Final report

PDS Central Australian Self Herding (CASH)

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Abstract

The Central Australian Self Herding (CASH) Producer Demonstration Site (PDS) project demonstrated Self Herding techniques to commercial beef producers in Central Australia. Self Herding consists of various techniques to passively influence the behaviour of livestock, using food rewards and other stimuli (visual stimuli, sounds and smells) to influence where stock choose to graze and to minimise stress in situations such as yards, new water points or when trucking. Self Herding can lead to a more even spread of grazing in paddocks and so can increase resilience to droughts. It has also been suggested to result in better feed availability, improved animal production and to have animal wellbeing benefits.

Department of Industry, Tourism and Trade (DITT) extension officers and Stress Free Stockmanship practitioner, Bruce Maynard, visited producers on their stations to develop tailored training and implementation, with a focus on influencing grazing patterns. Producers identified their own aims for applying Self Herding techniques. With assistance from the practitioners, the producers designed and implemented actions to change cattle behaviour.

The project was successful in transferring knowledge of the technique to multiple producers, some of whom actively trialled Self Herding techniques. One family has incorporated Self Herding into the management of their various stations and promote the benefits.

The intended implementation of Self Herding strategies was delayed for most participants due to a run of dry years, and a subsequent shortage of forage. Travel restrictions imposed by the Covid-19 pandemic and staffing challenges contributed significantly to the project implementation and a delayed uptake. The project finished early due to these and other unforeseen factors.

Executive summary

Background

Cattle stations in Central Australia are typically very large and are extensively managed by small numbers of staff. Unconfined grazing typically results in an uneven spread of grazing and some areas may be overgrazed while others are underutilised. Many properties have legacy areas of land that are in poor condition, often from damage that occurred decades ago. The challenges of managing grazing in the large scale and relatively low carrying capacity rangelands include remoteness, staffing numbers, and typically large paddocks, often with multiple widely spaced water points. In Central Australia there is an added challenge from the extremely variable climate that leads to great uncertainty about how much grass will grow in the year or years ahead. In this context there can be significant benefits from managing grazing pressure to optimise feed production and beef production. Traditional approaches to re-distributing grazing pressure include fencing, creating new water points and imposing spelling by turning off a sub-set of waters in a paddock.

The Self Herding techniques developed by Bruce Maynard and Dean Revell (Revell *et.al.* 2015) offer additional strategies that land managers can use to influence the spread of grazing pressure while simultaneously reducing pressure and impacts in over-use areas, enabling landscape repair. Self Herding consists of various techniques to passively influence the behaviour of livestock using food rewards and other stimuli (visual stimuli, sounds and smells) to influence where stock choose to graze and to minimise stress in situations such as yards, new water points or when trucking. Self

Herding can lead to a more even spread of grazing in paddocks and so can increase resilience to droughts. It has also been suggested to result in better feed availability, improved animal production and animal wellbeing benefits.

A previous Self Herding project was carried out in the Top End of the NT with trials conducted on the Department's Victoria River Downs Research Station (also known as Kidman Springs). (Revell 2019). That project was a collaboration between the Department (then the Department of Primary Industry and Resources), Dean Revell and Bruce Maynard. A small component of that project was the delivery of two Self Herding Introductory Workshops in Central Australia at Mt Riddock and Lyndavale stations. Producer interest led to consideration of a possible Self Herding project in Central Australia. Producers were supportive of the Department developing a program to trial Self Herding across a number of seasons; an important consideration in this region with such a highly variable climate. The PDS project proposal was developed collaboratively with Bruce Maynard from *Stress Free Stockmanship*. The project plan was written by Meg Humphrys (Extension Officer), Chris Materne (Rangeland Scientist) and Bruce Maynard, with input from Meat & Livestock Australia (MLA). The PDS project was funded by MLA and commenced in 2020.

Objectives

The overarching objective was to demonstrate and validate that pasture and animal production benefits can be achieved through redistribution of grazing by applying Self Herding techniques. Added to this was the aim of assisting producers in Central Australia to tailor Self Herding to their circumstances and to obtain other benefits including animal wellbeing, efficient use of staff time and ease of stock handling. The project set targets for the involvement of core producers in applying Self Herding and the involvement of others as observer producers.

Methodology

The methodology was developed specifically for each site based on the Self Herding expertise of Bruce Maynard, with a close partnership between Bruce, the respective station and the Department's Livestock Industries Extension Officer. Information was provided to producers by a combination of phone calls, emails, station visits, webinars, and presentations at field days (Bruce presented at a field day, via video link due to COVID-19 travel restrictions). The purpose of the project and a summary of the techniques was also presented at some meetings of the Alice Springs Pastoral Industry Advisory Committee (ASPIAC).

Multiple return visits to core participants were planned. Field days were planned for involving other stations as observers. Some of these visits were conducted jointly by Bruce Maynard and the Extension Officer, while others were conducted just by Bruce Maynard. Station visits included demonstration of low stress or stress-free stock handling, discussion of the principles and benefits of Self Herding techniques, and discussion of the producer's particular needs and opportunities that Self Herding could be used to address. Elements of property planning were incorporated into the method including review of landscape and infrastructure features with the property owners/managers. That included consideration of current stock behaviours and grazing patterns and identifying things that could be beneficially changed.

The method included collecting data demonstrating the benefits of redistributing grazing pressure including potential reduction in grazing pressure on the most favoured areas and thereby maintaining better pasture condition (reducing any potential over-utilisation).

Low stress stock handling information is a foundational component of the method and Bruce ran several low stress stock handling courses as part of the project.

An important part of the methodology was collecting evidence of the planning, adoption activities, changed awareness and changes in grazing distribution and pasture conditions.

Results/key findings

Key Outcomes

The core producers involved in the project indicated an increase in knowledge and confidence in using Self Herding techniques. The project confirmed that pastoralists in Central Australia are interested in Self Herding techniques including low stress stock handling. Good examples of actual and potential applications were documented.

Results from the demonstrations will encourage producers that Self Herding strategies are practical and efficient in enterprises in Central Australia, with extensive grazing management, relatively sparse infrastructure and where staff interact with herds only a few times per year. These results are relevant to other parts of Australia's arid and semi-arid rangelands where beef cattle are grazed.

Despite a good level of general interest, the number of core producers and return visits was less than originally planned. Various challenges limited the transition of observer producers into applying Self Herding techniques and becoming core producers in the project structure. Whilst some producers became enthusiastic about Self Herding only three producers became core participants. One of these did not progress to implementing Self Herding although they have planned activities and have a strong commitment to associated low stress stock handling practices. One of the core producers implemented initial activities in 2020-2021, but became too busy to continue and in 2022 they left to manage a station for a different employer in the district.

