A PAUSE TO CONSIDER: THE VALUE AND FEASIBILITY OF WETLAND MANAGEMENT INCENTIVES

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ABSTRACT

Land and water degradation costs the Australian economy approximately $6.5 billion annually so major and rapid changes are needed in the way our natural resources are managed to stop further decline and repair what has damage already happened. Over the past ten years, incentives have increasingly been seen as an important tool to encourage more sustainable use of natural resources. However, the progress toward widespread change has not occurred or is occurring more slowly than is required to stop or reverse degradation. This paper is not a review of incentives, but an exploration of why incentives may not have yet resulted in a widespread and rapid improvement in land management. Wetlands are used as a case study.

INTRODUCTION

Considerable land is in private ownership and if we are to address land degradation and conserve our natural heritage we need to engage these landholders in conservative management of our natural resources (Crase & Maybery, 2004). Management of natural resources is very complex because it includes social, economic and biological factors each having hierarchical spatial and temporal scales. Very seldom are all these aspects considered together, but we need to have a combined approach if we are to move forward in the conservation of our natural resources (Boully 1998). Incentives are widely accepted as a means of offsetting the cost of private landholders conservatively managing natural resources for public benefit (Whitten & Bennett 2001; Stoneham *et al.* 2003; Langpap 2004).

SPATIAL SCALE

Biological

Spatial scale in wetlands is best illustrated by the use of Australian wetlands by waterbirds. The largest spatial scale for waterbirds is global, because many species travel vast distances to breeding and feeding grounds that span both hemispheres and in the process cross many international boundaries. Within Australia, waterbirds also travel vast distances without regard for state or territory boundaries and utilise a wide range of aquatic systems across this geographic scale. In addition, some Australian aquatic systems, such as the Murray-Darling Basin, span vast distances over several state boundaries. However, the management of and incentives for wetlands are at the smallest spatial scale; individual wetlands.

To make sensible management decisions and prioritise natural resources spending, a good understanding of wetland systems is needed at all spatial scales, but especially at the smallest scale, individual wetlands, because this is where management decisions are made. Although restoring wetland function is a

priority at the local scale, we still need to put individual wetlands into the context of other wetlands in a system and how their conservation would improve ecological/ biological resources at a local, state, national and international level.

This is especially true for waterbird conservation. However, often local wetland knowledge is lacking or at best rudimentary (Barbier *et al.* 1996). For example, in the Murrumbidgee River system there is an understanding of what the maximum aerial extent of wetlands may be (Frazier 2001; Kingsford *et al.* 2003), but the knowledge of the exact number, size, hydrology, geomorphology and function of individual wetlands is rudimentary.

The most comprehensive information for wetlands on the Murrumbidgee River floodplain is for a 683km river length between Gundagai and Hay. Satellite imagery of flood events between 1989 and 1997 was used to roughly estimate the area of inundation for these events. From these data 1586 floodplain wetlands were identified for this river length. Most of these wetlands (85%, n = 1353) were less than 4 hectares in size, with a third of them (n = 461) 1 hectare or less in size (Frazier 2001). We have vegetation or fauna information for only about 12% of these wetlands, but for only about 6% (about 100 wetlands) do we have any information on their hydrology in regards to the permanency of water or commence to fill levels (pers. comm. from NSW Department of Infrastructure, Planning and Natural Resources (DIPNR)).

To gather the necessary wetland information on even half of the identified wetlands would be very labour and time intensive and most funding bodies or government agencies do not support such intensive work. However, without such information the same poorly informed funding and management decisions will continue to be made.

In addition to the lack of information, in regulated systems like the Murrumbidgee water diverted for agriculture is no longer available for inundating wetlands. Water needs to be returned to the wetlands if they are to provide their ecosystem services, such as trapping nutrients and sediments, recharging groundwater systems and providing native fish nurseries. At present responsibility for wetland management is a function of Federal and State Government agencies.

The wetlands most at peril on the Murrumbidgee floodplain are those that fill in low to moderate level flooding and would have filled on average once or more per year. If natural watering is not possible through water allocations, then other options for returning natural flooding regimes need to be considered. To achieve this, structures, such as regulators or pumps, are likely to be required for inundating individual wetlands.

But what is the cost at the scale needed and who pays? In addition, how effective will the unnatural process be in restoring natural processes if flood elements, such as woody debris and sediment, are not part of the unnatural watering? Which wetlands should be chosen out of the many thousand present, because it is not feasible to rehabilitate all wetlands with these methods? In addition to these problems, if global warming scenarios are correct the change in rainfall distribution and increased temperatures will be an addition impact on wetlands. How do we accommodate these changes?

Economic

As with biological spatial scales, the largest economic scale to consider is the

global. At the global scale, world commodity prices dictate prices landholders receive for their products, such as wheat, wool, rice and cotton. However, the decisions on how to farm each property are made on the smallest spatial scale and are driven by the landholder's personal financial needs, including the number and ages of the dependents he or she supports.

