



Project

Herdenschutz Niedersachsen – practical support for effective livestock protection against wolf attacks

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Introduction

The wolf (*Canis lupus*) was considered extinct in Germany for about 150 years until it returned at the beginning of the millennium [1]. Since then, the species has rapidly increased in numbers and spread to more regions [2,3]. Recolonisation of the federal state of Lower Saxony in northwest Germany began in 2008 (Fig. 1). By 2022/23 there were at least 38 reproducing packs and 15 pairs in the state [4]. Wolf attacks on livestock such as sheep, goats, captive deer, cattle and horses have posed a challenge for livestock husbandry.

The landscape of Lower Saxony is largely characterised by forestry and agriculture (Fig. 2). Around 2.6 million hectares, 55 % of its land area, is used for agriculture: about two thirds arable and a third permanent grassland. As of November 2023, there were 18,600 cattle farms with approximately 2.3 million animals [5] and 1,040 sheep farms with about 172,000 animals [6]. Professional shepherds generally use electric netting and thus fulfil the official requirements for basic anti-predator protection and the eligibility criteria to receive compensation in case of damage [7]. Dairy cows and beef cattle graze in most cases on pastures enclosed with one or two (barbed) wires

or, as is often the case in the northern part of the state, only by drainage ditches. Lower Saxony also has about 233,500 Hanoverian, Oldenburg, Icelandic and other horses, kept by breeders, sport and leisure riders [8].

In Germany, wolves prey mostly on various species of deer as well as wild boar (*Sus scrofa*), while domestic animals make up less than 2 % of their diet [9]. Nevertheless, a total of 5,727 head of livestock were reported killed, injured or missing due to wolf attacks in 2023, predominantly sheep and goats (90%) followed by farmed deer (6%), cattle (4%) and other animals [10]. In Lower Saxony, attacks on horses cause particularly emotional debates [11].

Non-lethal approaches such as wolf-deterrent fencing have been found to be significantly more effective at preventing depredation than lethal control of wolves [12]. Protection measures are subsidised by federal states to varying degrees in accordance with the respective funding guidelines. In Lower Saxony, the purchase of livestock guardian dogs and materials for wolf-deterrent fences is subsidised up to €30,000 per year per farm. In the case of horse and cattle farms, funding is only available for those with confirmed depredation by wolves or if there were at least three official records of wolf attacks on the respec-



Fig. 1. Young female wolf in heathland in Lower Saxony (Photo: Theo Grüntjens).

tive animal species within a radius of 30 kilometres and less than 12 months prior to the application. Sheep, goat and deer farms can be subsidised throughout the state [13]. Costs of construction and subsequent maintenance are not eligible, although this may change in the future. In order to provide help where official support is insufficient, the Herdenschutz Niedersachsen (Livestock Protection Lower Saxony) project was launched in 2017 by NABU¹, the state's largest environmental association.

Objectives

The Herdenschutz Niedersachsen project's overall objective is to safeguard livestock grazing in the long-term where wolves are present. To achieve this, it supports livestock farmers in implementing protection measures with the help of trained volunteers. The basis for achieving the best possible wolf-deterrent effect is the proper installation and maintenance of recommended fencing systems [14]. It is also important to consider each pasture area individually and to take into account aspects such as the operating procedures of each farm, the topography of the terrain and other particular features and restrictions [15].

In addition to providing on-site advice to livestock farmers and practical support in setting up wolf-deterrent

fences, the project also aims to contribute to minimising conflict between wolves and livestock farming through knowledge transfer. If farmers ask for support, the project helps to implement prevention measures in hotspot areas, but also in various natural areas under challenging conditions such as wetlands or slopes and in areas without established wolf territories throughout Lower Saxony (Fig. 3).

Although subsidies for fencing are available for sheep, goat and deer farms in areas without established wolf territories, in practice uptake is low. In such areas, if livestock farmers address protection at all, it is usually only when there is an increase in wolf attacks in their neighbourhood. This is one of the reasons for the consistently high numbers of attacks on these species, despite years of existing support programmes. In this context, the project helps to build wolf-deterrent fences in these areas for demonstration purposes and to encourage uptake (Fig. 4).