There were various unforeseen challenges to implementing the project as planned. Travel restrictions during the COVID-19 Pandemic limited opportunities for station visits in 2020 and 2021. Very dry conditions in 2019, 2020 and leading into 2021 impacted on producer interest and capacity to trial Self Herding at that time. The department faced challenges in recruiting to the Extension Officer position at critical points for the project.

Following a careful review of capacity to meet the targets set for adoption and for collecting data it was decided to finish the project sooner that originally intended. The final field trip was in July 2023.

Overview of Other Outcomes and Outputs

Three core producers planned and/or implemented Self Herding and one of them adopted the routine use of some Self Herding techniques. Two of the producers own more than one cattle lease in the project area.

One manager adopted techniques for encouraging stock to graze more widely around a water point and also demonstrated that Self Herding could be used to effectively assist stock to become familiar with new water points, saving considerable staff time. This is being documented in a case study (in press)

Two short articles published in industry e-newsletters and presentations at industry gatherings informed the wider community of the project. One e-news article has been published and a draft case study completed for the demonstration at Lyndavale Station. An introductory webinar about Self Herding principles was presented through Future Beef.

The project generated learnings about barriers for some producers which were mainly due to being too busy, and sometimes due to stresses arising from poor pasture conditions (i.e. drought). The project also created learnings around the resourcing needed to collect systematic documentation and evidence of the application of Self Herding. In this project, more resources were needed for this component than were available.

Benefits to industry

Results from the demonstrations will encourage producers that Self Herding strategies are practical and efficient in enterprises in Central Australia, with extensive grazing management, relatively sparse infrastructure and staff interaction with herds only a few times per year. These results are relevant to other parts of Australia's arid and semi-arid rangelands where beef cattle are grazed.

The project promoted Self Herding as a way for Central Australian beef producers to achieve triple-bottom line improvements without costly infrastructure development. An increased awareness of low stress stock handling practices and Self Herding strategies that are suitable for implementation in the Central Australian region. The successful activities completed on Lyndavale and Mount Ebenezer stations provide a relevant and positive demonstration of Self Herding practices that have been documented in the draft case study. Long-term practice change has been achieved on several stations with regard to stock handling practices and Self Herding principles.

The owner-managers of Lyndavale and Mount Ebenezer stations have been impressed with results obtained from using Self Herding techniques resulting in a reduced workload. While there has been no formal evaluation of cost:benefit analysis in this instance, application of the technique required very little economic outlay and resulted in a reduction in mustering labour.

The owner-managers of Umbeara and Idracowra stations have been impressed with the potential of Self Herding. They have invested time in planning and in putting staff through low-stress stock handling training.

One other station trialled Self Herding in 2020-2021 but had to stop due to other demands on station staff. The managers subsequently moved to a different station with different owners.

Future research and recommendations

The project provides firm basis for recommending adoption of Self Herding to producers. Commercial providers exist that can service interest from producers and Department extension staff can pass on requests for information. There is no recommendation for further Northern Territory Government research and adoption projects at this stage.

PDS key data summary table

*Complete all sections of the key data summary table **applicable** to your project. Refer to the 'Engagement and Adoption Performance Metrics' section of your Agreement for key metrics that are nominated for your project.*

Project Aim:
To demonstrate the range of benefits that Self Herding can bring to grazing management for Central Australian production systems including better drought resilience, expanded feed base and improved animal production and welfare outcomes.

	Comments		Unit
Production efficiency benefit (impact) Pasture productivity – kg DM/ha Stocking rate – DSE, AE or LSU/ha	No data collected.	0	Insert unit
Reduction in expenditure	Lyndavale Station reported a reduction in labour as a result of reducing labour required to establish stock on new watering points when using Self Herding principles however there was no data collected.	0	
Increase in income		$0.00	/ha
Additional costs (to achieve benefits)		$0.00	/ha
Net $ benefit (impact)		**$0.00**	**/ha**
Number of core participants engaged in project		5	
Number of observer participants engaged in project		1	
Core group no. ha		2,225,300	
Observer group no. ha		1,500,000	
Core group no. sheep		0	hd sheep
Observer group no. sheep		0	hd sheep
Core group no. cattle		38,000	hd cattle
Observer group no. cattle			hd cattle
% change in knowledge, skill & confidence – core	*Confidence in using Self Herding techniques*	80%	
% change in knowledge, skill & confidence – observer		0%	
% practice change adoption – core	*Incorporated into ongoing practices*	20%	
% practice change adoption – observers		0%	
% of total ha managed that the benefit applies to		66%	

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1. Background

The aim of this Producer Demonstration Site (PDS) project was to demonstrate the range of benefits that Self Herding can bring to grazing management for Central Australian production systems including better drought resilience, expanded feed base and improved animal production and welfare outcomes.

Cattle stations in Central Australia are typically very large and are extensively managed by small numbers of staff. Unconfined grazing typically results in a significantly uneven spread of grazing and some areas may be overgrazed while others are underutilised. Many properties have legacy areas of land that are in poor condition, often from damage that occurred decades ago. The challenges of managing grazing in the large scale and relatively low carrying capacity rangelands include remoteness, staffing numbers, and typically large paddocks, often with multiple widely spaced water points.

In Central Australia there is an added challenge from the extremely variable climate that equates to great uncertainty about how much grass will grow in the year or years ahead. In this context there can be significant benefits from managing grazing pressure to optimise feed production and beef production. Traditional approaches to re-distributing grazing pressure include fencing, creating new water points and imposing spelling by turning off a sub-set of waters in a paddock.

The Self Herding techniques developed by Bruce Maynard and Dean Revell (Revell *et.al.* 2015) offer additional strategies that land managers can use to influence the spread of grazing pressure while simultaneously reducing pressure and impacts in over-use areas, enabling landscape repair. Self Herding consists of various techniques to passively influence the behaviour of livestock using food rewards and other stimuli (visual stimuli, sounds and smells) to influence where stock choose to graze and to minimise stress in situations such as yards, new water points or when trucking. It has been suggested that Self Herding can lead to a more even spread of grazing in paddocks and so can increase resilience to droughts. It can also result in better feed availability, improved animal production and animal wellbeing benefits.

