

self herding

A SMARTER APPROACH TO MANAGING LIVESTOCK AND LANDSCAPES



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The production of this publication was supported by Rangelands NRM through funding from the Australian Government’s National Landcare Programme and the WA Government’s State NRM Program, supported by Royalties for Regions.



natural resource management program





introduction

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.

It has particular relevance and value in rangeland production systems, but can be used in farming situations as well. The self-herding principles and practices outlined in this publication draw on a large body of research, from Australia and overseas, on behavioural science, grazing management and nutrition.

Applying self-herding principles allows you to influence the decisions animals make about how they interact with: each other, you and the landscape.

The self-herding approach helps shape livestock grazing habitats and diet selection. By encouraging animals to make grazing decisions through positive experiences, you can establish long-lasting behaviours that benefit your business and your landscape.



DIVERSE APPLICATIONS

Self Herding can be tightly focussed around a particular issue, such as encouraging animals to graze a new area to allow another area to rest and recover, or to encourage animals to start using a new water point before turning off the previous water point.

Self Herding can also be used to help animals adapt to relocation, whether from one paddock to another, from one pastoral property to another, or across regions.

CONSCIOUS LANDSCAPE MANAGEMENT

As a concept, **Self Herding** also encourages you to think and act more broadly, to shape how livestock, wildlife, plants and people interact over time and space — when you start changing the behaviour of livestock, you influence the behaviour of other animals and plants across the landscape. Everything is connected.

BASED ON SCIENCE — EASY TO APPLY

The principles of **Self Herding** are based on behavioural science, nutrition, physiology and ecology. The self-herding applications are, in themselves, simple and inexpensive to apply. Success depends on how the approach is carried out.

We encourage you to participate in coaching opportunities and seek ongoing support, just as you would if you wanted to excel in sport or a new business.

For more information, email Dean or Bruce (see page 2) or go to www.selfherding.com



acknowledgements



A great many people have inspired, supported and collaborated on the development of **Self Herding** and **Self Shepherding**.

Inspiring work has come from the mercurial Professor Fred Provenza (Emeritus Professour at Utah State University) and Professor Derek Bailey (New Mexico State University) and the entire *Enrich* project team in Australia.

Ongoing support and encouragement has been critical; with Greg Brennan, Grazing Innovation, being pivotal in bringing many relevant people together in ways that have spurred further progress.

Collaboration from a great many pastoralists and agency staff has been extensive and essential to the successful implementation of the self-herding concept. We thank all of the people who have listened to our wild ideas, come up with their own interpretations and explanations, and adapted the concepts of **Self Herding** to their own local circumstances.

The Australian Government, through an *Innovation Grant in Sustainable Agriculture*, funded the initial project in the rangelands of Western Australia, which enabled the development of **Rangelands Self Herding**. Dr Dean Thomas and Gonzalo Mata from CSIRO also contributed to this project, especially with analysis of animal tracking data.

We are also grateful to Rangelands NRM, who hosted the original project and, since then, has continued to actively support, assist and encourage the overall development and application of **Self Herding**. Without this level of commitment from Rangelands NRM continual improvements and refinements would not have occurred.



ABOVE AND BELOW: Discussions and observations of trials and demonstrations helped develop and refine Self Herding practices.





the evolution of Self Herding

The principles, approaches and tools of **Self Herding** and **Self Shepherding** came about as a result of more than seven years of collaboration between researcher Dean Revell and livestock producer Bruce Maynard. The fortunate opportunities that arose out of the combined research work from Dean and the applied on-farm actions of Bruce led to a large body of innovation that show huge potential to affect issues and challenges, unsolvable via conventional means.

Dean and Bruce bring to the table a wide variety of complementary life experiences and important insights. The common desire to help provide both knowledge and practical skills to address social, environmental and business needs has seen them deliver a range of valuable initiatives.

LEFT: Dean Revell has had a life-long interest in science, animals and the environment and relishes the opportunity to work in a field of science with real-world relevance.



Dean has pursued a varied career in scientific research, always seeking to better understand how and why animals do what they do. It is the wide nature of his work that has offered Dean a deeper understanding of not only the parts of the complex plant–animal–human interaction, but also how we can better manage the connections between each component.

The substantial work Dean fostered by leading the Eureka Prize-winning *Enrich* research project team — which explored multiple benefits from incorporating Australian native forage shrubs into production systems — brought an even more sophisticated understanding of the interactions between plants animals and broadened our understanding of how animal behaviour could become a management tool. During that time Dean brought to Australia one of the leading thinkers in the behavioural science field, Professor Fred Provenza.

During that visit Bruce was invited to travel to Western Australia and share some of his practical on-farm

experiences with establishing and utilising saltbush as a commercial forage shrub in his integrated cropping and livestock operation. This meeting provided the elements for the future development of the self herding and self shepherding principles. Though it was not evident at the time, the necessary underpinnings were there: plant knowledge, animal knowledge and, most critically, an understanding that livestock behaviours could be shaped to radically change the circumstances people faced in managing livestock and landscapes.

Visits to the WA rangelands by Dean and Bruce and direct work with station owners and farmers provided more clues as to some of the tactics and tools that could be implemented to make the principles applicable in the field.

Finally, a combined inspiration occurred to the team — move animals around the landscape by choice instead of by force. This seemingly simple concept has profound implications, as it provides a completely new direction of managing livestock from the traditional approach, which restrict animals to areas by active shepherding or fencing.

Behaviour-based management allows livestock managers to optimise individual animal performance, because individuals can choose to suit their particular needs and circumstances. But at the same time, the tools and tactics of **Self Herding provide a means to manage groups of livestock to benefit natural resource management.**

Self Herding and **Self Shepherding** became a reality. Both Dean and Bruce slowly realised the importance of their discovery, as it rests solidly on a wide base of science and research work across decades, which has shown animals can rapidly change and actively seek options under guidance from livestock managers.





An initial project funded by the Australian Government's National Landcare Programme allowed Dean and Bruce to expand many of their ideas and tools, and carry out field trials to prove the practicality and the validity of the self-herding concept. Contained in this book are many of the small and large breakthroughs that have come from this work.

The initial concepts were expanded and strengthened over time by ongoing interactions with innovative WA pastoralists, who added their own ingenuity and insights. Through workshops, discussions and demonstrations, ideas became management tools and principles became practices.



ABOVE: A satisfied client that has been experiencing nutritional rewards and positive interactions with people.

about the authors

Bruce Maynard

Bruce Maynard is a fourth-generation farmer from Narromine, New South Wales. With his wife Roz and children Liam, Ella and Hannah, they operate a business that incorporates farming, training and accommodation.

Bruce's agricultural career began after completing a Rotary Youth Exchange to the USA during 1984. He was involved in the family businesses, including stud Berkshire and large white pig enterprises, irrigated and dryland cropping, wool and meat sheep, cattle and hay production

Following the implementation of one of the first whole-farm plans formulated in Central West NSW during 1990, Bruce shifted the business operations towards a sustainability- and diversity-focused farming system. Bruce has implemented many changes in his farming operations, including planting more than 200,000 trees and 300,000 shrubs on the property. This also led Bruce to be one of the first in Central West NSW to take up and apply cell grazing and holistic management approaches.

Subsequently Bruce invented the no-kill cropping concept, which is now being implemented on properties across Australia and internationally. Bruce has taught courses he developed on both no-kill cropping and pasture cropping across Australia and lectured on both concepts internationally.

Bruce's successful experience with intensive grazing management lead to him being appointed as the Conservation Grazing Officer for the Central West and Lachlan areas of NSW. Bruce advised landholders, agency staff and researchers on the relative merits of the competing grazing strategies available in an independent fashion.





When the Catchment Management Authorities (CMA) took over the Landcare roles Bruce was appointed as the Farming Systems Officer for Central West NSW, where he conceived and managed the Farming Systems Program for the Central West CMA, which was acclaimed as the best program operated by that organisation.

Bruce became a mature-age student to gain Diplomas in Agricultural Business and Conservation and Land Management and has attended rural leadership courses with Department of Agriculture and Rabobank, taking a keen interest in breakthrough technologies as they apply to agriculture and resource management issues.

In conjunction with his interest in all grazing management issues he developed **Stress-Free Stockmanship** methods that lead to innovations in influencing animal behaviour, such as active de-stressing livestock and initiating weed-eating

behaviours. Bruce has also developed, and helped develop, Future Farm projects for Greening Australia, a Sustainability Dashboard for Land and Water Australia, developed the Grassland Grain concept from the Agricultural Futures project during 2016 and was an active supporter of and participant in the Future Farm Industries CRC's *Enrich* program in forage shrub development.

Bruce is a life member of the Narromine Show Society and the RSPCA.

Bruce has become known as the 'lazy farmer' and continues his practical work on systems of agricultural innovation on his property and enjoys spreading the message through on-farm field days and presentations across Australia.

about the authors

Dean Revell

Dean first embarked on studies in agricultural science to combine his interest in science, animals, and the environment. Holidays to a relative's farm cultivated his desire to work in a field of science that had real-world relevance.

Dean completed his Bachelor of Science (Agriculture) with first class honours at The University of Western Australia (UWA), followed by a PhD in sheep nutrition and wool production.

Dean was awarded a 12-month scholarship to complete a postdoctoral fellowship at the prestigious Rowett Research Institute in Aberdeen, Scotland. Here he was exposed to new methods and ways of thinking about animal metabolism, under the guidance of world-leading scientists.

Dean returned to UWA as a research fellow to investigate the interactions between feed intake, body composition and milk production in lactating sows. He then moved to New Zealand's Massey University as a lecturer/senior lecturer in animal nutrition and metabolism, where he had the



opportunity to work with sheep, dairy cows, pigs and chickens.

Dean's next move was to The University of Adelaide, as senior lecturer, where he also served as Head of the Discipline of Animal Science. He maintained an interest in teaching and research across a range of livestock species and increasingly became interested in the way livestock interact with the landscape. Dean spent a decade with CSIRO, in Perth, WA, where he led a research team in Livestock and Environment Systems.

While at the University of Adelaide and CSIRO, Dean was heavily involved with both the Cooperative Research Centre (CRC) for Plant-based Management of Dryland Salinity and the Future Farm Industries CRC, receiving the Chairman's Award during 2012.



With his colleagues, Dean worked on a range of innovative projects that explored how livestock could be managed to improve degraded landscapes and to make profitable and sustainable use of land considered marginal for agricultural production. This work led to a greater interest in the role of plant diversity for the health and productivity of landscapes and animals. As his team delved deeper into the nutritional and extra-nutritional benefits of plant diversity, Dean was increasingly interested in how feeding behaviour could be managed, including prenatal influences and learnt behaviours.

During 2013 the *Enrich* project, which Dean co-established and co-led, won a prestigious Australian Museum Eureka Prize in Sustainable Agriculture. *Enrich* explored the multiple benefits of a diverse mixture of Australian native shrubs in grazing systems, including whole-farm economics, risk management, livestock productivity in a variable climate, animal health and NRM.

During 2014, Dean established Revell Science, to work at the interface between research and its application. He interacts with a range of partners, including NRM bodies, producer groups and other researchers. Dean is interested in transdisciplinary research, participatory research, and oral and written communication. He is a board member of the Northern Agricultural Catchments Council, the Executive Officer for the Gascoyne Catchments Group, and a member of the Regenerative Agriculture Advisory Committee for Wide Open Agriculture. Dean is also an Adjunct Associate Professor at UWA.

Dean regularly presents at field days and conferences has published 18 scientific review papers, six book chapters and more than 100 research articles.

basic principles and key tools of self herding

You have probably seen animals respond in a particular way to things happening around them. Animals respond to positive feedback, such as food or desirable contact with other animals or people, and to negative feedback, such as predators or unfamiliar situations. You may also have noticed that experiences from the past can affect animal behaviour for a long time.

The principles of **Self Herding** draw on observations about the underlying reasons why animals respond as they do to the circumstances around them. It uses positive rather than negative reinforcement to influence behaviour. It allows, as much as possible, for animals to make choices rather than being forced to exhibit a particular behaviour.

In applying Self Herding our role is to set up the circumstances that encourage animals to make choices that are both comfortable for them and favourable for us and the landscapes we manage.

The seven underlying principles of **Self Herding** are summarised on pages 19–21.

In the following pages (pages 40–69), we describe the tools used in **Self Herding**. *Attractants* and *Signals* (outlined below) are two of the foundational tools used.



Attractants

Small amounts of rewarding feeds or nutrients.



Signals

Sounds or objects, which clearly 'tell' animals where and when a reward (i.e. Attractant) is available.





Attractants and **Signals** are sometimes used in combination with other tools, such as strategically-placed fences or tracks, to guide livestock movement.



See the section on *Guidances Fences* and *Guidance Tracks* on on pages 60 and 62–66 for more information.

While it may sound confusing and mysterious at the start, after we've described the main tools of the trade, and a range of different applications of **Self Herding**, you will discover the broad range of possibilities of this innovative, yet simple-to-implement, livestock management approach.

BELOW: *Self Herding is a concept that uses positive reinforcement to encourage desirable livestock behaviour within a given landscape.*





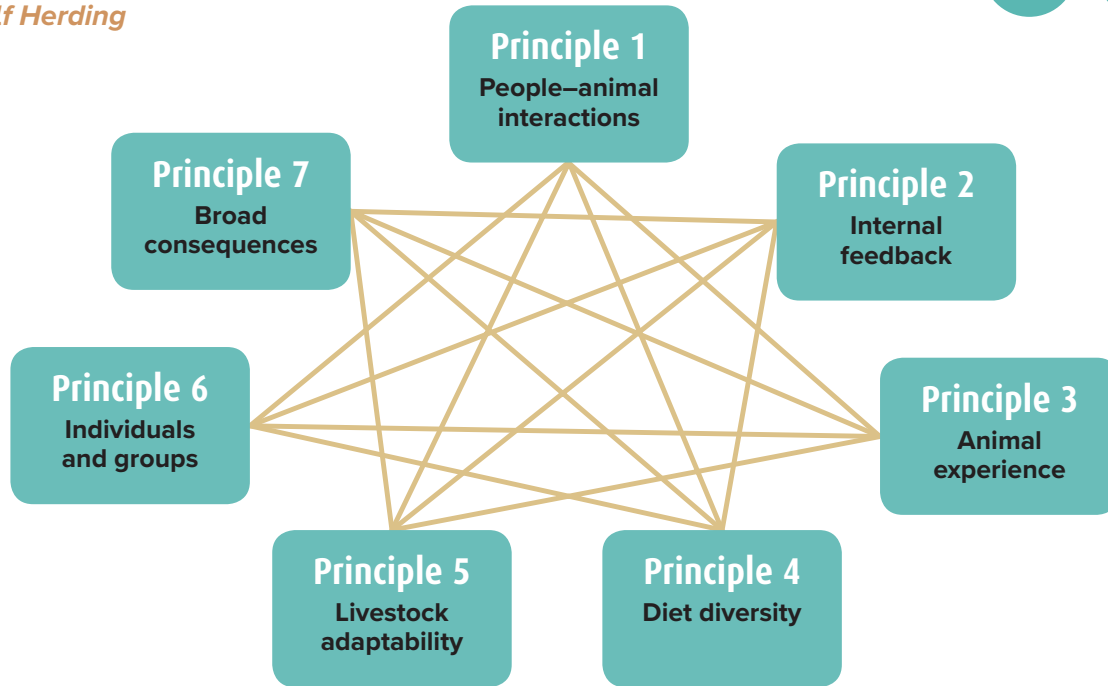
the seven principles of Self Herding

The key principles behind the concept of **Self Herding** draw on a large body of research, from Australia and overseas that build on the relationships between behavioural science, grazing management and nutrition.

