

# Virtual Fence Technology & Grazing Management

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# EOARC Precision Ag Technology (PAT) Working Group



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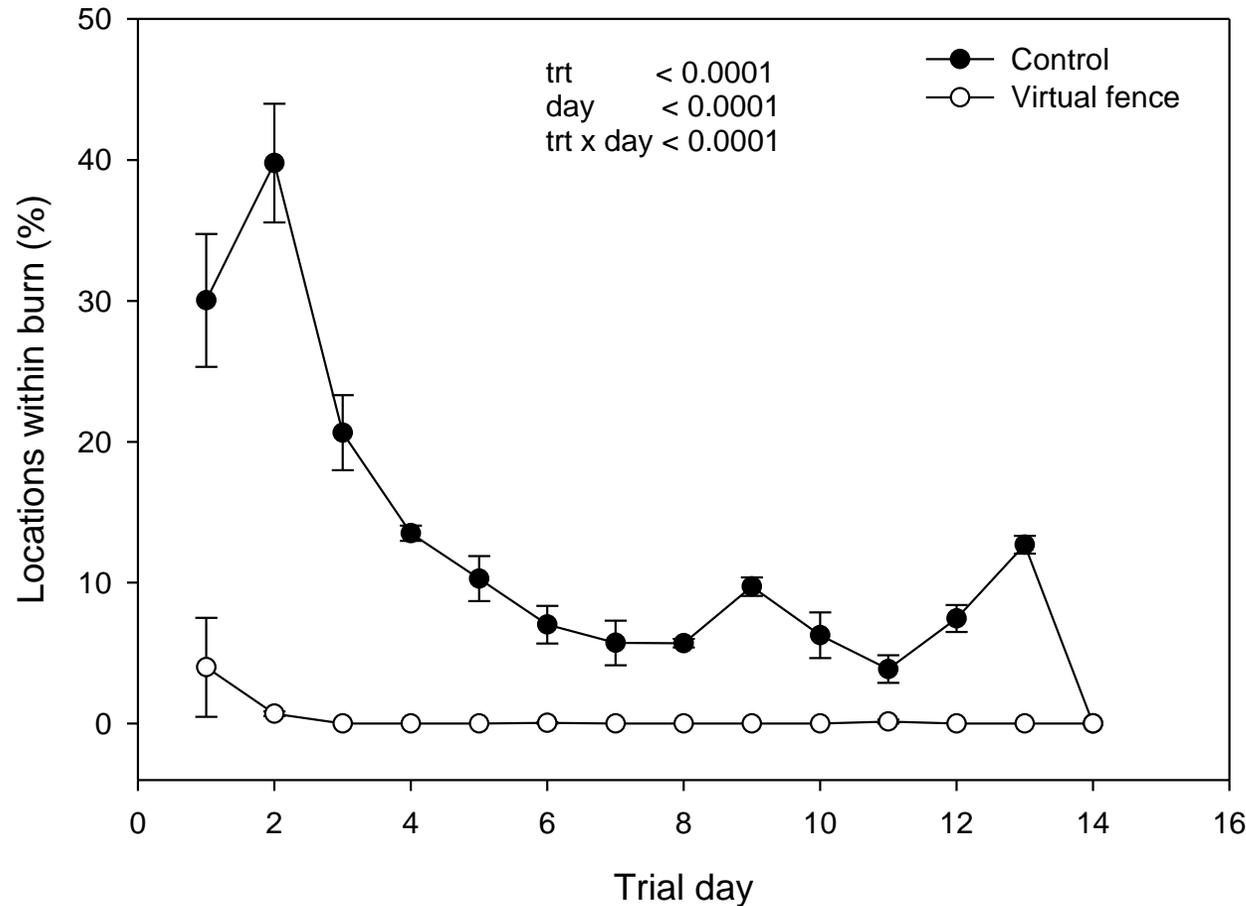


# The Wildfire Problem

- Increase in prevalence & cost of wildfire in the West
- Grazing restrictions post-fire



