

EMS in the pastoral industries of western Queensland: from customisation to implementation

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Abstract. This paper outlines the customisation of Environmental Management Systems (EMS) for the pastoral industry of western Queensland, the recruitment and training of pastoral producers, and their development and implementation of EMS. EMS was simplified to a 7-step process and producers were recruited to trial this customised EMS. Producers from 40 properties received EMS training, either as groups or individually. Of these, 37 commenced Pastoral EMS development through a facilitated approach that allowed them to learn about EMS while developing an EMS for their property. EMS implementation has been more effective with producers who were trained in groups. At this stage, however, most producers do not see value in EMS as there are currently no strong drivers to warrant continued development and implementation. Key findings resulting from this work were that personal contact and assistance is vital to encourage producers to trial EMS, and that a staged approach to EMS implementation, commencing with a self-assessment, is recommended. EMS training is most successful in a group situation; however, an alternative method of delivery should be provided for those producers who, either by choice or isolation, have to work alone. A support network is also necessary to encourage and maintain progress with EMS development and implementation, particularly where no strong drivers exist.

Introduction

There is growing pressure from government, industry and community for pastoral enterprises to achieve and demonstrate ecologically sustainable use of natural resources (Van de Witte 2000; Banney 2002; Pahl and Sharp 2007). For example, pastoral producers on leasehold land in Queensland may need to demonstrate that they are meeting their duty of care for the natural resources on their property (Anon. 2003). In addition, national and international markets are increasingly signalling the need for sound environmental management. International environmental standards, such as ISO 14001 (Anon. 1996), which specifies the requirements for an EMS, are now being considered for their roles in meeting regulator and market requirements (Pahl 2004).

EMS is a tool for improving the environmental performance of a business or enterprise (Carruthers 2003). It is based on the continuous improvement cycle of 'Plan, Do, Check and Review'. The application of EMS on farms is in its infancy, despite its wider application in other industry sectors (Anon. 2000; Gunningham and Sinclair 2002). Increasingly, EMS is becoming accepted in several of the more intensive agricultural industries such as fisheries, forestry and horticulture (Anon. 2004). However, the extensive grazing industries have little experience with EMS. Banney (2002) reported that EMS, particularly to ISO 14001 standard, will not be readily accepted by many producers in the cattle industry, due to the additional time commitment, paper work, lack of clearly defined and significant incentives, as

well as the high cost of audits. Pastoral producers have expressed a high level of interest in some form of environmental certification scheme such as EMS, but need a clear demonstration of the benefits and more information on the requirements before they will consider implementation (Pahl and Sharp 2007).

This EMS pilot project, one of the 16 projects funded under the Australian Government Department of Agriculture, Fisheries and Forestry, Natural Heritage Trust National EMS Pilot Program (<http://www.daff.gov.au/ems>, verified 20 December 2006), has used the experiences of previous related activities to customise EMS to the pastoral industry of western Queensland. Pastoral properties in western Queensland (Fig. 1) generally consist of mixed sheep, cattle and goat enterprises. Typically, they are very large (up to 100 000 ha), family owned and operated properties, requiring minimal agricultural inputs (fertiliser, veterinary chemicals, introduced pasture and water) and only employ casual staff or contractors for labour intensive activities such as shearing, lamb marking or mustering (Lawrence *et al.* 1997; Carman *et al.* 1998; Pahl 2003). Documentation is generally kept to a minimum as most producers do not use formal planning processes as on-property action-orientated activities take priority.

The aims of this paper are to describe the processes, outcomes and lessons regarding:

- (i) customisation of EMS for the pastoral industry of western Queensland

project. A wide variety of promotional methods were used to attract producers to the information days. These included promotion of EMS by the project team to producers attending local agricultural shows, radio advertising and interviews, print advertisements, articles in local papers and producer newsletters, and mail, email and fax invitations. Through this promotion, producers from over 1500 properties received information about the Pastoral EMS and were invited to the information days. In addition, producers from 107 properties were also telephoned and encouraged to attend the EMS information days. These producers were recommended by DPI&F staff, stock and station agents, consultants and natural resource management groups as those most likely to be interested in EMS.

