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1 **Aligning ‘public good’ environmental stewardship with the landscape-**
2 **scale: adapting MBIs for private land conservation policy**

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11
12 **Abstract:**

13 Market-based instruments (MBIs) are rapidly becoming a dominant characteristic of the
14 policy landscape for private land conservation in Australia and elsewhere. Price-based MBIs
15 are considered attractive to landholders, who are provided with financial payments for the
16 delivery of defined ecological outcomes on their land, and for policy-making, where
17 ecological return on investment can be measured quantitatively. Consequently, MBIs are
18 commonly used to promote competitive, individualized approaches to improve ecological
19 values, framed around the property-scale. We are concerned that there is a tension between
20 the property-centric focus of price-based MBI programs and the need for environmental
21 management policy and practice to reflect landscape-scale social-ecological processes.
22 Targeting MBI programs at individual properties could risk generating insufficient public
23 good conservation benefits, if those programs fail to reflect the relationship between
24 landscape-scale processes and property-scale conservation efforts. To remedy the neglect
25 of the landscape scale in private land conservation MBI policy, we develop a definition of
26 stewardship that directly connects landscape-scale ecological function to the ‘public good’
27 dimension of stewardship. We apply this over-arching definition to demonstrate how MBI
28 programs can deliver on the goal of landscape-scale conservation, and to suggest when
29 MBIs might not be well suited to achieving private land conservation objectives.

30
31 **Key words:** Stewardship, private land conservation policy, market-based instruments,
32 public good, landscape scale, collaborative management

1. Introduction

The growing application of market-based instruments (MBIs) to deliver ecological conservation benefits represents the most recent global policy shift in private land conservation (Lockie, 2013). MBIs use market mechanisms such as auctions, tenders, trading schemes and price signals to “influence peoples’ behaviour in pursuit of specific policy objectives” (Lockie, 2013, p. 90). Given the range of different MBI approaches, each with their own instruments and intentions, we focus here on price-based MBI programs, given their widespread application in Australia (Whitten, Reeson, Windle, & Rolfe, 2012) and elsewhere (Pascual et al., 2014). Price-based MBIs have proven popular due to their purported ability to deliver cost-effective investment in biodiversity conservation in a policy area where funding is heavily constrained. Price-based schemes use market mechanisms like auctions and tenders to deliver ecological goods (Whitten & Shelton, 2005), allocating funds to the most cost-effective bidders (landholders) who offer to deliver some form of conservation benefit on their land. As such, price-based mechanisms are underpinned by a rationale that links the delivery of conservation goods with payment for the delivery of those goods. We focus our analysis largely on Australia, as the early adoption and widespread experimentation with market mechanisms by conservation institutions provides a depth of program implementation on which to base our discussion (Lockie & Tennent, 2010).

Auction and tender mechanisms, and MBIs more generally, have enjoyed increased political popularity over the last decade (Engel et al., 2008; Stavins, 2002). This popularity has, in part, been due to some evidence of the successful design and implementation of MBI schemes (Landell-Mills & Porras, 2002; Pagiola et al., 2002). MBIs have also proven popular because they are often discrete and measurable, making them attractive for public policy reporting procedures, especially in light of the narrowing focus of environmental management funding towards short-term, easily accountable outputs (Robins & Kanowski, 2011). The popularity of MBIs is also grounded in; a purported ability to overcome market failures or create markets for biodiversity that encourage more ecologically-sensitive practices; allow flexible adoption for the “least cost” path to improved ecological outcomes; promote innovation in terms of landholders’ management practices; deliver more targeted outcomes than alternative policy instruments; deliver long-term outcomes, produce social and economic benefits; particularly for poor or marginalized landholders in developing nations, and increase the economic viability of pursuing more ecological and less

production-oriented land management practices and actions (Tennent and Lockie, 2013; Lockie, 2010; Engel et al., 2008; Wunder et al., 2008). The arguments in favour of MBIs for private land conservation are positioned against what is viewed as the failure of more 'traditional' regulatory, subsidy and extension-based programs to achieve conservation outcomes on private land and deliver an acceptable return on government expenditure (Whitten et al., 2012; Cocklin, Mautner, & Dibden, 2007).

