Livestock Guardian Animal Forum - Nov 2024

Final report

Table of contents

Acknowledgements

Executive summary

Landholders, researchers, veterinarians, and government representatives gathered in Canberra on 19–20 November 2024 for the first national Livestock Guardian Animal (LGA) Forum.

The purpose of the Forum was to explore the role of guardian animals in managing the impacts of wild dogs and dingoes across Australia. It provided a platform for sharing knowledge and insights on the practical application of livestock guardian animals across a range of grazing environments, production systems, and landscapes, with the aim of enhancing livestock protection and biodiversity.

The Forum featured several presentations from government, industry and community representatives, alongside producers who had experience with livestock guardian animals. Forum participants also engaged in group discussions to explore challenges and opportunities in using livestock guardian animals.

Key insights identified during the Forum included:
- Livestock guardian animals must be part of an integrated wild dog management strategy.
- There is not a one-size-fits-all approach to using livestock guardian animals.
- Proper training is crucial in ensuring the effectiveness of livestock guardian animals.
- More research is required into livestock guardian animal effectiveness and best practice.
- Greater support systems are needed to assist with livestock guardian animal implementation and maintenance.

From this Forum, the following activities were identified as next steps to help enhance the national approach in using livestock guardian animals as a tool for managing wild dog and dingo impacts.

- Development of a position statement about the use of livestock guardian animals.
- Creation of a 'suitability matrix' to help producers determine whether livestock guardian animals will be appropriate for their enterprise.
- Revision of current best practice guidelines for livestock guardian animals to ensure advice is fit-for-purpose and up to date.

Feedback from participants about the event was very positive, with many participants praising the interesting presentations and the opportunity to come together with a diverse range of people with experience and expertise in livestock guardian animals.

Introduction

The first national LGA Forum was held on 19–20 November at the Mercure Hotel Canberra in the ACT. It was hosted by the National Wild Dog Action Plan (NWDAP) with funding from the Australian Government Department of Agriculture, Fisheries and Forestry and Parks ACT.

Facilitated by Jenny O'Sullivan, the Forum brought together over 40 landholders, researchers, veterinarians, government representatives and community group members to explore the role of guardian animals (namely dogs, donkeys and alpacas) in managing the impacts of wild dogs and dingoes on livestock. The purpose of the workshop was to provide a platform for sharing knowledge and insights on the practical application of livestock guardian animals across a range of grazing environments, production systems, and landscapes, with the aim of enhancing livestock protection and biodiversity.

Over two days, attendees listened to presentations from producers with LGA experience, as well as community groups and researchers, before breaking into groups to discuss challenges and opportunities in using LGAs to protect livestock. Participants were advised that discussions at the Forum would inform the national approach to the use of livestock guardian animals as a tool to manage wild dog and dingo impacts.

Key insights

The Forum involved both presentations and group discussion activities that sought to explore challenges and opportunities with livestock guardian animal use, what best practice looks like and how the effectiveness of guardian animals can be improved. From these sessions, the following key insights were identified:

Livestock guardian animals must be part of an integrated wild dog management strategy.

Livestock guardian animals are most effective at preventing wild dog attacks when used in conjunction with other control methods, such as exclusion fencing. This indicates that livestock guardian animals should be used as part of an integrated wild dog management strategy that includes other control measures such as baiting, trapping and shooting. It is important to note that livestock guardian animals are not non-lethal as often described; they will attack and potentially kill wild dogs in the process of protecting livestock.

There is not a one-size-fits-all approach using livestock guardian animals.

Livestock guardian animals can be an effective control tool, but it is highly dependent on several factors, such as terrain, vegetation and habitat type, paddock size, predator density, stock numbers and the number of livestock guardian animals used with stock. This shows that livestock guardian animals may not be suitable as a wild dog control measure for all livestock enterprises.

Proper training is crucial in ensuring the effectiveness of livestock guardian animals.

Livestock guardian animals must be trained appropriately and bonded strongly with their livestock to be successful. This requires a significant time investment from the producer and can be a challenge without supporting resources and guidelines. The training process, particularly for dogs, can be very lengthy and needs to be considered when investigating how long it will take to get well-trained guardian animals into paddocks to protect livestock.

More research is required into livestock guardian animal effectiveness, best practice and their broader impact.

More research is required into the effectiveness of livestock guardian animals and how they can be implemented for the best results across various landscapes and production settings across the country. There is currently a significant knowledge gap in how to train and employ livestock guardian animals for different enterprises and production landscapes.

There is also little understanding of the non-target impacts of livestock guardian animals on biodiversity, the stress and welfare of the livestock they are protecting, or wildlife they may harass.

Greater support systems are needed to assist with livestock guardian animal implementation and maintenance.

Using livestock guardian animals is a time-intensive process, which requires sourcing, training and maintaining the animals. There is little support in Australia to assist producers in sourcing well-bred guardian animals, in training them (which can take up to two years for livestock guardian dogs) and in managing or resolving behavioural issues. This can result in producers being unable to implement guardian animals effectively.

