COLLEGE OF AGRICULTURE & LIFE SCIENCES
Natural Resources & the Environment

Cooperative Extension

THE UNIVERSITY OF ARIZONA
Arizona Experiment Station

Virtual Fence 101

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The findings and conclusions in this preliminary [publication/presentation/blog] have not been formally disseminated by the U. S. Department of Agriculture and Should not be construed to represent any agency determination or policy.

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Western SARE
USDA-NIFA AFRI
The Nature Conservancy

WESTERN SARE
Sustainable Agriculture Research & Education

USDA National Institute of Food and Agriculture
U.S. DEPARTMENT OF AGRICULTURE

Overview

What is Virtual Fence?

How It Works

Components of a Virtual Fence System

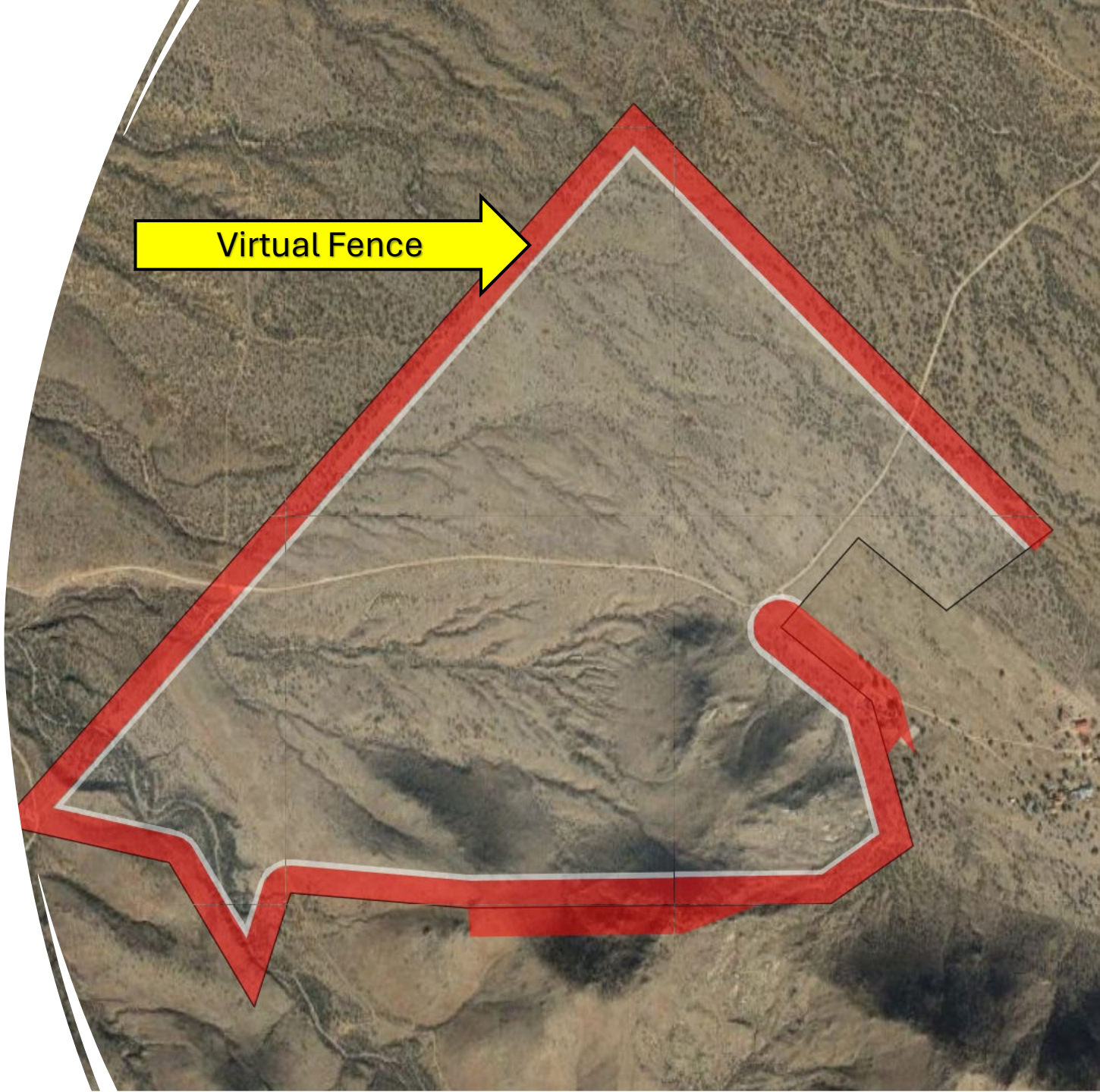
Cost Breakdown

Potential Applications

Additional Resources

What are Virtual Fences?