A previous Self Herding project was carried out in the Top End of the NT with trials conducted on the Department's Victoria River Downs Research Station (also known as Kidman Springs). (Revell 2019). That project was a collaboration between the Department (then the Department of Primary Industry and Resources), Dean Revell and Bruce Maynard. Self Herding principles were first introduced to Central Australian pastoralists in July and October 2019 via two Self Herding Introductory Workshops at Mt Riddock and Lyndavale stations. The concepts and methods were very well received by the participants and stimulated progressive discussion on how the suite of Self Herding options could be applied to particular local landscape and production issues. Producers were supportive of the Department developing a program to trial Self Herding across a number of seasons; an important consideration in this region with such a highly variable climate.

The PDS project proposal was developed collaboratively with Bruce Maynard from *Stress Free Stockmanship*. The project plan was written by Meg Humphrys (Extension Officer), Chris Materne (Rangeland Scientist) and Bruce Maynard, with input from MLA. The PDS project was funded by MLA and commenced in 2020.

2. Objectives

Objective 1: Demonstrate and validate in Central Australian pastoral conditions that greater production and improved landscape impacts can be achieved through redistribution of grazing using the application of Self Herding techniques. Financial (productivity, labour costs etc) and environmental (ground cover, pasture utilisation) benefits will be obtained from a combination of:

a. Visitation to grazing areas not previously utilised by livestock

b. A change in the directional travel of livestock grazing patterns

c. A reduction in habitual overused areas associated with water points

This objective was partially achieved with the demonstration of Self Herding techniques on Lyndavale, Umbearra and Aileron stations.

Objective 2: 80% of the core producer group and 50% of the observer producers will have adopted Self Herding techniques leading to demonstrated changes in grazing patterns (data collected on livestock visitation and observed effects on soil surface and vegetation). Presence or absence of grazing effects before and after interventions (pasture utilisation, physical disturbance and deposition of nutrients) will be the observed factors collected during the project.

This objective was only partially achieved as participant numbers were lower than anticipated. Core producers are defined as those implementing Self Herding practices with clear plans on how to do so. Plans were fully implemented on Lyndavale and Umbearra stations. Aileron Station had begun implementing Self Herding techniques however the station changed ownership and management, and implementation of Self Herding ceased with these changes. Potential applications for Self Herding projects were identified for Old Man Plains Research Station, Mt Ebenezer, Idracowra and De Rose Hill Stations.

Table 1. List of project participants, the area of land and number of cattle being managed.

Core Producers			
Owners	Stations	Approx. area	Approx. cattle numbers
Lyndavale Cattle Company	Lyndavale, Mt Ebenezer, De Rose Hill	7,000km^2	11,000
Adnanta Pastoral Company	Umbearra, Idracowra	8,200km^2	4,500 Umbearra (Est. 9,000 total)
Aileron Pastoral Holdings	Aileron	4,000km^2	8,500
Department of Industry, Tourism & Trade	Old Man Plains Research Station	330km^2	1,000
TOTAL	7 stations	19,530km^2	38,000
Observer producers			
Mt Riddock Pastoral Co	Mt Riddock	2,700km^2	-
Crown Point Pastoral	New Crown, Lilla Creek, Horseshoe Bend	15,300km^2	-

Palmer Valley Station	Palmer Valley	3,000km^2	8,500
The Garden Station	The Garden	2,100 km^2	-
TOTAL	6 stations	23,100km^2	

Due to unforeseen challenges detailed in the results section, there was no pasture, cattle or economic data collected on any of the stations.

Objective 3: 100% of core producers and 80% of observer producers will have increased their knowledge and skills in relation to Self Herding techniques.

Two core producers reported an increase in their knowledge and skills in relation to Self Herding techniques during mid-project reviews. An increase in knowledge was anecdotally partially achieved through station visits for the observer producers however there is no recorded data.

Objective 4: A range of extension and communication products will be developed by NTDPIR staff with input from the project partners, to increase awareness across other pastoral areas including case studies, producer guides and stories for MLA publications.

This was partially achieved with one article introducing the project in September 2020 and another two published in mid-2022 reporting on the success of strategies implemented at Lyndavale Station. The case study for Lyndavale Station has been completed but not yet published. An introductory webinar about Self Herding principles was presented through Future Beef.

Objective 5: Production of a cost/benefits analysis of all concomitant and ancillary benefits versus time, effort and variable costs incurred in the establishment of Self Herding techniques

This was not achieved.

The variation objectives:

Objective 1: Conduct the final property visits on 4 demonstration sites to upskill producers and commence the implementation of Self Herding practices.

The final visit was conducted in mid-2023. Seven properties were visited on this occasion including the demonstration site at Lyndavale Station.

Objective 2: Completion of the Post project surveys for core producers

This has not been done.

Objective 3: Delivery of the final report.

Completed.

3. Demonstration Site Design

3.1 Methodology

The initial core producer group was based on, but not restricted to, the membership of the Alice Springs Pastoral Industry Advisory Committee (ASPIAC), a pastoral advisory group with seven producer members.

The initial visits to each core producer station involved a number of common activities explaining the concepts of Self Herding and the opportunities for using techniques for various management challenges.

The methodology for participating properties included the identification of a stock handling or grazing distribution issue relevant to the particular station and the selection of appropriate Self Herding approaches, methods, signals and attractants.

Teleconferences and follow-up visits between the project management group and the producers allowed for adjustment and refinement of the techniques.

To raise awareness of, and encourage participation in, the project, articles were published in industry newsletters and presented at industry events such as the Northern Territory Cattlemen's Association conference and the ASPIAC meetings. A case study has been prepared to document the experiences of one core producer.

3.2 Economic analysis

There was no cost:benefit analysis or economic evaluation conducted on any part of the project. Anecdotal observations at Lyndavale Station are discussed in the results section.

3.3 Extension and communication

The original project communication plan was partially completed. The following plan details the events and outputs that were delivered. Teleconferences were undertaken between the core producers throughout the project as necessary.

Table 2. Extension activities.

Date	Detail of Activity
October 2020	On-station visits (knowledge transfer/activity development) at Lyndavale, Mt Riddock & Aileron Stations.
December 2020	Presentation to ASPIAC members at 98th meeting.
March 2021	On-station visits (knowledge transfer/activity development) at Umbearra & Lyndavale stations.
April 2021	Attendance & person-to-person discussion at NTCA conference, no formal presentation.
October 2021	Presentation via video link, Landcare NT Field Day, Aileron Station.
December 2021	Draft Lyndavale Case Study completed.
March 2022	Webinar series planned for March 2022. Part 1 delivered. Demonstration and on-station progress visits for core producers.
April 2022	Static presentation at the NTCA conference.
July 2023	Final demonstration site visits.