A total of 53 producers from 37 properties attended the Charleville and Longreach EMS information days. The information days included presentations from seven speakers, on the following topics: structure and function of EMS; producer experiences with implementing EMS; EMS as a tool for improving property management and profitability; marketing options; and the Pastoral EMS. Forty-one producers completed an 'exit survey' to record their impression of the information day, understanding of EMS and interest in joining the project. However, not all producers answered every question in the exit survey. Following the information days, further promotion of EMS occurred through articles in local papers and newsletters. Producers who expressed a high level of interest as a result of the promotion of EMS were contacted to arrange an introductory visit. Producers from 36 properties received an introductory visit to discuss EMS further and decide whether they would commit to joining the project. In addition to this, 67 producers from seven established groups in the region were visited to promote EMS. Formal training in the Pastoral EMS was then provided to producers who joined the project.

EMS training, development and implementation

The project team used a facilitated approach to EMS training, where the objective was for producers to learn about the Pastoral EMS while developing one for their property. Producers used the examples provided in the Pastoral EMS Guide to help them fill out the relevant templates. While the Pastoral EMS training strategy varied considerably between groups and individuals, the Pastoral EMS Guide developed by this project was the main document used during training. Four project officers provided training to producers for most of the project, although this declined to three in the final year of the project. The project officer conducting the introductory visit also trained and assisted these producers to develop their EMS. The role of these officers was to build relationships with producers, maintain contact and provide assistance and support. Producers from 40 properties undertook training and implemented the Pastoral EMS, 21 in groups and 19 individually.

Training groups of producers

Four producer groups (one group of nine properties, one group of six properties and two groups of three properties) were trained in the Pastoral EMS during two group workshops, which were either held on-property or nearby. These workshops occurred 1–2 months apart, and involved taking producers

through the individual steps of the Pastoral EMS. A third meeting was held with individuals from the groups to undertake a management review. This occurred between 3 and 12 months after the second workshop, depending on the producers' progress towards completing the documentation of their Pastoral EMS and their circumstances.

The two group training workshops went for half to a full day, depending on the size of the group and amount of detail necessary. The first workshop involved training producers in the EMS steps of environmental policy and risk assessment. The second workshop provided training in objectives and targets, action and monitoring plans, implementation and monitoring. During both of these workshops producers were given an explanation of each step of the Pastoral EMS. They were also shown ISO 14001 compliant examples for grazing properties and poster examples from the Pastoral EMS Guide. Using these examples, they completed the templates provided for each step of the Pastoral EMS, with the option of sharing this information with the group.

Variations to this training method occurred in the first workshop with two introductory EMS activities, 'Where am I now?' and the 'EMS Game', and a preliminary activity for risk assessment. A facilitated discussion was used to explore 'Where am I now?', which examined producers' current grazing and pasture management practices and any recording or monitoring being carried out. The 'EMS game' turned the steps of the Pastoral EMS into questions. For example, the environmental policy and risk assessment steps were transferred into 'where do I want to be?' and 'what is stopping me?', and producers appropriately ordered these questions. To introduce risk assessment, a noisy round robin activity (Frangenheim 2004) was conducted that allowed producers to generate a large number of risks and associated causes for their properties, before they started the formal risk assessment training.

The management review meeting took 1 to 3 hours and involved project officers individually visiting producers. During the management review, producers were asked 58 questions relating to the steps of the Pastoral EMS. The intent of these questions was to assess the producer's system in relation to the requirements of the Pastoral EMS and to assess the impacts and value of EMS implementation on property management. Between workshops and meetings, contact was maintained with producers via phone, fax and email to check on progress, provide assistance and to organise the next workshop or meeting.