- Geographic boundary that is programmed into an electronic device, typically a *collar* worn by livestock

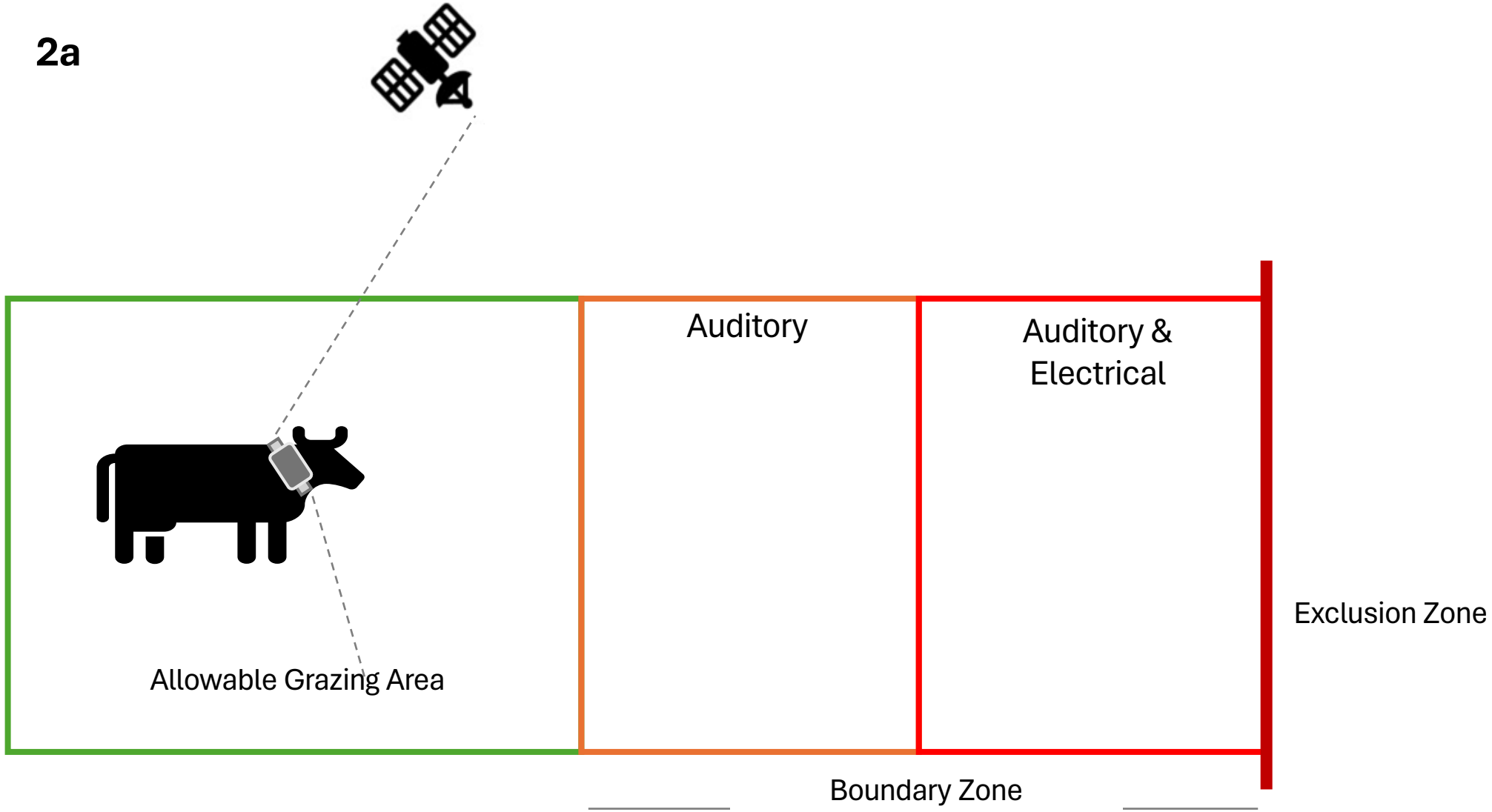


Virtual Fence Collars

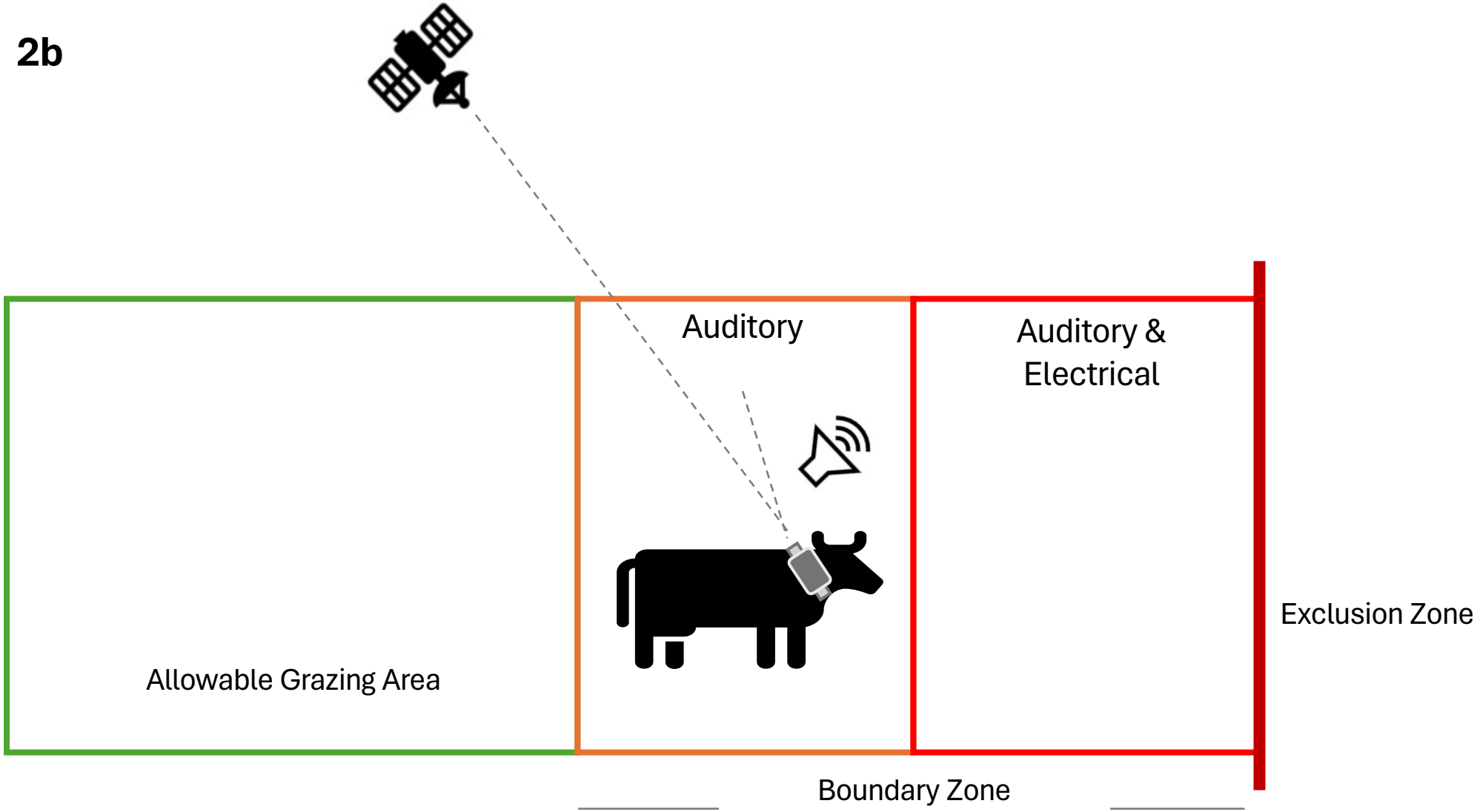
- GPS determines animal's geographic location
- Trains animals to stay within areas by sounds and electrical pulses
- Transmits data to the Internet via radio or cellular network

