Project

THE MONGOLIAN BANKHAR DOG PROJECT: PROTECTING A NOMADIC WAY OF LIFE

Zoë Lieb[1], Bruce Elfström[2]

[1] *Durrell Institute of Conservation and Ecology, School of Anthropology and Conservation, University of Kent, UK*
Contact: Zoelieb1@gmail.com

[2] *Nomadic Guardians Foundation, 112 Hemlock Valley Road, East Haddam, CT 06423, USA*

www.bankhar.org

1. Introduction

Harmful human-wildlife interactions are a major issue for Mongolian herding communities. Although studies suggest that the wolf *(Canis lupus)* and snow leopard *(Panthera uncia)* prefer wild prey, when this is depleted they readily predate on domestic animals (Hovens and Tungalaktuja, 2005; van Duyne et al., 2009). The wolf commands significant symbolic power in Mongolian culture, with its central tenet of nomadism, being simultaneously venerated and regarded as an enemy. Loss of livestock frequently results in retaliatory killing of predators. Although this may not be effective in the long-term as a means of reducing damage to livestock (cf. Treves et al., 2016), it can have a substantial impact on predator populations. For example, displacement of natural prey species and retaliatory killing due to livestock predation are considered to be two of the main threats to the snow leopard (McCarthy et al., 2017).

Pastoralists worldwide have developed an array of lethal and non-lethal strategies to protect their animals (Linnell et al., 1996). Livestock guardian dogs (LGDs) are an ancient technique, the use of which declined with socio-economic changes and suppression of predator populations during the 20th century (Rigg, 2001). Nowadays, LGDs are an increasingly popular method of reducing losses, thereby enhancing coexistence of rural communities and large carnivores (Gehring et al., 2010; Linnell and Lescureux, 2015). However, in many regions, a period of low predation risk led to erosion of culturally informed methods of damage prevention that may be needed again when predator populations rebound (Lescureux and Linnell, 2013; Linnell and Cretois, 2018).

Mongolia is a prime example of the loss of traditional damage prevention methods. LGDs were utilised by Mongolian herders for millennia to deflect predation from their livestock. However, predation prevention approaches changed markedly as a result of collectivisation during the socialist period, which lasted from the 1920s to the 1990s (Scharf et al., 2010). Nomads were forcibly relocated into settlements and fences and corrals became more widespread, reducing the need for LGDs out on the steppe. Predation management shifted to collective wolf hunts and den raids to control wolf numbers (Charlier, 2015; Sneath, 1998). Many herders, their parents and grandparents recall Bankhar dogs being killed or their use as livestock guardians discouraged during this period (MBDP, unpublished data).

Abrupt decollectivisation of livestock herding during the capitalist transformation led to a sharp increase in livestock numbers together with a major decline

A snow leopard in the Gobi Desert of Mongolia leaving a spring after having "licked" it's fill. *(Photo: Soyolbold Sergelen)*

of efficiency of production. In the decade following democratisation in 1990, the total head of livestock increased by more than 20% nationally but offspring survival fell by 10% and consumption of livestock products fell by 20% (Sneath, 2003). In the late 20th century, herders therefore faced a significantly altered societal and political landscape, with less support than during collectivisation, a rapidly changing system and pressure to alter their herding practices to fit a newly privatised economy (Chuluun et al., 2018) while also enduring the impacts of climate change (Nandintsetseg et al., 2018). After decades of herding in relatively wolf-free pasturelands with collectivised means of predation management, herders found themselves under-resourced to cope with predation pressure on their herds (Scharf et al., 2010).

The privatised and under-regulated system that emerged has resulted in larger herd sizes and alterations in land use patterns, as well as displacement of natural prey species, leading to more frequent interactions between wolves and livestock (Mijiddorj et al., 2018). Although there has yet to be a comprehensive study to determine wolf population size and distribution in Mongolia (Wingard and Zahler, 2006), there are probably several thousand individuals (Clark et al., 2006). Because of the abandonment of non-lethal deflection techniques practiced among Mongolian herders and other herding cultures in the region, it is estimated that 55% of poaching of snow leopards is a response to predation on livestock (Nowell et al., 2016). Wolf hunting is bolstered by increased access to vehicles and guns by rural populations (Wingard and Zahler, 2006). Nomadic herders concerned about the threat from predators increase the time they spend personally guarding their flocks, which they also tend to corral for longer and move less frequently, thereby contributing to problems of overgrazing (Elfström et al., 2019).

