

# Predator-Safe Electric Fences for Equines



### Thematic area:

Environmental Sustainability.

**Priority:** How to improve biodiversity while maintaining equine activities?

**Need:** Predation risk management: How can we preserve these species (wolves, bears, lynx)?

**Solution EU number:** BD-08.

### Content of the solution:

Electrified fixed or mobile fences with specific configurations and maintenance practices can be used to effectively protect horse livestock from large carnivores.

### Key Contacts:

- Biodiversity or governmental organisation, electric fence sellers, agricultural chambers.

## Reasons for Implementing the Solution

Adding an electrified fence or several strands to the pasture fence acts as a deterrent against large predators. This increases the safety of the horses by making it more difficult for predators to enter and reducing the risk of attacks. Mobile electric fences are particularly advantageous as they can be easily adapted to suit the grazing area and the movements of the herd. This means protection can be optimised as required and adapted to changing conditions.

## Description of Solution Strategies

An effective protective fence for horse pastures must ensure the safety of the animals while also warding off predators such as wolves. The recommended height of the fence varies depending on the country and requirements, but is usually at least 120 cm. In regions with a high wolf population, a height of between 150 and 180 cm is recommended to prevent jumping over.

To prevent undermining, the lowest wire should be positioned no more than 20 cm above the ground. An effective deterrent is a voltage of between 5,000 and 10,000 volts, which can be provided by a powerful pasture fence with an output of between 2 and 7 joules. Highly visible white or blue bands should be attached to the top edge to help animals see it more easily.

A possible conflict of objectives arises from the fact that wolf-repellent fences require additional live wires at the bottom, which could injure horses. To minimise this risk, there should be a minimum horizontal distance between the wires of the horse fence and those used to repel wolves. Alternatively, as with the 'North German variant', all electric wires can be mounted directly on top of each other on the inside. However, only current-carrying, plastic-coated wires should be used up to 80 cm to avoid injury from direct contact with metal wires.

Regular maintenance is essential. Vegetation must be removed to prevent voltage loss, and the wires should be regularly inspected for tension and stability. The fence will only function properly if

it has reliable earthing with several earthing rods and if the electrical components are protected from the weather.

Semi-mobile five-wire fences are a suitable solution for temporary protective measures. In many countries, electrified nets cannot be used as the sole horse fence as they pose a risk of injury. For larger areas, a roll-up system can make handling mobile fence elements easier.

As requirements for wolf-repellent fences vary across the EU, country-specific regulations should always be taken into account.

### Implementation Steps

#### 1. Advice and planning:

- Obtain advice: Consult experts such as the Chamber of Agriculture, biodiversity organisation, wolf experts or specialized fence construction traders.
- Obtain quotes: Compare quotes for fencing materials and energisers to select the best solution.
- Check for subsidies: Find out about possible funding or subsidies for the construction of protection measures (e.g. EU or state programmes).
- Analyse the farm layout: Identify vulnerable areas of the pasture that require special protection, such as open areas or places with a large population.

#### 2. Fence planning and design:

- Determine fence height and structure: Decide on the optimum fence height (at least 120 cm) and placement of the wires.
- Determine the position of the anchors: Plan where to install the fence posts or anchors will be installed to ensure a stable structure.
- Spacing of fence ladders: Ensure there is sufficient horizontal space between the fence ladders for horses and those for wolf control.

#### 3. Fence installation:

- Fence construction: Set up the fence posts and attach the wires (the lower wire should be set at a maximum height of 20 cm above the ground and should point outwards)
- Additional protective measures: If necessary, secure the fence with an additional protection mechanism, such as extra mesh panels or a mobile fencing system.

#### 4. Electrification of the fence:

- Connect energiser: Ensure the energizer is correctly connected to the fence (2-7 joules).
- Check the power supply: Ensure the voltage is between 5000 to 7000 volts.

