final report

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Developing a business case for monitoring natural resources on farm

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Abstract

Hyder Consulting were contracted by Meat and Livestock Australia (MLA) in August 2007 to assess the business case for on-farm monitoring. This project aims to provide the foundation for a MLA communications initiative (under its education and extension program) to promote the benefits of monitoring on-farm natural resource condition.

Key conclusions which can be drawn from this study include:

- Monitoring of natural resources is integral for ensuring effective on-farm planning and decision making.
- A diversity of tools, ranging from the simple to the sophisticated, are currently used by producers for on-farm monitoring of natural resource condition. However, the adoption of these tools is largely dependent upon their ability to create business benefits in on-farm environments which are typically resource constrained.
- Internal drivers for on-farm monitoring of natural resources include the potential for reducing production costs and risks, increasing asset values and productivity and provision of alternative income streams.
- External drivers for on-farm monitoring of natural resources include ensuring compliance with environmental regulatory requirements and meeting public expectations regarding the production of food.
- Further research is required to accurately quantify benefits associated with on-farm monitoring. The findings of this research may be used to develop a more compelling business case for on-farm monitoring of natural resources.

Executive Summary

Monitoring on-farm natural resources is increasingly recognised as essential to achieving sustainable land and water management. Data on the condition of soil, water and vegetation (including native and improved pastures), on farm can enable producers to take a more fact-based approach to on-farm decision making. Many landholders undertake adhoc monitoring through daily observations relating to changes in natural resource condition on their property. However, the majority of land managers do not undertake any formal monitoring or apply consistent methods for monitoring or document their observations. This lack of systematically recorded monitoring data for on-farm resource condition is a gap in the farm management.

This project aims to provide the foundation for a MLA communications initiative (under its education and extension program) to promote the benefits of monitoring on-farm natural resource condition. It builds upon a project finalised by Hyder involving a national evaluation of on-farm natural resource monitoring tools.

Hyder undertook extensive consultation with a number of large pastoral companies and smaller agricultural enterprises to identify red meat producers who were currently monitoring on-farm natural resource condition. Over 125 producers were contacted by Hyder and 50 producers were sent a survey, including questions related to determining business benefits associated with on-farm monitoring. Eight case studies were selected from the completed surveys which highlighted a range of business benefits associated with on-farm monitoring of natural resources. These benefits can be categorised according to internal business drivers and external business drivers.

Key conclusions which can be drawn from this study include:

- Monitoring of natural resources is integral for ensuring effective on-farm planning and decision making.
- A diversity of tools, ranging from the simple to the sophisticated, are currently used by producers for on-farm monitoring of natural resource condition. However, the adoption of these tools is largely dependent upon their ability to create business benefits in on-farm environments which are typically resource constrained.
- Internal drivers for on-farm monitoring of natural resources include the potential for reducing production costs and risks, increasing asset values and productivity and provision of alternative income streams.
- External drivers for on-farm monitoring of natural resources include ensuring compliance with environmental regulatory requirements and meeting public expectations regarding the production of food.
- Further research is required to accurately quantify benefits associated with on-farm monitoring. The findings of this research may be used to develop a more compelling business case for on-farm monitoring of natural resources.

Contents

1 Background

Effective planning is a fundamental aspect of any business and farm businesses are no exception. Monitoring natural resources is critical to identify emerging issues and also to measure progress against business goals. Following the establishment of baseline information regarding on-farm natural resources which have strong linkages to the production process, monitoring enables producers to determine if their management actions are depleting or restoring the natural capital on their property. Evidence from successful producers shows that monitoring on-farm natural resources can play an important role in boosting agricultural productivity. Monitoring is also likely to become more important as Australian producers need to demonstrate responsible environmental management.

Motivating factors as to why a producer may decide to monitor on-farm natural resources can be categorised according to internal and external drivers (Grodeki *et al.,* 2004). Internal drivers for monitoring on-farm natural resources primarily relate to improving management. External drivers include environmental management systems, quality assurance systems, international food markets, national and state legislation and strategies, regional bodies and industry organisations.

