



Tasmanian landowner preferences for conservation incentive programs: A latent class approach

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ABSTRACT

An empirical model of landowners' conservation incentive program choice is developed in which information about landowners' socio-economic and property characteristics and their attitudes, is combined with incentive program attributes. In a Choice survey landowners were presented with the choice of two incentive programs modelled as 'bundles of attributes' mimicking a voluntary choice scenario. Landowner behaviour and decision and the type of conditions and regulations they preferred were analyzed.

Based on choice survey data, landowner heterogeneity was accounted for using a latent class approach to estimate the preference parameters. Three latent classes of landowners with different attitudes to the role and outcome of establishing conservation reserves on private land were identified: *multi-objective owners*; *environment owners*; and *production owners*.

Only a small proportion of landowners, mostly *environment owners*, would voluntarily join a program. Although compensation funding contributed to voluntary program choice for *multi-objective owners* and *environment owners*, welfare losses were around 4000 AUD per hectare, which is less than the average agricultural land value in Tasmania.

Landowners for whom compensation funding contributed to voluntary program choice were also most likely to set aside land for conservation without payment. This raises the possibility that the government's compensation expenditure could potentially be either reduced or re-allocated to landowners who will not voluntarily take conservation action. Increasing participation in conservation incentive programs and minimizing the welfare losses associated with meeting conservation targets may be best achieved by offering programs that allow flexibility in terms of legal arrangements and other program attributes.

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1. Introduction

Australia possesses flora and fauna that are both highly endemic and has great species richness compared to many other parts of the world. However, much of Australia's rich biodiversity is threatened with extinction due to habitat loss or the degradation of habitat quality. As over 60 percent of land in Australia is managed by private landholders (Productivity Commission, 2001) many threatened ecosystems occur on private land.

Incentive programs for private forest conservation have existed in Australia for more than two decades (Figgis, 2004). Incentives

currently comprise grants (including management and stewardship payments), subsidies, tax relief, rate relief, offset payments, development incentives, the creation of environmental markets, and market-based incentives (e.g. James, 1997; Bateson, 2001; Comerford and Binney, 2004; Department of Environment and Water Resources, 2006). Most conservation incentive programs in Australia are voluntary and in joining a program landowners will generally restrict the use of the land by legal agreements or other means (CSIRO Wildlife and Ecology, 2001).

Tasmanian incentive programs have added significantly to biodiversity conserved on privately owned land.⁴ Landowners in this State were paid, approximately one-third of the estimated market price, to secure covenants on 180 properties in 2005 (Smith,

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⁴ As there is not much land in Tasmania that is leased, these were not explicitly considered.

2001; Department of Primary Industries and Water, n.d.). Nevertheless, in some regions more than 80 percent of land with conservation value remains unprotected and programs routinely fail to meet enrolment targets (Department of Environment and Water Resources, 2007). Targets are not being met even though there is flexibility in the amount of compensation that may be offered and available funds have not reached their limit. Considering the overall budget is adequate and the fact there is no evidence of a landowner waiting list, indications are that other landowner decision variables play a role. This has resulted in considerable debate not only about the design of programs but also around the question of whether landowners should be forced to protect land for conservation in order to achieve stated policy and conservation objectives. Due to the Australian constitution, even legislative or forced conservation in Australia would require some compensation to be paid to landowners. The option of forcing landowner entry into conservation incentive programs has already been considered in some Australian States (e.g. Stoneham et al., 2000). But before implementing compulsory schemes and to ensure Australian conservation targets will be met in the future, understanding landowners' preferences for incentive program attributes is likely to become increasingly relevant.

Participation in incentive programs is dependent on many variables that can be loosely grouped into four areas: program characteristics; landowner characteristics; property and business characteristics; and landowner attitude (e.g. Ervin and Ervin, 1982; Esseks and Kraft, 1986; Purvis et al., 1989; Cooper and Keim, 1996; Drost et al., 1996). Some studies have considered one or more of these four groups of variables, but none have systematically considered all four together as is undertaken in this current research.

Our general aim is to investigate landowner preferences for conservation incentive program attributes to better understand the contribution of the different program attributes to the decision to voluntarily join conservation programs. We also focus our investigation on the contribution of latent attitudes to the role of conservation on private land to the likelihood of joining conservation incentive programs. The outcomes of the study are intended to provide information that is useful in the development of new incentive programs and thus ensuring conservation targets are met in the future.