3.4 Monitoring and evaluation

Simple descriptions of the herd management issue in question and the Self Herding technique that could be used to address the issue has been described for each of the core producers. Anecdotal results record management observations.

Entrance survey results for four core producers and two surveys post-implementation. While there are no formal post project survey results, two core producers have adopted Self Herding techniques into their regular operations. There is no data on the reach or impact of extension activities.

The original project plans to collect and analyse data on animal management and performance, feedbase and land condition were not undertaken. There is anecdotal evidence that Self Herding techniques on Lyndavale Station have resulted in labour efficiency.

The Self Herding tools and technologies, and the extension activities undertaken, have been reported in the results section.

4. Results

4.1Demonstration site results

The following factors contributed significantly to the limited results achieved in this project:

- Delayed project commencement due to the Covid19 pandemic
- Continuation of, and recovery from, prolonged dry conditions restricted the ability of many stations to implement Self Herding strategies
- The DITT Extension Officer (project officer) position was vacant for considerable periods of time throughout the life of the project
- Ill-defined roles and expectations meant that data providing evidence of the outcomes of Self Herding was not collected
- A change of ownership prevented the continuation of Self Herding on one core producer property
- Unexpected, under-staffing on the Old Man Plains Research Station prevented the implementation of planned Self Herding activities

However, there were several successful implementations (Table 3).

Table 3. Identification of practices being implemented or planned as part of the PDS.

Station	Activities
Lyndavale Station	Implementation of attractant stations to implement 'Reliable Retention' of stock onto new watering points. Results: Before utilising attractant stations it would take approximately a week to establish cattle at a new watering point. Once the cattle were let out of the night paddock at the new water, they would often head straight back to the old watering point. This would require station staff to re-muster the animals and truck them back to the new water point again. Using attractant stations means that it now takes only 24-36 hours for the cattle to remain consistently at a new watering point therefore reducing cost and disruption associated with mustering and trucking.

Ebenezer Station	Planned use of attractant stations to achieve 'Accelerate Adaptation' of heifers into the breeder herd on adjacent property. Planned use of attractant stations to redistribute grazing in the weaner paddock using a technique known as 'Water Wheeling'. No results available.
De Rose Hill Station	Planned use of 'Rapid Retrievals' using fixed attractant stations to enhance retrieval of escaped cattle. Planned use of 'Jackpots' and straight line stockmanship manoeuvres to capture animals that have evaded mustering for more than a decade. Improve the trucking transition of animals using 'Accelerated Adaptation' techniques. No results available.
Aileron Station	Implementation of attractant stations to achieve redistribution of grazing. No results available as this project was prematurely ended due to the sale of the property.
Idracowra Station	Drafting of Landscape Jigsaw. Initial planning of 'Managed movement' using 'Attractant hopping' to bring unmustered cattle toward more accessible country. Initial planning of 'Carton Jackpot' deliveries by air to change the animal/human interaction pattern with reactive cattle.
Umbearra Station	Implementation of attractant stations to increase use of Walk-Over-Weighing platform at a watering point. Results: anecdotal observation from the manager that use of the platform increased after the implementation of Self Herding techniques. Initial planning on the potential to use Self Herding to move cattle away from the unfenced railway line.
Old Man Plains Research Station	Initial planning to test attractant preferences of cattle. Stress Free Stock handling workshop, 11th June 2021, 6 participants.
Palmer Valley Station	Preliminary visits/phone calls discussing general principles of Self Herding
New Crown Station	Preliminary visits/phone calls discussing general principles of Self Herding
Lilla Creek Station	Preliminary visits/phone calls discussing general principles of Self Herding
Horseshoe Bend Stn	Preliminary visits/phone calls discussing general principles of Self Herding

4.2Economic analysis

An economic analysis was not conducted for this project however, the following observations were made:

- The Lyndavale Station Case Study found that the attractant stations could be constructed from materials already located on the property, therefore requiring minimal cost. Anecdotally, they found that using attractant stations reduced the number of days typically spent relocating cattle therefore reducing costs.

4.3 Extension and communication

Article 14/08/2019 - (prior to the current project) Self Herding in the centre - Department of Industry, Tourism and Trade

Article 18/09/2020 - Central Australian Self Herding (CASH) - FutureBeef

ABC Radio Interview 02/10/2020 - NT Country Hour - NT Country Hour - ABC Radio

ABC radio interview 12/08/2021 - NT Country Hour - NT Country Hour - ABC Radio

Information document (not published) September 2021 - An overview of the terms used in Self Herding

Landcare NT field day. October 2021 - Sustainable Grazing and Self Herding by Bruce Maynard, Self Herding Specialist - YouTube

Webinar 1/03/2022 - Self Herding basics – how to change livestock behaviours to your benefit, by Bruce Maynard hosted by FutureBeef. There is no hyperlink available for this project.

NT Rural Review, 01/05/2022, project update and link to FutureBeef article. Central Australian Self Herding (CASH) Project in action | Department of Industry, Tourism and Trade

FutureBeef eNewsletter, 01/07/2022, reporting on the Self Herding activities implemented at Lyndavale Station Rewarding cattle to graze more evenly — the benefits of Self Herding - FutureBeef

Article (in preparation) – Self Herding in Central Australia Case Study (Lyndavale Station) by Lakota Taber, for publication on the Future Beef Website (see Appendix)

4.4 Monitoring and evaluation

Table 4. Summary of results from survey answers from core producers.

Survey question	Core Producer 1 (1=low, 10=high)	Core Producer 2 (1=low, 10=high)
(Pre-survey)		
Confidence using techniques	1	6
(Progression-survey)		
Confidence using techniques	5	8
Ease of implementation	6	9
Cattle response to techniques	6	9
Success in retaining cattle on new areas	4	9
Do you need further help?	'Labour. It is hard to stay focussed on research projects when other priorities arise. Assistance in implementation would allow for better results and then more likely adoption.'	'A map for each paddock would be good.'
Comments	'I am still interested in getting cattle to new areas, and making them stay there. This is definitely happening.'	'The results we have been getting have exceeded expectations. The cattle have learnt quickly and been able to find the attractant station no matter where I have put it.'

Only two core producers completed pre-project surveys however they had already started implementing strategies at the time and so they were not truly pre-project captures. There are no post-survey results primarily because most producers were no longer engaged with the project and there was insufficient staff available to conduct the surveys.

The strategies implemented are described in section 4.1. There were 4 core producers managing 7 properties. All of the core producers participated in some low stress or stress free stock handling training. A total of 3 strategies were implemented with 2 being completed. The third strategy was cancelled when the property was sold. At least 2 of the core producers have indicated that they intend to continue using stress free stock handling practices in their day-to-day operation and one producer has fully incorporated Self Herding techniques into their operations.

