

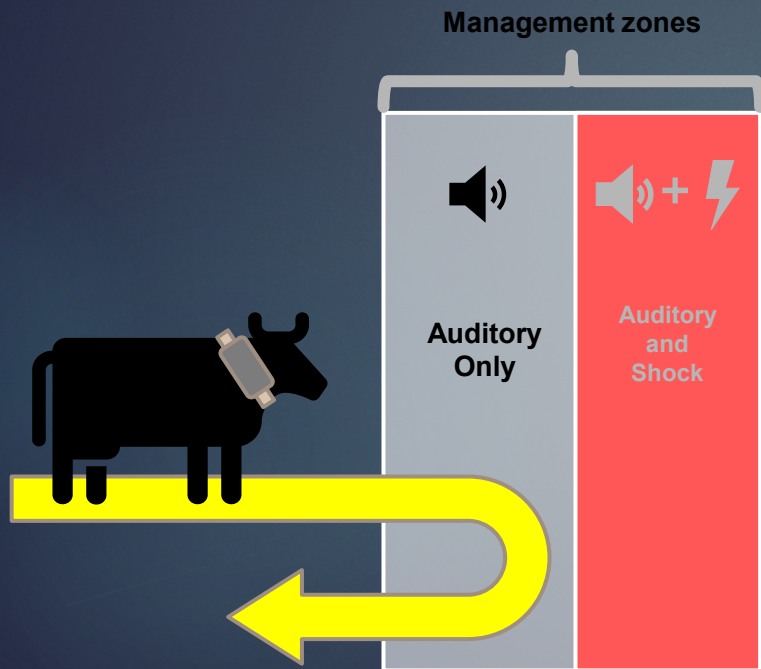
Application for Virtual Fencing

What can you do and how well
does it work...

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University of Arizona,
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Environment



Realistically, how to we accomplish this? Virtual fencing!



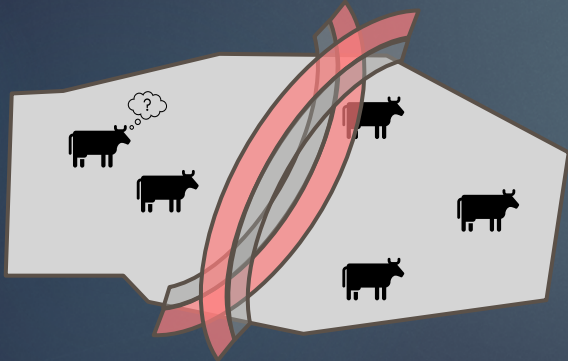
Virtual fencing allow users to plan, schedule, and remotely influence a herd:

- ▶ Controlling where grazing occurs
- ▶ Controlling when virtual fencing pressure is applied

What do I mean by “control”

Spatial Control

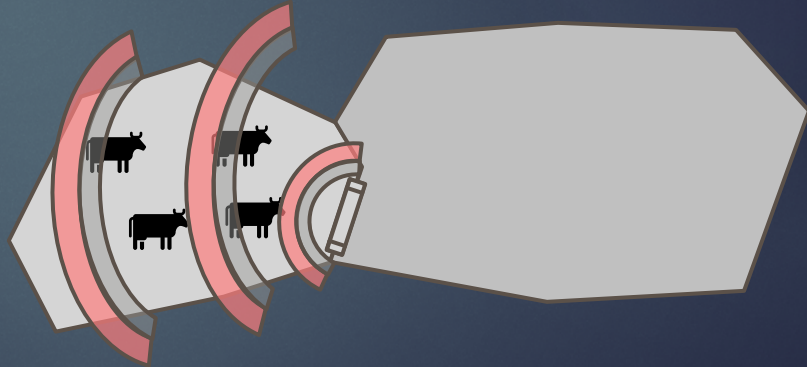
Spatial restriction of grazing within a pasture to better match available forage to forage use



