



*Angus mother cow with a GPS collar grazes above the Salmon Valley in Eastern Idaho. Jay and Chyenne Smith with the J Lazy S Ranch and several other permittees participated in a Virtual Fencing project on BLM and Forest Service lands in a post-fire situation, allowing them to graze the range with precision and avoid burned areas. (photo by Chyenne Smith, courtesy LifeontheRange.org)*

## VIRTUAL FENCING EMERGES AS NEW TOOL FOR MANAGING LIVESTOCK POST-BURN ON RANGELANDS

By Steve Stuebner

New technology for livestock management, called “Virtual Fencing,” is catching on in Idaho and the West.

Virtual Fencing works like an invisible fence for pets but at a much larger scale for livestock management on private, state or federal rangelands.

It’s been particularly helpful for livestock producers in various parts of Idaho after wildfires burn rangelands they depend on for grazing on state or federal lands because they can graze cattle with more precision, using Virtual

Fencing boundaries. Virtual Fencing also can be used to keep livestock out of riparian areas or areas with sensitive endangered species issues.

But there are significant start-up costs involved, and ideally, it takes a team effort between ranchers, state and federal agency officials, technical experts and Virtual Fencing companies to make things work, according to ranchers and agency officials who have used the technology so far.

Jay and Chyenne Smith, who own the J Lazy S Ranch north of Salmon, worked with a research team at the University of Idaho, and range staff

at the Salmon-Challis National Forest and Bureau of Land Management, to set up a Virtual Fencing project on spring, summer and fall range in 2023 and 2024.

The project really shined in allowing the Smiths to graze cattle in the Diamond-Moose Allotment in the Salmon-Challis National Forest immediately following the massive 130,000-acre Moose wildfire.

“After the Moose Fire, the standard Forest Service answer was to stay home for 2-3 years,” said Jay Smith. “We went up there and did a self-survey, in the fall of ‘22, we could see with our own eyes that



Grazing pasture in the Payette National Forest shows how the cattle honored the invisible boundary of the Virtual Fence in the Crooked River area in Hells Canyon. (photo courtesy Andy Bumgarner, Payette National Forest)

approximately 40,000 of the very best acres were unburned or lightly burned. With that much good forage, staying home for 2-3 years did not feel like the right answer to me.”

“So I reached out to the University of Idaho, and I said, hey, maybe this is the right time to negotiate a deal to not leave all that grass on the table.”

Turns out, the University of Idaho was eager to support the Virtual Fencing project. Joel Yelich, a Ph.D. Senior Livestock Researcher at the Nancy M. Cummings Research, Extension and Education Center in Salmon, jumped in with both feet.

“Not only did they have professional staff and knowledge-base to help us get going and manage the Virtual Fences, they had the connections, time and resources to help us apply for grants and get funding. We would not have been able to do this without the University of Idaho,” Smith said.

The Forest Service and Bureau of

Land Management also were helpful by investing in Virtual Fencing base stations to assist in the project. Base stations cost about \$10,000-\$15,000 each.

In the hot, dry summer of 2024, wildfires in multiple parts of Idaho had a major impact on state and federal grazing lands. That caused at least one Idaho ranch family to turn to Virtual Fencing technology to graze livestock around burned areas on BLM lands last fall near King Hill. Several ranchers are looking to use Virtual Fencing to graze areas suitable for grazing post-burn inside the Lava Fire zone in the summer of 2025 near Cascade.

In a similar vein, Payette National Forest range management officials have been working with the OX Ranch to allow grazing in the Crooked River area following the Woodhead Fire in 2020. They set up Virtual Fencing boundaries to protect bull trout in the riparian areas along the Crooked River in Hells Canyon.

“We planned it out in advance and it worked amazingly well. It kept the cows out of the riparian area,” said Andy Bumgarner, range management specialist for the Payette National Forest. “We are super excited about it.”

That said, Virtual Fencing may not work for everyone. Cell tower reception is required for some Virtual Fencing brands such as VENCE – that rules out a number

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## Virtual Fencing | The Next Evolution in Range Management



*Three-way interface system used by the VENCE Virtual Fencing system. A strong cellular signal is needed at the base station (top, middle). Location is key! The base station uses radio frequencies to communicate with GPS collars on livestock. A web interface allows ranchers to draw Virtual Fencing boundaries and get real-time data about cattle locations 24/7.*

of remote areas. The costs for Virtual Fencing base stations can be prohibitive for individual ranch owners to shoulder. But in instances where the Forest Service or BLM can step up to help cover the cost of base stations, that can make projects affordable for producers.