Internal drivers arise from a landholders business circumstances and include factors such as reducing operating costs, maintaining and improving on-farm natural resource condition and long term productivity, identifying and managing risk, providing access to alternative markets and improving the value of the land asset. External drivers include meeting regulatory requirements, and industry and market standards, as well as regional and industry expectations.

Hyder has recently completed a project commissioned by MLA to identify the tools available to assist rural producers monitor natural resource condition. These tools have been produced by a wide variety of organisations with an interest in improving natural resource management (NRM) on agricultural lands. Some of these tools have been developed and promoted by MLA.

As part of its education and extension program, MLA now intends to design and implement a communication initiative to promote a compelling business case for monitoring natural resource condition on farm. This consultancy aims to develop a business case for on-farm natural resource monitoring which will underpin a communications initiative. This consultancy has also been designed to compliment and contribute to a separate consultancy (contracted to Sefton and Associates) which will produce eight case studies highlighting the benefits of monitoring natural resource condition.

2 Project Objectives

The project objectives for this project were initially:

1. Develop a compelling business case for on-farm monitoring of natural resources via developing 6 case studies.

During delivery of the project the project objectives were modified by MLA to:

1. Identify eight red meat producers who are successfully monitoring natural resource condition on farm;

2. Provide details of red-meat producers successful undertaking on-farm monitoring of natural resource to Sefton and Associates; and
3. Build a theoretical case for monitoring natural resource condition on farm that will augment the case studies prepared by Sefton and Associates.

3 Methodology

3.1 Consultations with producers, government agencies, industry groups and research institutions

Hyder consulted approximately 125 stakeholders involved in the development and/or the application of on-farm natural resource monitoring tools. A detailed list of all contacts is provided in Appendix 7.1. Hyder used its established network of contacts and the organisations involved in the recent national evaluation of NRM tools for MLA, including:

- Australian red meat producers;
- Australian state government agriculture agencies, e.g. Department of Primary Industries Queensland, Victoria and NSW;
- Regional organisations involved in the delivery of NRM;
- Research organisations such as universities, CSIRO and Grains Research and Development Corporation; and
- Landcare co-ordinators.

Hyder liaised with large pastoral companies with a track record in natural resource monitoring and dedicated staff for this purpose such as Stanbroke Pastoral Company, the Australian Agricultural Company, Heytsbury and Kidman and Co. Hyder also ensured that smaller agricultural enterprises were also included by contacting key individuals such as Dr Richard Price, the program manager for the Grain and Graze Program. The consultation process identified 50 red-meat producers who are currently undertaking natural resource monitoring.

3.2 Interview Case Study Participants

Hyder developed a survey to assist with the structured collection of data and sent it to the 50 red meat producers identified during the consultation process. A copy of the survey template is provided in Appendix 7.2. The survey collected the following information;

- Name of property where tool/s currently applied;
- Number of months/years which tool/s has been used;
- Natural resources currently monitored;
- Frequency of application of tool;
- Process for management of data;
- How have management practices changed as a result of tool application; and
- Benefits to production process and evidence to support use of tool.

Nine surveys were completed by a cross section of producers. Survey results were entered into a Microsoft Access database. Hyder under the direction of MLA were requested to pass these project materials on to Sefton and Associates to enable them to deliver against their case study deliverables (authorised under a separate contract with MLA and to focus on delivering a theoretical business case for on-farm monitoring of natural resources. This direction was provided following interim analysis of the completed survey's where it became evident that information to support the development of a compelling business case (using case studies alone) was not readily available.

3.3 Preparation of theoretical business case

A theoretical business case for on-farm monitoring of natural resources was compiled using information collated from literature and discussions with producers and representatives from industry, government and research institutions. The report highlighted key internal and external driver business benefits associated with on-farm monitoring of natural resources where benefits were highlighted using examples from the producer surveys.

4 Results and Discussion

4.1 Internal Business Drivers

4.1.1 Reducing production costs

Monitoring natural resource condition provides producers with important information for assessing the appropriateness of current management practices. For example, monitoring soil condition indicators such as nutrients, organic matter and acidity, can help to verify the effectiveness of fertiliser application regimes. This can lead to reduced capital and operational costs.

