purpose. This is an issue of contract design and monitoring. Standard practice suggests that full payment should not be made until the project is completed to an adequate standard. It may be more efficient to pay full rehabilitation costs if the cost of monitoring the quality of landowner contributions is too high.

Compel

Current legislative requirements largely reinforce the status quo with respect to the development of wetlands and remnant vegetation in both the USE and MRF. That is, landowners can continue current activities but further development is restricted. Specifically, landowners do not possess management rights to transform native vegetation (except harvesting according to a forest management plan in NSW) including that in wetlands or to modify wetland hydrology. While these rights can be applied for, consent is unlikely to be given. In SA, where consent is given, a minimum requirement is a net gain in native vegetation elsewhere on the property consistent with a total property plan (South Australian Department of Environment and Natural Resources 1997). Where changes are considered that would reduce landowner property rights, Aretino et al. (2001, p. 26) indicate caution should be exercised as:

> Frequent or significant changes to property rights can create uncertainty which adds to the costs of doing business. This means that government changes to property rights are only likely to be worthwhile if they reflect persistent (long-term) changes to community preferences.

Finally, little evidence is available to suggest that the current division of property rights is considered inequitable by the wider community in either the USE or MRF (see discussion in Section 3.1).

The current resource based regulatory approach via legislation that includes the *Native Vegetation Act 1991* in SA *Native Vegetation Act 1997* in NSW can be interpreted as a 'one size fits all' approach. These regulations reduce the access of landowners to benefits from owning these resources. The resulting restrictions on land use usually amount to conservation focusing on designating specific land inputs rather than a mix of land, capital and labour inputs. These restrictions also increase the perverse incentive for resource owners to 'shoot, shovel and shut-up' where they may be subject to such legislation and may create disincentives to produce or manage for the desired resource. For example, as reported by one farmer in Binning and Young (1997): 'There are plenty of ways of getting around regulations. You can easily manage the land in ways which destroy the value of the vegetation and which will ultimately kill all of the vegetation'. Hence, potential exists under policies designed to compel certain behaviour by landowners whereby landowners can seek to benefit from property rights that they do not legally possess.

There are several ways to improve the efficiency of resource based laws and to create policies that would reduce the incentive to act illegally. The policies discussed elsewhere in this Research Report reduce the costs of complying with these regulations. However, a major disincentive may remain where the actions of the landholder directly benefit an endangered species or recreate native vegetation. One potential solution is to create and promote 'Safe Harbour' agreements as a way of reducing the perverse incentives. 'Safe Harbour' agreements guarantee resource owners that they will not become subject to specified legislation due to improvements in specified environmental conditions or outputs that result from their management actions (Environmental Defense 2000). For example, if a landholder rehabilitates or increases endangered species habitat at their own cost they are not precluded from modifying their land uses at a later point in time. In particular, it is suggested that habitat rehabilitation and restoration projects (for example, wetland restoration projects) undertaken at the owner's expense automatically qualify for 'Safe Harbour' type agreements.

Recommendation: Use 'Safe harbour' type schemes to reduce disincentives to rehabilitation of wetlands and remnant vegetation.

A second disincentive of importance is the reliance on land inputs to produce native vegetation and endangered species outputs. Transforming the prohibition components of regulations to a 'duty of care' oriented framework could facilitate innovative mixes of land, labour and capital into the management process. Under such a framework, the landowner would be required to show that an equivalent quantity of the outputs that were protected by the legislation continued to be produced as a result of his actions. For example, the landowner could be required to maintain an equivalent population of the endangered species or a specified range of native vegetation species. With some limitations, the owner could be allowed to substitute his land inputs for capital or labour inputs elsewhere. Hence, successful increases in endangered species populations in 'Safe Harbour' areas could benefit landowners if they could sell 'credits' to other landowners. This concept is known as 'mitigation banking' or 'conservation banking' (Environmental Defense 2000). Using credits from

projects that have already succeeded eliminates concerns associated with unsuccessful restoration projects. Use of 'like for like' and 'exchange rates' can reduce concerns that such projects do not lead to a net environmental improvement. 'Like for like' requirements specify that the same endangered species must be provided, or similar wetland habitat or native vegetation, or that the environmental good must be provided within a certain distance of that damaged (thus reducing quality concerns). The concept of 'Exchange rates' is similar but addresses quantity and quality issues. For example, a landowner could be required to provide 150 percent mitigation in order to take an endangered species.

Use of mitigation strategies facilitates innovative management strategies and greater efficiency in resource allocation. For example, users of resources that are of high value in alternative uses can purchase mitigation in order to change resource use, while those with low value could experiment with appropriate resource combinations and become conservation banks. These programs are sometimes also called 'Habitat Conservation Plans' that must be prepared to obtain rights to develop some areas (Environmental Defense 2000, Corkindale 1998).

Recommendation: Consider use of a 'duty of care' framework via use of mitigation banking or habitat conservation plans to encourage a mix of resource inputs to conservation and not just land.

5.3 Federal policy suggestions common to the USE and MRF

Facilitate

The majority of facilitative incentives are generated at the local and state level. Many of these state actions are generic although the outcomes are specific. They include compilation of basic GIS databases and implementation of Land for Wildlife type programs. It is likely that state and local government is better positioned to enact such policies. However, the operation of a number of separate programs at the state and local level could be further improved by facilitating information transfer. Hence, a role exists at the national level to monitor the coverage of such facilitative programs. Binning and Young 1997 advocate similar policy options to some suggested in Sections 5.1 and 5.2 at the national level. However, the risk of government failure is increased compared to management at the state level because of the additional layers of bureaucracy that must be managed and the resulting increases in coordination difficulties. In addition, differences in ecology and bureaucracies across the states are not easily recognised in federal schemes.

A facilitative role that the Federal government could play is providing an information resource and possibly some capacity building training to new and growing conservation organisations at the national level. The relatively small number of such groups (particularly when compared to the number of wetland owners) means that significant economies of scale could be possible at the national level compared to the state level.[41] In the US, some large conservation groups devote significant resource to training programs that are designed to increase the capability of local conservation organisations to use many of the tools and incentives proposed in this Research Report. For example, the Trust for Public Land has sponsored a large number of land trusts in the western part of the US and The Sonoran Institute sponsors training for local groups to build capacity (Trust for Public Land, no date, and Cestero 1999). Hence, capacity-building approaches could help to develop this role within groups such as Wetland Care Australia.

Recommendation: Provide an information and possibly a training resource to facilitate growth of non-government, non-profit conservation groups, such as Wetland Care Australia, undertaking on ground works.

Induce

Additional incentives to induce management change on private lands could be granted at the federal level through the both grants and the taxation system. The potential for Federal government grants to induce management change is similar to those suggested at the state level and is not repeated here. Caution should be exercised to minimise the negotiation costs facing wetland owners if grants are

[41] As noted by a reviewer, caution should be exercised that any facilitative role does not develop into a new layer of bureaucracy that must be negotiated by such groups, or an additional layer above state bureaucracies.

sought at state and Federal levels and to minimise the costs of delivery by using existing networks where possible.

Incentives generated through the taxation system fall into two groups:[42]

1. Incentives targeted at reducing the landowner's costs of conservation activities; and,
2. Incentives to induce additional contributions to conservation by the wider community.

Use of such incentives (compared to grants or other incentives) is warranted if the same outcome can be achieved via a taxation subsidy that is less than the losses due to government failure. However, taxation subsidies are a 'one size fits all' incentive with little ability to target to particular regions or issues. Where market failure remains, it is more efficient to use the private sector where the costs of market failure plus the tax subsidy are less than the costs of government failure. Binning and Young (1999) and Productivity Commission (2001) note that any proposed taxation incentive must be carefully considered and take into account tax neutrality, environment, equity and investment and development benchmarks for evaluating taxation arrangements.

Table 14: Taxation incentives to promote conservation management

Incentive type	Description	Priority
Tighten existing incentives		
Reduce incentive to clear vegetation or drain wetlands	Tighten regulations to ensure that expenditures on native vegetation clearance, including wetland drainage, are treated as capital expenditure and not deducted as part of normal operating expenses. Requirement would exclude woody weeds and regrowth. A further strengthening would treat all further clearances as fixed capital that will not depreciate over time hence removing depreciation on the capital expenditure.	Low - due to complexity and small gains.
Incentives allowed if conservation covenant or long term management agreement entered*		
Extend existing arrangements	Access to tax deductibility of management expenses – this would significantly reduce the costs of ongoing management of conservation lands that are not attached to a business entity – including GST costs (that is, recognised as income generating lands).	High
Extend existing arrangements	Access to tax rebates – reasons as above but more important for low-income earners.	High
Extend existing arrangements	Access to tax deductibility of interest payments (negative gearing) – would significantly reduce the costs of purchasing conservation lands by private individuals.	Moderate
Extend existing arrangements	Grant business status (including primary producer status) to conservation landholders. This would allow the three incentives above, GST refunds on inputs and additional incentives relating to the diesel fuel rebate and other primary production concessions that are currently available to primary producers.	Moderate
Extend existing arrangements – alternative to above	Extend 20% tax rebate for heritage structures to conservation lands	Alternative to above – high if not adopted
Broadening input definitions	Tax deductibility of the owner's labour input to management could be considered.	Low – policing is difficult

* The covenant or management agreement would need to contain certain pre-specified clauses to facilitate eligibility. The management agreement may be as simple as agreeing to comply with a relatively detailed farm management plan.