How Virtual Fence Works

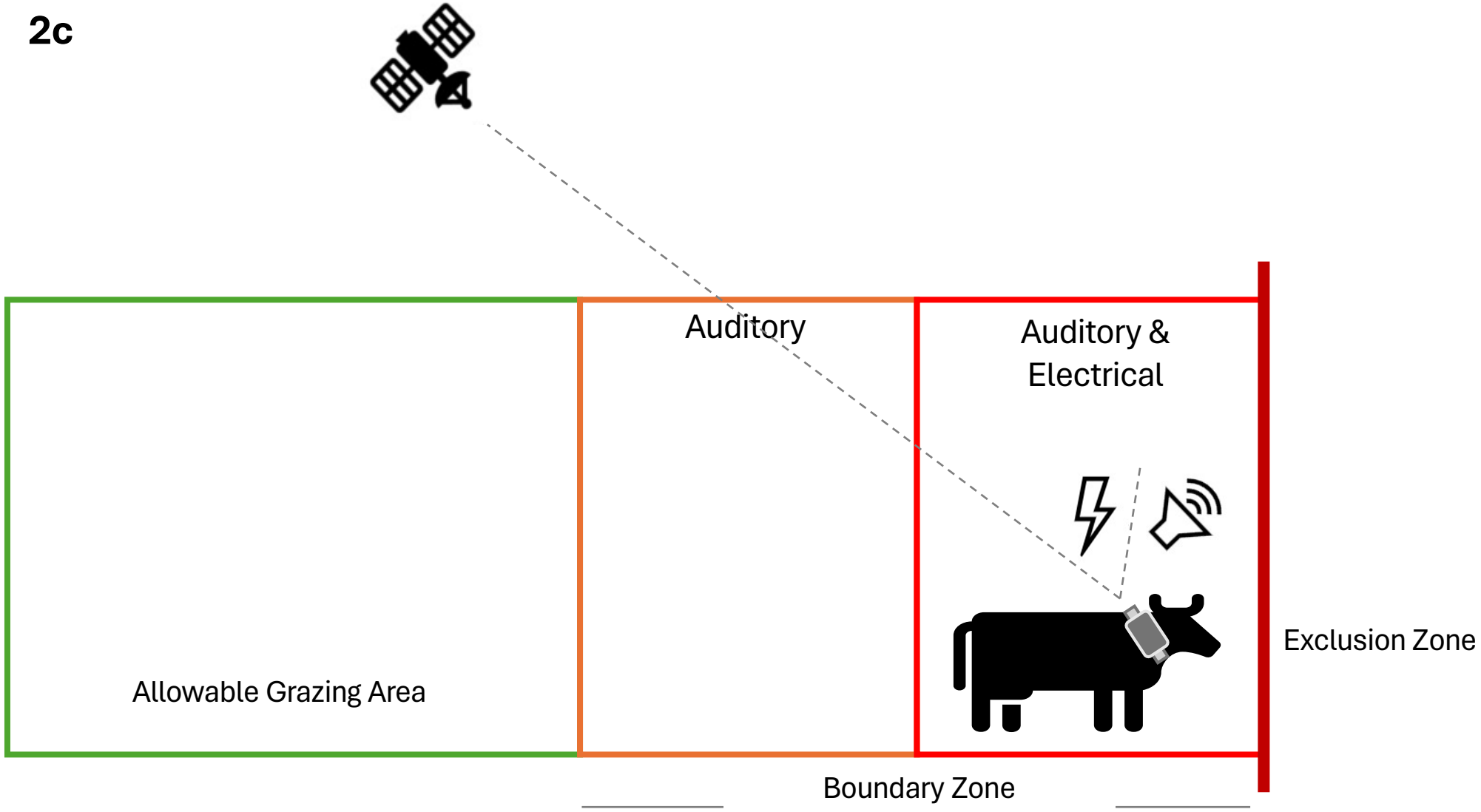
2a


Auditory
Auditory &
Electrical
Allowable Grazing Area
Exclusion Zone
Boundary Zone

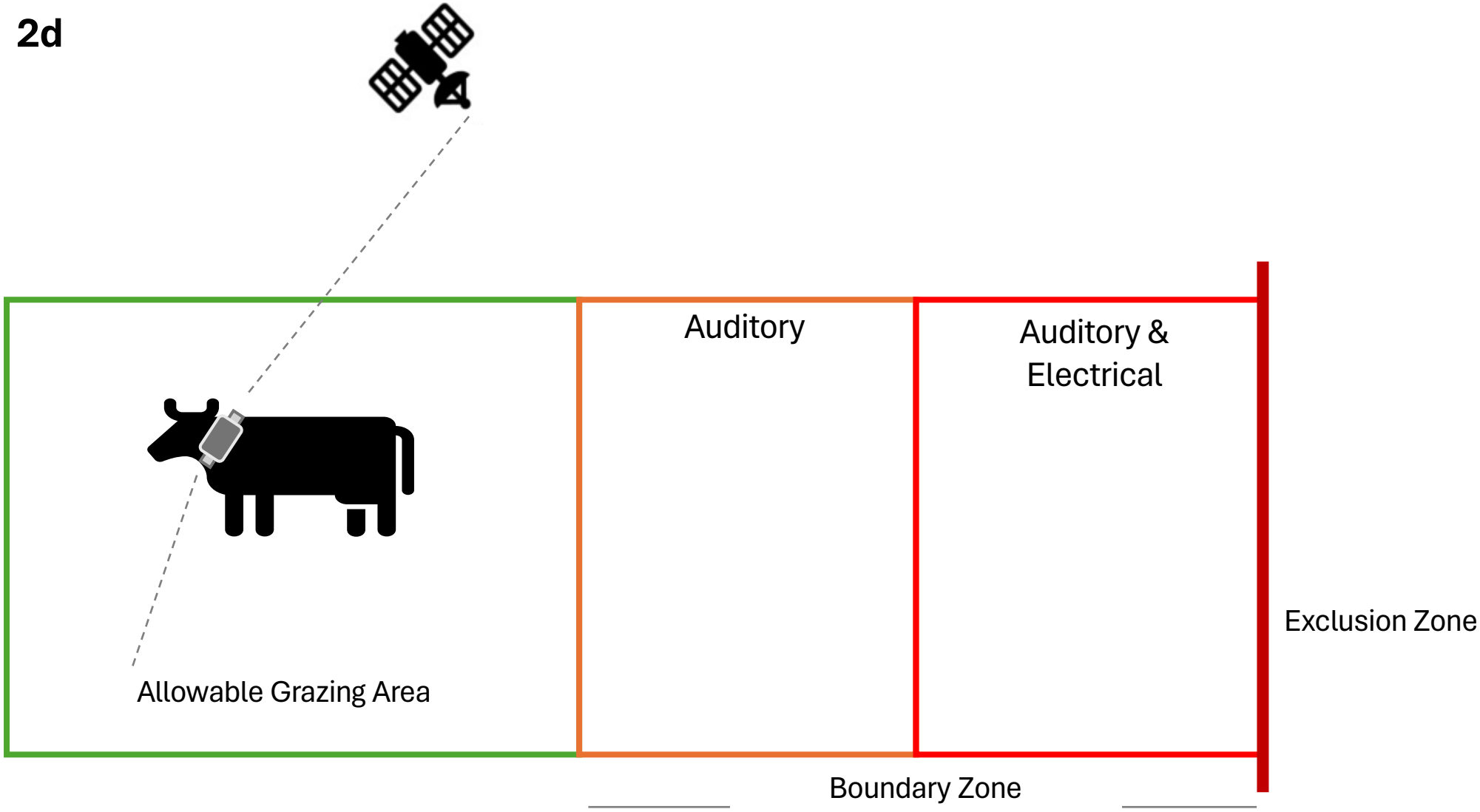
2b


Auditory
Auditory &
Electrical
Allowable Grazing Area
Exclusion Zone
Boundary Zone