As their home ranges typically extend beyond the boundaries of protected areas, large carnivores inevi-

tably interact with livestock and human populations (van Duyne et al., 2009). A lack of effective damage prevention measures, paired with reduced local tolerance of predator species due to increased livestock losses (Bagshi and Mishra, 2006), can therefore fuel renewed persecution of apex predators in unprotected or poorly protected areas (cf. Rust et al., 2013). Moreover, if conservation programmes neglect the 'human' element of human-wildlife conflict issues, some people may become alienated and view such programmes and the organisations running them as being in opposition to their lives and livelihood (Madden, 2004). This reduces the capacity and willingness of local communities, often uniquely positioned in remote and vulnerable ecosystems, to contribute to wider conservation efforts. Ultimately, conservation suffers by creating a separation between biodiversity and human needs and wellbeing. Conservation efforts should therefore engage with local people and integrate specific, meaningful and empowered indigenous input.

2. Mongolian Bankhar Dog Project

The Mongolian Bankhar Dog Project (MBDP) was founded in 2011 with the goal of remediating the issue of livestock predation and retaliatory killing of predators by integrating a culturally relevant and historically rooted solution within nomadic herding communities (Elfström et al., 2019; see Box 1). The project is working to restore the use of LGDs, drawing on the cultural significance of the Bankhar dog (Fig. 1) as well as the effort and engagement of local people interested in returning to this traditional practice.

Box 1 The Mongolian Bankhar Dog Project was founded by biologist and expedition specialist Bruce Elfström. While working in Mongolia on an IMAX film, he witnessed a particularly large predation event, during which wolves killed 17 horses, mostly foals. In retaliation, the affected herding community killed seven wolves. Bruce began researching an endemic livestock guardian dog, the Bankhar, as a possible solution already existing within Mongolian herding practices. He found that, although the Bankhar had become rare, some families still used them in remote areas of the country. Encouraged by this, he developed the premise for the project: find good dogs, breed them and distribute them to herders to improve the protection of livestock, thereby reducing the need to kill predators.

News of Bruce's search for dogs reached Bankhar enthusiast Megdee Kholorsuren. Through conversations together, they realised that collaborating would be a win-win situation: Megdee could supply dogs and assistance, while Bruce's breeding programme would help achieve Megdee's goal of saving the Bankhar from extinction. This led to Megdee selling his dogs to the new project and leasing his kennels near Ulaanbaatar. Subsequently, a new facility was built with larger enclosures and more dogs were added from other areas in order to retain genetic diversity.

Fig. 1 A Bankhar dog watches over a mixed flock of sheep and goats in the Mongolian steppe. *(Photo: Zoë Lieb)*

In collaboration with herding communities in several Mongolian provinces, the MBDP's objectives are: 1) to restore the widespread use of and access to Bankhar dogs and the knowledge needed to train them as livestock guardians; and hence 2) to reduce losses of livestock to predation; and thereby 3) reduce the motivation of herders to kill predators. An additional goal of the lead author of this article was to design and implement a study to test the efficacy of this approach in a nomadic herder setting and with the original, native type of LGD, thus contributing to an increasing body of scientific knowledge about culturally-oriented solutions to human-wildlife coexistence.

Fig. 2 Goats herded for cashmere production in Nomgon soum, Ömnögovi, Mongolia. *(Photo: Zoë Lieb)*

3. Livestock husbandry in the project area

Much of Mongolia's population is closely linked to herding, with approximately 170,000 households living as herders today (MICC, 2018). Mongolia is the second largest producer of cashmere worldwide (Fig. 2), accounting for over 25% of global supply (World Bank, 2003). However, the current state of herding has been drastically altered due to social and political upheaval and is widely considered to be under-managed and likely to be contributing to land degradation (Sneath, 2003).

The MBDP works with herding communities in a variety of habitat types in Undur Ulaan (Arkhangai Province), Noyon and Nomgon (Ömnögovi Province), Khustai National Park (Argalant Province) and Terelj National Park (Töv Province) (Fig. 3). Cashmere, meat and milk products are the most common types of production from participating herders. All herders have mostly sheep and goats (Fig. 4) although, depending on the environmental conditions of their region, they also herd larger stock. For example, herders in Undur Ulaan have yaks (Fig. 5), while herders in Noyon and Nomgon keep camels because of their adaptation to desert conditions (Fig. 6).