Source: Most incentives in this table are from Binning and Young (1999).

[42] Both categories of taxation incentives are currently in a state of flux in Australia with additional reforms and extensions of current policy regularly announced over the last eighteen months. Readers should check whether the reforms proposed have been enacted or not. Some suggestions may simply require a test of current interpretations while others are more complex.

Taxation incentives aimed at reducing landowner's costs of conservation activities have two major advantages over grants. Firstly, they avoid the aspects of government failure in collecting and redistributing taxation as net tax collection does not increase. Secondly, they are uniformly accessible and serve to recruit and reinforce the motivations of landholders (Binning and Young 1999). However, Binning and Young also note that taxation grants may not be the appropriate instrument if the transfer is large or a negotiated outcome is desirable. Many of the taxation incentives in this section follow those proposed by (Binning and Young 1999).[43] Taxation incentives to promote conservation management are summarised in Table 14.

Recommendation: Broaden taxation incentives targeted at reducing wetland owners costs of conservation management.

Extending the incentives of individuals to contribute to private sector conservation organisations expands the pool of resources available to private sector conservation and helps reduce government failure in the collection and reallocation of revenues.

Changes made to the taxation system in 2000 and 2001 have increased the range of donations that are tax deductible. For example, the range of donations that are tax deductible has been extended to include the value of donated conservation covenants. However, several extensions would allow for greater consistency across all types of donation and with other business activities. These suggestions are outlined in Table 15. The most important incentives would treat current incentives more uniformly with respect to donated covenants, bargain asset sales and business losses. Capital gains tax reform with respect to donations is also an important instrument.

Recommendation: Increase taxation incentives targeted towards additional contributions to conservation groups.

Table 15: Taxation incentives to promote private sector donations

Incentive type	Description	Priority
Uniform current incentives	Allow tax deductible donation of conservation covenants – the deductible amount should be the reduction in land value caused by the covenant less any payment made for the covenant.	High – allows partial rights sale.
Uniform current incentives	Bargain sales of land to conservation organisations should be tax deductible – the deductible amount should be the gap between the sale price and the market value of property.	High – allows sale where some cash income is required
Extend existing arrangements	Ensure no capital gains tax is payable on any donation. For partial donations (eg. covenants and bargain sales) capital gains tax should only be payable on the proportion of value retained.	High – important where large gains could be made if sold.
Extend existing arrangements	Ensure that conservation groups are not required to pay capital gains tax or other Federal tax on asset transfers such as sales.	Low – unlikely to be a significant cost.
Extend tax incentives	Consider treating some donations as a partial tax credit rather than a deduction. This would increase the relative value of donations from cash poor donors to similar levels as cash rich donors	Low
Extend tax incentives	Increase the value of high value donations (eg covenants or land of very high conservation value) beyond 100%.	Moderate – complex because of identification issues.

Note: Conservation covenants would need to include pre-specified clauses to facilitate eligibility.
Source: Most incentives in this table are from Binning and Young (1999). A useful discussion of taxation incentives can also be found in Productivity Commission (2001).

[43] Many of these incentives were further developed in a publication by the Ian Potter Foundation (1999).

Compel

Most strategies that would compel landowners to change wetland management are available at the State government level. However, the Federal government has extensive powers over wetlands of national or international significance (designated via Ramsar listing) and nationally listed threatened species and ecological communities via the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBCA). Actions that could significantly impact on listed items become subject to a referral, assessment and approval process at the Federal level. The act also provides for listing of 'Key Threatening Processes' that could cause a species or ecological community to become nationally listed or further endanger existing listed species and ecological communities. Listing triggers development of a 'Threat Abatement Plan'. Designation provides a potential tool to influence management changes outside of the landowners property that could not normally be influenced by wetland owners. However, the trade-off is that listing at the Federal level (and hence under the EPBCA) can effectively remove management rights to transform wetlands in any way that would reduce the environmental values generated. Furthermore, the EPBCA is likely to discourage Ramsar nominations at the state level as it automatically grants rights to the Federal government.

5.4 Other policy suggestions common to the USE and MRF

Revolving funds are used by some US conservation groups (and the Victorian Trust for Nature) as a signalling device to notify potential buyers of the nature conservation values associated with the land. Revolving funds have several forms:

1. Urgent land purchases that are then on-sold to government;
2. Short term funding to enable conservation groups to raise sufficient funds for the purchase; and,
3. Land purchases that are then encumbered with a conservation easement and on-sold to conservation oriented buyers.

In some cases, revolving funds are able to make a profit (especially where they act as a signalling device to buyers). A revolving fund could perform any of these purposes in the USE or MRF regions but is likely to be most effective as a short term finance source for conservation groups or signalling device for potential buyers. Revolving funds in the US are often owned and operated by large conservation groups. However, in Australia it is unlikely that a non-profit organisation could raise sufficient capital in the short to medium term to facilitate such a fund. Hence, there is a significant opportunity for State or Federal government to provide seed capital or operate such a revolving fund at arms length (as has been the case in Victoria). Such a fund would need to have access to sufficient capital to allow several purchases to be undertaken at a single point in time. NSW (through the Nature Conservation Trust of NSW) and SA (in conjunction with the Federal government and the Nature Foundation) are committed to the establishment of revolving funds but they are not yet active in either state.

Recommendation: Finance revolving funds to signal wetland conservation values and reduce the search costs of potential private buyers.

Non-profit conservation organisations should also consider using tools such as options and rights of first refusal to help ensure land management goals are achieved. Options are an agreement with a landowner to purchase a specific area of land within a specified time and price. Rights of first refusal ensure that the conservation group has the opportunity to purchase the land at the price offered by any other party. More complicated legal arrangements allow the conservation group to purchase a conservation covenant prior to sale at the gap between the price with and without the covenant. Where conservation minded buyers can be found the gap will often be minimal.

Recommendation: Encourage use of a wide range of real estate tools by conservation groups including options and rights of first refusal.

Where planning tools are used, individuals and communities that are adversely affected (by the process or decisions) should have access to the decision making process.[44] Adverse effects should include both monetary and non-monetary impacts. Private sector conservation groups should be able to act on behalf of the community where a resource owned by the state is adversely affected (as is often the case

[44] Society explicitly allows many adverse impacts, such as the impact of new shops on current shop owners. These impacts should be allowed as they provide the incentive for innovation and the resulting gains to society.

in the English system). Access could include granting conservation groups active in the USE and MRF (such as Wetlands and Wildlife) a right to be consulted about specific issues.

Recommendation: Ensure communities (including conservation groups) can access planning processes and non-monetary impacts are considered in planning processes.

6 USE specific policy suggestions

In this Section, policy suggestions that are only relevant to the USE case study area are discussed. These may be USE specific due to the nature of the wetlands in the region or due to the current policy framework.

6.1 Local policy suggestions specific to the USE

Facilitate

The USE lies on a major tourism corridor between Melbourne and Adelaide. USE wetlands are not mentioned in the current promotional literature for the USE region despite the importance of tourism in immediately neighbouring regions. The tourism potential of the wetlands is emphasised by their recognised importance in meeting the criteria for Ramsar listing (White 1997) and their significance under the Japan Australia Migratory Birds Agreement (JAMBA) and China Australia Migratory Birds Agreement (CAMBA). Wetlands tourism in the region could be based on wetland based attributes such as birdwatching, bushwalking, experiencing a scenic vista and in some cases water based recreation such as canoeing. Wetland tourism could also be packaged with other activities such as farm stays and experiences, ecosystem education and tours or regional food and wine specialties. As tourism promotion is often undertaken at a combination of local, regional and state levels it is important that the tourism potential of the wetlands is recognised and included in promotional literature.

Recommendation: Incorporate wetlands tourism into local tourism promotion.

The Melbourne and Adelaide tourism corridor grants access to a large number of international, interstate and state based tourism. Wetlands in the region could be promoted as a stop-off point and a destination in their own right. There are several roles that local government could undertake as a regional grouping or in cooperation with the state government with, including:

- Development of tourist infrastructure including information about wetlands and development of scenic drives including stop-off points;
- Training for wetland owners who are interested in starting tourism ventures;
- Assisting with access to specialist markets (such as bird-watching clubs within Australia and internationally); and,
- Facilitating an USE wetlands tourism organisation that would eventually become stand-alone.[45]

The costs of developing tourism infrastructure could be substantial if roads and other facilities are upgraded. Hence, a more detailed study of the tourism potential and contributions from other levels of government would be required before proceeding. Caution must also be exercised that development does not seek to 'pick winners' among potential market entrants, or do more than facilitate market development. Other incentives such as potential operator training, investigating market access and including USE wetlands in promotional literature would be relatively low cost and are recommended. In the US, non-government organisations (for example the Sonoran Institute) sometimes facilitate the development of conservation oriented diversification of land management such as nature based tourism (Alexander 2000).