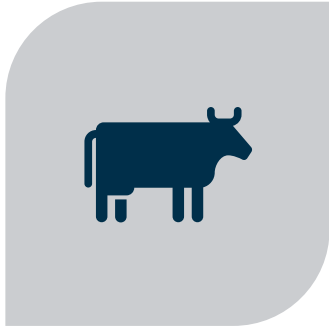
Timing Control

- Precise movement of herd between areas grazing is permitted

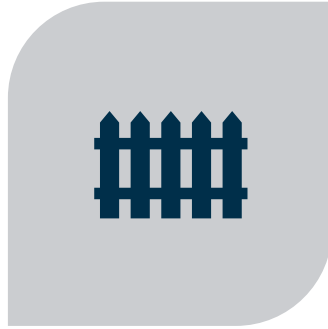
Day 00



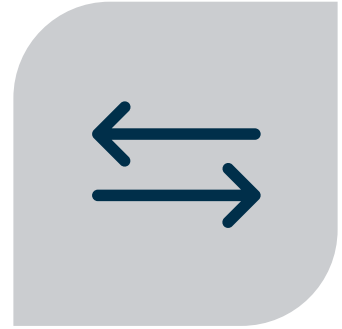
Potential Applications



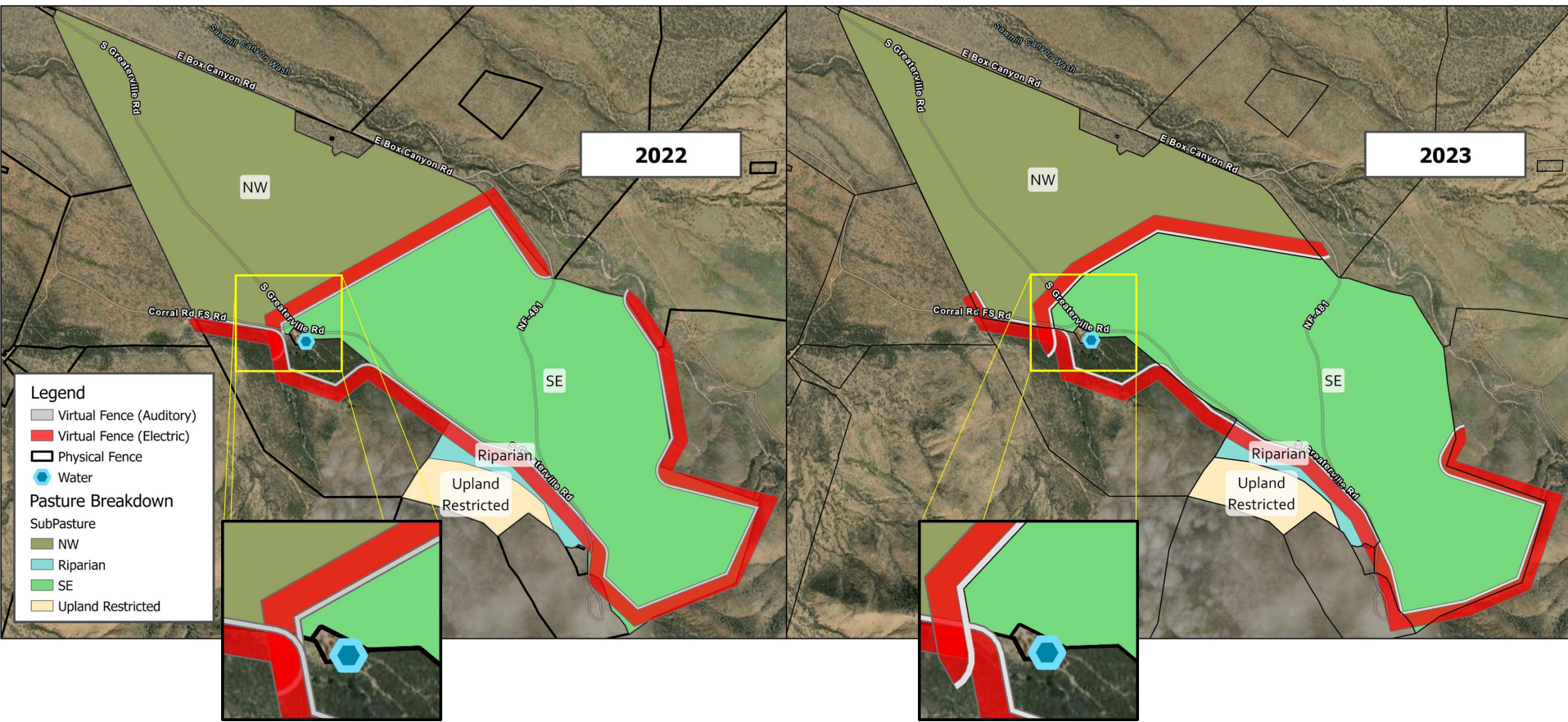
EXCLOSURES



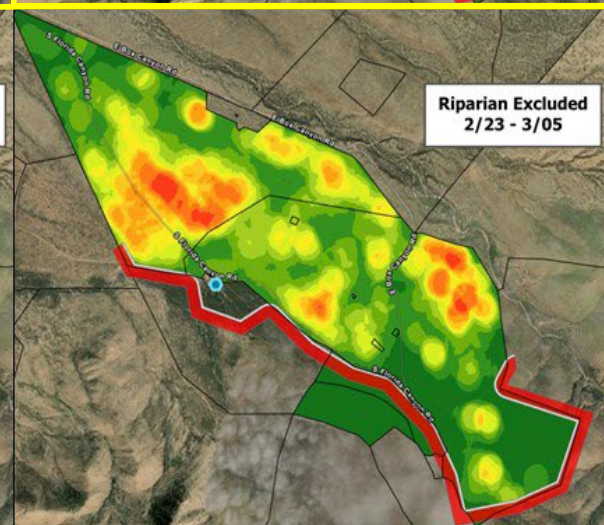
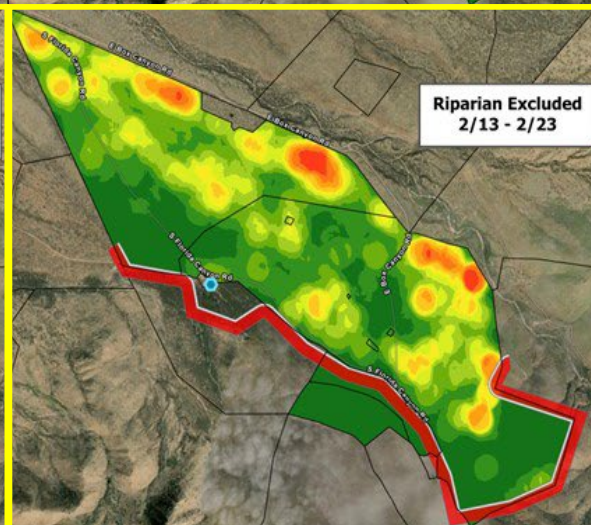
