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Socioeconomic monitoring for the environmental stewardship program

Report prepared by CSIRO Ecosystem Sciences for the Department of Sustainability, Environment, Water, Population and Communities

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Executive summary

The Environmental Stewardship Program (ESP) supports private land managers to protect, rehabilitate and improve particular ecological communities, through such activities as reducing stocking and grazing intensity, reducing fertiliser use, expanding weed management and replanting of native species of a period up to fifteen years. Underpinning the ESP is the importance of long-term biodiversity conservation activities involving enduring changes in land manager attitudes and behaviours towards environmental protection.

The purpose of the research was to design and implement a method for assessing attitudes, motivations and behaviours toward biodiversity management amongst private landholders. These measures were derived from literature review and developed into a survey conducted with landholders in areas where the ESP is active. To better understand those land managers who are contracted to the ESP, it was also important to consider the views of those who expressed interest in the scheme but did not bid, unsuccessful bidders and also surrounding landholders who had not previously expressed interest in the Program.

This process was designed to be repeatable such that change in these measures can be tested throughout the duration of the Environmental Stewardship Program. The report provides details of the methodology use to conduct the survey such that it may be repeated in the future to track change over time. The survey focused on geographical locations with a high density of ESP participants. These were the catchment areas of Lachlan, Central West and Murrumbidgee, all within NSW. Overall, 850 surveys were distributed. These included 480 to participants identified through the ESP register. A further 370 surveys were sent out to a control group identified through neighbouring Landcare groups in order to match the control group to the study group as close as possible. A total of 286 completed surveys represents a favourable response rate of 34%.

Overall, the Environmental Stewardship Program has been very successful. It has been attractive to a wide range of landholders, including those with no prior interest or experience with environmental programs. It is clear that the Program is viewed favourably by the vast majority of survey respondents, including those who chose not to become involved with the Program and those who wanted to become involved but were not successful during the bidding process.

The survey provides evidence of early attitudinal change amongst contracted landholders which is a positive sign at an early phase of the Environmental Stewardship Program. Specifically, there was evidence of increased desire to protect the environment and increased aesthetic appreciation of properties. Moreover, for one of the variables (the importance of actions to conserve flora and fauna), we found statistical evidence which indicates that people who have been in the Program for longer durations see this as more important compared to those who have been in the Program for shorter durations.

1 Introduction

The Environmental Stewardship Program (ESP) supports private land managers to protect, rehabilitate and improve particular ecological communities, through such activities as reducing stocking and grazing intensity, reducing fertiliser use, expanding weed management and replanting of native species. Underpinning the ESP is the concept of enduring change, i.e. long-term processes to involve land managers in biodiversity conservation on their land and stewardship of the natural environment. Supporting enduring changes in land manager attitudes and behaviours towards environmental protection and sustainable land management practices is a fundamental outcome of the Program.

Traditionally, existing markets have rewarded agriculturalists but 'failed' to conserve environmental and cultural goods because they did not send signals that encouraged participants to use and manage natural resources sustainably. That is, the full costs of production decisions are not reflected in the market price paid for most products. A simple example is that in producing a tonne of wheat, the price paid for the wheat does not include any costs of using environmental resources or causing environmental degradation in the production of this tonne of wheat.

In theory, the supply problems for goods arising from market failure can be remedied through some level of government intervention (Murtough et al., 2002). Intervention can be divided into three distinct categories:

Facilitative: where measures are designed to improve the flow of information and corresponding signals and incentives without providing any direct incentive payments to landowners. For example, extension programs providing information about how to manage land to improve biodiversity conservation.

Incentive: where measures are designed to directly alter the structure of pay-offs to land managers and are usually specifically intended to substitute for missing monetary signals that are generated within markets for other goods and services. Payments for particular activities are an example of incentives.

Coercive: where non-voluntary measures are designed to compel management change using the coercive powers of government. Regulations designed to protect native vegetation are an example of coercive policies.

The Environmental Stewardship Program (ESP), established in 2007 by the Australian Government Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) and announced as a part of the Caring for our Country initiative in 2008, is an example of an incentive based form of government intervention to bring about improved management of biodiversity on agricultural properties.

Since its inception, the purpose of the ESP has been to contract private land managers to conduct management practices to maintain and improve the condition and extent of targeted high public value environmental assets on private land. Targeted assets are a subset of those listed as matters of National Environmental Significance (NES) under the Australian Government's *Environment Protection and Biodiversity Conservation (EPBC) Act 1999.* The initial target was box gum grassy woodlands (BGGW) and derived grasslands (2008 to 2010) across NSW and southern Queensland (investment in Victoria was undertaken through a separate process). The target was expanded in 2010–11 to incorporate additional ecological communities in NSW (natural grasslands on basalt and fine-textured alluvial plains of northern NSW and southern Queensland, and Weeping Myall woodlands) and in South Australia to target Peppermint Box (*Eucalyptus odorata*), Grassy Woodland of SA and Iron-grass Natural Temperate Grassland of SA. This project primarily focuses on the BGGW element of the program in order to begin to evaluate the enduring change element across the five years of the program to date as is further discussed in Part 1.

To date, the ESP has been delivered using a competitive reverse auction mechanism whereby land managers compete for government funding to enable them to conduct conservation actions on their land (Binney et al.,

2010). Contracts and funding can extend for up to 15 years and can include a covenant on land to ensure outcomes occur into perpetuity.

In early 2012 the DSEWPaC[1] contracted the CSIRO to assess the appropriateness, impact, effectiveness and efficiency of the Environmental Stewardship Program (ESP) in achieving one of its strategic objectives 'enduring changes in land manager attitudes and behaviour towards environmental protection and sustainable land management practices'. Specifically, the DSEWPaC aimed to address the question: 'is the investment in ESP changing values, attitudes, motivations and behaviours towards biodiversity conservation on private land?'

To answer the question above, three major tasks were performed:

A literature review was conducted to identify the key social, economic, demographic and other measures of land managers' values, attitudes, motivations and behaviours towards biodiversity conservation and management on private land. The purpose of the literature review was also to identify which of these measures was likely to be directly influenced by the Environmental Stewardship Program (and over what time frame).

The identified parameters were then distilled into a set of indicators which could be practically (and cost effectively) measured

The final task was to develop a longitudinal socioeconomic monitoring and reporting methodology for the program (inclusive of monitoring frequency) and implement this methodology to establish a baseline for the identified indicators across a representative sample of land managers under the program.

The outcomes from conducting these three tasks are presented in this report which is structured in three parts. Part 1 synthesises the literature about landholder adoption of environmental practices specifically and to a lesser extent innovation more generally. Part 1 concludes by discussing these parameters as a set of indicators which can be practically and cost effectively managed (base for an evaluation methodology). In Part 2 the implementation of the methodology is described and results are discussed. In Part 3 the key conclusions from the study are presented.

[1] Specifically, the Environmental Stewardship Program, Biodiversity Conservation Branch, Land and Coasts Division

2 Literature review

There is extensive literature describing the motivations behind landholder behaviour. This literature tends to be generated by two disciplines: 1) social scientists (such as rural sociologists) and 2) economists. By exploring the literature from both disciplines we have captured a breadth of motivating factors as well as the debate surrounding how the factors influence landholder behaviour. Across both disciplines, the literature is advanced in relation to landholder adoption of farming practices but less so for the adoption of practices that generate an environmental benefit. Following is an overview of the literature review. We categories the literature into demographic, economic, biophysical and physical factors as well as social and other influencing factors.

2.1 Demographics

Demographic factors were broken down into age, whether the farm was held by the family or a corporation, and the level of education of the primary decision maker. There was some disagreement within the literature with regard to the importance of age when thinking about why farmers adopt new practices (farming or environmental). For example, Whittenbury and Davidson (2009) note that Mendham et al. (2007) suggest that some farmers feel an obligation to leave land in the best condition as they get older. This is supported by Baumgart-Getz et al. (2012) who find that age has a negative impact on practice adoption. Vanclay (2011) and Barr and Cary (2000) both note that investment in the farm is less likely to occur when farmers are older and they do not expect the family farm to be kept within the family. Because of this Vanclay (2011) refers to family life stage rather than age and notes that young families tend to be more committed to remaining on the farm than couples later in the life cycle or young singles. Vanclay (2011) suggests that families in a younger life stage will be more likely to take up new practices. Pannell et al. (2006) clarifies the link between age and adoption and suggests that there is a link between age and the length of time between the practice adoption and the payoff from this. Older farmers have less time to wait for changes that may benefit them a long time in the future. Despite these findings Byron et al. (2006) found no link between age and uptake of recommended farm practices.

The ownership status of the farm (how the farm was owned, i.e. corporate versus a family farm) was also found to influence adoption of new practices. Barr and Cary (2000) note that a family farm is likely to mean that there is a greater potential for inter-generational handover and so adoption of practices that may have longer time periods to benefit (links with age). Barr and Cary (2000) also note that corporate farming results in difficulty to identify the decision maker for change which may slow down adoption. Pannell et al. (2006) found similarly for family farming, noting that family farming units are diverse and there may be many involved in decision making which can slow down practice uptake.

Education of the primary decision maker is another recognised issue in relation to practice adoption. Barr and Cary (2000) and Kilpatrick (2000) note that education assists in decision making and adoption of complex innovations. However, the method of education is important. For example, Barr and Cary (2000) found that there is reticence from farmers to get involved in formal training. Instead, farmers prefer one on one style training for management practice changes. One reason for this is the introverted nature of many farmers and therefore their level of comfort in one on one rather than group training. Mendham et al. (2007) also note the importance of education to adoption of new practices but refer to informal learning. For example, Mendham et al. (2007) note the newness of the environmental practice plus a lack of involvement in other conservation activities (e.g. Landcare) reduces confidence in the mechanism because people don't know how to start. Whitten et al. (in press) note that seeing a practice applied on the ground often assists landholders to learn about the practice and its associated risks. There is also debate about how the level of education affects adoption. Knowler and Bradshaw (2007) also discuss informal learning, and use the term 'education' as perception and awareness of a problem rather than formal education level. Informal training is also supported by Baumgart-Getz et al. (2012) who note that formal education had an insignificant impact on adoption but participation in informal training such as extension had a positive impact on adoption. Pannell et al. (2006) highlight some complexities with education. Pannell et al. (2006) also note that farmers have limited time

available for learning activities. Those with higher education may be able to grasp complex new ideas quickly but may have less time for adoption due to other commitments (as they may be spending a lot of time off farm). More educated farmers may also be slower to adopt due to their ability to pick new practices apart and disagree with them.

2.2 Economics

All literature supported the well known statement 'it is hard to be green when you are in the red!' Mendham et al. (2007) highlighted that financial security is often the highest priority for farm families and there needs to be financial compensation for lost production associated with practice uptake. It was common throughout the literature that farmers tend to readily take up practices that lead to an increase in profitability and rarely take up practices that generate a loss (Barr & Cary, 2000; Baumgart-Getz et al., 2012; Cary & Wilkinson, 1997; Lawrence et al., 2004; Vanclay, 2004; Wilson & Hart, 2001). Pannell et al. (2006) did note that perceptions of profitability are also counterbalanced by issues such as time, lifestyle and risk. Others (Pannell et al., 2006; Rhodes et al., 2002; Robertson et al., 2009) discuss risk and note that profitability is of greatest concern when upfront costs are high, long-term financial benefits uncertain and there is a lack of understanding of positive spillover from a practice.

Valentin et al. (2004) note that many recommended environmental practices are profit-neutral. Pannell et al. (2006) highlight that if conservation practices are not profitable they will only be adopted by the more conservation minded landholders, which will be small scale.

Another economic factor that was noted to potentially influence adoption was landholders' off farm commitments, in this case off farm income (Baumgart-Getz et al., 2012; Mendham et al., 2007). Off farm activities were noted to have both an increasing and decreasing influence on adoption. Barr and Cary (2000) note that increasing commitments to off farm work is associated with decreasing effectiveness of Landcare groups. Access to off farm income can also increase adoption because it may reduce the financial risk of adopting. For example, Barr and Cary (2000) found that lack of financial viability inhibits adoption by reducing the capacity to adopt, rather than benefit from adoption. However, off farm income may also reduce the incentive to adopt practices that increase profitability. Off farm income commitment may also inhibit adoption because it may involve greater management demands or time requirements (Pannell et al., 2006). Curtis and De Lacy (1996) note that non-farmers may bring new ideas, new skills and financial resources which can increase practice adoption.

Other economic factors to influence adoption were found to be the current financial status of the landholder (i.e. level of debt, current financial commitments (business and family) and attitude to borrowing) (Wittenbury and Davidson, 2009).

Another economic factor noted to affect practice change is perceived and actual transaction costs (the indirect costs of participation such as time and effort to collect information, apply, learn about changes, report on these changes etc). Falconer (2000); Falconer and Saunders (2002); Kuperan et al. (2008); Mettepenningen et al. (2009); and Rorstad et al. (2007) are some of the studies that include or explicitly analyse the transaction costs of an environmental policy to private parties. Across those that included both public and private transaction costs, transaction costs ranged from 21% to 50% of total policy costs. Mettepenningen et al. (2009) explicitly look at private transaction costs of an agri-environmental scheme and report that on average these are 15% of the total cost of the policy. Landholder transaction costs can decrease with past experience with the practice or with the agency implementing the practice.

In relation to biodiversity conservation practices, Whitten et al. (in press) note that contract flexibility (five years, ten years or in perpetuity) can influence uptake.Whitten et al. (in press) also found that many farmers regard biodiversity conservation as incompatible with their production goals. However, this depends on landholder types as conservation may be compatible with lifestyle farmers.

2.3 Biophysical

There was much discussion in the literature of the importance of the physical location of landholders and their potential to adopt new practices. If neighbours were adopting (referred to by Pannell et al. (2006) as change champions), others were found to be more likely to adopt as neighbours provide information and a test bed of the practice. Being located a large distance from information providers was also shown to reduce the potential for adoption. Pannell et al. (2006) also noted that areas within a reasonable driving distance to the city tended to have many tree change landholders who often did not have the knowledge and skills to make practice changes.

Biophysical characteristics of the property also had a large bearing on the ability of some landholders to adopt. Some practices are just better suited to some regions compared to others (Pannell et al., 2006), and other practices will be adopted if they are introduced and supported during the right time in the production cycle (Whittenbury and Davidson 2009). For example, Barr and Cary (2000) note that many properties in the rangelands are too small to be able to apply tactical grazing strategies designed to sustain the fodder base. The current practices of a property and the complexity of current and the new practice (compatibility of practice and overall farm objectives) also affect adoption. New practices that are complex also increase the risk of failure and the cost of gaining knowledge (Barr & Cary, 2000; Vanclay, 2011; Wilson & Hart, 2001). New practices may also require investment in new infrastructure (Mendham et al., 2007; Pannell et al., 2006). Pannell et al. (2006) expand the discussion of compatibility to note that adoption may be related to impact on other parts of the farming system. For example, keeping old trees may reduce the flexibility of crop producers who wish to swap in and out of crop production depending on weather conditions. All of the literature across the two disciplines highlighted the difference in adoption when a practice was for the whole farm versus a small component. Being able to pick and choose practices for smaller parcels increased adoption (this will depend on the investment requirements for practices). However, Pannell et al. (2006) found that implementing practices over larger areas tended to increase the benefits of adoption, and increased adoption rates.

2.4 Social

Both the social and economic sciences highlighted a number of social factors that affected practice adoption. Much of the literature (Measham et al., 2007; Pannell et al., 2006) highlights that uptake of conservation practices is defined within life and family goals such as financial, career, social acceptance, leisure and work life balance goals. Pannell et al. (2006) found that information about land conservation will only be gladly received if there are not more pressing life and family issues.

Attitude to risk was also noted to influence adoption, however there were different opinions regarding the influence of risk on adoption. Whittenbury and Davidson (2009); Montagu et al. (2006) and Mendham et al. (2007) all note that risk and different approaches to risk affect implementation of practices. However, Baumgart-Getz et al. (2012) found attitude to risk was insignificant at describing adoption. Pannell et al. (2006) found that farmers vary widely in their attitudes to risk, however the more risk averse a farmer is the more likely they are to adopt a practice that reduces risk and vice versa.

Social norms and expectations were also emphasised as contributing to adoption uptake (Montagu et al., 2006; Pannell et al., 2006; Whitten et al., in press; Whittenbury & Davidson, 2009; Wilson & Hart, 2001). Farmers tend to see themselves a certain way (e.g. I am an organic producer, I am a cattle farmer etc.) and adoption tends to be higher if it increases social standing and gives the perception of being a good farmer within a farmer's view of what that is. At the same time, farmers can receive criticism and 'social sanctions' from surrounding farmers if new practices challenge the status quo (Richards et al., 2005). Cary et al. (2002) suggest that adoption is less likely if a practice does not fit with social norms such as valuing local industries and communities and/or if there is the potential to negatively impact on the natural resources and the opportunities of others. Barr and Cary (2000) provide an example where improved pasture and increased stocking rate was incompatible with a region's reputation as a boutique producer of fine wool and therefore affected practice uptake.

Trust in government and relationship with information givers was also noted by social scientists as influencing adoption (Whittenbury & Davidson, 2009) . Adoption is enhanced when there is clear information from government (Vanclay, 2011) and strong trust in government (Mendham et al., 2007) and vice versa. The benefit of government information and trust is eroded however by high staff turnover of regional government (CMA) officers as this makes it difficult to establish rapport and build relationships. Mendham et al. (2007) note that there is high suspicion of government (what are the implications for the future of adoption now) which affects adoption. Trust is affected by past schemes and landholders' experiences Pannell et al. (2006). A history of respectful relationships is positively correlated to adoption through enhanced trust (Cooke et al., 2012).