"Monitoring soil condition has enabled us to gain a detailed understanding over time of the various soil types on our property which has enabled us to significantly reduce the application of traditional soil fertilisers. This has produced significant cost savings."

Gilgai, Western NSW producer

4.1.2 Maintaining and improving on-farm natural resource condition and long term productivity

Maintaining good resource condition is essential to maintaining the long term productivity of any property. Long-term productivity is influence by a range of natural resources including; soil fertility, soil structure, soil biota, pasture composition (including weeds), pest and disease burdens. Monitoring of these natural resources may enable producers to protect and improve long-term farm productivity.
Monitoring tools such as Stocktake provide producers with critical information regarding the effects of grazing on pasture composition. Information such as this can assist producers to determine whether their current practices are degrading or enhancing the natural resource capital on their property.

"Monitoring available pasture reserves combined with rainfall forecasts enables us to project potential landscape impacts under different stocking scenarios. This approach has yielded

improved productivity through enabling cows to retain better body condition which has in turn resulted in improved weaning rates."

Wandoan, Qld producer

4.1.3 Identifying and managing risk

Monitoring on-farm natural resources can assist producers to better idenfity and manage on-farm risks. Monitoring can be helpful in detecting imbalances in soil, plants and animal indicators so that management actions can be taken to minimise risks such as weed and pest.outbreaks. Monitoring groundcover provides another example of where monitoring can alleviate production and erosion risks.

"We have the ability to better understand the impact of stocking rates and grazing according to land type. That means we can make more informed decisions about things like strategic positioning of fence lines, which will ultimately improve soil and pastures."

Western Queensland producer

4.1.4 Factual approach to decision-making

Monitoring can provide an improved spatial understanding of on-farm variability in resource condition, promoting more targeted management actions at property scale. This information can lead to a greater awareness of changes in critical natural resource assets, which can be assessed against historical climate data and management actions. Monitoring can be used to determine if current enterprise types are appropriately suited to farm land and soil types, which helps optimise the enterprise mix and increase profitability. For example, only a proportion of a property may be suited to high input, improved pasture systems, while other areas of the property may be suited to lower input, native pastures. Robust monitoring information collated over time will provide producers with more confidence when considering significant changes to current practices.

"Whilst the monitoring does not have a huge impact on day-to-day management, the goal is to build a body of information which will affect management over time. This all leads to better decisions made by station managers to maintain and increase land condition as well as a greater awareness of natural resources."

North and Western Queensland producer

4.1.5 Access to additional markets

Certain markets favour agricultural products that have been grown in an environmentally friendly manner – organic or free range meat, and chemical-free fibres, such as wool, are now commonly marketed at premium prices. For example, the UK leading supermarket chains now supply a significant proportion of their food lines as certified organic produce. This is no longer viewed as a niche market and is growing at 40 per cent per year (Grodeki et al., 2004).
Australian primary producers are also becoming increasingly aware that one of the competitive advantages they can develop is a 'clean and green' image and label.

"AACo's investment in monitoring brings a number of returns. Its branding of 1824 Premium Beef as a 'green' product can be backed up with facts and it can charge market premiums for its products to capitalise on the traceability and sustainability of its production system."

North and Western Queensland producer

4.1.6 Potential for diversification of income

Red meat production businesses are significantly exposed to both national and international market forces, as well as climatic variability and impacts. On-farm monitoring may provide a useful catalyst for producers to seek to enhance or supplement their business income from sources other than conventional farming production through diversifying their business activities. For example, monitoring information for indicators such as organic soil matter and soil nutrients may provide producers with information to consider new entrepreneurial initiatives such as locking up areas of a property for promotion of biodiversity and carbon sequestration.
Emerging eco-service industries such as carbon sequestration, biodiversity protection and improving water quality in urban catchments, may require monitoring systems to be in place to ensure that eco-services are being generated.

"Long term improvements in on-farm biodiversity, aided by monitoring has provided us with natural capital worthy of alternative future enterprises such as education and nature tourism farm stays. This reduces our dependency on cattle money when stock numbers are reduced in accordance with seasonal conditions".