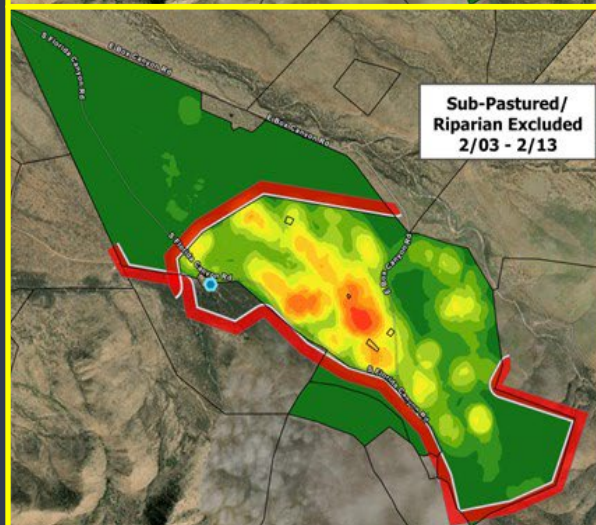
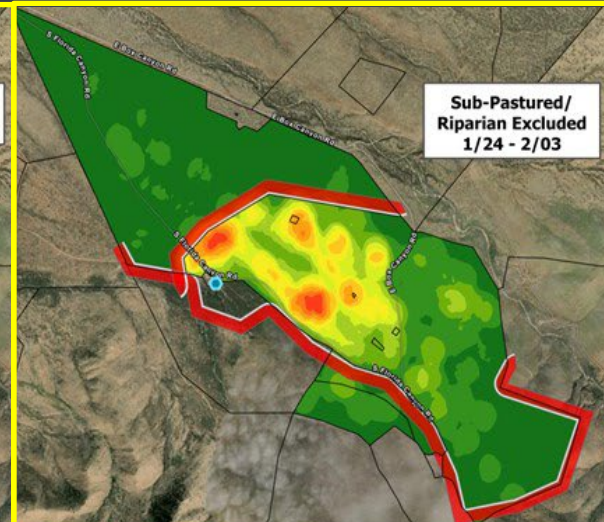
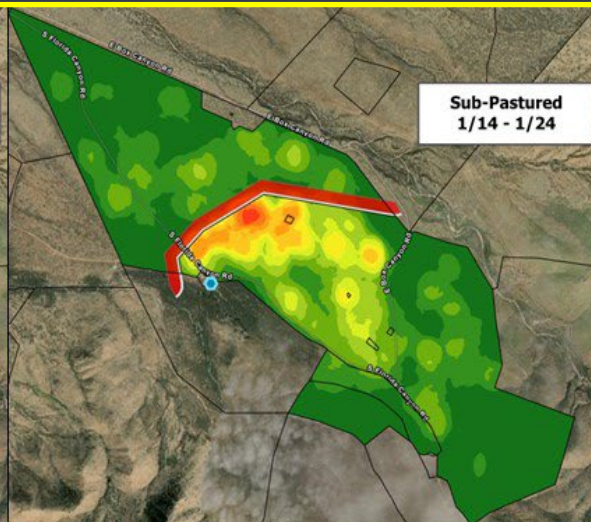
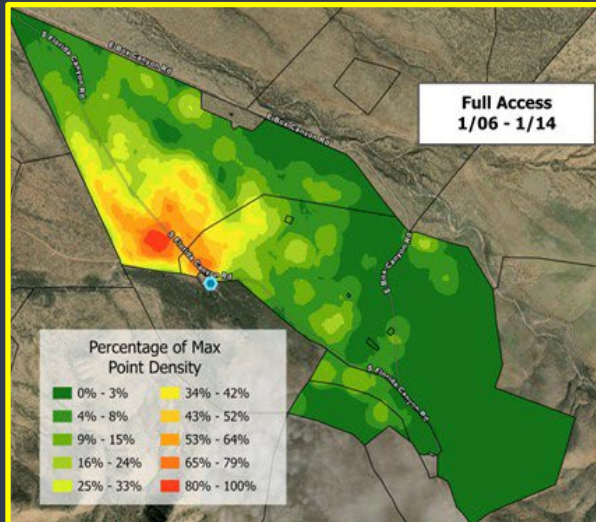
**SUB-
PASTURING**

