

TESTING THE USE OF DOGS TO PREVENT WOLF ATTACKS ON FREE-RANGING PONIES IN NW IBERIA

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1. Introduction

The use of livestock guarding dogs (LGDs) is one of the most widespread traditional measures to protect livestock from predators. It is considered a non-lethal, farm-based and effective ‘green’ tool which allows livestock husbandry in coexistence with predators (Gehring et al., 2010a). LGDs are used to protect livestock from wolves (*Canis lupus*), among other predators (Rigg et al., 2011), although their effectiveness may be dependent on many variables including training, care and handling and the breeds involved (Bruns et al., 2020). Multiple reviews (e.g. Eklund et al., 2017) have highlighted the scarcity of field experimentation to quantify their efficacy. However, several studies have documented high levels of user satisfaction and substantial reductions in reported losses (e.g. Cortés et al., 2020; Salvatori and Mertens, 2012).

In parts of Spain such as Castilla y León, the traditional management system of herds with shepherds and LGDs has existed for centuries. Moreover, the use of LGDs has increased in the Iberian Peninsula in recent years thanks to EU-funded programmes (e.g. Cortés et al., 2020). In addition, purchase of LGDs is

often funded by regional governments, as is the case in Galicia, northwest Spain, in order to promote their use to protect livestock. The Spanish Mastiff, an autochthonous breed of the Iberian Peninsula, is used quite widely in Galicia.

LGDs are most often used with sheep and goats, which habitually aggregate and so are easier to keep watch over than cattle (Bruns et al., 2020), although LGDs are also used with the latter (Gehring et al., 2010b). In general, their application is considered more straightforward for animals grazing in fenced areas of limited extent than with unattended livestock on open ranges (Hansen and Smith, 1999). Developing a strong bond between LGDs and the animals to be protected is considered critical. The process of socialisation is part of the ancient knowledge of shepherds and farmers in areas where the presence of wolves has been continuous through the ages. It has been formally described for sheep (Hansen and Smith, 1999) and cattle (Gehring et al., 2010b), but information on the use of LGDs with horses is scarce.

