

Virtual Fence Systems for Managing Livestock



Photo credit: NoFence

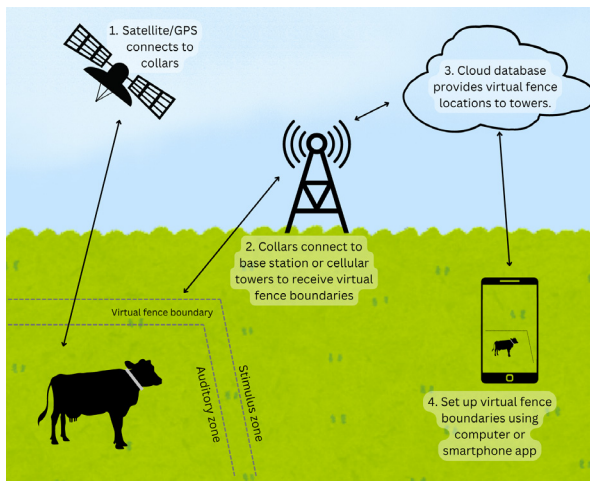
What is a Virtual Fence System?

Virtual fence systems are useful where increased control of livestock grazing (location, and time) is desired.

The system typically consists of three main components: A base station/tower, a battery operated collar worn by the animal, and a computer or other device (tablet or smart phone) that is used to draw the virtual fence boundaries.

Virtual fence systems may decrease labor requirements for locating livestock, moving herds to different grazing areas, or building and repairing physical fences.

Virtual fencing is covered under NRCS Conservation Practices 382 (Fence) and 582 (Prescribed Grazing)



How does it work?

Animals are fitted with a battery operated collar that communicates with a base station.

Fence locations are determined by the operator using smartphone, tablet, or computer software to digitally draw virtual fence lines on an image of the landscape.

Fence locations are communicated to each collar and these locations are retained by each collar until it is next updated. This allows the virtual fence system to work (using GPS) even if the network is offline or unreachable. The precision of this location is dependent on many factors (typically between 10 and 35 feet).

Collars will emit sounds as the animal approaches the virtual fence boundary. These sounds are designed to get the animal's attention and, with appropriate training, cause the animal to turn away from the virtual fence boundary.

If the animal continues to approach the virtual fence boundary, an electrical stimulus is given to the animal through the collar. This stimulus is designed to cause the animal to turn away from the boundary. If the animal does pass through the virtual fence boundary, the system will allow the animal to return to the grazing area without experiencing additional stimulus.

The battery charge will last from several weeks to months, depending on the demand on the battery from encounters with virtual fence boundaries and how often the collar communicates with the GPS system and rancher's computer.

More Information

The following website has useful information including videos and frequently asked questions:

<https://rangelandsgateway.org/vf>

Producers and landowners should contact the NRCS office at their local USDA Service Center for additional information and one-on-one technical support specific to their working land.

To locate your local NRCS office in Nevada, scan the QR code below to access the office map.



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Who might be interested?

- Stockers
- Cow-calf operators
- Public Land Users

Where can the systems be used?

Virtual fence systems can be applied on all grazed lands (public and private). Areas need to have good connectivity between the collars, the client computer or another device, typically through the cellular network, local area network or other means.

Installation of base stations on BLM or Forest Service land would need to be addressed to their respective local office. A Right of Way may be required which could take some additional time for completion of the necessary paperwork.

Opportunities with Virtual Fence Systems

- Easier to modify than physical fence systems and boundaries can be added or removed.
- Allow more flexibility to adapt to the variable conditions caused by drought, floods, wildfire, or other situations.
- Has the potential to enhance the efficiency of grazing management by controlling the distribution of livestock to ensure the timing, intensity, duration and frequency of grazing is appropriate for the area being grazed.
- Many grazing land management applications for this technology, including rotational grazing, targeted grazing, cover crop or residual aftermath grazing, post fire grazing in unburned areas, protection of riparian, wetland and other sensitive habitats.

Potential Challenges with Virtual Fence Systems

There can be challenges associated with virtual fence systems.

Systems rely on functional technology and collar connectivity. Tree cover and slopes may affect connectivity issues with both GPS and producer's computer.

There are significant upfront costs associated with collars and any necessary base stations and systems require an annual subscription fee. These systems may not be an economically viable option for some livestock producers.

Livestock will need to be trained to respond appropriately to the stimuli provided by the collars, as well as be comfortable wearing the device.

Livestock may need to be handled several times during the grazing season to replace lost collars, replace batteries as needed, or clean devices.

Physical fences will still be needed in some areas. This is especially true at boundaries (to control neighboring livestock or avoid highways) or around hazardous areas.

Virtual fence systems will not contain 100% of the herd 100% of the time, **complete exclusion** of livestock from a specific area may not be possible with virtual fence.

Clients will need to ensure that the technology will enable them to meet their grazing management objectives (economic and ecological).



A virtual fencing collar. Credit: Morgan Lawrence, USDA