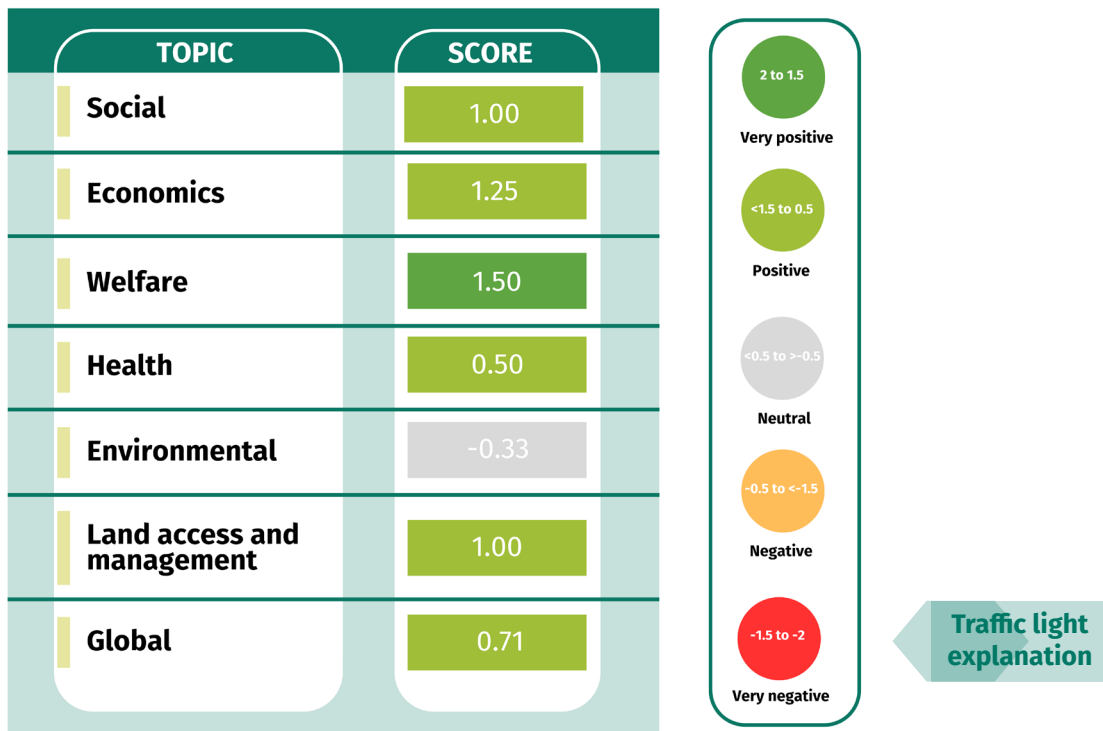
#### 5. Anchoring and securing:

- Anchor the fence: Secure it in the ground using U-shaped iron rods or anchor bolts.
- Fill gaps: Close any gaps under the fence using mesh or concrete mulch.

### 6. Regular maintenance:

- Remove vegetation: To prevent loss of tension, keep the area around the fence clear at all times.
- Check the wires: Check for tension and strength.
- Test the tension: Regularly check the fence's functionality with a tester.

### How Will this Solution Impact the Performance of your Farm?



**Socioeconomics:** This solution will support the socioeconomic performance of your farm by reducing predation effectively, which makes herd monitoring easier and can increase profitability. However, its effectiveness depends on predator pressure and initial predation rates. While it improves working conditions, it requires regular maintenance to prevent power loss, which leads to additional electricity costs. Further considerations are required if the land is rented. In some countries, installing electric fences is a prerequisite for compensation schemes. Their relevance also depends on national regulations and local predator activity.