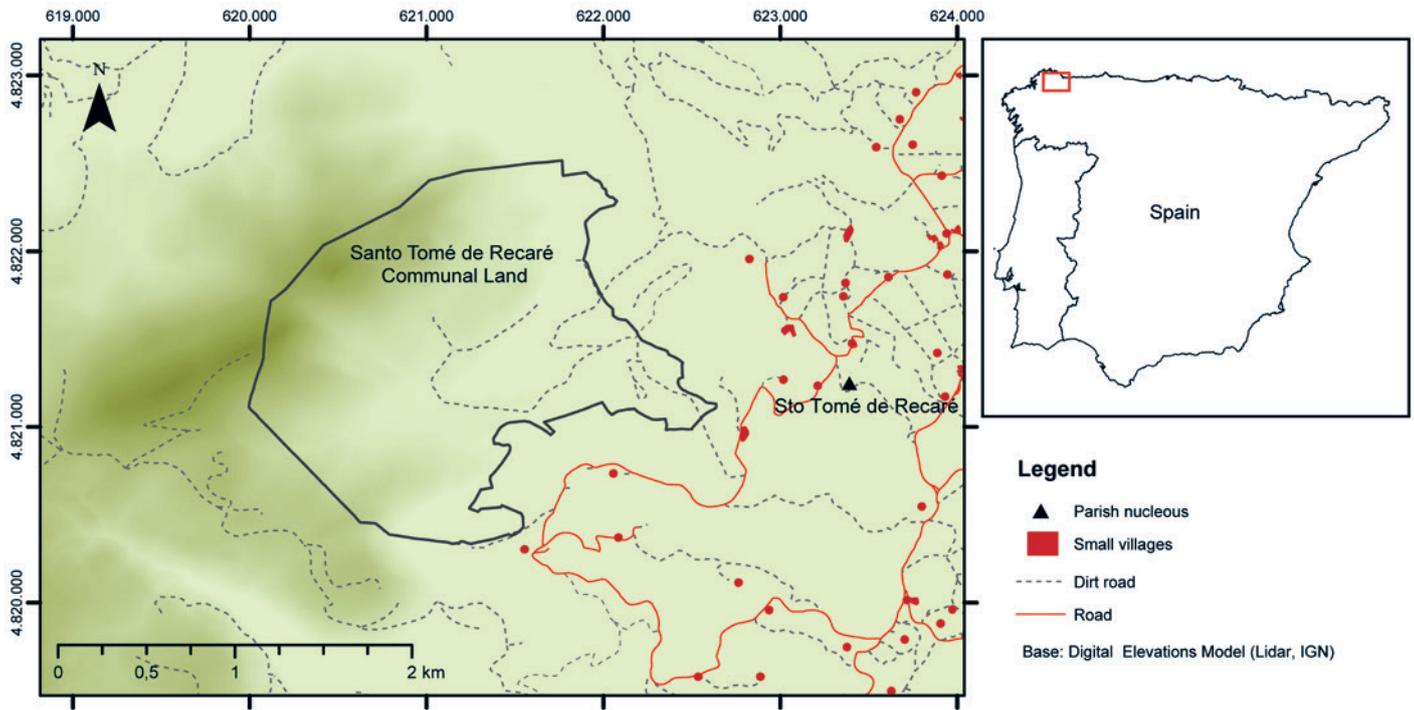


Fig. 1 Location of the Santo Tomé de Recaré Communal Land, where the trial with LGDs and Galician wild ponies was implemented.

Wild ponies or *garranos*¹ are present in Galicia and northern Portugal, where they are managed in an old, traditional system esteemed for its cultural value (Bárcena 2012; Iglesia, 1973; Nuñez et al., 2016). Once or twice a year, their owners (*besteiros* in Galicia) gather them to remove foals for meat, fire brand them, cut their manes and deworm them (Bárcena 2012; Iglesia, 1973; Lagos, 2013; Lagos et al., 2019). But for most of the year they live with very little human influence, free-roaming in the mountains. There, they form stable groups (known as bands), each of which maintains a home range of about 400 ha (Lagos et al., 2020) that may overlap to varying degrees with those of neighbouring bands, as has been described for other free-roaming horses (Schoenecker et al., 2016). Their grazing is considered beneficial for the maintenance of Atlantic wet heathlands (Fagúndez, 2016), a priority habitat according to the EU Habitats Directive 92/43/EEC. However, wolves prey selectively on ponies in Galicia (Lagos and Bárcena, 2018), killing an estimated 60% of foals born each year (Lagos, 2013). Solutions are therefore needed to reduce wolf predation in order to maintain populations of these free-roaming ponies.

It is difficult to implement damage prevention measures without changing the traditional husbandry system. Recommended options are based on achieving certain band characteristics, such as size or stability (Lagos, 2013; see Lagos and Bárcena in this issue). There is no tradition of using LGDs with *garrano* ponies and introducing them presents certain difficulties. In this article, we report one of the first trials using Spanish Mastiffs to protect a band of ponies in northern Galicia. We describe the socialisation process, calculate costs of implementing LGDs, assess their effectiveness and discuss the potential for wider application.

2. Study area and husbandry

The trial was carried out on the Communal Land of Santo Tomé de Recaré (325 ha), in the north of the Serra do Xistral, in Lugo (Fig. 1). The Serra do Xistral, designated as a Natura 2000 site, reaches a maximum altitude of 1,056 m, with elevations of 408–789 m in Recaré. The climate is extremely wet, with annual rainfall of 2,000 mm and frequent fog. Such conditions favour the existence of wet heathland in-

¹ *Garrano* is the name of the mountain ponies in Portugal and, at the same time, the designation suggested for all ponies free-roaming in the mountains of NW Iberia (Bárcena, 2012). Those in Portugal have been recognised as an official autochthonous breed called the Garrana, while in Galicia the breed has been designated as *Cabalo de Pura Raza Galega*. These breeds include only individuals that meet certain morphological characteristics.

terspersed with bogs, accompanied by other shrub formations and improved pastures for cattle (Fig. 2). In Serra do Xistral as a whole, there are estimated to be 1,500–2,000 ponies in an area of approximately 113 km² (Lagos et al., 2019). The mountain range is divided into Communal Lands of 300–2,000 ha, some fenced and others open, with 50–300 or more adult ponies in each.