Recommendations: Consider development of tourism infrastructure (including scenic drives, maps and stop-off points).
Assist with training for wetland owners interested in starting a tourism venture.
Assist with wetland owner access to specialist markets (such as bird-watching clubs).

[45] Huybers (2001) discusses the potential for tourism groupings to encourage improved environmental management via peer pressure and monitoring of behaviour.

A mature regional tourism industry could eventually provide additional funding for environmental management. Creation of special rating districts or regional bed taxes could access part of the consumers' and producers' surplus that would be generated by tourist visits to the region. These institutions raise funds by taxing specific areas or businesses (for example, accommodation providing businesses) at a higher rate. The taxes raised could then be used to induce specific environmental improvements that would maintain or increase tourism. Precedents to taxes aimed at extracting tourist consumer's surpluses exist in several parts of the US (Hopper 1998), Austria and effectively via zoning legislation within Australia.[46] Tourism organisation member levies are also potential means of capturing part of the producers' surplus from tourism but free-riding on the voluntary membership of such bodies reduces the effectiveness of these levies.[47]

Recommendation: Sponsor an USE wetlands/ecotourism organisation.

6.2 State policies specific to the USE

Facilitate

Native fauna rights are retained by the state government in SA but can sometimes can be obtained via a license as indicated in Table 3. Landowners may then have no direct incentive to produce native fauna but can only benefit indirectly through charges for access to hunt on their land. For example, hunters are charged to participate in organised shoots by Wetlands and Wildlife in the USE region (see Research Report 7 for more information). Alternative separations of rights in several US states (including Colorado, California and Utah) allow greater incentives to landholders that participate in 'ranching-for-wildlife' programs (Leal and Grewell 1999). In Australia, Tasmania has a similar system of 'ranching for wildlife'. Under a 'ranching for wildlife' scheme landowners are granted additional rights to resources in return for agreeing to manage their resources in ways that would benefit that resource. For example, owners of sufficiently permanent wetlands in the USE could be granted additional access to game waterfowl species in return for a management agreement or conservation covenant over the wetland and buffer areas. The rights granted could include an extended hunting season, the right to charge per waterfowl hunted or a combination of these. Access to the resource increases the incentives to produce. Earth Sanctuaries Pty. Ltd. provides a practical example of the current lack of incentives to resource owners.[48] Earth Sanctuaries' title to the native fauna produced on its land is unclear. Hence it has been difficult for the company to sell the fauna or, until recently, to report successful breeding programs as an increase in assets.

Recommendation: Consider appropriateness of 'Ranching for Wildlife' programs to encourage conservation.

7 MRF specific policy suggestions

7.1 Local policies specific to the MRF

Facilitate

Floodplain ordinances are designated at both the local and state level. Historically, such ordinances have been used to minimise the potential for damage to human life and property (both directly and by changing floodplain flow-paths). More recently, a contributing reason for designating floodplains has been retention of the values generated by floodplains (including wetlands) in their natural state. One aspect of floodplain ordinances has been to restrict any form of development on floodplains without appropriate approvals. The application and approval process is much more complex where building or removing structures is considered. These processes may include costly preparation of environmental

[46] Creation of such a zone in SA would require Ministerial approval (Cripps and Young 1998).
[47] A reviewer also notes that caution would need to be exercised to ensure that any such organisation was not dominated by National Parks and Wildlife SA and Wetlands and Wildlife who are by far the largest conservation oriented wetland owners. Furthermore, creation of any such organisation would require care to ensure that management and distribution activities are transparent and accepted by constituents.
[48] Information about Earth Sanctuaries can be found on their website at: www.esl.com.au

impact statements and a specified process of community consultation. These processes apply equally whether wetland rehabilitation or other actions are being considered. The impact of the time consuming and costly process to change wetland management significantly reduces the incentives for rehabilitation of floodplain wetlands.

Recommendation: Floodplain and other similar ordinances should be designed to avoid constraining or acting as a disincentive to wetland rehabilitation activities.

Induce

Local government levies development application fees in NSW, which consist of a development application fee ($450 per application plus $50 per additional allotment), a certification fee ($30) and unspecified additional fees for advertisements and other consultative / public notice requirements. These fees may be a disincentive to subdividing land to facilitate conservation management. Hence, an exemption for conservation groups or revolving funds purchasing such lands for conservation purposes is recommended providing a suitable plan of management is provided with the application.

Recommendation: Conservation lands are exempt from development application, certification and consultative fees.

7.2 State policies specific to the MRF

Facilitate

Native fauna rights are retained by the state government but sometimes can be obtained via a license as indicated in Table 3. Landowners may then have no direct incentive to produce native fauna but can benefit indirectly through charges for access: for example, via charging visitors to visit. Alternative separations of rights are possible in the MRF. However, MRF wetlands are not conducive to producing game species such as ducks and hunting is currently banned in NSW.

Approximately 30 percent of red gum timber harvested in the MRF is from NSW State Forests managed lands. At present the harvest practices decided by NSW State Forests who sell the timber to local mills at a pre-negotiated price (using a residual value pricing system as described in Marsden and Associates (2001)). Sales are effectively at a preset price via a process that does not allow environmental groups to tender to defer or prevent logging.[49] Specifically, environmental groups cannot at present offer to contract to have forests remain standing. Hence, environmental groups are unable to act in the timber market to retain red gum forests. It is suggested that mechanisms be considered to allow environmental interests to compete with timber harvesting interests where red gum forests are potentially to be logged. The residual value pricing system may set prices too low in order to guarantee a minimum profit to saw-millers as discussed in Marsden and Associates (2001). Furthermore, the methodology used to set the price does not include any costs due to lost environmental values where forests are harvested. Therefore, a second recommendation is to investigate appropriate pricing mechanisms that include all costs to society. It should be noted that lower timber prices reduce the incentives to private wetland owners to harvest timber in their wetlands and higher prices may increase timber harvesting.

Recommendation: Ensure that environmental interests are able to act in a competitive market (with purchasers of timber) to defer or prevent timber harvesting.

Recommendation: Investigate timber pricing mechanisms to ensure pricing includes all costs.

Induce

All water in NSW is owned by the state. Access to water is granted via a licence and payment of specified fees and charges. According to Fisher (2000), these fees and charges do not yet include the

[49] The price paid to defer harvest would be much less than that paid to harvest trees. The price would effectively be the return on the income plus risk of forest destruction (for example by fire) plus natural degradation if any (for example, mature trees rotting or becoming hollow thus reducing values) less additional timber through growth.

full costs of supply (including environmental costs). Hence, an implicit subsidy is given to users of water. The implicit subsidy acts as a signal to water users to over-extract water (because the true cost is greater than what users pay). This signal is referred to as a perverse incentive. The over extraction of water leads to less water being available to flood wetlands and hence wetland degradation. However, it must also be considered that the subsidisation of water also reduces the incentives to wetland owners to try to extract water from their wetland systems.

Recommendation: Remove all subsidies hidden or otherwise in water pricing in NSW.

Land tax is not applicable to properties conducting primary production and lands classified as rural land. Land managed for conservation in other classifications (that is, non-primary production or rural) is only exempt with the approval of the Director-General of National Parks and Wildlife NSW. It is suggested that the status of such land is clarified to ensure a perverse incentive to develop does not exist.

Recommendation: Extend land tax exemption to land managed for conservation within all classifications.

State government land management

Adoption of some strategies can be concentrated on lands owned and managed by NSW State Forests. Changing management reduces the scale of the task of changing management in the private sector. However, government failure due to collection of taxes remains an issue because the income lost due to management changes must be collected from alternative sources.

State Forests NSW manages nearly 13,000 hectares of wetlands in the MRF. The cost-benefit analysis of potential management options reported in Research Report 10 suggests that grazing management in all State Forests land be managed to maximise conservation outcomes. Adoption of such a strategy has largely been completed as recent changes to State Forests grazing management strategies have significantly reduced stocking rates and introduced rotational practices to favour native grasses. It is also recommended that grazing be eliminated from some wetland areas and others not be grazed until dry. Elimination of grazing across all State Forests wetlands is not a favoured option because of the resulting increase in wildfire risk. Changing management in State Forests NSW land alone would not be sufficient to adopt the 'grazing management' option but would significantly reduce the scale of adoption and associated costs to private sector wetland owners (to approximately 5,000ha).[50]

Recommendation: NSW State Forests to adopt the 'grazing management' option on all wetland areas where possible.