Queensland producer

4.1.7 Improving property values

A systematic record of historical monitoring information can indirectly influence property asset values. Information on the health of on-farm natural resources recorded over time can provide valuers and potential purchasers with a detailed account of the status of natural capital. It can provide information on how well a property has been managed over the long term.

4.2 External Business Drivers

4.2.1 Compliance with environmental regulatory requirements

On-farm production systems have been exposed to increasing levels of environmental regulatory requirements in recent years. Key examples of federal legislation include Environmental Protection and Biodiversity Conservation Act 1999 and the Water Act 2007. Monitoring provides the necessary information to demonstrate compliance with land management obligations outlined in legislation. Strategies such as the Queensland Rural Leasehold Strategy (2003) also include requirements for land managers to assess their potential environmental impacts and to monitor property natural resource condition so that management activities are adopted which minimise these impacts (Grodeki et al., 2004).

"Monitoring provides us with the necessary information to demonstrate compliance with regulations and forces State Agencies to be more objective in their decision making".

South Australia, Queensland and Western Australia producer

4.2.2 Compliance with environmental management systems and quality assurance schemes

Potential environmental impacts arising from on-farm management practices has resulted in governments, industry associations and some land managers supporting the adoption the ISO 1400 Environmental Management System approach or other quality assurance schemes. An example of a relevant EMS for meat producers is the AEMS EMS, a tool for producers to measure and monitor environmental management. Monitoring information is critical for

demonstrating continuous improvement in minimising environmental impacts and risks associated with agricultural production.

"You have to have hard evidence to know if you're going forward," says Neville. "We now pay much closer attention to maintaining ground cover and preventing land degradation. It's been a learning process."

Rockhampton producer

4.2.3 Public sentiment

Natural resource monitoring information can be used to demonstrate sound environmental management practices. As environmental stewards, producer's management practices directly influence the natural resource base upon which they are dependent. Increasingly the community is questioning these management practices across the agricultural sector. The Ipsos Report (Ipsos Pty Ltd, 2006) found that agricultural issues such as salinity, biodiversity loss and soil erosion were beginning to attract the attention of the Australian community. The participants interviewed during the Ipsos market research stated that the lack of information regarding the sustainability of agriculture, created doubts and negative perceptions in the minds of government policy makers and opinion leaders. Natural resource monitoring information can be used to substantiate good management practices and build greater credibility in the agricultural sector.

"Monitoring gives us hard data if we need to justify our land management decisions to outside interests. If you don't have evidence to back you up then people can assume the worst."

Western Queensland producer

5 Conclusions and Recommendations

Key conclusions which can be drawn from this study include:

- Monitoring of natural resources is integral for ensuring effective on-farm planning and decision making.
- A diversity of tools, ranging from the simple to the sophisticated, are currently used by producers for on-farm monitoring of natural resource condition. However, the take up of these tools is largely dependent upon their ability to create business benefits in on-farm environments which are typically resource constrained.
- Internal drivers for on-farm monitoring of natural resources include the potential for reducing production costs and risks, increasing asset values and productivity and provision of alternative income streams.
- External drivers for on-farm monitoring of natural resources include ensuring compliance with environmental regulatory requirements and environmental management and quality assurance systems and meeting public expectations regarding the production of food.
- Further research is required to accurately quantify benefits associated with on-farm monitoring. The findings of this research may be used to develop a more compelling business case for on-farm monitoring of natural resources.

6 Bibliography

Grodecki A, Hey K and Gardiner. D (2004). *A landholder's monitoring guide for sustainable natural resource management practice.* Department of Natural Resources Mines and Energy, Indooroopilly, Qld Australia.