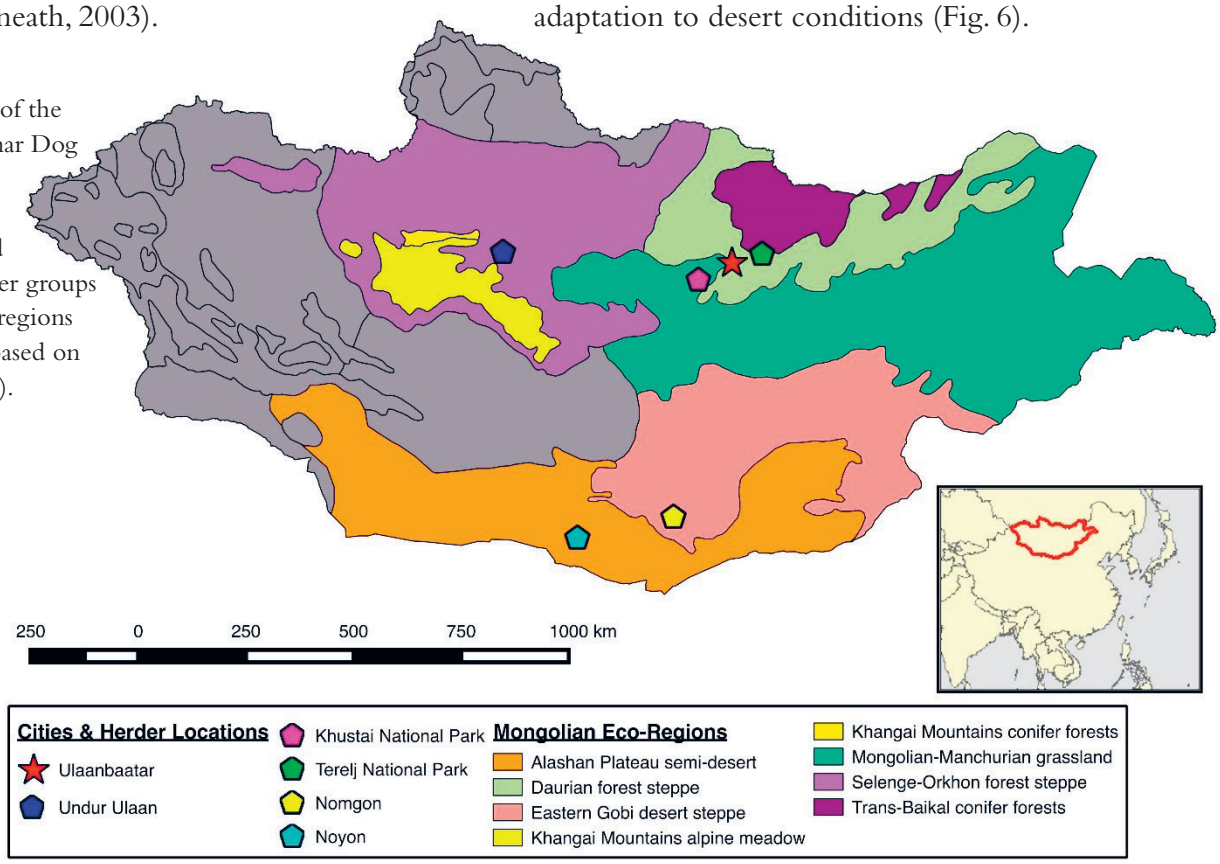

Fig. 3 Locations of the Mongolian Bankhar Dog Project breeding facility in Khustai National Park and participating herder groups (pentagons). Eco-regions of Mongolia are based on Olson et al. (2001).

Fig. 4 A mixed herd of sheep and goats grazing in Nomgon soum, Ömnögovi, Mongolia with a herder on horseback watching over them. *(Photo: Zoë Lieb)*

Herders follow similar seasonal patterns: most families move multiple times over the summer to cover large open pastures and spend winter in more sheltered areas, with fewer movements during that season. Most herders accompany their animals throughout the day on horseback, motorcycle or on foot, especially in the winter. During summer months, because summer pastures are more open, herders often watch their livestock from a much greater distance. At night, sheep and goats are kept in half-covered corrals (Fig. 7).