Attitude towards the environment is also noted as a factor that affects adoption (Mendham et al., 2007). For example, Knowler and Bradshaw (2007) found that a positive attitude towards soil conservation resulted in both positive and insignificant correlations with soil conservation (mixed results). However, Barr and Cary (2000) note that there is a significant body of evidence to suggest that the link between environmental belief and environmental behaviour is tenuous.

Formal or informal connections with community or social networks have also been found to assist in practice adoption (Curtis & De Lacy, 1996; Mendham et al., 2007). Informal connection is in the form of relationships with neighbours and community groups. Vanclay (2011) notes that farmer knowledge can be a greater source of information than extension officers. This is supported by Pannell et al. (2006) who suggests that before trialling a practice, a landholder's perceptions of a practice relies on information from others. Formal connection may be in the form of membership of groups such as Landcare which can enhance landholder knowledge and skill and confidence in the recommended practice as well as develop trust in the advice given by extension officers (Baumgart-Getz et al., 2012; Lockie, 2006). Social connection is particularly important for high risk decisions because the issue is bigger than whether a practice will work; it is also about others sharing responsibility for the decision and providing support if it fails (Pannell et al., 2006).

It has also been shown that farmer involvement in establishing the research agenda will maximise the chance of on farm implementation of the associated practices (Barr & Cary, 2000). Personal involvement in innovation trials is critical to adoption (Barr & Cary, 2000).

2.5 Other

There were a few remaining influencing factors that fell outside of the previous categories. These were primarily institutional. For example, Cooke et al. (2012) note that land tenure arrangements (freehold or leasehold) add complexity to adoption decisions. Mendham et al. (2007) and Pannell et al. (2006) highlight that the compatibility of a practice with existing or future policy will also affect its uptake (for example, does it close off future opportunities?) Rigid rules surrounding a practice, or implementation (including funding rules and monitoring) will also deter landholders from engaging (Whitten et al., in press).

3 Indicator selection

The literature review formed the basis for the selection of indicators which were then used to design the survey. In the selection of indicators, care was taken to identify a subset of indicators which were able to deliver a representative result across participants. The criteria for the inclusion of indicators in the survey encompassed: prominence in the literature reviewed, inclusion of a cross-section of social, economic, demographic, attitudinal and motivation measures; avoiding duplication; minimising respondent burden; likelihood and time to change in response to ESP, and ease and accuracy of data collection. An overview of the indicators that were desirable to have represented in the survey are provided in Table 1.

Table 1: Potential indicators based on literature review

Category	***Types of indicators – what contributes to the decision to join up?***
Recreational benefits:	• are conserved areas visited by the owner just to look at, used for walks/picnics or similar?
Social networks	• involvement in formal groups (e.g. Landcare) and informal networks of producers, open days etc., (e.g. did you join up because of Landcare and have you joined any groups because of ESP involvement) • interactions with neighbours (e.g. how influential was this has your interaction changed because of ESP) (peer influence) • distance to neighbour (how influential was this)
Economic factors:	• Effects on profitability (perceived and actual) • Negative economic impacts (e.g. reduced farm area) • Positive economic impacts (e.g. shade or wind shelter improve animal health • On and off farm income. If off farm income what type of employment and location of employment. How many hours of off farm income • Attitude to borrowing. Attitudes to risk • Financial viability (feelings of financial security for the next 5, 10 years to decisions about participation) • Proportion of income attributed to farming
Demographics	• Age and life cycle stage (e.g. young or older couple, kids, single) • Education (type of education and type and date of most recent education experience including training courses. It is important to capture the less formal education) • Past experience and how did this affect participation decisions? • Duration of current residence • Succession planning (has this been done yes/no did this influence participation decisions?) • Farm type (family or corporate...if family how many decision making partners) Did this influence participation decisions • Occupation identity
Attitudes about management practices:	• Making amends for past mistakes • Changes to the focus of management (e.g. focus on trees, grasses, other visual indicators) • Changes to attitudes about specific managements (e.g. Remove or retain fallen timber) • Compatibility with current practices, farm structure, infrastructure etc. • Were you concerned about changes in control over farm management? Did this influence your participation decision? How? • Did the management change align with your landholder identity (organic,

	production, lifestyle? • Attitude about the environment
Motivations for decisions about management (and participation in ESP):	• Family benefit inter-generational benefits. Feelings about handing over the land, making environment available for the next generation • Other family need drivers • Were you concerned about visual impact from management change? • Were you concerned about alignment with broader regional identity • Connection to the land • Bureaucratic exhaustion? • To what extent did trust in government administration influence participation decisions? What generated or dissolved trust...same type of question focused on credibility of the environmental practice. • Which household member(s) were interested in ESP program?

The indicators were used in the design of the survey. Elements of each were included in the final survey version. However, tradeoffs between the time needed for survey completion and the likely respondent burden and response rate meant that not all of the potential indicators in Table 1 were able to be included in the final survey version (further information in Section 4). A copy of the complete survey is supplied as Appendix 3.

4 Methodology development and application

In this section we provide an overview of the sampling process to facilitate replication in future data collection efforts.

4.1 Process of survey design

Based on the key findings of the literature review reported on previously, the research team developed a draft survey which was released for comment by SEWPaC and pre-test by a number of landholders and people active in the conservation community in October 2012. The pre-test revealed that the survey took too long to complete and had some components that were repetitious. In response to comments the survey was carefully cut from 18 pages to 12 pages with great effort taken to reduce the number of questions and effort required to answer questions without compromising the information that would be collected from the surveys. The outcome of this rigorous process of survey testing and refinement was a survey that provides sufficient detail to be useful without irritating respondents.

4.2 Process of survey implementation

Our initial intention was to use a mail out mail back approach with two follow up reminder postcards and send the survey package (survey, introduction letter and reply paid envelope) to:

- All valid addresses of land managers contracted in the 2008 to 2011 rounds of the ESP (supplied by SEWPaC)
- All valid addresses of land managers who submitted an expression of interest (EOI) or otherwise participated in the ESP BGGW element but who did not receive contract offers (supplied by SEWPaC)
- A similar set of non-participants to be identified in consultation with a subset of CMAs in the regions targeted by the ESP.

The ESP Team within SEWPaC provided addresses for approximately 700 individuals identified as having expressed interested in the ESP over five rounds, some of whom applied and of those, some who were successfully contracted to the Program. Many of these names turned out to be duplicates: i.e. individuals who expressed interest in more than one round of the ESP. After removing duplicates, the list was reduced to 480 addresses.[2] A survey was dispatched to each of these in early November 2012, representing the first tranche of the survey. Two reminder postcards (sent a week apart) were also sent to all addresses in an effort to optimise the response rate.

The original research design specified approaching a group of landholders with similar characteristics who could have been eligible for the program but did not express interest in it and therefore were not counted in the sample supplied by ESP. This group was to be identified by mapping the locations of Box Gum Grassy Woodlands and identifying properties in these locations using cadastral data. Unfortunately, the data supplied by ESP did not specifically demonstrate the locations of Box Gum Grassy Woodland and was generated at a scale which cannot be used to identify individual properties with any degree of precision.

Due to these data limitations hindering the original design, the research team approached the Lachlan and Central West CMAs for a list of names which matched the control group criteria. In each case, the CMAs politely refused to supply these names for reasons of protecting the privacy of the individuals involved (this despite agreeing to participate in this element of the study when the proposal was submitted). The CMA staff

[2] It is unclear exactly which elements and which rounds the dataset covers. It is likely that the set is predominantly landholders who requested a site assessment encompassing those who then submitted bids and those who chose not to. It is unclear whether the set contains those who simply requested further information about the program, although it is certain it did not include all individuals who requested further information (submitted an EOI). We discuss the potential implications in more detail when comparing the responses to the survey.

suggested an alternative approach of asking for the cooperation of Landcare groups located in regions of high significance for Box Gum Grassy Woodland. The research team adopted this approach as the most viable option for defining a control group in these circumstances. The Little River, Dunedoo, Murrumbateman and Mid Macquarie Landcare groups, areas with a high density of Box Gum Grassy Woodland and in areas that have been heavily targeted by the Environmental Stewardship Program, all agreed to assist. Therefore they provide a suitable alternative control population. None of the groups were prepared to share contact details of their membership with the research team for privacy reasons. Instead an agreed number of surveys in envelopes were sent to each group (along with enough stamps to cover postage) and the envelopes were addressed and sent out by the Landcare groups. Overall, 370 surveys were sent out to a control group through the Landcare groups.

Across the three potential groups a total of 850 surveys were distributed. A total of 286 completed surveys were returned resulting in a response rate of 34%. As we do not identify specific respondent classes in the data we cannot derive a completely accurate response rate for our three cohorts. Nevertheless the respondent data suggests response rates for contracted landholders of approximately 59%, for partial participants between 13 and 22% and for the control group between 19% and 26% (experience suggests towards the upper level for partial participants and the lower for the control group). We note that this response rate compares favourably with response rates to similar mail surveys of participants in conservation tenders in the Wimmera CMA region of Victoria that we have previously undertaken. Data was entered by Pacific Transcription with data coding and cleaning occurring with direct involvement from members of the research team. Due to some missing variables, the statistical analysis reported in the appendixes was conducted with 279 observations rather than the full 286 surveys returned.

5 Results

5.1 Basic survey responses

5.1.1 ABOUT THE RESPONDENTS

Of the 286 surveys we received, 77% of respondents were male and 23% were female. The majority of respondents were in the age categories 30–49 (30%), 50–59 (30%) and 60–69 (29%) (Figure 1). The largest category of respondents had a university degree (54%) (Figure 2).

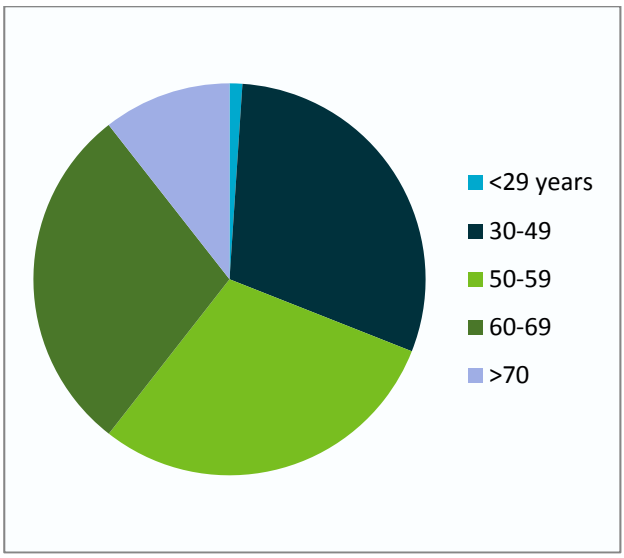

Figure 1: Respondent age

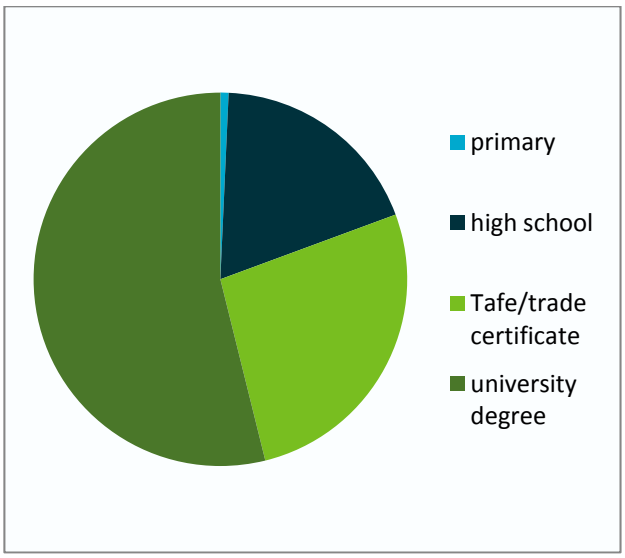

Figure 2: Respondent education level

The median number of years farming was 28 years and the median on the property relevant to the ESP was 20 years. A small number of properties were not considered farms as they were purchased for conservation objectives.

5.1.2 ABOUT THE PROPERTIES

The mean property size of respondents was 1,038 hectares with the smallest property being 1 hectare and the largest being 7,000 hectares. The median property size was 617 hectares.

Table 2: About the respondents' properties

	AVERAGE (HA)	SMALLEST (HA)	LARGEST (HA)	MEDIAN (HA)
Property size	1,038	1	7,000	617

Approximately three quarters of properties by area were engaged in sheep (45%) or cattle (29%) grazing with smaller proportions of dryland cropping (10%) and native vegetation (15% or a total area of 4.6 million

hectares). Note however that this analysis partially distinguishes between native vegetation used for grazing and that managed for conservation or not used at all as well as incorporating some double counting of that area.

The properties were located in the Murrumbidgee, Lachlan, Central West, Namoi and Border Rivers and a number of other catchments (mostly non-responses and some external to NSW – labelled 'other') (Figure 3).

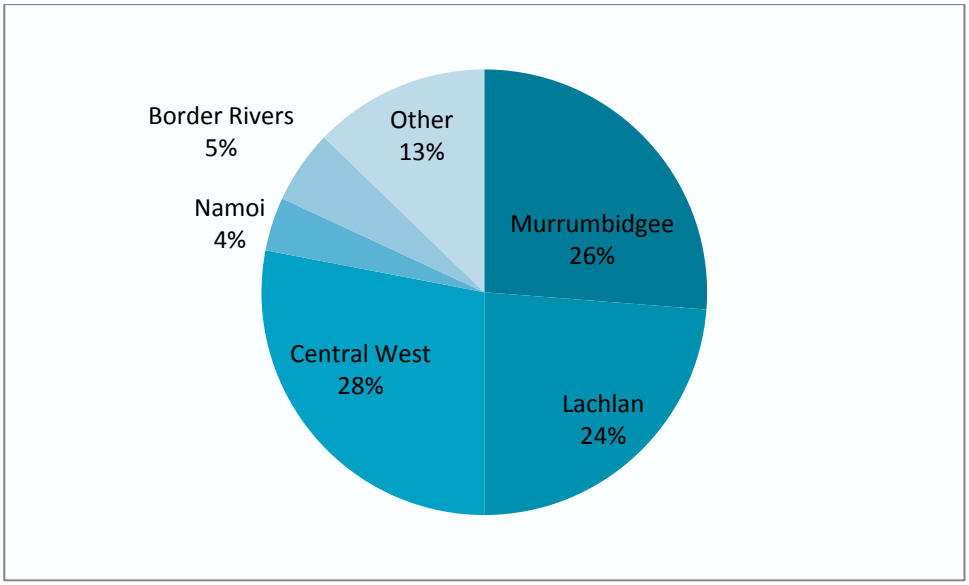

Figure 3: Respondent catchments

For a small number of respondents (29%), the objective of the property was for profit generation, 17% stated that the objective was to protect the environment, 29% stated their objective to be financial independence, 18% for country lifestyle, 10 % other, and 8% had multiple objectives (e.g. country lifestyle and protect the environment) (Figure 4).

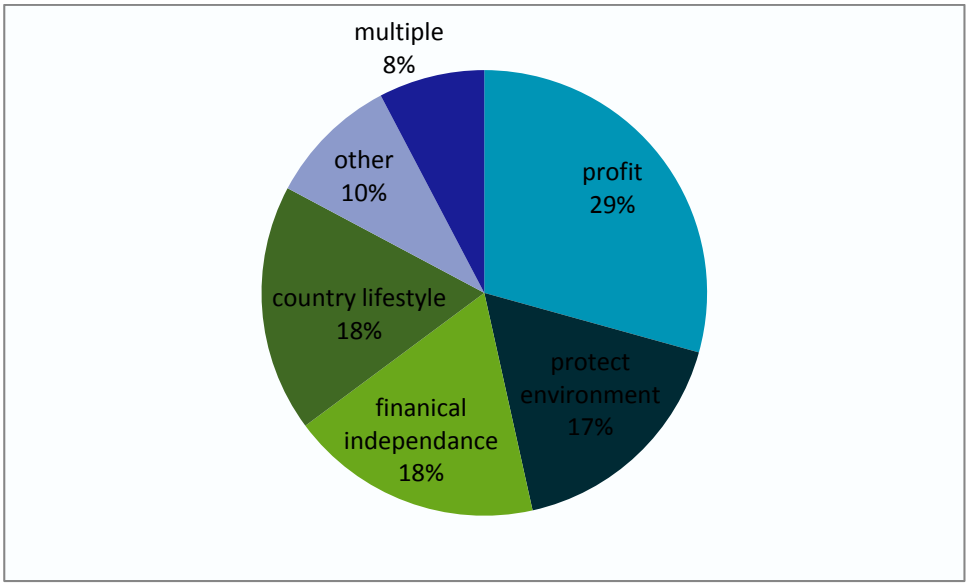

Figure 4: Objective of the property

5.1.3 EXISTING ENVIRONMENTAL BEHAVIOURS AND ISSUES OF CONCERN ON THE PROPERTIES

Respondents were asked about any other conservation agreements or funded conservation arrangements that they may have on their property. Thirty one percent had no other formal conservation arrangements while 54% had either a landholder agreement or property vegetation plan (PVP) with the local catchment management authority (CMA) (Figure 5).

