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MARKETS FOR BIODIVERSITY OUTCOMES IN THE RANGELANDS

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ABSTRACT
This paper introduces the use of market based instruments as policies for biodiversity management in the Australian rangelands. We discuss the potential benefits of using MBIs and some of the key issues that need to be considered in their design and use.

INTRODUCTION
Market Based Instruments (MBIs) are receiving increasing attention as a tool for natural resource management. For instance the National Action Plan for Salinity and Water Quality has established the National Market Based Instruments Pilots Program with funding of $10m over 5 years to investigate the potential for MBIs to improve natural resource management. The purpose of this paper is to introduce MBIs; to point out the potential benefits of using MBIs to achieve biodiversity outcomes in the rangeland; and to discuss some of the key MBI design issues.

MBIs can take many forms. Applications of MBIs to Australian NRM include auctions such as BushTender (Stoneham et al 2003), development offsets, and water trading schemes. MBIs can be classified as priced based, where the primary focus is on defining a price; quantity based, where the focus is on defining the underpinning definition and ownership of units to enable trade; or facilitative which focus on lowering transaction costs in otherwise viable markets (also known as market friction instruments).

MBI are generally characterised by three features. First, they aim to identify and correct the underlying reasons for under provision of a good or service. Second, MBIs use markets or elements of market mechanisms to achieve the policy objectives. These include voluntary exchange, competition, and prices as signalling mechanisms. Finally, they aim to achieve more efficient resource management by decentralizing decisions to individual resource owners and by providing financial incentives for outcomes that (ideally) reflect society's values. Decentralising decision making allows individuals to utilise their private knowledge about local circumstances and personal values that is not available, or very costly for governments to acquire. MBIs can therefore take advantage of heterogeneous costs and abilities of achieving certain outcomes by allocating the task to those who can most easily and willingly do them. MBIs can also provide flexibility in how outcomes are achieved, and provide a financial incentive to do so in innovative ways.

The potential significance of these issues in rangeland biodiversity explains our interest in using MBIs. Specifically, there appears to be large variation in costs, ability, and willingness to provide biodiversity outcomes. The focus on biodiversity outcomes in rangeland settings is relatively new. Previous policies have not generally encouraged innovative approaches to achieving biodiversity outcomes, therefore the potential for innovation is high. The large

spatial scale means that variation in circumstances is high, and remoteness increases the importance of using local knowledge. In addition MBIs, by providing positive rewards and voluntary participation may be able to build on individuals' intrinsic motivation to maintain biodiversity. (See Reeson and Tisdell, 2006)

DEVELOPING MARKET BASED INSTRUMENTS
Issues and opportunities
Most markets emerge spontaneously to take advantage of "gains from trade" that benefit both buyer and sellers. Numerous issues may prevent potential markets from forming, therefore MBIs need to be designed on a case by case basis in order to address them. For rangeland biodiversity, some of the key issues appear to be the public good nature of biodiversity, the uncertain rights and responsibilities surrounding biodiversity (property rights) and the difficulty of defining a unit of biodiversity that can be traded. Other potentially important issues include fitting in with existing institutions (Coggan et al, 2005b), risk and risk sharing, missing and private information, market size and market power, and mixing different policy instruments. Key elements in developing an MBI are to define an item to be exchanged, to define ownership of this item, and to ensure a market structure exists that permits trade. Finally, the engagement of potential participants in the process of development can be vital to the success of the policy.

Property rights and public goods
In economic terminology, biodiversity is a "public good". This means one person's enjoyment of its existence does not diminish the enjoyment by others. It also means that it is difficult to exclude people from benefiting from its existence (and therefore to make them pay). The public good problem affects ownership and market structure. The difficulty of excluding people for the benefits of public goods tend to mean that ownership is poorly defined and contested. This is particularly the case for emerging issues such as biodiversity. The market structure issue is that the value of a public good is dispersed across many people. They need to coordinate if this value is to be turned into effective demand. Governments therefore have a role to play in facilitating the allocation of property rights and in coordinating demand for biodiversity.