### **Virtual Fencing 101 - How does it work?**

Virtual Fencing systems have three basic components:

- A base station, typically solar powered, in a place where it can receive a strong cellular signal from an existing network.
- Vence GPS collars are placed on livestock, typically, mother cows, assuming that calves will stay with them.
- Grazing boundaries are set with herd-management software.

Once connected, all three components must be able to communicate with each other via

radio frequencies and the Internet.

Then, producers can see where their cattle are located on the range 24/7. They can draw Virtual Fencing boundaries with the software to keep cattle grazing on pastures where they want them. (4-5 days of training in a small pasture with fixed fences are required to get started).

Virtual pastures must have water for livestock; it helps to draw Virtual Fence boundaries around natural geographic features for them to be effective, officials say.

Most of the Virtual Fencing pilot projects that have occurred in Idaho so far are using VENCE base stations, GPS collars (typically rent/lease for \$50 each) and herd-management software.

At the recent Idaho Range Livestock Symposium, sponsored by University of Idaho Extension and the UI Rangeland Center, officials pointed out that there are other Virtual Fence technologies available such

as the eShepherd/Gallager solar-powered system in New Zealand, the Halter solar-powered system (no cell service needed) and NoFence (no tower needed, but cell service needed). The University of Idaho also is working on developing Virtual Fencing technology with ear tags. No GPS collars or cell service are needed for that system, but it's still in its infancy.

### **Rafter T Ranch Virtual Fencing project – BLM land**

In the late summer of 2024, two wildfires occurred south of the Snake River on BLM land near King Hill. The fires burned pastures in two different grazing allotments that the Jarvis family used for fall and winter grazing.

"After those two fires occurred, we were like, great, there went our Plan B and Plan C for fall and winter grazing," said Jessie Jarvis, who with husband, Justin, works on the Rafter T Ranch, owned by her parents

Allen and Kim Thompson. Jarvis spoke at the Idaho Range Livestock Symposium about her family's experience with Virtual Fencing.

It didn't make economic sense to put up miles of temporary solar fence or permanent fence to salvage being able to graze on BLM lands outside of the burned areas, so the Jarvises looked into using Virtual Fence technology for 150 cow-calf pairs, she said.

They were able to borrow a VENCE base station from the BLM, a savings of \$12,500. It took only one base station to cover all of the fall and winter grazing pastures. And then the Jarvises rented the GPS collars for \$40 each, plus the cost of batteries (\$10 each). Total cost was \$9,000, while it would have cost \$24,000 per mile to build permanent fence, or \$26,500 to feed their cattle hay for the winter, she said.

It took them 1.5 hours to put GPS collars on their cattle using a squeeze chute for each one. Then it took 4 days of training in a fixed pasture.

"It was a bit overwhelming to learn at the beginning," Jarvis said. "But if we can do it, anybody can."

Overall, the positives:

- GPS data gave them more data on how, when, and where their cattle graze, allowing them to become better resource managers.
- Virtual Fencing can be a cost-effective option, when compared to fencing or winter feeding.
- Their cows were quick learners when getting trained to respond to a light shock or a tone when reaching the Virtual Fence boundaries.

Negatives included:

- It takes pre-planning and extra time to get the Virtual Fencing system set up (moving cows, moving base



*Virtual Fence base station purchased and built by the Payette National Forest and the OX Ranch for the grazing pilot project. Here the base station is set up above the training pasture near Payette, Idaho. (Courtesy Payette N.F.)*

stations into place, and working with VENCE on tech support.

- Virtual fence pastures do not replace the need for hard fencelines, especially at property boundaries.
- V.F. technology doesn't prevent their collared cattle from mixing with non-collared cattle herds.

### **OX Ranch Crooked River project**

The Payette National Forest worked with the OX Ranch to create Virtual Fencing pastures along four miles of Crooked River to keep 275 cows out of the riparian area to protect bull trout in the stream and bull trout habitat as per U.S. Fish and Wildlife Service guidelines, officials said.