Recaré is situated four kilometres away from where commoners and pony owners live. It is enclosed with a fence built about 30 years ago to help control the ponies and cattle grazing there. Around 75 ponies and 175 cows are kept on the Communal Land. Ponies graze freely on the heathlands all year round. In winter, pastures for cattle within the Communal Land are left open to be used by ponies

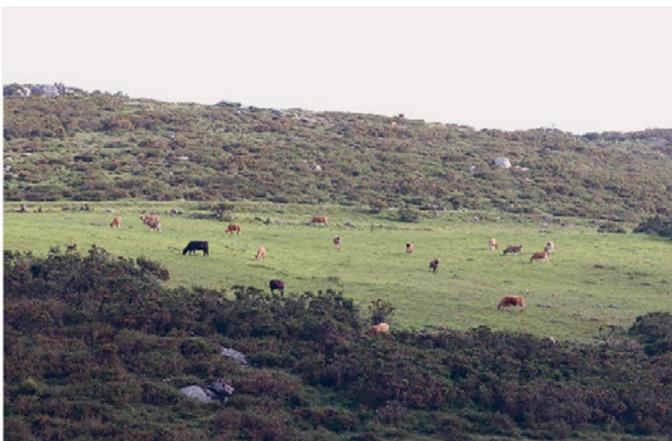


Fig. 2 Landscape in Santo Tomé de Recaré Communal Land. From top left to down right: general view, Atlantic wet heathlands, improved pastures for cattle and several views of the ponies in the mountains. *(Photos: Laura Lagos)*



Fig. 3 Band stallion and female livestock guarding dog

(Photo: Laura Lagos)

as well. Ponies form stable groups of six bands, each with one stallion, 6–13 mares, their foals and sub-adults (<2 years old). Traditional husbandry has little influence on this semi-natural social structure, and it is usual for *besteiros* to have their ponies in different bands.

3. Method of integrating dogs into a pony band

The second author of this article oversaw the socialisation of Mastiffs with ponies and recorded the process with notes and mobile phone photographs. The band into which dogs were integrated was formed artificially and consisted of five mares already inhabiting Recaré under the traditional system, to which were added one stallion, eight mares and two fillies from other areas of Galicia purchased in the two preceding years. These animals are classified as *Cabalo*

de Pura Raza Galega (Fig. 3), an officially endangered breed of Galician wild pony (Fernandez et al., 2001). Their value is higher than that of other Galician ponies, not only due to the market price of foals but also because of subsidies for a protected breed which their owners receive from the Common Agricultural Policy.

In November 2018, two Spanish Mastiff pups, male and female offspring of cattle guarding dogs, were purchased and integrated into the pony band. The three-month old pups were housed in a barn with two female foals aged 8–9 months for a period of 3.5 months. Following this, pups and foals were released with the rest of the band into a 0.5 ha pasture surrounded by a two-wire electric fence of 8,000–9,000 volts for another 3.5 months. To prevent pups developing bonds other than those with ponies, their contact with people was kept to a minimum. They were fed daily by the same person during the shortest possible amount of time.