These insights will help inform the national approach to the use of livestock guardian animals as a tool for managing wild dog and dingo impacts.

Event proceedings

A more detailed summary of the Forum's presentations and group discussion are below.

Day one – 19 November 2024

1. Welfare implications of livestock guardian dog use in Australia and overseas
Dr Ben Allen, Research Scientist, spoke about the relationship between ethical frameworks and justification for engaging in lethal control of animals. Dr Allen highlighted: • For holistic consideration of animal welfare, **indirect and unintentional impacts must also be considered** in addition to direct and intentional impacts. • Livestock guardian dogs may cause significant lethal and non-lethal animal welfare impacts to individual animals that they are intending to control as well as non-target animals (Allen et al., 2019). • The fundamental tenets of animal welfare (i.e. considering all sentient animals and all harms) are often forgotten or disregarded in discussions of predation management. • Predator control is justified ethically and on a welfare basis if the control tools are capable of reducing predation on livestock and cause the least harm to other wildlife as possible (Allen and Hampton, 2020). • Livestock guardian dogs were not assessed under the model for assessing the relative humaneness of pest animal control methods (Sharp and Saunders, 2011). • The approach likely to generate the least harm is **targeted lethal control** at times of greatest predation risk to livestock, using the safest and most humane control tool for a given situation.

2. Research investigating the effectiveness and implementation of livestock guardian dogs within Australia

Dr Linda van Bommel, from the Australian National University, spoke about a research project exploring the effectiveness of livestock guardian dogs in Australia over the past 10 years. The original survey interviewed 150 livestock guardian dog users of which 52% indicated wild dogs as their main pest of concern. Ten years later, 112 (82%) were still using guardian dogs. Key takeaways from Dr van Bommel's presentation on the recent survey include:
• Of the 112 participants in the survey, 50% still used livestock guardian dogs and 50% no longer did.
• The reasons for no longer using livestock guardian dogs included change of business (53%), behavioural problems with dogs (e.g. behavioural, wandering, barking, high maintenance) (24%) and problems with neighbours (e.g. barking, baiting) (19%).
• Of the dogs used in the past 10 years, 42% died before old age.
   ➢ 29% were euthanised mainly for behavioural reasons, followed by medical conditions.
   ➢ 26% fell victim to lethal predator control mainly baiting.
   ➢ 19% were killed by wildlife, mainly snake bite, but also fights with other dogs.
   ➢ Other causes included disease before old age, motor vehicle, paddock accident and unknown.
• Livestock guardian dogs may establish territories which do not necessarily exclude predators but can have strong effects on predator behaviour.
• Between the 1st and 2nd interviews, participants considered livestock guardian dogs to be more effective (57%), equally effective (32%) and less effective (7%).
• Reasons for being less effective included increased predator pressure and age.

- There was an 16% increase in the use of other predator control (lethal) by participants between the 1st and 2nd survey.
- No information on the level of wild dog control being delivered around the participating properties was collected as part of the survey.
- Lethal control was more likely to be used on large properties, and non-lethal control more likely on smaller properties.

Additional research projects also offered insights on the behaviour of livestock guardian dogs and how they are managed. This included how livestock guardian dogs:
- Act as an early warning system to alert shepherds to danger in the northern hemisphere.
- Are left in the paddock unattended by people to defend against predators in Australia.
- Deter predators through territorial behaviour (e.g. barking, scent marking) and confrontation (aggression).
- Establish territories.
  - These do not exclude predators.
  - They can, however, have a strong effect on the behaviour of predators (particularly of smaller predators like foxes which exhibited reduced foraging behaviour in the presence of livestock guardian dogs).
  - No evidence this is the case with wild dogs and dingoes.
- Influence large herbivores.
  - No wallabies or sambar were found on properties with livestock guardian dogs.
  - Kangaroos avoided livestock guardian dogs spatially and temporally.

Other key points indicated that:
- Livestock guardian dogs can be a cost-effective predator control method in Australia, provided that a sufficient number of guardian dogs are used and they are properly managed; however, determining the 'right' number of guardian dogs can be a challenge.
- Livestock guardian dogs can work on large properties; however, getting the number of dog-to-livestock and -area is more problematic.
- Behavioural issues persist, having led to 24% of participants stopping the use of livestock guardian dogs, and accounting for 26% of livestock guardian dogs that were euthanised or lost.
- There is a need to establish support for people wanting to use livestock guardian dogs, including readily available information and a support system to support implementation.

3. Use of livestock guardian dogs in the high country of NSW with sheep and goats

A producer from the Brindabellas in NSW, spoke about their experience using livestock guardian dogs and livestock guardian llamas on their property to prevent wild dog attacks on their sheep and goats. Situated in extremely hilly country with national park and the Burrinjuck Dam bordering his property, key insights from the producer's experiences using Maremma guard dogs and llamas included:
- The use of llamas proved challenging, as they would stay together rather than protect livestock or cover the 200-acre paddock.
- Maremmas must have the right training to be successful.
- The mindset of guardian animals is to keep out intruders – this can include native animals, such as kangaroos, as well as humans.