# Virtual Fencing to Exclude Cattle from Burned Areas: Overview



## Management Objective

Use VF to reduce use of previously burned area during spring/summer grazing

## Project Results

Grazing in burned areas was reduced from 70% with Control to <3% with VF

## Efficacy

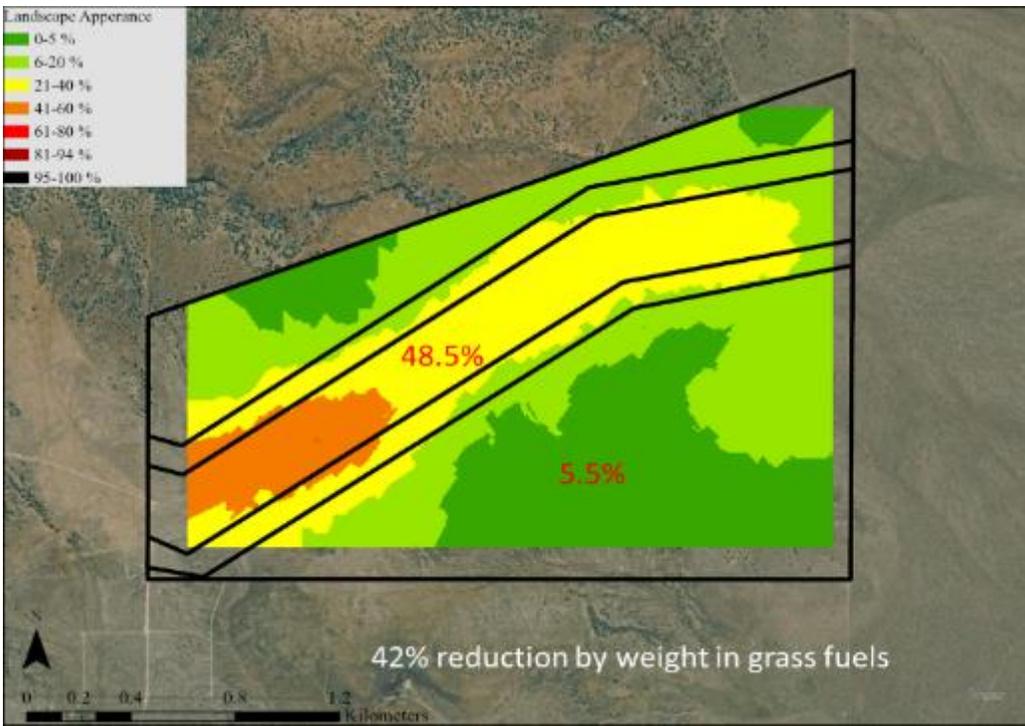
Cows were in the VF exclusion zone only incidentally; 4% of observations on d 1 and <1% thereafter

## Success

Management objective met



# Virtual Fencing for Grazed Fuel Breaks



## Management Objective

Use VF to create a 200-m fuel break

## Project Results

- Outside of fuel break: 5% utilization
- Within fuel break: 48% utilization
- **42% reduction in standing crop**

## Efficacy

Animals in VF boundary 87% of the time

## Success

Management objective met

Contents lists available at [ScienceDirect](#)

**Rangeland Ecology & Management**

journal homepage: [www.elsevier.com/locate/rama](http://www.elsevier.com/locate/rama)

**Using Virtual Fencing to Create Fuel Breaks in the Sagebrush Steppe**

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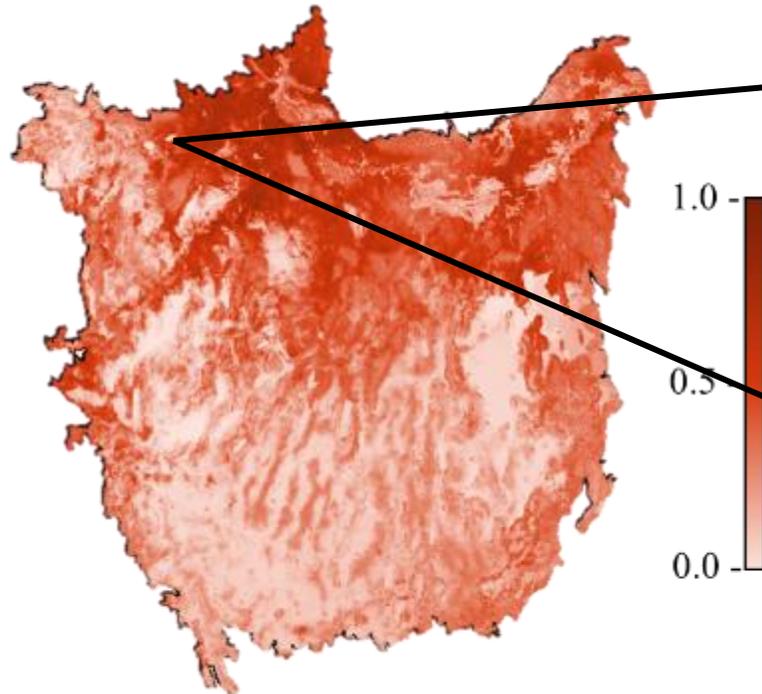
# Strategic Fuel Reduction