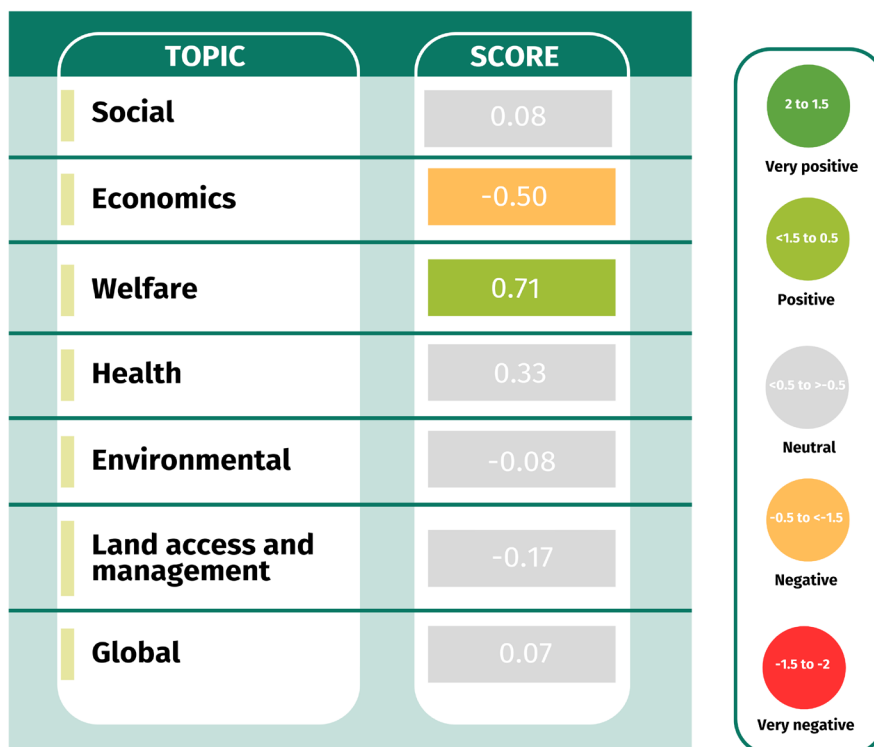


**Health & Welfare:** This solution will protect horses from injuries and fatalities caused by predation. It also allows horses to be pastured in groups in regions prone to predator attacks. Therefore, compared to keeping horses in a stable, this solution contributes to their positive emotional state during grazing. Therefore, this solution can ensure the health and welfare of horses.



**Environmental Sustainability:** This solution has a positive effect on grassland management performance. However, it does not affect the farm's performance in terms of environmental sustainability. However, it does consume some energy.

### How Will this Solution Impact the Resilience of your Farm?



**Socioeconomics:** This solution will not have a direct or even slight negative effect on the farm's socioeconomic resilience when facing external challenges. While it provides better protection for horses and reduces human labour, it also requires significant maintenance and increases energy consumption. Although solar batteries can mitigate electricity costs, the overall expense remains high. The wider use of grasslands is a benefit, but the balance between reduced labour requirements and increased costs may result in a neutral or slightly negative score. However, the relevance of this solution depends on predator pressure and the country's context: if predation is high, the benefits could outweigh the costs, making it a valuable investment.



**Health & Welfare:** This solution will help farms exposed to attacks by predators to recover from health challenges, as it ensures good health and prevents injuries and mortality. With this solution, the farm will be more resistant to challenges in the welfare area, but not in the health area, as it ensures outdoor locomotor and social activities for horses.



**Environmental Sustainability:** This solution will not directly affect the farm’s ability to recover from environmental or grassland management challenges. It was noted that it uses electricity; on the other hand, solar panels can reduce the energy use.

### How Can this Solution Help your Farm to Face Specific External Challenges to be More Resilient?

CHALLENGES	SCORE
Inflation	0.13
Pandemic	-0.25
High welfare standards	0.21
High infectious diseases	0.13
Extreme weather event	-0.54
Loss or limited access to grassland	0.88

2 to 1.5  
Very positive

<1.5 to 0.5  
Positive

<0.5 to >0.5  
Neutral

-0.5 to <-1.5  
Negative

-1.5 to -2  
Very negative



**Inflation & Social Crises:** This solution will reduce the farm’s global performance in the face of inflation because it increases energy costs, which can pose a particular challenge during periods of rising prices. Although it reduces the need for human labour, the high overall costs may offset this benefit, making the farm more vulnerable to financial pressure. However, this solution will support the farm’s performance during a pandemic because it enables the continued use of paddocks even with a reduced workforce. Although there is less human control over horse activities, the system helps maintain operations with fewer workers.



**Welfare & Diseases:** Although this solution may not directly impact the provision of good welfare conditions if higher welfare standards are implemented, it may contribute to ensuring them, even in areas at increased risk of predation. However, it will not protect the farm against the consequences of an infectious disease outbreak, such as pain, mortality, and increased drug use.



**Climate Change & Access to Land:** This solution negatively affects the performance of farms if they face abnormally high or low temperatures, drought, excessive rainfall or strong winds.

## Cost-benefit Analysis

### Costs

#### Socioeconomics:

##### • **Installation Costs:**

- Fence materials: cost of the fence mesh, wires, energizers, stakes and anchoring.
- Labor costs: Wages for installing the fence (including erection and electrification).
- Additional equipment: Cost of accessories such as insulators, tensioners and vision strips.
- 3 to 10 euros per linear meter.

##### • **Maintenance Costs:**

- Maintenance labour: time and labour for regular inspections, repairs and vegetation maintenance.
- Energy consumption: Electricity costs for operating the fence (depending on the voltage and the area of fenced pasture).
- Material replenishment: Costs for spare parts such as wires, insulators and energizer components.
- Electricity: Ongoing costs for operating the fence, especially if the system has a high energy consumption.