Currently, a landholder does not receive a greater value for his products if he engages in conservation on his property. However, the increased demand for organic food, which requires full details of production methods and has a higher market value, does give some hope that the public might support paying extra for products produced by landholders who practise conservation management.

Markets can be easily developed for the services provided by natural resources if clear property rights are evident. In such cases there is a clear linear relationship between the producer and the buyer, or regulatory agency (Miles *et al.* 1998; Pannell 2001*b*; Byron *et al.* 2002; Chaudhri 2003).

An example of marketable rights is the Hunter River Salinity Trading Scheme where saline water producers buy rights to discharge saline water into the Hunter River. In this case a cap or limit to the allowable level of salinity was set by modelling river flow and salinity data collected by the Environmental Protection Agency. On the basis of this, dischargers of saline water have bought rights to discharge various levels of saline water into the system provided the cap is not breached. Continual monitoring and modelling of river flow and salinity levels are used to provide daily discharge rights information. It is possible to trade these rights amongst themselves depending on their needs and the environmental conditions of the river (EPA 2003). This is an example of effective co-operation between private landholders and a public agency to achieve sustainable use of an ecological system.

For most ecosystem services it is difficult to develop a market-based approach because large and complex systems make it difficult to define property rights and conservation outcomes cannot be easily defined, observed or measured. There is also difficulty in developing an economic value for the services because markets do not presently exist for the products nor are there products of similar nature to base value on. It is further complicated by the fact that ecosystems provide multiple services that are often intertwined (Barbier *et al.* 1996; Miles *et al.* 1998; Pannell 2001*b*; Byron *et al.* 2002; Murtough *et al.* 2002; Chaudhri 2003). In addition, the desired outcomes may not occur for some time in the future or in the immediate vicinity of the conservation work (Hoehn *et al.* 2003).

Attempts have been made to establish a value for these services through environmental economics methods, such as contingency valuation and willingness to pay. These methods assume that the general public has adequate knowledge to make trade-off choices and will do so in a simple linear manner, e.g. I have $x to spare and I am willing to pay $y to conserve species. However studies have shown that people feel inadequate and/or uncomfortable in making these decisions and consider quite a diverse range of factors other than their financial circumstances. In addition, even if they are willing to pay extra for conservation at the time of the survey, results have suggested that when the time actually comes to contribute they are reluctant to or feel they are unable to (Hoehn *et al.* 2003; Svedsäter 2003).

Types of market mechanisms that have been explored for more diffuse systems and have had success are:

- Certification and eco-labelling produce from farms using sustainable land management (Cocklin *et al.* 2003). A success is BRL Hardy's Wines marketing of Banrock Station Wine where a percentage of the sale price goes towards wetland rehabilitation on Banrock Station and Landcare. In this case the consumer is actively involved when they choose to purchase that wine over others and are able to see the consequences of their purchase either at the winery or on the website (Byron *et al.* 2002).

- Eco-tourism has been suggested as a way of recouping the cost of conservation efforts on private properties. However, realistically this would probably occur at only a very small percentage of properties with wetlands. The number of wetlands affected would be dependent on the farmer's willingness to engage in such activities. Even if the farmers are willing, wetlands also have to be reasonably accessible and attractive to be a popular tourist destination. The attractiveness of wetlands varies with weather conditions, e.g. a dry wetland does not have much appeal. The inland floodplain wetlands, such as on the Murrumbidgee floodplain, are dry more often than they are wet partly due to regulation which has reduced their inundation by 50%. The reliance on tourism also assumes that the public will have the capacity to engage in travel which relies on financial security and reasonable travel costs.

- Auction systems have been successful both in Australia and overseas. The most notable in Australia has been the Bush Tender program in Victoria. Part of its effectiveness has been the small scale at which it operated and the engagement of landholders in determining the cost of biodiversity conservation. Because of its success, the system is now being trialled to deliver multiple outcomes rather than just biodiversity in another part of Victoria.

The above examples have considered large scale markets forces, but on the local level we also need to know if the landholder will improve or not reduce his production by better managing his wetlands. Evidence from landholders retiring marginal land to revegetation shows promising results with no net loss in the carrying capacity of their property.

Social

Socially we need to encourage people at all spatial scales to improve natural resource management. The most successful projects have been those that engage the landholders at the local level (Lyall and Wright 1998; Lanholtz *et al.* 2000; Irvine & Kaplan 2001; Moore *et al.* 2001). However, there are issues, such as water allocation for wetlands, that need the commitment of governments and therefore the willingness of the whole community to make sacrifices. To date, there is still a reluctance to embrace the concept and this might be the result of a number of issues.