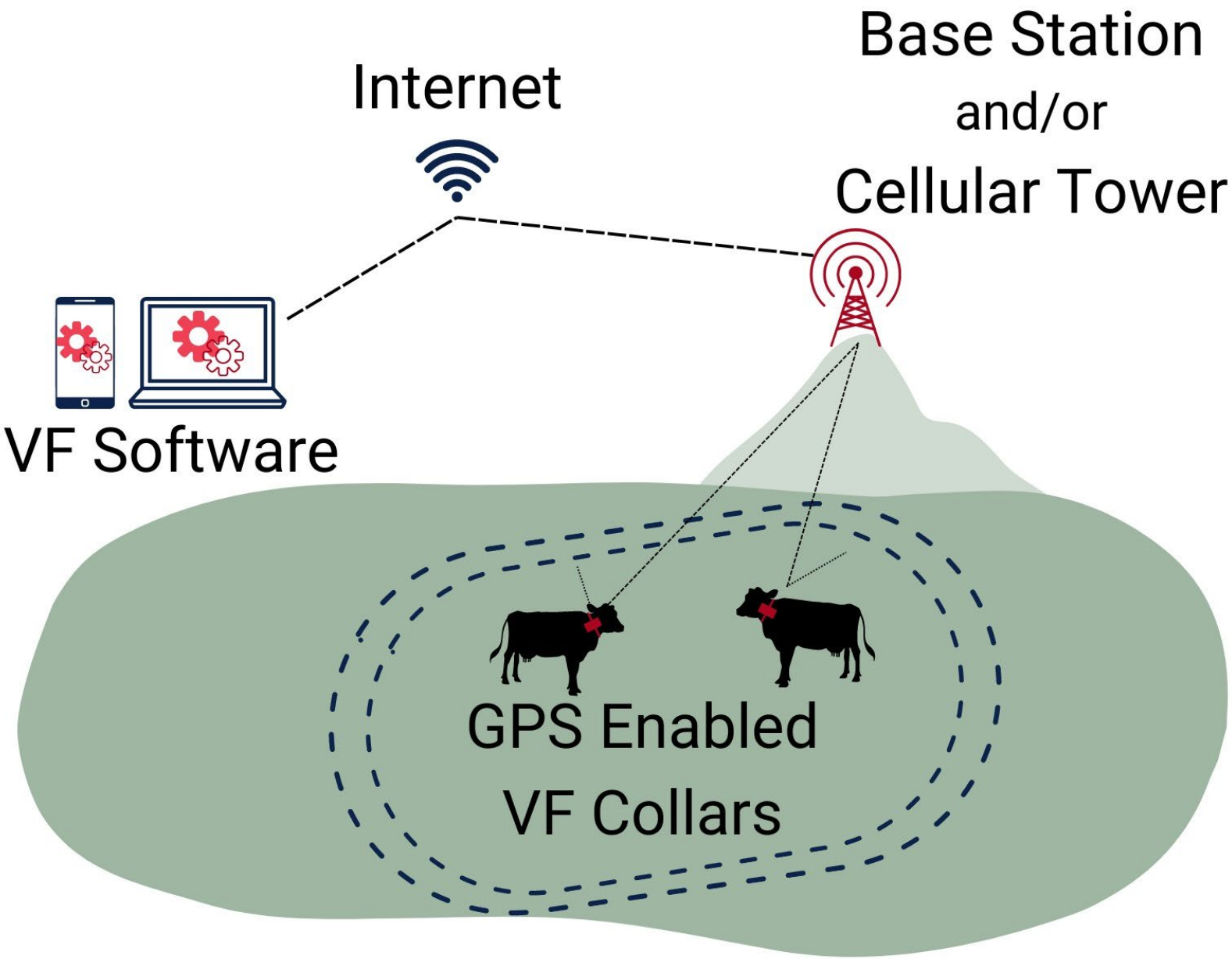
2c


Auditory
Auditory &
Electrical
Allowable Grazing Area
Exclusion Zone
Boundary Zone