5. Conclusion

5.1 Key Findings

The demonstration at Lyndavale station, and initial results from the activities at Aileron station, indicates that Self Herding techniques can be used in Central Australia to effectively retain cattle in new areas of the landscape. The demonstration at Umbearra station indicates that movement of Central Australian cattle through yards can also be influenced using Self Herding techniques.

There is a strong interest in developing stock handling skills that reduce stress and improve welfare for animals and the humans interacting with them.

When designing projects, proponents need to carefully consider labour requirements, in particular skills and time available, of all parties. In addition, where there are multiple partners involved, expectations need to be very clearly identified with regard to all steps involved in successful completion of the project.

5.2 Benefits to industry

Implementing low stress stock handling practices may result in safer, less stressful experiences for humans and cattle. This knowledge is presented as a precursor to successful adoption of Self Herding practices.

Self Herding practices can be used in the Central Australian pastoral landscape to move cattle into areas that they may not normally be grazing in. These techniques do not necessarily require a lot of input or expense to establish and have potential to save considerable amounts of labour. However, producers will need to complete some training before being able to successfully implement Self Herding techniques in the way envisioned by the development of the techniques trialled in this project.

6. References

Revell, D. (2019) B.GBP.0025 Grazing with Self Herding. Meat & Livestock Australia.

Revell DK, Maynard B, Erkelenz PA, Thomas DT (2015) 'Rangeland Self Herding' - positively influencing grazing distribution to benefit livestock, landscapes and people. Proceedings of the Australian Rangeland Society Conference, Alice Springs, 12-17 April 2015.

7. Appendix

7.1 Media articles

7.1.1 Project page published on FutureBeef, September 2022

Central Australian Self Herding (CASH)

Central Australian Self Herding (CASH) is a five year project being rolled out across the region. It is a collaboration between Bruce Maynard, a passionate farmer and co-developer of the Maynard and Revell Self Herding and self shepherding management practices. Bruce, and the local livestock team in Alice Springs are working with producers in the region to discuss how Self Herding could assist them by solving problems through animal behaviour.

Uneven grazing distribution in the extensive areas of Central Australia has resulted in overutilisation and underutilisation of pastoral grazing lands. There have been a limited number of practical options for re-distributing grazing pressure on an ongoing basis in the large scale and low carrying capacity rangelands (e.g. new water points, turning off waters and extensive fencing investments).

Self Herding offers a number of strategies for landholders to encourage utilisation in less grazed areas while simultaneously reducing pressure and impacts in overused areas. It is anticipated that repositioning grazing pressure into previously underutilised areas will increase production and enhance landscape repair. This new field of management will assist Central Australian beef producers to achieve triple bottom line improvements with cost effective investments while ensuring long-term land sustainability.

The effects of unmanaged grazing can be large and easily observable but not necessarily easily quantifiable in rangeland settings. This project will examine the amount of change possible across the landscape by implementing tools that can achieve improvements in the control of livestock. Giving people more tools in their management tool-box to observe and manage grazing using animal behavioural change empowers them and helps build resilient actions into the future.

Self Herding principles were first introduced to Central Australian pastoralists in late 2019 with short seminars and producer group meetings on two stations. The concepts and methods were well received and stimulated progressive discussion regarding how Self Herding techniques could be applied to local landscape and production issues. The participants expressed their support for a locally based program to explore the various applications of Self Herding across several seasons.

The Central Australian Self Herding project aims to:

Demonstrate and validate that greater production and improved landscape function can be achieved through redistribution of grazing using the application of Self Herding techniques in Central Australia.

1. Support at least 80% of core producers and 50% of the observing producers to adopt some or all of the Self Herding techniques demonstrated, leading to changes in grazing patterns and production benefits.
2. Achieve 100% of core producers and 80% of observer producers demonstrating increased knowledge and skills in Self Herding techniques.
3. Undertake a cost/benefit analysis of all concomitant and ancillary benefits versus time, effort and variable costs incurred in the establishment of Self Herding techniques.

How? Financial (productivity, labour costs etc) and environmental (ground cover, pasture utilisation) benefits will be obtained from a combination of:

i) Visitation to grazing areas not previously utilised by livestock.

ii) A change of livestock grazing patterns.

iii) A reduction in habitually over-used areas associated with home ranges.

If you were a beast, what would you do? Bruce Maynard, a passionate farmer and co-developer of the Maynard and Revell Self Herding and self shepherding management practices, uses the figurines to show how cattle habits are affected by more than just water and food but social dynamics too.

Duration: 2020-2025

Contact:

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7.1.2 Project update published in the Northern Territory Rural Review, May 2022

Central Australian Self Herding (CASH) Project in action

May 2022 | Lakota Taber, Pastoral Technical Officer

The Department of Industry, Tourism and Trade is facilitating the Meat and Livestock Australia funded Central Australian Self Herding Producer Demonstration Site (PDS). This is a 5 year project, currently moving into the third year.

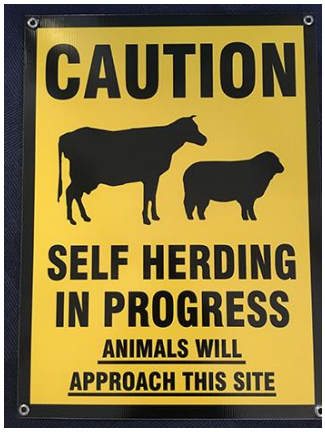
Self Herding is the brain child of Bruce Maynard and Dr Dean Revell. It is a multifaceted system for influencing cattle behaviour and the way they interact with humans. The overall aim is to enhance stock management, with minimal stress and reduced effort. That can include encouraging cattle to graze new areas, helping them quickly become familiar with new water points and reducing stress during yarding and trucking.

Bruce Maynard emphasises that the approaches of Self Herding can be tailored to suit the individual needs of station managers and that starting with their concerns or interests is when the application is most successful.

Several Central Australian pastoralists have already taken part in the project and one producer has fully integrated the Self Herding principles into day-to-day operation.

To read a detailed case study about Ross and Joanne Stane's journey with the Central Australian Self Herding (CASH) project and to see the impact Self Herding is making on Lyndavale Station follow this link: https://futurebeef.com.au

Figure 1: Self Herding Sign that has been created by Bruce Maynard to visually attract cattle to an attractant station. Attractant stations can be used to encourage stock to spend time grazing particular areas and as a tool for reducing stress in unfamiliar situations. They typically include tasty feed supplements as well as visual and sound cues.