- Well-trained dogs in smaller paddocks (a paddock you can see) of up to 300 head were very effective.
- While guardian dogs had a positive effect on larger paddocks, they cannot be everywhere all the time.
- Maremmas also killed stock that had entered their paddocks from neighbouring properties.

4. Introduction to the Humane Society International (HSI) Predator Smart Farming Guidelines

Louise Boronyak from HSI spoke about the HSI Predator Smart Farming Guidelines and their desire to shift from lethal control of dingoes (via shooting, trapping and poisoning) to identifying pathways to coexistence with dingoes. This included:
- Aiming to do this by using knowledge of dingo ecology and behaviour to deter dingoes from livestock grazing areas.
- Increasing deterrents such as increased human presence and livestock guardian animals (however, nothing that it may not be feasible to increase human presence in large and extensive grazing systems).
- Using aversive and disruptive predator deterrents.
    - Visual deterrents such as lights
    - Audio deterrents such as air horns and sirens.
- Implementing livestock husbandry practices to increase resilience and reduce vulnerability.
    - Checking livestock regularly and removing the carcasses of dead animals that could attract predators.
    - Desexing working dogs.
    - Lambing/calving closer to home so they can be checked frequently.
    - Providing sound nutrition and vaccination to improve animal health.
    - Using low-stress handling techniques to keep stock calm when mustering.
    - Recording wild dog and predator interaction to determine trends and seasonality of impacts so that strategies can be developed.
- Using donkeys which can be effective guardians of livestock.
    - They attack and chase dingoes to protect livestock
    - Have a long lifespan and therefore working career
    - Work best in pairs
    - Further discussions with farmers with donkeys are required to better understand how they work and if they are practical.

5. Research investigating livestock guardian dog use in pastoral WA for sheep and cattle

Dr Tracey Kreplins from the WA Department of Primary Industries and Regional Development spoke about her research project into livestock guardian dogs in WA. Key takeaways from her presentation included:
- Guardian dogs do not create territories or exclusion zones.
- Guardian dogs must be bonded with livestock.
- It is important to keep guardian dogs in the paddock as they wander and can move a long way.
- The ratio of livestock-to-guardian dog is hard to get right in large pastoral and production systems.
- The age of the guardian dog is important – puppies will exhibit puppy behaviour, whilst older dogs may start to get lazier.

- There is a tipping point where guardian dogs cannot keep up with the number of wild dogs.
- Guardian dogs are not non-lethal.
- It is likely that producers will still need lethal control on their boundary, which requires careful management.
- Maremmas can sometimes play roughly with the livestock that they are protecting, which can stress the animal.

6. Using livestock guardian dogs to protect goats and sheep in southeast Qld

A representative from the Yarrabee Boar Goats and Dorpers Gommbungee Qld spoke about using livestock guardian dogs in south-east Qld. Key information and takeaways from her experience included:
- Has had Maremmas since 1998.
- Since then, she has expanded the goat herd and got dorpers (14 years ago).
- While she had a good run with very few attacks, she started breeding pups and increased her Maremma numbers in paddocks soon after an attack resulted in 13 goats killed in a mob of 120.
- She now runs two adult dogs to a mob, occasionally introducing a younger dog with the adults.
- Maremmas were found to bond more closely with the goats than sheep.
- Sheep tended to spread out more when grazing, making them more vulnerable to predation by wild dogs.
- Wild dogs are still present around the property.
- Losses still occur in paddocks with livestock guardian dogs.
- She now has a couple of donkeys and also gets a professional trapper in from time to time to control wild dogs when they are detected on remote cameras.

The presenter's top tips for success based on their experience include:
- Do not let the dogs escape or get out from where you want them to be.
- Have them in pairs as pups.
- Feed twice a day until nine months of age, and then once a day with biscuits and meat.
- Supervise appropriately – catching bad behaviours early is essential.
- Match the Maremmas with the appropriate age class of livestock.
- Make sure they are socialised with family and other farm dogs as pups.
- Provide sufficient socialisation with humans so they can be handled without making them into pets.
- Never let them in the house yard.
- Source them from a trusted or reputable breeder.
- Desex all dogs that will used left out in paddocks unsupervised.

7. Sunshine Coast Council perspective on guardian animal use

Matthew Heness from the Sunshine Coast Council spoke about a council's perspective on guardian animals. Key takeaways from his presentation included:
- Guardian dogs and animals are bred to protect stock, not set up territories.
- Guardian animals will aggressively defend livestock and attack invasive, native and domestic animals as well as humans.
- Guardian animals are subject to domestic animal laws and can be declared as menacing or dangerous.
- There are a range of local laws that apply to owning a livestock guardian dog.