1. Are the right people being targeted with the present incentives, such as fencing? Evidence suggests that landholders initially taking up incentives are well informed and are inclined to use best management practices, including conservation (Rhodes *et al.* 2002; Stoneham *et al.* 2003; Langpap 2004). Other studies suggest that pro-active

farmers feel it is the "laggards" that are benefiting (Cocklin *et al.* 2003). If it is the pro-active farmer that is being involved, what percentage of the total farming community do they represent? Anecdotal suggestions from project officers, farmers and an ABC Background Briefing (August 2004) report are that between 10 and 25% are actively involved in better natural resource management. That leaves a large percentage of private landholders reluctant to commit to conservation. If this is so, have the present and past initiatives even begun to engage the more conservative landholders? If we have not been able to engage the conservative element, then have we been in an "incentive honeymoon period" with a major decline in involvement looming?

If we are only engaging the pro-active farmers, will incentives ever engage the rest of the farmers? If incentives are unlikely to engage the rest of the farmers, then why not, and what is the way forward? Personal experience suggests that there is often a lag period from when incentives become available to when people become involved. The greatest increase in involvement occurs after about three years when information has had time to filter out into the community. However, this is the time funding usually ends.

2. Are we using the right terminology to sell the concept of conservation and the need for incentives? What do ecosystem services, biodiversity, salinity and greenhouse gas emissions mean to the average landholder or member of the public? We assume because these terms have been used in the media for years that the general public understand, but studies have shown the public does not fully understand and the capacity to absorb this information varies (Langholtz *et al.* 2000; Svedsäter 2003). It may be difficult to believe that people do not understanding some of these issues, but it is often hard for people to put these issues into a personal context. Elix and Lambert (1998) found in promoting white box woodland conservation that people have difficultly putting their local white box remnants into a wider context.

3. Are we listening to the right people to determine which incentives will work? Uncertainty in government direction and funding, lack of understanding of the landholders' constraint in delivering outcomes and ability to adapt to local conditions are major obstacles for widespread adoption (Pannell 2001*a*; Cocklin *et al.* 2003). People are less likely to contribute to or become involved in issues that do not directly affect them. The public also has to be assured that the government is a long-term partner to the management and solutions for wetland conservation, especially in the provision of water.

TIME SCALES

In addition to the spatial scale, time scale needs to be considered. The value of a landholder's products can vary dramatically over very short time scales (e.g. daily), but his personal financial needs and those at which conservation operate at much longer time scales, decades or centuries. We also have to recognise that many of the problems needing to be addressed by landholders now are the result of past land management practices, which in some cases had been promoted by government agencies.

The time scale of government initiatives, such as incentives, is too short to determine the effectiveness of the activities initiated. For example, the Bush Tender Program for biodiversity lasted for 3 years and appeared to be successful,

but rather than building on and monitoring this program a new but similar program is being implemented elsewhere in Victoria. In natural systems it takes many years before the benefits are measurable, especially when revegetation and weed control are concerned. The length of the Bush Tender Program is just one of many examples of the short duration of incentive programs.

SUMMARY

To move forward we need to recognise and include in incentives the time and spatial scales of the biological, economic and social factors that impact the natural Australian environment. We need to incorporate these multiple time and spatial scales into incentives, because short-term market values alter the landholder's capacity to engage in, much less commit to, conservation management.

The time scale in most incentive schemes and government initiatives is too short both for engaging the public and achieving the desired outcomes. Time is needed to invest in the long term knowledge, research and development of income and management options. This includes:

1. More investment in wetland assessment at the individual level to best target funding and management necessities. Without this there is little idea of the true cost of conserving or rehabilitating wetlands at the local level, let alone the national level;

2. Development of long-term monitoring and evaluation to determine if the current management and incentives are having the desired outcomes (Jensen 1998);

3. More research and development into better income options and crops to grow to help offset conservation cost. This is especially true in view of global warming and potential reduction in available water; and

4. Development of better ways to educate the whole community in how vital it is to conserve and better manage our natural resources.

Of course the cornerstone of this approach is the need for long-term funding, which means an ongoing commitment by state and federal governments. We need to explore funding generation at the more local level, such as catchment scale. As evidence has shown, people need to feel that they are partners in the process and can see benefits from their efforts, and this is best done at a smaller scale than federal (Langholtz *et al.* 2000). A good example of this is the development of the Hunter River Salinity Trading Scheme by the local community.

The catchment scale not only encompasses many natural resource boundaries, but also social connectivity through the use of those resources, especially water. It is feasible that the outcomes will be observable within the catchment from the community efforts. In turn, the community is more likely to continue to support and engage in such schemes, especially if they can have a say in the way funds are used or if they can determine it at the point of purchasing a product. A national approach is still needed to identify large scale problems and potential solutions, but to develop the motivational impetus that is needed to sustain natural resource management a smaller spatial scale is required.

There needs to be recognition of not only the natural diversity, but also the diversity of the people within the community. This means that a suite of incentives is needed to choose from, not just for landholders

but also other members of the community. To engage the larger community, we need to develop eco-labelling like that of BRL Hardy's Wines marketing of Banrock Station Wine. It is possible to move forward if we start talking to the landholders and the community, but this is very labour and financially expensive. But the potential loss if we do not is the continual decline in wetland health and systems as a whole.

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