The rise of MBIs in private land conservation sits within the broader context of an increasingly neoliberal approach to land management and environmental policy (e.g. Higgins et al., 2014). The application of neoliberal governance approaches has seen a growing policy emphasis on private property rights, individual freedom and commodification that accords with wider policy shifts in agriculture and global trade liberalisation (Lockie & Higgins, 2007). The rise in MBIs for private land conservation has seen a corresponding move away from collective action efforts for achieving conservation outcomes, particularly in Australia (Tennent & Lockie, 2012). A reduction in government funding and support for Australia's National Landcare Program – a community-based natural resource management initiative that encourages landholders to work collaboratively to overcome local conservation and land management challenges – encapsulates this policy shift (Curtis et al., 2014; Tennent & Lockie, 2013). In terms of funding priorities, governments at national, state and regional levels now direct money towards conservation programs that favour contracts with individual landholders at the private property scale, arguably at the expense of collective-action initiatives (Curtis et al., 2014; Lockwood & Davidson, 2010; Robins & Kanowski, 2011; Tennent & Lockie, 2012).

Targeting MBI programs at individual properties, however, could threaten the generation of public-good conservation outcomes, particularly if those programs fail to reflect the way landscape-scale social-ecological processes shape conservation efforts at the property scale (Higgins, Dibden & Cocklin, 2012; Pascual et al., 2014). Given that a growing body of research is pointing to the need for a landscape-scale conception of environmental management policy and practice (Fitzsimons, Pulsford & Wescott, 2013; Laven et al., 2005; Laven, Jewiss, & Mitchell, 2012; McKinney & Johnson, 2009; Worboys & Mackey, 2013), an interrogation of the tensions that might arise when attempting to achieve public good conservation benefits through MBI programs targeted at individual properties is critical (Pannell, 2008). The inter-relationship between the effectiveness of property-level

conservation efforts and social-ecological processes at larger scales means that even when programs do not have 'landscape scale conservation' as their discrete program objective, the design and implementation of price-based MBIs must recognise how the landscape scale will shape program outcomes (Pascual et al., 2014; Palmer & Filoso, 2009). From a social context perspective, property-focused MBIs can create a tension between the use of competitive bidding in the implementation of price-based MBIs and the need to engender the cross-boundary collaborative land management ethic that can support landscape-scale conservation efforts (Meadows, Herbohn, & Emtage, 2013). While selective attempts have been made at the program level to factor in landscape-scale processes in MBIs (see for example Windle et al, 2009), a need exists for a more formal integration of landscape-scale ecological function into the policy-making process to maximise the public good benefits that flow from MBI programs in the long term.

In this paper we engage with the concept of environmental stewardship to demonstrate its latent potential for incorporating landscape-scale ecological function in the design and delivery of private land conservation policy. We highlight the potential for enhancing policy benefits by connecting the 'public good' dimension embedded in the environmental stewardship concept directly to a landscape-scale conception of private land conservation. We provide an operational definition of public good environmental stewardship for MBI policy design that could serve as a conceptual tool for bringing attention to landscape-scale social-ecological processes. By employing environmental stewardship in this way, we demonstrate that the tension between the delivery of landscape scale public good conservation benefits and the property scale of land ownership is not an intrinsic element of price-based MBI programs. We also show how using the concept of environmental stewardship can guide the use of MBIs and alternative policy instruments in pursuing private land conservation.