Similarly, the 'timber management' option could be adopted entirely by instituting changes in State Forests wetlands. However, not all of the State Forests NSW wetlands would be flooded by the artificial flood considered under the 'combined strategies' option. Hence, in order to obtain the synergistic response shown in Research Report 6, at least some changes to timber management on private land would need to be made to adopt the 'combined strategies' option. That is, management would need to change on between 2,000 and 4,000 hectares of private land depending on the frequency of flooding of State Forests wetlands. Combined changes to timber and grazing management would effectively create a number of reserves in State Forests wetlands areas. NSW State Forests manages significant areas of reserves in NSW but they may not be the best-placed organisation to manage such resources. Hence, if management changes result in single use State Forests the most appropriate management organisation for these resources should be reassessed. The issue of competitive neutrality with respect to bidding for State Forests timber resources (mentioned in the previous sub-section) is also relevant when considering the appropriate organisation and structure to manage resources.

[50] Adoption of altered grazing management practices on State Forests NSW wetlands would not impact as significantly on adoption of the grazing management aspects of the 'combined strategies' option. This is because the synergistic responses under this strategy require grazing management changes to be concentrated on the 50 percent of the floodplain that is more regularly flooded. While State Forests wetlands are likely to include a larger proportion of these wetlands than privately owned wetland areas, a synergistic response would require changes to grazing management on up to 10,000 hectares of private wetlands.

State government water management

Additional incentives to acquire sufficient water to create an artificial flood as per the 'water management' and 'combined strategies' outcomes are outlined in this section. These strategies were shown to generate a positive NPV to the wider community when the strict assumptions regarding extrapolation of the CM values were relaxed in the sensitivity analysis in Research Report 10 as discussed in Section 5.1. Hence the recommendations in this section should only be adopted if the less conservative extrapolation is accepted. They are separated from other incentives because they do not relate to wetland owners but to the allocation of water rights by the NSW State Government.

Three categories of environmental water are provided for under the *Water Management Act 2000* (WMA) (NSW Department of Land and Water Conservation 2001, p. 6):

1. Water for fundamental environmental health to be provided at all times (*environmental healthy water*);
2. Water committed for specified environmental purposes but which may, under nominated circumstances, be used for other purposes (*supplementary environmental water*); and,
3. Water granted under an access licence but committed for specified environmental purposes (*adaptive environmental water*).

Water in Categories 1 or 2 cannot be sold for other uses as no access licences exist for this water. Where Category 2 water becomes available for other purposes it will be allocated under existing access licences. Water reforms to delineate current environmental allocations in the MRF have not been completed (they are scheduled for completion by December 31 2001). It is likely that the current 'end of system' (EOS) flow requirements and 'environmental contingency allowances' (ECA) will be designated Category 1. Other environmental allocations (including transparency and translucency requirements)[51] are likely to be designated as Category 2 environmental water.

Stored Category 2 and part of Category 1 water was used to create an artificial peak and small flood through the MRF in 1998 and 2000. In neither case was the size of the flood sufficient to flood wetlands other than those closely connected to the Murrumbidgee River (in part due to current flow constraints at Gundagai). These releases demonstrate the potential for an artificial flow to flood wetlands under the 'water management' and 'combined strategies' options. The recent releases also demonstrate that only part of the water required to create an artificial flood would need to be reallocated from consumptive uses such as irrigation. Analysis suggests that approximately 22,700ML of Category 2 water would be available in 50 percent of years (or about 11,300ML per year).[52] This amounts to approximately two-fifths of the water required for an artificial flood. It is recommended that part, or all, stored Category 2 environmental water be contributed towards a managed artificial flood program as per the 'water management' and 'combined strategies' options. Category 2 water is currently discounted by 50 percent if it is not used by the 31st of October. It is recommended that this constraint be removed in conjunction with conversion of stored Category 2 water to Category 3 water to provide an access licence and the ability to trade such water.

Recommendation: Part or all of the stored environmental water be made available for artificial floods (preferably under an access licence that would allow it to be sold in years where a flood is not released).

Recommendation: The cut-off for full carryover of stored environmental water should be extended to at least November 30 and preferably to the same period as standard access licences.

Assuming that on average 22,600ML of Category 2 environmental water is available in 50 percent of years, approximately 39,000ML of additional water would need to be acquired each year to create an artificial flood. Water could be acquired by immediate or gradual reallocation among existing users

[51] Transparency rules protect against low flows downstream of dams by releasing an equivalent amount of water to inflows below a threshold daily flow. Translucency rules ensure some degree of natural flow and variability downstream of Burrinjuck Dam. The translucency rules aim to release a proportion of the water flowing into Burrinjuck Dam depending on the time of year, the catchment conditions and the dam volume. Source: Water Sharing Plan for the Murrumbidgee Valley (Regulated System) (no date).

[52] Personal Communication, Mark Foreman, Regional Hydrologist, Murrumbidgee Region, Department of Land and Water Conservation.

either with or without compensation. In Research Report 10 and this Research Report, water is assumed acquired over a five-year period. The State of NSW exercises water rights to all water in the MRF and exercises allocation powers over competing interests.[53] Hence, water for environmental purposes could be acquired by reallocating of water among uses without compensation to current water users. For example, (Quiggin 2001) suggests that current rights with a limited duration could be withdrawn on expiration and that an 'efficiency dividend' to environmental flows could be imposed on licence owners based on efficiency gains associated with using 'best practice' technology in on-farm water use.

An alternative approach is to compensate water users for water reallocated to environmental uses. Reallocation could be through the voluntary purchase of access rights, or compulsory purchase of a proportion of access rights. In either case, the appropriate compensation payment needs to be set. Efficiency gains will be maximised if water is purchased via voluntary sales in the market place. Competing buyers and sellers in the market place also set the appropriate payment to sellers. However, the market price of water may not be the appropriate compensation payment from an economic point of view. Water access and use charges in the MRF do not include a full rate of return on capital invested (dams, weirs, channels etc.) or environmental costs. The price of access licences will be higher than their true cost as they include, in part, the capitalised future benefits of the water price subsidy. Under this scenario, full cost water pricing would reduce the purchase price of water access rights. Subsidised water leads to perverse incentives to over-extraction of water and increased incentives to develop wetlands to store water for future use or as irrigation sites. Moreover, general taxes must be set higher than they would otherwise need to be in order to fund the implicit subsidy. Conversely, full price water may increase the incentives to extract water from wetlands if the water can be acquired at lower cost than in the market place. An alternative argument suggests that rights to access water are uncertain due to the water reform process in NSW. The price of water access rights may thus be reduced by the relative uncertainty associated with the rights.

Completion of the water reforms in NSW will create more secure and better defined property rights to water (including water in wetlands).[54] It is recommended that current water price subsidies continue to be removed to ensure that the full cost of water is taken into account by users when deciding among alternative uses. Finally, it is suggested that water access licences are purchased (over five years) in order to acquire the additional 42,000Ml (of licences) required to create an artificial flood. The cost of purchasing 42,000Ml of water at current costs is approximately $14.0m. However, income generated from sales in years where an artificial flood is not created conservatively amount to approximately $6.2m.[55] Purchasing licences potentially provides a source of income for wetland owners seeking to increase water usage efficiency or to enter new industries. The water acquired would amount to a large access licence (50,000Ml of water in total or 54,000Ml of access rights to account for the allocation percentage in a 'normal' or 'average' year). The size of the water access licence required could also be reduced if part of the used right was returned if Burrinjuck and Blowering dams spilled after an artificial flood had been released.[56]

Recommendation: Completion of the water reform process in NSW to facilitate an improved market for water rights.

Under the *Water Management Act*, the allocation of water between the environment and alternative users is devolved to River Management Committees (RMCs). RMCs determine the allocation rules for Category 1 and 2 water and are a potential organisation for managing the water acquired to generate an artificial flood. The role of RMCs in allocating water between users and setting rules for water management within river systems could lead to potential incentive conflicts, particularly where

[53] The Federal Government has rights to water in parts of the Murrumbidgee catchment but has no rights to water once it leaves the designated tributaries.
[54] The possibility exists that post-water reforms, additional clarification of water property rights may be useful.
[55] There is potential for such management to generate a 'profit' by buying excess (and therefore cheap) water in wet years to supplement a smaller licence and selling water in dry years when it is scarce (and therefore expensive).
[56] Return of the entire access amount is not justifiable as the initial allocation of water to the access licence will have reduced the quantity available to other users and impacted on their decisions. Hence, a partial return would allow environmental benefits at a lower cost and, if the proportion returned is appropriately selected, at no cost to other users.

decisions must be made about whether to create a flood or to sell water. An alternative organisational structure is that of a trust.

A trust is a legal assignment of decision-making powers to 'trustees' who manage assets on behalf of another according to a goal. In the MRF, the goal of the trust would be to maximise the health of the floodplain wetlands using the assets over which it has control. The trust would therefore make decisions about use of the water purchased for an artificial flood on behalf of the wider community. Precedents for trusts to manage natural resources are widespread in Australia and overseas, although rarely on the scale of the water that would be managed by a MRF wetlands trust. In order to ensure the trustees act in the interests of the community and carry out the mission of the trust three aspects of accountability should be included (Anderson 1999):

- specifying ways of measuring and monitoring the trustees' performance;
- compensating the trustees for acting in ways that correlate with the beneficiaries' welfare; and,
- enforcing specific behavioural rules or policies.

