



FOLLOW THE HERD

WHETHER TRACKING ROAMING SHEEP AND CATTLE OR MONITORING REMOTE FEEDING STATIONS, SATELLITES ARE A FARMER'S BEST FRIEND. CORRY BRENNAN EXPLAINS HOW DEVICES THAT PROVIDE SATELLITE-ENABLED GEOSPATIAL DATA ARE HELPING FARMERS BETTER MANAGE THEIR BUSINESSES

Keeping track of valuable livestock grazing in remote regions is a major challenge for farmers. Losing livestock to predators or through illness during the grazing season not only affects that year's revenue, but can also have a profound effect on the quality of the breeding foundation for future herds for years to come.

Careful breeding and bloodstock management are fundamental to the long-term robustness of any kind of flock or herd. Accurately and dynamically recording the behaviour patterns of grazing animals, including herd movement and food intake, helps farmers to know the important metrics needed to ensure the sustainability of a strong livestock base and a sound agricultural business.

Halvor Mjoen comes from a long line of Norwegian sheep farmers and knows only too well all the things that can go wrong when it comes to safeguarding a flock. His family lost 22% of its sheep flock to predators during the 2009 mountain grazing season.

Determined to find a solution to the enduring problem of how to better track and protect his livestock in a region where there is no mobile phone network, Mjoen hit on the idea of a satellite-based collar that acts as a virtual shepherd, alerting the farmer to potential prob-

lems. The result was the setting up of FindMySheep AS. FindMySheep's tracking collar automatically sends the farmer the location data for each animal on a time- or event-driven basis over Globalstar's second generation mobile satellite network. Following successful, large-scale field trials, FindMySheep started marketing the low-cost collars commercially in time for Norway's 2013 grazing season. Halvor's company sold 3,500 collars in its first season.

Today, incorporating the new sister brand 'FindMyAnimal', more than 21,000 of the company's satellite collars are protecting valuable herds. The sealed collars are robust, light and waterproof, featuring a long-lasting rechargeable lithium ion battery.

Safeguarding free-roaming grazing stock

Farmers can use the solution to geo-fence their livestock – essentially, defining an area in which they want their livestock to graze. A message is sent to the farmer alerting him or her when any animals are close to the edge of this area or if they have managed to escape.

In the north of Norway, as there's no paddock or fenced field for grazing sheep, the animals are let out onto the mountains to roam



FindMyAnimal works using collars attached to the farmer's animals



The FindMyAnimal collar

free. So knowing where they are and if they are okay becomes both paramount and immensely difficult.

When the collars are being configured, the farmer can use GPS coordinates to create a square or rectangular four-sided notional fence. This is literal geo-fencing: building a virtual fence not a physical one.

The collar signals the animal's position at pre-set intervals. However, if the animal escapes past the virtual fence, the farmer can 'ask' the collar to send out alerts with new GPS co-ordinates every few minutes until the animal is found.

This functionality is also being used by reindeer farmers in Norway to keep their animals from straying onto railway lines.

Intelligence in the chipset

The chipset that's embedded in the collar sends a signal to one of 32 orbiting satellites. These are fully secure short burst data messages, sent in nine-byte chunks using the Globalstar satellite network and a network of ground-based satellite gateways. The signals are in turn delivered to the FindMySheep platform through Globalstar's private data network for access by and distribution to FindMySheep customers.

The messages typically contain a GPS position, taken from the in-built GPS chip. With

some additional adaptations to the system, the signal can also be configured to convey additional information, such as temperature. The tracking platform developed by Halvor can then build up a full picture of position and preferred grazing areas, identify sheep that have been in the same position for a long time, sheep which have strayed too far and so on, all of which are vital tools for the farmer.

The signal can also be delivered through a normal laptop or computer interface, or by an app available on a smartphone, depending on whether a farm has access to fixed Wi-Fi or only to a mobile phone network. The system can then display individual information, maps or views of the herd.

User-friendly and scalable 'virtual shepherd'

Alternatively, a farmer can ask for text message alerts, tailored to his or her needs. A large industrial farm is likely to have someone whose full-time responsibility is to monitor the herd virtually; a smaller-scale farmer, on the other hand, would probably use smartphone app access. The business model works to scale, whether for the farmer with 200 head of sheep or the large operator who's got 5,000 head.

Over time, the FindMyAnimal system can also provide useful information based on tracking and analysis of patterns of where the animals that produced the best quality meat were grazing. The result could be the delivery of invaluable information and insight that can be used to determine the best grazing areas for future seasons. The farmer can also watch an animated video which shows where each sheep has moved on a map.

A farmer activates the collars in a similar way to a SIM card in a mobile phone. Once activated, the collars can be set up on a private web page, to send a pre-set number of messages per day; for example, at the start of the grazing season, this might be set to one daily message, while at the end of the season, when the sheep are being herded back to

lower grazing fields, a higher frequency of messages can be scheduled.

The data collected shows the time-stamped latitude and longitude of each sheep and the remaining battery life of the unit.

The FindMyAnimal system can also be used to detect abnormal behaviour. For example, it can be set up to alert the farmer if a sheep or cow has moved more than usual – which might signal that the animal has been scared off by a predator or is struggling to find grass. Someone can then go and check on the animal. This helps ensure that an animal in peril is seen to promptly, and saves time as farm employees are spared from patrolling paddocks or hillsides unnecessarily.

The financial realities of farming in today's competitive environment mean that a farmer must maximise efficiencies while protecting valuable livestock in order to survive. So while we may no longer find shepherds wandering the mountains in the Pennines or the Pyrenees, it's clear that affordable and effective satellite technology can now fill this valuable role.

THE FARMER CAN ALSO WATCH AN ANIMATED VIDEO WHICH SHOWS WHERE EACH SHEEP HAS MOVED ON A MAP

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The chipset next to a US quarter