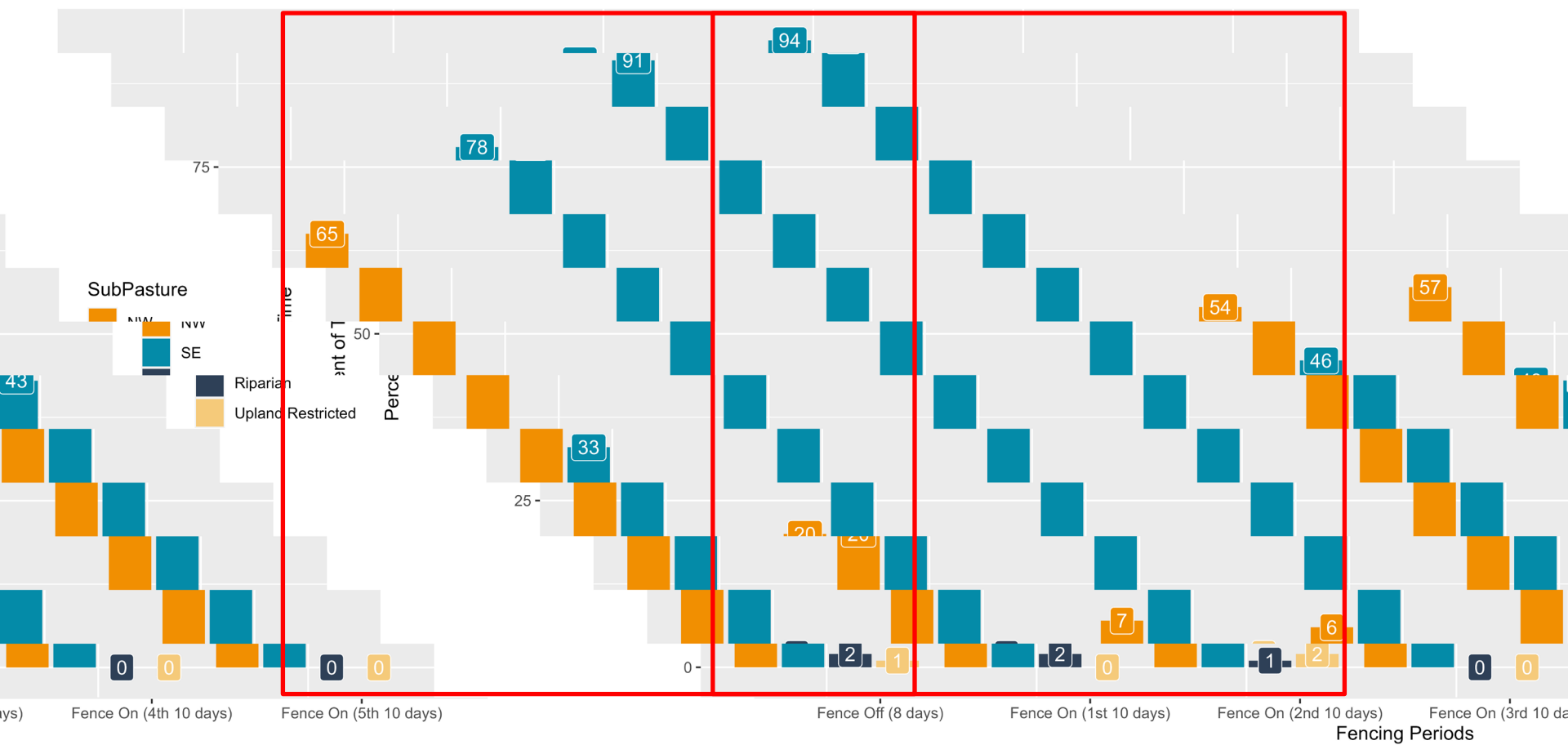


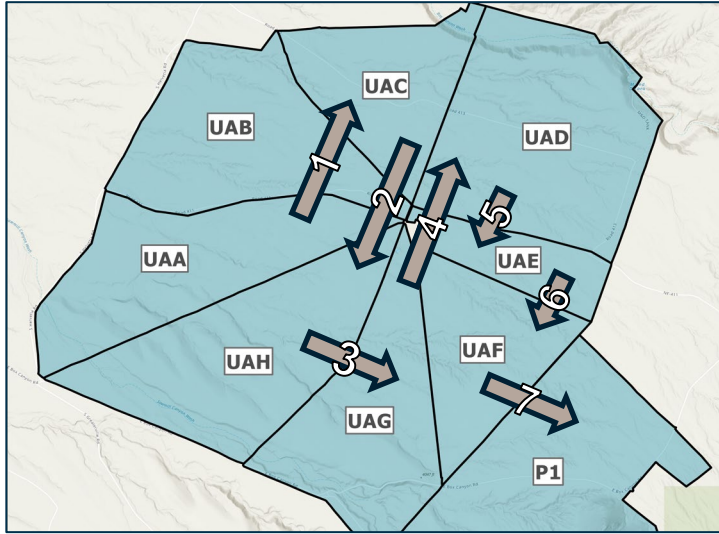
MOVEMENT



Control of Space: Where grazing occurs



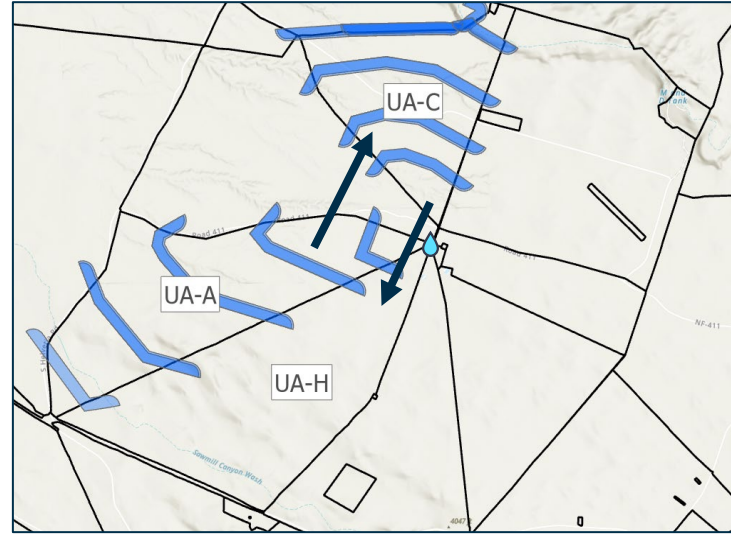




Maintaining a 10-day rotation during the growing season.