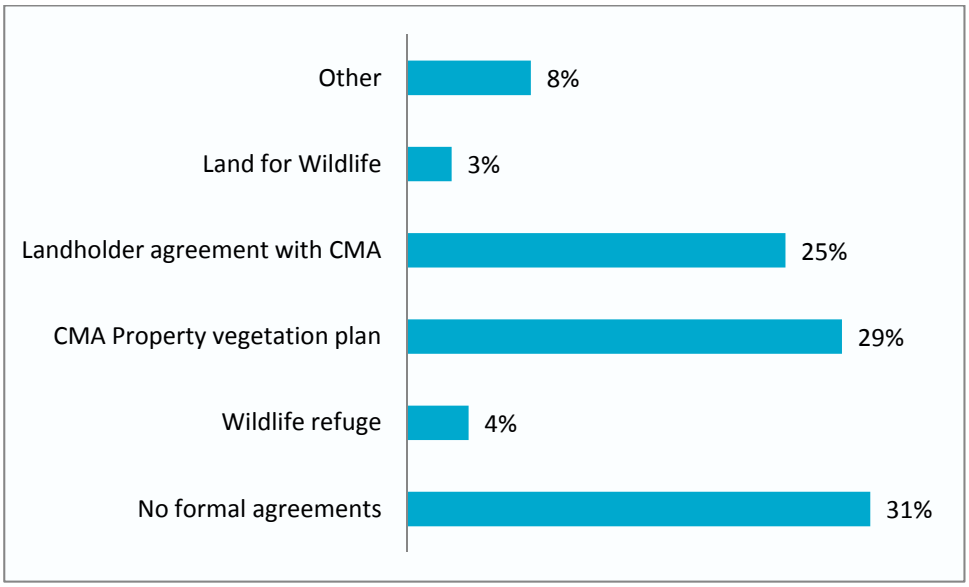

Figure 5: Properties with other conservation arrangements

Respondents were asked about the environmental issues which require the most attention on their properties (the importance of the issue is major, minor not a problem or they are unsure). Figure 6 to Figure 13 depict respondent concerns for environmental issues.

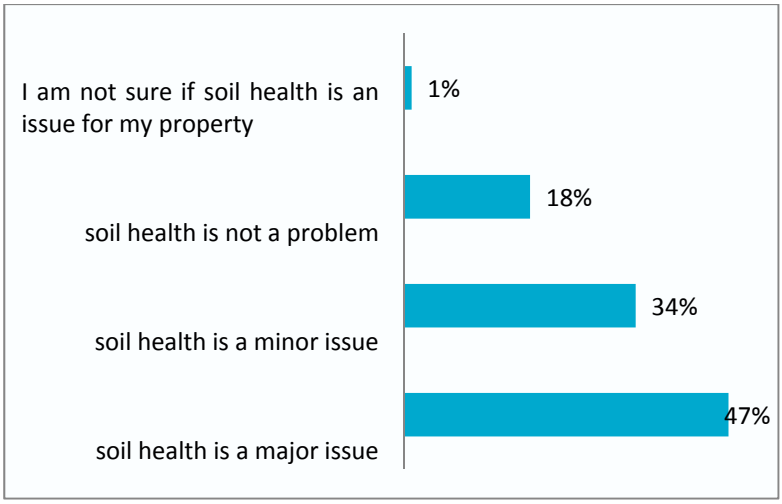

Figure 6: Is soil health an environmental issue of concern on your property?

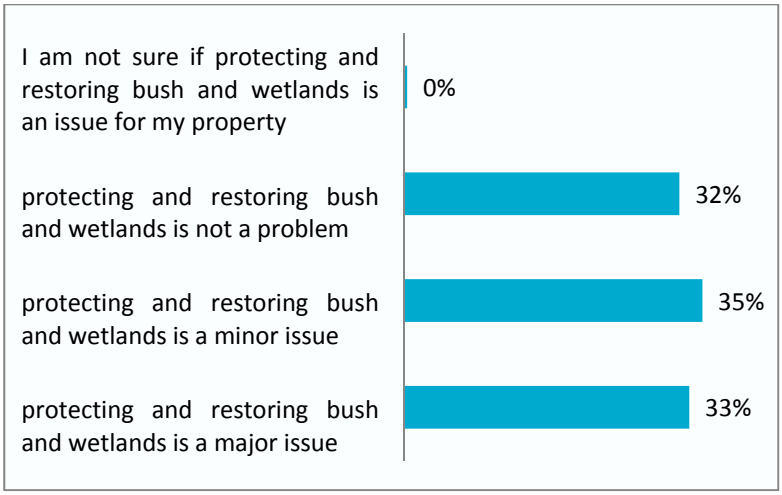

Figure 7: Is protecting and restoring bush or wetlands an environmental issue of concern on your property?

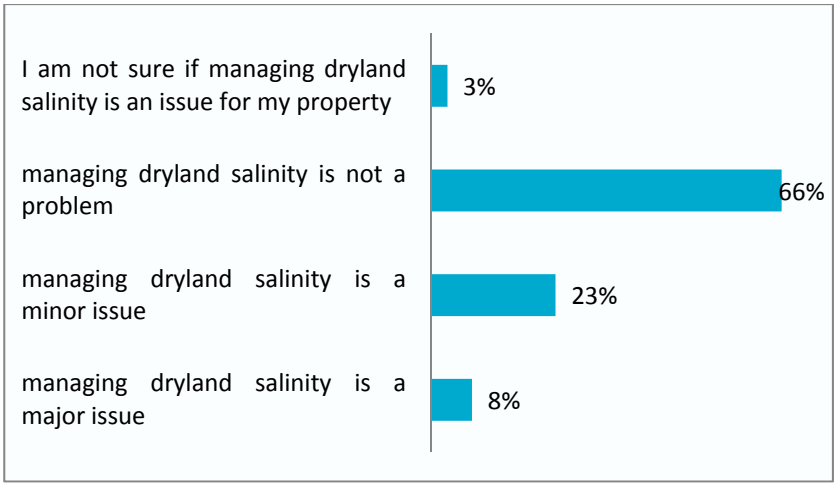

Figure 8: Is managing dryland salinity an environmental issue of concern on your property?

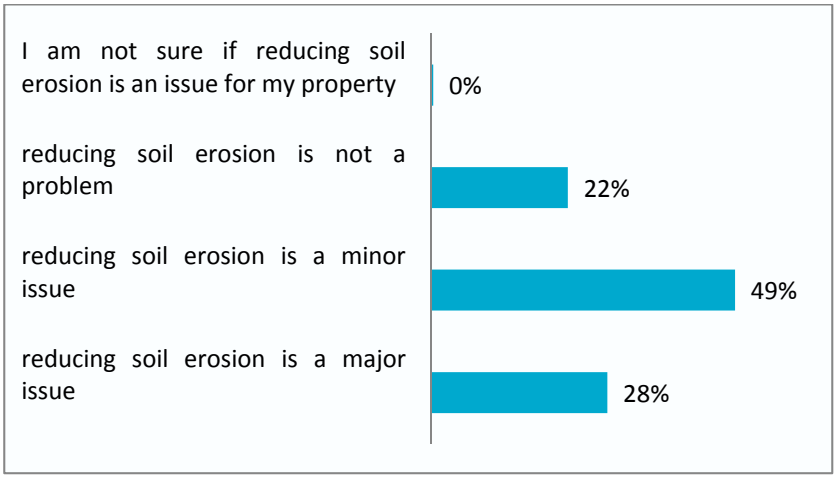

Figure 9: Is managing soil erosion an environmental issue of concern on your property?

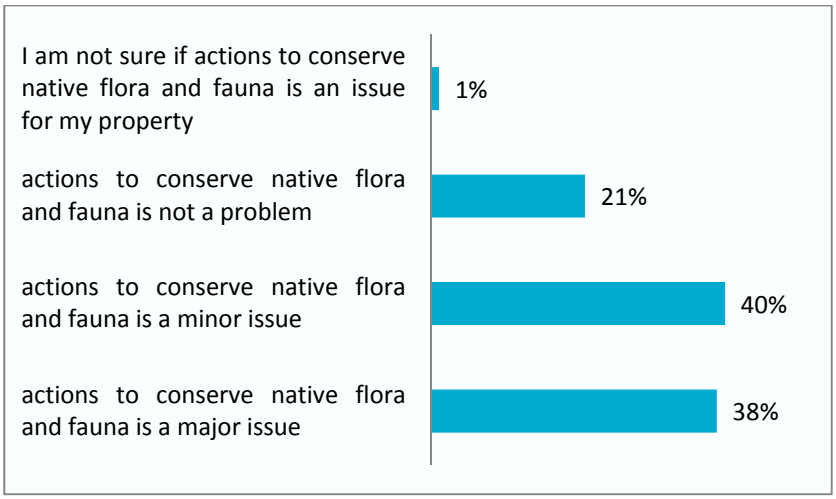

Figure 10: Is conserving native flora and fauna an environmental issue of concern on your property?

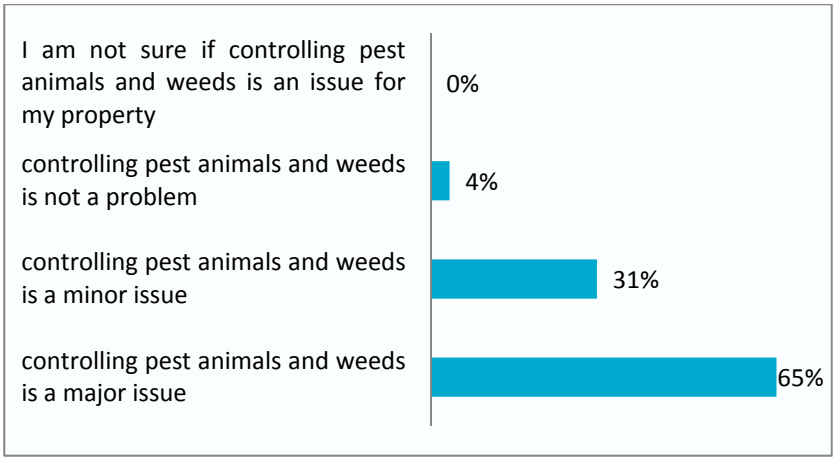

Figure 11: Is controlling pest animals and weeds an environmental issue of concern on your property?

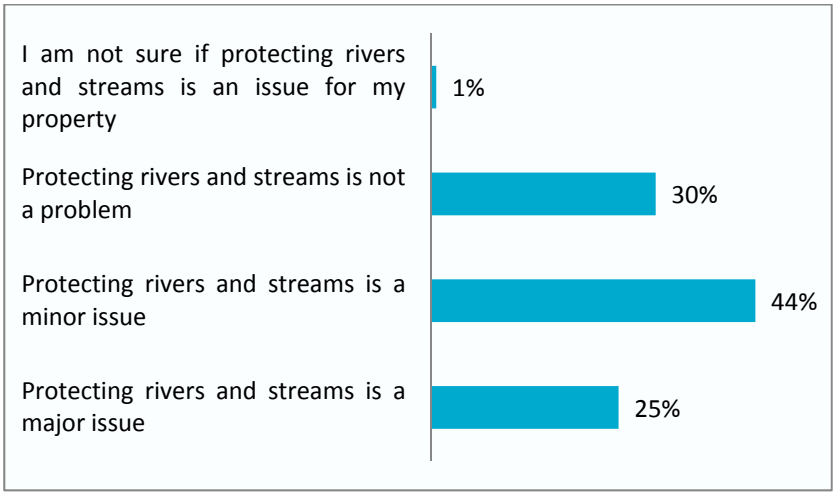

Figure 12: Is protecting rivers and streams an environmental issue of concern on your property?

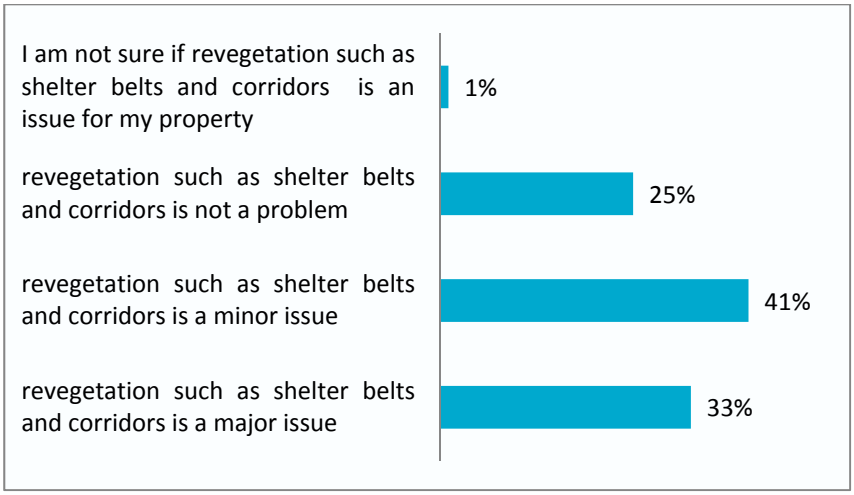

Figure 13: Is revegetation such as shelter belts and corridors an environmental issue of concern on your property?

5.1.4 HOW DID RESPONDENTS FEEL ABOUT INCENTIVE SCHEMES TO HELP THEM ADDRESS ENVIRONMENTAL ISSUES ON THEIR PROPERTIES?

Fifty three percent of respondents strongly agreed that grants and tenders are a good way to deliver financial incentives to landholders while 36% agreed with this statement (Figure 14).

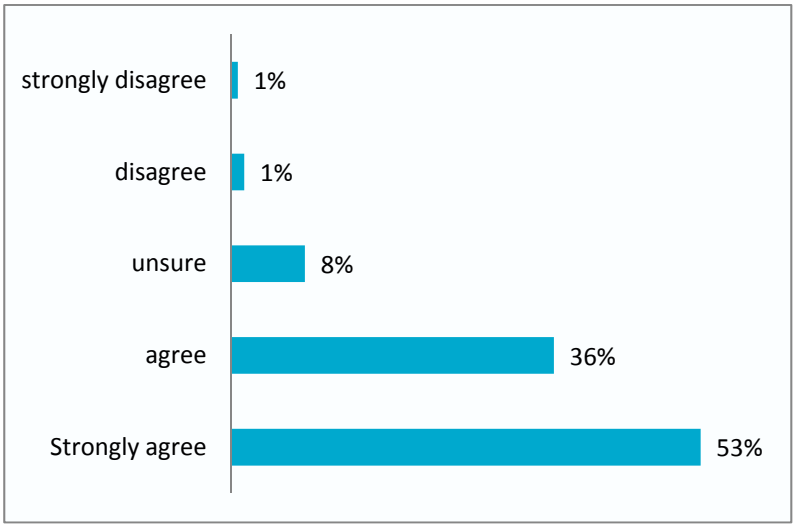

Figure 14: Grants and tenders are a good way to deliver financial incentives to landholders

Thirty eight percent of respondents agreed that environmental incentives are a good business opportunity. Only 27% strongly agreed with this statement, however (Figure 15).

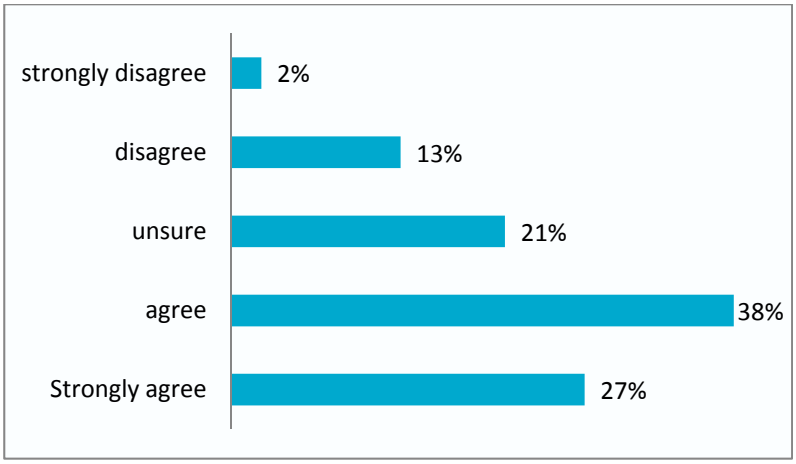

Figure 15: Environmental incentives are a good business opportunity

Fifty three percent of respondents strongly agreed with the statement that environmental incentives are an opportunity to improve land management (Figure 16).

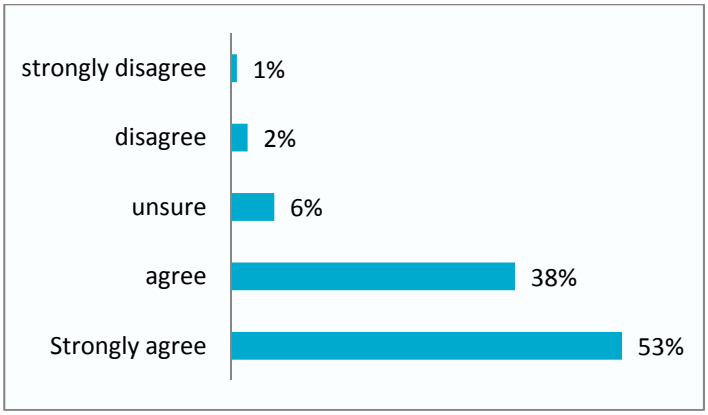

Figure 16: Environmental incentives are an opportunity to improve land management

5.2 Broad findings from the survey

5.2.1 AWARENESS OF ESP

Three quarters of respondents were aware of the ESP, 20% were not aware and 5% were not sure (Figure 17). Of those that were aware of the ESP, CMA mail out was the most effective form of communication (42% made aware by this medium) followed by word of mouth (33%), newspaper (16%) and radio (4%). Five percent could not recall how they heard about the program.