Ipsos Pty Ltd (2006). Environmental stewardship requirements for Australian Broadacre farmers. Farm Policy Journal. Vol.3 November 20

7 Appendices

7.1 Appendix 1 – Key Contacts

Organisation	Case Study Available? (Y)
CSIRO Centre for Sustainable Ecosystems - Brisbane	
CSIRO Centre for Sustainable Ecosystems - Canberra	
CSIRO Centre for Sustainable Ecosystems - Alice Springs	

Organisation	Case Study Available? (Y)
Centre Landwatch	
Dept of Agriculture WA	
CSIRO	
Victorian Department of Primary Industries	
CSIRO	
Rural Industries Research and Development Corp (RIRDC)	
Grains Research and Development Corporation (GRDC)	
Queensland Department of Primary Industries	
NSW Department of Primary Industries	
Queensland Department of Natural Resources and Mines	
NT Department of Primary Industries, Fisheries & Mines	

Organisation	Case Study Available? (Y)
NT Department of Infrastructure Planning and Environment	
NT Department of Natural Resources, Environment and the Arts	
Tropical Savanna Co-operative Research Centre, Darwin	
Western Australian Department of Agriculture	
Department of Enironment & Heritage	
South Australian Department of Primary Industries and Resources	
Land and Water Australia	
Dairy Australia	
Grain and Graze	
South Australian Department of Water, Land and Biodiversity Conservation	
National Dryland Salinity Program	
National Program for Sustainable Irrigation	
Tasmanian Department of Primary Industries Water and Environment	
Tasmanian Institute of Agricultural Research	
Victorian Department of Sustainability and Environment	
Western Australian Department of Conservation and Land Management	
The Co-Operative Research Centre for Beef	

Organisation	Case Study Available? (Y)
The Co-Operative Research Centre for Weed Management	
Greening Australia	
Mallee Sustainable Farming Inc	
Natural Resources Commission	
Northern Rivers CMA	
Australian Government Facilitator - NSW Bushcare	
Australian Government Facilitator - NSW Landcare	
Australian Government Facilitator - NSW Rivercare	
Australian Government Facilitator - Vic Bushcare	
Australian Government Facilitator - Vic Landcare	
Australian Government Facilitator - Vic Rivercare	
Australian Government Facilitator - QLD Biodiversity	
Australian Government Facilitator - QLD Bushcare	
Australian Government Facilitator - QLD Rivercare	

Organisation	Case Study Available? (Y)
Australian Government Facilitator - SA Bushcare	
Australian Government Facilitator - SA Landcare	
Australian Government Facilitator - SA Rivercare	
Australian Government Facilitator - WA Bushcare	
Australian Government Facilitator - WA Landcare	
Australian Government Facilitator - WA Rivercare	
Australian Government Facilitator - Tas Bushcare	
Australian Government Facilitator - Tas Landcare	
Australian Government Facilitator - Tas Rivercare	
Australian Government Facilitator - NT Bushcare	
Australian Government Facilitator - NT Landcare	
Australian Government Facilitator - NT Rivercare	

Organisation	Case Study Available? (Y)
Australian Government Facilitator - ACT Bushcare and Landcare	
Australian Government Facilitator - ACT Rivercare	
Border Rivers-Gwydir - NSW	
Border Rivers-Gwydir- NSW	
Central West- NSW	
Hawkesbury-Nepean- NSW	
Hunter-Central Rivers- NSW	
Hunter-Central Rivers- NSW	
Hunter-Central Rivers- NSW	
Lachlan- NSW	
Lower Murray Darling- NSW	
Murray- NSW	
Murrumbidgee- NSW	
Northern Rivers- NSW	
Northern Rivers- NSW	

Organisation	Case Study Available? (Y)
Northern Rivers- NSW	
Southern Rivers- NSW	
Southern Rivers- NSW	
Sydney Metro- NSW	
Sydney Metro- NSW	
Western- NSW	
East Gippsland- Vic	
Glenelg-Hopkins- Vic	
Goulburn Broken- Vic	
Mallee- Vic	
North Central- Vic	

Organisation	Case Study Available? (Y)
North East- Vic	
Port Phillip and Westernport- Vic	
West Gippsland- Vic	
Wimmera- Vic	
Border Rivers Maranoa-Balonne - Qld	
Burdekin- Qld	
Burnett-Mary- Qld	
Cape York- Qld	
Condamine- Qld	
Desert Channels- Qld	
Fitzroy- Qld	
Northern Gulf- Qld	
South-East QLD	
Southern Gulf- Qld	
South-West QLD	
Alinytjara Wilurara - SA	