Volunteer support

At the heart of the project is practical support of farmers to protect their livestock from attacks. New fencing is often accompanied by improvements in pasture management. Use of wolf-deterrent permanent electric fencing is

¹ <https://niedersachsen.nabu.de/>



Fig. 2. Aerial view of a typical landscape in Lower Saxony (Photo: Stockfoto).

common practice on sheep/goat, cattle and horse farms in Lower Saxony, but requires sound knowledge of materials and components as well as professional installation. Farmers often find it difficult to install an effective wolf-deterrent fence on their own due to lack of knowledge and time. Many of them, especially part-time or hobby farmers, also struggle to finance construction by a specialised company, even if the purchase of the material is subsidised by the state. This is where the Herdenschutz Niedersachsen project has proven its worth, with trained volunteers working under the coordination of experienced full-time project staff. In this way, additional costs and workload for farms to protect livestock can be minimised.

Usually, farmers contact the project themselves or are informed about it by authorities, wolf consultants, the chamber of agriculture, environmental organisations, fencing companies or other farmers and animal owners who have already benefited from the project. The specific procedure for a work assignment then involves prior con-

sultation with project staff, procurement of fencing materials by the farmer and planning the schedule. On the day of the work effort, volunteers and farm employees or helpers are assigned by project staff to various tasks. These include marking out heights of electrical conductors on fence posts, attaching insulators and tensioners, connecting wires or driving tractors, depending on the experience and preference of the volunteers.

While at the start of the project there were special training courses for volunteers with theoretical and practical content, on-the-job learning has become established over time. Volunteers are now instructed and trained directly during fence construction work (Fig. 5). This enables interested individuals to be integrated into the project on an ongoing basis, allowing for greater flexibility. There are no prerequisites for volunteers other than physical fitness, the ability to cope with all kinds of weather and a willingness to interact with farmers who may have different attitudes, especially towards wolves. This is ascertained during an initial interview and confirmed in the

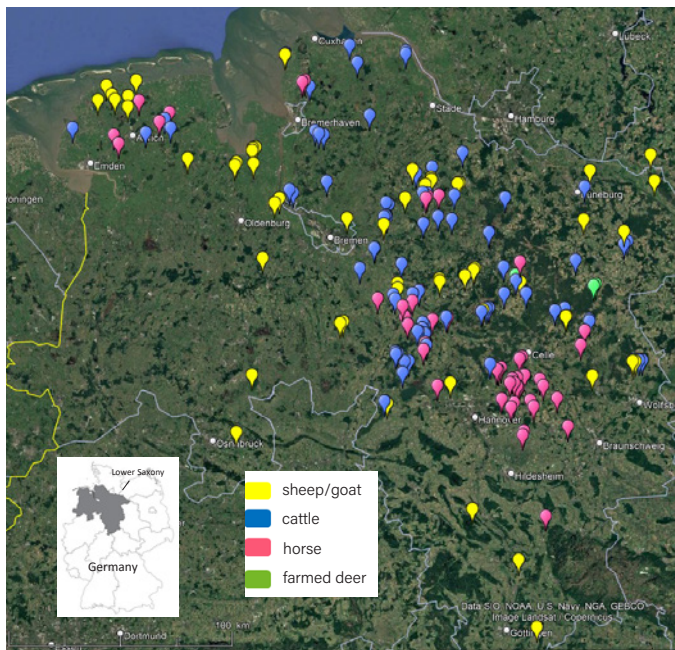


Fig. 3. Distribution of livestock farms with wolf-deterrent permanent electric fences supported by the Herdenschutz Niedersachsen project.

following work efforts. There is no fixed duration for voluntary work: some people invest many hours on a regular basis while others help occasionally according to work and family commitments.

From the start of the project in 2017 until summer 2024, more than 200 interested people were trained (including government employees) of whom a total of 50 volunteers provided the equivalent of more than 850 person days of practical work. Volunteers come from all corners of life and include students, pensioners and working people, among them government employees, nurses, a doctor, an architect and farmers who were themselves previously supported by the project. There have been about the same number of women as men.