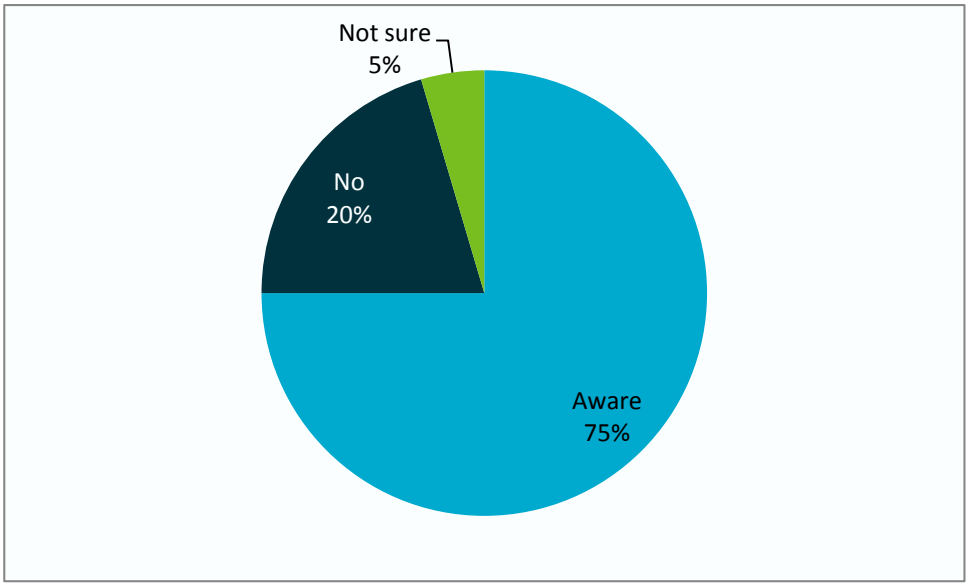

Figure 17: Awareness of the ESP

5.2.2 PARTICIPATION IN THE ESP

Respondents in this study were categorised using Whitten et al. (2013) as being either non-participants, partial or active participants or complete participants. A non-participant was a respondent who was not aware of the ESP or was aware but did not submit an EOI to the ESP. One third of respondents were non-participants. A partial participant was one who submitted an EOI but did not submit a bid and an active

participant submitted only unsuccessful bids. Thirteen percent of respondents were partial or active participants. As indicated earlier, there appears to be a failure to capture partial participation in our survey population with just five percent of respondents falling within this category. A complete participant was one who submitted an EOI and at least one bid into the tender process. Nearly two thirds of respondents were complete participants.

83% of respondents who were aware of the ESP, submitted an EOI. Seventeen percent of those who were aware did not submit an EOI.

Expressions of Interest (EOI)

The most common reason for not submitting an EOI was that the landholder did not have the relevant vegetation (18%). Other reasons for not submitting an EOI were that the landholder did not feel that they would be successful (15%), the landholder was too busy (14%) and concern about losing control (13%) (Figure 18).

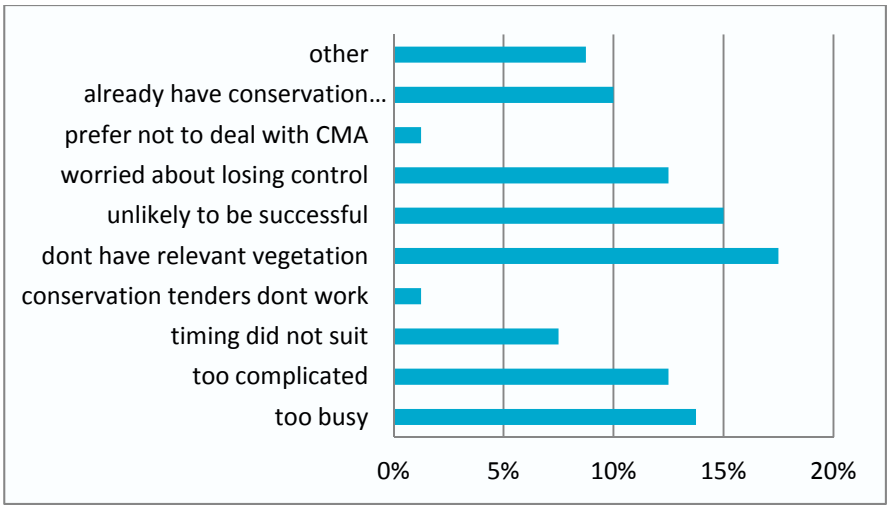

Figure 18: Reasons for not submitting an EOI

For those that did engage formally with the ESP by submitting an EOI, the most common motivation was an opportunity to help change land management (40%). This was followed by the financial opportunity that the ESP presented (17%) and the fact that the ESP provided an opportunity to learn more about the management of Box Gum Grassy Woodland (15%). While respondents were asked to tick only one main attraction motivating an EOI to the ESP, many landholders ticked more than one response (21%) which largely took in the three motivating factors discussed above.

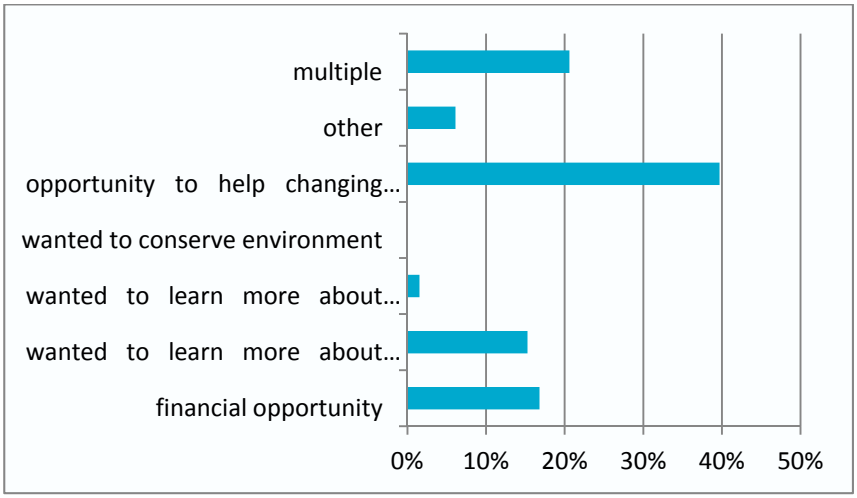

Figure 19: Factors motivating an EOI to the ESP

Participants

Sixty two respondents were active or complete participants, submitting at least one tender to the ESP since its inception. Those that submitted a bid were asked the top three reasons motivating them to bid in the ESP. The top three motivating factors for bidding in the ESP were (Figure 20):

1. Improving the environment for the next generation
2. Improving the conservation of flora and fauna
3. Being paid for environmental benefits

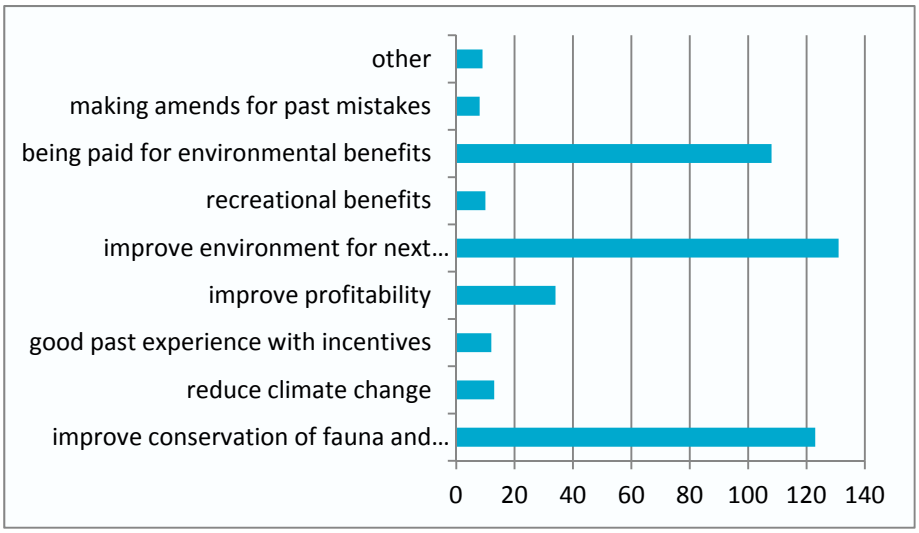

Figure 20: Top three reasons for submitting a bid to the ESP

Of those few who expressed interest but did not tender the most common reason for the lack of tender was a feeling that the chance of success would be too low to bother.

5.2.3 ANALYSIS OF PARTICIPATION

Successful bids and years bidding

Ninety percent of those who submitted an ESP bid were successful in at least one of their bids. Ten percent were completely unsuccessful. Most respondents only bid in one ESP round. Across all respondents there had been 239 bids, and only 79 bids that were not successful. Respondents reported bidding in the ESP from 2003 through to 2012 (despite the program funding commencing formally in 2008). Most respondents had bid between 2008 and 2010 (Figure 21 – with supposed bids prior to 2008 assumed to be in that year).

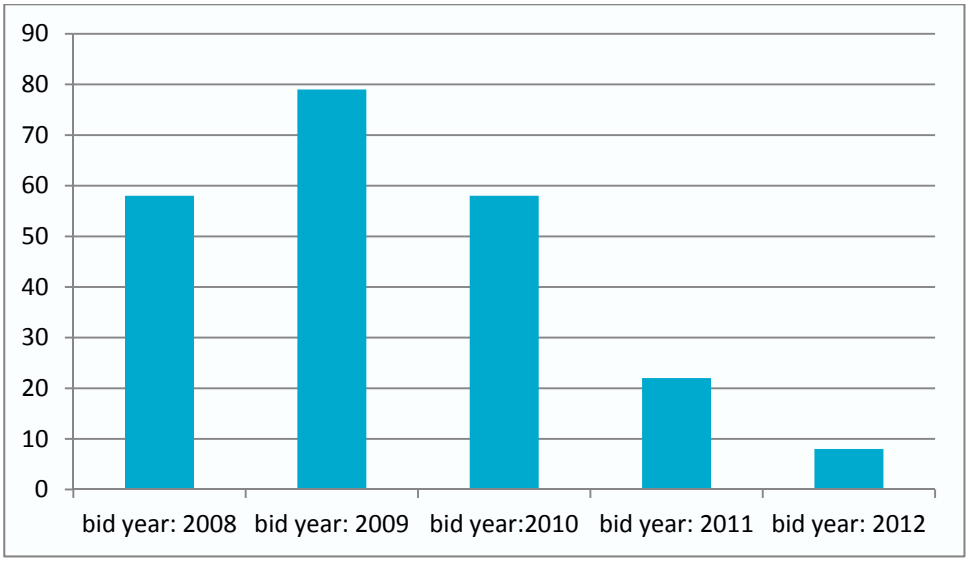

Figure 21: Bid years

The bidding experience

Respondents were asked about the bidding experience. The majority of respondents found the bidding process either difficult but manageable (38%) or mostly straightforward (46%) (Figure 22).

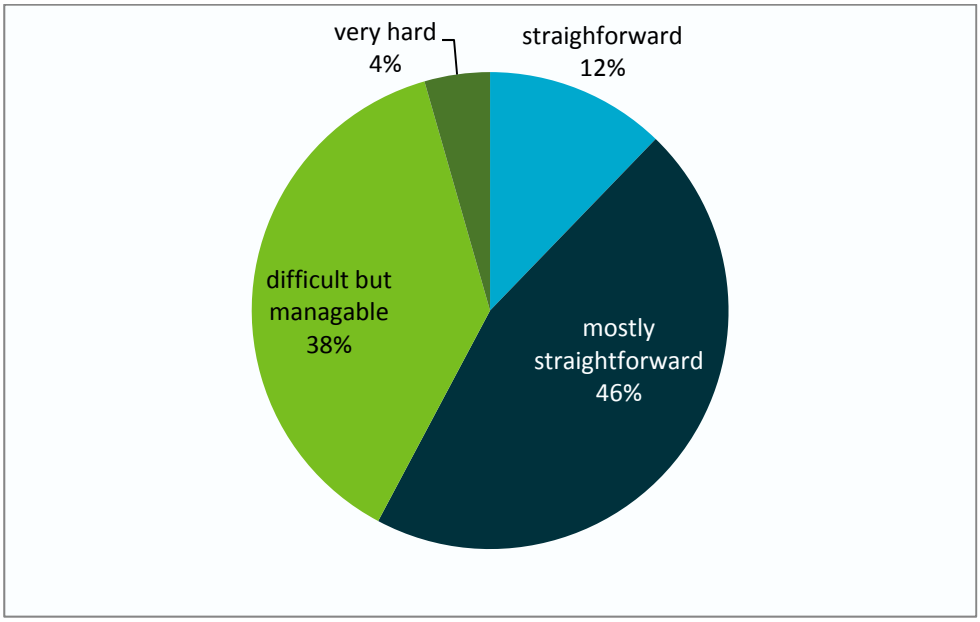

Figure 22: Bid ease

It did not appear that the transaction (or hidden) costs of participation in the program were high enough to deter participation. Most participants noted that finding out about the program, filling in the application form and reading and signing the contract took only between one and five hours. There were a number of participants who did find filling in the application form time consuming (between six and ten hours) (Figure 23).

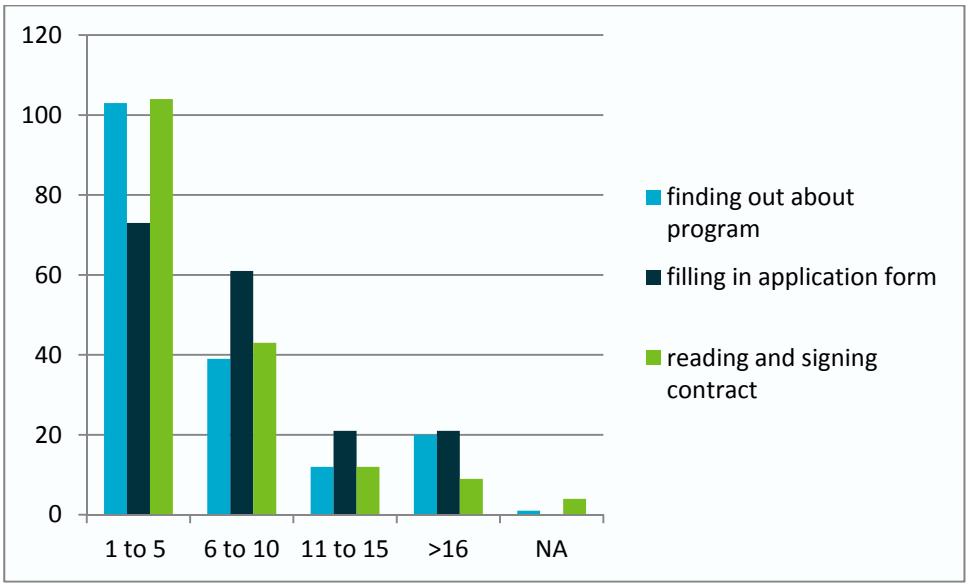

Figure 23: Time cost of participation

Over one third of bidders (35%) were neutral in their opinions of whether the bidding process was fair. However, over half felt that the bidding process was fair or very fair with only 3% noting that they thought the bidding process was very unfair (Figure 24).

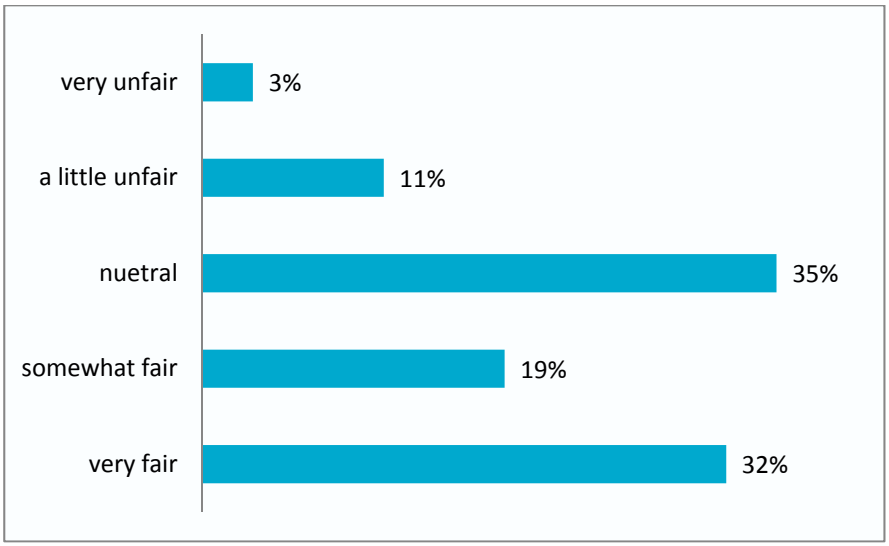

Figure 24: Fairness of the bidding process

Thirty six percent of those who submitted a bid requested feedback on their bid and most (81%) received feedback.

The contracting experience for the successful bidders

Of those respondents who had successful bids, 23% had opted for a covenant on their property, 67% did not opt for a covenant and 11% did not know or could not remember if they opted for this. Eighty eight percent of those with successful bids found the contracting process reasonable and 89% with successful bids found the monitoring and reporting process reasonable.