- They must be contained.
- They must not attack other animals.
- Signage making people aware of dangerous dog is required.
- Most shires and local governments only allow you to own two dogs – any more requires a permit, and for more than 20 dogs, a planning law approval process is required.
- Animal management and welfare legislation such as *Animal Management (cats and dog) Act 2008 (Qld)* require dog owners to take reasonable steps in ensuring an animal does not attack or act in any way that cause fear to someone or another animal.
- There are similar legislation in other states; so, using Maremmas creates a problem as they protect livestock through direct confrontation, aggression and/or by instilling fear to prevent predators and people from entering their paddocks.
- *Animal Care and Protection Act 2005 (Qld)* and similar acts in other states clearly identifies that you have a duty of care to provide food, water, shelter and allow to animal to exhibit natural behaviours – does leaving Guardian dogs in paddocks unattended and unsupervised meet these requirements?
- Other legal implications include the relevant Biosecurity Acts and/or vertebrate pest legislation where domestic dogs living in the wild could be considered a wild dog.
- Maremmas and livestock guardian dogs pose a range of legislative issues that are all open to interpretation from the relevant office or jurisdiction.
- They also cause significant nuisance complaint due to their ongoing barkling in peri-urban and urban areas.
- The use of guardian animals should be considered as just another tool in the toolbox for integrated management of wild dogs and predators, rather than a solution.

8. Use of livestock guardian dogs for protection of sheep in the agricultural areas of the northern Mallee region of WA

A producer from Derella Downs Merino Stud in Esperance WA, spoke on a pilot project trialling the use of livestock guardian dogs on broadacre farming properties in the Esperance region. The project was supported through the Northern Malee Declared Species Group in 2010 soon after the release of the *Best Practice Manual for Livestock Guardian Dogs*. Key takeaways from this presentation included:
- Properties participating in the trial were on average around 5,000ha spread across numerous blocks.
- Paddock sizes were on average around 270ha with stocking rates between 350–400 head of sheep.
- Maremmas were purchased to commence the trial in 2010, with a further six Maremmas purchased with funding from the Australian Dingo Foundation in 2011.
- All dogs were bonded with the sheep using the Invasive Animal Cooperative Research Centre's *Best Practice Manual for Livestock Guardian Dogs*.
- Dogs of varying ages were purchased but most were over 6 months of age from a reputable breeder in Victoria.
- Dogs were bonded with small mobs of sheep in a shearing shed at first, before being moved into paddocks and where more sheep were added until a flock size of 400 was reached.
- One dog was lost early in the project to a wild dog bait on the adjacent public land; the second dog bonded well with the mob.
- It is challenging to tell if the Maremmas were successful or if good results were due to other control techniques such as baiting.

- The single dog could not manage the large mob and the wild dogs coming into the paddocks; as a result, they lost sheep.
- There was a range of issues that limited the success of the project, including the dogs:
  - Kept leaving their bonded sheep and going to the neighbours' where there was less wild dog activity, and caused mismothering/disturbed lambs
  - Could not be kept in their paddocks.
  - In some instances, were found eating sheep carcasses (but it could not be determined if they were responsible for killing the sheep).
  - Made other forms of control challenging, particularly baiting.
- It may be that guardian dogs are more suitable for small acreage and in conjunction with exclusion fencing.
- Additional observations and thoughts on why they had not succeeded included:
  - The dogs showed interest in the sheep but kept sneaking off.
  - Getting pups at earlier age might have helped with the bonding process.
  - Two of the dogs were very aggressive to people, bailing up a neighbour.
  - Felt the dogs were more aggressive to people than wild dogs.
  - The use of dogs made bring sheep in the yard more difficult.
- Participants did not consider the pilot a complete failure but felt that livestock guardian dogs were probably better suited to smaller blocks where they could be supervised more closely.

9. Using donkeys to protect livestock in Qld

A producer in the St George region of southwestern Qld, talked about their experience with using guardian donkeys. Their property comprises of 6,600 acres running sheep and another 7,500 acres running cattle, upon which is a mixture of Box and mulga woodland (20%) and improved pasture (80%). Key take aways from their presentation included:
- Having suffered extensive stock loss to wild dogs between 2010 and 2014, Rod introduced an integrated wild dog control across both properties and the neighbours' to try and manage impacts.
- At this time, around 10% of sheep were lost per year and lambing was down to 40–50%.
- Introduced seven untamed donkeys in 2014, running two per paddock – donkeys had been selected as you could still bait and undertake wild dog control compared to guardian dogs.
- While they still experienced wild dog attacks, the donkeys were believed to have limited the carnage and slowed secondary attacks.
- Donkeys worked really well in the open country but were of no use in heavily timbered country which is where the dogs were coming from.
- Donkeys potentially caused some mismothering when to many in the same paddock.
- Losses stopped after exclusion fencing was erected in 2016.
- Now running 4–5 donkeys per paddock within three paddocks, though this may prove to be too many.
- Fencing has been the game changer with less impacts and more time to manage sheep effectively.
- Lambing has increased 100% per year for the last 5 years.
- Dog control still being delivered outside of the fences to manage wild dog numbers, with one digging under the fence in early 2024 resulting in a number of sheep attacks and killed even in the presence of the donkeys.