Training individual producers

Due to extensive travel distances or a lack of interest in participating in a group, producers from 19 properties were trained individually over a period of 1 to 6 months. These producers were trained in one of two ways, depending on their need for assistance. Producers either completed the majority of their EMS on their own after the introductory visit, or after an additional one to two visits. Each visit lasted about half a day. During the first visit, producers received training in the EMS process using the Pastoral EMS Guide. Subsequent visits to producers desiring further assistance provided more detail on the Pastoral EMS steps and assistance with EMS development. These visits were relatively unstructured compared to producer group workshops, with outcomes dependent on the progress

made by each producer and the time available for the meeting. Activities such as 'Where am I now?' and the 'EMS game', and the ISO 14001 compliant examples were also offered to all individuals. Contact with these producers between visits (via phone, fax and email) varied, depending on their individual needs and progress. The individual producers who had developed and implemented the first six Pastoral EMS steps received a face-to-face visit (1 to 3 hours) for the 7th step, management review.

Results

EMS customisation

Input from people experienced in EMS application

The main messages from the people experienced in EMS implementation and the extensive grazing industries were to 'keep EMS simple and flexible, and minimise documentation'. They also recommended the use of the continuous improvement cycle of 'Plan, Do, Check and Review' covering the ISO 14001 steps of environmental policy, aspects and impacts including a risk assessment, objectives and targets, action plans, monitoring and a management review.

Review of EMS resource materials

The review found two of the five EMS resource materials were not designed specifically for extensive pastoral industries and all resources were based on ISO 14001 specific terminology. Relevant and applicable information, templates and examples from these resource materials guided the project team's development of the Pastoral EMS.

Development of a customised EMS

The product of the EMS resources review and input from people experienced in EMS application was the 7-step Pastoral EMS (Fig. 2). The 15 reviewers of this EMS provided mostly positive feedback and constructive advice for improving the Pastoral EMS. Generally, they found the EMS straightforward, with easily understood language and terms. Reviewers indicated the explanations were clear and focused on both production and environmental outcomes, although the five producer reviewers thought that the explanations were overly focused on the environment. All reviewers thought the examples provided were a good reference for producers writing their own EMS. The producer reviewers also offered practical advice on the example environmental policies, as these tended to be bureaucratic in style, containing terms that are not frequently used by producers, such as 'social responsibility' and 'remnant vegetation'.

Two of the EMS experienced reviewers questioned the simplicity of the product, as they preferred that the Pastoral EMS contain all elements of the ISO 14001 standard. Also, even though the Pastoral EMS contained seven steps of ISO 14001, these were not always to certification standard. These steps omitted requirements identified by the EMS project team as being less relevant to producers in western Queensland, such as a commitment to preventing pollution in the environmental policy and making it publicly available. There was also some question whether the terminology of the Pastoral EMS steps should vary from those in ISO 14001. For example, the terms 'aspects and impacts' in ISO 14001 were changed to 'risk and

cause' in the Pastoral EMS. However, it was decided to keep the terminology as simple, familiar and clear as possible and, as such, the terms 'risk and cause' were retained.

The result of this review was the Pastoral EMS based on the continuous improvement cycle of 'Plan, Do, Check and Review' (Fig. 2). The steps of the Pastoral EMS are briefly described below.

Plan:

- (1) Environmental policy. A statement of the producer's vision for long-term natural resource management, production and marketing.
- (2) Risk assessment. Identifies risks and associated causes to the environmental, production or marketing components of a property. A decision tree (Fig. 3) assists the prioritisation of risks as high, medium or low, using considerations such as legal requirement, severity, probability of occurring, and benefits and costs.
- (3) Objectives and targets. Developed for at least the two highest ranking risks identified in step 2.
- (4) Action plans. Details how producers will achieve their objectives, targets and monitoring plans, along with completion dates.

Do:

- (5) Implementation. The carrying out of tasks detailed in the action plans.

Check:

- (6) Monitoring. Conduct the monitoring described in the action plans.

Review:

- (7) Management review. Reflection and review of everything that has been carried out and documented as part of the Pastoral EMS.

EMS promotion and producer recruitment

The promotional campaign assisted in attracting 80 participants to the two EMS information days (Table 1). These included 53 producers, as well as industry representatives the media, DPI&F staff and presenters. Of the 41 producers that completed the 'exit survey', 66% attended the information days as a result of telephone contact.