Almost all (98%) of those who had successful bids were happy with the changes to their properties. In terms of how the ESP had affected the successful bidders, most felt that involvement in ESP had not changed their profitability or had increased it a little, most felt that the amount of work required on their property had increased a little, most felt that their desire to protect the environment had increased a lot with their

aesthetic appreciation either increasing a lot, a little or not changing. Finally, most respondents felt that being involved in the ESP had not affected the real estate value of their property (Figure 25).

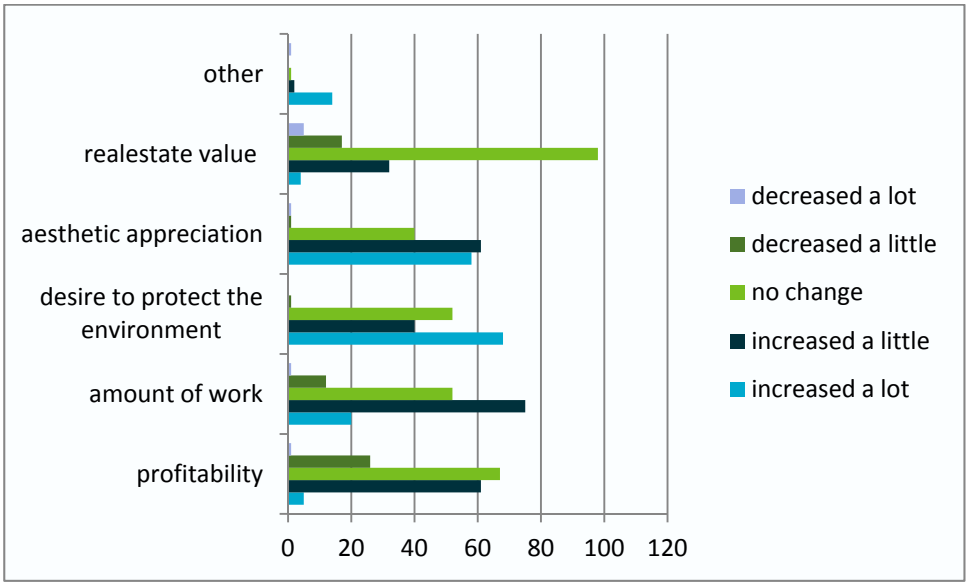

Figure 25: How has the ESP affected the successful bidders?

Most successful bidders had seen more wildlife species and no change in pest species. Successful bidders did note that there was an increase in fire risk and more weeds (other) (Figure 26).

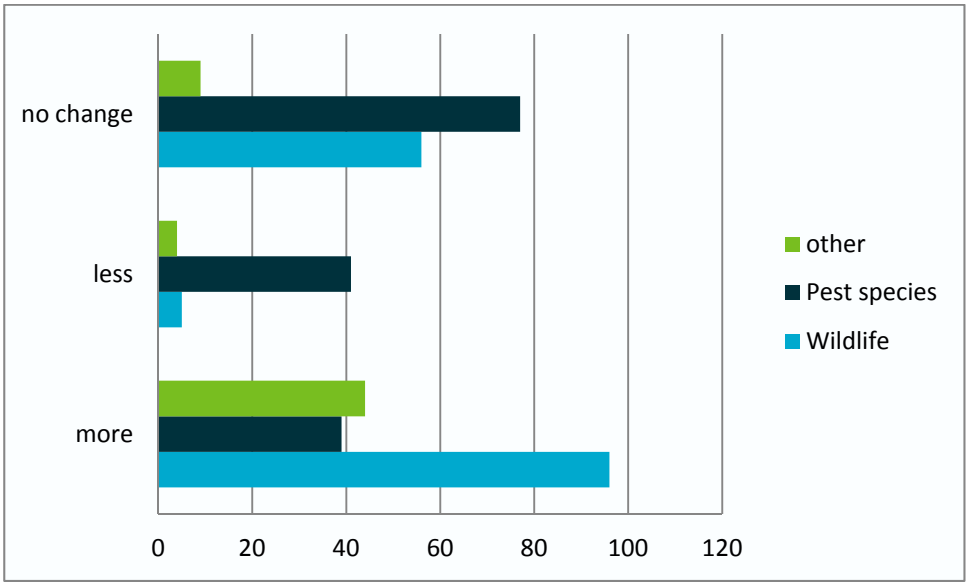

Figure 26: Changes in wildlife and pest species due to ESP

Half of those with successful bids would not make any changes to their bid if they had the opportunity to go back and do it again. Forty one percent would increase the price and eight percent would opt for a different site or management plan. No respondents would reduce the price asked (Figure 27).

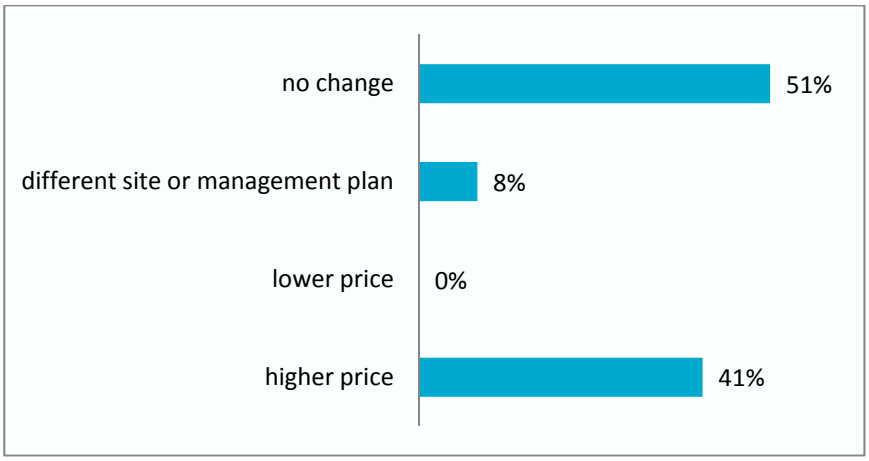

Figure 27: Would you change your bid?

5.2.4 FUTURE PARTICIPATION

Over two thirds of all respondents would definitely or probably participate in future rounds of ESP if they were available. One quarter were not sure if they would participate and ten percent indicated they probably or definitely would not participate.

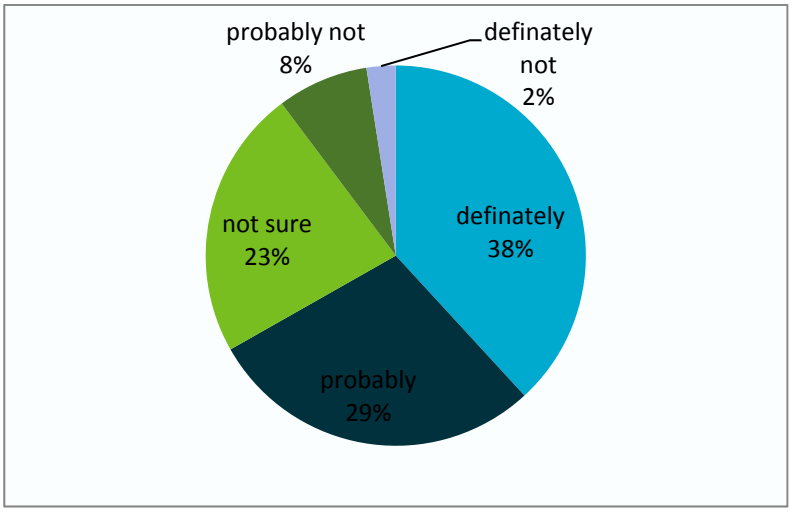

Figure 28: Participation in future rounds of ESP?

Figure 29 and Figure 30 demonstrate the enthusiasm to participate again of the different participation groups (non-participants, partial and complete participants).

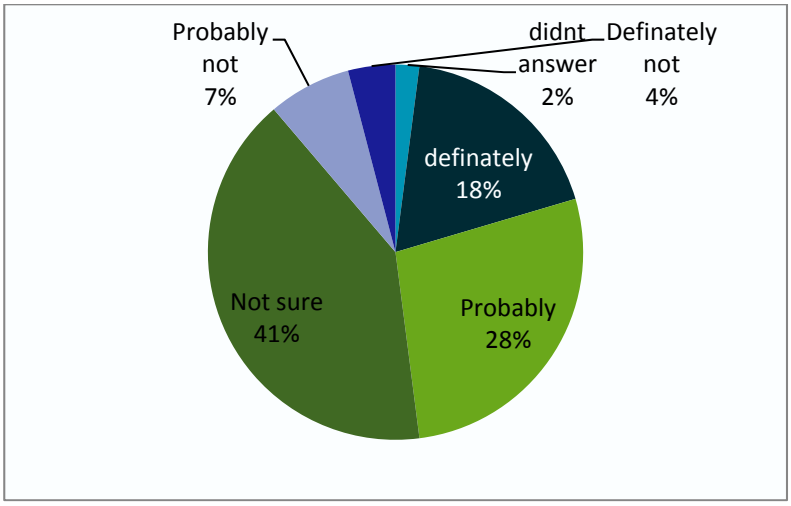

Figure 29: Non-participants' willingness to participate in future ESP rounds

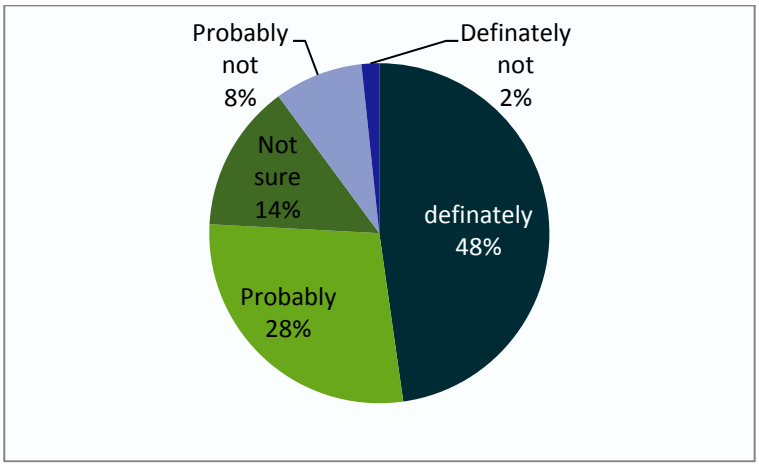

Figure 30: Complete participants' willingness to participate in future rounds of ESP

5.2.5 PARTICIPATION AND CHILDREN

Children and EOI

We analysed whether having at least one child (under the age of 18) living in the house influenced involvement in the ESP. Over a third (37%) of those who submitted an EOI did not have children currently residing in the home. Twenty nine percent of those who submitted an EOI did have at least one child living at home. Eight percent of those who did not lodge an EOI had no children living at home and 6% of those who did not lodge an EOI did have at least one child living at home (Figure 31). There is no relationship between children living at home and submitting an EOI.

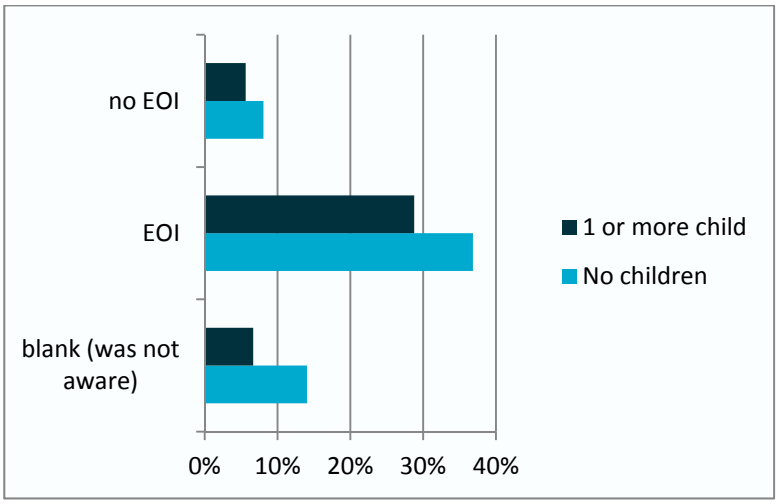

Figure 31: Relationship between children living at home and submitting an EOI

Children and bidding

34% of those who submitted a bid to ESP did not have at least one child living at home. 29% of those who submitted a bid had at least one child living at home. 7% who did not bid did not have children living at home and 3% who had no bid did have one or more child living at home. Gender did not make a difference to this result.

5.2.6 FUTURE PARTICIPATION AFTER PAST SUCCESS

Whether participants would bid in future rounds did not seem to be affected by past success. For example 49% of participants with successful past bids would definitely bid again while 50% of participants who had not had success would also definitely bid again in the future (Figure 32).

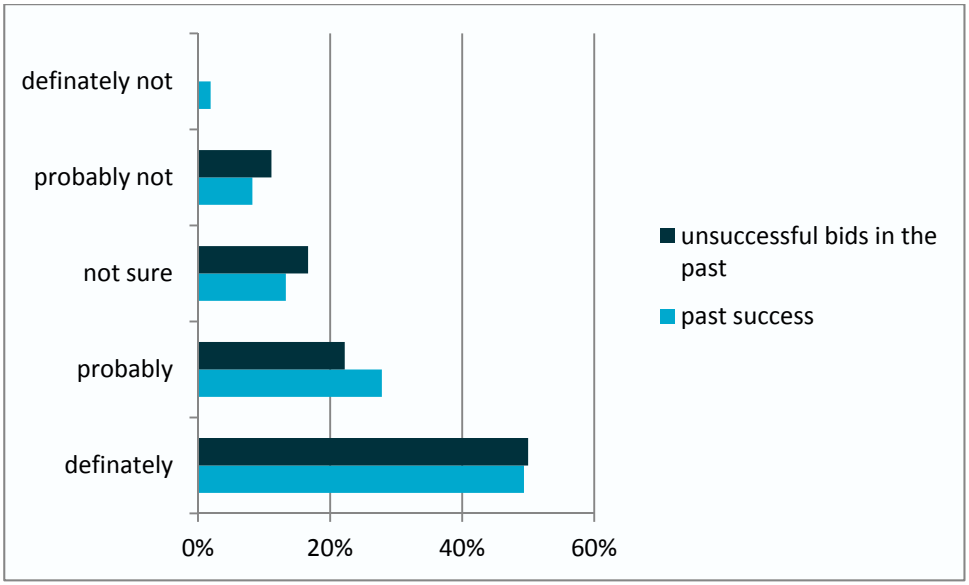

Figure 32: Does past bid success affect willingness to bid again in the future?

5.2.7 PARTICIPATION AND TRUST

The literature suggests that the more the landholders trust the government the more likely they are to participate in government run schemes such as the ESP. We did not find this to be the case in all circumstances. For example, all types of participants (non, partial and complete) found local government to

be a little trustworthy (54%, 56% and 51% respectively), however 54% of non-participants found local government to be 'not at all trustworthy' compared to 5% of complete participants (Figure 33).

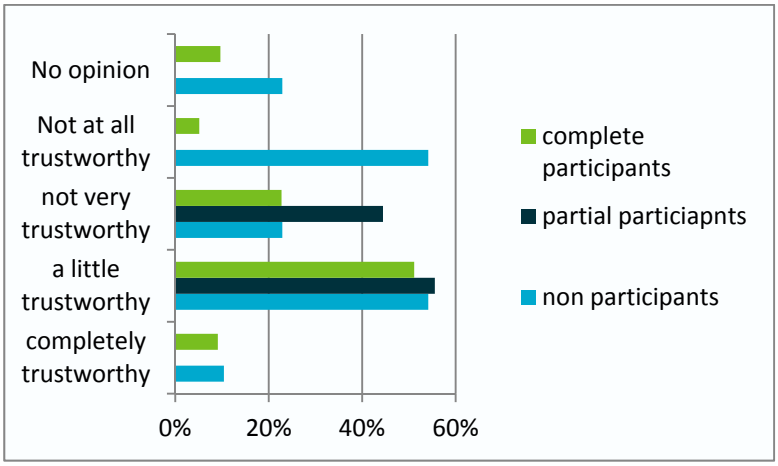

Figure 33: Level of trust in local government

There was also not a lot of difference between participant types and whether they found the CMA to be completely (10%, 0% and 9%) or a little trustworthy (54%, 56% and 51%). However, more partial participants found the CMA to be 'not very trustworthy' 33% compared to non-participants (6%) and complete participants (6%).

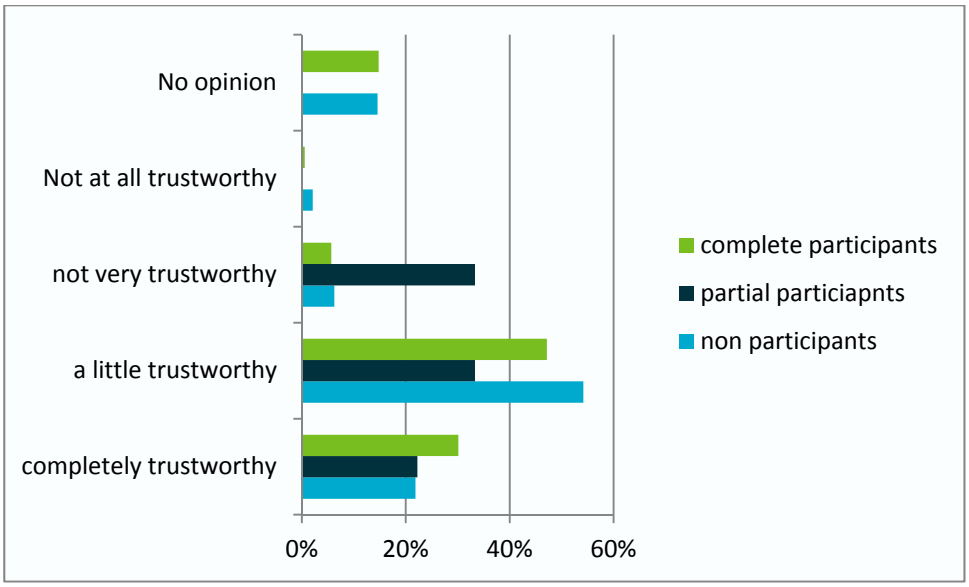

Figure 34: Level of trust in CMA

All types of participants tended to find the NSW Government either a little trustworthy (36%, 56%, 31%) or not very trustworthy (30%, 33%, 20%).