2. MBIs and ecological and social fragmentation

2.1 MBIs and ecological fragmentation

In parallel to the shifting governance approaches outlined above, there has been a growing body of literature that advocates an approach to conservation that takes a holistic view of ecological function at the landscape scale (Worboys & Mackey 2013; Laven et al., 2005; Laven, Jewiss, & Mitchell, 2012; McKinney & Johnson, 2009). To manage populations and

ecological systems more effectively, the larger landscape scales that support species' habitat, migration and reproductive requirements must be considered in policy design (Laven, Jewiss, & Mitchell, 2012; Laven et al., 2005). For example, increasing habitat fragmentation and associated decreasing connectivity affects the persistence of local populations that can become confined to habitat patches (Arponen et al., 2013). A landscape-scale approach to private land conservation requires that multiple properties and multiple landholders across the landscape be considered in pursuit of a particular conservation objective, particularly in landscapes characterized by small land parcels.

Consequently, doubt exists about the potential for priced-based MBIs targeted at individual properties to successfully incorporate sensitivity to landscape-scale ecological function for biodiversity conservation (Banerjee, de Vries, Hanley, & van Soest, 2014; Higgins et al., 2012; CSIRO, 2003). MBIs that fund the most competitive bids can overlook benefits of spatial coordination and habitat continuity, which are important for a range of ecosystem processes and functions, including the movement of wildlife and pest eradication (Shogren & Crocker, 2014; Hanley et al, 2012; Hartig & Drechsler, 2009) . Moreover, the combined effects of individually participating landholders will not necessarily provide the benefits of a targeted landscape approach in which neighbouring landholders participate together (Engel et al. 2008; Wünscher et al., 2008). Other potential ecological shortcomings include a lack of additionality (the additional ecological benefit that is gained from the implementation of the program), leakage (high additionality only for the area included in the program), low permanence (the ability to achieve long-term ecological outcomes), and slippage (movement away from a specific ecological goal) (Moon & Cocklin, 2011; Wu, 2000; Engel et al., 2008; Wunder, 2005). Failure to deliver broad, landscape scale ecological benefits can be partly attributed to a focus on property-level management, ineffective translation of individual actions into regional benefits and delivery of discrete projects without connectivity as a strategic focus (Banerjee et al., 2014; Mills et al, 2011; CSIRO, 2003).

Individually-targeted MBIs programs may be especially problematic for private land conservation amidst rapid demographic change in rural regions, potentially exacerbating ecological fragmentation and reducing collaborative management between landholders (Yung & Belsky, 2007). For example, 'rural amenity migration' is resulting in the growing occupation of rural landscapes by non-farming landholders (predominantly in post-

industrial nations), often increasing both the subdivision of farmland into smaller land parcels and the heterogeneity of land uses (Carmona-Torres, Parra-López, Groot, & Rossing, 2011; Gobster & Rickenbach, 2004). The diversity of land use preferences and mosaic of property parcels in such landscapes in coastal and hinterland regions of Australia, for example, presents particular challenges for targeting conservation action at the scale of ecological function (Urquhart & Courtney, 2011; Klepeis, Gill, & Chisholm, 2009).

2.2 MBIs and social fragmentation

As noted above, the roll out of auction and tender schemes in Australia has been largely targeted to the individual landholder, whereby individuals in a given region are competing for the same pool of funds (Curtis et al., 2014; Whitten et al., 2012; Hajkowicz, 2009). While helping to make schemes more cost efficient, this competitive element of tenders can give rise to animosity between individuals and communities, where winners gain entry into a scheme at the expense of others (Cheshire & Lawrence, 2005). Moreover, to avoid collusion in the process of bidding for management funds, tender mechanisms often forbid participants to interact with one another in preparing their application (Higgins, Dibden, & Cocklin, 2010). Not knowing who else is participating in a scheme, and the activities they plan to carry out, can inhibit cooperation and knowledge sharing amongst landholders (Lockie, 2013).