Gaining an appreciation for the interconnectedness of **Self Herding** principles outlined in the following pages will allow you to positively influence the decisions animals make about how they interact with each other, you and the landscape.



Figure 1. Seven principles of *Self Herding*



1. PEOPLE-ANIMAL INTERACTIONS — interaction shapes outcomes

- Critical to adaptive systems.
- Our interaction with natural systems can actively shape the systems.
- *How* something is done can be more important than *what* is done.
- Human behaviour can be the largest variable.

2. INTERNAL FEEDBACK — feedback sets behaviour

- Animals start an eating behaviour if they expect a reward (behaviour).
- Sight, sound, smell and taste serve as signals (or cues).
- Animals continue eating if they receive a reward (physiology).
- Foraging behaviour determines nutrition — internal feedback drives foraging behaviour.

3. ANIMAL EXPERIENCE — experience reinforces behaviour

- Replace unwanted behaviours by encouraging new behaviours.
- What animals do depends on their experience, and new experiences build quickly.
- Patterns of grazing can become fixed — but fixed patterns can be changed.
- We can influence and design new behaviours.

4. DIET DIVERSITY — animals seek dietary diversity

- Different plants delivery different nutrients from different soil depths at different times during the year.
- Even plants that form a small part of the diet can have an important effect on animal performance (and a diverse diet minimises the risks of toxicity).
- Diversity in the diet stimulates appetite.
- Nutrients and secondary compounds can provide complementary benefits.
- A diverse diet improves performance, but animals must first become familiar with and learn to incorporate new feedstuffs.



5. LIVESTOCK ADAPTABILITY — adaptability is required to face change

- A wide range of experiences prepares animals for a range of future circumstances.
- Early-life exposure is a powerful way to influence subsequent behaviours.
- Animals learn from locally-adapted peers.
- De-stressed animals more willingly face new circumstances and try new things.

6. INDIVIDUALS AND GROUPS — peer pressure works

- Individuals need to experiment with, and learn about, all the resources where they live.
- Individual experimentation shapes group behaviour and diet selection.
- The group guides how individuals behave.
- Group–individual dynamics act continually in both directions.

7. BROAD CONSEQUENCES — everything is connected

- Livestock behaviours directly affect other parts of the system: soil, plant, other animals and people.
- Plant communities change with altered livestock behaviours.
- Other herbivores are affected by livestock, triggering further landscape effects.
- Livestock resilience can influence the consequences of predator behaviour.





grazing at the landscape scale — a landscape jigsaw

Understanding the way animals interact with the landscape provides the first step in better understanding how we can manage and influence these interactions.

At most points in time, within any particular landscape, animals have a 'grazing centre' where they choose to spend a large part of their time. From this grazing centre animals move to graze and explore the surrounding areas.

Often, grazing centres are around a water point, but they also can be based on other preferences and habits related to man-made or natural features. Animals use grazing centres as the familiar and reliable parts of their experience, from which they actively explore other areas and learn through experimentation.



You can influence the decisions animals make about their grazing centre such as:

- how tightly individuals, and the mob as a whole, focus around a grazing centre
- how and when animals move from one location to another or, in other words, how and when they create a new grazing centre.

The typical way to visualise grazing centres is to draw a grazing circle around a watering point, although utilisation is rarely in an even pattern around any given grazing centre, so it might be more realistic to mark a more irregular-shaped area where animals are spending time.

This grazing area might be bounded by landscape formations (hills, rivers, plains etc.). The more we explore where animals spend their time, the more these areas resemble jigsaw pieces, rather than perfect circles. Throughout this publication we will refer to the ***Landscape Jigsaw***.

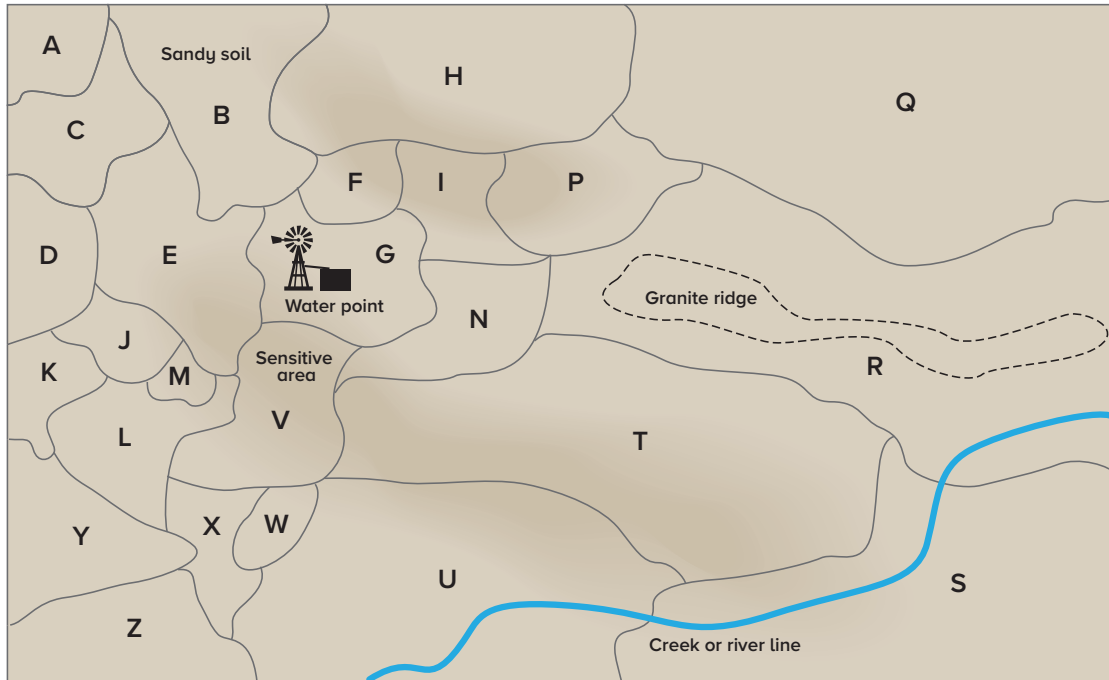
On pages 25–28, we describe a planning and recording tool we encourage you to use.

Self Herding influences the connections between grazing centres — that is, the connections between each of the jigsaw pieces in your landscape — over time by influencing animal decisions as to whether they remain in an one ***Landscape Jigsaw*** or to move from one jigsaw area to another.

You can influence the timing and direction animals move from one piece of the ***Landscape Jigsaw*** to another by the way you employ the self-herding approach.

The ***Landscape Jigsaw*** concept can be used as an effective a planning and recording tool. A guide to planning and recording is included on pages 25–29.

example of a *landscape jigsaw*





PLANNING AND RECORDING TOOL

The **Landscape Jigsaw** is primarily a planning and recording tool with two purposes. The first is to guide the decision-making process for moving animals from one jigsaw piece to another. By drawing the planned movement of livestock on a map, you can visualise how your paddock will be utilised over time.

The second purpose of a **Landscape Jigsaw** is to record the movement of livestock around the landscape, serving as a reminder of the previous and current locations, and the planned future locations of the grazing centres and the intensity of use around each centre.

Using a **Landscape Jigsaw** is easy and it provides a reference to help you adapt in real time to direct animals toward areas needing grazing and away from areas requiring rest and recovery. It is a visual tool designed to ensure the grazing manager actively influences the way animals spread across the landscape and their impact on any given area.

Using the **Landscape Jigsaw** provides an instant reference on past movements and future possible grazing options, aiding long-term productivity increases and landscape regeneration.

CONSTRUCTING THE LANDSCAPE JIGSAW

When establishing a **Landscape Jigsaw**, the first step is to split the area under management into at least 26 portions labelled A through Z. If there are more than 26 portions identified, split the area into more than one jigsaw. Any property can contain more than one **Landscape Jigsaw** and the jigsaw pieces can vary widely in size.



how to set up and use a **Landscape Jigsaw** as a planning and recording tool

Refer to the illustrations on the following pages.

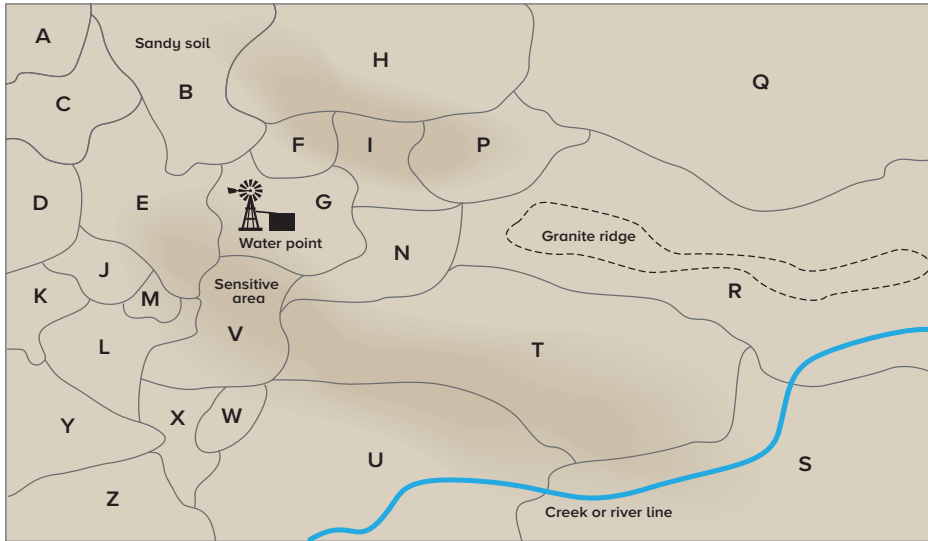
- After dividing an area into 26 portions to create your **Landscape Jigsaw**, label each portion from A to Z (see page 24). This is now ready to use as a planning tool.
- Construct a table under your jigsaw to record for each month the location you are targeting as the grazing centre (see page 28).
- Create a second row in the table to record the grazing intensity each center (i.e. high, medium or low).
- The idea is to shift the grazing centre through the **Landscape Jigsaw** portions as you see fit during the year.



constructing and using your *landscape jigsaw*

- Use an aerial photo image of your property as the base for the planning.
- On that image split the landscape into 26 portions and label each portion with a letter from A to Z.
- If you identify more than 26 divisions then make more than one jigsaw.
- There is no single way to decide on the size or shape of each portion of the jigsaw. It should reflect the way animals are likely to use the landscape, which is influenced by water locations, vegetation patterns, terrain and current animal behaviours.
- The jigsaw portions can reflect how the animals are currently using the areas, or how you would like them to use the areas — it's up to you how you define or identify the different jigsaw pieces across your landscape. As new technology, such as satellite imagery and spectral imaging, become more readily available, you may choose to use indices of vegetation cover or vegetation type to inform how you draw your jigsaw and how your livestock use the landscape.
- The idea is to shift the grazing centres through the jigsaw pieces as you see fit during the year to achieve grazing management benefits that usually only come with intensive subdivisions. By drawing a line between the grazing centres, you generate a visual record of where grazing occurred, which can help you plan livestock movement for the future seasons so the impact of the animals varies over time.
- The planning tool includes a table to record, for each month, the location being targeted as the grazing centre and the intensity of the attraction to the centre that, in turn, will increase or decrease the grazing impact around those centres.

how to record information on your *landscape jigsaw*



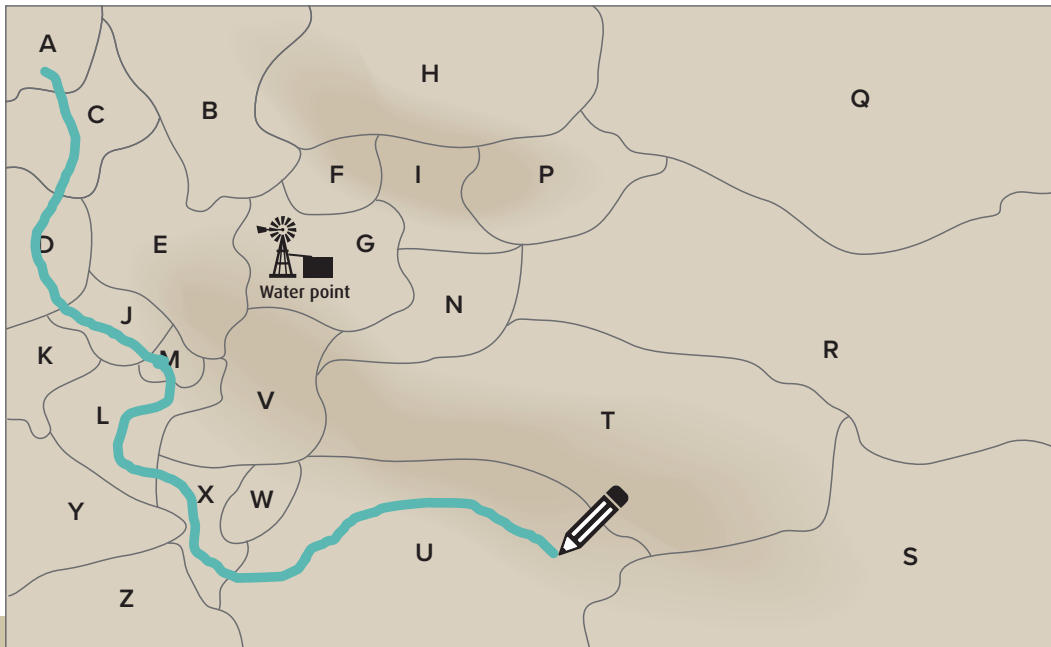
note



The grazing centre changes across the landscape as we influence the movement of animals through the portions of the jigsaw.

| MONTH | January | | | | February | | | | March | | | | April | | | May | | | June | | | | | |
|-------------------|---------|---|---|---|----------|---|---|---|-------|---|---|---|-------|--|--|-----|--|--|------|--|--|--|--|--|
| GRAZING CENTRE | A | A | C | C | D | D | J | M | L | L | X | U | | | | | | | | | | | | |
| GRAZING INTENSITY | M | M | H | H | H | M | M | H | L | L | L | L | | | | | | | | | | | | |

how to record information on your *landscape jigsaw* (continued)



During, or at the end of the year, trace the path you have taken the animals on, as shown in the example.

4. landscape jigsaw



applications of Self Herding

Self Herding, can be used for broadscale stock and landscape management purposes (such as grazing distribution and pressure) down to situation-specific applications (such as fire management, herd fertility and accelerated animal adaptation).

In this section we will broadly outline the key applications of **Self Herding**. The tactics and tools employed to achieve each application are explained in detail on pages 40–82.

There are two primary applications of **Self Herding** used to influence the grazing distribution and pressure across the landscape:

- Managed Movement
- Reliable Retentions



MANAGED MOVEMENT

➤ **A *Managed Movement* is employed to influence the movement of livestock through a landscape over time.**

A behaviour-based approach, such as **Self Herding**, does not focus on 100% of the animals sweeping across the landscape, like a herd of wildebeest, but rather shapes the location and grazing direction of most of the animals within a mob.