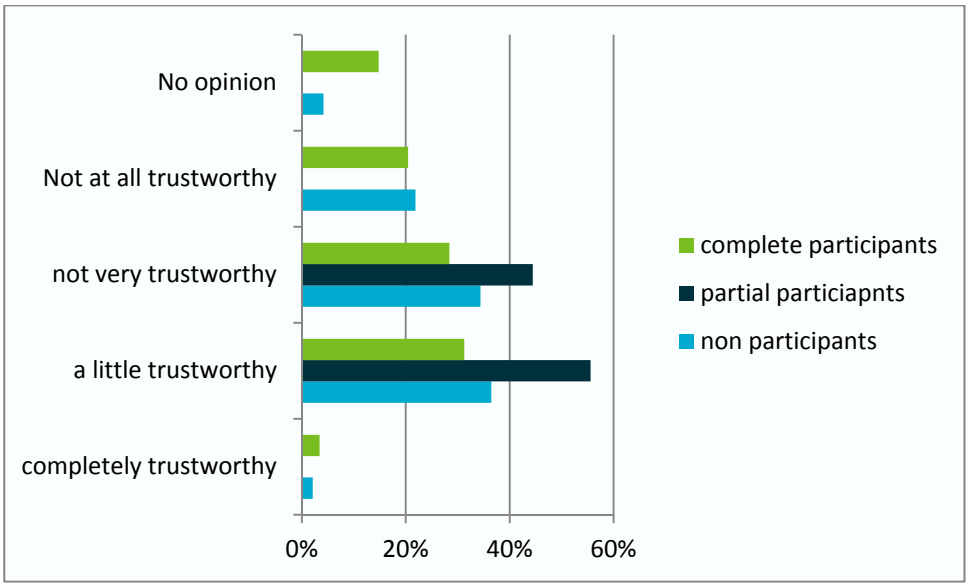

Figure 35: Level of trust in the NSW Government

Few participants indicated they felt the federal government completely trustworthy (3%, 11%, 7%). More complete participants found the federal government a little trustworthy (42%) than partial or non-participants (33% and 30%). There was not a big difference between participant type in terms of if they found the federal government not very (30%, 33% and 20%) or not at all trustworthy (30%, 22%, 21%).

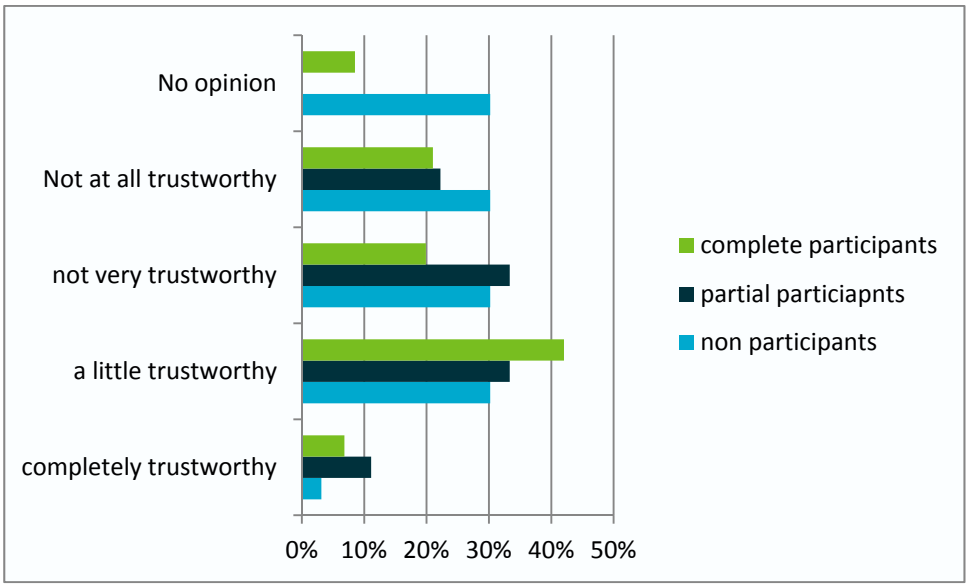

Figure 36: Level of trust in federal government

5.2.8 PARTICIPATION AND GROUP MEMBERSHIP

The literature suggests that social connection (measured through membership of groups) can increase adoption/participation in environmental stewardship programs. We did not find a strong relationship between group membership and type of participant in the ESP. For example, 88% of non-participants are members of some type of group, 61% of non-participants are members of a conservation group (such as Landcare), 75% are members of a community group (school, rural fire or emergency services) and 26% of non-participants are members of producer groups (Figure 37).

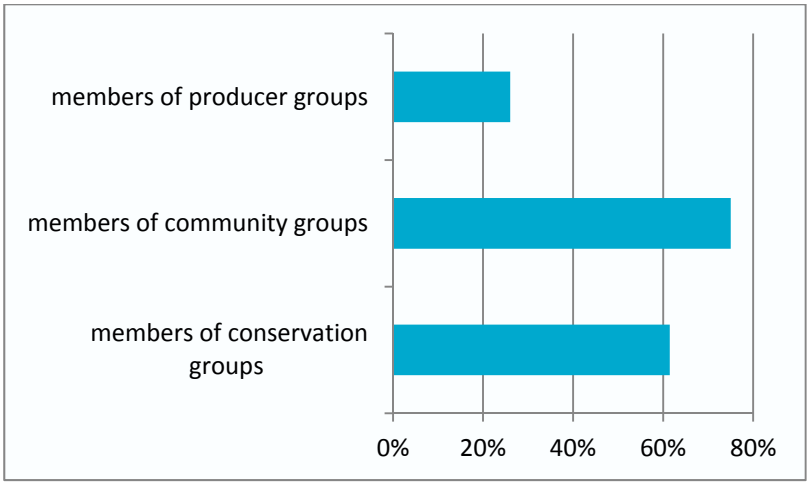

Figure 37: Group membership of non-participants

Most (89%) complete participants were members of at least one type of group, 67% of complete participants were members of a conservation group, 73% were members of a community group and 33% were members of a producer group (Figure 38).

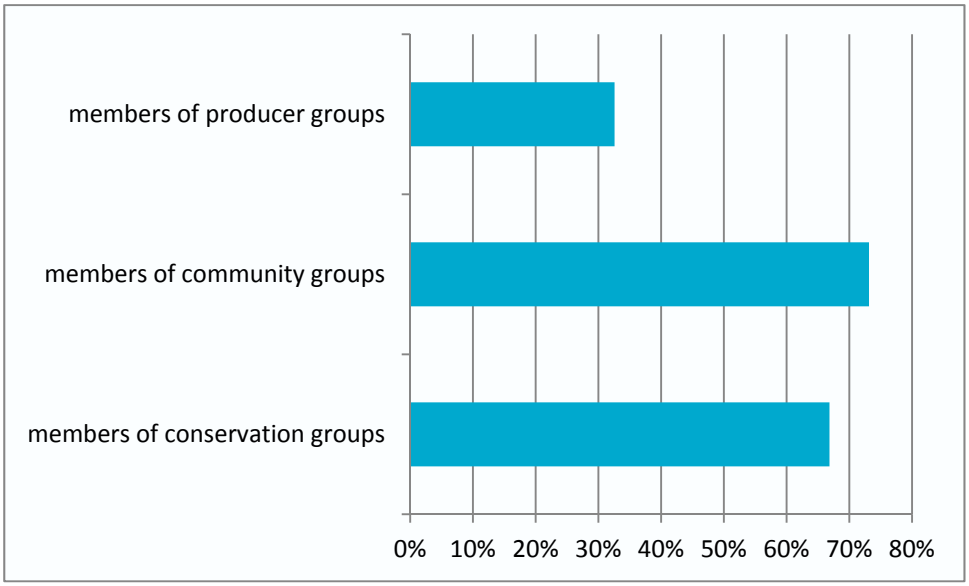

Figure 38: Group membership for complete participants

5.3 Relative strength of explanatory factors

Statistical models were constructed to predict which factors affected landowners' decision to submit an EOI and which factors affected landowners' final decisions about whether or not to submit bids to the program. An additional model also attempts to capture socioeconomic factors likely to affect the success of applicants' bids in the program. These three models, their results and discussion are provided in Appendix 1. The models are broadly consistent with others found in the literature in offering some, but relatively weak, explanatory power for a range of indicators of participation. To date a strong model predicting participation has not be identified that would be a suitable model to build policy engagement around.

6 Discussion

The survey had a strong response rate which was consistent with returns from similar exercises in recent periods (Whitten et al., 2013). In terms of age range and location (within NSW), the survey population was relatively diverse. However, it is important to note that the sample was relatively well educated – the majority had university education. This provides a solid basis on which to evaluate the Program across all dimensions identified through the survey development process and drawing on the background literature review.

What the results show is all metrics throughout the survey have very favourable responses in regards to the Environmental Stewardship Program. This includes both the Program design and implementation. These positive findings are particularly relevant given that the ESP is a complex program, spanning multiple regions and timeframes. Moreover, the favourable views on the ESP are not only prominent amongst successful Program participants, but also those who expressed interest yet chose not submit bids as well as those who submitted unsuccessful bids.

The most frequently stated objective amongst participants in regards to their property was to make a profit. This demonstrates that the ESP as a market instrument is effectively pitched at mainstream farmers seeking support for environmental initiatives, rather than purely niche environmentally sensitive landholders. This was echoed in the qualitative data captured through the survey:

> *'In my years of farming this is the first program to give the farmer an incentive for improving land management.'*

Others viewed the scheme as helping them to achieve environmental goals which they previously had trouble implementing:

> *'The Stewardship program helps us financially in what we have been aiming to achieve with our scrub land.'*

Similarly,

> *'Grazing for profit is very hard. I am more interested in looking after the environment than trying to make a living from the ridiculous meat + wool industry with the fluctuating markets.'*

> *'Many of the tasks required to be done under the contract I would like to do anyway so to be paid to do it means that they will get done and that I am being paid to look after the health of the land.'*

The majority of participants agreed (or strongly agreed) that environmental incentives were a good business opportunity, and many also thought that environmental incentives improve land management. Around two thirds of the sample had some kind of vegetation or wildlife plan or agreement with another agency, while around a third had no pre-existing agreements.

Considering the qualitative data, it is also noteworthy that a small minority felt dissatisfied with the level of feedback on why some bids were successful over others. This minority included successful and unsuccessful bidders alike, who felt there was insufficient information as to how decisions were made. This represents a potential area for improvement in future rounds of the ESP. However, these concerns were restricted to a small minority and should be seen as a qualification on the overall high level of satisfaction of the program.

There were a number of respondents who bid in the past but were strongly against bidding in the future. These included respondents who would not bid again due to perceived or actual problems with the design of the ESP.

> *'When it was managed by CMA, if you needed help, they were friendly in supplying help. Now that it is managed by Commonwealth public servants they are not helpful (and we will leave it at that).'*

'In third year of BGGW project suddenly the annual reporting process became a massive "compliance" issue, the Dept. invoking the excessive powers conferred by the agreement.'

Overall, however, the results are strongly positive.

An important focus of the Environmental Stewardship Program is on supporting enduring change in attitudes amongst program participants. The survey does provide quantitative evidence of attitudinal change amongst contracted landholders. Specifically, there is evidence of increased desire to protect the environment and increased aesthetic appreciation of properties (Figure 25). This was also reflected in some of the qualitative comments received through the survey. One participant expressed that the ESP provided:

'Outstanding encouragement for landholders to make environmental improvement to this land resource. Grants in 2006 were the catalyst for monumental change in my farming approach. The grant… given then made me an "enviro-addict" and we have since poured our own [funds] into some superb enviro outcomes at our place'

In principle, the survey was designed to permit analysis of timeframes over which these attitudinal changes occurred, by surveying participants who have a diverse range of durations under contract. However in practice the majority of survey participants entered the program around the same time in 2009, with limited timeframes to detect significant differences for most measures. The only question where we see a significant effect is in Question 7, focusing on actions to conserve native flora and fauna. Contracted participants were more likely to recognise the importance of conserving native flora and fauna. Moreover, we found statistical evidence that people who had been contracted for longer had a higher recognition of the importance of taking action to conserve native flora and fauna. Considering the other variables in the survey, it is too early to tell if time in the Program has had a significant effect. This is an important area for further research during the life of the Environmental Stewardship Program. In essence, the data do provide evidence of attitudinal change, but the data were insufficient to determine the importance of program duration in generating that change.

There is always some concern that environmental programs are only taken up by participants who are already actively engaged in other environmental initiatives – i.e. that environmental programs are preaching to the converted. It is unsurprising then that farmers who have a record of participating in environmental programs were keen participants in this program. However, we also see evidence in this survey that the scheme did attract participants who were not previously involved in NRM incentives, as well as extending landholders who were already active in other environmental programs (Figure 5 and Figure 20). This is important because it demonstrates the Program is reaching a broader audience. Considering the qualitative feedback demonstrates that there is a wide range of ways that participants viewed the program – from compensating them for actions they were already undertaking through to providing the stimulus to take new action.

Overall, the range of motivations expressed by participants is broadly consistent with those identified through literature review. One area of difference compared with other environmental programs is that the Program was appealing to landholders with a strong economic motive. Essentially, the returns for some landholders were attractive compared to grazing in the targeted areas. This represents evidence that the Program is economically viable for landholders and does not overly rely on goodwill.

The survey demonstrated that young farmers were more likely to submit bids than older farmers. It is likely that the long duration of contracts is influential here. Older farmers may be less confident that they will remain in control of the farm and able to meet all management and reporting requirements 15 years into the future. The survey also demonstrated that trust is an important issue. Landholders who had a higher level of trust in the federal government were statistically more likely to bid compared to those with a lower level of trust.

Recommendations for repeat survey

The questions in the survey form have been phrased so that they should require minimal re-wording for a future follow up survey.

Table 3: Recommended repeat questions for follow up future surveys (in bold)

Category	***Types of indicators – what contributes to the decision to join up?***
Recreational benefits:	• are conserved areas visited by the owner just to look at, used for walks/picnics or similar?
Social networks	• **involvement in formal groups (e.g. Landcare) and informal networks** • interactions with neighbours • distance to neighbour (how influential was this)
Economic factors:	• Effects on profitability (perceived and actual) • **Negative economic impacts (e.g. reduced farm area)** • Positive economic impacts (e.g. shade or wind shelter improve animal health • **On and off farm income. If off farm income what type of employment and location of employment. How many hours of off farm income** • **Attitude to borrowing. Attitudes to risk** • **Financial viability (feelings of financial security for the next 5,10 years to decisions about participation)** • **Proportion of income attributed to farming**
Demographics	• **Age and life cycle stage (e.g. young or older couple, kids, single)** • **Education (type of education and type and date of most recent education experience including training courses. It is important to capture the less formal education)** • **Past experience and how did this affect participation decisions?** • **Duration of current residence** • **Succession planning (has this been done yes/no did this influence participation decisions?)** • **Farm type (family or corporate...if family how many decision making partners) Did this influence participation decisions** • Occupation identity
Attitudes about management practices:	• Making amends for past mistakes • Changes to the focus of management (e.g. focus on trees, grasses, other visual indicators) • **Changes to attitudes about specific managements (e.g. Remove or retain fallen timber)** • Compatibility with current practices, farm structure, infrastructure etc. • **Were you concerned about changes in control over farm management?** Did this influence your participation decision? How? • Did the management change align with your landholder identity (organic, production, lifestyle? • **Attitude about the environment [Re-word question to test for future change]**
Motivations for decisions about management (and participation in ESP):	• Family benefit inter-generational benefits. Feelings about handing over the land, making environment available for the next generation • Other family need drivers • **Were you concerned about visual impact from management change?** • Were you concerned about alignment with broader regional identity • Connection to the land. • **Bureaucratic exhaustion?** • **To what extent did trust in government administration influence participation decisions?** • Which household member(s) were interested in ESP program?

Some particular questions from the survey (Question 7 and Question 35) will be particularly important to include in follow up surveys to test for change over the duration of the environmental stewardship program. Question 7 will not require any word changes as it is a question on perceived issues at the time of the survey.

By contrast, Question 35 asks how attitudes have changed over time. For this question, it would be useful to take account of the period between the 2012 baseline and the future survey. For example, a survey in 2017 might ask how attitudes have changed over the last 5 years.

Conclusion

The purpose of the research was to design and implement a method for assessing key measures of land managers' attitudes, motivations and behaviours towards biodiversity management on private land and consider the impact of the Environmental Stewardship Program on these. This report has identified these measures, based on literature review, and presented the method by which they were implemented as a survey instrument. This process was designed to be repeatable such that change in these measures can be tested throughout the duration of the Environmental Stewardship Program.