Organisation	Case Study Available? (Y)
Eyre Peninsula- SA	
Kangaroo Island- SA	
Adelaide and Mt Lofty Ranges- SA	
Adelaide and Mt Lofty Ranges- SA	
Senior Project Officer, Mallee & Burra Water Resources SA Murray-Darling Basin NRM Board	
South Australian Murray Darling Basin- SA	
Northern & Yorke- SA	
South Australian Arid Lands- SA	
South East- SA	
Avon - WA	
Northern Agricultural - WA	
Rangelands (Northern) - WA	
Rangelands (Southern) - WA	

Organisation	Case Study Available? (Y)
South Coast - WA	
South West - WA	
Swan - WA	
North- Tas	
North-West - Tas	
Alice Springs - NT	
Alice Springs - NT	
Darwin - NT	
Katherine-NT	
ACT - ACT	
Land and Water Australia	
Heytesbury	Y
S.Kidman and Co	Y

Organisation	Case Study Available? (Y)
Stanbroke	Y
Victoria River District Conservation Association	
Consolidated Pastoral Company	
Traprock Wool Association	Y -

Organisation	Case Study Available? (Y)
Lyndavale Station (Southern Beef Producers)	
Lilla Creek and New Crown Station (Southern Beef Producers)	
Narwietooma Station	
Yamba Station, Alice Springs	
Gippsland Natural Beef	
Livestock Officer	
NRCMA Contractor (Upper Clarence)	
Jigsaw Farms	
"Stoneleigh" Ando via Bombala	
"South Bukalong" Bombala	
Pathways to EMS	

Organisation	Case Study Available? (Y)
Grasscheck	
Stocktake	
Woodgreen Station, Alice Springs	Y
Gilgai' Geurie NSW	Y
RCS Hassall	
Australian Agricultural Company	Y
Pinetrees', Delungra, NSW	
Consultant	
Queensland Water and Land Carers Inc (QWaLC)	
VegMachine Participant	Y
coordinator Brigalow Jimbour Landcare Group 'Glenoak', Brigalow	

Organisation	Case Study Available? (Y)
'Bellevue' Millmerran	
Dept. Primary Industry, Fisheries and Mines	
Dept of Natural Resources, Environment and the Arts	
NT Cattleman' Association (NTCA	
Grazing Land Management Officers	
Grazing Land Management Officers	
King Island NRM	

Organisation	Case Study Available? (Y)
Joint Program Leader, Red Meat Targets	
sheep graziers in the Burra area	Y
Bega Cheese	
Australian Wool Innovation Limited	
North Central CMA Regional Landcare Coordinator	
DPI Kyabram	

Organisation	Case Study Available? (Y)
Manager Community Partnerships & Projects RMIT University	
producer at Wandoan, Qld	Y
''Fortuna' Aramac Qld	Y
Melrose' Rockhampton	Y
Dukes Plains' Theodore	
near Moura, Qld	
near Baralaba, Qld	
Elton Downs' Hughenden	
Naringla', Yeoval	

Organisation	Case Study Available? (Y)
Lake View', Uralla	

7.2 Appendix 2 – Survey template

Landholder interview questions

Date and time:

Contact:

1) Name of the property where the tool(s) is currently applied

2) Name of tool

3) Description of Tool(s)

4) Number of months/years which the tool(s) has been used

5) Natural resources which are currently monitored:

6) Frequency of application of tool

7) Processes used for management of data

8) How have management practices changed as a result of tool application?