**Problem:** Large complex landscapes with high fine fuel loads.

## Management Objective

Merge remotely sensed data to inform virtual fence boundaries to target graze fine fuels between 40% and 50%.

2021 Great Basin Fire Probability



Smith et al. 2022. REM

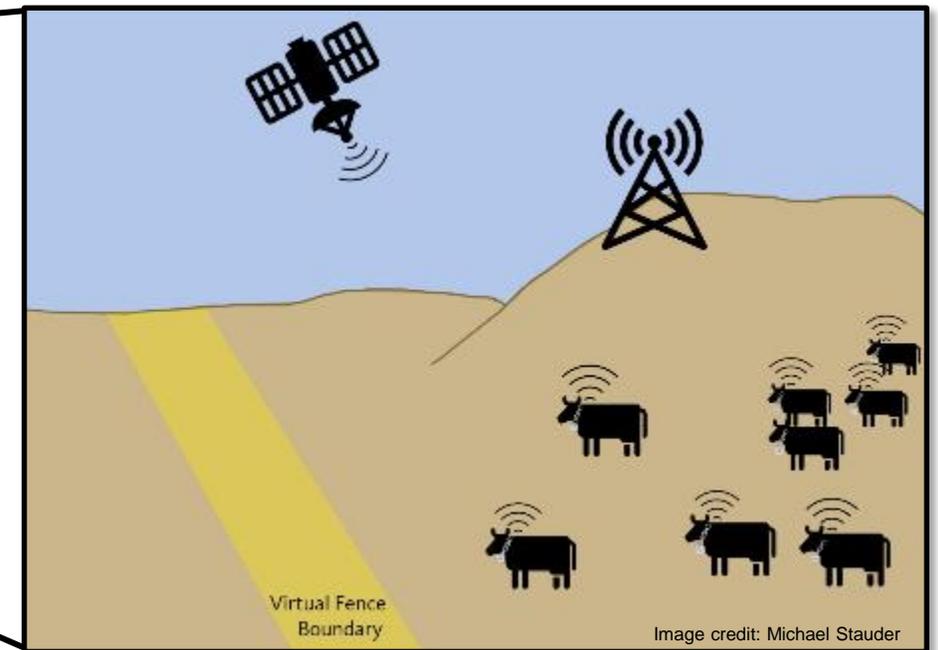


Image credit: Michael Stauder

