

Listening in on nature



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GEORGE CATERER

AI-driven wildlife sensors are helping growers to quantify on-farm biodiversity and evidence positive landscape-level changes. *CPM* learns more about Wilder Sensing.

By Janine Adamson

With increasing onus on what agriculture can deliver for nature, quantifying the true benefits of environmentally-focused actions could soon become a part of daily farm business for UK growers.

And rather than manual surveys by ecologists, a solution for continuous data capture and interpretation now exists, meaning full-scale biodiversity monitoring is just a few sensors away from becoming reality.

“Growers are fully accustomed to collecting data across the farm, yet until now, biodiversity has found itself

left behind, or isn’t regularly updated,” comments Wilder Sensing’s George Caterer. “But by utilising bioacoustic technology, we can begin to understand what’s happening at a landscape-level, evidence biodiversity and measure the impact of specific actions,” he adds.

The concept began four years ago as a post-lockdown notion, recalls George. “The goal was to find a way to quantify biodiversity and improve data capture as interest was increasing in monetisation, similar to carbon credits.

“This meant finding an appropriate, accurate, scalable technology that



Providing evidence

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Missing link

According to agronomist Todd Jex, unlike something like soil sampling, the industry isn't very good at capturing biodiversity.

could deliver what we required, which ultimately led us to bioacoustics – using sound technology to record, store and analyse large collections of animal communication data.”

The starting point for this was birds, he adds. “They’re quite an emotive taxa and appeal to much of the general public. They’re also a fantastic reference for the health of an ecosystem because they cover all levels of the food chain.”

Now known as BirdSense, the system is data-based, where growers utilise an off-the-shelf recording device and an SD card. Recordings are then uploaded to the cloud which are interpreted by Wilder Sensing within 48 hours, using AI to identify different species and their activity levels. Growers can then view, explore and download their high-resolution results from the same portal.

Because Wilder Sensing licenses the BirdNET database – an open-source research project developed by Cornell Lab of Ornithology – it can tap into a reliable reference recording for every UK bird species.

George highlights that without AI, it’d be near-on impossible to fully process the recordings. “That’s been the barrier for this type of work so far. But now, because it’s much easier, it’s opened up the opportunity to truly

understand activity levels and compare these across sites or timeframes.”

The technology has continued to develop too, he notes, with the launch of BatSense, which works to similar principles. The team has also recently introduced MothSense, although this is image-based, says George.

“MothSense operates using a solar-powered camera and a UV light to attract species to a base plate. A photograph is taken every two minutes and then similar to our other systems, AI analyses the data for automated identification of around 275 macro moth species.

“While they’re often downplayed, moths are a nocturnal pollinator and therefore have the potential to be an important species for arable growers.”

Critically, by utilising all three systems, it’s possible to assess impact cross-taxa, raises George. “For example, we can measure how moth populations may impact bird life, and so on. To look at this in more detail, we’re launching the collaborative WildSense pilot project this summer, which will run across seven UK sites.

“The overall goal is to support growers to increase their awareness of the services that nature may be providing,” he urges.

Agrii agronomist and Agri-TechE Ambassador, Todd Jex, has been exploring Wilder Sensing’s technology on one of his customer’s farms. He says the aim was to use recorded bird song to quantify biodiversity across two contrasting farming systems.

With a mix of regenerative and conventional tillage systems at Barton Farm in Dorset, this provided an ideal opportunity to gather comparative data, says grower, Oli Harris.

“Originally, we adopted no-till regenerative farming practices for financial reasons to scale up the business. Contractors were doing much of the work, and it was a way to bring all operations back on the farm and take control of arable production.

“Very quickly, it became a passion to see the environmental benefits the new system was having,” he explains.

Overseen by Todd, two recording devices were set up at the farm for a six-day trial, tallying around 20,000 bird calls. Looking at the data in more detail, the conventional field was

dominated by corvid and generalist urban birds, while at the regenerative field, there were more insectivorous and seed-eating birds. George highlights that one of the starkest comparisons was between skylark calls: the regen location had more than 4000 while the conventional had just 11.

Commenting on the monitoring, Todd says recording baseline data is a critical first step. “You require the baseline at the point of change to see what’s happening for good or bad. You can then make appropriate recommendations if things aren’t evolving the way we want them to,” he explains.