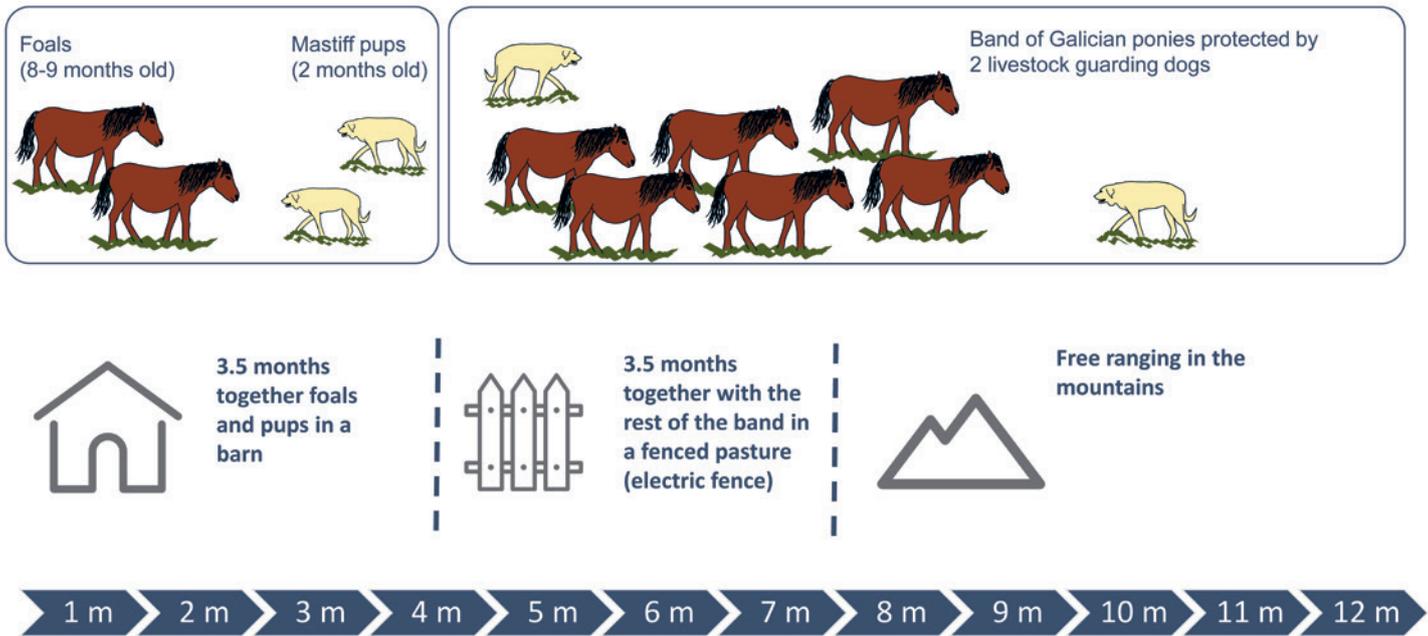


Fig. 4 Process of integration of livestock guarding dogs with Galician wild ponies.

(Graphics from Flaticon.com)

From June 2019, the whole band together with LGDs was released onto the Communal Land (Fig. 4). Weekly visits were made to check the dogs' welfare, whether they remained with the band and the composition of the band. The birth of foals and their survival were also recorded. Pony owners went to the rangelands daily to feed the dogs (Fig. 5), ensure they remained with the ponies and check

their health. Dogs were provided with about 40 kg of commercial dog food per month, supplemented with leftover food from home (Fig. 6). After 1.5 years on the open range, the dogs adapted to feed from a 16 kg self-feeder. Veterinary care consisted of initial microchipping, vaccination and deworming, with no additional treatment needed during the first two years of life.



Fig. 5 Feeding dogs and filling the dog feeder.

(Photo: Pedro Palmeiro)



Fig. 6 Dogs feeding and, in the background, two different bands of ponies.

(Photo: Pedro Palmeiro)

4. Costs

We calculated the average annual cost of two dogs to be € 651 (Fig. 7). This is based on the initial purchase price (€150 per pup) plus food, veterinary expenses and travel spread over an average expected lifespan of 5.5 years, as found by the Grupo Lobo LGD programme in Portugal (S. Ribeiro, pers. comm.). Initial veterinary costs for microchipping and vaccinations were €50 per dog. In addition, we estimated an average annual cost of €25 per dog for basic veterinary care. We did not include the cost of insurance for the dogs because it was covered by livestock insurance. The most expensive item was for travel to feed and check the dogs (10 km round trip from the pony owner’s house). We counted three trips per week; on the remaining four days, owners attended to the dogs when they went to check their cattle and so had no additional expense. If pony owners did not have cattle and therefore needed to make daily trips specifically to attend to the dogs, the total annual cost would be €982.



Fig. 7 Breakdown of costs of the two livestock guarding dogs used in the trial. The initial purchase price has been spread over an estimated lifespan of 5.5 years. Cost of veterinary care was calculated by prorating the initial cost of microchipping and vaccination and adding an estimation of annual expenses.