The Crooked River area had been rested for three years following the 100,000-acre Woodhead Fire. It would have taken eight miles of fencing to exclude livestock from the Crooked River. At a cost of \$20,000 per mile, it would have cost \$160,000 to fence off both sides of Crooked River, official said.

The Payette National Forest acquired one VENCE base station with post-fire rehabilitation funds. The OX Ranch rented GPS collars at \$50 each. They trained the cattle with Virtual Fencing technology in a fixed pasture owned

by the OX near Payette.

In the first two months of the project, snow prevented putting the base station high above the Crooked River canyon, so they could not see where the cows were grazing with the web interface. But the Virtual Fence boundaries keep the cows in the right place, they learned later.

After the snow melted, they set up base station above the Crooked River drainage once the snow melted. They created eight different cattle pastures with the VENCE software. "That country coming out of Hells Canyon is pretty darn steep and rugged," Bumgarner said.

When he and the OX ranch manager went out to look to see how it was working, they were amazed to see how well it worked, he said. "We had 96 percent compliance. We'd be looking at the range, and you could see where the cattle respected the Virtual Fencing boundaries and there was no grazing below that point toward the creek. That was amazing to see that."

"So far, it's proven to be successful," said Les Nunn, OX

# THE TRAINING PHASE



## DURATION: 4 DAYS

- Day 1: Make actual fenceline hot
- Day 2: Bring in Vence 10m from hard fence
- Day 3: Introduce warning tones, in addition to Day 2 Vence
- Day 4: Cut field "in half", using Vence

ranch manager, "but we have a lot to learn with the technology, I'd say. We're still seeing it as a pilot project. Also, It would be helpful if the costs came down."

They plan to use the same approach in 2025.

Back to the Smiths in Salmon, they liked knowing where their cattle are located with the GPS collar signals and the VENCE software. Again, the Forest Service and BLM shouldered the costs of acquiring six base stations with federal grants.

"I think it's been really beneficial and almost fun to get to do this and learn about it. It's been a helpful tool, all in all," said Chyenne Smith.

"My wife's happy, my cows are doing good, the range is managed well, the forest and the BLM are happy, and our calf weights are up, and the markets good, how do you do any better than that?" added Jay Smith.

Boise National Forest officials are working to acquire base stations

to assist ranchers who want to graze post-burn on West Mountain and Snowbank Mountain in the aftermath of the 97,585-acre Lava Fire in Fall 2024. The Forest Service is reviewing the burn severity soil maps to determine what areas may be rested or grazed, officials said.

"We will be resting the most severe part of the burn for two years, but the burn severity was lighter in other areas, and Virtual Fencing will be a great fit for those areas," said Matthew Morehead, range management specialist for the Boise National Forest.

They are investigating Virtual Fencing tower locations that will work for producers in the West Mountain Area.

"This is something where we've been watching how it's working elsewhere, and it will help us protect bull trout habitat and other sensitive habitat areas," he said.

Officials with the Valley Soil and

Water Conservation District are interested in Virtual Fencing technology as well. They see possibilities in using Virtual Fencing to keep cattle away from Lake Cascade where they don't have hard fencing to do so. They are looking into grants for the future application of Virtual Fencing technology around the reservoir.

"We are working to do whatever we can to assist our producers in finding grant funding for Virtual Fencing," said Durena Farr, administrator of Valley SWCD. "We will continue to work with NRCS and the Conservation Commission and whoever else can help provide financial or technical assistance."

## Resources for landowners:

- Contact SWC staff nearest you.
- Contact NRCS, BLM and Forest Service range staff nearest you.
- Contact University of Idaho - Livestock Extension specialist nearest you.
- Thadd Strom, Idaho Department of Agriculture Range Program Manager, thadd.strom@isda.idaho.gov, 208-332-8561.
- Life on the Range video on Virtual Fencing: <https://lifeontherange.org>
- Virtual Fence user guide: <https://rangelandsgateway.org/virtual-fence>
- Vence: <https://www.merck-animal-health-usa.com/species/cattle/vence/resources>

Steve Stuebner is a regular contributor to the SWC newsletter.

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