If you want to get involved with the CASH project contact with Lakota Taber on 8951 8144 or email Lakota.taber@nt.gov.au

7.1.3 FutureBeef eNewsletter, July 2022, reporting on the Self Herding activities implemented at Lyndavale Station

Rewarding cattle to graze more evenly – the benefits of Self Herding

Page published: July 18, 2022 | Page reviewed: July 18, 2022

During the dry conditions of 2019, Lyndavale and Mount Ebenezer station owners Ross and Joanne Stanes opened up previously ungrazed areas and installed many watering points.

Located 260 kilometres south-west of Alice Springs, the properties carry 7000 cattle over 5300 square kilometres. A major challenge of grazing this country is that cattle spend most of their time within 3km of the watering points.

The Stanes decided to try Self Herding using attractant stations to encourage cattle to graze pasture around the new watering points rather than returning to familiar watering points.

Attractant stations use visual, sound and scent cues associated with variable food rewards to attract cattle. The stations are placed in a familiar location until cattle learn to associate an attractant with a food reward. The food rewards vary and are offered semi-randomly so they do not become predictable.

Mr Stanes uses a wind chime made out of an old road sign and a chain with a piece of poly pipe attached.

“The sign provides a visual cue and the poly pipe works as a wind-catcher so the chain bangs against the steel to create a sound cue,” Mr Stanes said.

“Raspberry cordial is sprayed around the attractant station to create a scent cue.

“We have achieved good results using two drums containing food rewards—one with a supplement (usually phosphorous) and the other a jackpot.”

Figure 1. Lyndavale and Mount Ebenezer station owner Ross Stanes says his cattle are so drawn to the attractant stations that they run towards them while they are being set up.

Hitting the Jackpot

Jackpots are highly desirable rewards that are paired with their own unique sound cue and intermittently provided to the cattle. This variability encourages a high level of anticipation from the animals.

“A splash of molasses attracts a strong response,” Mr Stanes said.

“One of the keys of Self Herding is to regularly change the reward and to offer it sparingly so it retains its novelty value.

“Once familiar with the attractant station, the cattle will readily follow it to new locations, making it easier to manage grazing pressure.”

Mr Stanes says he sets up an attractant station in an area with no cattle activity and returns to the spot several days later.

“Using attractant stations has decreased the time involved in familiarising cattle with a new watering point,” he says.

“Previously, once the cattle were moved to a new water, they would often head straight back to the old watering point.
“In the past it could take up to a week to familiarise cattle with a new watering point but now it takes one day.
“We have integrated Self Herding techniques into our current supplementation program, so there has been no significant increase in workload—and we save time and money associated with moving cattle back to new watering points.”
Mr Stanes believes Self Herding techniques are an investment in the future, saving work in the long run.
“I understood how using the attractant stations could work but I wasn’t expecting the response,” he said.
“It has amazed me with how well it has worked.”
The Stanes plan to make more wind chimes for the supplement drums near each of their watering points and turn them into static attractant stations.
They believe their cattle have a better response to a mixture of reliable and predictable stationary placements and dynamic stations that are moved around the property.
For more information about Self Herding and the Central Australian Self Herding project, visit futurebeef.com.au and search for ‘Self Herding’ or contact Northern Territory Government pastoral technical officer Lakota Taber on 08 8951 8144 or lakota.taber@nt.gov.au.

7.1.4 An overview of the terms used in Self Herding

As part of the PDS Central Australian Self Herding, the Department of Industry, Tourism and Trade compiled the following overview and glossary of terms relevant to Central Australia. Self Herding was developed by Dean Revell and Bruce Maynard (Revell *et.al.* 2015). The following glossary and images are derived from materials authored by Bruce Maynard.

Self Herding applications

Self Herding is a behaviour-based livestock management approach, which provides livestock managers with strategies and tools to positively influence grazing distribution, and help livestock adapt to new surroundings. Based on behavioural science, nutrition, physiology and ecology. It is a simple and inexpensive to apply. With success depending on the approach. Two primary applications *Managed Movement* and *Reliable Retentions*.

Managed movement – movement of livestock through a landscape over time from one area to another. Tactics include; *Attractant Hopping*, *Attractant Leapfrogging* and *Water Wheeling.*

Reliable Retention – encourages animals to stay in a particular area for a period of time by using attractants and signals to help animals feel comfortable where you want them to be by using methods that build familiarity and adaptability.

7 principles of Self Herding – Factors that are interconnected.

- People animal interactions (interaction shapes outcomes)
- Animal Experience (experience reinforces behaviour)
- Internal Feedback (feedback sets behaviour)
- Diet diversity (animals seek dietary diversity)
- Livestock Adaptability (adaptability is required to face change)
- Individuals and groups (peer pressure works)
- Broad consequences (everything is connected).

Glossary

Accelerated Adaptation - improves the capacity of livestock to adapt to change through de-stressing and positive exposure to novel places and feedstuffs. Even though everything else around them may be quite different from their original location, relocated animals respond positively to seeing, hearing, smelling and tasting familiar *Signals and Attractants* they associate with nutritional rewards.

Accelerated Adaption - a Self Herding approach that encourages animals to be inquisitive, but not stressed, by new conditions and environments. It can be used to relocate animals from one area to another with a minimum of stress. Involves moving attractants to different yards creating a familiar sound, sight, smell and touch in the different environments over the course of 2 days.

Attractant/ Attractant Station – small amounts of tasty and nutritious feedstuffs used to provide positive feedback to animals when they consume them — they are not feed supplements. A collection of Attractants offered together forms an Attractant Station. Attractants are not expensive and the goal is the animals to create a habit of investigating the attractant/ attractant station on a regular basis. They are put in a drum or trough common attractants are; coarse salt, 'Bruce's Brew' (ash and charcoal), mineral lick.

Attractant Hopping - is a Self Herding tactic that encourages livestock to move through a Landscape Jigsaw in a planned direction. This tactic has the effect of expanding the grazing area while allowing ungrazed areas to rest and recover, and intentionally broadening the animals' diet as they move through the landscape.

Attractant Leapfrogging – is similar to *Attractant Hopping*, but combines the concepts of *Managed Movements* and *Reliable Retentio*ns to move animals through the *Landscape Jigsaw*, but hold them in areas where a greater intensification of grazing is desired.

Dean's Deli' - is a mix of minerals that can serve as a Attractant as well as providing a valuable tool to identify any potential deficiencies livestock may be experiencing at any particular time or location.