- The donkeys and the fencing have resulted in increased productivity but must still be incorporated into integrated control program to manage wild dog population.
- More bonding and training would also be helpful.

10. Implementing guardian animals to protect sheep in north-western Qld

A representative from Blackall Tambo Regional Council in Qld spoke about using livestock guardian animals on their property. Key takeaways from their presentation included:

- Their property is on the Mitchell Grass Plains with black cracking soils inside the wild dog barrier fence in Qld.
- About 25 years ago, wild dog numbers slowly started to increase on their property, progressively worsening, and in two successive years they killed 87 and 104 wild dogs. The neighbours also had similar stories.
- Tried alpacas, guardian dogs and donkeys before putting up exclusion fencing.
- Alpacas were tried first based on the available information on guardian animals and availability at the time.
- Alpacas were not successful or effective for mitigating the impact of wild dogs in their grazing situation; they required a lot of time, spat and squealed at humans, were difficult to shear and got a lot of burrs in their coats.
- Maremmas also required a lot of time management with bonding and feeding.
- They were somewhat effective although they had to put down a few after they killed a ewe. Each one had a kennel. Careful baiting still occurred.
- Got donkeys in response to the escalating wild dog numbers and impacts.
- At on stage, had nearly 200 donkeys across the property with 12–15,000 sheep.
- The introduction of the donkeys saw a definite reduction in the carnage of adult sheep being killed by wild dogs.
- Donkeys are **NOT** non-lethal, and he has witnessed the "brutal slaying" of a dingo by two donkeys on the property.
- Donkeys did not stop the carnage of the predators killing lambs; as the donkeys rounded up the adult sheep, they left the lambs behind, exposing them to wild dogs and other predators, such as eagles and feral pigs.
- The only way forward was to build exclusion fences.
- They were fortunate enough to have the terrain and productivity to justify the expenditure of exclusion (or as he calls it inclusion) fencing.
- The fencing was extremely effective at stopping wild dog predation and losses to other predators in the presence of the donkeys – pre-fence lambing was at 7%, while post-fence lambing was up to 87%.
- Also had considerable ecological benefits with increased grass cover and reduced predator numbers befitting ground dwelling animals and birds.
- Wild dogs still jump the fence or grid occasionally.
- Guardian animals alone do not work. Otherwise, you spend all the time managing guardian animals rather than managing your property.
- Surrounding properties participated in a bounty – scalps are now down from the thousands a year in previous years to just 133 in 2023. This is due to the Qld cluster fencing and ongoing coordinated baiting programs.
- No magic bullet when it comes to livestock guardian animals. Fencing was the big problem-solver to reduce the 'carnage'. The fence cost $1 million and they got their return in 2.5 years.

In conjunction with fencing, runs 30 donkeys now with 3–4 per mob of sheep.

- Do not stake your future on guardian animals alone – donkeys are reasonably effective in conjunction with the fencing.
- East of Blackall is predominantly cattle grazing country which is not fenced, and they suffer up 10% losses of calves to wild dogs/year. The use of donkeys in those unfenced paddocks has seen a decrease in predation by about half, but wild dogs still kill and bite lots of calves in those areas.
- Guardian dogs are far less effective than donkeys.

11. Implementing guardian animals using livestock guardian dogs to protect sheep in Mulga country, southwest Qld

A producer and veterinarian from Mitchell Qld, spoke about their experience using livestock guardian dogs on their property. Key takeaways from their presentation included:

- Always had a wild dog issue but numbers and impacts increased following the floods in 2010–11.
- 2012 onwards, suffered catastrophic losses of sheep and lambs to wild dogs.
- Animals were suffering as a result of the ongoing attacks from wild dogs and dingoes.
- As dogs got worse so did the economic impacts and psychological trauma.
- Entered into a cluster fence agreement with 10 other properties that was 500,000 acres in size.
- Wild dog management syndicate was created with other properties as part of fence agreement.
- Decided to introduce Maremmas with the sheep for added protection while the cluster fence was being built.
- Had problems in the early years including:
  - Not enough knowledge on the bonding or training of Maremmas.
  - Maremmas exhibited poor and destructive behaviours as a result of poor bonding.
  - Wild dog numbers were increasing and exceeded the capabilities of the Maremmas.
  - Not enough Maremmas per paddock led to ongoing attacks.
- By 2016–2022, with the fences complete, the wild dog numbers were managed with very little impacts inside the fence.
- During the same time, the training got better and sorted out the behavioural issues with the Maremmas.
- Benefits included minimal-to-no ongoing losses, sheep and human welfare improved and the sheep became accustomed to the livestock guardian dogs, which resulted in a massive increase in lamb survival.
- Predation from other predators like foxes, pigs and eagles was further reduced by reducing paddock size, increasing the density of livestock guardian dogs per mob and further reducing predator density through trapping and targeted baiting.
- Key learnings Included:
  - Livestock guardian dogs need to be physically with the sheep to prevent attacks from wild dogs.
  - Need an experienced mature team of livestock guardian dogs.
  - Make sure the wild dog pressure does not exceed the capabilities of the livestock guardian dogs.
  - Smaller paddocks and higher livestock guardian dog numbers per flock increases effectiveness.
- Lethal control of foxes and wild dog population (trapping) is necessary to keep predator population low.