It is suggested that the trustees are appointed by the Director Generals of the NSW Department of Land and Water Conservation and the New South Wales National Parks and Wildlife Service, and that appointments be staggered to avoid political interference associated with elections. To ensure balanced decision making the trustees should be drawn from a range of interest groups including environmental groups, local government, forestry and farming groups. The Trust would be self-sufficient because water sales would generate sufficient revenue to achieve the trusts objectives (including environmental monitoring). It is suggested that the trust be initially funded by a grant of approximately $6m and a zero interest loan of approximately $8m to purchase water for the artificial flood in the water market. If the trust was also absolved of water access and use fees, sufficient cash would remain to fund activities. A trust would also be more likely to act entrepreneurially in the water market using tools such as options to maximise returns in years where water is sold.

Recommendation: Purchase of sufficient water to allow an artificial flood to be released in five out of six years.

Recommendation: Creation of a trust to manage the water for the artificial flood. The trust should be partly funded by a one-off grant to purchase water and partly via an interest free loan to be paid back over the next 30 years.

Should an artificial flood be created an issue of positive and negative externalities to floodplain landholders arises. Positive externalities are generated by the small but positive impact of floodwaters on pastures and a corresponding negative externality is imposed by the forced removal of stock from these pastures. A negative externality is also imposed upon farmers who must raise irrigation pumps, the Gundagai community due to flooding of sports fields and low lying roads and a market gardener near Gundagai. It is anticipated that some compensation would be required to induce a change of management because of the current requirement to avoid flooding in the neighbourhood of Gundagai – referred to as the 'Gundagai choke'.

Recommendation: A solution is sought to the constraint to flooding imposed by the 'Gundagai choke'.

7.3 Potential Federal policies in the MRF

Induce

An additional taxation incentive of importance to wetland conservation in the MRF is a three-year deduction or tax rebate or credit at 34 cents in the dollar for water storage. Water storages are often constructed in wetlands as these reduce excavation and pumping costs because they are low lying basins. For example, at least one wetland basin in the MRF has recently been converted and used for water storage.[57,58] It is recommended that access to deductions, credits and rebates be vetted to ensure that wetland habitat has not been harmed by construction of water storages.

[57] James Maguire, personal communication (NSW Department of Land and Water Conservation).
[58] It is unknown whether the taxation arrangement contributed to the conversion of the wetland in question.

Recommendation: Ensure tax deductions and rebates for construction of water storages do not apply where wetland conservation values are destroyed.

8 Cost sharing, scheduling and implementation issues

In Sections 6,7 and 8 a wide range of potential policies have been suggested to facilitate, induce or compel a change in wetland management in the USE and MRF. The relative weights applied to different policy options, the relative timing of policy application and some important implementation mechanics are discussed in this section.

8.1 Cost sharing

The concept of cost sharing

The sharing of the costs of policy changes between wetland owners, regional communities, states and nationally may limit the community acceptance of the alternative policy solutions. If cost sharing is strongly weighted towards wetland owners then policy solutions are more likely those that coerce change. If cost sharing is weighted towards the wider community then policy will be weighted towards those strategies that transfer gains from the wider community to wetland owners.

The current property right framework as detailed in Section 3 is the starting point for considering any changes to property rights and thus the status quo in terms of cost sharing. Two potential methodologies, the 'polluter pays' and the 'beneficiary pays', are available to help determine how the costs of changing management should be shared based on the current assignment of property rights and any proposed changes to that assignment.

The 'polluter pays' principle may be applied where individuals do not bear the full costs of their decisions (Aretino et al. 2001). The 'polluter pays' principle implies that individuals who have caused a reduction in wetland outputs and the consequent reduction in community welfare should bear the cost of compensation. Under the 'polluter pays' principle, those who benefit have the right to specified benefits of wetlands in perpetuity. Alternatively, wetland owners have a duty to ensure continued production of wetland outputs or an equivalent benefit. The assignment or strengthening of property rights may facilitate enforcement of the 'polluter pays' principle.

The 'Beneficiary pays' principle requires anyone who benefits from the change in wetland management to contribute to the costs of changing management. That is, the wider community that would benefit from improved wetland management should contribute to the costs wetland owners bear in producing wetland outputs. Aretino et al. (2001) points out that because the 'beneficiary pays' principle does not lead to an uncompensated change in property rights it can only be used to encourage voluntary conservation. Aretino et.al. also note that it may be appropriate for some government contribution to be made to the costs of changing management on behalf of the general community. Government contributions are only appropriate where the costs of government redistribution are lower than those improved by collective action problems, and, where net benefits remain after the costs of government action are taken into account.

In practice, both principles can be applied simultaneously pertaining to different wetland outputs, or the same output, depending on the assignation of property rights. For example, native vegetation clearance restrictions impose a duty on wetland owners not to clear wetland vegetation. However, at present there is no requirement that wetland outputs continue to be produced. Subsidies may also be available to producers to encourage increased production of wetland outputs. Thus, any wetland owner who clears their wetland will be subject to the polluter pays principle up to the previous condition of the native vegetation. The previous condition is the reference level with respect to the current division of property rights relating to wetland vegetation. Additional assistance may then be available to increase the net level of wetland outputs beyond the reference level. This division between application of the polluter and beneficiary pays principles was explained by the concept of the reference level of environmental outputs in Section 2. According to Hutchinson (1997), the location of the reference level is primarily determined by the outcome expectations of the community. These outcome expectations also include equity considerations with respect to wetland owners.

These two principles are briefly applied to the issue of cost sharing to achieve the management changes suggested for the USE and MRF in the remainder of this section.

Cost sharing in the USE

Application of the 'polluter pays' principle to the USE is complicated by the way that the historical distribution of property rights has shaped present outcomes. Application of the 'polluter pays' principle defines the 'polluters' as those landowners who are no longer producing wetland outputs. However, the current reduction in wetland outputs is the result of the actions of those who initially developed wetland and remnant areas in the USE during the 1950s, 60s and 70s. Often these individuals no longer own the farms. Furthermore, clearing and draining of wetland areas was actively encouraged in the region by State and Federal Governments until at least the mid 1970s. Finally, due to low commodity prices and a succession of dry years few current landowners in the region would have sufficient cash to undertake wetland and remnant rehabilitation thus forcing a change of property ownership and loss of management experience. Hence, it would be inappropriate to attempt to apply the 'polluter pays' principle to past changes. The 'polluter pays' is potentially an appropriate principle that could be used to help prevent further degradation.

The conclusion that the polluter pays principle should not be applied increase wetland outputs in the USE is supported by the available evidence with respect to the reference level as reported in Section 3.1. This evidence suggested that the appropriate reference level is the status quo with respect to development of wetlands in the USE. Hence, the appropriate cost sharing principle to increase wetland outputs is 'beneficiary pays'. The beneficiaries of changing wetland management in the USE are wetland owners as well as the wider community. The exact benefits generated to USE wetland owners from changing management are significant but unquantified. Hence, USE wetland owners should be willing to contribute to improved wetland management in the region. The level of wetland owner contributions that are expected must be less than the benefits generated, or no gains from changing management will remain and thus no incentive for wetland owners to change management. In Section 5, it was suggested that a minimum contribution was required of wetland owners in order to ensure a degree of ownership over the outcomes and future management. Such a contribution should be a minimal contribution. Wetland owners should also be encouraged to make additional contributions according to their willingness to pay (further discussed in Section 8.2 relating to scheduling).

The remaining capital and opportunity costs of adoption not paid by the polluter or wetland owner, should be divided between USE residents, other residents living in SA and residents of other states. The proportion of the costs borne by each group should be approximately in-line with the benefits generated in order to ensure an equitable distribution of benefits. At the maximum, the transfer from other SA residents should not exceed the conservative estimate of the non-monetary values shown in Table 5. Hence, the suggested cost-sharing framework is implicitly derived from the policy makers beliefs about the extent of extrapolation of the CM results reported in Research Report 9 that is appropriate.

Transfers from within SA along with labour and future management contributions from wetland owners will only achieve adoption of the 'Pro-wetlands' option. Adoption of the 'Wetlands and Remnants' and 'Cumulative Farm Forestry' strategies would rely on additional contributions from other states (via government or other mechanisms). There is an argument for interstate contributions to both the 'Wetland retention' and 'Pro-wetlands' options as well because these options also generate benefits to residents outside SA. The results in Research Report 9 suggest that significant benefits are generated outside of the catchment, for example to Canberra residents. Hence, the appropriate cost sharing frameworks should include contributions from residents outside of SA.

Recommendation: Adoption of any option beyond 'wetlands retention' should include cost-sharing beyond SA residents.