By triggering the movement of livestock from one area to the next, and using a **Landscape Jigsaw** to help plan and monitor progress, you can effectively bring a larger area of the landscape into production than is traditionally achieved in a rangeland grazing system. You can also allow areas commonly over-used to rest and recover by redirecting the grazing pressure elsewhere.

RIGHT: Managed Movement offers landholders considerable control of overgrazing pressure across the landscape.

The main tactics used in *Managed Movement* are **Attractant Hopping**, **Attractant Leapfrogging** and **Water Wheeling**. See pages 71-82 for more details on these tactics.



RELIABLE RETENTIONS

➤ **A *Reliable Retention* is the other side of the coin to *Managed Movement*. Rather than triggering livestock to move from one area to another, *Reliable Retention* encourages animals to stay in a particular area for a period of time.**

For example, you may have commissioned a new water point where you want to place animals and allow them to develop grazing habits around this position in the landscape. You may be keen to avoid the animals voluntarily moving off and returning to their previous grazing range immediately after arriving at the new water point.

Another example could be that you may need to move livestock from one part of the property to a new area, or you may have purchased animals from another property and want those animals to choose to remain as a mob in a particular location, rather than scattering and walking fencelines.

You may instigate a ***Managed Movement***, followed by a ***Reliable Retention*** at a new location (e.g. a new water point).

The ***Reliable Retention*** strategy helps livestock feel comfortable where you want them to be by using methods that build familiarity and adaptability.

The main tools used in reliable retentions are *Attractants* and *Signals*. See pages 41-51 for more details on these tools.



bruce's tip

A key to successful ***Reliable Retention*** is ensure your livestock become familiar with the ***Attractants*** and ***Signals*** before directing them to a new area.



SITUATION-SPECIFIC APPLICATIONS

The following applications of the self-herding tools and tactics help achieve situation-specific management goals, such as manipulation species diversity, fire management and mob nutrition.

Pyric Grazing

▶ ***Pyric Grazing*** describes the interaction between fire and grazing. It includes both where the interactions occur (spatial interactions) and when they occur (temporal interactions).

The interactions between fire and grazing trigger processes that deliver a shifting pattern of disturbance across a landscape. These shifting patterns — often called ‘mosaics’ — create niches for different plant species. Rangeland animals rely on a range of plant species to best meet their nutritional requirements when plant quality and abundance varies over time and place.

RIGHT: Pyric Grazing — the interaction between grazing and fire — can be used to manipulate species diversity.



Mosaics can also build resilience into biological systems and increase livestock production, creating patches with different attributes, allowing animals to best manage seasonal fluctuations.



The main tools and tactics used in *Pyric Grazing* are *Attractants* and *Signals*, and possibly *Attractant Hopping*. See pages 41–51 and 71–75 for more details on these tools and tactics.

When using fire as a management tool, there are three basic landscape conditions: burnt, unburnt and recovering (or transition). Using **Self Herding** to control the grazing impact on each of these fire-based mosaic patches can double the number of landscape patches (i.e. each of the existing conditions — burnt, not burnt, and recovering — can now also be grazed or ungrazed). This can be important because the greater the functional diversity in a landscape — in other words, the greater the range of landscape mosaics — the greater the resilience of a grazing landscape to fluctuating seasonal conditions.

LEFT: Pyric Grazing can be used to manage total 'fuel load'.



LEFT: Managing mosaics through the controlled use of fire and grazing can add resilience to landscape function.

Also, the intersections between different land systems or mosaics can often be the most productive; a phenomenon referred to as the 'edge effect'.

You also can use **Pyric Grazing** to target grazing in areas at risk of fire to reduce the total fuel load, or to create more effective firebreaks, by concentrating grazing pressure in targeted areas off tracks or in between tracks.



more information

For more information on how *Pyric Grazing* can be used to manage the landscape, see pages 84-87.

Rangelotting

➤ **Rangelotting** concentrates animals in particular areas and moves the areas of concentration from patch to patch over time.

The term **Rangelotting** came about because the approach draws on principles used in rangeland grazing (movement and dietary choice) and in feedlotting (concentrating animals and feeding grain or pellets).



ABOVE: Rangelotting incorporates principles of rangeland grazing with feedlotting.

Rangelotting involves concentrating animals into smaller areas within larger paddocks, and strategically supplementing their diet to lift production and allow surrounding landscapes to regenerate.



ABOVE: By moving the location of supplementary feeds in the Rangelotting procedure, you can achieve the desired level of animal impact on the landscape.



Depending on the landscape and timing, landscape regeneration can benefit from intensively managed, short-duration grazing. But to use grazing as a regenerative tool, grazing pressure must be adequately controlled to avoid risking further degradation.

The most common tool for **Rangelotting** is a mobile lick feeder. Mobile lick feeders provide a controlled amount of supplement in a simple, cost-efficient way, and being mobile allows you to easily change the location where animals are being attracted.



The main tools used in **Rangelotting** are **Attractants** (typically in mobile lick feeders) and **Signals**. See pages 41–51 for more details on these tools.

RIGHT: Mobile lick feeders are commonly used as an **Attractant** in Rangelotting applications.

more information

More information on specific **Rangelotting** applications (i.e. **Rangelot Flushing** and **Rangelot Haydown**) can be found on pages 88–97.



Accelerated Adaptation

- **Accelerated Adaptation improves the capacity of livestock to adapt to change through de-stressing and positive exposure to novel places and feedstuffs.**

By carefully exposing livestock to new things, paired with rewards and clear signals, you can change the behavioural state of the animals so they are more tolerant and resilient to change.

New experiences and feeds, paired with clear signals, are offered to animals in a positive way before relocation. The feeds and feeding systems are then offered at the destination, again paired with the now-familiar signals.

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.

RIGHT: Accelerated Adaptation can help animals quickly adjust to new environments by using familiar feeds and feeding systems.



Animals that adapt quickly to new surroundings or circumstances will perform better during the transition phase as they fully settle in to their new surroundings. They more rapidly begin to show normal behaviours, such as grazing, rather than undesirable behaviours, such as walking fencelines or choosing to restrict their habitat selection to one small patch (e.g. next to a water point).



The main tools used in *Accelerated Adaptation* are *Attractants* (typically in mobile lick feeders) and *Signals*. See pages 41-51 for more details on these tools.



more information

More information on specific *Accelerated Adaption* principles and procedures can be found on pages 98-103.



BELOW: Well-adapted animals exhibit normal behaviours more quickly in new surroundings.





the tools of Self Herding

The following simple and inexpensive tools are used across a range of self-herding applications. The tactics used to achieve a desired application are described on pages 70-82.





ATTRACTANTS AND ATTRACTANT STATIONS

➤ **Attractants** are 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 eaten in large amounts, nor are they expensive.

When using **Attractants**, the goal is for animals to investigate the **Attractant** or **Attractant Station** on a regular and, in most cases, frequent basis.

The amount of the **Attractant** an animal eats is less important than the number of times it visits the **Attractant** or **Attractant Station**.

Any safe feedstuff can be used as an **Attractant**, but in line with the key principles of **Self Herding**, using **Attractants** should not become an expensive exercise.

If you know a particular nutrient is limiting livestock performance, it can be beneficial to provide that nutrient as an **Attractant** (e.g. include phosphorus in a mineral lick if you know your landscape is phosphorus deficient).

Livestock actively seek nutrients that are lacking in their diet. Cells in the animal's body can detect when nutrient supply is insufficient to meet requirements. When animals consume a 'limiting nutrient', even in small amounts, the strong positive nutritional feedback reinforces the behaviour. In this way, the attractiveness of a feed depends on how well it meets the animal's needs.



> drums and troughs

Cut-off 44 gallon drums are ideal for offering **Attractants**. Blue plastic drums are perfect, as they are lightweight and can easily be relocated in the landscape and found by animals because their colour makes them stand out.

Cutting drums lengthwise allows more animals to access the **Attractant** at the same time. If drums are cut horizontally, a dominant animal can often command total occupancy to the drum, excluding others.

Long feed troughs also can be used — they allow more animals to access them at the same time, but they are less easily relocated.

Moving the trough or drums is necessary to correctly implement the tactics of **Self Herding**.

TOP: Long feed troughs can be used but are more difficult than drums to relocate.

RIGHT: Blue plastic drums cut lengthwise are ideal to use in Self Herding.

FAR RIGHT: A loose mineral lick in a small feed trough.





Commonly-used *Attractants*

Three standard *Attractants*, which work well in many situations, are:

- coarse salt
- ‘Bruce’s brew’ — a mix of ash and charcoal
- a commercial or home-made mineral lick.



Coarse salt

Livestock appear to have an innate desire to consume salt — or sodium (usually in the form of sodium chloride). As such, salt has a strong attraction value unless there are already high levels of salt in local vegetation (e.g. saltbush) or in the drinking water. Also, providing salt on its own — as opposed to providing it as part of an expensive mineral mix — allows animals to consume the desired amounts from an inexpensive source.



'Bruce's brew'

➤ 'Bruce's brew' is a locally-sourced ash and charcoal mixture.

The ash component consists of minerals from burnt timber and the charcoal component can act as a detoxifier in the gut due to charcoal having a 'reactive surface', which binds toxins.



ABOVE: Bruce's Brew, a mix of charcoal and ash, may not look appetising, but animals sometimes pay it a lot of attention.

Commercial or home-made mineral supplements (loose licks or blocks)

A wide range of mineral licks is available, including phosphorus or urea licks. These can be used in a dual role as a supplement and an **Attractant**.

If supplementation is not required, or you choose not to use supplements for a period of time (e.g. because of their cost), using a mineral lick or block as an **Attractant** allows animals to become familiar with it, so when it is used at some other time as a supplement, your animals will know what it is and how to eat it.



ABOVE: A loose lick can be used successfully as an Attractant.

SIGNALS AND INDICATORS

› **Signals and Indicators** are cues that livestock may see, hear, smell or touch, 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.

Effective and easy-to-use **Signals** are witch's hats, or traffic cones. Not only are they easily-identifiable visually, but livestock often enjoy 'playing' with them, which can help build exploratory behaviours.

Simply place the **Signals** on the ground next to an **Attractant Station** — although you will need to check if animals move it too far away from the **Attractant Station** if they are not fixed in place.

TOP AND BELOW: Signals and Indicators are used to help livestock identify the presence of an **Attractant Station**.





bruce's tip

tips for using witch's hats

- **An alternative (and more secure) option to placing witch's hats on the ground is attach it to chain. With this approach you can attach the witch's hat to a nearby tree or post, or a trough, drum or lick feeder.**

These constructions are called *Witch's Hat Indicators*. You can use *Witch's Hat Indicators* to reliably signal animals toward *Attractants* or areas

you want animals to investigate or explore.

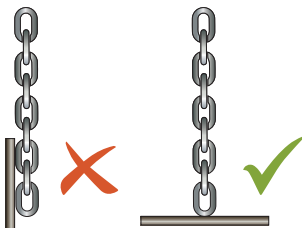
They are designed to be quickly and easily assembled or taken away.

A *Witch's Hat Indicator* has a three-part construction: a hat, chain and short rod welded to the chain.

Follow the steps and diagrams outlined below to construct a simple, yet sturdy, *Witch's Hat Indicator*.

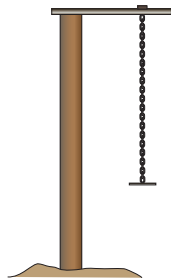
Configuration of a *Witch's Hat Indicator* chain

STEP 1



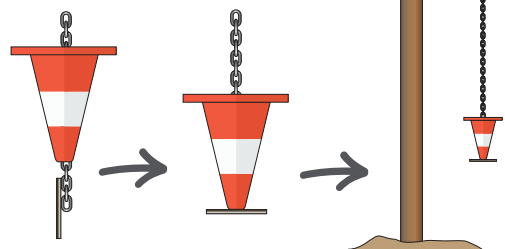
Weld short metal rod perpendicular to the end of a piece of chain.

STEP 2



Attach top of chain to a secure object with wire (or similar).

STEP 3



Lie the rod alongside the chain to allow you to slide the witch's hat over the chain. Release the rod so it lies perpendicular to the chain and hat as shown.

OTHER SIGNAL OR INDICATOR OPTIONS

Other effective **Signal** options incorporating sight, sound, smell and touch include:

Sight

Tie old CDs to a tall object to swing in the breeze and glint in the sun. You can use any other object that catches the eye, such as a shiny whirly gig.



LEFT and ABOVE: CDs provide effective visual Signals as they glint in the sun.

Sound

Homemade bells or wind chimes, provide effective visual **Signals**, with the added benefit of creating sound, which animals will recognise after repeated exposure.



ABOVE: Old iron bells and chimes provide visual and auditory Signals. RIGHT: Home-made devices can also be effective as visual and auditory Signals.

Smell

Diluted food flavouring or undiluted cordial are effective odour-based **Signals**. Cordial is the most easily accessible and cost-effective option available.

Whichever option you use, it is important to be consistent. Animals can be hesitant to try new things.

As cordials or food flavourings contain almost no energy, the main effect is to leave a lingering odour on whatever it is applied to. For optimal success, pair the flavouring with a feed reward. The reward can be as simple as water at a water trough, or any feed used as an **Attractant** or supplement.

To ensure animals investigate and associate a particular smell with a reward, apply it a number of times to ensure the link is strong.



ABOVE: A spray bottle is ideal for spraying undiluted cordial around feed bins or water troughs. It has a surprisingly strong smell.



dean's tip

Odour-based signals are best if sprayed on and near the *Attractant Stations* (feed drums or troughs) rather than directly on the feed. Animals can be wary of flavouring applied directly to their feed or water because it doesn't match their previous experiences of the smell and taste of that feed.

Another option for a smell **Signal** is to use diluted molasses — one part molasses in four parts water — because molasses has a distinctive and attractive smell. Diluting the molasses makes it easier to use — it's ideal in a spray bottle or squeeze tomato sauce (ketchup) bottle. Dilution also makes a drum of molasses last longer than if used neat, which helps keep costs down.



LEFT AND ABOVE: Odour-based Signals, such as food flavouring or a molasses–water mix can be effective when applied on or near Attractant Stations.

Touch

Livestock often like to chew tactile objects, such as metal or plastic chain, polypipe or metal objects, which can be used as **Signals** or **Indicators**.



bruce's tip

In country with plenty of shrubs or trees, use sound and/or smell signals. A visual signal will be less effective and is best employed in open country.

When used in combination, **Signals** can be attached to devices to form '**Attractant Coathangers**'.



JACKPOTS

➤ A *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.

A *Jackpot* (or *Jackpot Reward*) is used to establish a strong habit to come toward the *Signal* and that, in turn, will attract other animals towards the location.

The feedstuff used as the *Jackpot Reward* serves as an *Attractant*, in the same way as the standard *Attractants* described on pages 41–44 for *Attractant Stations*.

However, the *Jackpot Reward* is especially enticing because it provides a reward of energy and nutrients. The minerals (such as salt) used in standard *Attractant Stations* do not provide energy.

The *Jackpot Reward* can be any energy-rich tasty feedstuff — a biscuit of hay, crushed lupins, oats or other grain, cattle or horse pellets etc. Whatever very desirable feeds you provide, make sure you vary them from time to time. Keeping the same reward feed will lower the response over time but varying it increases the response.



ABOVE: A nutritious, tasty and occasional reward, paired with a clear and consistent *Signal*, can attract a lot of attention.