Fig. 5 A herder separating yak calves from the herd in Undur Ulaan, Arkhangai, in spring 2017. *(Photo: Zoë Lieb)*

Fig. 6 Camels kept by herders in the desert steppe of southern Mongolia. *(Photo: Zoë Lieb)*

Fig. 7 Livestock camp on the Mongolian steppe. *(Photo: Zoë Lieb)*

Fig. 8 Sensory stimulation of a young Bankhar pup. Brief exposure to the cold, and being turned in different directions, can help pups during their development. *(Photo: Zoë Lieb)*

Fig. 9 Batbaatar Tumurbaatar of the MBDP team setting up a temporary fence for young pups. When pups are old enough to venture out of the shelter, this fence allows them to continue to be close to livestock without the risk of being trampled. *(Photo: Zoë Lieb)*

4. The Bankhar as a livestock guardian

The Bankhar dog is an ancient landrace that originated in Eurasia and persists today in Mongolia as a powerful cultural symbol, representing the strength and independence of the herding way of life. While the use of the Bankhar as a livestock guardian was largely abandoned in socialist-era Mongolia, many herders remember the traditional practices of earlier generations and some aspects have been preserved (E. Batchuluun, personal communication). Moreover, the Bankhar has maintained its genetic distinctiveness (Shannon et al., 2015) and morphological characteristics that enable it to withstand a harsh climate, with temperatures ranging from 43 °C to −48 °C. Unusually among LGDs, the Bankhar's belly is completely furred. It has a compact structure with small eyes, short tail, small ears, tight snout, small feel, short muzzle and extremely dense, long fur[1].

Since 2014, the MBDP has operated a Bankhar dog breeding programme at its dedicated facility in the buffer zone of Khustai National Park. While the number of dogs living at the facility fluctuates, 21 adult Bankhar dogs are currently permanent members of the breeding programme. The first generation of dogs was sourced from an in-country enthusiast who had dogs from several provinces across Mongolia including Uvs, Hovd and Bayankhongor. Later, additional adult dogs were sourced from various locations in order to integrate additional genetic diversity and traits. The genetic diversity of available dogs and their suitability to form a sustainable breeding programme were assessed by researchers at Cornell University and the Institute of Canine Biology[2]. They found the genetic diversity of the Bankhar to be very high, suggesting it may be one of the oldest known canine landraces (Shannon et al., 2015). Genetic analysis also confirmed that the project's Bankhars had not crossbred with other dogs (many dogs in Mongolia, especially strays, are mixed-breeds).

Bankhar dogs at the breeding facility generally give birth between mid-November and early January. The project produces 10–17 pups per year. Livestock are co-housed with the mother Bankhar and her litter, ensuring that pups are exposed to sheep and goats from birth. An early life handling protocol[3] is utilised to aid pups' development. This is based on recommendations of Dawydiak and Sims (2004), adapted for a Mongolian context and influenced by five years of implementation practice (Elfström et al., 2019). It includes sensory stimulation from shortly after birth (Fig. 8), socialisation approaches to discourage aggressive behaviour towards livestock or humans and basic obedience training ("stay" and "go to herd") before

[1] https://www.bankhar.org/bankhar-dogs/
[2] https://www.instituteofcaninebiology.org/
[3] https://www.bankhar.org/livestock-guardian-dog-care-use-manual/

Fig. 10 An 8-month old Bankhar pup trained to follow sheep and goats at the MBDP facility. *(Photo: Zoë Lieb)*

Fig. 11 A yearling Bankhar dog guarding a flock of sheep and goats in Nomgon soum, Ömnögovi. *Photo: Zoë Lieb)*

placement. Pups are kept at the MBDP facility for approximately four months, during which time they are vaccinated and spayed or neutered. They are kept in constant contact with livestock to prepare them for their future role as guardians (Figs. 9, 10). Pups are generally placed with herders in spring, when they are old enough to be trained to stay on the pasture (Fig. 11).

In 2015–2019, a total of 59 Bankhar pups were placed with nomadic herding communities in Nomgon (Ömnögovi province), Undur Ulaan (Arkhangai province), Khustai National Park area and Terelj National Park. Either through partnering with other organisations, such as the Wildlife Conservation Society's Sustainable Cashmere Project in Nomgon, or by directly collaborating with herder cooperatives as in Undur Ulaan, the MBDP interviews interested prospective recipients of Bankhar pups. Herders are selected on the basis of several criteria including their willingness to implement the training protocol, the absence of non-guardian dogs at their homestead (which could distract pups and/or crossbreed with Bankhars) and if they had lost livestock to predators. Successful candidates are provided with training protocols, support regarding dog behaviour, care and training, and check-ins from the MBDP team during the training progress.

The initial evaluation interviews and a series of follow-up interviews are used to assess the outcome of placing Bankhar pups with herder families. Follow-up visits also give the MBDP team the opportunity to check on growing pups to determine if they are healthy and receiving adequate care and, if necessary, to modify the advice given to herders for their training. Pups were generally placed in a male and female pair. Herd sizes varied from 150 to 800 head of sheep and goats (most herders also have separate herds of horses, cattle, yaks or camels). Depending on initial training outcomes, there was an option for herders with large herds to receive a third or fourth dog in subsequent years. As of 2019, 30 herders had received Bankhar pups from the MBDP programme.