The difficulty that participants in MBI schemes face in collaborating with one another also has the potential to crowd-out or remove opportunities for community-based approaches to land management at regional scales (Lockie, 2013; Muradian et al., 2010). The lack of interaction between participants associated with many price-based MBIs is a notable departure from the shared learning and cooperative management efforts across property boundaries previously championed through the National Landcare Program and other regional and national programs (Tennent & Lockie, 2012; Prager, 2010; Cramb, 2006; Curtis & Lockwood, 2000). Indeed, the ability to learn through interaction with others has been frequently demonstrated as an integral element of private land conservation programs (Mendham, Curtis, & Millar, 2012; Riley, 2006), and environmental management policy in general (Sharp, Thwaites, Curtis, & Millar, 2013). Of course, exceptions to this rule exist, with some MBI programs having an explicit objective to promote cooperation between landholders to connect areas for improved management across a region (Rolfe, Windle and McCosker, 2009; Windle et al., 2009). Yet, most schemes are based on

competitive bidding, where the competition between landholders drives down the financial bids that landholders make for completing their conservation work, thereby reducing the amount that institutions have to spend to maximize the conservation investment (Whitten et al., 2012; Reeson et al., 2008).

The imperative for working across-property boundaries to achieve conservation outcomes could be accentuated by rural demographic change, with new rural landholders often having different land use and land management interests than long-time rural residents (Mendham & Curtis, 2010; Cadieux & Hurley, 2009; Klepeis et al., 2009). For rural-amenity migrants, the pursuit of an 'idyllic' rural lifestyle can manifest in a desire for seclusion on one's own land (Meadows et al., 2013; Urquhart & Courtney, 2011; Yung & Belsky, 2007). As a result, amenity migrants can become very 'property-centric' in their ecological interests (Cadieux, 2011; Gill, Klepeis & Chisholm, 2010). While rural-amenity migrants are certainly capable of collaborative responses to local ecological problems (Larsen, Sorenson, McDermott, Long, & Post, 2007), price-based MBIs may serve to reinforce the property-centric notions of conservation activity exhibited by some rural-amenity migrants, making cross-boundary management efforts more challenging (Cooke & Lane, 2015; Gill, 2013).

Given the context of ecologically and socially fragmented mosaics across private land, recognising the influence of landscape-scale ecological processes in policy design presents a significant challenge. Importantly, we do not deny that individual properties working in isolation can contribute public good benefits at the landscape scale, or that property-centric conservation programs do not deliver any whole-of-ecosystem conservation benefits (Hajkowicz, 2009). The potential for programs targeted at individual properties to be sensitive to the landscape-scale is particularly evident when schemes are implemented across rural regions where properties are very large. Instead, we are suggesting that private land conservation policy needs to foster collaborative conservation action that is actively conscious of overcoming ecological fragmentation across private land tenure, by allowing landholders to collaborate and share ideas (Riley, 2006; Marshall, 2004). Private land conservation policies need to support landholders to think and act at scales beyond the property parcel, and to work collectively with each other across property boundaries, rather than reinforcing an individualistic and property-centric conservation ethic that will struggle to foster the cooperative management needed to address landscape-scale ecological function.

3. Environmental stewardship: bringing attention to the landscape scale in MBIs?

We argue that significant potential exists for re-appropriating the concept of ‘environmental stewardship’ in private land conservation policy-making to call attention to landscape-scale ecological function. Stewardship has been defined as “the responsible use (including conservation) of natural resources in a way that takes full and balanced account of the interests of society, future generations, and other species, as well as of private needs, and accepts significant answerability to society” (Worrell & Appleby, 2000, p. 275). This definition neatly captures the idea that notions of stewardship deployed in policy must acknowledge both a public and private good dimension. While the idea of stewardship amongst landholders is a concept that is always in the making, built around the cultural context of everyday life (Gill, 2013; Trigger, Toussaint, & Mulcock, 2010), at the level of policy-making, notions of stewardship are being actively constructed and deployed by policy-makers in an effort to generate specific public good conservation benefits from private landholders (Gill, 2013).