##### • **Costs for Leased Areas:**

- Lease agreements: If the land is leased, the cost of installing and maintaining the fence could be allocated to the lessee or owner.
- Restrictions on use: Potential restrictions imposed by the lease, e.g. if the fence is of little use to the leaseholder or is not maintained.

#### Health & Welfare:

##### • **Risk of Injury from the Fence:**

Entanglement in wires: Especially with improperly maintained fences or improper installation, horses can get caught in the wires or wire connections, which can lead to injury.

### Benefits



- Reduces mental stress caused by predation: The fence provides effective protection against predators, which increases the feeling of security and thus reduces stress for farmers and horse owners.
- Condition for compensation claims in some countries: In some countries, farmers can receive compensation for losses caused by predators if they took appropriate protective measures, such as wolf-proof fencing. This can reduce the economic loss in the event of predation.
- Economic profitability through long-term savings: A secure fence protects horses from predators, resulting in fewer losses from attacks and therefore increasing the profitability of the farm in the long term.



- Allows horses to be turned out, event at night (in some countries, there could be no compensation for horse loss due to predator attack at night time if horses are outside): Horses can graze day and night.
- Reduction of greenhouse gas

### Cost-benefit Analysis

#### Costs

- **Possible Ineffectiveness Against Wolves:**
  - Fence circumvention by animals: Wolves can learn to avoid the fences, leading to possible ineffectiveness of the system.
- **Strange Animals at the Fence:**
  - Proximity to predators: If the fence is meant to ward off predators (such as wolves), these animals can still come close to the fence and cause the horses to panic, even if there is no immediate danger. This can cause stress and lead to health problems.

#### Environmental Sustainability:

- **Reduction of Wildlife Routes:** Obstruction of natural wildlife movements: The fence could result in wildlife no longer being able to use their usual migration and hunting routes, resulting in detour. This can potentially affect the local wildlife population.
- **Energy-Consumption**

#### Cooperation Between Farms:

- **Time Required for Coordination:** effort and resources required to coordinate between different farms to ensure effective implementation and maintenance of the fence.
- **Coordination of Maintenance Cycles:** When multiple farms are involved, it requires additional time and organization to coordinate the maintenance and control of the fence across larger areas.

#### Benefits

- **Lower mortality and injury rates:** Protection from predators reduces the number of deaths and injuries in horses, resulting in better health and lower economic losses.
- **Potential Use of Solar Energy:** Using solar energy to power the fence reduces dependence on fossil fuels and minimizes environmental impact, ensuring a more sustainable energy supply.
- **Installation and Maintenance:** Shared expenses for installing and maintaining electric fences, including labour and materials.
- **Electricity Consumption:** Collective electricity costs for powering the fences.
- **Reduced Individual Costs:** Lower individual expenses due to shared costs for installation, maintenance, and electricity.
- **Strengthening:** Fostering a sense of community and cooperation among neighbouring farms, leading to better resource management and support.



### Additional Resources

#### Websites

- <https://www.lfl.bayern.de/itz/herdenschutz/243881/>
- <https://www.praxis-agrar.de/bundeszentrum-weidetiere-wolf/herdenschutz/herdenschutzzaeune>
- <https://www.landwirtschaftskammer.de/landwirtschaft/tierproduktion/herdenschutz/zaun-pferde.htm>
- <https://www.dlg.org/mediacenter/dlg-merkblaetter/dlg-merkblatt-455-herdenschutz-gegen-den-wolf>
- <https://intelligenter-herdenschutz.de/>
- [https://niedersachsen.nabu.de/imperia/md/content/niedersachsen/flyer\\_pferd.pdf](https://niedersachsen.nabu.de/imperia/md/content/niedersachsen/flyer_pferd.pdf)