9) Examples of benefits to production process and evidence to support use of tool i.e.:

- **Improved productivity**
- **Reduced costs**
- **Increased natural resource security (access to water land, grazing rights)**
- **Diversifying income (environmental services, new enterprises)**
- **Reducing production risk (i.e. reduced erosion)**
- **Opening of niche markets (ecolabeling)**
- **Market access (environmental trade barriers)**

7.3 Appendix 3 – Completed Case Studies

Case Study Details

Case Study Name
Number 1

Size of Property
2550ha

Livestock Production Type
Wool, Beef, Mutton and Lamb

Name of Tool(s)
Holistic Resource Management; Natural Sequence Farming Principles Cell Grazing; Advance Sowing techniques; Pasture Cropping and No Kill Till; Pastures from Space; Soil Food Web

Description of Tool
Utilisation of a comination of simple natural resource monitoring techiques e.g. monitoring soil condition and sophisticated monitoring techniques involving use of remote sensing for quantification of pasture biomass..

Months of application
43 months

Natural resources monitored
Water cycles, mineral cycles, energy cycles, native flora and fauna. Land Function Analysis ex David Tongway

Frequency of use
Every day

Data Management Process
'Paddock Action Management QA Plus' software with mapping, pastures from space and individual animal records.; 'Quickchecks" ecology monitoring with Vanguard Business Services; Land Function Analysis with David Tongway and Peter Ampt from FATE program

Changes in management practice
Complete reversal from conventional agriculture techniques

Benefits
Improved productvity, reduced production costs, reducing production risk

Case Study Name
Number 2

Size of Property	Livestock Production Type
Variable	Beef

Name of Tool(s)
GRASSCheck (modified)

Description of Tool
It is basically an AACo version of GRASSCheck

Months of application
Pasture monitoring undertaken anually on all properties since 2000

Natural resources monitored
Waterways/riparian areas, pastures, soil, vegetation, special value areas, rainfall

Frequency of use
Annually, with movement to bi-annually for some tools.

Data Management Process
Collation and analysis of data at central point (i.e. rangelands manager, rangelands officers)

Changes in management practice
Better decisions can be made by station managers that increase/maintain land condition. Greater awareness of natural resources and their role in appropriate management practices.

Benefits
Improved productivity, reduced production costs, increased natural resource security, reduced production risk, opening niche markets, diversifying income

Case Study Name
Number 3

Size of Property	Livestock Production Type
27,000 ha	Beef cattle breeding producing weaners

Name of Tool(s)
"How often" as well as photo points to monitor restoration of degraded country

Description of Tool
Rainfall modelling tool obtained through DPI. It models rainfall and gives a prediction of likely rainfall allowing users to develop a feed budget. They are about to integrate it with another tool ‘Stocktake’

Months of application
6 months

Natural resources monitored
This is mainly a tool which monitors pasture condition because the ultimate aim is to never let the Mitchell Grass get lower than about 14cms.

Frequency of use
Every six weeks

Data Management Process
Excel spread sheet that looks at total number of livestock and compares it to the kgs of dry matter on the property at the time.

Changes in management practice
Making decision regarding carrying capacity according to land condition. Examples of decision include fencing to different land types and managing each land type accordingly

Benefits
Improved productivity - More production with less damage to pastures; Reducing production risk (i.e. reduced erosion) - always matching livestock carrying capacity to available pasture without damage

Case Study Name
Number 4

Size of Property	Livestock Production Type
27,000 ha	Red meat (Breeding cows and weaners)

Name of Tool(s)
GRASSCheque and photo points

Description of Tool
GRASSCheck is a pasture and ground cover monitoring tool developed and promoted by Qld DPI. Monitoring of pasture and groundcover is undertaken at approximately 20 reference sites on the property.

Months of application
120

Natural resources monitored
Groundcover as well as plant species

Frequency of use
Every 2 years

Data Management Process
Manually through collection and storage of data sheets that can be referred to.

Changes in management practice
It has made us look more closely at what we do. We wish we had started it when we first bought the property 20 years ago. We can see how natural resources respond to different management actions.

Benefits
It is hard to say but we are running more cattle now through rotational grazing. Knowing more about the property has given us security and made us more adaptable to drought.