Over the years the project has employed an average of two full-time staff who have visited more than 400 animal owners for consultations. About 220 livestock farms have been supported with fence construction. Almost half (49%) had cattle (Fig. 6), 27% sheep/goats (Fig. 7), 22% horses (Fig. 8) and 2% farmed deer. Most of them (62%) were sideline businesses while 28% were professionals and 10% hobby farms.

Altogether 405 pastures totalling 1,800 hectares (from 0.3 to 70 ha each) have been equipped with wolf-deterrent fences with a combined length of more than 500 km. Permanent electric fences predominate (306 pastures, 76%



Fig. 4. Demonstration of wolf-deterrent permanent electric fencing (Photo: Peter Schütte).

of fences), followed by mobile electric net fences (75, 19%), upgrading existing fences (12, 3%), mesh wire (8, 2%) and polywire fences (4, 1%).

Evaluating outcomes

Permanent electric fences constructed with the help of the Herdenschutz Niedersachsen project have been found to deter wolves and wild boar while being permeable to other wildlife [16]. Moreover, whereas 23 of 405 pastures had wolf attacks prior to implementation of preventive measures, none of them lost any livestock when protected by fully functional fences. Although wolf attacks occurred in three protected pastures, they were found to have occurred when fences were not operational (no electricity) or where other wildlife such as foxes (*Vulpes vulpes*) or nutria (*Myocastor coypus*) had dug beneath the fence, providing an access route to wolves.

Farmers who received support from the project in 2017–2020 were interviewed in order to evaluate their views relating to wolves, livestock grazing and protection as well as their experience of the project [17]. A total of 19 semi-structured interviews were conducted in the summer of 2020, nine of them with full-time farmers and ten with people for whom keeping livestock was a hobby



Fig. 5. Project volunteers being trained in fence construction (Photo: Peter Schütte).



Fig. 6. Typical cattle pasture in Lower Saxony protected with a 5-wire permanent electric fence (Photo: Peter Schütte).



Fig. 7. Sheep protected by a 5-wire permanent electric fence; a fence monitor and gate set are visible on the right (Photo: Peter Schütte).



Fig. 8. Wolf-deterrent permanent electric fencing with modified wires to prevent injury to horses (Photo: Peter Schütte).

or sideline. Respondents identified their main challenges as being financial aspects as well as lack of time and expertise regarding suitable materials, proper installation and the necessary parameters (voltage, correct earthing). Another aspect cited was difficulty in finding a competent contact person who could provide them with sufficient information about options for protecting their animals.

All 19 respondents stated that co-operation with the project had brought them concrete benefits, especially relief from severe negative stress thanks to a reduction in their workload. Practical help was particularly important for hobby or sideline farmers. The high level of expertise and extensive experience of project staff was emphasised several times. Interviewees valued the project's un-bureaucratic and flexible approach as particularly supportive and felt they were provided with customised support.

In addition to practical support and expertise, interviewees also emphasised social aspects that had the potential to moderate existing conflicts. Farmers stated that they liked the personal commitment of conservationists. They praised the co-operation between actors from different social groups and considered this to be important and commendable. They saw a particular strength of the project's work in bringing together conservation-minded

people and farmers who are directly affected by wolf presence, increasing mutual understanding of each other's concerns and opinions. Interviewed farmers also felt that the project had filled a gap by providing expertise specifically focused on wolves.

Challenges and solutions

The project has been involved in finding solutions to several specific challenges of implementing livestock protection measures in cultural landscapes. For example, fences to protect horses have a white plastic coating on the wires to make them clearly visible to horses and to prevent injuries resulting from legs or hooves getting caught in the fence (Fig. 8). This is particularly important for the bottom two wires, 20 cm and 40 cm above the ground [18].

Permanent electric fences on river dykes have to be approved by local or national water authorities while fluctuating water levels due to tides pose challenges on sea dykes. In addition, dykes are used for walking or cycling trails, which necessitates additional safeguards such as self-closing gates. Due to concerns and misgivings from the tourism sector, it was not until May 2020 that we



Fig. 9. Wolf-deterrent permanent electric fence on a sea dyke next to tourism infrastructure (Photo: Peter Schütte).

could help with the first permanent electric fence system for a sheep farmer on a sea dyke in the district of Cuxhaven (Fig. 9). Other solutions such as mobile fences have also been implemented on river dykes.