#### Publications

- AGRIDEA: Pilotprojekt zum Verhalten von Wölfen gegenüber Zäunen in der Landwirtschaft. [https://www.protectiondestroupeaux.ch/fileadmin/doc/Berichte/Studien/Schlussbericht\\_WolfZaun\\_DE\\_8.9.16\\_final.pdf](https://www.protectiondestroupeaux.ch/fileadmin/doc/Berichte/Studien/Schlussbericht_WolfZaun_DE_8.9.16_final.pdf)
- LIFEstockProtect: Current study: Wildlife permeability of wolf-repellent electric fences <https://lifestockprotect.info/en/current-study-wildlife-permeability-of-wolf-repellent-electric-fences/>
- pdf in German: [https://lifestockprotect.info/aktuelle-studie-wilddurchlaessigkeit-wolfsabweisender-elektrofestzaeune/#flipbook-df\\_36774/3/](https://lifestockprotect.info/aktuelle-studie-wilddurchlaessigkeit-wolfsabweisender-elektrofestzaeune/#flipbook-df_36774/3/)
- Smith, Tom & Gookin, John & Hopkins, Bryan & Thompson, S.H.. (2018). Portable Electric Fencing for Bear Deterrence and Conservation. Human-Wildlife Interactions. 12. 309-321. 10.26077/h9sw-qg28.
- Schuette, P. & Nolte, T. (2023). Wildlife permeability of wolf-deterrent permanent electric fences. 26. [https://www.researchgate.net/publication/374156782\\_WILDLIFE\\_PERMEABILITY\\_OF\\_WOLF-DETERRENT\\_PERMANENT\\_ELECTRIC\\_FENCES](https://www.researchgate.net/publication/374156782_WILDLIFE_PERMEABILITY_OF_WOLF-DETERRENT_PERMANENT_ELECTRIC_FENCES)
- Schuette, P. (2021): Wolf-deterrent fencing for horses: best practice in Lower Saxony. [https://cdpnews.net/wp-content/uploads/2023/11/cdpnews\\_schuette\\_2021.pdf](https://cdpnews.net/wp-content/uploads/2023/11/cdpnews_schuette_2021.pdf)

#### Model Companies

- <https://www.ako-agrar.com/fr/protection-contre-animaux-sauvages/defense-contre-loup/clotures-filets/cloture-combinee>
- <https://www.cloture.pro/information-fournisseur-clotures/generalites-de-cloture-electrique/cloture-contre-les-loups/>
- <https://lacme.com/lacme/agriculture-elevage/cloture-electrique/protections-d-espaces-cultures-patures-golfs/loups/>
- [https://www.patura.com/fr\\_CH/instructions/cloture-electrique-informations-de-base/la-cloture-electrique](https://www.patura.com/fr_CH/instructions/cloture-electrique-informations-de-base/la-cloture-electrique)
- <https://www.podazaun.de/blog/wolfschutzzaeune/schuetzen-sie-ihre-tiere-vor-woelfen/>
- <https://www.weidezaun.info/info/ratgeber/wolfszaun>

## Ideas to Animate a Workshop About the Solution

- Ask a company specialising in farm electrification or animal husbandry to sponsor the workshop.
- Find a model farm where the workshop can take place.
- Complete the following tasks and let the participants take part in these demonstration tasks.

## Proposed structure for the workshop on electric fences for better predatory management in equine farms

### 1. Introduction to Electric Fences

- What are predator safe electric fences?
- Key features and components of electric fences (e.g., materials, quality).
- Types of electric fences available on the market (e.g., fixed, mobile).

### 2. Benefits of predator save electric fences in equine farms

- Reduced mental strain of worrying about the horse's protection.
- Reduced dangers from carnivores for horses, e.g. lower injury rate.
- Enhances protection: effective deterrent against all predators (dogs, wolves, bears, ...).

### 3. Practical applications on equine farms

- Individual adjustment of the fence height and wire placement to address farms needs and options

### 4. How to choose the most suitable fencing

- Evaluation of the needs of the farm.
- Assessment of the structural requirements.
- Features such as material, construction and methods.
- Price comparisons.

### 5. Hands-On Demonstration

- Live demo of the building of an electric fence system.
- Have a predator expert invited who checks the fencing and explains on the model in the field again how this is effectively working against predators.
- Proper techniques of fence control for maximising efficiency and reducing wear on the equipment.

### 6. Maintenance and troubleshooting

- Cleaning and care of modules and parts such as wires, insulators, and energisers.
- How to control vegetation around the fence and check for potential trouble causes for the fence.
- Readjustment and regular inspection.



### **7. Case studies and real-world examples**

- Examples of farms or equestrian centres using predator safe electric fences.
- Discussion of how they experience the fences and the effectiveness of them.
- Lessons learned and tips from farm operators using this electric fence building.

### **8. Cost Analysis and Return on Investment (ROI)**

- Initial cost of electric fences vs. long-term savings in veterinary costs, and potential European subsidies.

### **9. Q&A Session**

- Open floor for participants to ask questions about specific concerns or experiences.
- Address any uncertainties regarding the effectiveness or cost of electric fences.

### **10. Wrap-Up and Resources**

- Summary of key points covered in the workshop.
- Additional resources for further learning (websites, suppliers, online communities).
- How to access special discounts or offers on electric fences if partnered with suppliers.