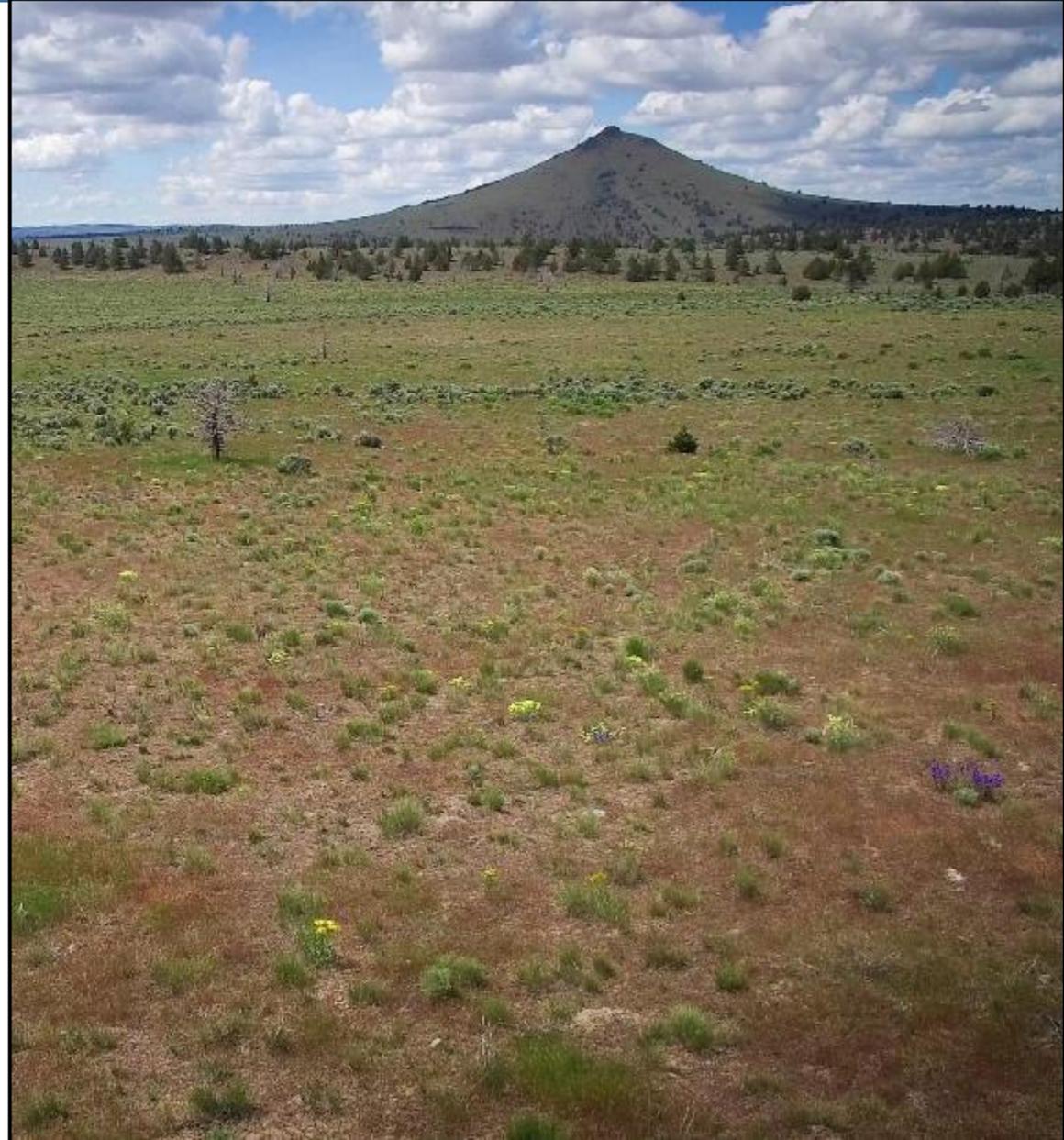
# Strategic Fuel Reduction

## Management objective

Merge remotely sensed data to inform virtual fence boundaries to target graze fine fuels and reduce fine fuels between 30% and 50%.

## Project Results

- **Efficacy:** Various degrees of efficacy were met depending on the pasture grazed
- **Success:** Management objective met