Cost sharing in the MRF

The 'polluters' in the MRF are divided between historical wetland owners, current wetland owners and those who initially developed irrigation in the MRF. As in the USE, clearing and development of wetland areas and irrigation water supplies in the region was actively encouraged, subsidised and

facilitated by construction of infrastructure by State and Federal governments. The assistance continues via ongoing subsidisation of water supply costs. Finally, many wetland owners in the region would have insufficient cash to undertake wetland rehabilitation thus forcing a change of property ownership and loss of management experience. Hence, it would be inappropriate to attempt to apply the 'polluter pays' principle to past changes but it may be appropriate to prevent further degradation.

Aspects of natural resource management to which the polluter pays principle could be applied include any off-site environmental degradation due to future timber harvesting or irrigation development. Property rights that allow access to the benefits from timber harvesting could be granted in return for a management plan that incorporates measures to prevent off-site harms. Individuals or groups that are harmed as a result of these activities should also be able to seek damages under either common laws or environmental regulations. Imposing the polluter pays principle would reduce the costs of adopting the 'timber management' or 'combined strategies' options on the wider community at the expense of imposing additional costs on wetland owners.

The conclusion that the polluter pays principle should not be applied increase wetland outputs in the MRF is also supported by the available evidence with respect to the reference level as reported in Section 3.1. This evidence suggested that the appropriate reference level is the status quo with respect to development of wetlands in the MRF as discussed above for application of the 'polluter pays' principle. Hence, the appropriate cost sharing principle to increase wetland outputs is 'beneficiary pays'. The beneficiaries of changing MRF wetland management are the wetland owners and the wider community. The value of wetland rehabilitation to MRF landowners is significant but unquantified. Therefore, wetland owners should be willing to contribute to improved wetland management in the region. The contributions from wetland owners must be less than the benefits to wetland owners or no gains to wetland owners will arise and thus no incentive for wetland owners to change management. It was suggested in Section 5 that a minimum contribution was required of wetland owners in order to ensure a degree of ownership over the outcomes and future management comprising some labour inputs to changing wetland management and a commitment to ongoing management inputs. Such a contribution should be a minimal contribution. Wetland owners should also be encouraged to make additional contributions according to their willingness to pay (further discussed in Section 8.2 relating to scheduling).

The remaining capital and opportunity costs of adoption not paid by the polluter or wetland owner, should be divided between MRF residents, other residents living in the Murrumbidgee catchment, including the ACT, and residents of other states. The proportion of the costs borne by each group should be approximately in-line with the benefits generated in order to ensure an equitable distribution of benefits. Transfers from within the catchment along with labour and future management contributions from wetland owners will only achieve adoption of the 'grazing management' option. The population of the ACT is also included within the estimate of catchment benefits. Excluding the ACT from the within catchment estimates generates a positive benefit from adopting the 'grazing management' strategy ($331,144) but a transfer from the ACT to wetland owners is suggested on equity grounds. Adoption of the 'water management' or 'combined strategies' options would rely on additional contributions from outside of the catchment (via government or other mechanisms). There is an argument for contributions from the remainder of NSW and interstate to facilitate adoption of the 'combined strategies' option. The 'combined strategies' option generates significant benefit to downstream residents of SA and is likely to generate significant benefits to NSW residents and to a lesser extent other states. Hence, the suggested cost-sharing framework is implicitly derived from the policy makers beliefs about the appropriate extent of extrapolation of the CM results reported in Research Report 10.

Important jurisdictional issues are raised by the recommendation that cost-sharing frameworks should include the ACT (at a minimum). As indicated, cost sharing may be via either market or planned systems. The ACT is an obvious market for wetland conservation groups in the MRF and market transactions lie outside of any inter-jurisdictional concerns, hence transfers via the market are not further discussed in this section. As discussed in Sections 5 and 7, it is unlikely that the scale of transfers required to achieve the management changes the community desires can be achieved entirely via purely market based mechanisms. Hence, some transfers will need to be coerced via government redistribution. The concept of fiscal federalism suggests that different jurisdictions should be able to raise sufficient taxes internally to fund government services provided at that level. Hence, it is suggested that any government transfer from the ACT be based on fiscal federalism. ACT taxpayers

and administrators are likely to require a say in how such transfers are distributed and monitored. Therefore, any transfer from the ACT to the MRF (in NSW) would require organisations capable of providing such assurances. The structure of such organisations is beyond the scope of this Research Report. However, it is suggested that one option is distribution via non-government structures. Possible examples include the Greening Australia's distribution of National Heritage Trust funds to fence remnant vegetation and Wetland Care Australia's distribution via the Living Wetlands Fund.

Recommendation: Adoption of the 'grazing management' option should include cost sharing with ACT residents.

Recommendation: Adoption of any option beyond 'grazing management' should include cost sharing with residents outside the Murrumbidgee catchment (and potentially interstate).

8.2 Scheduling of policy implementation

Policy scheduling is the order in which the policy suggestions are applied. Some suggestions are important as a framework for facilitating other suggestions. Other policies, while not specifically required to enact other policies, have the potential to increase significantly their effectiveness (termed policy packaging). That is, the net benefit of later policies is in part dependent on the range of policies already adopted. Hence, the benefit stream from changing wetland management is, in part dependent on the order in which policies are adopted and the package of policies adopted. Unfortunately, the relative effectiveness of many policies is difficult to determine. The difficulty is complicated when different combinations of policy options are considered. The uncertainty associated with policy application should be taken into account in part by a process of review and readjustment over time (as noted in Section 2). Despite this uncertainty, governments should seek to apply policies in the order and package that delivers the highest expected net benefit stream with transaction costs taken into account.

As discussed in Sections 2 and 3, the property rights framework that underlies wetland management is critical to the signals regarding the relative values of alternative wetland outputs that are generated to wetland owners. Policy makers may wish to alter the definition or allocation of some property rights to facilitate market transactions or for equitable cost sharing arrangements. Clarifying the property right framework may also improve the effectiveness of other policy options by minimising the uncertainty associated with ownership of benefit and cost streams associated with wetlands. Hence, defining the property rights held by wetland owners, others in the community and the state is an important prerequisite to enacting further policies to encourage changes to wetland management. Property rights suggestions are listed among the facilitative and coercive suggestions at the state government level. For example, adoption of a policy to allow environmental organisations to negotiate and monitor conservation covenants (which are partial property rights).

The costs of adopting policies to clarify property rights are expected to be relatively low unless a significant monitoring or education component is envisaged. Adoption of these strategies alone is not expected to be sufficient to achieve the changes to wetland management desired by the community. Once the appropriate frameworks are in place, application of policy options should proceed according to the expected stream of net benefits that is generated. The net benefit estimates should take into account the cost of any transfers incurred through tax collection and redistribution. In general, the potential for government failure can be minimised by using mechanisms that seek to encourage voluntary contributions to wetland management in line with the values held for wetland outputs. However, some suggestions may require substantial investment by government in facilitative infrastructure. Caution should be exercised in these cases to ensure that the net benefits are sufficient to warrant investment (for example, development of wetlands tourism infrastructure in the USE region). These mechanisms are discussed in more detail in the next section.

The recommendations suggested in Sections 5, 6 and 7 form a suite of options that are available to policy makers at various levels. It is not envisaged that all policy options need necessarily be applied to achieve the outcomes that are desired by the community, hence the importance of policy adjustment and review over time to achieve the most efficient and effective package.

8.3 Some implementation mechanics where government transfers are considered

Policy implementation that does not require direct transfers via government is relatively straightforward. The mechanics require appropriate legislative action and in most cases an educational component. Where property rights are transferred to government, a monitoring program is also necessary. Where policy implementation requires a transfer via the taxation system the mechanics become more complex. Two main aspects of implementation mechanics that should be considered are the appropriate levels of government to collect and redistribute payments and the relative ability of different distribution mechanisms to incorporate landowner values for wetland outputs. Detailed policy mechanics are beyond the scope of this Research Report but a brief discussion of some important aspects is provided in this section.

The analysis presented in Sections 5, 6 and 7 showed that while many suggestions are common to both the USE and MRF a significant number are not. Suggestions that differ between the two case study areas generally require a more targeted approach to state or regional issues. Likewise, the cost-sharing arrangements discussed in Section 8.1 indicate that the burden of cost sharing is not nation wide but rather highest within the region. Hence, in seeking to apply policy suggestions, care should be taken that policy application matches the cost sharing suggestions. Similarly, some policy suggestions require a greater level of regional knowledge and expertise than can be expected at the Federal, and to a lesser extent, the state level. These policies have generally been specified at the level of government that is most appropriate to their application in Sections 5, 6 and 7.

The second issue relates to the most efficient use of government resources. Wetlands generate significant values to the landowner (as shown in Research Reports 2 and 5). In order to maximise the efficiency of scarce government resources these values should be taken into account when designing incentive mechanisms. For example, if a wetland owner draws very high enjoyment from fishing in their wetland the net costs of conservation may be quite low relative to a landholder who gains no significant enjoyment from a similar wetland. However, governments do not know the benefits landholders receive from their wetlands. Thus, wetland owners have an incentive not to reveal the true value of their wetlands to themselves if there is a possibility that they may consequently be offered a larger reward. That is, wetland owners have an incentive not to reveal the true net costs of changing or continuing conservation management if they believe they will be able to claim higher benefits from an incentive program. Therefore, economists have sought to design mechanisms with built-in incentives for wetland owners to reveal their true net costs of conservation.