Producer feedback on both the Charleville and Longreach information days was positive with regard to both the presentations and overall value of the day. Seventy-three percent of producers surveyed found the information days valuable (with a ranking of 4 or 5, where a ranking of 1 was 'a waste of time' and 5 was 'really valuable') and 69% found them excitingly presented (with a ranking of 4 or 5, where a ranking of 1 was 'tedious' and 5 was 'excitingly presented') (Table 2). Despite this, 39% of producers indicated they did not have a good understanding of EMS at the end of the information days (with a ranking of 1, 2 or 3, where a ranking of 1 was 'still don't know what EMS is' and 5 was 'have a good understanding of EMS') (Table 2). Sixty-one percent of producers indicated they were very likely (with a ranking of 4 or 5) to adopt EMS, while only 12% were not interested (with a ranking of 1 or 2, where a ranking of 1 was 'not interested at all' and 5 was 'yes, will sign up now') (Table 2).

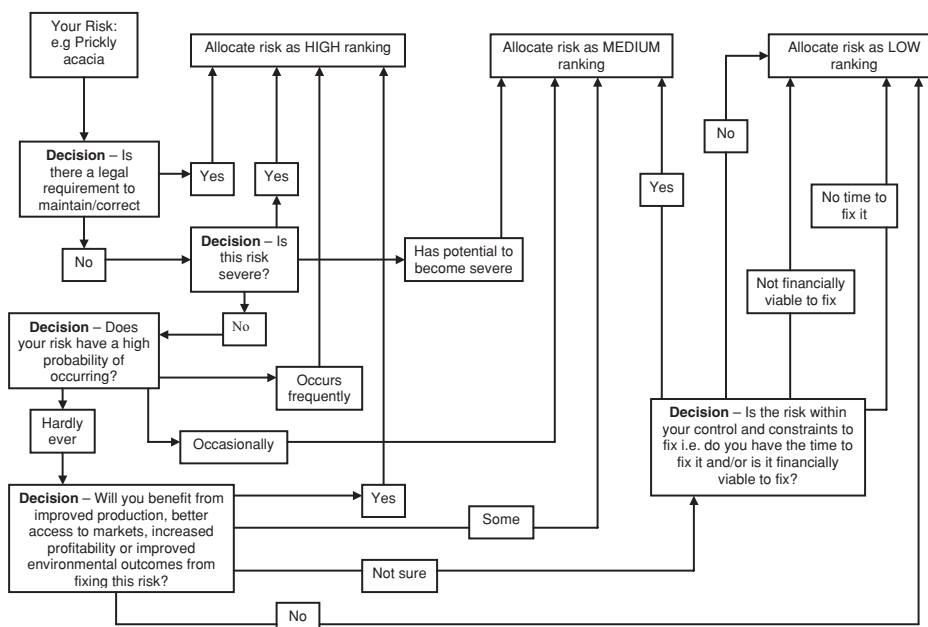


Fig. 3. The Pastoral EMS risk assessment decision tree.

Of the producers from the 40 properties that decided to trial EMS, 43% were recruited via presentations to established groups, 35% were a direct result of the two EMS information days and 22% became involved as a result of other promotional methods.

EMS training, development and implementation

Producers from 40 properties have been trained in environmental policy, risk assessment, objectives and targets, action plans, implementation and monitoring. Producers from 32 of these properties were also trained in management review (Table 3). Participating producers are at varying levels of EMS development. Producers from 37 properties have developed an environmental policy and risk assessment. Producers from 36 properties have developed objectives and targets and action plans. Producers from 32 properties have completed a facilitated management review (Table 3).

Groups of producers

The 21 producers working in groups developed and documented the first six steps of their EMS during the two group training sessions, with the exception of seven producers who wrote drafts before the workshop and continued working

Table 1. Number and type of participants at the Charleville and Longreach EMS information days

Participant type	Charleville participants	Longreach participants	Total
Producers (properties)	35 (23)	18 (14)	53 (37)
Industry representatives	2	3	5
Media	1	1	2
DPI&F staff and presenters	11	9	20
Total	49	31	80

on their EMS after the workshops. All of the producers trained in groups have developed and implemented the first 6 steps of the Pastoral EMS (Table 3). Only one producer has not completed the management review, ‘the 7th step of the Pastoral EMS’, due to personal circumstances. Some difficulties were experienced with group training: on occasions it took some time to organise a suitable workshop date; and some workshops were attended by only one partner, then a different partner attended the next workshop.