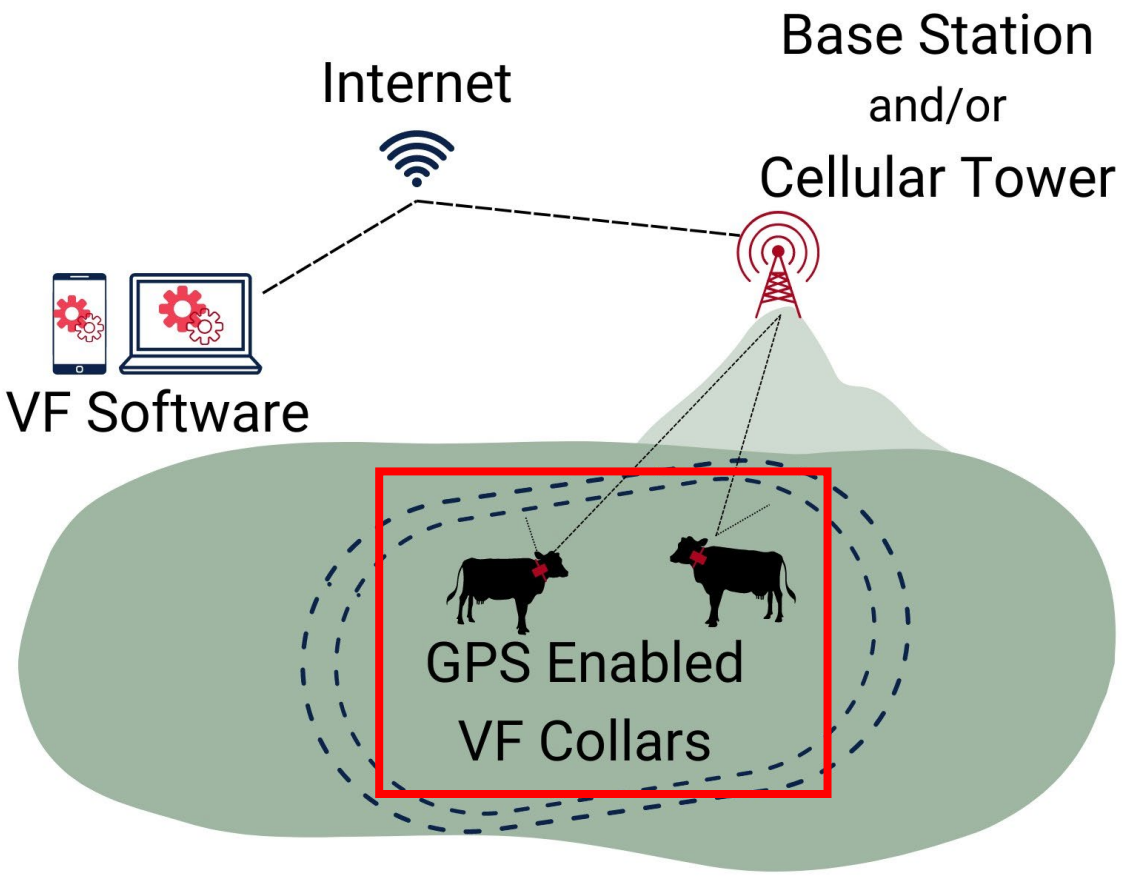
2d


Auditory
Auditory &
Electrical
Allowable Grazing Area
Exclusion Zone
Boundary Zone

Components of Virtual Fence Systems


Internet
Base Station
and/or
Cellular Tower
VF Software
GPS Enabled
VF Collars

Virtual Fence Collars



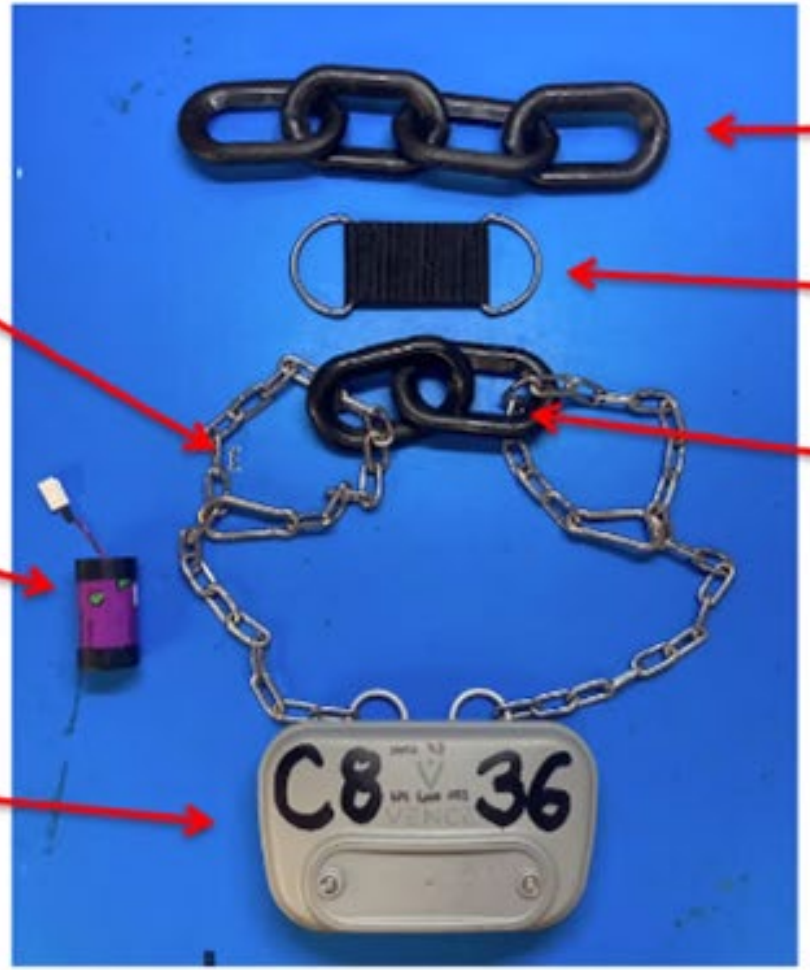
Cattle Rider V2 Chain Collar – Part Descriptions