The ‘public good’ aspect of stewardship reflected by Worrell and Appleby (2000) encapsulates the well-established notion of being a socially and ecologically responsible custodian of the land for the good of both people and ecosystems into the future. As Leopold (1949) stated, a ‘land ethic’ (i.e. environmental stewardship) rests on the premise that an individual is a member of a community that is comprised of all living things working interdependently. Similarly, Young and McCay (1995) suggest that stewardship focuses on long-term benefits rather than short-term opportunistic gains, because an individual’s behaviour and motivations are balanced with an encouragement to engage in collective action that generates long term benefits.

The ‘private good’ dimension of stewardship recognizes that landholders have a right to generate private benefits from their property while still progressing ecologically ‘responsible’ land use (Hajkowicz, 2009). Private benefits are linked closely with private property rights; a claim to a benefit stream that the state protects by limiting the rights of others to access that stream, which continues to form the mainstay of the agricultural and rural policy discourse (Bromley & Hodge, 1990). With respect to stewardship, an area for debate is the extent to which a reduction in private benefits to provide an increase in public benefits might warrant compensation (e.g. through MBIs) (Worrell & Appleby, 2000). While

the stewardship definition noted above suggests that the provision of some public benefits free from compensation is a requirement of environmental stewardship, it is now a common expectation in private land conservation policy that society should provide some compensation to private landholders for the provision of ecological benefits, particularly when private benefits are lost (Worrell & Appleby, 2000).

The environmental stewardship concept is already heavily invoked in price-based MBIs for private land conservation, with programs often framing financial incentives for landholder participation as ‘payments’ for the delivery of their environmental stewardship (Dibden et al., 2005; Dobbs and Pretty, 2004; Victorian Catchment Management Authority, 2003). Indeed, several MBIs (E.g., English Countryside Stewardship Scheme; Australian Environmental Stewardship Program) feature stewardship directly in their title. These programs reflect both public and private good elements of environmental stewardship by providing landholders with financial compensation (private good) for the provision of some conservation benefit (public good). For such individualization of conservation to be justified, it must be more effective and efficient in delivering conservation benefits than collaborative management efforts (Lockie, 2013) – a point that remains unclear for MBI programs, given uncertainty about whether “landholders place less importance on program design and transaction costs within tender programs than they do on non-monetary value and social-based aspects” (Blackmore & Doole, 2013, p2050).

Price-based MBI programs can also create an expectation amongst landholders of compensation for undertaking activities they may have previously considered part of their responsibility and undertaken without the need for compensation, crowding out altruistic behaviour (Muradian et al., 2010; Vatn, 2010). Landholders can calculate what is in their best individual interest (Vatn, 2010), weakening the public dimension of stewardship and strengthening the private dimension. For example, some landholders have indicated that they are unwilling to participate in conservation covenant programs (see Adams & Moon, 2013) that do not offer financial incentives, because it may exclude them from participating in programs that do offer payments, such as carbon trading or property tax/rate rebate schemes (Moon, 2013).

Viewing price-based MBI policies through the lens of stewardship indicates they are well placed to accommodate the private good dimension of stewardship through payments and

recognition of private property rights. However, could programs that are more attuned to landscape-scale ecological function represent private land conservation policy that enhances the delivery of public good environmental stewardship benefits on private land? As we have sought to establish, landholders working in isolation are often unable to “internalise enough of the social and environmental costs of their activities to generate landscape scale benefits” for wider society (Lockie & Higgins, 2007, p. 5). The idea of collective societal benefits inherent in the concept of stewardship could be more directly applied in price-based MBIs, to encourage public good conservation benefits that extend beyond the boundaries of individual properties (Higgins & Lockie, 2002; Pannell, 2008). As such, potential exists to connect the stewardship concept more closely to a landscape-scale scale conception of private land conservation policy.