The most common mechanism currently suggested is termed an 'auction'. Under an auction program, wetland owners submit a secret bid detailing the outcome they are prepared to provide in return for a specified reward. For example, the Wetlands Reserve Program (WRP) uses an auction mechanism to elicit information about the relative costs to farmers of changing management of wetland areas. Under the WRP landowners submit bids representing the payment they are willing to accept for granting a conservation covenant on a wetland on their land. Bids are ranked by environmental benefits per government dollar spent on restoration and covenant acquisition. It is suggested that auctions or similar mechanisms are used where governments (or other organisations) are considering direct incentive payments to wetland owners to change management or as a reward for ongoing wetland management.

9 Generalisation of findings and conclusions

In this Research Report policies have been identified to encourage adoption of the findings of the bio-economic modelling phase of the 'Private and Social Values of Wetlands' research project that were reported in Research Reports 9 and 10. In Section 9.1 these findings are assessed to identify which aspects can be generalised to wetlands Australia wide. The Research Report concludes with a brief summary of the major findings.

9.1 Potential for generalisation to other Australian wetland systems

The 'Private and Social Values of Wetlands' research project has examined the values generated to private wetland owners and the wider community from wetlands in the USE and MRF regions.

Policies that would encourage wetland owners to manage their wetlands in ways that would generate the highest values to the community as a whole (including wetland owners) were suggested in the previous sections of this Research Report. The extent to which these incentives can be generalised to privately owned wetlands Australia wide is addressed in this section.

The wetland systems in the MRF and USE are biophysically quite different from each other and generate differing values to wetland owners and the wider community. Despite the biophysical differences, the policy recommendations for the MRF and USE share considerable common ground. The common ground is shown by the large number of suggestions that pertain to both case study areas as reported in Section 5. The degree to which the policy recommendations overlap indicates how broadly many of the incentives could apply to wetland systems Australia wide.

Many policies in Section 5 are directly relevant in all jurisdictions Australia wide without significant additional analysis. In particular the suggestions relating to strengthening the property right framework of wetland ownership and management are directly relevant to all wetlands in Australia. These suggestions seek to facilitate increased conservation of wetlands by reducing the transaction costs associated with wetland conservation. For example application of 'safe harbour' and 'duty of care' arrangements could be generalised across Australia.

The potential for policies that induce changes in wetland management to be transferred outside of the case study areas is less clear. Where a public good is clearly generated by conservation management of all or nearly all wetland systems, it may be appropriate to encourage conservation via a low cost (relative to the benefits generated) generic incentive. The tax policies suggested at the Federal level fall into this category as does the potential for a wetland owner information network similar to (or as part of) the Land for Wildlife scheme in Victoria. Other similar policies such as exemptions or rebates of stamp duty, local government and Rural Lands Protection Boards rates can potentially be targeted towards areas where the values generated by conservation management are higher. However, these policies are also recommended generically due to their relatively low cost and potential to signal the importance of conservation management of wetlands. Perverse incentives and potential subsidies to the destruction of wetlands such as subsidised irrigation water and tax rebates or deductions on water storages constructed in wetlands should be removed in all jurisdictions. However, the specific nature of any perverse incentive may differ from region to region. For example, water subsidies and tax rebates for construction of water storages are only of importance in the MRF.

The potential application of grant based incentives would require a more detailed assessment of the costs and benefits of encouraging changes to wetland management in particular regions despite their suggestion for both the USE and MRF. An assessment of the net benefits of such a scheme would need to determine whether changing wetland management in the region is likely to generate significant net benefits to the wider community. A simplified bio-economic model, compared to that reported in Research Reports 9 and 10, could incorporate a transfer of non-monetary benefits from wetland valuation surveys reported in Research Reports 7 and 8. In particular such a methodology could apply to inland wetland systems that face similar threats to the USE or MRF.[59] Transferring benefits to coastal and upland wetland systems, as well as those in Northern Australia is not recommended, hence assessment of the non-monetary values of such wetland systems forms a logical extension to this project.

There are a significant number of suggestions that are only relevant to either the USE or MRF as reported in Sections 6 and 7 respectively. The importance of the region specific suggestions to each case study area indicates that adoption of the generic recommendations discussed above may not be sufficient to ensure adequate wetland conservation in any region. Therefore, any attempt to encourage wetland conservation on a national scale must consider the importance of region specific incentives and disincentives.

The results also indicate that the current management of government owned resource does not always reflect the desires of the wider community. For example, management of State Forests NSW wetlands in the MRF focuses on the generation of monetary outputs to the NSW government at the expense of

[59] Other surveys of the non-monetary values of wetlands were reported as part of the Choice Modelling Research Report series which can be found at: apsem.anu.edu.au/staff/jbennettr.htm

wetland conservation outputs to the wider community which is clearly contrary to the interests of the people of NSW.

In cases where the transfer of results is not advisable (such as to coastal and upland wetland systems), the methodology demonstrated in this project is readily transferable. The methodology is also readily applicable to urban and semi-urban wetland systems and to non-wetland circumstances (such as acid-sulphate soils and salinity among others).

9.2 Conclusions

In Research Reports 9 and 10, the wetland management options that would generate the highest values to the community were identified. In this Research Report, two sets of policy changes are recommended to achieve these management changes for the USE and MRF wetlands. The policy suggestions were divided between those that would facilitate, induce and compel changes to wetland management. These findings were generalised to other Australian wetlands in Section 9.1.

Adoption of various levels of changes to wetland management would require cost sharing beyond residents near wetlands to residents of other catchments and states. Policy makers need to assess the potential for cost sharing when deciding on the extent of wetland management changes that are to be targeted. Although the policy framework was developed in line with local, state and federal government policies it is not intended all transfers to wetland owners be achieved via government tax collection and redistribution. Rather, governments should create an institutional environment that maximises the potential of the private sector to achieve transfers. This issue was suggested with respect to scheduling of policies in Section 8.2. Where private transfers are insufficient due to market failure there may be an opportunity for direct transfers via government. Direct transfers should only take place where the government activity does not crowd out the private sector and the potential for government failure does not outweigh the benefits generated. Direct transfers should also take into account the efficiency suggestions with respect to the use of auction mechanisms discussed in Section 8.3.

The main findings of this Research Report, along with all previous reports in this series are summarised in 'The Private and Social Values of Wetlands: An Overview'. That report will be the final output of this research project.

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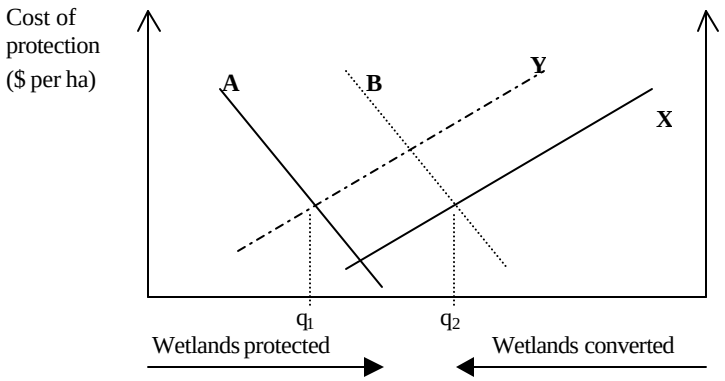
Appendix 1: The economics of policy actions

Policy action should be considered where the institutions currently in place lead to a situation where, from a viewpoint of social efficiency, there are consistently too few or too many wetlands protected.

For example, consider the situation depicted in Figure A1. The current supply of wetland protection, as perceived by wetland owners, is represented by the line 'Y'. Similarly, the revealed private demand for wetland protection is represented by 'A'. These supply and demand curves lead to a level of production 'q_1'. However, 'Y' and 'A' do not reflect the true demand for, and supply of, wetland protection by society under alternative policy frameworks. Specifically, 'A' does not include the social benefits of wetland protection that are enjoyed by the wider community but for which the wetland owner receives no rewards for producing. If ways can be found for the community to express these demands for wetland protection then the demand revealed for wetland outputs will increase from 'A' to a higher level such as 'B'. Similarly, 'Y' reflects the perceived costs of producing wetlands under the current institutional framework. If policies can be found that would reduce the costs of production then supply would increase from 'Y' to a higher level such as 'X'. These policies could focus on reducing the transaction costs of supplying wetland outputs or increasing the opportunities for innovation and entrepreneurial behaviour that discover lower cost ways of producing wetland outputs. Hence, adoption of policies that effectively access social demands and reduce costs of supply would lead to a higher level of production 'q_2'. That is, adoption of such policies would shift production from the current level 'q_1', that is lower than is desired by society, to a socially preferred level at 'q_2'.

Figure A1: Optimal wetland conservation/protection



Source: Adapted from Heimlich et.al. (1998)

Appendix 2: Summary of potential policies for the USE

LOCAL GOVERNMENT

Incorporate wetlands tourism into local tourism promotion.