# Strategic Fuel Reduction – Lessons Learned



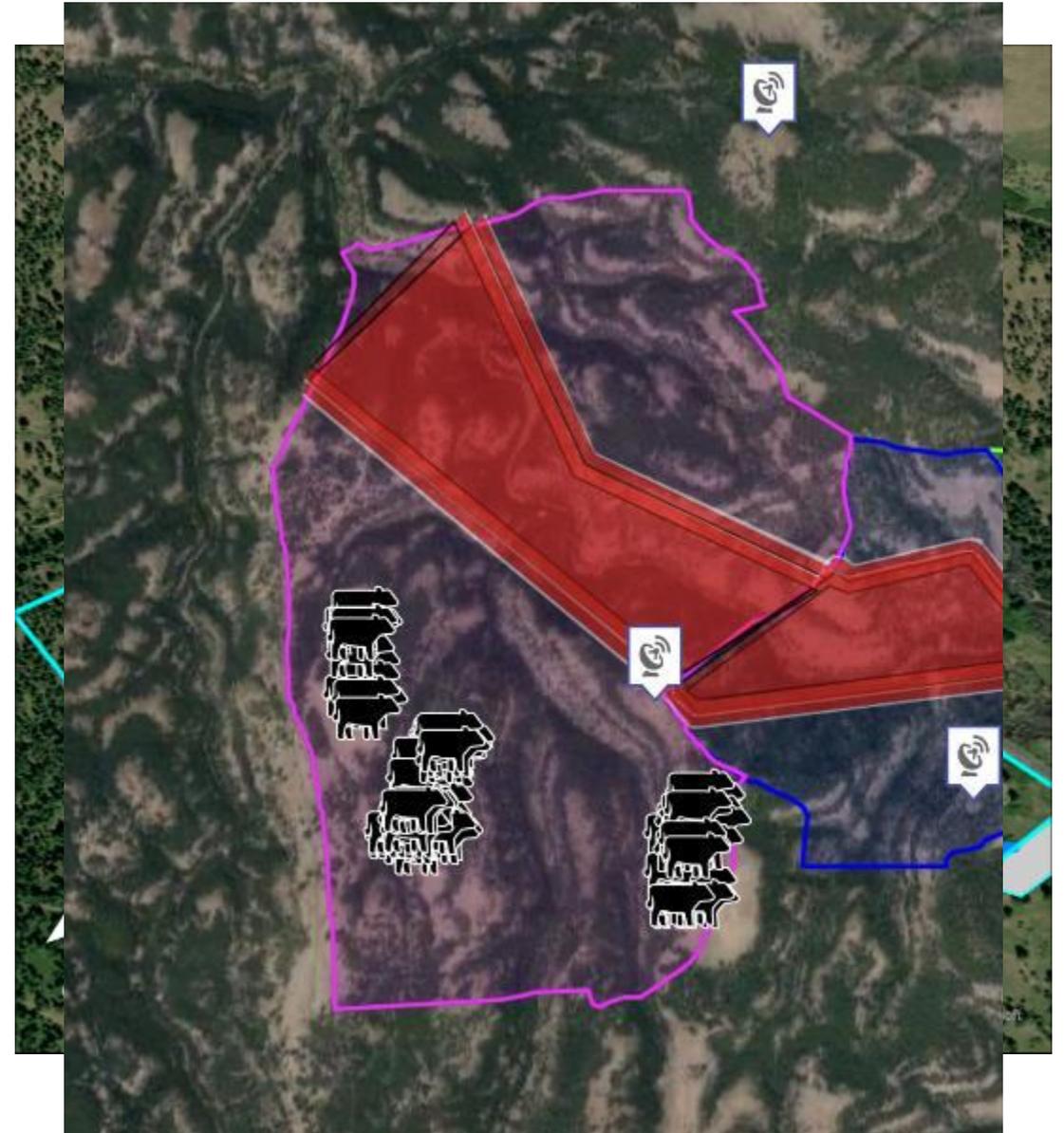
# Riparian Exclusion

## Management objective

Reduce use of riparian area vegetation and stream access

## Results

- **Efficacy:** Failed, too much use next to and in stream
  - Virtual fencing works but **WE** failed in setting the technology up to be successful
  - Virtual fence boundaries too close to riparian area; especially an issue with cow/calf pairs
- **Success:** Management objective not met
- **Current projects:** Learn/use adaptive management
  - Reduce incentive of riparian area  
e.g. keep in uplands
  - Range riding efficiency
  - Exclude sensitive areas



# Take Home Messages

- VF technology is a promising tool for land and livestock management
- Virtual fencing is not an “iron gate” and will work best when used as a tool within a larger strategy
  - VF Buffer size is very important
    - minimize attraction and/or access to audio, visual, and other stimuli (riparian forage, other animals, etc.)
  - “Success” is contingent on the specific management objective
  - Animal type (dry cows vs cow/calf pairs; yearlings, etc.) should be considered in management objective
    - Not all animals may be “trainable”
- VF Technology Works!!
  - However, setting up a VF system requires careful consideration and knowledge of the technology, landscape, water location, and animal behavior to meet management objectives and expectations
  - Can provide almost real-time animal locations
  - Must be willing to learn as you go – adaptable management!