Despite the opportunities presented by stewardship, we recognise that problems encompassing local social-ecological complexity, policy path dependency (Marshall, 2013; Daniels, Bagstad, Esposito, Moulaert, & Rodriguez, 2010) and landholder perceptions of ‘absolute’ private property rights (Reeve, 2001) could be inhibiting policy-makers from incorporating landscape scale processes in policy and program design. Perhaps most significantly, policy-makers can be confronted with a host of transaction costs associated with the institutional processes the surround the design and delivery of MBI programs (Marshall, 2013); coordinating MBIs that are more attuned to collective action coordinated across private property is likely to increase such transaction costs (Marshall, 2007). We see substantial potential, however, in employing stewardship as a vehicle for promoting attention to landscape-scale processes in instances where policy-makers are unaware of cross-scale tensions in MBIs, when policy-makers are looking for guiding principles for new policy design and when alternate MBI policy mechanisms are being weighed up against one another.

To connect the landscape-scale directly to public good stewardship in MBI policy-making effectively, we take cues from the definition of Worrell and Appleby (2000) to provide an operational definition of environmental stewardship that ties directly to the policy context: *the responsible provision of private good benefits to landholders for the delivery of long term public good ecological benefits to society that are sensitive to the landscape scale of ecosystem function, while encouraging collaborative conservation action across the private property boundaries of affected actors.* In some instances, priced-based MBI mechanisms for private

land conservation are driving the policy-making process, rather than serving as a potential mechanism for delivering on already determined conservation objectives (Lockie, 2013; Muradian, 2013). A ‘fit-for-purpose’ stewardship definition could assist with ensuring that strategic conservation policy objectives are being factored into the design and implementation of MBIs. Our definition of environmental stewardship is intended to serve as an over-arching conceptual framing that can guide policy development – especially in the early stages – from which specific policy instruments and approaches can flow. We now consider the types of policy instruments that could be implemented under the umbrella of environmental stewardship for price-based MBIs, while also reflecting on when environmental stewardship might not be best served by MBI policy.

4. Opportunities for re-imagining MBIs through environmental stewardship

Price-based MBIs have the potential to play an enhanced role in private land conservation policy when designed and delivered through the lens of environmental stewardship. As such, our objective here is not to dismiss the use of price-based MBIs in private land conservation. Rather, we are suggesting that private good benefits to landholders need to be more strongly contingent on the provision of public good benefits that respond to the ecological and social challenges presented by the fragmentation of landscapes through private land tenure. Here we describe some potential policy approaches for responding to the social and ecological dimensions of the landscape scale. We keep these options deliberately broad as a way of recognising that any policy ideas presented will be more or less relevant to a given locality, depending on factors like local socio-ecological context, land use, existing policy frameworks and opportunity costs (Marshall, 2013; Mills et al., 2011).

4.1.1 Sensitivity to the scale of ecological function through policy instruments

As the landscape scale accommodates spatial and temporal continuity and interconnectedness across a contiguous area (Emmelin, 1996), price-based MBI policy instruments must look to *connect* the actions of individuals on private properties to create a holistic conception of landscape-scale ecological function. Such an approach would provide an opportunity for MBIs to play an overarching role in engaging landholders at the local scale to deliver regional ecological improvements. This function of policy is highly relevant for private land conservation because the ecological benefits of conservation typically depend on what activity is occurring within a defined spatial area, and not just on one land parcel (Piorr, 2003; Hodge & McNally, 2000). To this end, policy instruments can be used to

create linked corridors of habitat – either contiguous or ‘stepping stones’ – to reduce the creation of isolated habitat patches that can be ineffective for maintaining viable populations of species and can contribute to narrowing species’ gene pools and increasing predation (Hodge, 2001). Coupled ecological-economic modelling has shown that MBI programs designed to consider landscape connectivity and dynamics can achieve significantly better ecological outcomes than programs that do not, and can also improve cost-effectiveness, particularly in highly ecologically fragmented landscapes (Hartig and Drechsler, 2009).