Another challenge is presented by hedge banks. They are very common in East Frisia and used to serve as enclosures for pastures and to protect livestock from wind or rain. Authorisation from nature conservation authorities is required if fences need to cross hedge banks, which are of great ecological importance, interacting in many ways with the ecosystems of surrounding landscapes. However, due to their height (up to a metre), they can be used by wolves to jump over fences. To prevent this, either fence lines must be moved inward, which reduces the area available for grazing, or the fence height must be increased (Fig. 10).

Knowledge transfer

The project can be helpful on many levels through direct talks, on-site visits, knowledge transfer and providing contacts. Once a modern, durable and low-maintenance fence has replaced old, dilapidated fencing, word gets around. People from the surrounding area and the wider livestock farming community come to see for themselves. The effects of the project can be observed not only in the field but also in people's minds, as when participating farmers share positive experiences with their community.



Fig. 10. A high electric fence (with wires at 20, 40, 60, 80, 105 and 130 cm plus polywire to increase visibility at 155 and 180 cm above the ground) to deter wolves from using the adjacent hedge bank to jump over (Photo: Peter Schütte).

Farmers typically rely on peer-to-peer learning and are influenced more by each other than by outsiders [19]. Some requests for help can be traced back to recommendations from farmers who were already supported. This is a remarkable recognition of the project's achievements and is a positive signal for the possible coexistence of livestock farming and wolves.

Staff take part in various events such as lectures, discussions, group consultations, practical information days, international conferences and professional expert exchanges (Fig. 11). Information sheets and specialist articles based on the experiences and activities of the project have been published [16,18]. Publications and videos (tutorials, testimonials, etc) on the use and setting up of prevention measures including wolf-deterrent fences and livestock guarding dogs in different contexts and for various types of livestock are available on the project website². In cooperation with farmers and WWF, an information video about livestock protection on sea dykes³ was produced in 2021 and, in 2022, a study on the topic was carried out on behalf of the Federal Agency for Nature Conservation [20].

Conclusions and key messages

Implementation of effective protection measures is key to enabling low-conflict coexistence between livestock farming and wolves. The results of the Herden-

² <https://niedersachsen.nabu.de/tiere-und-pflanzen/aktionen-und-projekte/herdenschutz/31334.html>

³ <https://youtu.be/SVZAVmKssdo>



Fig. 11. Field visit of Wolf Fencing Team Belgium (Photo: Peter Schütte).

schutz Niedersachsen project show that this can be achieved even in areas previously subject to numerous wolf attacks. Each pasture must be considered individually and professional, personalised on-site consultations are essential. Also crucial are fast response times to enquiries as well as networking between farms, authorities, researchers, companies and other organisations (e.g. dyke association, tourism bodies). Combined with practical help, these are indispensable building blocks for overcoming scepticism and resistance to changes that are necessary to protect livestock in the presence of wolves.

The project's fact-based, pragmatic approach and joint efforts of staff, volunteers and farmers create opportunities to forge a long-overdue alliance and constructive dialogue between agriculture and nature conservation. When they overcome their reservations and prejudices, people from different backgrounds and communities can work together, even if they have differences of opinion on some topics directly relevant to the work [19]. By identifying common ground, they can achieve shared goals, protecting livestock from wolves and thereby also wolves themselves. So altogether a higher tolerance for wolves is apparent due to the project's activities [21]. At the same time, the additional effort required to achieve effective protection is apparent and should be recognised by politics and society.

As farmers typically influence each other rather than reacting to pressure from outsiders, the sharing of knowledge and information among livestock farmers is a crucial

goal that, in the case of the Herdenschutz Niedersachsen project, has been consistently achieved. Beyond implementing activities, maintaining them is also imperative because farming communities' trust is dependent upon their ability to rely on the consistency of a given tool year after year [19].

We are currently embarking on another funding period in which existing activities will be continued and new elements added, such as data collection to assess effectiveness and develop recommendations for the operation and further development of practical and effective protection measures. The diversity of conditions across Lower Saxony makes the Herdenschutz Niedersachsen project experience exemplary for many other federal states and regions, especially in areas where wolf recolonisation is only just beginning.

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