Because these feedstuffs provide a palatable, highly-valued reward of energy and nutrients, you can expect the *Jackpot* to be more rapidly consumed than the mineral-based attractants used in *Attractant Stations* described earlier.



dean's tip

Unlike the cue for the *Jackpot Signal*, you can change the actual *Jackpot Reward* from time to time. Varying the type of reward helps to keep animals interested because it is something different, but the predictability of getting a reward remains the same. It is an important reminder of the practical application of predictability and variety all animals respond to.

Animals like predictability, but also need variety. Predictable *Signals* with a variety of feeds are an effective way to provide what your animals want. Furthermore, the consumption of variety in one set of foods encourages animals to eat a variety of other foods.

So, incorporating variety into the *Jackpot Reward* will help encourage animals to include a broader range of feeds in their everyday diet, such as some of the plants in the landscape they could use, but currently do not use because of ingrained habits.

Jackpot Signal

A *Jackpot* is paired with a clear and consistent sound cue (*Signal*). The sound can be anything, but an umpire's or referee's whistle is particularly effective because they are loud and clear, easy to carry around, and everyone who offers a *Jackpot* can use the same cue.

It's important the cue is unique to the *Jackpot* and not other activities.

Preferably, don't use a car horn or a human voice as a *Jackpot Signal* as you may want to use this sound at another time for another reason, when you may not want animals coming towards to you. The audio *Signal* should be clearly different from anything else the animals are likely to hear.

Using a *Jackpot*

A *Jackpot* can be used on its own or in combination with other tools and tactics of **Self Herding**. On its own it can be an effective way to change the habits of highly-reactive (flighty) animals.

Reactive animals are attuned to detecting a difference in how humans interact with them, so will learn to approach humans when triggered by the rewarding experience of a *Jackpot*, rather than just repeating a pattern of avoiding human contact.

When *Jackpots* are used as part of an **Attractant Station** their impact magnifies the effects and leads to more animals inspecting the station. This can be important in a **Reliable Retention** application (see page 32), because the added desire of animals to be present when a *Jackpot* is offered keeps them in a closer range than would be the case with the lower-level, constantly-available rewards of a standard **Attractant Station**.

*RIGHT: A **Jackpot** can be particularly effective when carrying out a **Reliable Retention**, where it is beneficial to keep animals at relatively close range.*

Putting a *Jackpot* to work

If you want to encourage animals to a particular location, use a *Jackpot* to attract their attention and trigger them to move to the ‘target’ area. Even if only a few of the animals appear to be responding to the **Jackpot Signal**, rest assured other animals are likely to be watching and learning from these more gregarious animals. When a handful of animals move with intent, their movement draws others with them.





When placing a **Jackpot** in position, use your chosen sound cue (**Signal**) three times loudly. Place the **Jackpot** either in a feed trough or on the ground. To avoid individual animals dominating or bullying others, provide multiple **Jackpot Rewards** in the one location.

Stay near the drums for a few minutes after delivering the **Jackpot** to observe the animals and to let them build an association between people and a positive reward.

The goal is to change the relationship the animals have with people arriving in the area, and the overall human-livestock relationship more generally.

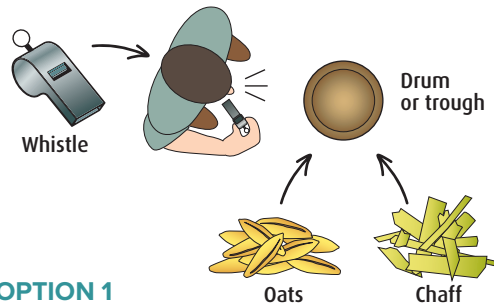
The flow-on effects of a better relationship between livestock and people are enormous — from easier yard work through to better performance of animals after transportation from one location to another.

using a jackpot reward

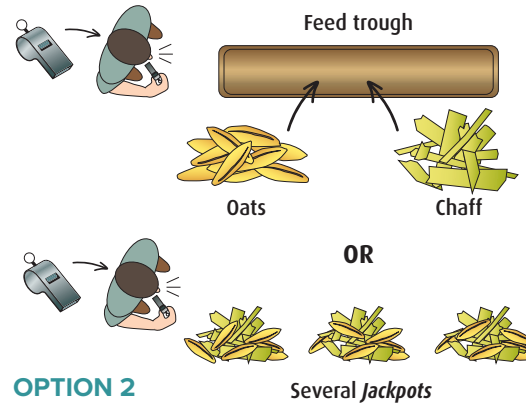
KEY

Blowing a whistle (*Signal*) before providing the *Jackpot Reward* alerts the animals to your intentions and they observe the procedure closely.

On arrival blow the whistle loudly three times then place the drum on the ground. Add the feeds you are using as a *Jackpot Reward*, for example oats or chaff, to the container.



If some animals are dominating the *Jackpot Reward* and the others are not getting a chance to access it, then use a trough instead of a drum or locate several *Jackpots* around the area so more animals can access the rewards.



Using a *Super Jackpot*

➤ A *Super Jackpot* is the provision of a larger *Jackpot Reward* so more animals can share the benefits and so the reward lasts longer.

A roll of high-quality hay is an ideal *Super Jackpot*.

To increase the attraction of the *Super Jackpot*, sprinkle lupins (or other grain, or pellets) all over the teased-out hay, or drizzle diluted molasses over the hay — making a kind of treasure hunt for the animals. This will generate more activity and interest, and help draw a larger group of animals to the site.

You can use the same *Signal* (e.g. whistle) for a *Super Jackpot* as for a regular *Jackpot*, or, if you use a *Super Jackpot* frequently enough, you can pair it with its own unique *Signal* (an air horn perhaps!).

RIGHT and ABOVE RIGHT: Sprinkling grain or drizzling diluted molasses over the Super Jackpot can increase the animals' level of interest and engagement.





dean's deli

- ▶ '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.

Dean's Deli provides the main macro-minerals animals need in their diet in as pure a form as possible. Offering the minerals separately in a 'deli' style arrangement has been termed 'cafeteria feeding'.

Providing minerals separately, rather than in a mixture, allows animals to self-select the minerals they need the most. Animals must be familiar with the offerings and regularly sample them to have the 'nutritional experience' to select according to their needs. Without this experience, their choices may be random rather than reflecting the minerals they need most.

With repeated exposure to the deli, animals will learn about the different minerals based on 'metabolic feedback' as they are consumed. For this reason it is important to combine *Dean's Deli* with behaviour-



A *Dean's Deli* is not just cafeteria feeding, it is the combination of the mineral supplements with management to ensure animals become experienced in consuming the minerals they need the most. Like so much of **Self Herding**, it is not just what you do, but how you do it.

based management to encourage animals to continuously explore the offerings and consume them in a proportion approximately matching their nutritional requirements. (Failing to do this probably accounts for a lot of the variable results in the literature on the effectiveness of cafeteria feeding).

> dean's deli (continued)



To maintain animals' interest in sampling the minerals on offer, consider placing buckets of minerals in a trailer so they can be moved around the landscape.

Pair a **Signal**, such as a **Witch's Hat Indicator**, with the **Dean's Deli** to help animals locate and build a strong association between the **Signal** and the nutritional reward.

Regardless of whether the buckets are placed in a trailer or in a more fixed structure, move the position of the buckets each time you visit the deli.

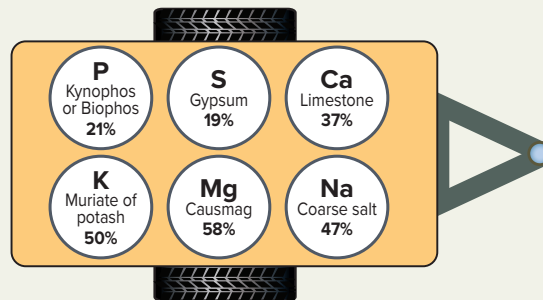
Varying the position can help animals to keep exploring (just as supermarkets move items around the store).

If animals continue to consume a particular mineral in various positions, it may indicate the animals 'need' this mineral rather than reflecting random consumption.



The minerals used in **Dean's Deli** are:

- **Phosphorus (P)** — a source of mono-calcium phosphorus, such as commercial phosphorus licks Kynophos or Biophos, which contain about 21% phosphorus
- **Sulphur (S)** — gypsum, which contains about 19% sulphur
- **Calcium (Ca)** — limestone, which contains 37% calcium
- **Potassium (K)** — muriate of potash, which contains about 50% potassium
- **Magnesium (Mg)** — 'Causmag', which contains 58% magnesium
- **Sodium (Na)** — coarse salt, which is 47% sodium.





understanding animal pressure zones

In a number of the following sections, animal movement may be triggered or increased by carefully applying pressure.

An understanding of the influence of pressure intensity and direction on stock will greatly improve all animal-people interactions.

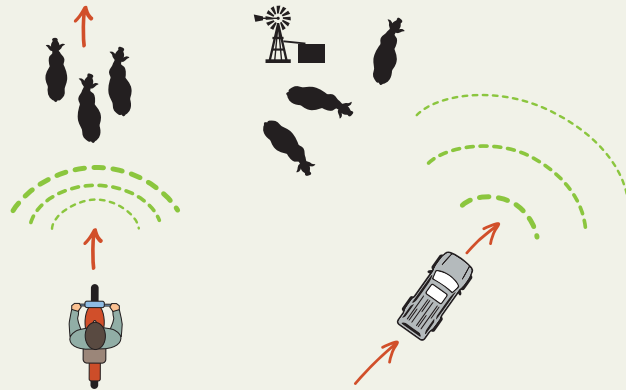
Animals start to respond to people (or vehicles) well before you actually hit their flight (or pressure) zone. Think of this zone like the ripples that radiate around a pebble hitting water — fanning out and then subsiding.

Consider your own influence on your animals in a similar way — sometimes you will want to increase the intensity of your influence (e.g. to encourage animals to move in a desired direction) while at other times you will want to minimise your influence (e.g. when approaching a water point or handling yards for monitoring or maintenance).

The direction and intensity of your pressure zone or waves will affect animal movement and the type of interaction you have with the animals.

aim

To manage animal movement by asserting (or avoiding) pressure.



An intense and direct zone of pressure will encourage animals to move away from the source of pressure.

EXAMPLE 1

A steady and indirect approach in a straight line (minimising the intensity and direction of influence) reduces any pressure felt by animals, who will tend to remain stationary and relaxed.

EXAMPLE 2



GUIDANCE FENCES OR GUIDANCE TRACKS

➤ **Guidance Fences** are relatively short-length fences (most likely 20–100m, but it depends on local circumstances), which guide animal movement in a desired direction. They are not designed to contain animals, as a conventional fence structure would aim to do, but to make it visually clear to animals the direction you want them to move.

Guidance Fences can be electrified tape fastened to star pickets, or conventional wire. The fences can be permanent or temporary fixtures.

You may want to erect 'training lengths' of electrified tape in any frequently-used area so livestock learn about the electric tape and walk along the fenceline rather than busting through it. By encountering the training length when under no pressure or stress, the animals can calmly learn to be guided by the fence.

You can strengthen the learning experience by placing **Attractants** at the end of the training fence to draw animals in that direction, and to reward animals for the desired behaviour of moving along a fence.

Because you will have created a positive association between a fence and a small reward, livestock learn to respect and walk along a fence next time they encounter one.



In some cases, a '**Guidance Track**' may be all you need to encourage the movement of animals in a particular direction. A track will be less certain in influencing movement than a **Guidance Fence**, but animals often show strong preferences for walking along a track rather than bush-bashing. You could try putting in some short **Guidance Tracks** first, and erect **Guidance Fences** at a later time if required.

Funnel Fences

- **A Funnel Fence is a series of short Guidance Fences designed to speed animal movement. This can be desirable for various reasons, with the most common to increase movement and momentum toward or into handling yards or for increasing speed past obstacles.**

The series of fences, which make up a **Funnel Fence** system are not parallel, instead they are angled to create funnel shapes to collect at their 'base' and accelerate movement through the narrower section. The actual width of the base can vary depending upon the speed required. If the base is broad then the speed at that point will be lower. If the base is narrow, or the fences long, then the speed at the point will be faster.

Relatively short lengths will influence movement significantly. This can be useful for places in the landscape where additional momentum for groups of animals aids the mustering process.

RIGHT: *When animals learn to move along a length of fence towards a reward, the fence becomes more than infrastructure for containment; it also serves to guide the flow and speed of movement.*



bruce's tip

To trigger and then reinforce the use of the **Funnel Fences**, place **Attractants** and visual **Signals** at the end of the fence lengths to add an additional incentive for the animals to move in the desired direction. This is helpful when new **Guidance Fences** are erected as it encourages strong behaviours from the start of the interaction between the animals and the fences.





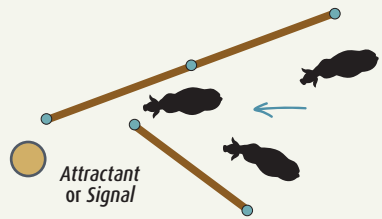
using *funnel fencing*

aim
To increase the speed of animals toward a desired location.

Funnel Fencing designs can vary widely. Length, width and angle of entry are key components depending upon the result required. The greater the angle between fences, the faster the animals will move through the funnel. If pressure is applied as animals enter the funnel (e.g. during mustering), animal movement will be further increased.

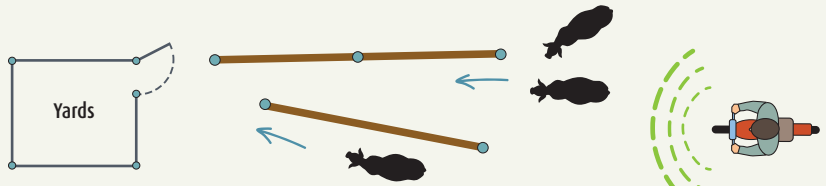
EXAMPLE 1

A wide-angled funnel fence can be used to gather animals from a broad area and trigger movement in a desired direction.



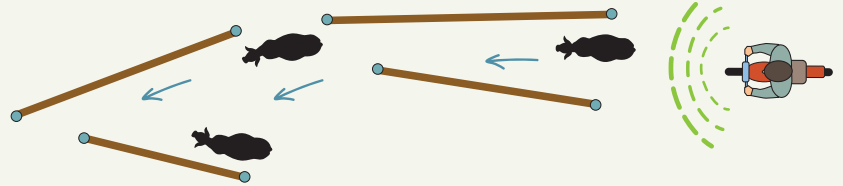
EXAMPLE 2

Funnel fences can assist with mustering by making it easier to direct animals to targeted areas such as holding yards.



EXAMPLE 3

Multiple funnels can speed general progress along a chosen direction (see right).



Louvre Fences

➤ **Louvre Fences** are series of parallel, short lengths of fence used to ‘sweep’ animals in a desired direction from difficult-to-access areas, such as river systems.

The two main purposes of a **Louvre Fence** at a river or creek line are to (i) encourage more foraging time off-river and (ii) increase the speed and effectiveness of mustering off-river.

The fences overlap and are angled to coordinate movement in desired directions and intensify the rate of movement animals make to join other animals.

Erect a Louvre Fence to encourage animals out of a difficult-to-access area, such as a river or breakaway, and direct them toward a target, such as a trap yard, or just into adjacent areas.

The length of each louvre and the overlap to the next can vary according to a set of factors such as, the strength of movement required, the strength of fence construction, topography and available finance.