Case Study Name
Number 5

Size of Property	Livestock Production Type
1,500 Ha	Beef cattle

Name of Tool(s)
Groundcover, pasture composition and soil composition monitoring tool/s

Description of Tool
Monitoring of ground cover levels / change. Composition of pastures
Monitoring soil composition

Months of application
144

Natural resources monitored
Vegetation, soil

Frequency of use
Daily

Data Management Process
Excel spreadsheets

Changes in management practice
Various tools have resulted in a constant refinement of operations

Benefits
Sale stock are sold earlier, feedlot ready; Less animal health treatments; Paddocks are free of cattle well before onset of winter, retaining 100% groundcover, good bulk in order to limit frost damage; Paddocks have around 3 months recovery time.

Case Study Name
Number 6

Size of Property	Livestock Production Type
8,000ha	Beef cattle breeding and fattening

Name of Tool(s)
Photo point monitoring

Description of Tool
Involves taking photos between 2 steel posts 10m appart as well as taking four photos in four points of direction from the same post. Utilises two photo points in the rotational grazing (1041ha) part of the property and four in the cell grazing (1666 ha)

Months of application
60

Natural resources monitored
Vegetation (pasture)

Frequency of use
Once annually sometimes twice a year

Data Management Process
Visual record

Changes in management practice
Much closer attention to maintaining ground cover and preventing land degradation. It has been a learning process."If we had kept doing what we were doing it would have been a disaster".

Benefits
Stocking rate has increased without damaging country , reduced land degradation

Case Study Name
Number 7

Size of Property
3844ha

Livestock Production Type
Beef breeding for store weaner production

Name of Tool(s)
Scenario Projection

Description of Tool
Stocking rate is monitored directly at all times via land condition assessment. Combined with use of RCS Grazing Chart, SOI (Southern Oscillation Index), MJO (Madden Julian Oscillation), Australian Rainman phase forecasting tool

Months of application
120

Natural resources monitored
Pasture reserves
Water quality and quantity

Frequency of use
Annually at weaning/oreg testing (April/May)

Data Management Process
Utilisation of Cattle book

Changes in management practice
Practices remain the same, but the level of informed decision-making has improved. Numbers can be adjusted in advance of the usual “too late” indicators like over-utilisation during calving, when reduction of numbers is an animal welfare issue.

Benefits
Cows retain body condition better, therefore weaning rates are improved. Weaning weights are also better protected; Reduces the need to replacement feed most spring times; Reduced production risks

Case Study Name
Number 8

Size of Property	Livestock Production Type
7900 ha	Beef cattle

Name of Tool(s)
Grass check (modified to suit own property needs), Grazing charts, Soil tests

Description of Tool
Grass check grass species, ground cover, fixed point photos at end growing & dry seasons. Monitoring of soil moisture & infiltration after rain events. Soil tests (Albrecht) to identify nutrient status & organic matter.

Months of application
Grass check since 1997 . Two soil tests over last 20 years.

Natural resources monitored
Soil, timber, water, wildlife

Frequency of use
Grass check twice yearly and soil testing as per needs

Data Management Process
All paper based recording & planning with data entered into computer for analysis purposes.

Changes in management practice
Timber treatment has been reduced substantially, grazing practices have changed & continue to change. Much emphasis is put on “water use efficiency & maximizing the amount of grass grown from any given rain event.

Benefits
Individual animal performance, more kgs beef per ha,increased water use efficiency; Better security of lease hold tenure, w; Diversification of income; Reduced production risks; Opening of niche markets

Case Study Name
Number 9

Size of Property
180,000 ha

Livestock Production Type
Beef and sheep

Name of Tool(s)
Vegmachine

Description of Tool
Vegmachine is a DPI&F led initiative involving use of satellite technology to measure long-term change in on-farm natural resources. VegMachine lets land managers access satellite data on-farm, in a form that aids management decisions.

Months of application
60

Natural resources monitored
Land condition. Allows interpretation of changes in soil and vegetation (using records dating from 1986)

Frequency of use
Annually

Data Management Process
All data is electronically available on a home based computer. Satellite imagery data is updated by Queensland DPI&F annually in October.

Changes in management practice
immediate or timely adjustments to stocking rates, ability to better understand impact of stocking rates and grazing according to land type, and positioning of fence lines

Benefits
Improved condition of soil and pastures and enabled a more uniform distribution of pasture utilisation across the property through robust monitoring information.