Consider development of tourism infrastructure (including scenic drives, maps and stop-off points).

Assist with training for wetland owners interested in starting a tourism venture.

Assist with wetland owner access to specialist markets (such as bird-watching clubs).

Sponsor an USE wetlands/ecotourism organisation.

Streamline local government processes to facilitate sales of wetlands to conservation groups.

Provide information sources to wetland owners interested in developing compatible alternative enterprises (particularly targeting high value niche tourism markets).

Extension of rate exemptions to all wetlands managed for conservation outcomes. Rate exemptions should also include catchment levies and Rural Lands Protection Boards rates.

STATE GOVERNMENT

Sponsor a wetland owners 'Land for Wildlife' type program, potentially as part of the Wetland Care Australia 'Wetland Carers' group.

Education and extension programs targeted at wetland owners not currently interested in conservation oriented management of wetlands.

Encourage and assist farmers to complete farm management courses and plans.

Signal the importance of wetlands via designation as Ramsar sites or Wetlands of National Importance where appropriate and incorporation of wetland conservation objectives in regional land management plans.

Compile and facilitate access to GIS databases of relevant land management information.

Allow incorporated conservation groups to negotiate and monitor conservation covenants (including agreements similar to Heritage Agreements).

Ensure a wide degree of flexibility in covenanting requirements to facilitate innovation in protecting natural resources including the ability to covenant timber, water and fauna harvesting practices.

Stamp duty exemption for sales and donations to non-profit conservation groups and on revolving funds sales.

All State Government fees are waived for subdivisions for the purpose of conservation (defined by conservation organisation or revolving fund purchases or to facilitate a conservation covenant).

Capital grants to cover part (or all) of the capital costs of changing wetland use (sometimes in exchange for temporary or permanent conservation covenants).

Subsidise inputs to changing wetland management such as revegetation, management advice, equipment and labour inputs.

Use 'Safe harbour' type schemes to reduce disincentives to rehabilitation of wetlands and remnant vegetation.

Consider use of a 'duty of care' framework via use of mitigation banking or habitat conservation plans to encourage a mix of resource inputs to conservation and not just land.

FEDERAL GOVERNMENT

Provide an information and possibly a training resource to facilitate growth of non-government, non-profit conservation groups such as Wetland Care Australia undertaking on ground works.

Broaden taxation incentives targeted at reducing wetland owners costs of conservation management.

Broaden taxation incentives targeted towards additional contributions to conservation groups.

NON-SPECIFIC SUGGESTIONS

Finance revolving funds to signal wetland conservation values and reduce the search costs of potential private buyers.

Encourage use of a wide range of real estate tools by conservation groups including options and rights of first refusal.

Ensure communities (including conservation groups) can access planning processes and non-monetary impacts are considered in planning processes.

Consider appropriateness of 'Ranching for Wildlife' programs to encourage conservation.

Adoption of any option beyond 'wetlands retention' should include cost-sharing beyond SA residents.

Appendix 3: Summary of potential policies for the MRF

LOCAL GOVERNMENT

Streamline local government processes to facilitate sales of wetlands to conservation groups.

Provide information sources to wetland owners interested in developing compatible alternative enterprises (particularly targeting high value niche tourism markets).

Floodplain and other similar ordinances should be designed to avoid constraining or acting as a disincentive to wetland rehabilitation activities.

Conservation lands are exempt from development application, certification and consultative fees.

Extension of rate exemptions to all wetlands managed for conservation outcomes. Rate exemptions should also include catchment levies and Rural Lands Protection Boards rates.

STATE GOVERNMENT

Sponsor a wetland owners 'Land for Wildlife' type program, potentially as part of the Wetland Care Australia 'Wetland Carers' group.

Education and extension programs targeted at wetland owners not currently interested in conservation oriented management of wetlands.

Encourage and assist farmers to complete farm management courses and plans.

Signal the importance of wetlands via designation as Ramsar sites or Wetlands of National Importance where appropriate and incorporation of wetland conservation objectives in regional land management plans.

Compile and facilitate access to GIS databases of relevant land management information.

Allow incorporated conservation groups to negotiate and monitor conservation covenants (including agreements similar to Voluntary Conservation Agreements and Registered Property Agreements).

Ensure a wide degree of flexibility in covenanting requirements to facilitate innovation in protecting natural resources including the ability to covenant timber, water and fauna harvesting practices.

Ensure that environmental interests are able to act in a competitive market (with purchasers of timber) to defer or prevent timber harvesting.

Investigate timber pricing mechanisms to ensure pricing includes all costs.

Stamp duty exemption for sales and donations to non-profit conservation groups and on revolving funds sales.

All State Government fees are waived for subdivisions for the purpose of conservation (defined by conservation organisation or revolving fund purchases or to facilitate a conservation covenant).

Extend land tax exemption to land managed for conservation within all classifications.

Capital grants to cover part (or all) of the capital costs of changing wetland use (sometimes in exchange for temporary or permanent conservation covenants).

Subsidise inputs to changing wetland management such as revegetation, management advice, equipment and labour inputs.

Remove all subsidies hidden or otherwise in water pricing in NSW.

NSW State Forests to adopt the 'grazing management' option on all wetland areas where possible.

Part or all of the stored environmental water be made available for artificial floods (preferably under an access licence that would allow it to be sold in years where a flood is not released).

The cut-off for full carryover of stored environmental water should be extended to at least November 30 and preferably to the same period as standard access licences.

Completion of the water reform process in NSW to facilitate an improved market for water rights.

Purchase of sufficient water to allow an artificial flood to be released in five out of six years.

Creation of a trust to manage the water for the artificial flood. The trust should be partly funded by a one-off grant to purchase water and partly via an interest free loan to be paid back over the next 30 years.

A solution is sought to the constraint to flooding imposed by the 'Gundagai choke'.

Ensure tax deductions and rebates for construction of water storages do not apply where wetland conservation values are destroyed.

Use 'Safe harbour' type schemes to reduce disincentives to rehabilitation of wetlands and remnant vegetation.

Consider use of a 'duty of care' framework via use of mitigation banking or habitat conservation plans to encourage a mix of resource inputs to conservation and not just land.

FEDERAL GOVERNMENT

Provide an information and possibly a training resource to facilitate growth of non-government, non-profit conservation groups such as Wetland Care Australia undertaking on ground works.

Broaden taxation incentives targeted at reducing wetland owners costs of conservation management.

Broaden taxation incentives targeted towards additional contributions to conservation groups.

NON-SPECIFIC SUGGESTIONS

Finance revolving funds to signal wetland conservation values and reduce the search costs of potential private buyers.

Encourage use of a wide range of real estate tools by conservation groups including options and rights of first refusal.

Ensure communities (including conservation groups) can access planning processes and non-monetary impacts are considered in planning processes.

Adoption of the 'grazing management' option should include cost sharing with ACT residents.

Adoption of any option beyond 'grazing management' should include cost sharing with residents outside the Murrumbidgee catchment (and potentially interstate).

Appendix 4: Current stamp duty rates in SA and NSW

Stamp duty is payable at the following rates in SA:

Where value of the property conveyed	Amount of Duty
Does not exceed $12,000	$1.00 for every $100 or factional part of $100
Exceeds $12,000 but not $30,000	$120 plus $2.00 for every $100 or fractional part of $100 of the excess over $12,000
Exceeds $30,000 but not $50,000	$480 plus $3.00 for every $100 or fractional part of $100 of the excess over $30,000
Exceeds $50,000 but not $100,000	$1,080 plus $3.50 for every $100 or fractional part of $100 of the excess over $50,000
Exceeds $100,000 but not $500,000	$2,830 plus $4.00 for every $100 or fractional part of $100 of the excess over $100,000
Exceeds $500,000 but not $1,000,000	$18,830 plus $4.50 for every $100 or fractional part of $100 of the excess over $500,000
Exceeds $1,000,000	$41330 plus $5.00 for every $100 or fractional part of $100 of the excess over $1,000,000

Source: www.treasury.sa.gov.au/revenuesa/sdreal.html, accessed 12/7/01.

Stamp duty is payable at the following rates in NSW:

Where value of the property conveyed	Amount of Duty
Does not exceed $14,000	$1.25 for every $100 or factional part of $100
Exceeds $14,001 to $30,000	$175 plus $1.50 for every $100 or fractional part of $100 of the excess over $14,001
Exceeds $30,001 to $80,000	$415 plus $1.75 for every $100 or fractional part of $100 of the excess over $30,001
Exceeds $80,001 to $300,000	$1,290 plus $3.50 for every $100 or fractional part of $100 of the excess over $80,000
Exceeds $300,001 to $1,000,000	$8,990 plus $4.50 for every $100 or fractional part of $100 of the excess over $300,001
Exceeds $1,000,000	$40,490 plus $5.50 for every $100 or fractional part of $100 of the excess over $1,000,000

Source: www.osr.nsw.gov.au/taxes/info_sd.html, accessed 26/7/01.

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