The Desert Uplands Landscape Linkages Program, offered to Queensland cattle graziers is an example of an MBI program that aimed to improve ecosystem function at the landscape scale, by engaging landholders across adjacent properties to develop a wildlife corridor (Windle et al., 2009). By promoting landholder cooperation to align and connect areas for improved conservation outcomes, this program demonstrates that landscape-scale conceptions can be incorporated into MBIs scheme design, whilst still achieving the cost efficiency benefits that MBIs in general purport to deliver. Policy instruments such as these, which encourage collaboration at the landscape scale, commonly generate effective environmental stewardship outcomes (Gates & Morgan, 2003).

Collective land management outcomes could also be achieved efficiently through mechanisms that seek to coordinate conservation outcomes spatially across the landscape. Agglomeration bonuses are one such example of a spatial coordination mechanism, which works by paying landholders a bonus for every unit of land that he or she retires that borders any other retired unit to create a contiguous reserve across property boundaries (Parkhurst et al., 2002). This mechanism has been demonstrated to achieve targeted ecological outcomes by offering a selection of subsidies that encourage specific spatial patterns of ecosystem preservation that enhance ecological function (Parkhurst & Shogren, 2007). The goal is to maximize ecological outcomes and minimize landholder resentment (Parkhurst, Shogren, & Crocker, 2014), thereby decreasing ecological fragmentation, and taking advantage of landholders’ local ecological knowledge and collective management efforts across property boundaries (Banerjee et al., 2014).

Given MBIs are not necessarily designed to generate long-term behaviour change amongst participants (Frahm et al., 2001; Dwyer et al., 1993), it is important that these schemes

make the most of opportunities to formalise learning and knowledge exchange networks, which landholders can turn to when short to medium term MBI contracts expire. The critical role of extension or outreach services in building the land management capacities of landholders in conservation programs is testament to the importance of sharing knowledge between participants for long-term conservation benefits (Higgins et al., 2014). Reflecting on an environmental stewardship definition for MBIs that recognises the importance of long-term public good conservation outcomes can facilitate an emphasis on capacity building and knowledge sharing amongst landholders that extends beyond the life of a discrete program.

4.1.2 Creating room for cross-boundary collaborative conservation efforts

As we have noted, when not designed with cross-boundary cooperation in mind, individual contracts for conservation on private land can constrain opportunities for collaboration between landholders, potentially conflicting with ‘public good’ environmental stewardship objectives (Hodge, 2001; Hodge & McNally, 2000). Conservation actions on private land should not be paid for when payment promotes competition over collaboration, particularly when collaboration is central to achieving the conservation objectives of a program (Lockie, 2013; Meadows et al., 2013; Reeson & Tisdell, 2007). One policy approach that could overcome the limitations of short-term, property-centric MBIs is enabling landholders to participate in the design and delivery of MBIs collectively (Lennox & Armsworth, 2013; Race & Curtis, 2009). When landholders feel a greater sense of control and ownership over an MBI program, it may actually encourage collaborative interactions between landholders, rather than discourage them. Given landholders frequently share similar land management goals, collaboration across property boundaries is often a workable proposition (Meadows et al., 2013; Creighton et al., 2002; Jacobson, 2002). Neighbouring landholders could develop a local cooperative to negotiate and develop an agreement to be funded by the funding body, that would achieve economies of scale, encourage cooperation, and generate landscape scale ecological outcomes (Lobley & Potter, 1998). MBI programs in the UK that have had to accommodate common property ownership arrangements have demonstrated the potential for collective agreements to work in practice (Mills et al., 2011). Both of the above approaches could also draw on the benefits of voluntary education programs by supporting information sharing across property boundaries and to stimulate attitude and behaviour change.