5. Findings so far

Sustained interest in reviving the use of Bankhar dogs within their husbandry practices was found among the herding groups (Elfström et al., 2019). We also found that most herders knew about Bankhar dogs as livestock guardians or had childhood memories of their grandparents using them in this way. Moreover, the herders involved in our evaluation demonstrated pride, joy and excitement at the prospect of participating in the programme. Many cited their cultural perspective of Bankhar dogs and recognition of them as a symbol and component of traditional herding methods, or a desire to set a good example for their community. Even more importantly, most herders we interviewed saw the reintroduction of Bankhar dogs as a benefit for their entire cooperative or herding group.

Nearly all the participating herders saw their livestock losses plummet after the first year of receiving their dogs. Initial results based on reports from 2015–2017 suggest that, on average, the presence of Bankhar dogs reduced livestock losses to predators by more than 90% (Elfström et al., 2019). A more rigorous analysis of the major outcomes of the project will be included in an upcoming study (Lieb et al., in prep.).

Another positive sign was that herders began to frequently refer one another to the project. Neighbours of participating herders would often tell us they wanted to get involved because they saw how successful the dogs were. This shows how the use of LGDs could continue to snowball beyond the scope of the project, with herding groups collectively growing interest in the method after an early-adopters phase. While the MBDP has ongoing work in assessing the effectiveness of the dogs, as well as investigating their possible deleterious impacts on wildlife (cf. Smith et al., 2020), the fact that there is support among herder groups themselves is encouraging.

6. Challenges

Successful realisation of the project has needed time, effort and perseverance. After its initial conception in 2003, the first eight years were taken up with a survey of the *status quo* and feasibility study. This was followed in 2012–2015 by a process of preparation, implementation and troubleshooting, during which time the project was officially launched, breeding facilities were established and the first pups were born but there was still a steep learning curve. It was only from late 2016 that the team was able to switch its focus to implementing core project activities (Elfström et al., 2019).

Operating in any setting that involves people, communities and their cultural landscapes requires extensive care and attention to the views, beliefs, needs and lifestyles of the local population. Working with a talented team of Mongolian scientists and specialists was instrumental in bridging the gap between the MBDP's scientific-conservation goals and the realities on the ground regarding solutions that would actually work for Mongolian herders.

One example of this was the issue of neutering male dogs. While few herders cared about spaying female dogs (or had never heard of this being possible), most did not want to receive neutered male dogs. Nearly all herders had the same concern about using neutered male dogs for guarding livestock: they thought they would not be "brave" enough to confront wolves. Herders also noted that, while a neutered male dog might live longer, it was not as useful to have an old, unhealthy dog. This compelled the project to adapt to the perspectives of the herding communities. We provided spayed female dogs and selected more carefully where to place unneutered male dogs with herders that did not have other dogs at their homestead.

The project also gained insights into the motivations of herders to hunt wildlife. As other researchers and community members from subsistence settings have noted, there is more to killing predators than simply wanting to protect livestock. Hunting is also an activity pursued for tradition, community engagement, education of young people and entertainment. It is therefore not enough to boil down the human experience of the environment to buzzwords such as 'resource extraction' and 'ecosystem services'. In order to address the issues surrounding human–wildlife coexistence and human impacts on wildlife, conservationists must strive for greater understanding of the relationship herding communities have with the land, hunting practices and wildlife itself.

7. Moving forward

LGDs and other community-based approaches are still in need of continuous assessment and validation. There remains some reasonable criticism of adding more domesticated canines to landscapes already pressured by stray animals in view of the impact they may have on wildlife. Studies are needed to examine how working LGDs may interact with or contribute to stray dog populations, or if a shift in how herders utilise dogs may reduce the occurrence of strays. Nonetheless, community-based methods, especially those supported and welcomed by local people, warrant more support, study and innovation. Our ultimate goal is to re-establish widespread use of the Bankhar as a livestock guardian and thus negate the need for retaliatory killing of predators. This demonstrably effective and mobile means of protection also has the potential to facilitate diversification of livestock holdings, smaller herd sizes and more frequent relocations, thereby reducing overgrazing and soil loss.

If there is a key lesson we have learned from the project's outcomes to date, it is that effective, balanced, inexpensive and relevant solutions for the challenges subsistence communities face can be found within the cultural practices, histories and traditions of those very same people. Finding the means to empower those with knowledge and understanding of particular cultural contexts and practices can reveal a treasure trove of improvements for how we protect the natural landscapes on which we all depend.

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