



Invisible lines

Virtual fencing trials are being conducted by the National Parks & Wildlife Service, **TEAGASC** and IT Sligo.

Various strategies to limit cattle movement either in or out of a specific land area have evolved over the years, from human supervision to wood, stone, and wire and electric fences. Now, the virtual fence is a reality. The concept involves remote mapping, GPS sensors and wireless technologies to keep animals in certain areas and out of others. The animals have a GPS collar fitted and the perimeter of the grazing area is defined by geo-co-ordinates, which can be drawn on a phone or tablet screen using the associated app. As an animal approaches the pre-virtual perimeter, the GPS collar emits an audio cue. As the animal progresses, the audio warning will increase, and if they persist, the animal will receive an electrical pulse as they cross the perimeter fence co-ordinates. This is the learning or training process for the animal, i.e., the link of the audible cue(s) to the electric pulse, such that once they experience the audible cue, the animal would be deterred from continuing to or through the perimeter. The development and uptake of this device has been slow up to recent times due to the challenging nature of the technology. However, there is now significant interest in virtual fencing (VF) systems for controlling grazing management and animal movement, including here in Ireland.

Pioneering study

Since summer 2020, the Agri-Ecology Unit of the National Parks &

Wildlife Service (NPWS) and three farmers have been progressing Ireland's first VF studies on commercial farms, assisted by Teagasc, IT Sligo and Michael Martyn, Agri-Environmental Consultants. The collars were supplied by Nofence in Norway. These conservation grazing trials using innovative technologies are being undertaken on three farms participating in the NPWS Farm Plan Scheme. Rigorous, real-time animal behaviour monitoring will take place over the three years of the study, while habitat condition and farmer feedback will also be evaluated. The trials are undertaken on upland scenarios, with a view to managing important habitats and safeguarding peat soils, which in turn are important for carbon sequestration, water and biodiversity.

It is hoped that if proven successful, this could herald a new era and opportunities for the management of these important sites and other areas of environmental interest. There will likely be other wide-ranging uses for the technology elsewhere, but these initial steps are vital to inform the strengths, weaknesses, opportunities and threats in an Irish farming context. One of the primary objectives of the project is to undertake a feasibility study, to break new ground for other parties who may be interested in adopting this cutting-edge approach. There is a lot to learn and the technology should not be considered as a gadget to be used out of the box, without very careful consideration and planning.



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Animal welfare

It is absolutely necessary that assurance can be given that this technology is consistent with animal welfare principles and codes of practice; therefore, stringent animal welfare regulations must be satisfied. It is crucially important that this technology is deployed and tested within a research framework with ethical approval and guidelines, together with appropriate monitoring of the technology and animal behaviour over time. By doing so, this project will provide real-life scenario testing in an Irish context to inform the approach for future roll-out. Apart from environmental management, the envisaged benefits of VF include improved lifestyle of livestock managers, due to a reduced requirement for manual labour (time and cost) and the peace of mind of knowing where animals are at any time. In summary, this virtual fence concept is now being pioneered by this research group in Ireland, with a view to evaluating:

- effectiveness in maintaining cattle in location as desired;
- applicability in delivering quality environmental goods, including biodiversity, water, and soils;
- how it works for the animals; and,
- how it works for the farmers.

The group will provide a detailed report after the three years of study, but will continue to provide updates as relevant and useful, as

this is an emerging and innovative approach to farming in the 21st century. Further information can be found at: <https://npws.ie/research-projects/agri-ecology-research>.

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