Labor intensive
Short Staffed

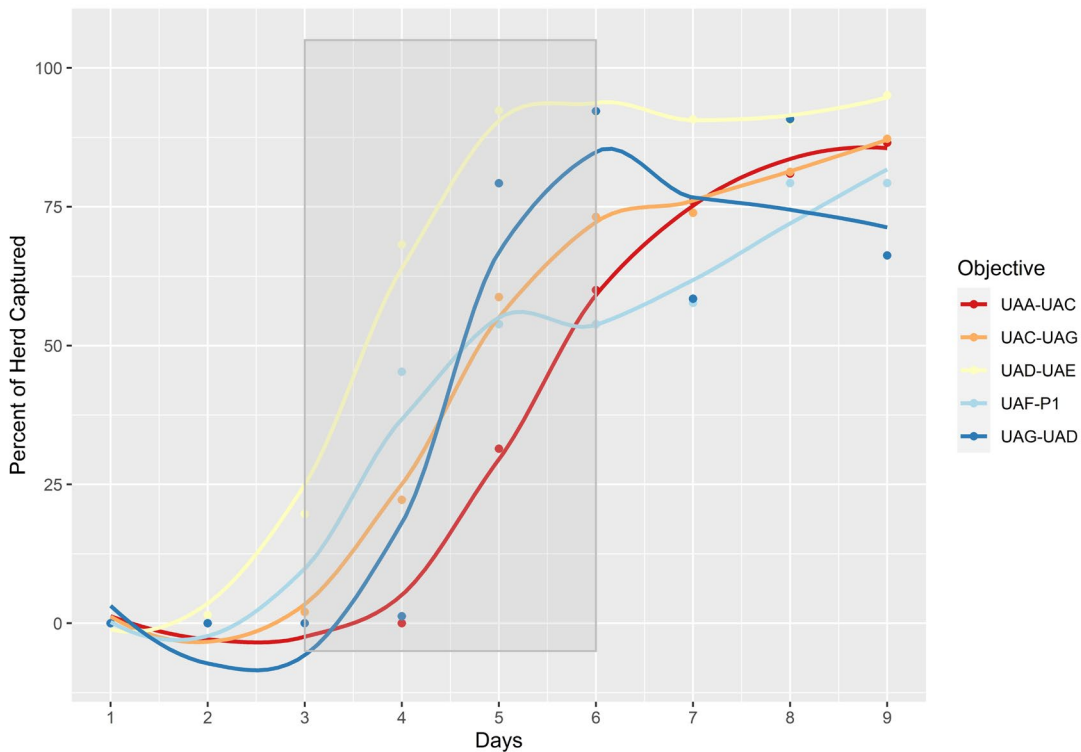


Using virtual fencing to execute a virtual rotation

Precision in Timing: Movement and Rotations

Passive Capture Results

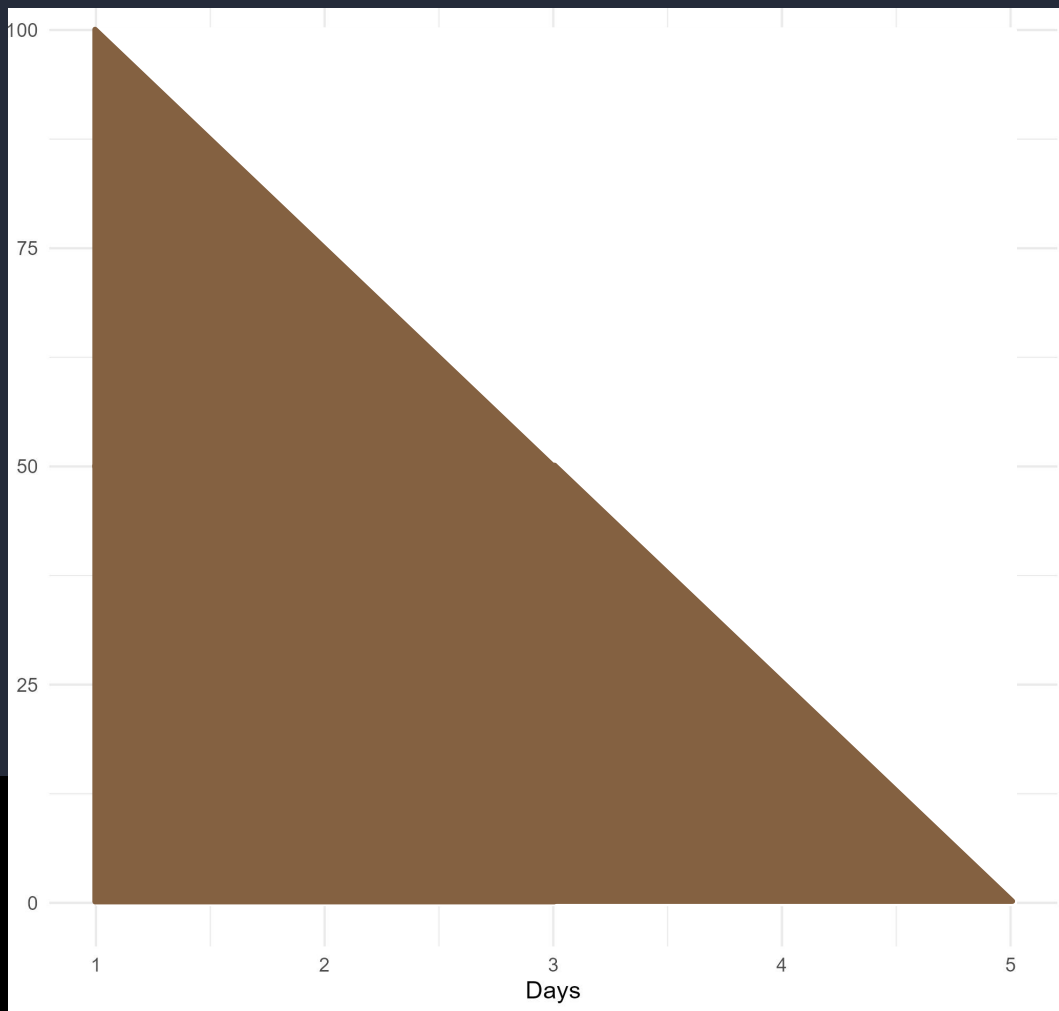
End-of-Day Percent
of Herd Captured



- **50% of the**

Objective	Rate
UAA-UAC	21