- Maintain young but experienced team of livestock guardian dogs as their effectiveness drops off with age.
- The training and bonding process is crucial in the success of livestock guardian dogs.
- Need to remember that guardian dogs require care (e.g. feeding, clipping coats, general husbandry).
- Six livestock guardian dogs to around 1,200 wethers seemed to work well.
- Bonding and training to work without supervision takes time. On average it takes **18–24 months** before pups are bonded properly and large and strong enough to work.
- There are also considerations for the care of old/retired dogs – we owe them a good retirement for their service.
- Bonding time in pens is very important. Separate pups from mums early (from 8 months to 2 years) and supervise, give it time and patience and be persistent.
- Observe paly behaviour early – anticipate it if you can (worse in cool weather) – this can turn into hassling sheep.
- Low supervision can occur once they are 100% trustworthy; otherwise, they can develop destructive behaviours and dogs need maturity for confrontation of predators.
- Clip coats.

Current situation:
- Not all people inside the fence still have sheep, and those with cattle are not managing dogs very well.
- La Nina (2022–2024) resulted in very wet years – increased wild dog pressure on the exclusion fence.
- Wet weather has caused erosion and washouts, allowing wild dogs access into the paddocks.
- Maremma presence is very important when there is a breach.
- Problem was that the livestock guardian dog team was very small due to the lack of wild dogs and their impacts over the last 10 years.
- Maremma density has been too low to prevent attacks on sheep.
- Currently rebuilding the livestock guardian dog team, breeding more pups and sourcing dogs from other breeders.
- Undertaking lethal control, trapping and baiting in paddocks on the periphery of where the livestock guardian dogs are located.
- More trapping and fencing planned.

## 12. Guardian dogs for protection of livestock in Australia and livestock guardian dog use in Italy

Paul Gibb, Senior Biosecurity Officer with Central Tablelands of NSW (NSW Local Land Services), spoke about his experience with shepherding and guardian dogs in Italy. Key takeaways from his presentation include:
- Wild dogs have been controlled for over 200 years in the region and yet they just keep coming.
- Significant change in land ownership in the region – over time in the Central Tablelands of NSW, there has been a change in the landholder base with 14,173 rate payers (usually less than <150 ha – 10,583 landholders).
- Ongoing pressure to limit lethal control but how do producers minimise impacts and predation from wild dog without lethal control?
- Fencing and guardian used widely around the world.

- In 2022, Paul travelled to Italy to visit farmers, shepherd and researchers in the region in and around Alberese where they used guardian dogs.
- In 2023, spent another 2 months in Italy shepherding in the Piedmont region and back in Alberese.
- Spent time on a 300-sheep dairy farm in Alberese, where wolf attacks on sheep started in 2010.
- It is illegal to kill wolves in Italy.
- In response, all the sheep are penned up each night in an enclosure with high fences in the presence of Maremma guardian dogs.
- The sheep are taken out and grazed on pasture and native grasses in the presence of the livestock guardian dogs and humans.
- Wolf attacks occur during the day and mostly in areas close to timber.
- Wolves also come down out of the timber during the night and would have a look around and investigate where the sheep were being kept.
- Shepherds were always present with guardian dogs when they were out grazing.
- In the Piedmont region, they have a transhumance existence during periods of the year the herders live with the sheep and guardian dogs in the in the Alps for spring and summer, before winter. Very remote living and a lot of wolves.
- There are a lot of challenges – hikers, pet dogs, naked Germans, mountain bikes, and wolves.
- Livestock are penned nightly behind an electric wire, which is a lot of work.
- Bonding is very important; livestock guardian dogs are born and die in the flock.
- Difes Attiva in Italy is an organisation that promotes livestock guardian dogs, finds homes for pups and dogs with farmers, and provides ongoing support with bonding and training.

Implementing livestock guardian dogs in the Mudgee Area
- Management and husbandry costs $1,250 to $2,100/year per livestock guardian dogs.
- Challenges include isolation (no farm network).
- $800 to $1,000 to purchase dog.
- In NSW, considerations for the use of livestock guardian dogs include:
    - Barking being an issue
    - Bonding being very important
    - Maintenance of wild dog numbers (lethal control) still being necessary.
    - Support being limited for landholders compared to overseas (e.g. DifesAttiva (Italy) and Texas A&M University (USA)).
    - That the livestock guardian dogs are tools, **not pets**.
    - Livestock guardian dogs can stray and wander if fences are not up to standard.
    - Livestock guardian dogs aggressively confronting people and pets.
    - Hybridisation with dingoes/wild dogs.
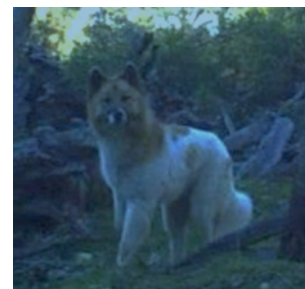
13. Using donkeys to protect sheep in southern Qld

A producer from Westmar Qld, spoke about using guardian donkeys on their property. Key takeaways from their presentation included:
- The 4,169ha property is 40% native vegetation.
- Wild dogs have always been an issue in the region.
- Properties were established in 1908 and was fully vermin-fenced as a condition of the lease.