4.1.3 When MBIs should be avoided

As Muradian (2013, p1165) notes, financial incentives have the potential to be counterproductive when “the tasks at stake have an important component of moral obligation or contribution to the common good”. Yet, by thinking about landscape-scale social-ecological processes in private land conservation policy, ideas of moral obligation and common/public good can be brought to the forefront of price-based MBIs. The adoption of collaborative approaches to MBI design and implementation like those cited above offer one direct avenue for considering moral obligation. However, in circumstances where the success of private land conservation policy is heavily dependent on these aspects – for example, in scenarios where payments are unlikely to be a major factor in determining whether landholders decide to participate – then other policy mechanisms like education and information programs, alongside regulatory arrangements, may prove more effective (Vatn, 2010; Cocklin et al., 2006). Yet, adopting a non-MBI policy mechanism is no guarantee that a sensitivity to landscape-scale social-ecological processes will suddenly materialize. A range of conditions relating to the need for program scalability, collaboration between participants, the importance of information exchange, the financial capacity of actors involved, property rights arrangements, transaction costs and institutional capacity need to be a part of determining which policy mechanism would be appropriate (Lockie, 2013; Marshall, 2013).

There are a number of policy instruments and approaches that aim to deliver landscape scale improvements that align with both the public and private good dimensions of environmental stewardship, without the application of price-based MBIs. In the US, environmental cooperatives are proving increasingly popular. Environmental cooperatives consist of a local organization of farmers and non-farmers who work collaboratively with one another and local, regional and national agencies “to integrate nature management into farming practices by adopting a pro-active approach based on a regional perspective” (Franks & McGloin 2007, p. 473). Environmental cooperatives provide an example of endogenous development, whereby development arises from local physical, human and intangible resources that are indigenous to that locality, raising the consciousness of the locality as the unit of policy and action (Ray, 1999). Such organizations aim to deliver environmental benefits, as well as to strengthen and integrate the rural economy (Franks & McGloin, 2007). In instances where cooperatives could be nurtured, MBI implementation may not be a cost-effective strategy for private land conservation.

5. Conclusion

Despite a push for a market-based solution to private land conservation policy challenges, ecological problems typically have social causes and consequences and thus efforts beyond those of well-intentioned individual landholders acting in isolation are required to redress them (Higgins & Lockie, 2002). Despite the ability of MBIs to generate some landscape scale ecological benefits, most conservation-oriented MBIs do not account sufficiently for these processes, focusing instead on individual land parcels, resulting in significant implications for the ecological effectiveness of MBI programs (Hartig & Drechsler, 2009). Given the importance of landscape-scale conceptions of ecological function in the design and delivery of private land conservation policy, price-based MBIs need to look beyond the individual property parcel, and the individual landholder working in isolation. Here we have suggested that the limited attention of price-based MBIs in their current form to the delivery of landscape-scale ecological benefits risks a sub-optimal provision of ‘public good’ environmental stewardship benefits from the ‘private good’ benefits that are provided to landholders. However, the stewardship language that currently surrounds many prominent price-based MBIs schemes holds latent potential for highlighting this shortfall in delivery of public good ecological benefits. Linking the public good benefits inherent in the concept of environmental stewardship to landscape-scale function helps to bring the landscape-scale to the forefront of MBI policy-making considerations. Whilst recognising challenges like transaction costs and policy path dependencies make a focus on the landscape scale in MBIs difficult for some policy-makers, re-purposing environmental stewardship can help to illuminate the cross-scale tension between individual properties and landscape-scale processes at the outset of the policy-making process. As a result, our MBI stewardship definition allows for reflection during the early stages of policy initiation, to determine whether price-based MBIs will be capable of delivering the intended public good conservation outcomes in a given social-ecological context. By being sensitive to the landscape-scale, we can then turn our attention to whether approaches like collaborative MBI program design, spatial coordination and shared learning outcomes could form part of price-based MBI design. The increasing popularity of price-based MBIs means now is an important time to reflect on public good ecological benefits and the landscape scale, before a mindset of private land conservation policy that is bounded by the private property parcel become too entrenched.

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