Based on the findings from the survey, it is clear that the Program is functioning well. It has been attractive to a wide range of landholders, including those with no prior interest or experience with environmental programs. It is clear that the Program is viewed favourably by the vast majority of survey respondents, including those who chose not to become involved with the Program and those who wanted to become involved but were not successful during the bidding process. Of those who chose to become involved, some were motivated by environmental factors – improving biodiversity – and others were motivated by economic factors. This was reflected by a wider range of participants than tends to be found in most environmental policy initiatives. Specifically, the Program has received uptake by some landholders with no prior activity in environmental programs, along with those who have a strong history of environmental action. Moreover, the survey provides evidence of attitudinal change amongst contracted landholders. Specifically, there was evidence of increased desire to protect the environment and increased aesthetic appreciation of properties. Moreover, for one of the variables (the importance of actions to conserve flora and fauna) we found statistical evidence which indicates that people who have been in the Program for longer durations see this as more important compared to those who have been in the Program for shorter durations.

References

Barr, N., & Cary, J. (2000). Influencing Improved Natural Resource Management on Farms: A guide to understanding factors influencing the adoption of sustainable resource practices. Canberra, Australia: Department of Agriculture, Fisheries and Forestry.

Baumgart-Getz, A., Stalker Prokopy, L., & Floress, K. (2012). Why farmers adopt best management practice in the United States: A meta-analysis of the adoption literature. *Journal of Environmental Management, 96*, 17-25. doi: 10.1016/j.jenvman.2011.10.006

Byron, I., Curtis, A., & MacKay, J. (2006). Benchmarking community attitudes towards natural resource management in the Lachlan Catchment. Canberra, Australia: Bureau of Rural Sciences.

Cary, J., Webb, T., & Barr, N. (2002). Understanding landholders capacity to change to sustainable practices. Insights about practice adoption and social capacity to change. Canberra: Commonwealth of Australia.

Cary, J. W., & Wilkinson, R. L. (1997). Perceived Profitability and Farmers' Conservation Behaviour. *Journal of Agricultural Economics, 48*(1), 13-21.

Cooke, B., Langford, W. T., Gordon, A., & Bekessy, S. (2012). Social context and the role of collaborative policy making for private land conservation. *Journal of Environmental Planning and Management, 55*(4), 469-485. doi: http://dx.doi.org/10.1080/09640568.2011.608549

Curtis, A., & De Lacy, T. (1996). Landcare in Australia: Does it make a difference? *Journal of Environmental Management, 46*, 119-137.

Falconer, K. (2000). Farm-level constraints on agri-environmental scheme participation: a transactional perspective. *Journal of Rural Studies, 16*(3), 379-394. doi: http://dx.doi.org/10.1016/S0743-0167(99)00066-2

Falconer, K., & Saunders, C. (2002). Transaction costs for SSSIs and policy design. *Land Use Policy, 19*(2), 157-166. doi: http://dx.doi.org/10.1016/S0264-8377(02)00007-8

Kilpatrick, S. (2000). Education and training: Impacts on farm management practices. *The Journal of Agricultural Education and Extension, 7*(2), 105-116. doi: http://dx.doi.org/10.1080/13892240008438811

Knowler, D., & Bradshaw, B. (2007). Farmers' adoption of conservation agriculture: A review and synthesis of recent research. *Food Policy, 32*, 25-47. doi: 10.1016/j.foodpol.2006.01.003

Kuperan, K., Abdullah, N. M. R., Pomeroy, R. S., Genio, E. L., & Salamanca, A. M. (2008). Measuring Transaction Costs of Fisheries Co-Management. *Coastal Management, 36*(3), 225-240. doi: 10.1080/08920750701681991

Lawrence, G., Richards, C., & Cheshire, L. (2004). The environmental enigma: Why do producers professing stewardship continue to practice poor natural resource management? *JOurnal of Environmental Policy and Planning, 6*(3-4), 251-270. doi: http://dx.doi.org/10.1080/1523908042000344069

Lockie, S. (2006). Networks of Agri-Environmental Action: Temporality, Spatiality and Identity in Agricultural Environments. *Sociologia Ruralis, 46*(1), 22-39. doi: 10.1111/j.1467-9523.2006.00400.x

Measham, T. G., Kelly, G. J., & Smith, F. P. (2007). Best Management Practice for Complex Problems: a Case Study of Defining BMP for Dryland Salinity. *Geographical Research, 45*(3), 262-272. doi: 10.1111/j.1745-5871.2007.00459.x

Mendham, E., Millar, J., & Curtis, A. (2007). Landholder participation in native vegetation management in irrigation areas. *Ecological Management and Restoration, 8*(1), 42-48. doi: 10.1111/j.1442-8903.2007.00331.x

Mettepenningen, E., Verspecht, A., & van Huylenbroeck, G. (2009). Measuring private transaction costs of European agri-environmental schemes. *Journal of Environmental Planning and Management, 52*(5), 649-667. doi: http://dx.doi.org/10.1080/09640560902958206

Montagu, K., Thomas, B., Thomas, G., Christen, E., Hornbuckle, J., Baillia, C., . . . Cornish, P. (2006). Understanding irrigation decisions from enterprise planning to the paddock *Irrigation Insights*: Cooperative Research Centre for Irrigation Futures.

Murtough, G., Aretino, B., & Matysek, A. (2002). Creating markets for ecosystem services *Productivity Commision Staff Research Paper*. Canberra: Productivity Commission.

Pannell, D. J., Marshall, G. R., Barr, N., Curtis, A., Vanclay, F., & Wilkinson, R. (2006). Understanding and promoting adoption of conservation practices by rural landholders. *Australian Journal of Experimental Agriculture, 46*(11), 1407-1424. doi: http://dx.doi.org/10.1071/EA05037

Rhodes, H. M., Leland, J. L. S., & Niven, B. E. (2002). Farmers, Streams, Information, and Money: Does Informing Farmers About Riparian Management Have Any Effect? *Environmental Management, 30*(5), 0665-0677. doi: 10.1007/s00267-002-2714-7

Richards, C., Lawrence, G., & Kelly, N. (2005). Beef Production and the Environment: Is it really 'Hard to be Green When You are in the Red'? *Rural Society, 15*(2), 192-209.

Robertson, M. J., Measham, T. G., Batchelor, G., George, R., Kingwell, R., & Hosking, K. (2009). Effectiveness of a publicly-funded demonstration program to promote management of dryland salinity. *Journal of Environmental Management, 90*, 3023-3030. doi: doi:10.1016/j.jenvman.2009.04.007

Rorstad, P. K., Vatn, A., & Kvakkestad, V. (2007). Why do transaction costs of agricultural policies vary? *Agricultural Economics, 36*, 1-11.

Valentin, L., Bernardo, D. J., & Kastens, T. L. (2004). Testing the Empirical Relationship between Best Management Practice Adoption and Farm Profitability. *Review of Agricultural Economics, 26*(4), 489-504.

Vanclay, F. (2004). Social principles for agricultural extension to assist in the promotion of natural resource management. *Australian Journal of Experimental Agriculture, 44*(213-222).

Vanclay, F. (2011). Social principles for agricultural extension in facilitating the adoption of new practices. In D. J. Pannell & F. Vanclay (Eds.), *Changing Land Management: Adoption of New Practices by Rural Landholders* (pp. 51-67). Collingwood, Australia: CSIRO Publishing.

Whitten, S., Reeson, A., Windle, J., & Rolfe, J. (in press). Designing conservation tenders to support landholder participation: A framework and case study assessment. *Ecosystem Services*. doi: http://dx.doi.org/10.1016/j.ecoser.2012.11.001

Whittenbury, K., & Davidson, P. (2009). Beyond adoption: The need for a broad understanding of factors that influence irrigators' decision-making. *Rural Society, 19*(1), 4-16.

Wilson, G. A., & Hart, K. (2001). Farmer Participation in Agri-Environmental Schemes: Towards Conservation-Oriented Thinking? *Sociologia Ruralis, 41*(2), 254-274.

Appendix 1: Predicting program participation and success

In this appendix we show probit models aimed to better understand factors affecting landowners' likelihood of deciding whether or not to submit an EOI and final bids to the Stewardship program. We also model factors affecting the likelihood of having successful bids based on data collected in the survey.

From the total pool of surveys collected, 209 respondents were aware of the program. These 209 surveys formed the sample used to model factors affecting decisions whether to submit an EOI to the program. In the EOI model we included factors likely to affect this decision that were available from the data collected in the survey. Table 4 reports the marginal effect of the probit model used to estimate the influence of each factor. As can be seen only four out of the fifteen variables are statistically significant at 10% or lower. It is interesting to observe that farm size has a positive effect on the likelihood to submit an EOI, while the numbers of adults in the household also have a positive sign. Another factor positively affecting landowners decision to submit an EOI was the trust respondents reported towards the federal governments, where the higher the trust the more likely landowners aware of the Stewardship program were to submit an EOI.

Column 3 of Table 5 shows the results of our 'Bids' model. In this case only 183 surveys are used in our sample, which correspond to the landowners that submitted an EOI to the program. This probit model uses the same variables as the EOI model to better understand the factors affecting the disposition of participants to finally submit, or not submit, bids to the Program. Results show that five out of the fifteen variables are statistically significant at the 10% level or lower, with farm size again being a factor that positively affects a landowner's behaviour – in this case his/her decision whether submit a bid or not. In this case trust in the federal government is no longer significant, but the trust respondents reported toward their respective CMA was positive and significant, suggesting that landowners with high levels of trust toward the CMA were more likely to formally apply to the program. Farmers' age is another category positively affecting the likelihood of submitting bids, where younger farmers are more likely to participate than older ones.

Results of the model attempting to understand better the factors influencing the likelihood of a landowner to have a successful bid are shown in Table 5. Given the data collected in the surveys, we modelled this outcome using variables that may have affected this likelihood. In this case our sample is reduced now to only 172 surveys, which are the ones reporting bids submitted to the Stewardship program. Results in Table 5 show that three out of seven variables are statistically significant with farm size again having a positive effect. The number of rounds a landowner bid in the Program also shows an, expected, positive effect, indicating that experience in the sumbission process increases the likelihood to have successful bids.

Table 4: Marginal effects of probit estimations for landowners submitting EOI and Bids

Covariates	EOI (n=209)	Bids (n=183)
Farm hectares (thousands)	0.049	0.006
	(0.023)**	(0.007)***
DV if landowners non-seeking profit	0.061	-0.001
	(0.042)	(0.006)
DV if landowners seeking profit	0.067	-0.001
	(0.046)	(0.005)
DV if landowners participate in environmental activity	-0.046	0.016
	(0.040)	(0.018)**
DV if household making less than $100k per year	0.043	0.009
	(0.034)	(0.008)**
DV if household heads with school education	-0.006	-0.005
	(0.055)	(0.008)
DV if household heads with TAFE of similar education	0.005	-0.008
	(0.042)	(0.009)
Farmer's age (categorical variable 1 to 5)	0.017	-0.005
	(0.019)	(0.005)**
DV if landowner has succession plan	-0.017	-0.002
	(0.039)	(0.005)
DV if landowners concerned with interest rates	0.025	0.005
	(0.043)	(0.004)
Level of trust in CMA (decreasing scale 1 to 5)	0.049	-0.005
	(0.022)**	(0.005)**
Level of trust in Federal Gov. (decreasing scale 1 to 5)	-0.038	-0.001
	(0.014)***	(0.002)
Percentage of household time spent working off farm	-0.000	-0.000
	(0.001)	(0.000)
Dummy variable if farm has cattle	-0.018	-0.000
	(0.038)	(0.005)
Number of adults in household	0.065	0.003
	(0.026)**	(0.004)
Pseudo R-squared	0.15	0.36

Notes: parenthesis show robust standard errors. DV = Dummy variable (where variable = 1 if the respective characteristic is present, and 0 otherwise). The dependent variables (EOI and Bids) are also DV. ** $p<0.05$; *** $p<0.01$.

Table 5: Marginal effects of probit estimations for successful versus non-successful bidders

Covariates	Bidded vs non-bidded (n=172)
Farm hectares (thousands)	0.027
	(0.014)*
DV if landowners participate in environmental activity	0.001
	(0.048)
Farmers age	0.014
	(0.017)
Dummy variable if farm has cattle	-0.073
	(0.034)**
Hours landowner spent filling bid	0.009
	(0.016)
Number of rounds landowner placed bids	0.067
	(0.037)*
Dummy variable if landowner used assistance to bid	0.021
	(0.032)
Pseudo R-squared	0.12

Notes: parenthesis show robust standard errors. Dependendent variable is a dummy variable with the value of 1 if landowner was bidded, and 0 otherwise. * $p<0.1$; ** $p<0.05$.

Appendix 2: Analysis of environmental attitudes across respondents

In order to analyse whether the ESP had changed the attitudes of participants over environmental concerns and/or motivation to protect ecosystems, we performed analysis over four different categories of participants in our surveys. In this way, respondents were classified as 'not aware of ESP' (in the case of landowners stating no to question 10 in the survey), 'Aware of ESP, but did not bid' (for landowners that knew about the program but decided not to participate), 'Did bid, unsuccessful' (for landowners that were not successful in their bids), and 'did bid, successful' (for respondents who reported successful ESP bids). We analysed the pattern of responses across these four categories to the survey questions related to attitudes towards environmental concerns. If patterns of response were different, we then proceed to analyse whether the number of years participating in the program have any effect in the responses, or not.

Our analyses were done for questions 45 (Table 6), 5 (Table 7), and 7 (Table 8 to Table 10) in the survey. Results are shown below.

Table 6: Responses to question 'Would you participate in future rounds of the ESP, if available?' (question 45 in survey) by category of respondents

	Not aware of ESP	Aware of ESP, but did not bid	Did bid, unsuccessful	Did bid, successful
Likely to participate in future rounds	32 (46.5%)	20 (61%)	11 (69%)	122 (76%)
Unsure	32 (46.5%)	8 (24%)	4 (25%)	21 (13%)
Not likely to participate in future rounds	5 (7%)	5 (15%)	1 (6%)	17 (11%)
Total	69	33	16	160

From Table 7 it can be seen that respondents more likely to participate again in the program are those who have had a successful bid, and less likely are those in the group of landowners who knew about the program and did not bid. However, when implementing Kolmogorov-Smirnov (K-S) test to check if the four different samples of respondents belong to the same distribution (each category was tested separately compared to the rest), we can affirm only whether respondents not aware of the ESP and the successful bidders are behaving differently than the rest. Thus, considering that successful participants in the program differ from the rest with respect to their willingness to apply again, we checked if their duration in the program had any effect in their responses. To check this last point we performed a chi-square test to see if a landowner's duration in the program (years since he/she made a successful bid) was statistically related to future participation in the program. Results from the chi-squared do not support this link (p-value of 0.99), which suggests that duration does not affect willingness to participate in future rounds. However, caution should be taken in this interpretation as successful respondents may have been confused by this question considering that the ESP involves 15 year contracts, and perhaps landowners are not willing to participate again because they do not have more land to bid in their parcels.

Table 7: Responses to question 'Farm objective?' (question 5 in survey) by category of respondents

	Not aware of ESP	Aware of ESP, but did not bid	Did bid, unsuccessful	Did bid, successful
Make a profit	19 (28%)	8 (24%)	8 (50%)	44 (28%)
Protecting the environment	4 (6%)	5 (15%)	2 (12%)	34 (21%)
Financial independence	16 (23%)	4 (12%)	3 (19%)	27 (17%)
Country lifestyle	20 (29%)	7 (21%)	3 (19%)	19 (12%)
Other or not answered	10 (14%)	9 (27%)	0 (0%)	36 (22%)
Total	69	33	16	160

Using the information in table 8, and following the same approach described above, we performed the K-S test to check if the different categories of landowners behaved differently when responding the 'objective of farm' question. From this test we did not find differences between respondents, suggesting that the program does not have a strong effect over the attitudes of respondents toward their objectives of farming.

Finally we checked the responses of our four landowners' categories to the environmental issues they believed needed more attention in their properties (question 7 in survey). Results are shown in Table 8 to Table 10.

Table 8: Responses to 'Protecting and restoring bush or wetlands' as main environmental issue (question 7 in survey)

	Not aware of ESP	Aware of ESP, but did not bid	Did bid, unsuccessful	Did bid, successful
Major issue	13 (20%)	9 (30%)	0 (0%)	63 (41%)
Minor issue	20 (32%)	10 (35%)	8 (62%)	51 (34%)
Not a problem	30 (48%)	10 (35%)	5 (38%)	37 (24%)
Unsure	0 (0%)	0 (0%)	0 (0%)	1 (1%)
Total	63	29	13	152

Note: Total numbers vary because not all respondents answered this question.

Table 9: Responses to 'Conserve flora and fauna' as main environmental issue (question 7 in survey)

	Not aware of ESP	Aware of ESP, but did not bid	Did bid, unsuccessful	Did bid, successful
Major issue	12 (19%)	9 (30%)	2 (17%)	75 (49%)
Minor issue	31 (49%)	11 (37%)	8 (67%)	54 (35%)
Not a problem	18 (29%)	10 (33%)	2 (17%)	24 (15%)
Unsure	2 (3%)	0 (0%)	0 (0%)	1 (1%)
Total	63	30	12	154

Note: Total numbers vary because not all respondents answered this question.

Table 10: Responses to 'Protecting rivers and streams' as main environmental issue (question 7 in survey)

	Not aware of ESP	Aware of ESP, but did not bid	Did bid, unsuccessful	Did bid, successful
Major issue	12 (20%)	6 (21%)	5 (39%)	41 (27%)
Minor issue	28(47%)	13(47%)	5 (39%)	67 (44%)
Not a problem	20 (33%)	9 (32%)	3 (22%)	44 (28%)
Unsure	0 (0%)	0 (0%)	0 (0%)	2 (1%)
Total	60	28	13	154

Note: Total numbers vary because not all respondents answered this question.