Jackpot - is an occasional offering of a delicious feed (sometimes referred to as a Jackpot Reward) paired strongly with a distinct sound cue (Signal) designed to trigger strong movement by animals towards the reward. Used to keep them interested and to change the habits of highly reactive animals.

Landscape Jigsaw – Areas are identified with different features, needs and how the animals interact with them. Differentiating the different areas provides the first step in better understanding how we can manage and influence these interactions.

Pyric Grazing - describes the interaction between fire and grazing. It includes both where the interactions occur (spatial interactions) and when they occur (temporal interactions). Can be used to manipulate species diversity, fire management and mob nutrition. The main tools and tactics used in Pyric Grazing are *Attractants and Signals*, and possibly *Attractant Hopping*.

Rangelot Flushing- is a procedure to increase conception rates through improved heifer or ewe lamb nutrition while using managed animal impact to regenerate the landscape. It uses a combination of small amounts of supplementation and behaviourbased management (e.g. Managed Movement).

Rangelotting - concentrates animals in particular areas and moves the areas of concentration from patch to patch over time. Incorporation of rangeland grazing and feed lotting. Tools used *Attractants and Signals.*

Signals and Indicators - are cues that livestock may see (witches hat), hear (wind chime), smell (cordial) or touch (Plastic/metal chain and polypipe), which alert them to the presence of an Attractant or Attractant Station. Attractants must be paired strongly with Signals (cues) to build associations between the Signal and the reward. Signals help livestock identify where Attractant Stations are located.

Water Point Paralleling - is a process that directs the line of movement of people approaching to inspect a water point and, in doing so, reduces the likelihood animals will disperse from around the water.

Water Wheeling - is used to introduce animals to a new area with multiple water points. It is intended to ensure animals are familiar with more than one source of water so they can adapt to situations when water is turned off or fails. Attractants are placed around the water point and gradually distanced further away in a circular motion until it is closer to the next water point.

References

Revell DK, Maynard B, Erkelenz PA, Thomas DT (2015) 'Rangeland Self Herding' - positively influencing grazing distribution to benefit livestock, landscapes and people. Proceedings of the Australian Rangeland Society Conference, Alice Springs, 12-17 April 2015.

7.1.5 PDS Central Australian Self Herding Case Study - Stress Free Movement of cattle in extensive Rangelands (In preparation)

Properties: Lyndavale/ Mount Ebenezer
Business Name: Lyndavale Cattle Co.
Location: 260km SW of Alice Springs
Carrying Capacity: 1.5 AE/ km²
Managed Area: 5,300km²
Total number of cattle: 7000

What is Self Herding?

Self Herding is a behaviour-based style of management that can be used to move domestic and native animals across landscapes. In addition to using behavioural responses it also uses established science in nutrition, physiology and ecology to achieve concurrent improvements in livestock management, landscape function and business outcomes.

Cattle (just like other animals) are creatures of habit and will generally spend their time grazing in areas where they already have familiarity and that minimize the distance from waterpoints.

Self Herding uses curiosity, familiarity (associations of signals with rewards) and diversity to initiate anticipation of positive feedback to move cattle to desired locations. In this way, cattle move to different areas of the paddock by their choice and are not forced to occupy any particular area (so their grazing activity changes without negative stressors).

What is an Attractant Station?

One of the most easily deployed Self Herding tactics is to encourage cattle to explore a new area using an Attractant Station. Attractant Stations use visual, sound and scent cues in association with variable food rewards, to attract cattle. **Cattle learn to associate an attractant station with a food reward and it motivates them to approach and regularly visit the attractant station.** The food rewards are varied and are offered semi-randomly so that they do not become predictable.

Initially, the attractant station is placed in an area familiar to the cattle, for example at the water point, so the cattle can become accustomed to the combination of rewards and signals. Once cattle are familiar with the attractant station signals they can be incrementally moved further away to areas that the cattle don't normally graze or to a completely new watering point.

What is the Central Australian Self Herding (CASH) project?

The CASH project is funded by Meat and Livestock Australia and works with central Australian cattle producers to increase awareness and adoption of Self Herding techniques through providing information, training, and on-property demonstrations. It allows producers to see the benefits of Self Herding techniques in extensive central Australian production systems. The techniques can provide management options to enhance evenly spread grazing distribution throughout paddocks. Changed grazing impacts can lead to an expanded feed base, more even paddock utilisation, provide drought resilience, and improved animal production outcomes.

Lyndavale/Mount Ebenezer's involvement and experiences in the Central Australian Self Herding Project

Ross and Joanne Stanes first became aware of the principles of Self Herding through involvement in an Alice Springs Pastoral Industry Advisory Committee meeting. They could see how their cattle may respond to Self Herding and decided to become involved with the Central Australian Self Herding Producer Demonstration Site.

It was extremely dry in 2019, so Ross and Joanne were putting in a lot of new watering points and opening up areas that had previously not been grazed. Self Herding, and in particular, the use of attractant stations to retain animals at a new water point seemed like a solution that could address some of the challenges of having animals return to the previous watering point after being moved.

Ross and Joanne started with the 'stress free stockmanship' course. Ross says that the course forms "the foundation of Self Herding".

Ross and Joanne see several benefits for their business from using Self Herding:

- Achieve improvement in land condition
- Get cattle to graze previously under-utilised areas
- Rest overgrazed areas
- Keep cattle at new watering points with less effort
- Encourage cattle to camp beyond their preferred 1km zone close to water.
- Create passages within the paddock that have been grazed to act as a firebreak.

Attractant Stations – Getting the senses involved

The materials used in attractant stations are typically low cost or repurposed items. Producers are only limited by their imagination when designing/using them as long as fundamental behavioural principles are applied.

On Lyndavale/Mt Ebenezer, a wind chime was made out of an old metal road sign with a chain and a piece of poly pipe attached. The sign provides a **visual cue** and the poly pipe works as a wind-catcher or sail so that the chain bangs against the steel to create a **sound cue**.

Raspberry cordial is sprayed on and around the attractant station to create a familiar **scent cue**.

Full Attractant Stations have four drums; three for feed stuffs that are kept topped up and one for a jackpot (an intermittent, unusual but high reward food). Ross has found that in his applications two drums have been sufficient to achieve good results. One drum holds supplement, usually phosphorous, and the other a jackpot.

Jackpots provide extra motivation for cattle as they are usually a highly desirable reward that is paired with a unique sound cue and this variability in reward provision provides a high level of anticipation from the animals.