UAC-UAG	25
UAD-UAE	24
UAF-P1	17
UAG-UAD	35

in **3.85** days.



Building this into our rotation

25% capture rate

**Turn on fences two
days before a move
and maintain
stocking!**

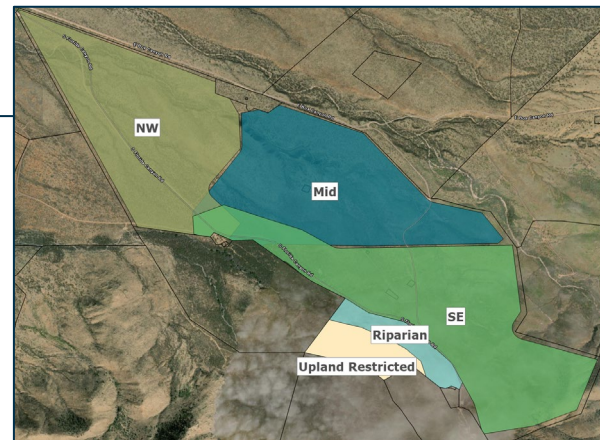
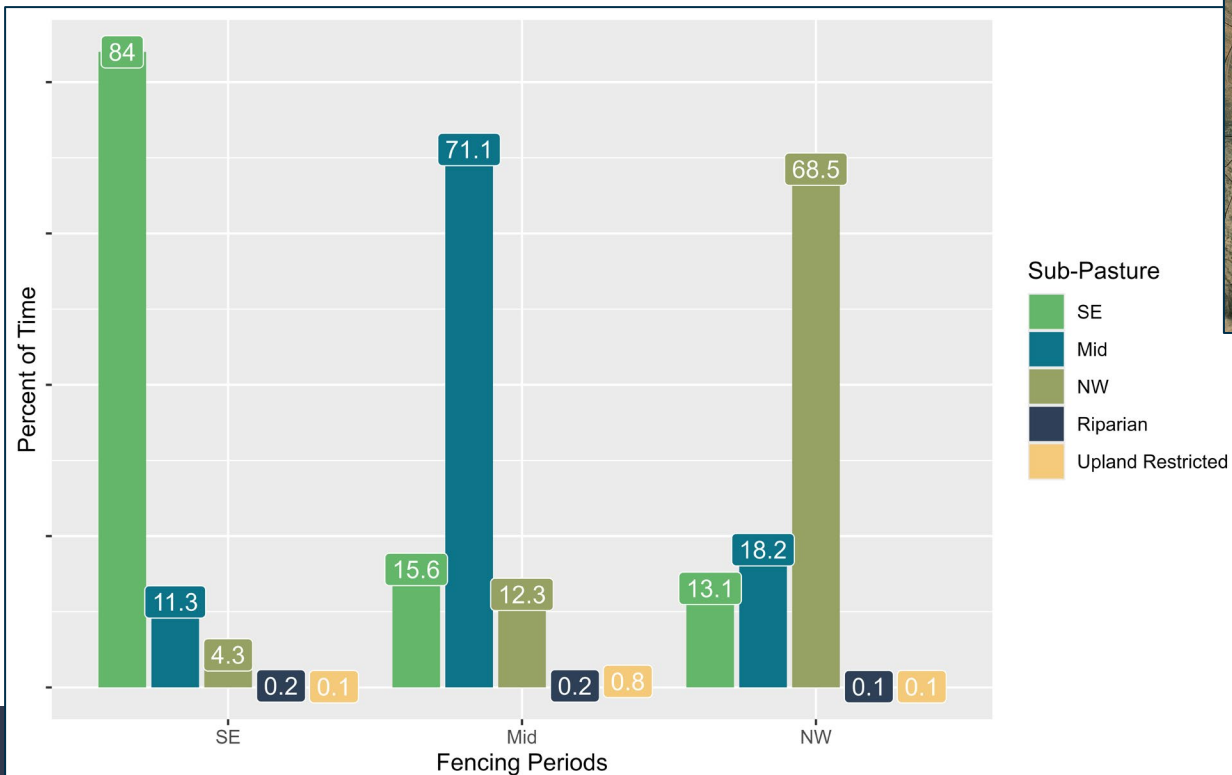
- 100/17% capture rate =
~6 days
- 3 days prior to move