From the information in Table 8 to Table 10, K-S tests show that successful bidders belong to a 'different distribution' than the rest when stating 'Protecting and restoring bush or wetlands ' and 'conserve flora and fauna' (Table 8 and Table 9). For 'protecting rivers and streams' the K-S test failed to reject that participants are different. Considering the K-S test results for Table 8 and Table 9, we checked the participants duration in the ESP versus these question to see if there were any relationship between years participating in the ESP and 'protecting the environment' and 'conservation of flora and fauna' environmental concerns. Chi-squared test results showed a positive and statistical significant relationship between duration and 'flora and fauna' conservation concerns (p-value = 0.097), but not for 'protecting the environment. This result suggest that participants who have been participating in the program for more time have increased their concern toward the protection of flora and fauna – although the reverse may also be true, i.e., that landowners more concerned about flora and fauna applied in early stages of the ESP.

Appendix 3: Additional demographic information

The majority of respondents owned their property (96%) with only a small portion renting (1%), managing the land for other people (1%), corporations (0%) or owning their and under a multiple arrangement (1%) (e.g. own some and rent some) (Figure 39).

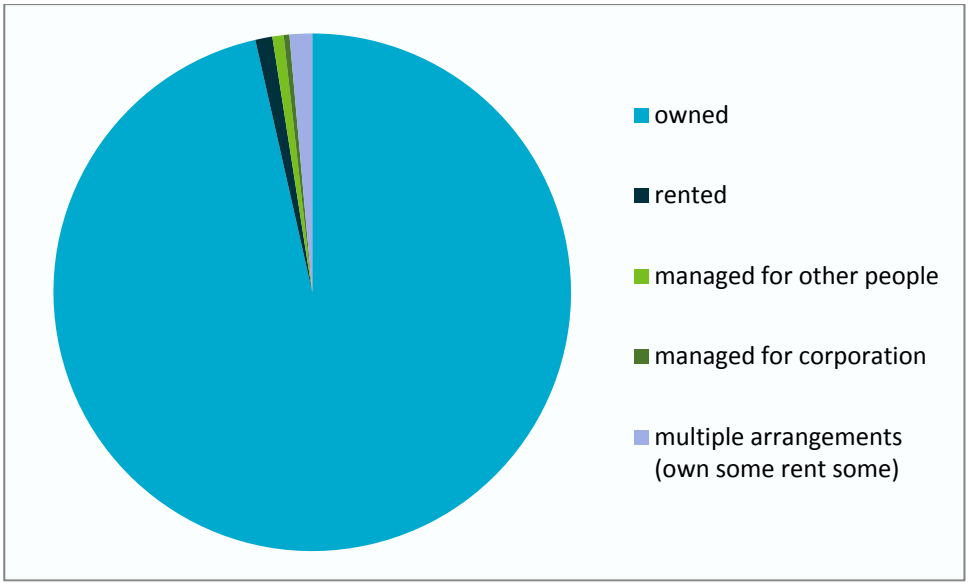

Figure 39: Ownership status

49% of respondents had succession plans in place for the future management of their properties. 43% had no succession plans in place and 8% were unsure of the arrangements for the succession of their properties (Figure 40).

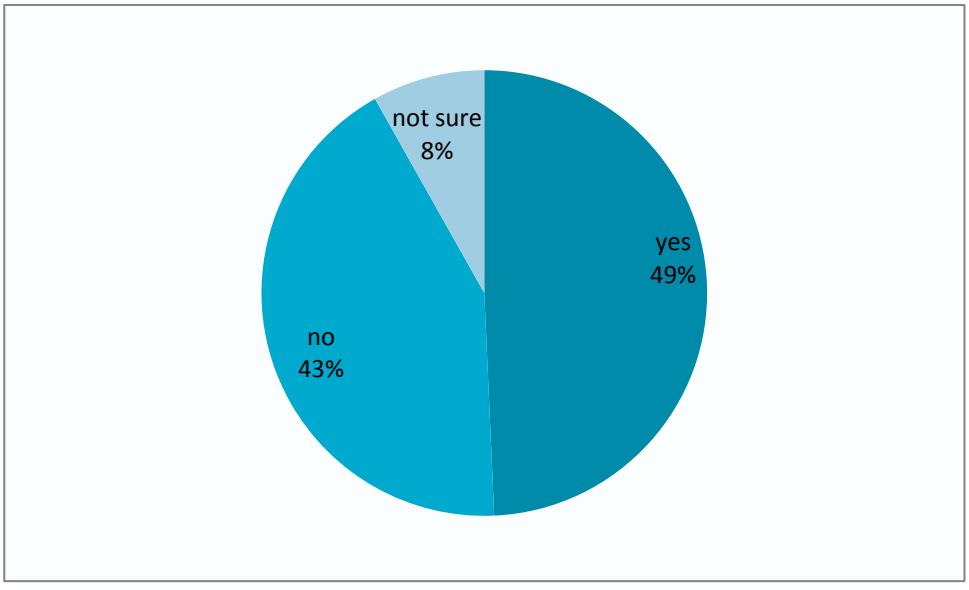

Figure 40: Succession arrangements for properties

PARTICIPATION AND AGE

Age has a bearing on participation in ESP. Most current participants in the ESP are between the ages of 30 and 49 (67%) and 50 and 59 (68%). Participants in these age groups were also those most likely to submit a bid in the future.

PARTICIPATION AND INCOME

	Yes EOI	No EOI	blank
<50 000	49%	15%	37%
50-99 999	66%	13%	21%
100-149999	71%	11%	17%
150-199999	60%	20%	20%
200-249999	82%	5%	14%
250-299999	73%	18%	9%
300-349999	70%	30%	0%
>350000	68%	5%	26%

	yes bid	did not bi	blank
<50 000	56%	7%	37%
50-99 999	60%	8%	32%
100-149999	68%	13%	20%
150-199999	65%	5%	30%
200-249999	64%	5%	32%
250-299999	64%	27%	9%
300-349999	90%	0%	10%
>350000	53%	21%	26%

% off farm Y	yes bid	no bid	blank
0	61%	18%	21%
01-020	66%	14%	20%
21-40	67%	14%	19%
41-60	61%	13%	26%
61-80	66%	24%	10%
81-100	68%	8%	24%

PARTICIPATION AND FINANCIAL SECURITY

debt and bidding again - complete participants					
	definately	probably	not sure	probably not	definately not
with debt	58%	25%	11%	4%	1%
no debt	27%	32%	20%	17%	3%
debt and bidding again - non participants					
	definately	probably	not sure	probably not	definately not
with debt	10	17	16	5	1
no debt	9	10	24	2	3
debt and bidding again - non participants					
	definately	probably	not sure	probably not	definately not
with debt	20%	35%	33%	10%	2%
no debt	19%	21%	50%	4%	6%

Appendix 4: Survey form

ENVIRONMENTAL STEWARDSHIP AND YOU

A SURVEY ON YOUR EXPERIENCES AND OPINIONS ABOUT ENVIRONMENTAL STEWARDSHIP

SECTION ONE: ABOUT YOUR PROPERTY

1a.What size is your farm? _____ hectares

1b. Which catchment (CMA) is it located in? _____

2a. Approximately, how much land do you have allocated to the following?

LAND USE	LAND AREA (%)
Cattle grazing	
Sheep grazing	
Irrigated crops (specify types)	
Dryland crops (specify types)	
Tree crops (forestry)	
Native vegetation	
Other (e.g. house paddock etc.), please specify _____	

2b. How many years have you been farming in total? _____years

2c. On this current property? _____ years

3. Is your property:

☐ Owned ☐ Rented ☐ Managed for other people ☐ Managed for a corporation

4. Do you have a succession plan?

☐ Yes ☐ No ☐ Not sure

5. What is the most important objective for your farm (tick one)?

☐ Make a profit ☐ Protecting the ☐ Financial ☐ Country lifestyle

environment independence

☐ Other (please specify) _____

6a. Is your household involved in any of the following groups? (tick all that apply)

Landcare	☐
Rural fire service or State Emergency Services (SES)	☐
Local sport and recreation (football, soccer, ballet, etc.)	☐
School based group (P&C etc.)	☐
Conservation group (please specify) _____	☐
Producer group (please specify) _____	☐
Other (please specify) _____	☐

6b. In a typical week, how many hours does your household spend participating in these groups? _____ hours

6c. Is your household committed to a leadership/management role within any of these groups?

☐ Yes ☐ No ☐ prefer not to say

SECTION TWO: ABOUT THE NATURAL ENVIRONMENT ON YOUR PROPERTY

7. Please indicate what environmental issues require the most attention on your property?

	Major issue	Minor issue	Not a problem	Unsure
Soil health	☐	☐	☐	☐
Protecting and restoring bush or wetlands	☐	☐	☐	☐
Managing dryland salinity	☐	☐	☐	☐
Reducing soil erosion	☐	☐	☐	☐
Actions to conserve native flora and fauna	☐	☐	☐	☐
Controlling pest animals and weeds	☐	☐	☐	☐
Protecting rivers and steams	☐	☐	☐	☐
Revegetation such as shelterbelts and corridors	☐	☐	☐	☐
Other (please specify) _____	☐	☐	☐	☐

8. How do you feel about incentives to help you address environmental issues on your property?

	Strongly agree	Agree	Unsure	Disagree	Strongly disagree
Grants and tenders are a good way of delivering financial incentives to landholders	☐	☐	☐	☐	☐
Environmental incentives are a	☐	☐	☐	☐	☐

business opportunity					
Environmental incentives are an opportunity to improve my land management	☐	☐	☐	☐	☐

9. Do you have any of the following conservation arrangements or other funding arrangements on your property?

☐ Not applicable: no formal agreements

☐ Wildlife Refuge

☐ Property Vegetation Plans with the local Catchment Management Authority (CMA)

☐ Landholder management agreement with the local CMA

☐ Land for Wildlife agreement

☐ Others (please specify)

_____

SECTION THREE: LAND MANAGEMENT

10. Are you aware of the Australian Government's Environmental Stewardship Program?

☐ Yes ☐ Not sure ☐ No → **Please go to Section 6 on page 10 to complete the survey**

11. How did you become aware of the Environmental Stewardship Program? (tick all that apply)

☐	☐	☐	☐	☐
Local radio	CMA mail out	Local newspaper	Word of mouth	Not sure

12. Did you submit an expression of interest to the Environmental Stewardship Program?

☐ Yes → **Please go to question 14** ☐ No

13. If no, which of the following best describes your reason for not submitting an expression of interest (EOI)? (tick all that apply)

- ☐ Too busy
- ☐ Too complicated
- ☐ Timing didn't suit
- ☐ Conservation tenders don't work
- ☐ I don't have the relevant vegetation type on my property
- ☐ Unlikely to be successful in the tender
- ☐ Concerned about losing full control over my farm
- ☐ Prefer not to deal with CMA
- ☐ Already have conservation agreement(s) listed in Question 9
- ☐ Other (please specify)

_____

Please go to SECTION 6 on page 10 to complete the survey.

14. If yes, what was the MAIN attraction to the Environmental Stewardship Program? (please select only one response)

- ☐ Financial opportunity
- ☐ Wanted to learn more about box gum grassy woodland management
- ☐ Wanted to learn more about the tender scheme
- ☐ Wanted to conserve the environment
- ☐ Opportunity for help in changing land management
- ☐ Other (specify)

_____

SECTION FOUR: THE APPLICATION PROCESS

15. Did you submit a formal bid to the Environmental Stewardship Program?

☐ Yes → **Please go to question 17** ☐ No

16. If no, what was the MAIN reason for not submitting a bid? (please tick only one)

☐ Too busy to apply

☐ Too difficult to put a bid together

☐ The management required would be too restrictive

☐ Considered my chance of success to be too low to be worthwhile

☐ Other (please specify)

_____

Please go to Section 6 on page 10 to complete the survey

17. If yes, which of the following statements best describes your reasons for submitting a bid? (please number the three most important reasons where 1 is the most important)

☐ Improve the conservation of fauna and flora

☐ Reduce climate change

☐ I had good past experiences with government incentives

☐ Improve profitability

☐ Improve the environment of the property for the next generation

☐ Recreational benefits (e.g. hunting, picnics or observing the conserved areas)

☐ Being paid for the environmental benefits

☐ Making amends for past mistakes

☐ Other (please specify)

_____

18a. In how many rounds of the Environmental Stewardship Program have you submitted a bid? _____

18b. In which years did you submit a bid? _____

19. How easy was it to assemble and submit your bid?

☐ Straightforward	☐ Mostly straightforward	☐ Difficult but manageable	☐ Very hard

20. Did you consult any of the following when preparing your bid(s)?

☐ Accountant

☐ Lawyer

☐ Financial planner

☐ Other (please specify) _____

21. When preparing your bid(s), how much time did you spend on the following activities?

	1-5 hrs	6-10 hrs	11-15 hrs	More than 16 hrs	Not applicable
Finding out about the program	☐	☐	☐	☐	☐
Filling in the application form	☐	☐	☐	☐	☐
Reading and signing the contract or funding agreement	☐	☐	☐	☐	☐

22. Did you seek feedback on your bid?

23. Did you receive feedback?

☐ Yes ☐ No ☐ Yes ☐ No

24. Was the feedback on your bid sufficient?

☐ Yes, sufficient ☐ No, insufficient ☐ Not applicable

25. How fair do you think the bidding process was?

☐ Very fair ☐ Somewhat fair ☐ Neutral ☐ A little unfair ☐ Very unfair

Why? _____

IF YOU HAD NO SUCCESSFUL ENVIRONMENTAL STEWARDSHIP PROGRAM BIDS PLEASE GO TO SECTION SIX ON PAGE 10 TO COMPLETE THE SURVEY.

SECTION FIVE: SUCCESSFUL BIDS

26. Across all rounds of the Environmental Stewardship Program, how many of your bids were successful? _____ successful bid(s)

27. How many hectares did these successful bids cover? _____ hectares

28. Did you opt for a covenant associated with any successful bids?

☐ Yes ☐ No ☐ Don't know

29. In which year was your first successful bid contracted through the Environmental Stewardship Program?

_____

30. Was the contracting process reasonable?

☐ Yes

☐ No, why? _____

31. Is the monitoring and reporting required by the Environmental Stewardship Program reasonable?

☐ Yes

☐ No, why? _____

32. How many hours per year do you spend monitoring and reporting on the activities required under the Environmental Stewardship Program?

_____ hours

33. Overall are you happy with the changes to your property?

☐ Yes ☐ No

34. With the benefit of hindsight, would you change your bid?

☐ Higher price ☐ Lower price ☐ Different site or management plan ☐ No change

Why? _____

35. How has the Environmental Stewardship Program affected you?

	Increased a lot	Increased a little	No change	Decreased a little	Decreased a lot
Profitability	☐	☐	☐	☐	☐
Amount of farm work	☐	☐	☐	☐	☐
Desire to protect the environment	☐	☐	☐	☐	☐

Aesthetic appreciation of my property	☐	☐	☐	☐	☐
Real estate value of my property	☐	☐	☐	☐	☐
Other: please specify _____	☐	☐	☐	☐	☐

36. As a result of the Environmental Stewardship Program, have you seen any environmental changes on your property (good or bad)?

Wildlife	More ☐	Less ☐	No change ☐
Pest species	More ☐	Less ☐	No change ☐
Other (please specify)	More ☐	Less ☐	No change ☐

_____

SECTION SIX: ABOUT YOU

37. Are you? ☐ Male ☐ Female

38. How old are you?

☐ 29 years or younger ☐ 30-49 ☐ 50-59 ☐ 60-69 ☐ 70 years or older

39. What is your highest level of education?

☐ Primary school ☐ High school ☐ TAFE /trade certificate ☐ University degree

40. What is the composition of your household:

Number of people under the age of 18 in your household	_____
Number of people 18 years and over in your household, including yourself	_____

41. Do you currently have debt attached to your land?

☐ Yes ☐ No

42. Are you concerned about interest rates?

☐	☐	☐	☐	☐
Very concerned	Somewhat concerned	Not very concerned	Not concerned at all	Don't know

43. Do you think the following are trustworthy?

	Completely trustworthy	A little trustworthy	Not very trustworthy	Not at all trustworthy	No opinion
Neighbours	☐	☐	☐	☐	☐
Local government	☐	☐	☐	☐	☐
CMA	☐	☐	☐	☐	☐
NSW government	☐	☐	☐	☐	☐
Australian Federal Government	☐	☐	☐	☐	☐

44a. We want to know how environmental stewardship is or is not attractive to farms of different financial circumstances. What is the average annual income for the whole household before tax (including farm profit and off farm income)?

☐ less than $50,000 ☐ $50,000 to $99,999

☐ $100,000 to $149,999 ☐ $150,000 to $199,999

☐ $200,000 to $249,999 ☐ $250,000 to $299,999

☐ $300,000 to $349,999 ☐ More than $350,000

44b. What percentage of the household's TOTAL average annual income is earned off farm?

_____ % is earned off farm

44c. What are the TOTAL hours per week that your household works:

On the farm? _____ hours

Off the farm? _____ hours

45. Would you want to participate in a future round of the Environmental Stewardship Program if available?

☐ Definitely ☐ Probably ☐ Not sure ☐ Probably not ☐ Definitely not

Why? _____

_____

_____

_____

_____

46. Do you have other comments on the Environmental Stewardship Program?

_____

_____

_____

_____

THANK YOU FOR COMPLETING THE SURVEY. YOUR TIME IS MUCH APPRECIATED

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