Ross has used a range of things as a jackpot. He has found that 'A splash of molasses has a strong response. Ross believes that one of the keys of Self Herding is to not use the same thing for too long and not to put much in so that it stays interesting for the cattle.

Placement of an Attractant Station

Ross selects an area with no cattle activity, sets up an attractant station, and returns several days later while on the bore run or completing cattle checks.

There are now eight fully equipped attractant stations located on Lyndavale.

Photos 1 and 2: Examples of an attractant station featuring two drums and a home-made wind chime.

The cattle response to Self Herding

"now the cattle are so drawn to the attractant stations that they are running towards it while you are setting them up."

In the series of photos below it is evident that cattle have regularly visited the attractant station since it was set up in that spot. There is defoliation of grass, presence of animal tracks and the feed troughs have been moved.

The cattle enjoy interacting with the attractant stations so much that Ross has witnessed cattle walking back into a yard immediately to revisit an attractant station after they have been let out.

Table 1. Attractant stations immediately after they have been set up and then again after a few days, when cattle have interacted with the station.

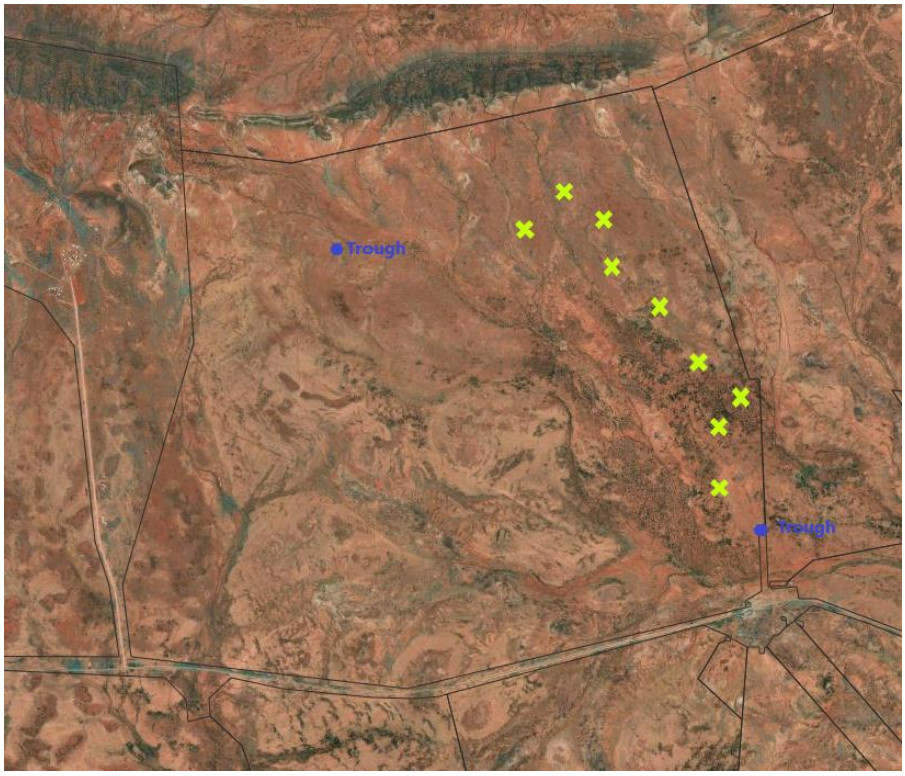
Before	After
	
	
	

Moving cattle around a diverse landscape

Once cattle are familiar with the attractant station, they will readily follow it to new locations. This gives Ross the opportunity to manage the grazing pressure around Lyndavale/Mt Ebenezer and to influence cattle distribution. Picture C shows the locations of one attractant station as it was moved around the paddock every week or two over an approximately three month period on Mt Ebenezer.

"The cattle were able to locate the attractant station even when I tried to hide it in the heavy scrub." – Ross Stanes

Photo 3: Shows locations and movement pattern of an attractant station on Mt Ebenezer station.



Moving and holding cattle on a new watering point

"In the past it could take up to 1 week to familiarise cattle with a new watering point but now it takes 1 day!"

Before utilising attractant stations it would take approximately a week to establish cattle at a new watering point. Once the cattle were let out of the night paddock at the new water, they would often head straight back to the old watering point. This would sometimes require station staff to re-muster the animals and truck them back to the new water point again.

Using attractant stations means that it now takes 24-36 hours for the cattle to stay at a new watering point. The attractant stations provide incentive for the cattle to stay at the new water point. They act like a security blanket for the cattle ensuring there is a familiar and rewarding feature in any new environment they are moved to. This reduces the settling time and the overall anxiety of the cattle. Just as importantly it saves staff time and reduces the cost and disruption associated with mustering and trucking.

Savings by Implementing Self Herding

Due to the success of using the attractant stations at keeping cattle at new water points Ross has been able to reduce the amount of fence checks needed to look for any wandering stock that may need to be walked back to water.

Ross was feeding out supplement to his cattle before the Self Herding project. Therefore integrating the project with his current operations was not a significant increase in work but rather an investment for the future management of his cattle. He believes that Self Herding *"saves work in the long run".*

Future Plans for Self Herding

Ross and Joanne have been impressed with the results gained from using Self Herding techniques, in particular the use of attractant stations. While they started small, they have found that installing complete attractant stations, with all the bells and whistles, is very worthwhile as it creates a stronger response in the cattle.

Supplementing

Ross is planning to construct more homemade wind chimes for the static supplement drums near each of his watering points, and to turn them into static attractant stations, as he believes the response from the cattle is much greater by providing the reliable and predictable stationary placements as well as having the dynamic stations that he moves around the broader property.

Heifer management

Ross has designed an induction process for new heifers on Mt Ebenezer to ensure that prior to their move into the breeder herd they are familiar with an attractant station. When moving them into the new paddock the familiar presence of an attractant stations will assist the heifers settle down quickly and explore fully their new location.

Introducing the attractant stations to maiden heifers, allows them to teach their calves the concept of the attractant stations, reducing the amount of work it takes to train future generations of cattle. Ross said "With each generation of cattle the work should get easier."

Weaning

Having an attractant station set up in the yards at weaning time will make the weaning process less stressful. The stress of entering a new environment will be reduced due to the familiar scent, visuals, sound and tastes of the attractant station. Used in this way, Self Herding substantially changes the transition that young animals face when separated from their mothers and the supporting social grouping of the mob.

Photo 4: Cattle enjoying the supplements at an attractant station a few minutes after the station was set up.

"I could see how using the attractant stations could work but I was not quite expecting the response, it has amazed me with how well it has worked". – Ross Stanes