VENCE

Chain Collar w/Adjustment Carabiners

CR Battery

Cattle Rider Electronics Housing



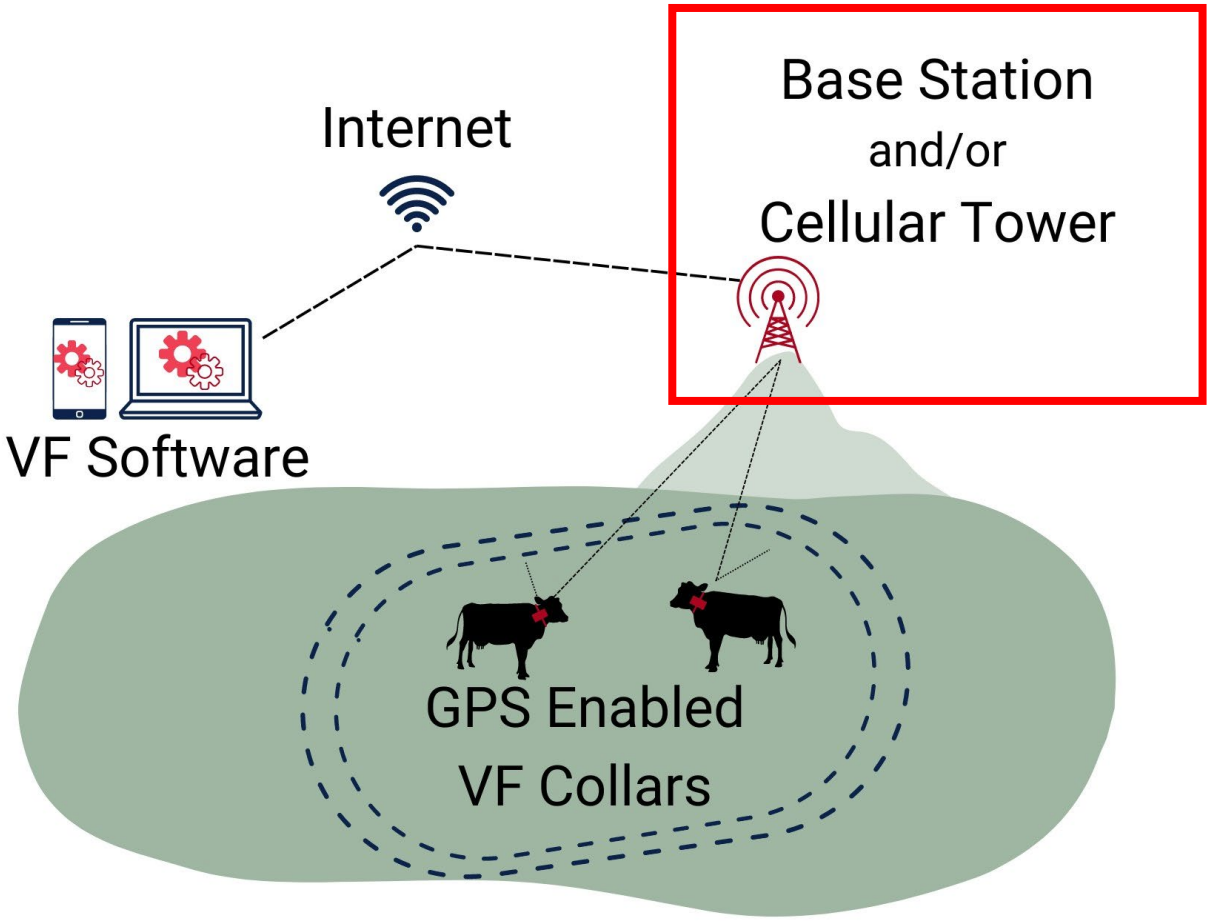
Optional Large Animal Bridge

Optional Webbing Bridge

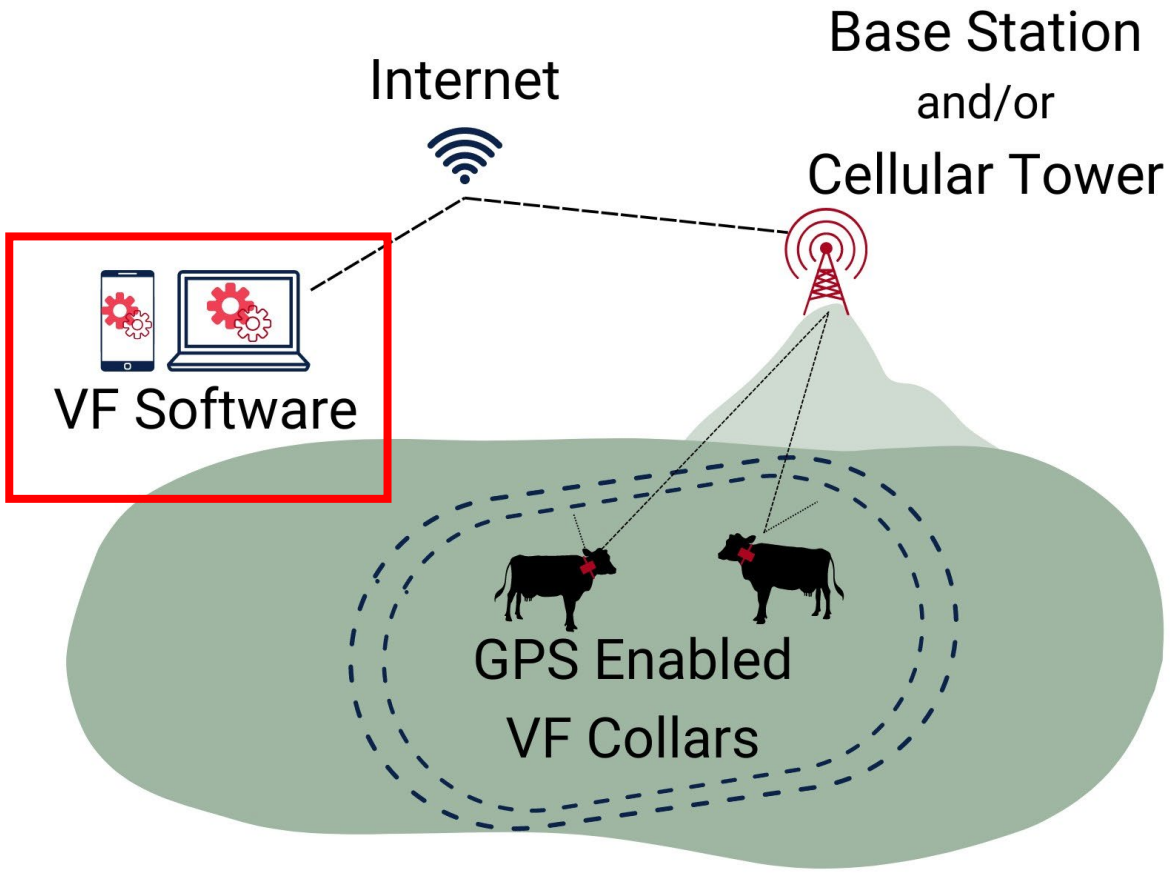