- Trapping and baiting occur – the council runs coordinated baiting program and trapping across 80% of the property.
- Now has exclusion fencing around half the property but wild dogs are still a problem.
- Terrain is reasonably flat but has plenty of vegetation and small paddocks that are around 2,500 acres in size.
- In 2013, wild donkeys brought in after a bad experience with livestock guardian dogs.
- **What worked:**
  - Most practical with the sheep.
  - Can still undertake baiting for wild dogs.
  - Easy to bond with sheep and very territorial to the paddock.
  - Definitely reduced stock lost to wild dogs.
  - Allowed greater use of paddocks and reduced total grazing pressure.
- **What did not work:**
  - Not effective on other pests – still have feral cats foxes and pigs.
  - No good for lambing ewes, only used to protect wethers.
  - Lack of control on neighbouring properties meant wild dogs kept coming.
  - Trapped 25 dogs in last 12 months despite donkeys.
- Some additional costs include purchase price ($300), plus hay for yards when bonding.
- Need additional time for mustering to draft off donkeys.
- They are self-replacing (donkeys bred on the property).
- Had to change feed supplements and lick to due to donkeys but not a huge cost.
- Extra mustering time due to the donkeys.
- **Advice to Others**
  - Still maintain all wild dog control tools.
  - Time costly.
  - Bonding is very important.
  - Need to match livestock guardian dogs with enterprise and stock type.
  - Livestock guardian animals do not help your neighbours with their dog problems.
- It all takes time and is incredibly hard to achieve perfection – no silver bullets in predator management.

14. Group discussion

Groups were asked to answer four questions around what they had learned during the day's proceedings. Key themes for each question are outlined below.

What were the key messages from today?
- Need integrated management approaches – guardian animals work best with other tools.
- Support and resources are needed to assist producers with the implementation of livestock guardian animals.
- Property and contextual factors impact success of livestock guardian animals.
- Success with livestock guardian animals requires significant effort and training.
- Using livestock guardian animals has ethical and legal considerations as they are not entirely non-lethal and can have impacts on wildlife.
- Greater success is achieved through collaboration with neighbours.
- Need for ongoing research into the effectiveness and context-specific requirements of livestock guardian animals.

Did you hear anything that concerned you?

- Livestock guardian animals are not as effective as a standalone tool.
- Livestock guardian animal management may be too complex for the average farmer.
- Concern about misinformation related to livestock guardian animals and that they are non-lethal.
- Challenges with implementation due to cost, size of property, etc.
- Impact on biodiversity and welfare risks to the livestock guardian animals.
- The time commitment required to implement livestock guardian animals.
- Lack of support available to landholders.

What excited you about what you heard today?
- Hearing real stories from a mix of people.
- Opportunities to use livestock guardian animals to achieve a balance between lethal and non-lethal control techniques.
- The potential of livestock guardian animals, particularly donkeys and their capabilities.
- Opportunities to conduct research or develop advisory networks.

What did you learn?
- Livestock guardian animals can be effective with other control tools.
- Fencing is important when using livestock guardian animals.
- Non-lethal controls, such as fencing, may have a lethal impact on dingoes.
- Training and managing livestock guardian animals are time-intensive.

Day two – 20 November 2024

1. Implementing a successful livestock guardian animal strategy

Erin Williams, from Livestock Guardian Dogs Australia, spoke about how to effectively train and implement livestock guardian dogs. Key takeaways from this presentation included:
- There is no set formula to determine dog-to-stock ratio, as individual fixed and variable assets will affect it.
- Fencing is an absolute must – particularly if a smaller operation.
- Need to consider paddock size – how much space does that dog have to cover?
  - If the area is too big, you will be wearing the guardian dog out and making it vulnerable to a pack of wild dogs.
- What are the physical impediments that can stop dogs from guarding? For example, if you have scrub, you will need more dogs as it is harder terrain to cover.
- It is important to look after your guardian dogs – you cannot just think of them as tools. Need to provide everything they need to function properly.
- Do not blame dogs for not working but look at underlying reasons why.
- Poor behaviour in guardian dogs is often due to failures in training and management.
  - Can take from birth to two years to train a guardian dog.
  - Need to meet the dog's needs, have realistic expectations, commit to training, have suitable infrastructure and consider your livestock type and environment.
- What's missing is science-based education for practitioners and agricultural students, to ensure they can offer support to producers looking to implement guardian dogs.
- Backyard breeding is an issue.

- o   Good breeders will cull for temperament and confirmation.
- o   Need to be careful where you are sourcing your dogs.