5. Results

The dogs stayed with the ponies throughout their first two years in the band (Figs. 8–9). Outside the reproductive period, the band divided into two sub-groups and one solitary mare with her offspring. The LGDs stayed within approximately 30 m of the sub-group containing the two fillies with which they were first bonded. They exhibited protective behaviour against cattle and ponies from other bands. For instance, the two dogs were observed barking at, threatening and harassing a stallion from another band that approached the ponies seeking mates (Fig. 10).



Fig. 8 Vigilant dogs around a band of ponies.

(Photo: Laura Lagos)



Fig. 9 Dogs resting close to ponies, alert to surroundings.

(Photo: Laura Lagos)



Fig. 10 Interaction between livestock guarding dogs and a chestnut stallion from another band which approached in search of mates.

(Photo: Laura Lagos)



Fig. 11 Pups born in the Communal Land and heathlands of Santo Tomé de Recaré.

(Photo: Laura Lagos)

In 2020, the LGDs had three pups (Fig. 11), which were born in a den dug under a rock, protected from harsh weather. They were regularly visited to check their welfare and were properly cared for and socialised with humans until they were removed and placed on other farms at five months of age. During this period, their mother was more attentive to her pups than to the ponies, but the father remained with the band most of the time. This suggests that neutering LGDs could help to maintain their attentiveness to ponies. On the other hand, pups born in the band can readily socialise with ponies, so this might be the best way to give continuity to the system of protection.

The presence of LGDs was apparently associated with lower levels of wolf predation on foals. Five of seven foals (71%) born in the band in the first year and three of four (75%) in the second year survived. Only one foal was confirmed as killed by wolves and it was not consumed, presumably because the dogs stayed nearby and precluded access to the carcass. Survival of foals on the whole Recaré Communal Land increased from 0–9% during the two years preceding the trial to 49–55% in the two years following the introduction of LGDs. In contrast, owners reported that survival of foals on surrounding Communal Lands remained consistent at 20–40% during all four years.

6. Discussion and conclusion

Two Spanish Mastiffs were successfully socialised with *garrano* ponies and integrated into the band. Wolf predation on foals was lower in the band with LGDs

than that observed in general for Galician wild ponies. There was also an apparent reduction in losses of foals in other bands on the same Communal Land. For a more thorough assessment of LGD effectiveness, other measures should be taken, such as tracking the occurrence of wolf approaches and successful predation events in comparison with a control area or band.

Despite this success, several possible limitations to the application of the method were identified. Firstly, it is difficult for *besteiros* to bear the extra costs that LGDs entail given the current low value of foals. In the specific conditions where the trial was conducted, with car access, use of LGDs was possible. Elsewhere, travel costs and the time needed to attend to dogs could be greater. In our calculations, we did not include additional time spent travelling and caring for dogs, which is likely to be higher than in other systems (cf. Ribeiro and Petrucci-Fonseca, 2005). Sheep and cattle farmers are usually with their animals on a daily basis or, in the case of extensive grazing, check on them at least 2–3 times per week. In contrast, ponies under the traditional management system are usually in the mountains and are not visited so frequently, so travel to check and feed dogs is an additional burden.

In this trial, semi-tamed ponies were used. It might be more difficult to socialise dogs with wild ponies, although the fact that five wild mares from the Communal Land accepted the dogs and remained part of the band suggests that socialisation might be possible even without tamed ponies. In any case, this would involve putting wild or semi-wild ponies through a process of habituation to humans. An additional problem may arise if, during the socialisation process,

ponies became accustomed to feed in meadows or to be fed by people. They might then start to utilise low-land pastures in seasons of scarce food availability. This is a frequent cause of conflict in rural communities of Galicia, where ponies range freely in unfenced areas (Lagos et al., 2020).

LGDs probably cannot be used in several bands in the same area simultaneously due to possible interac-

tions between dogs from different bands. In remote, open mountains, LGDs might interfere with other land uses including livestock grazing. We therefore consider this practice appropriate and effective for protecting a specific band of valued animals, as in the case of *Cabalo de Pura Raza Galega*, but not as a panacea against wolf predation on free-roaming ponies in all areas of Galicia and Portugal.

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