Individual producers

Of the 19 individual producers trained in the Pastoral EMS, only 15 have developed the first six steps (Table 3). Ten of these worked independently and developed their EMS on their own after the introductory visit. Five developed it after one or two additional visits. Producers reported that they appreciated the project team contacting them, as it encouraged them to continue developing their EMS. Only 12 producers have completed a management review, the 7th step of the Pastoral EMS (Table 3).

Pastoral producer EMS content and progress

The results presented below are from the 32 collated management reviews that producers undertook after having documented their EMS. The environmental policies developed by producers were generally hand written and half a page in length. Only 56% of these environmental policies were signed and dated. Ninety-one percent contained a commitment to continuous improvement, improved production and natural resource management, while only 47% contained a commitment to improved marketing. Policy statements varied widely between producers, with a representative example provided in Table 4. Producers found it difficult to start writing their policies and expressed concern as to why they were writing an

Table 2. Producer responses to the exit survey of the EMS information days at Charleville and Longreach

Values are the numbers of respondents

	Ranking				
	1	2	3	4	5
Value of the day ^A	1	1	10	25	2
Presentation of talks ^B	1	1	10	25	2
Understanding of EMS ^C	0	5	11	17	8
Interest in establishing an EMS on own property ^D	1	4	11	17	8

^AThe value of the day was ranked from 1 to 5 where 1 was ‘a waste of time’ and 5 was ‘really valuable’.

^BThe presentation of the talks was ranked from 1 to 5, where 1 was ‘tedious’ and 5 was ‘excitingly presented’.

^CUnderstanding of EMS was ranked from 1 to 5 where 1 was ‘still don’t know what EMS is’ and 5 was ‘have a good understanding of EMS’.

^DInterest in establishing an EMS on the respondent’s own property was ranked from 1 to 5 where 1 was ‘not at all interested’ and 5 was ‘yes, will sign up now’.

environmental policy and not a business policy. Only 16% of producers had chosen to make their environmental policy available to external parties.

During the risk assessment step, the average number of risks identified by producers was 10, with most risks having more than one cause. All producers identified risks relating to livestock and pasture management, 94% identified risks relating to pests, weeds and feral animals, while 63% identified risks relating to water and soil management. Biodiversity was only mentioned in 25% of producers’ risk assessments. Even though a decision tree was provided to assist prioritising risks, 34% of producers did not use it. Instead, they ranked risks based on their own experiences and knowledge. Table 5 contains an example of one producer’s risk assessment, outlining risks, causes and rankings.

The risk assessment process encouraged producers to think and plan more about risks, and to break their big problems up into more manageable pieces. Ninety-four percent of producers indicated that the risk assessment effectively identified and prioritised risks and 72% indicated that this process improved their knowledge of these risks. Despite this, producers claimed that those risks ranked as high priority were usually the ones they were going to address anyway.

On average, producers initially focused on three of their high priority risks and developed objectives, targets, action and monitoring plans for these. Ninety-seven percent of producers thought that their objectives and targets were aimed at achieving

the intention of their environmental policy. Eighty-eight percent of these objectives and targets were related to high ranked risks in producers risk assessment and 81% had ‘SMART’ (Carruthers 2003) targets. Only 56% of the action plans were signed and dated. Common issues addressed in action plans were herd and flock improvement strategies, weed infestation, pasture improvement through fencing and redistribution of watering points, feral animal control, and management of tree regrowth and encroachment. Seventy-two percent of producers accessed new information, tools and training to help inform their actions. Monitoring activities detailed in producers’ action plans include photo sites and pasture assessments; these have ranged from limited visual observations to formal GRASS Check sites (Forge 1994). Other monitoring activities included regular visual observations of weed infestations, shrub and tree regrowth, watering points and stock condition; records of livestock numbers and movements; and pasture feed budgeting and grazing charts. Table 6 provides an example of objectives and targets, as well as action and monitoring plans developed by a participating producer.