2.   Panel discussion

Erin Williams, Dr Van Bommel and Dr Kreplins answered questions submitted by Forum participants the day prior. Key points from this panel include:

- When you have a guardian dog, you need to look after it and put it in a situation where it can do its job.
- In terms of training, buying an older dog can work, especially if it has been working with livestock. If the dog has not worked with livestock, it can be a lot more difficult to train.
- Some training is still required with donkeys, especially if the donkey is not used to human contact.
- Donkeys protecting livestock can be terrifying – there is a lot of noise and running. If donkeys get a hold of wild dogs, they will bite and kick them.
- A potential risk of using livestock guardian dogs is that they hunt wildlife to consume. However, other species can benefit from the presence of guardian dogs. For example, in one area where guardian dogs deterred foxes, there was an increase in black swans.
- There's very little research on the efficacy of donkeys as a guardian animal – this is a large gap in knowledge.
- Guardian dogs can take two years to become effective and then have a 10-year average working life, while you can get 30–40 years out of donkeys. Need to be thinking about succession planning when using livestock guardian animals.

3.   Group discussion

Groups were asked to discuss a series of questions based on what they had heard at the Forum. Key themes for each question are outlined below.

What key factors need to be in place for livestock guardian animals to successfully protect livestock?

- Training and knowledge for farmers/landholders, including information on livestock guardian animal best management practices.
- Predator pressure that is not too high, as a high number of wild dogs can overwhelm livestock guardian animals.
- Integrated control strategy that includes lethal tools.
- Fencing to stop/reduce incursions of wild dogs and contain livestock guardian animals.
- Informing neighbours about the use of livestock guardian animals.
- Commitment to investing time and money in the training and maintenance process of livestock guardian animals.

Where and why would livestock guardian animals be ineffective?

- Lack of training of guardian animals.
- Inadequate support and information for producers to implement livestock guardian animals.
- High predator densities.
- Peri-urban areas may not be suitable for livestock guardian animals.
- Poor management of livestock guardian animals, such as not properly caring for them.

- Inability to invest time and resources to managing livestock guardian animals.

What key knowledge/research gaps exist around livestock guardian animals?
- Cost-effectiveness and cost/benefit analysis.
- Efficacy of livestock guardian animals in different environments.
- Dynamics between dingoes and kangaroos, dingoes and feral animals, etc. How do livestock guardian animals interact with predators like dingoes and what is their impact on predator behaviour?
- Non-target impacts of livestock guardian animals, such as impact on livestock stress/condition, grazing pressure from large herbivores, etc.
- Best practices for training and handling livestock guardian animals and training and bonding requirements, especially during specific events like lambing.
- Long-term and broader impacts on biodiversity and ecosystems.
- General public understanding of how, why and where livestock guardian animals can be effectively used and the complexities around using them.

Key recommendations for better outcomes across Australia
- Require greater training and education services, such as more local coordinators/ extension officers to disseminate information. Need ongoing support, not just short-term.
- Need to establish best practices for fencing to balance wildlife movement and predator management.
- Incorporate livestock guardian animals into integrated pest control strategies.
- Improve information sharing – for example, create a community of practice/ information hub about livestock guardian animals, improve information-sharing between organisations, governmental agencies and farmers.
- Greater community engagement to generate community and landholder buy-in to livestock guardian animals as an effective management tool.
- Increase in funding to Invest in research and support producers to implement livestock guardian animals.

Outcomes

The Forum was delivered to investigate the applicability and effectiveness of guardian dogs and other animals to protect livestock from wild dog and dingo attack across Australia's diverse agricultural grazing and production systems. It also explored what factors need to be in place to improve the effectiveness and efficiency of livestock guardian animals.

The following outcomes were identified during the Forum, to be further explored by the NWDAP:

- Development of a position statement about the use of livestock guardian animals.
- Creation of a 'suitability matrix' which will help producers determine whether livestock guardian animals will be appropriate for their enterprise.
- Revision of current best practice guidelines for livestock guardian animals to ensure advice is fit-for-purpose and up to date.

Feedback

Feedback from participants about the workshop was very positive. Participants felt they had the opportunity to access a range of diverse perspectives and were struck by the collaborative and open-minded approach of delegates. Participants also felt they learnt a lot about livestock guardian animals from the workshop and indicated they would take learnings back to their respective roles.

Some participant comments have been listed below:

"I felt that this Forum was groundbreaking in bringing esteemed stakeholders together for the first time, despite their differing views and approaches."

"One of my key takeaways was that we need to provide robust science-based best practice education in how to use livestock guardian animals effectively to prevent the continued dissemination of misinformation, and to prevent failures."

"It was great to work with other livestock producers, members of government and researchers who work in predator management and compare experiences and ideas."

"Got a lot out of the workshop, particularly on how to engage with our landholders and if they were to be interested in using livestock guardian animals, how to support and incentivise them in the process."

"Greatest density of guardian dog and donkey talks I've ever had. Intellectually stimulating and really useful. Greater amount of knowledge now