A Sub-pastured Rotation:

Adding Complication
because we can.



Results!

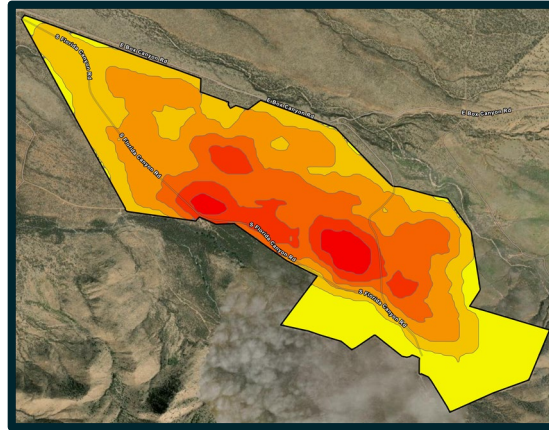


Integrating Tech: Adding Insight

The fun doesn't stop there!

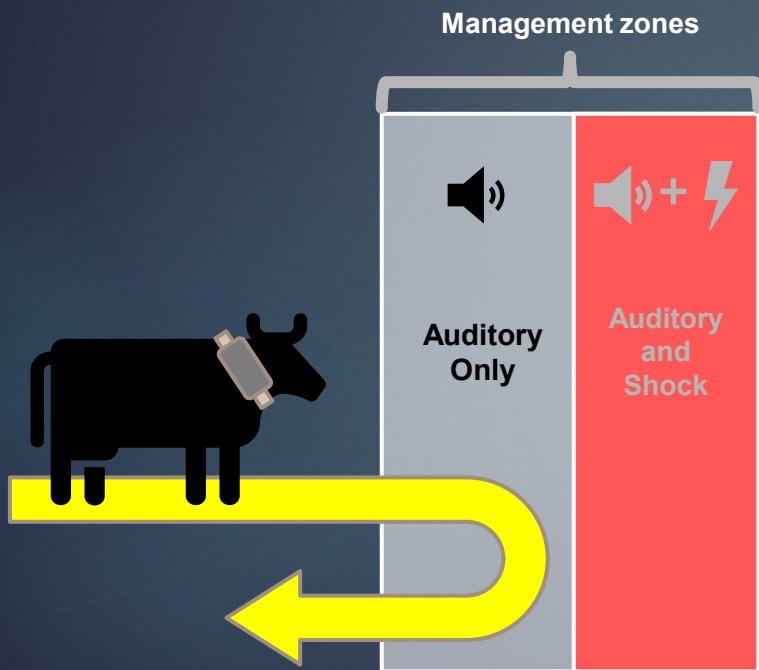
- Virtual fencing needs more to work to it's fullest
- Including more to help us plan and understand the effects of our decisions

What does remote sensing give us?



Leverage GPS data from virtual fences to inform where its grazing locations and how do what

Virtual fencing: In Conclusion



What can this technology do?

- ▶ Control/precision
- ▶ Inference
 - ▶ Decision vs results

Reduces the effort needed by the operator to integrate more intensive practices and focus on the Bigger picture

- ▶ Adaptability, Flexibility, Operations resilience
- ▶ Ecological resilience and sustainability

The University of Arizona

Virtual Fence Program



THE UNIVERSITY OF ARIZONA
**Arizona
Experiment Station**



Cooperative Extension



COLLEGE OF AGRICULTURE, LIFE & ENVIRONMENTAL SCIENCES
**Natural Resources
& the Environment**

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rangelandsgateway.org/vf