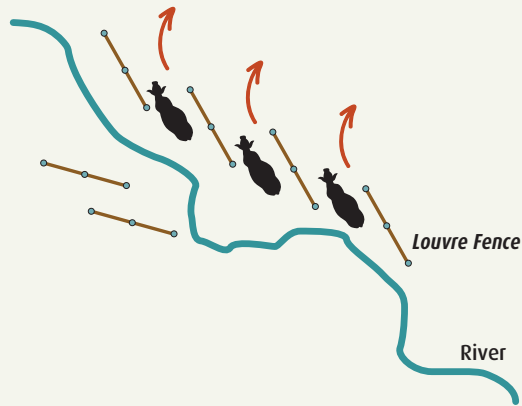


ABOVE: Louvre Fences can encourage animals to move more easily through difficult-to-access landscapes and terrain.

When mustering, take care to use the **Louvre Fences** in a way that produces the desired result. Too much negative pressure applied to the ends of the fences when animals are emerging from them will cause turnarounds and disrupt the flow of movement (see **Stress-Free Stockmanship** on pages 104–105).

As with **Funnel Fences**, placing **Attractants** at the end of the last **Louvre Fence** will entice animals toward it and reward them when they arrive.

using *louvre* fencing

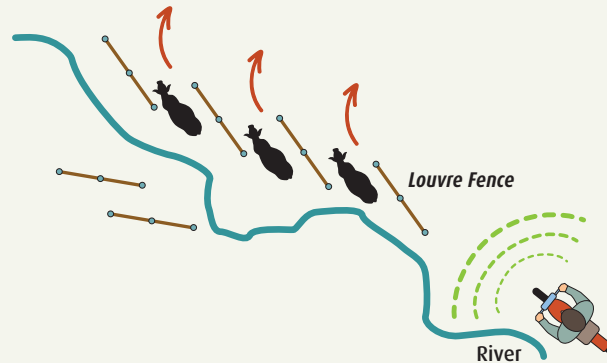


SCENARIO 1 — Increasing foraging off-river

- Stock movement is guided off-river to make the effort of return slightly more than movement away from the river.
- The length of each louvre (and the overlap to the next) can vary according to a set of factors, which include strength of movement required, strength of fencing construction, topography and available finance.

aim

To direct animals away from a difficult-to-access area.



SCENARIO 2 — Increasing mustering efficiency

- Animal movement is guided off-river by applying pressure, multiplied by the *Louvre Fence* effect of increasing momentum as the animals progress along the fenceline.
- With conventional mustering along riverine areas animals may seek to escape behind the pressure to the familiar and inaccessible areas.



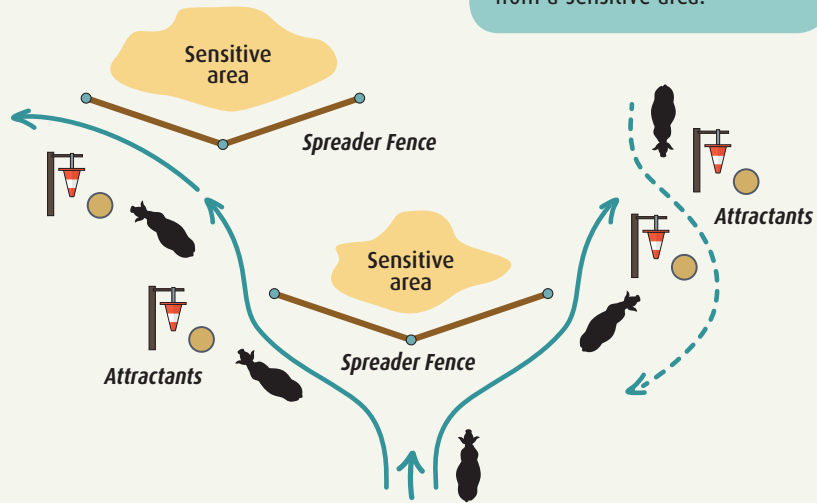
Spreader Fences

- **Spreader Fences** are typically short lengths of fence used to direct animals away from erosion-prone or environmentally-sensitive areas.

As with *Louvre* and *Funnel Fences*, placing multiple **Attractants** will encourage movement along the fence and away from the sensitive area.

using spreader fences

- Animal movement is directed away from a sensitive area by *Spreader Fences* and the movement is positively reinforced by *Attractants*.
- Returning animals will be enticed to the *Attractants* and, over time, will follow the new pads (or tracks) influenced by the *Spreader Fences*.





A MASTER MOB

- **A Master Mob is a group of experienced or trained animals that initiate strong following behaviours in other animals.**

These animals are selected for a combination of calmness, inquisitiveness, adaptability and willingness to be followed by others. Animals in a **Master Mob** are not selected for 'dominance', but rather for a capacity to learn and exhibit desirable habits.

The benefit of having a Master Mob is the reduction in time and effort to initiate behaviours in larger groups or across larger areas, increasing the speed of adaptation of the other animals.

Investing time and effort working intensively with a relatively small group in a **Master Mob** can prevent the need for longer and more expensive work across larger areas.

RIGHT: Master Mobs can be used to encourage positive behaviours in other animals.



Strong behaviours of experienced animals are the most effective signal for new animals to follow and mimic.

The larger the change new arrivals face, the greater the benefit of using a **Master Mob** to help the new animals find water and forage. New livestock can't be expected to know how to best mix plant species to optimise nutrition, so combining new arrivals with receptive

Master Mob individuals will show inexperienced animals what to do and how to do it.

At times where it may be necessary to reduce stock numbers on a property, give priority to retaining animals in the **Master Mob**, as these animals can be used to teach desirable grazing behaviours to future arrivals. Their behaviours are just as valuable an asset as their genetics and the preservation of both in difficult times can maximise returns down the track.





mob size

A *Master Mob* can include up to 30 animals and animals can be constantly added and removed from the group at any time, leaving enough remaining animals so the *Master Mob* behaviour remains strong.

The number of *Master Mob* animals to use with a group of new arrivals depends on the strength of behaviours exhibited by the new arrivals and the *Master Mob* animals. In general, the larger the group of new arrivals, the larger the number of *Master Mob* animals required. As a starting rule of thumb, aim for *Master Mob* animals to represent about 10% of the total mob, but remember the important thing is not the number of animals, but how well they interact.

The training procedure for a *Master Mob* can vary depending upon what cues and behaviours are required.



Selecting appropriate animals is important because you not only want desirable behaviours, but also animals who willing to accept others.

Dominant animals with strong habits may not be ideal if they do not pass on those habits to others. Choose animals that interact positively with others.

Keep a *Master Mob* available for 'refresher training' in paddocks adjacent to the main handling yards. Small paddocks (10–20ha) are ideal. It is preferable to have a set of three small paddocks for retaining a *Master Mob* so each paddock can receive appropriate rest periods.





the tactics of Self Herding

The following pages describe a range of **Self Herding** tactics, which use the tools covered in the previous chapter to achieve multiple management objectives.

In addition to the explanations of each tactic, the diagrams that accompany each approach outline how to apply the tactics in a range of situations.

As with any new concept the tactics of **Self Herding** can appear confusing at the outset, but with training, application and hands-on experience they will have long-term benefits for both livestock, people and the landscape in which they interact.



ATTRACTANT HOPPING

➤ **Attractant Hopping** is a self-herding tactic that encourages livestock to move through a *Landscape Jigsaw* (see pages 22–29) in a planned direction (e.g. *Managed Movement*). 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.

If you want to maintain the grazing focus in smaller areas of the landscape, you can simply restrict the size of the 'hops' of the *Attractants* to increase the length of time the animals tend to stay in one general area before you encourage to move further afield with larger 'hops'.

The first and vital step in the *Attractant Hopping* process is to familiarise livestock with the *Attractants*, *Signals* and *Jackpots*.

It is important the animals' initial encounter with the *Attractants*, *Attraction Station* (drums or troughs containing the enticing feedstuffs) and the associated *Signals* is in a low-anxiety setting.

Anxiety can impair an animal's ability to rapidly develop a strong desire to sample the *Attractants* and *Jackpots*.

If animals are in a yard, start familiarising them there, as this will maximise the number of encounters they have with the *Attractants* and the *Jackpots*.

If the animals are not in a set of yards, start the familiarisation process in a location where they are currently contented, such as near a regularly-used water point or camp.

During the familiarisation phase it is important to couple the *Attractants* with clear and unambiguous *Signals* — livestock quickly learn to associate these signals with rewards.

Setting up the *Attractant Station*

Before setting up the *Attractant Station* (see page 41) identify a place the animals are familiar with and spend a lot of time.

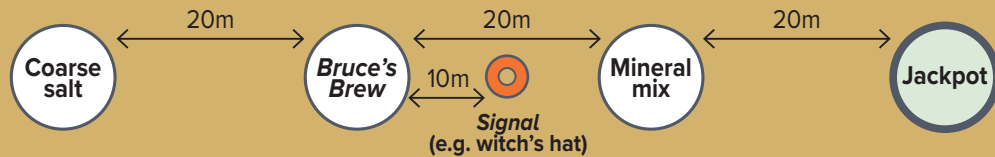
Place three drums containing the *Attractants* (e.g. coarse salt, mineral mix and Bruce's Brew) on the ground about 20m apart. This distance is usually sufficient to prevent dominant animals from intimidating more submissive animals from exploring the *Attractant Station*.

Place the *Signal(s)* you have chosen to use nearby, preferably within 10m of the *Attractant Station*.

In addition to the three *Attractant* drums, use a fourth drum to offer a *Jackpot* as frequently as you can during the initial familiarisation stages. This encourages exploratory behaviour around the station.



attractant station set-up for attractant hopping





When your livestock are readily and frequently visiting the **Attractant Station**, you can reduce the frequency of the **Jackpot**. If the animals appear to lose interest in the **Attractant Station**, you can increase the frequency of the **Jackpot**, or even consider using different ‘treats’ as the **Jackpot** feed to increase the reward the animals receive.

Starting the moves

When there is plenty of activity and investigation of the **Attractants**, start moving the **Attractant Station** (drums or troughs) through your planned **Landscape Jigsaw** — smaller, less-frequent moves initially, followed by longer moves when the animals readily follow the direction you are setting (see diagram on page 74 for more information).



dean's tip

How often and how far you move the **Attractant Stations** is the ‘art’ of applying the science. You have to determine what the cattle are telling you with their level of activity around the **Attractant Stations**.

Pastoralists have been known to move the **Attractant Station** in ‘hops’ as small as 50m up to several hundred metres, and even more than a kilometre. On one occasion, a hop of 2km proved too far for a single move, so the **Attractants** were brought back to re-connect with the animals.

attractant hopping — principles to practice

- Start the tactic with a high level of intensity, incorporating frequent use of *Jackpots*.
- Adjust the intensity (through timing and feed) to reinforce and encourage attraction and exploration.

aim

To encourage animals to move through the landscape in a planned direction and grazing intensity (e.g. *Managed Movement* and *Pyric Grazing*).

- Continue with the *Attractants* and *Signals* for final reinforcement at the new area.

Tips:

- Changing the order of drums for each hop will help maintain interest and exploration of the *Attractants* by the animals.
- Start the moves at modest sized 'hops' (e.g. 50m) extending the distance as animals show strong interest in following the direction of travel.
- Re-evaluate the distance for each 'hop' — make it far enough to achieve timely progress towards the destination, but not too far that animals are lost on the way.



Movements (including timing and frequency) will depend on the animals, the way the *Attractants* are delivered, and the landscape (e.g. flat/open, wooded or hilly).



bruce's tip

Observing the reactions and interest of the animals is critical to the continued success of *Attractant Hopping*.

Just moving *Attractants* about will not prove effective. The moves and intensity of attraction are adjusted in relation to what the animals are showing with their behaviours. When there is a lot of interest from animals the *Attractant Station* can be moved quickly and larger distances but if interest slows or decreases then the moves need to be less frequent and shorter distances.



ABOVE: A handy tip — rewards offered in feeders have been stabilised with star pickets bolted to the bottom.



ATTRACTANT LEAPFROGGING

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

The inclusion of a particularly enticing reward (e.g. **Dean's Deli**, mobile lick feeder or a **Super Jackpot**) is used to encourage more intensive grazing around the **Attractant Station**.

The large reward is positioned ahead of the **Attractant Station**, and the **Attractant Station** is progressively moved towards this reward.

The **Attractant Station** is progressively moved past the rewards — leapfrogging it. The full process is described in more detail on pages 78–79.

RIGHT: It's not just the animal consuming the Reward that is learning. The others watching are learning too.

Attractant Leapfrogging is useful for gathering additional animals by attraction or for sending groups of animals out into areas they might not otherwise traverse. The large reward the animals interested for longer than the **Attractant Station** used in **Attractant Hopping**, which attracts more animals or encourages them to stay around the area for longer.

The use of a larger, main reward also provides a greater opportunity to discover and observe more animals around the **Attractants**. This can be useful, for example, in identifying cleanskin animals and calming them down as they learn about the rewards and see you more frequently in a positive situation.





Mobile lick feeders

A mobile lick feeder containing feed that provides energy and nutrients (e.g. lupins or pellets) is an ideal enticing reward to complement the **Attractant Station**.

Lick feeders are not feeders containing mineral 'licks' but rather grain or pellet feeders that only enable animals to lick, rather than gorge feed.

Lick feeders limit the amount of feed consumed and the amount of time an individual animal can spend at the feeder because animals become motivated to leave to consume water when their mouth dries up after licking from the feeder. For this reason, it is better to position a lick feeder away from a water point to encourage a flow of different animals around the lick feeder.

You can use other offerings as the large reward. Self feeders, rather than lick feeders, can be used, but this can lead to some animals 'going on welfare' by relying on the provided feeds as a substitute for foraging widely.

To reduce the risk of developing welfare-dependent livestock, move the feeders in a planned pattern around the landscape to make it less attractive to remain camped at one location near the feeder. The movement of animals between new locations where the feeder is placed will also encourage new grazing activity.



Another option for the large reward is a *Dean's Deli*, described earlier on pages 58-59.



Starting the process

The first step in the **Attractant Leapfrogging** process is to offer the **Attractant Station** and **Jackpot**, as with **Attractant Hopping**.

When livestock are clearly interested in the **Attractant Station** and **Jackpot**, move them towards the large reward (e.g. mobile lick feeder, **Dean's Deli** or **Super Jackpot**), which you have placed about 100–250m, away.

When the **Attractant Station** reaches the large reward (via 'hops' as described from **Attractant Hopping**), continue to move it past the large reward — 'leapfrogging' it.

When the **Attractant Station** is some distance on the other side of the large reward, relocate the large reward further afield in the desired direction. Over time, continue along the desired direction of travel, and adjust the frequency of moves of the large reward to achieve the intended grazing intensity.