Ninety-one percent of producers thought that the development of objectives and targets was beneficial to property management. Sixty-nine percent of producers thought action plans were beneficial, as the plans helped to improve producers’ focus and encouraged them to take action now. Even so, 30% of producers commented that documenting objectives, targets, action and monitoring plans was frustrating and not

Table 3. Numbers of properties, as groups of producers or individuals, that have been trained in and then implemented the Pastoral EMS steps

Pastoral EMS steps	Groups		Individuals		Total	
	Trained	Implemented	Trained	Implemented	Trained	Implemented
Environmental policy	21	21	19	16	40	37
Risk assessment	21	21	19	16	40	37
Objectives and targets	21	21	19	15	40	36
Action plans	21	21	19	15	40	36
Implementation	21	21	19	15	40	36
Monitoring	21	21	19	15	40	36
Management review	20	20	12	12	32	32

Table 4. Example of an environmental policy, developed by a producer participating in the Pastoral EMS project

Environmental policy
<p>Our property is best suited to extensive grazing industries. Production, financial and life style outcomes are closely aligned with responsible and caring management of the environment.</p> <p>This policy is a living document that sets out a commitment to a process of continual improvement to ensure environmental sustainability and improvement.</p> <p>Management principles underpinning this policy are:</p> <ul style="list-style-type: none"> • Practices relating to enterprise mix and stocking strategies are developed using principles that maintain and/or improve the health of the environment. Issues of soil type, woody vegetation type and density, pasture mix, ground cover and climate variation are paramount. • Use of appropriate best practice management and marketing strategies to produce and turn-off high quality meat and fibre. • Responsible and conservative use of natural water resources. • Commitment to both human and animal health and safety through responsible use of chemicals and safe work practices. • Proactive participation in opportunities to keep abreast of advancements in technology, business management and personal development.

particularly useful. All producers have started to implement their action and monitoring plans, 44% have seen on ground improvements and 53% commenced monitoring.

Discussion

Customising EMS for the pastoral industry

The decision by the Pastoral EMS project to initially develop and promote a simple and flexible form of EMS and not commence with ISO 14001 is consistent with several other studies (Ridley *et al.* 2003; Huhn *et al.* 2005; Seymour *et al.* 2007). Banney (2002) reported that, for EMS uptake to be successful in the beef industry, a staged approach is necessary. Seymour *et al.* (2007) and Taylor (2001) also support a staged approach to EMS, noting that it would be difficult for most pastoralists to use ISO 14001 as a starting point. Pahl and Yeoman (2005) also acknowledge the need for a staged approach, but suggest that it may fall short of accommodating the diversity of people and circumstances found in the pastoral industry.

In a comparative study on 15 of the Department of Agriculture, Fisheries and Forestry pilot projects by Anon. (2004), only five of these projects chose to fully implement ISO 14001. The Australian Landcare Management pilot recommended that

producers implement ISO 14001 as it could allow greater international and national recognition, plus it is an established and standardised system (Gleeson *et al.* 2004). Anon. (2004) further reported that some industries, such as the seafood industry, chose ISO 14001 as they have a greater need to publicly demonstrate their environmental credentials. In contrast, the broad acre pastoral industries are currently facing less public pressure with Seymour and Ridley (2005) noting there were few drivers for EMS adoption in these sectors and a fully compliant ISO 14001 approach is not practical for most family farms (Banney 2002; Huhn *et al.* 2005; Seymour *et al.* 2007).

Producer recruitment into the Pastoral EMS pilot project

The high initial interest in EMS from western Queensland producers is consistent with the findings of Pahl (2003), who reported that over 70% of rangeland producers were interested in some type of environmental certification. Very few studies have reported how producer groups or individuals have been selected or recruited into agricultural EMS projects. However, Huhn *et al.* (2005) and Reid and Ridley (2005) advised that existing supply chain or landcare and catchment groups could be targeted and used as the basis for recruiting producers into EMS. For this

Table 5. Example of a risk assessment, developed by a producer participating in the Pastoral EMS project