“The soil analysis we do is very in-depth; but biodiversity is the part we aren’t very good at capturing at the moment, and it’s such a massive part of it.”

Having conducted the trial, Oli says it’s reaffirming to see they’re doing the right things. “We’re tenant farmers and our landowners are keen to see us improve the environment. This data puts us in very good standing with them – it’s a great way to demonstrate that we farm sensitively to the environment,” he comments.

The trial at Oli’s farm was originally instigated by Agri-TechE. Director Belinda Clarke says they’re delighted with the success of the collaboration. “This kind of collaboration is what Agri-TechE is all about – bringing people

together to test and develop new technology in real world situations.

“It’s discussed at our events time and time again how researchers

and tech developers don’t have enough opportunities to apply their research or technology on farms. On the flip side, farmers are reluctant to give up their valuable time to beta-test something that may not have a value to them yet.”

As for the investment required to install Wilder Sensing technology, each system operates through an initial hardware cost from £150 per device, plus an annual subscription fee. George says he hopes by providing accessible technology, more growers will engage with biodiversity monitoring.

“However, this isn’t to replace traditional methods, it’s about supplementing existing ecological monitoring to empower growers and agronomists with actionable insights.” ●

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Private network project update

Trials continue at Overbury Enterprises to understand how best to serve the farm with cost-effective, reliable connectivity

While a government-funded project that aimed to showcase the benefits of 5G private networks in agriculture has concluded, the work continues, to understand alternative connectivity options.

As reported in May 2025 issue of *CPM*, the original research centred around a collaboration between Virgin Media O2 Business and River Severn Advanced Wireless Innovation Region (RSPAWIR). It involved installing a 4G/5G private network at Cotswolds-based Overbury Enterprises to demonstrate how enhanced connectivity can boost crop production and environmental preservation.

Despite the proof-of-concept project being a technical success, because the work and funding was finite, the private network has since been decommissioned. However, in a bid to maintain the range of IoT devices



Applied research

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CPM first reported on the connectivity project at Overbury in its May 2025 issue.



installed at Overbury, alternatives are now being scoped, explains River Severn Partnership's Matt Smith.

"Once we learned that the maintenance costs from the original project were estimated to be substantial, therefore unviable for most commercial farmers, we wanted to find out whether a similar outcome could be achieved from scaling back, or using alternative sources.

"This led us to working with Virtuser's multi-network sims, which essentially assess all network providers in the local area and then cherry pick the best signal as well as LoRaWAN for some devices."

So far, the results seem promising, suggesting that rather than requiring a full 5G private network of their own, growers can power a range of sensors at various locations with improved consistency, using what already exists. Equally, it's hoped in time, 5G private networks will become more accessible as technology progresses, costs reduce and adoption increases.

Despite further work being required, farm manager Jake Freestone isn't discouraged. He says because so much of the technology is cutting edge, including the sensors that were installed at the farm, it's all still in development phase.

"Unless these technologies are tested on-farm in real-world situations, they'll never be as good as they could be. They have to be trialled in a practical environment, to enable them to move

from the lab to the farm," he comments.

As well as providing the sims required, Virtuser is also developing a cohesive digital dashboard to pull all of the sensor data outputs together. Although this was a key goal for the original project, it wasn't achieved within the timeframe allocated due to external barriers, explains Matt.

"But we can deliver that now at a more commercially-viable price-point by using relatively cheap software options," he adds.

For Jake, some of the sensors deployed during the original project have proven more useful than others. "With four nitrate water sensors now installed we can try to understand the true impact of our farming operation on water quality and pollution, segmenting our contribution from that of wider society's.

"If we are polluting the watercourse, we will know and can quantify that and hopefully rectify it. That's a huge win for us," he explains.

Jake also commends the success of the farm's pest sensors, enhanced weather stations and soil moisture sensors. However, one aspect that wasn't so useful on reflection, was water trough monitoring, he adds.

"But if I can see all of that useful information on one dashboard, then it'll make my life a lot easier day-to-day."

To conclude, Matt adds that the work at Overbury is very much continuing. "We're just being more mindful now of the costs involved."