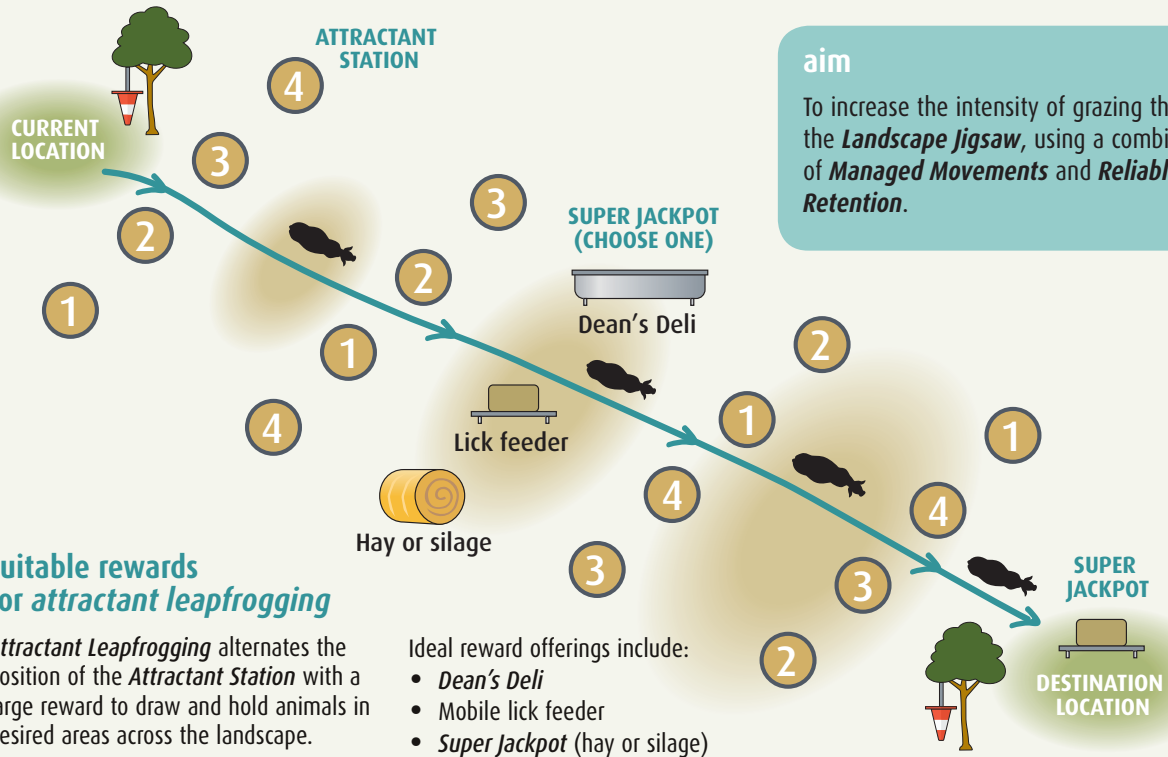
Depending on the situation, and how far and fast you want to move the animals, you could move the **Attractant Station** weekly (e.g. when on a mill run) and the large reward once every 4–6 weeks. If the large reward is receiving a lot of attention, you may need to move it more frequently to avoid the animals overusing the patch around it.

RIGHT: Replenishing Rewards in feed troughs is easy because the amounts used are small. Even small offerings can still attract sufficient attention.





attractant leapfrogging — principles to practice



aim
 To increase the intensity of grazing through the *Landscape Jigsaw*, using a combination of *Managed Movements* and *Reliable Retention*.

suitable rewards for attractant leapfrogging

Attractant Leapfrogging alternates the position of the *Attractant Station* with a large reward to draw and hold animals in desired areas across the landscape.

- Ideal reward offerings include:
- *Dean's Deli*
 - Mobile lick feeder
 - *Super Jackpot* (hay or silage)

WATER WHEELING

➤ **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.

It applies a **Managed Movement** approach to guide animals to new watering points progressively and, while at each water point, encourages them to fully explore in all directions around the water point before moving on to the next area.

Water Wheeling uses **Attractant Hopping** or **Attractant Leapfrogging** to draw the animals around each water point before heading toward the next water point.

Attractant Hopping or **Leapfrogging** is used to encourage animals from one water point to the next and, upon arrival at the new water point, to 'circumnavigate' it before being encouraged to move on to another water point.

Water Wheeling changes herd behaviour to use multiple water points over time, allowing rest and recovery in areas that may have been heavily used in the past.

You can also use **Water Wheeling** to increase the use of water points previously inadequately used, by extending the time spent around a particular point.

Water Wheeling mimics natural livestock grazing behaviours exhibiting grazing loops from a water point, but also draws animals to areas they may not otherwise choose to use without encouragement and reinforcement.

It allows slower animals to continue to follow the group movements without losing track of the direction of the **Attractants** or other animals. This assists where animals in the herd are giving birth.

RIGHT: Water Wheeling is a self-herding tactic that encourages animals to access multiple water points and results in more even grazing of the landscape.





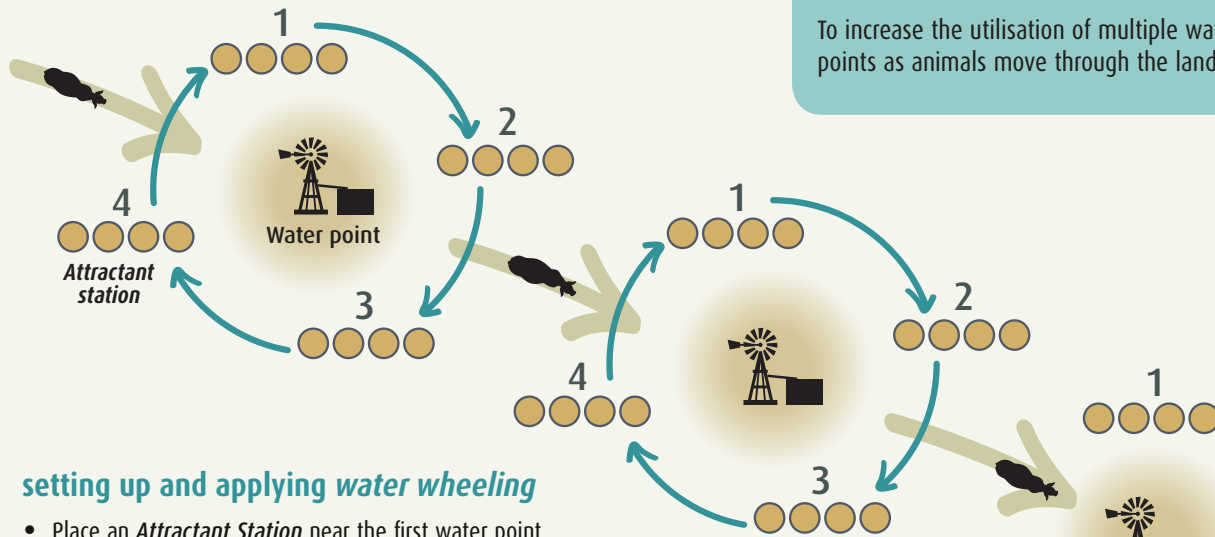
the benefits of *Water Wheeling* include:

1. **More even grazing** — Based on GPS tracking of cattle at a number of properties, the natural grazing behaviour of animals is to looping out and back from water.
2. **Rewarding slower animals** — It allows slower-moving cattle arriving at the new water a chance to catch up with others and receive the rewards.
3. **Consolidating the mob** — It allows individual animals to return to the previous water for a short period before heading back out to the new water, without losing touch with the *Attractants* or the other animals in the group. In many situations, individual animals are keen to go back to their previous water to ‘check it out again’ before being happy to move on to the new water. We want to work with this behaviour rather than fight it.



ABOVE: This image shows the paths animals followed in and out around water points. The cattle were fitted with GPS tracking collars, with different coloured lines representing different individuals.

water wheeling — principles to practice



aim

To increase the utilisation of multiple water points as animals move through the landscape.

setting up and applying *water wheeling*

- Place an *Attractant Station* near the first water point.
- Then move it around the water point doing a full circuit before taking the *Attractant Station* to the next water point.
- Repeat the process around however many water points you want the animals to use.



situation-specific applications of self-herding tools and tactics

The following applications of the self-herding tools and tactics help achieve situation-specific management goals.

The use of **Pyric Grazing**, with **Pyric Highways** or **Freeways** can influence species diversity and also reduce the risk and impact of bushfires.

Rangelotting applications can be employed to manipulate mob nutrition and fertility, and to influence the time and intensity of grazing across the landscape in order to address landscape degradation issues.

PYRIC GRAZING HIGHWAYS

➤ **Self-herding tactics can be used to develop *Pyric Grazing Highways*, which are enhanced firebreaks that use animal impact along existing tracks or firebreaks to widen the area of reduced fire load. This enables more effective fire-fighting efforts than relying solely on narrow tracks to interrupt a moving fire.**

Pyric Grazing Highways can be easily formed along any area of track where a reduced fire load is needed. The reduction in flammable vegetation need not be total; rather aim to thin it out enough to be effective, but not enough to create unwanted erosion.

Livestock are effective at reducing fine vegetation, such as grasses, which can be highly valuable in reducing fire intensity and rate of spread.

You can use *Attractant Hopping*, *Attractant Leapfrogging*, *Jackpots* and *Super Jackpots* to influence the grazing intensity

along the *Pyric Grazing Highway*. The choice of which tools and tactics to employ will depend on how much self-herding work has been done previously, (i.e. how strongly the animals are already cued to *Signals* and *Attractants*), and what response you can achieve under the particular seasonal conditions at the time.

An added bonus of using *Pyric Grazing Highways* is that the procedure reinforces the desirable behaviour of animals moving along a track or path. This is particularly useful during mustering, and for any other self-herding work you undertake to attract animals into under-utilised areas.





pyric grazing highways — principles to practice

establishing a pyric grazing highway

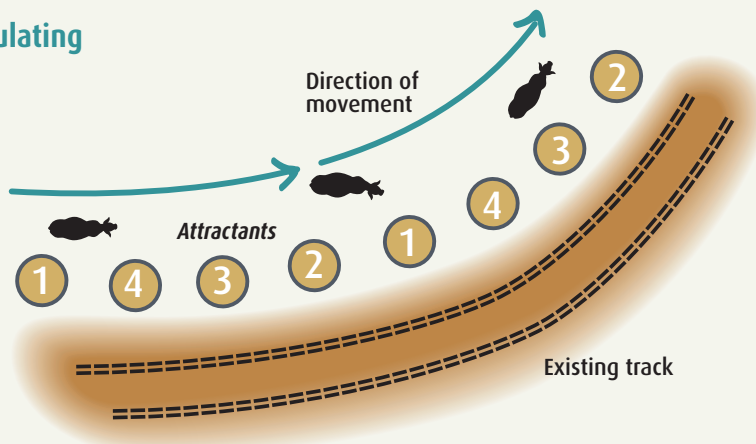
- Move *Attractants* or *Attractant Stations* alongside an existing track where fire loads need to be reduced.
- Move the *Attractants* faster or slower along the track depending the level of vegetation you want to remove.

aim

To use self-herding strategies to reduce seasonal fire loads by creating a firebreak of reduced vegetation.

tactics and tools for manipulating grazing intensity

- *Attractant Hopping, Attractant Leapfrogging, Jackpots* and *Super Jackpots*.



PYRIC GRAZING FREEWAYS

➤ ***Pyric Grazing Freeways* are large firebreaks and fire suppression areas. They provide a significant width of reduced vegetation load so the chances of successfully fighting wildfires are greatly improved. They are used on properties or in areas with a high fire risk or where fire control is difficult due to limited access.**

Pyric Grazing Freeways are a deliberately wide stretch of ground between two graded or cleared tracks. The width should be at least 200m and could be much wider in extensive landscapes. The width is designed at a local level, taking into account factors such as maximum fuel load, wind strength, landform and likelihood of ignition.

A *Pyric Grazing Freeway* is constructed by firstly establishing two *Pyric Grazing Highways* running parallel to one another. The widths between the two tracks – i.e. the *Freeway* – can vary; it does not need to be a uniform distance along the whole length.

Between the tracks, vegetation is managed via a combination of animal impact and managed fire-reduction burns. Both of these tools need to be applied tactically to reduce residue loads while avoiding erosion. The area is managed to keep the fuel load as low as possible so it serves as a large landscape firebreak.

Grazing intensity is manipulated along the *Pyric Grazing Freeway* by using self-herding tactics and tools such as *Attractant Hopping*, *Attractant Leapfrogging*, *Jackpots* and *Super Jackpots*.

While chemical or mechanical means can establish large firebreaks, the environmental damage and costs of these approaches prevents their widespread use. *Pyric Grazing* offers a new, more sustainable approach.



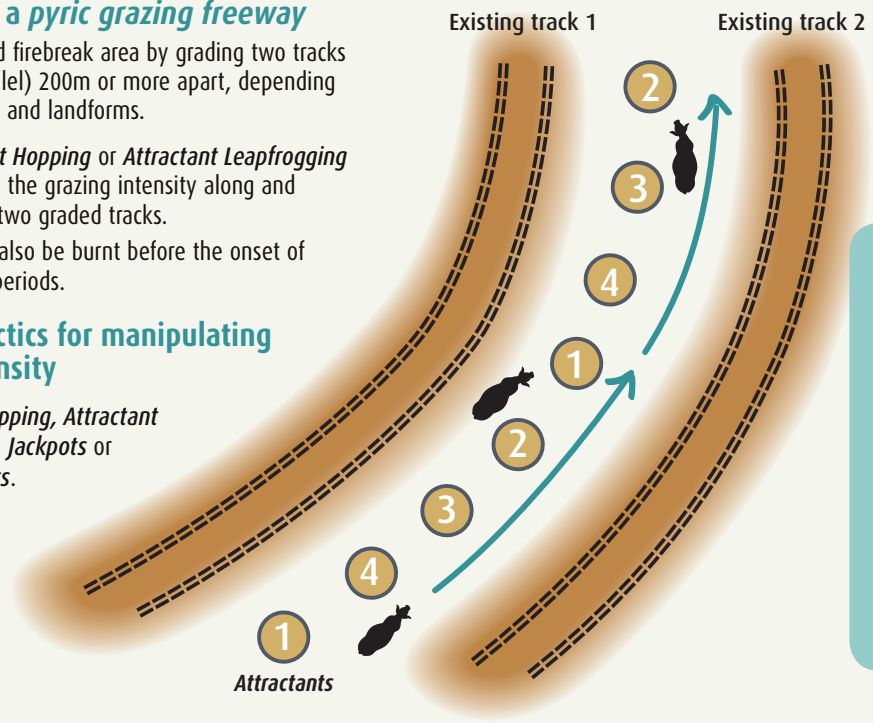
pyric grazing freeways — principles to practice

establishing a pyric grazing freeway

- Create a broad firebreak area by grading two tracks (roughly parallel) 200m or more apart, depending on vegetation and landforms.
- Use *Attractant Hopping* or *Attractant Leapfrogging* to manipulate the grazing intensity along and between the two graded tracks.
- This area can also be burnt before the onset of fire-risk periods.

tools and tactics for manipulating grazing intensity

- *Attractant Hopping, Attractant Leapfrogging, Jackpots or Super Jackpots.*



aim

To use self-herding tactics to develop wide areas from which to safely fight fires and backburn. *Pyric Grazing Freeways* also offer a refuge for livestock in uncontrolled wildfires, away from radiant heat and direct flame.



RANGELOT FLUSHING

➤ *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 behaviour-based management (e.g. *Managed Movement*).

Rangelot Flushing consists of a triple-paddock system — a flushing paddock, a joining paddock and a settling paddock. The roles of the three paddocks are rotated annually to enable a variable rest period effect on the landscape.

It is particularly important to ensure the 'joining' paddock varies each year as this paddock is at greatest risk from excessive animal impact.