Risk (environmental, production and marketing)	Cause	Ranking (low, medium or high)
Decline in pasture quality and quantity	<ul style="list-style-type: none"> • Stocking pressure (domestic and feral) • Climate variability • Woody vegetation thickening and spreading • Introduced pasture pests 	High
Wild dogs	<ul style="list-style-type: none"> • Ineffective control procedures 	High
Inability to respond to and profit from market opportunities	<ul style="list-style-type: none"> • Lack of production diversity • The standard and level of structural and pasture improvements • Not knowing what is happening and/or how to respond to situations • Not innovative or creative enough 	Medium
Suboptimal production levels	<ul style="list-style-type: none"> • Nutritional fluctuations and deficiencies • Predators • Management deficiencies • Costs and financial uncertainty 	Medium
Chemical contamination	<ul style="list-style-type: none"> • Lack of practical alternatives to chemicals 	Medium
Major disease outbreak (Ovine Johnes Disease; exotics)	<ul style="list-style-type: none"> • Introduction of infected animals or other material 	High
Labour availability	<ul style="list-style-type: none"> • Population decline in rural areas • Rural work not seen as a desirable career path. 	Medium

Table 6. Example of the objectives and targets, action and monitoring plans, developed by a producer participating in the Pastoral EMS project

Risk	Decline in pasture quality and quantity (build up feed in goat paddocks)
Is there a legal requirement?	No
Objective (What I aim to do to alleviate the risk)	Improve pasture quality/quantity
Targets (What I aim to achieve, by how much and when)	2004–06: increase quality/quantity of available feed 2004 onwards: control regrowth
Actions (how am I going to do it?)	When Done (✓)
• Assess feed quality/quantity regularly — has all been seeded to Buffel.	Monthly ✓
• Reduce goat numbers if needed by selling to best market — do a ‘whole of property’ muster to get numbers up for selling at the same time — employ gyrocopter and extra man on bike.	Annually or as needed ✓
• Visually assess regrowth — increase goat numbers to these paddocks to control regrowth while monitoring pasture condition.	Monthly ✓
• Measure rainfall and record — gauge is at dam and trap yards.	When it rains As needed
Monitoring (how will I know if I have met my targets?)	When Done (✓)
• Visually assess feed on ground.	Monthly ✓
• Muster/draft sale goats — gyrocopter and extra man.	Annually or as needed ✓
• When adequate feed and regular rainfall returns, burn part of paddock to reduce timber on the ground.	Hopefully in 2006
Comments (complete if delays/problems)	Lack of rain has delayed pasture response and timber clean-up.
Signature:	Date:

EMS pilot project, the most successful methods of recruitment were the Pastoral EMS information days and presentations to established producer groups; these recruited 78% of producers. Personal contact both before and after the information days was also very important in achieving producer involvement in the project. Collins *et al.* (2001) also recruited producers using personal contact and prominent or ‘champion’ producers.

A facilitated approach to EMS training – more successful with groups

This EMS pilot project took a facilitated approach to training, whereby producers learnt about EMS as they developed it for their property. Delivery of the training was flexible in both the number and frequency of workshops, depending on the participants’ requirements. Roberts *et al.* (2005) also reported that flexible training workshops delivered over time (albeit to ISO 14001 standard) have proven successful in training producers. The approach by the Pastoral EMS project has been particularly successful with groups of producers, as highlighted in Table 3, as all the producers trained in groups have developed and implemented the Pastoral EMS, compared to 79% of individuals.

The training provided to groups of producers was more structured, with predetermined meeting dates and agendas, more detailed explanations and discussion generating activities as well as time for producers to write their own EMS during meetings. These factors are probably some of the reasons why groups have made more progress with their EMS than individuals.

Producers working in the groups also derived several other benefits similar to those reported by Riddiford (1999), Banney (2002), Ridley *et al.* (2003) and Ridley (2004). The work of Banney (2002), Anon. (2004) and Roberts (2004) found producers often obtain social benefits from being part of a group. This supports Ridley *et al.* (2003), who found that groups can engender a sense of belonging and reduce the isolation common on family farms. The Pastoral EMS producers working

in groups also benefited from the ideas and discussions of the group, which individual producers were not exposed to. Groups can collectively contain a lot of experience and a diversity of views and knowledge, and the discussion that occurs may result in more informed and better decisions (Banney 2002; Ridley *et al.* 2003; Ridley 2004).