Defining a metric
A market based policy instrument needs to be able to compare different biodiversity outcomes, in order to choose among them. Defining a metric for a biodiversity market that enables this is difficult. By definition, what we seek to achieve is diversity, whereas a market wants to be able to compare and price similar things. The problem is conceptually complex and is made more difficult by the stochastic nature of rangeland environments and the inherent expense in measurement of complex outcomes in remote areas. Pragmatic solutions are needed and these focus on things that are easy to observe and measure. Typically this includes management actions and surrogate measures of desired outcomes. An imperfect metric causes several problems. Uncertainty about what is being traded generally reduces the value of trade. The compromise of focusing on inputs and management actions also reduces the flexibility to achieve outcomes in innovative and cost effective ways.

To develop improved metrics we need to first define their purpose. MBIs, and most other policies, require metrics for a range of different purposes. We argue that we may need to define slightly different, but conceptually consistent metrics for these purposes. Some of the main elements of a policy that require a measure of the biodiversity include:

1. Defining the broad biodiversity outcomes to underpin the new MBI initiative. What is the overall aim at a regional scale we wish to achieve with the program and how will we monitor our progress?
2. Defining the specific changes we wish to achieve from this policy intervention? These may be management actions, intermediate, proxy or specific objectives that we can practically target.
3. Evaluation and comparison of competing biodiversity management proposals or outcomes. What criteria do we use to judge the value of different biodiversity "items" that are for sale? How do we rank them or place a relative price on them?
4. Monitoring of management changes: For policies that involve contracting for future biodiversity management or outcomes, how do we decide if individuals have done what they were required to do under the terms of the contract?
5. Monitoring our MBI effectiveness. Has the MBI achieved the specific management changes or specific outcomes it set out to in step 2?
6. Evaluation of the MBI against the broad policy targets defined in step 1: Is the MBI contributing to our regional scale biodiversity goals as intended?

Specifying different metrics for each purpose can simplify the task because they require metrics that work at different scales (paddock, property or regional), are aimed at different audiences (e.g., pastoralists, traders, ecologists, government) and focus on different aspects of biodiversity. The implications of measurement error in each step are also different. In particular some types of measurement error in steps three and four may be systematically exploited in ways that reduce the effectiveness of the policy. These steps may need metrics based on easily and accurately observable features. For the monitoring steps (eg step 5 and 6) we may use a more relevant but less accurate measure as the basis of our assessment.

Policy development process
Unlike other policy development, which is often done on a trial and error basis, with potentially costly consequences, a feature of MBI's is a systematic approach to policy design and testing (Coggan et. al. 2005a, Whitten et. al., 2005). This includes experimental testing of key issues in the "laboratory" (Rolf, 2002) and in the field (e.g., Windle et. al., 2004). With all policy, the consultative and stakeholder engagement process is crucial for success, and this is perhaps more so with MBIs. The testing stage of the process provides opportunities for consultation and feedback, however there is also a need to build in good communication throughout. In addition, in the rangeland, developing a metric is an important element of the policy, and this needs to be incorporated into the consultation process.

To date there have been several applications of MBIs in the rangelands. A tender for biodiversity management has been successfully trialed in the Western Division of NSW (Shepherd, 2006). A tender mechanism for vegetation corridors has also been tested in a workshop setting with pastoralists in the Desert uplands (Windle et. al., 2004) and will be implemented during 2006.

These experiences also point to the importance of a communication and community support. With small numbers of pastoralists good participation rates are required. To be effective the schemes must also build on rather than crowd-out existing initiatives and good will. As a new scheme, there is a need for a process to iron out bugs and to allow people to learn about the scheme, and manage or become comfortable with the risks involved.

CONCLUSIONS

Market based policies appear to have important advantages over other policy tools such as direct regulation, primarily due to the way in which they can be designed to achieve efficiency gains. Despite their potential it remains difficult to define effective ways to measure and monitor a biodiversity commodity. Further research will focus on designing biodiversity metrics for outcome based contracts and more effective ways to engage landholders in the business of biodiversity management.

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