Implementing *Rangelot Flushing*

Hold females for an initial two-day training period in the yards, to familiarise them with visual **Signals** and **Attractants**. During this period provide nutritional supplements in the form of **Dean's Deli** and via a mobile lick feeder.



Pair the supplements with a **Signal**, such as a **Witch's Hat Indicator**, to teach the animals the relationship between the **Signal** and the reward, thereby strengthening behavioural responses in the future.

Each day expose the mob to a single session of **Stress-Free Stockmanship** (see page 105), which involves parallel movements to reduce the speed of movement in animals, guiding animals through the different parts of the yards, and placing animals in specific locations within the yards.

Following this initial training period, place females in the 'flushing paddock' and offer supplementary rations in a mobile lick feeder and **Dean's Deli** to increase body condition and ovulation rates. Commonly-used supplements include lupins or high-protein pellets, depending on relative price and availability.

Feed about 1.5kg/head/day of lupins to heifers (or equivalent on a crude protein basis for pellets) or about 300g/head/day to ewes.

The supplementary feeds are designed to stimulate ovulation rate and the size and maturation of the ovulatory follicle.

Each week shift the lick feeders to a new impact area, using a **Managed Movement** process — move the **Attractant Stations** (**Dean's Deli** and mobile lick feeders) throughout the area, incorporating a **Jackpot** at each new area, to influence grazing distribution. Animal activity for short periods (1–7 days) around the **Attractant Station** disturbs and fertilises the sites without risking structural soil damage.

During the **Rangelot Flushing** process, replenish **Dean's Deli** components as required.

Keep bulls or rams in the adjacent 'joining' paddock allowing 'fenceline contact' to trigger the 'bull' or 'ram' effect (non-cycling heifers or ewes are stimulated to ovulate by a sudden exposure to male pheromones).

The 'flushing' period

A flushing period of six weeks is recommended to maximise the chances of all animals ovulating (six weeks spans two oestrous cycles). If oestrus is synchronised by hormone treatment as part of a breeding program, the flushing period can be shorter (about one week), as the benefits of improved nutrition to ovulation occur over just a few days before ovulation.

In most rangeland situations six weeks of supplementation not only helps ensure most animals

will receive improved nutrition at the right time in their oestrus cycle, but it will also help heifers or maiden ewes build body condition, which is a key driver of reproductive performance.

At the conclusion of the flushing period, place the heifers or ewes into a 'joining paddock' for another six weeks.

Provide mobile lickier feeders in the 'joining paddock' to maintain the nutritional effect on both female and males, and increase male-to-female contact over a short period to concentrate calving or lambing.

RIGHT: Rangelot Flushing sets up females to maximise chances of conceiving and completing a successful pregnancy.





Continue the *Managed Movement* process in the joining paddock to influence grazing behaviour and landscape impact.

After joining, place the heifers or ewes in the ‘settling paddock’, where you may choose to include bulls or rams if you think there are females not already mated. You do not need to continue the supplementary feeding now, but you can if you want to continue to elevate the level of nutrition.

Continue the *Managed Movement* process in the settling paddock to influence grazing behaviour and landscape impact.



Rangeland Flushing considerations:

Each year:

- place the *Attractant Stations* (mobile lick feeders and *Dean’s Deli*) in different locations in the paddocks
- use a *Landscape Jigsaw* map as a useful tool to keeping track of annual *Attractant Station* locations
- take some photos to record ‘before’ and ‘after’ effects on the landscape.



rangelot flushing — principles to practice

Triple paddock system — the flushing paddock, the joining paddock and the settling paddock.

- The supplementary feeds supplied in *Attractant Stations* stimulate increased ovulation.
- The feeds concentrate the females for animal impact on degraded areas within the flushing and joining paddocks.
- The animal impact in each paddock is manipulated by shifting the *Attractant Stations* frequently (maximum of one week in any one spot), providing disturbance and nutrient application without risking structural soil damage.



aim

Increase conception rates through improved animal nutrition, while managing the grazing impact at a landscape level.

1. flushing paddock

- Females are placed in the flushing paddock (adjoining the bulls/rams in the joining paddock) and fed supplementary rations to increase body condition and ovulation rate of the animals.
- Females stay in the flushing paddock for six weeks before moving to the joining paddock.

2. joining paddock

- Bulls, with access to a mobile lick feeders, are in the joining paddock for six weeks before being joined by the heifers for another six weeks, after which the heifers are pregnancy tested.

3. settling paddock

- At the conclusion of the joining period females are placed into the settling paddock where *Managed Movement* processes influence grazing behaviour and landscape impact.



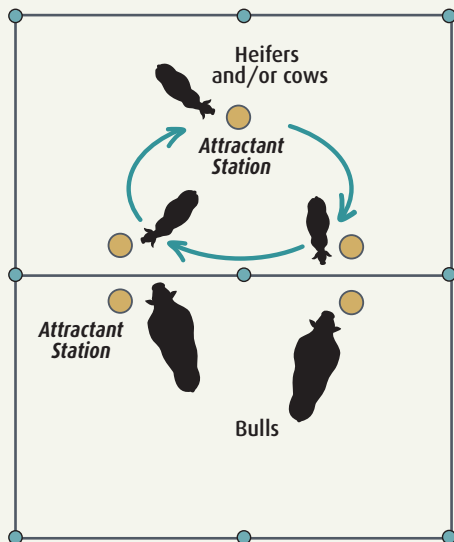
dean's tip

You could set up a motion detection camera at the lick feeder to record the amount of attention it receives from your livestock. It's amazing how much happens when you're not there!

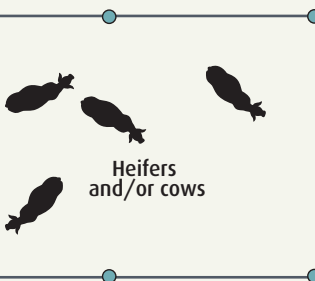
If you use a smartphone or tablet for taking photos — the Photomon application is a handy tool for making sure your photos are taken in exactly the same place each time. It provides overlaid transparent reference photos for consistent field of view. The app can be downloaded for Android and Apple devices.

Go to www.nacc.com.au/photomon for more information.

1. flushing paddock



2. joining paddock



3. settling paddock

➤ benefits of *rangelot flushing*

Rangelot Flushing lifts reproductive rates and achieves other benefits including:

- Increased joining percentages.
- Earlier identification of poor performers.
- Faster genetic improvement.
- Setting behavioural responses in young females early in their life, which can provide benefits in the longer term as they become experienced breeder animals.
- Landscape repair.
- Triggering responses that can occur during development of the foetal calf or lamb. These are called epigenetic changes, which change the expression of genes (i.e. turning genes on or off) rather than changing the actual genes that an animal inherits.

Increased joining percentages

Animals in a **Rangelot Flushing** system receive a short-term boost in nutrition, especially protein supply, which, along with the ram or bull effect, stimulates ovulation resulting in increased joining percentages. Keeping animals in a smaller space alongside rams or bulls also helps to synchronise cycling, supporting a tighter joining period.

Earlier identification of poor performers

In a **Rangelot Flushing** situation, animals are easily inspected around **Attractant Stations**.

Behaviours and physical condition can be assessed during inspections, potentially allowing for early culling of 'empty' females and a post-mating assessment of bulls or rams.

Faster genetic improvement

Using **Rangelot Flushing** with first-time heifers (or maiden ewes) and bulls (or rams), can maximise the chances of success with animals specifically selected for calf (or lamb) production; that is, you can increase the chances



that the newest genetics from both sire and dam lines are incorporated into your herd or flock.

An efficient joining period with high genetic merit animals will increase the rate of genetic gain.

Establishing behavioural responses early

During *Rangelot Flushing* of heifers or maiden ewes, young stock have positive experiences that will, hopefully, be part of the breeding herd (or flock) for many years to come. The young females will become familiar with the use of **Signals** and **Attractants**, so when they are used in the future, the animals will respond more quickly.

Also, when young animals learn to explore different feeds or different locations, and receive positive feedback by doing so, it strengthens exploratory behaviour throughout their life. The advantage of young breeding animals showing increased exploratory behaviour is that they pass it on to their offspring, creating the generational transfer of desired behaviours.

Landscape repair

A three-paddock system allows concentrated animal impact over controlled periods of time, allowing complete rest within the empty paddock.

Increasing the stocking density and controlling stock movement through each paddock using **Attractants** and **Management Movement** approaches can help to break soil surface compaction and create soil surface niches through controlled hoof impacts.

Epigenetic improvements

Nutritionally-triggered responses through the use of supplements, such as such as lupins in a lick feeder or minerals in *Dean's Deli*, can be passed onto offspring via both sperm and egg. The exposure of the embryo or foetus to nutritional signals can have long-lasting beneficial effects.

RANGELOT HAYDOWN

➤ The *Rangelot Haydown* procedure is used to **increase contact between males and females for mating, and to lift animal nutrition while repairing erosion points in the landscape.**

The underlying principles are the same as for *Rangelot Flushing*, but there is a lower impact on nutrition because hay is used rather than a higher-value grain or pellet supplement.

Providing hay (or silage if preferred or available) attracts animals and retains their interest for a period of time while they consume the feed.

When adopting a *Rangelot Haydown*, use a sound **Signal** (such as blowing a whistle) when putting out the hay (see comments for *Super Jackpots* on page 57).

A *Witch's Hat Indicator* placed near the **Attractant** area (in this case a hay or silage *Super Jackpot*) can help encourage animals to continue to visit the site.

Landscape repair through *Rangelot Haydown*

The grazing activity brought to a site by providing hay or silage offers a tool to address landscape erosion issues such as gully heads, scalds or eroded channels. The combination of animal impact, the carbon from uneaten plant material, and nutrients from urine and dung can kick-start regeneration.

Place the hay on or near eroded areas for the animals to feed on. Monitoring the impact of the activity around the hay is important because over-disturbance can cause additional erosion.

The decision to spread bales or leave them in the one spot depends on the combination of how large an area needs to be impacted and how many animals are expected to gather at the spot.

A prolonged offering of hay can attract both females and males to the area, which can increase contact and increase joining rates.



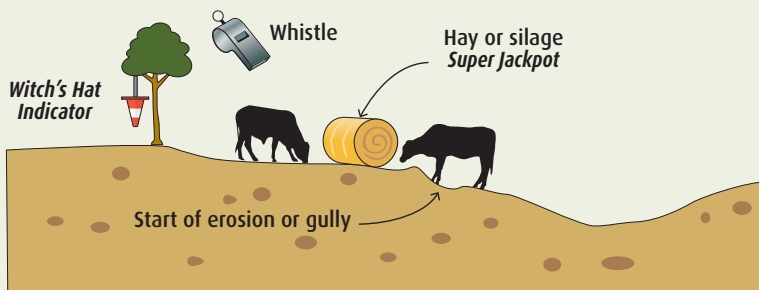
rangelot haydown — principles to practice

implementing a *rangelot haydown* for landscape repair

- Place hay or silage *Super Jackpots* on repair sites.
- You will achieve a high level of activity if you have used the *Super Jackpot* method previously and animals have built a level of expectation and excitement.
- Continue the approach in a predictable manner and direction so the animals build more excitement with each new location.
- Whistle signals can be used to further increase excitement.
- *Witch's Hat Indicators* can encourage animals to return to a *Super Jackpot* when the sound signal is absent. Use visual signals if repeat visits are required to achieve the desired site impact.

aims

1. The spreading of hay, urine and dung in a controlled way (i.e. focussed in an area and for a short duration) can halt the early signs of erosion and trigger regeneration.
2. A short-duration grazing event can also increase the joining percentage of a mob by increasing the contact between males and females.



ACCELERATED ADAPTATION

➤ **Accelerated Adaptation** is 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.

Lower levels of stress before and after relocation are associated with higher growth rates, reduced health disorders and higher meat quality.

This movement could be from one paddock to another, one property to another, or from one region to another. The greater the difference in the conditions and environment (e.g. the plants on offer, climate, terrain, or infrastructure) between the departure and arrival locations, the greater the benefits in animal performance you can expect from using an **Accelerated Adaptation** approach.

RIGHT: Building familiarity among the animals with feed bins, feedstuffs, rewards and Signals before their relocation, coupled with the same procedures upon arrival, will help animals relocate from one place to the next with minimal stress.

The underlying principles

The underlying principles of the **Accelerated Adaptation** application are to:

- expose animals to novel feeds as rewards (in a similar way to a **Jackpot Reward**) in a positive environment
- avoid ‘overloading’ animals with too many new things at once
- provide clear **Signals** to help animals associate the feed rewards with a **Signal**
- provide animals with familiar rewards and **Signals** after relocation — essentially providing ‘familiar furniture’ in a new location.





Starting the process — the ‘departure lounge’ procedure

The following ‘departure lounge’ instructions aim to initiate animal behaviours in a familiar setting that can be repeated upon arrival at the new destination (arrival lounge) to ensure animals quickly regain their usual eating and exploratory behaviours.

Time suggested

Allow about four hours, split over two days, to apply the departure lounge procedures. Investing this time early on will be rewarded with calmer animals that more rapidly adapt to their new surroundings.

Supplies required

- Oats (usually one 20kg bag per group of animals is sufficient, depending on the group size).
- Lucerne chaff (one bag per group).
- Molasses (20 litre bucket per group).
- Coarse salt (two bags per group).
- Hay (sufficient to provide consumption at 3% of bodyweight per day).

- Undiluted strawberry cordial (avoid using citrus-flavoured cordial).
- Spray bottle (to spray flavouring).
- Witch’s hats (two orange-coloured hazard markers).
- Whistle (referee/umpire style).
- Mineral lick or block (with trace elements if available).
- Drums (a 200 litre drum cut in half (horizontally) making two half drums).
- Troughs (two low, long troughs).



Adaptation tasks:

There are four tasks (A–D) to be carried out over the two-day ‘departure lounge’ period.

DAY ONE PROCEDURES

Task A — De-stressing in Yard 1

(30 minutes)

1. Guide (don’t force) animals into the yard containing the hay, salt and mineral lick (Yard 1) and observe closely to see if all are either eating or drinking.
2. Those that do eat, leave alone, but those that are not eating or drinking should be de-stressed using **Stress-Free Stockmanship** methods (see pages 104–105, or www.stressfreestockmanship.com.au). Do not upset the feeding behaviour of the mob by trying to encourage individual animals to eat. It is better to allow most animals to rapidly eat and drink then apply **Stress-Free Stockmanship** on any anxious animals.

Task B — Introducing new feed rewards in Yard 2

(30 minutes)

1. Place troughs into a convenient place in a second yard (Yard 2). Put oats in one and lucerne chaff in the other.
2. Place witch’s hats near troughs in Yard 2.
3. Spray sides of troughs and witch’s hats with strawberry flavour.
4. Blow whistle with three loud bursts.
5. Let animals into Yard 2 concentrating on walking them in rather than letting them run in.

Task C — De-stressing in Yard 1

(30 minutes)

1. Return animals to Yard 1 and observe for excess movement, ill health or lethargy.
2. De-stress using **Stress-Free Stockmanship** methods.



Task D — Introducing new feed rewards in Yard 3

(30 minutes)

1. Move troughs to a third yard – Yard 3, placing oats in one and lucerne chaff in another.
2. Move witch's hats to Yard 3.
3. Spray witch's hats and outside of troughs with strawberry flavour.
4. Blow whistle with three loud bursts.
5. Let animals in to yard, concentrating on walking them in rather than letting them run in.