EMS implementation – support, enthusiasm and progress

There has been little EMS progress by producers outside of meetings and without the presence of the project team. It is unlikely that the majority of producers would have progressed this far without the coordination, encouragement and assistance provided by the team. The importance of ongoing external support for producers developing and implementing EMS has also been mentioned by Anon. (2004) and Huhn *et al.* (2005); producers also identified the need for, and importance of, this support (Roberts 2004; Roberts *et al.* 2005).

As most producers have progressed through to the end of their first cycle of the Pastoral EMS, it is apparent that their enthusiasm and motivation for EMS has declined. This can be demonstrated as producers from 40 properties have been trained in the first six steps of the Pastoral EMS and only 36 have developed and implemented these steps. Of the 40 that have been trained, only 32 have completed the 7th step, management review. This decline may be at least partly explained by Ridley *et al.* (2003). They suggest that producers can be ‘turned off’ EMS if their first experiences are with the more ‘bureaucratic’ elements such as policy, objectives and targets, and they recommend that an environmental self assessment activity is an effective way to introduce EMS. This initial self-assessment stage was also recommended by Banney (2002), Van de Wouw (2005) and J. Williams, J. O’Sullivan and K. Roberts, unpubl. data. It is similar to the strategic business planning process promoted by Pahl and Yeoman (2005), which preceded the development and use of EMS.

Carruthers and Tinning (2003) found that participants in a grains industry pilot were universal in their desire to minimise paperwork. Despite the Pastoral EMS containing minimal documentation, the majority of producers have subsequently made little progress with their EMS beyond the initial planning and development stage. Given that most benefits of EMS are not immediately apparent (Anon. 2004; Watson and Galligan 2005), producers tend to succumb to the short-term documentation pain. If this is then combined with busy and/or stressful periods, such as drought, then it is not surprising that producers will lose enthusiasm for EMS and even stop implementing it (Anon. 2004; Medhurst 2005; Van de Wouw 2005).

Anon. (2004) reported that adoption of EMS has been greater where EMS has been led by an industry group. This is supported by Loveday (2003) and Watson and Galligan (2005), who report that in industries such as seafood and cotton, the respective peak industry bodies are driving the uptake of EMS due to the pressures felt by growers from the community and government. In the case of the Pastoral EMS project, there has been no relevant industry body promoting EMS to producers.

Conclusions

A high level of uptake of EMS in broad-acre industries is not occurring, due to the lack of tangible benefits for producers who have invested time, money and resources in this process (Banney 2002; Roberts 2004; Pahl and Yeoman 2005). To counter this, it is recommended that a staged approach to EMS is necessary. This must start with some form of self-assessment which allows producers to rate themselves against best practice criteria for their industry. Such a self-assessment can act as a trigger for improvement, enabling producers to develop and implement an EMS in line with their motivations and requirements. Following a self-assessment, producers could be then introduced to a customised EMS that suits their needs or market requirements, should this demand become more evident.

To foster increased levels of voluntary adoption of EMS in the pastoral industries, considerable effort is required to recruit producers, obtain their interest and to gain uptake of the process. It has been recognised that, for wide scale adoption to occur, industry champions need to be personally contacted by extension officers who are familiar and respected by them. These industry champions have been shown to be quite influential and, once they have experienced the benefits of the process, they are more likely to promote this to the small rural communities they are part of.

Training in EMS needs to be delivered so that producers can learn about EMS while they are developing one for their property. Training needs to be flexible, interesting and relevant and it must fit in with the busy schedules of producers. If possible, training in a group situation is preferable, as producers gain immense benefits from the motivation, enthusiasm, support and discussions that groups generate. However, for those producers who have to work individually, either by choice or isolation, some form of support network is vital. This support can come from other producers and/or organisations with a vested interest in the outcomes of EMS, such as government departments, catchment organisations and industry groups. This support network is vital for producers working in groups or individually, to encourage and maintain EMS development and

implementation, particularly where no drivers for EMS adoption exist. For EMS adoption and implementation to increase, it is likely that producers will need external benefits or recognition.

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