The existing literature within each of the four groups of variables that contribute to landowner participation in incentive programs is reviewed below.

2. Literature overview

It is well established that landowner participation rates in incentive programs are affected by program characteristics and attributes including, for instance, tax relief or the level of compensation. Empirical studies confirm the relationship between the size of an inducement payment and the likelihood of participation (Esseks and Kraft, 1986; Chisholm and Dumsday, 1988; Purvis et al., 1989; Cooper and Keim, 1996; Lynch et al., 2002; Stevens et al., 2002; Greiner et al., 2003; Horne, 2004). Even though the positive relationship between higher payments and increased participation seems to be straightforward, there is little information on the shape of the curve describing this relationship. It is also unclear whether there is any heterogeneity in the response to higher payments across landowners.

Higher compliance cost (Wynn et al., 2001) and longer periods of commitment were found to decrease participation rates (Esseks and Kraft, 1986; Gasson and Hill, 1990; Stevens et al., 2002; Horne, 2004). In contrast, program flexibility, allowing for easy succession planning for families (Wilson, 1997), confidence in the payment

mechanism (Johnston et al., 1999), and positive landowner attitude towards the agency responsible for delivering the program (Dedrick et al., 2000) increased the likelihood of participation.

Participation in incentive programs is also dependent on landowner characteristics. Wilson (1996), Drake et al. (1999) and Greiner et al. (2003) all reported that socio-economic characteristics, such as younger age (Steel, 1996; Wilson, 1997; Lynch et al., 2002; Dupraz et al., 2003), higher education, and residency, were important in explaining farmer increased conservation behaviour and participation. Private landownership as opposed to leasing land also had a positive impact on the willingness to participate in incentive programs (Force and Bills, 1989; Kraft et al., 1996; Wynn et al., 2001). Business and property characteristics such as larger property size (Drake et al., 1999; Dupraz et al., 2003), agricultural use, higher income (Force and Bills, 1989), off-farm income, and lower household debt (Gasson and Potter, 1988; Tisdell and Harrison, 1999; Loftus and Kraft, 2003) also increase the likelihood of participation. Furthermore, landowner awareness of available incentive programs and prior participation (Drake et al., 1999; Wynn et al., 2001) increased participation.

Property characteristics also explain landowner participation in incentive programs. A high number of changes required to the way the farm was being managed was likely to have a negative effect on the decision to participate (Vanclay and Lawrence, 1995; Drost et al., 1996; Wynn et al., 2001). Allowing landowners to continue some of their current practices relatively unaltered, such as grazing, increase the likelihood of participation (Esseks and Kraft, 1986; Gilfedder and Kirkpatrick, 1997).

The last group of variables that affect participation in incentive programs are related to landowner attitudes. Many studies have established that landholders who participated in incentive programs had a more favourable attitude⁵ towards the environment (Luzar and Diagne, 1999; Drake et al., 1999; and Klosowski et al., 2001; Dupraz et al., 2003). Wynn et al. (2001) found that landowner attitude to conservation explained early entry into conservation schemes (timing) but did not impact on the probability of entry. The link between attitude and entry into a program is also questioned by Vanclay and Lawrence (1995) who indicated that landowner behaviour may change due to intervening factors, such as financial opportunity, even if the attitude remained the same.

Our *a priori* expectations in this research were that all four groups of variables contributed to landowner decisions to participate in conservation incentive programs. In the next section we outline the theory that underpins our research and the approach we have taken to better understand landowner's decision-making process with respect to joining incentive programs.

3. Theoretical framework and estimation method

The importance of understanding the decision-making process with regard to participation in policy programs has been recognised for many years (Brotherton, 1989). This early recognition has led to the development of theoretical behavioural models in economics (e.g. Lynne et al., 1988; Beedell and Rehman, 2000), psychology, and the other social sciences (e.g. Sinden and King, 1990). In economics, a utility-maximising framework is frequently applied to explain behaviour as it can include economic as well as non-economic motivations and attitudes (Lynne et al., 1988; Ajzen, 2001).

In this current study the Stated Preference (SP) technique, choice modelling, is used to analyse choice behaviour with respect

⁵ Attitudes are learnt stable psychological tendencies to evaluate particular entities with favour or disfavour.

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