DAY TWO PROCEDURES

Repeat tasks A–D on day two, but change to different yards for Task B and D, and change from troughs to drums if available.

These changes add another small 'level' of challenge for the cattle, and encourage them to be less anxious with new things.

Arrival lounge procedures

The following instructions aim to reinforce behaviours already imprinted during the 'departure lounge' procedure.

Time suggested

Allow two hours, split over two days.

Supplies required

The supplies are identical to those used in the '*Departure lounge procedures*', see page 99.

Adaptation tasks:

There are four tasks (A–D) to be carried out over the two-day ‘arrival lounge’ adaptation period.

DAY ONE PROCEDURES

Task A — De-stressing in Yard 1

(15 minutes)

1. Guide (don't force) animals into the pen containing the hay, salt and mineral lick. (Yard 1) and observe closely to see if all are either eating or drinking.
2. Those that do eat, leave alone, but those that are not eating or drinking should be de-stressed using **Stress-Free Stockmanship** methods. Do not upset the feeding behaviour of the mob by trying to encourage individual animals to eat. It is better to allow most animals to rapidly eat and drink then apply **Stress-Free Stockmanship** on any anxious animals.

Task B — Introducing new feed rewards in Yard 2

(15 minutes)

1. Place troughs into a convenient yard (Yard 2) and put oats in one and lucerne chaff in the other.
2. Pick up witch's hats and place near troughs in yards.
3. Spray sides of troughs and witch's hats with strawberry flavour.
4. Blow whistle with three loud bursts.
5. Let animals in to yard concentrating on walking them in rather than letting them run in.

RIGHT: A long trough allows multiple animals to access it at the same time, minimising competition and maximising the rewarding experience of consuming the grain or chaff.





Task C — De-stressing in Yard 1

(15 minutes)

1. Return animals to Yard 1 and observe for excess movement, ill-health or lethargy.
2. De-stress using ***Stress-Free Stockmanship*** methods.

Task D — Introducing new feed rewards in Yard 3

(15 minutes)

1. Move troughs to Yard 3 placing oats in one and lucerne chaff in another.
2. Move witch's hats to Yard 3.
3. Spray witch's hats and outside of troughs with strawberry flavour.
4. Blow whistle with three loud bursts.
5. Let animals in to yard concentrating on walking them in rather than letting them run in.

DAY TWO PROCEDURES

Repeat tasks A–D on day two, but change to different yards for Task B and D.



ABOVE: De-stressed and well-fed animals show clear signs of being comfortable, and become more willing to investigate new things.



improving interactions between people and livestock

Researchers around the world are investigating the links between the mental stresses stock face and their productivity attributes, such as growth rates, fertility and general health and wellbeing.

Studies have found that whatever the beliefs people handling stock hold — those beliefs translate straight into their handling skills. These handling skills, in turn, determine whether animals are stressed when the handler works with them.



The results indicate that stressed animals reproduce at lower rates, grow more slowly and get sick more often.

Not only can stress lower productivity, it possibly increases the risk of contamination from Salmonella and other bacterial pathogens.

Stress-Free Stockmanship is a way of combining the best of many strands of animal and livestock research and practice. The approach incorporates thinking from individuals such as Bud Williams, Temple Grandin, Fred Provenza and Bruce Maynard to make an immediate difference to animals, people and economics of businesses. It also incorporates behavioural, swarm theory and animal training research as this fast-moving scientific field gathers pace.



more information

More information on *Stress-Free Stockmanship*
go to: www.stressfreestockmanship.com.au

ADJUSTING STOCK NUMBERS USING SKIMMER BOXES

- Matching the stocking rate to the feed on offer and the intended duration of grazing is an ultimate goal of most grazing enterprises.
- A *Skimmer Box* is a relatively simple and cheap fence construction with a design that achieves two things:
 1. improves the interactions between people and livestock over time; and
 2. allows you to collect animals from watering points at short notice, without setting up a trap yard.

It is not normally an easy task to quickly adjust stock numbers in response to seasonal conditions or market opportunities. But a *Skimmer Box* provides a procedure to gather and collect animals whenever required.

A *Skimmer Box* also allows you to gather smaller numbers of problem animals, such as cleanskin bulls or animals that require health checks, which can often avoid trap yards, and do so without a major mustering event.



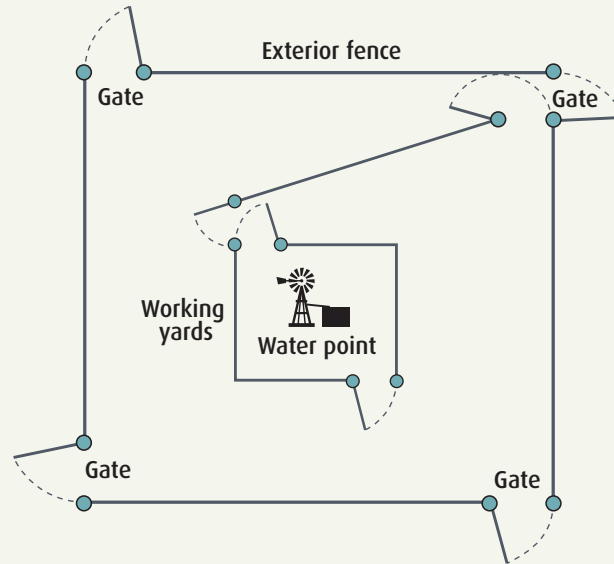
When used in conjunction with *Stress-Free Stockmanship* principles, *Skimmer Boxes* offer a range of choices that trapping and mustering cannot, providing opportunities to familiarise and de-stress animals each time they are gathered.

The way in which *Skimmer Boxes* are used is critical to their success. When *Skimmer Boxes* are combined with *Stress-Free Stockmanship*, the animals feel less anxious in working yards, preparing them for easier handling.

Crucial things to consider when erecting **Skimmer Boxes** are: yard angles, hinging of gates and the stockmanship procedures associated with their use. Precise dimensions depend on specific, local situations. While the design is crucial, it is also important that **Skimmer Boxes** are inexpensive to construct. They can be permanent or temporary.

RIGHT: This diagram shows the general design principles of a Skimmer Box. The exact dimensions should be discussed in more detail to get a complete picture of how it can work most effectively for you. Dimensions and angles can be important, but don't forget that successful outcomes also depend on how you use infrastructure.

basic layout of a skimmer box



A key part of the **Skimmer Box** operation is the familiarisation process that occurs throughout the year — this is where the principles, tools and tactics of **Self Herding** come into their own.

Repeating the process outlined on page 110 allows animals to become accustomed to the confines of the structure and how they can exit through the gateways. This familiarisation stage is important so animals are calm each time they enter the **Skimmer Box**.

As part of the familiarisation process animals can easily enter and exit on every occasion, except for ‘collection day’ when exits are closed. The final gathering operation can be done without additional stress, because the animals are experiencing a familiar and non-threatening procedure.

When carrying out regular water checks, always move parallel to the animals inside the area — you are effectively guided in this process as you move along each side of the **Skimmer Box** (see **Water Point Paralleling** on pages 112–113).





On each visit, close one of the open gates (Gate 1, 2 or 3) and open the gate that had been closed on the previous visit. This provides animals with the experience of gates closing and opening with no consequence. Leave Gate 4 open at all times, except on collection day, to prevent accidentally trapping animals in the corner where the internal wing fence is directed.

On collection day, follow the same procedure, but close all the gates in sequence as you move along the sides of the **Skimmer Box**. Close the internal gates in sequence as the animals walk into the central working yard.

dean's tip

It is important the vehicle goes on the outside of the *Skimmer Box* fence. The result is that the animals get four parallels before being approached directly by the handler. Speed approaching the gateways is important — moderating so the animals can escape without being squeezed through the opening. See diagram page 110 for more explanation.



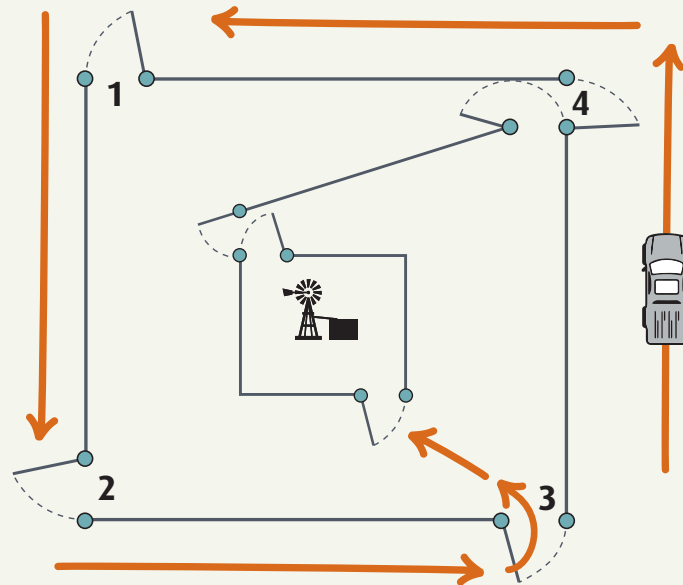
skimmer box — principles to practice

aim

To parallel the animals in the area four times during each regular inspection.

1. Operating procedure for regular water checking

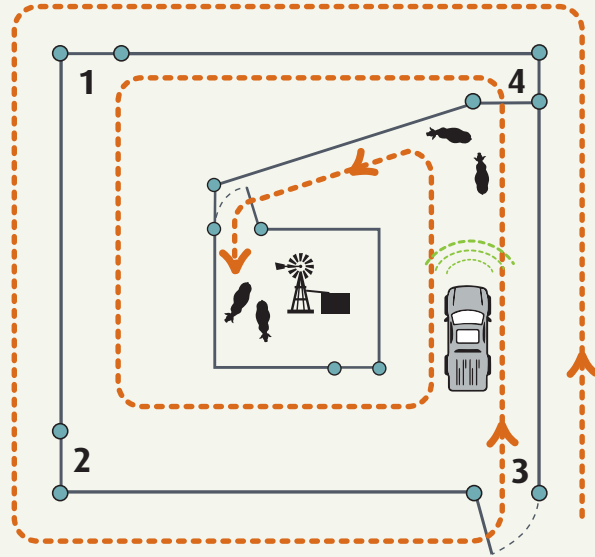
- Start at one gate (any gate) before proceeding round to the others.
- **Closing and opening gates** — on each visit close one of gates 1, 2 or 3 and open the one you closed on last visit.
- **Don't close Gate 4 on regular inspections** — it is only closed on collection day. We don't want animals to feel trapped in the confined space between the outside fence and the internal wing fence.
- When operating gates try not to squeeze animals otherwise it reverts to a trap yard — not what we want!
- **Moderating speed is an important aspect** — don't squeeze animals through gates. Let them walk out if they are heading out a gate as you approach.





2. Operating procedure for gathering stock into the yard

- On the day you want to gather animals into the inside yard (collection day), move around the outside of the **Skimmer Box** as you would when checking the water point, except close each of the gates as you pass them.
- Enter through the last gate (no. 3 in the diagram), and close it behind you.
- Move around between the outside fence and in the inner yard towards the diagonal wing fence.
- Calmly sweep the animals ahead of you. Close the outer gate on the wing fence after you've passed through it, and close the inside gate on the wing fence after you've passed it.
- Continue to sweep the animals around the inner yard. Close the second gate to the inner yard (if you have one) as you pass it (this is the bottom gate to the inner yard in the diagram).
- On the final circuit, use the diagonal wing fence to guide the animals in to the inner yard.
- Close the final gate (the top yard gate in the diagram).



WATER POINT PARALLELING

▶ **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.

The design takes the vehicle *past* the water point *before* approaching directly for the inspection. Going past the point allows the animals to see the person (and their vehicle) approach, but without any immediate consequence. The animals at the water point will quickly assess the straight-line approach and recognise the person is on a line that will not intersect with them.



112

With usual track design people drive directly at water points — a potentially threatening action to animals. Reducing your speed and pausing during approach can moderate animal reactions to a direct approach, but this can only work on the animals you observe. Animals not visible to you will react and move off with a flight zone response and this can be detrimental to how the animals respond to people, especially if it is repeated many times.

Changing the track design to incorporate **Water Point Paralleling** starts to affect unseen animals by forcing the person's approach to initially follow a benign line by driving past individuals and groups of animals. This initial calming effect is repeated on every visit and becomes a positive reinforcer for calm reactions from animals.

Over time, the larger the number of animals that react positively (without apprehension) to the arrival of people the more it calms any animals new to the area, such as 'cleanskins'.

The layout of the tracks forces a consistent behaviour of the people who inspect water points, regardless of the operator and their competence in handling animals. This consistency allows for ongoing improvement in the reactions of animals to people and vehicles.

LEFT: The way you approach water points on your mill runs can have a large effect on how the animals react to people at that water point and in the future.



water point paralleling — principles to practice

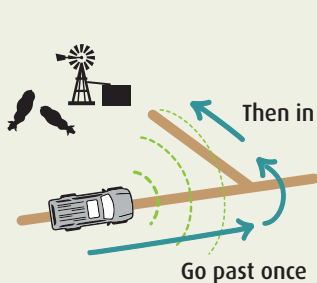
- As you move past the animals gathered around the water point, you are ‘paralleling’ them, which slows down any movement they may exhibit.
- The ‘pressure wave’ of your movement should not impact the animals’ behaviour. If animals move away, you are applying too much direct pressure, no matter how far away you are. Stop and wait for movement to dissipate before progressing. Be aware you may affect animals you can’t see.
- Many **Water Point Paralleling** designs can be employed successfully, but the simplest design is to follow the main track past the watering point, then double back to the water (Option 1 below).

aim

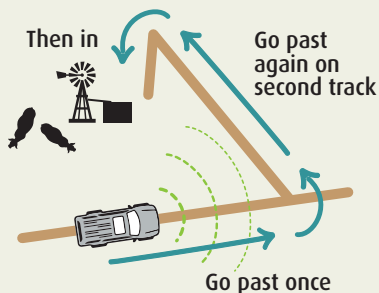
To develop tracks around water points that ensure operators approach in a way that reinforces positive and calm behaviour in animals before the operator heads directly to the water point.

This is only effective if you always approach the water point from the same direction, otherwise you’ll head straight in without passing (i.e. ‘paralleling’) the animals.

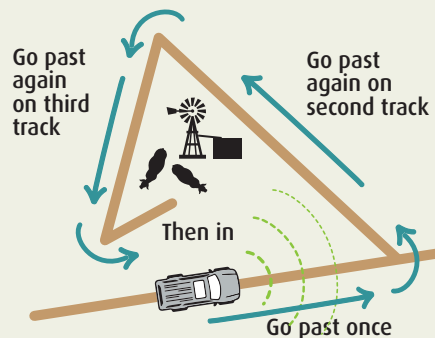
- Where possible, add tracks to force operators to parallel the animals two or three times (Options 2 and 3).



OPTION 1



OPTION 2



OPTION 3

Rangelands Self Herding provides you with a suite of tools and applications to provide positive interactions between people, livestock and landscapes and, therefore, the profitability of pastoral enterprises.

The self-herding approach is forever being improved and developed as we, and the many innovative producers we interact with, refine procedures and add new ones. It's exciting to see **Self Herding** as an evolution, not just a revolution! Let's keep exploring together.



 www.selfherding.com