Standard Chain Bridge

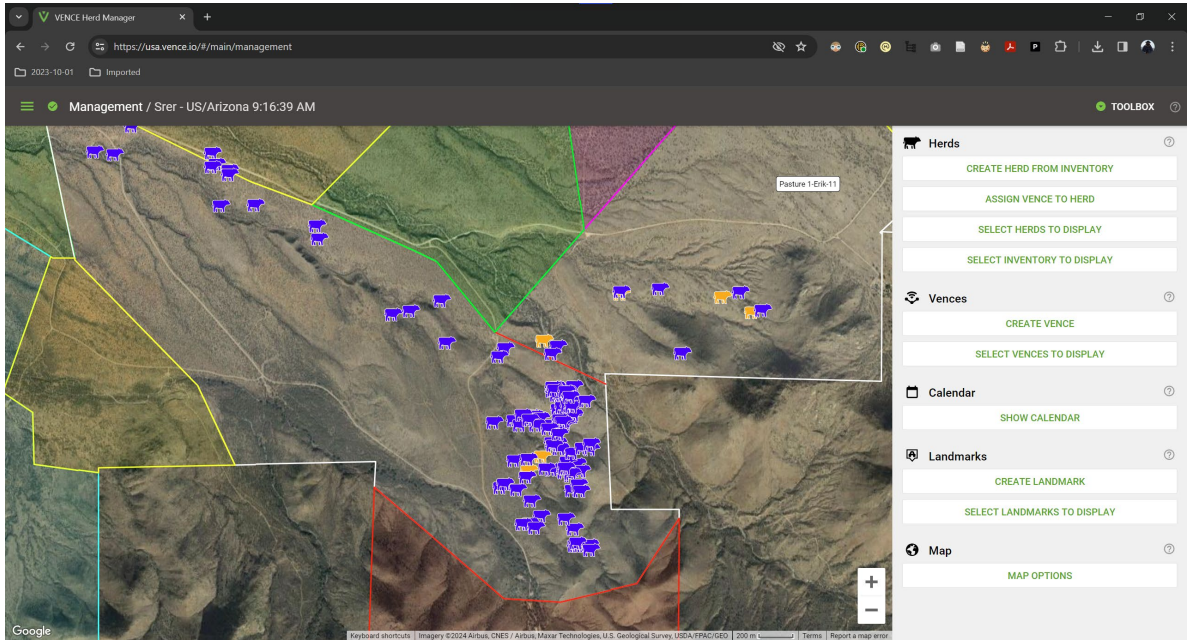
Note: Chain always loops through the bridge and clips back on itself with the carabiner. Do not clip carabiner directly to bridge.

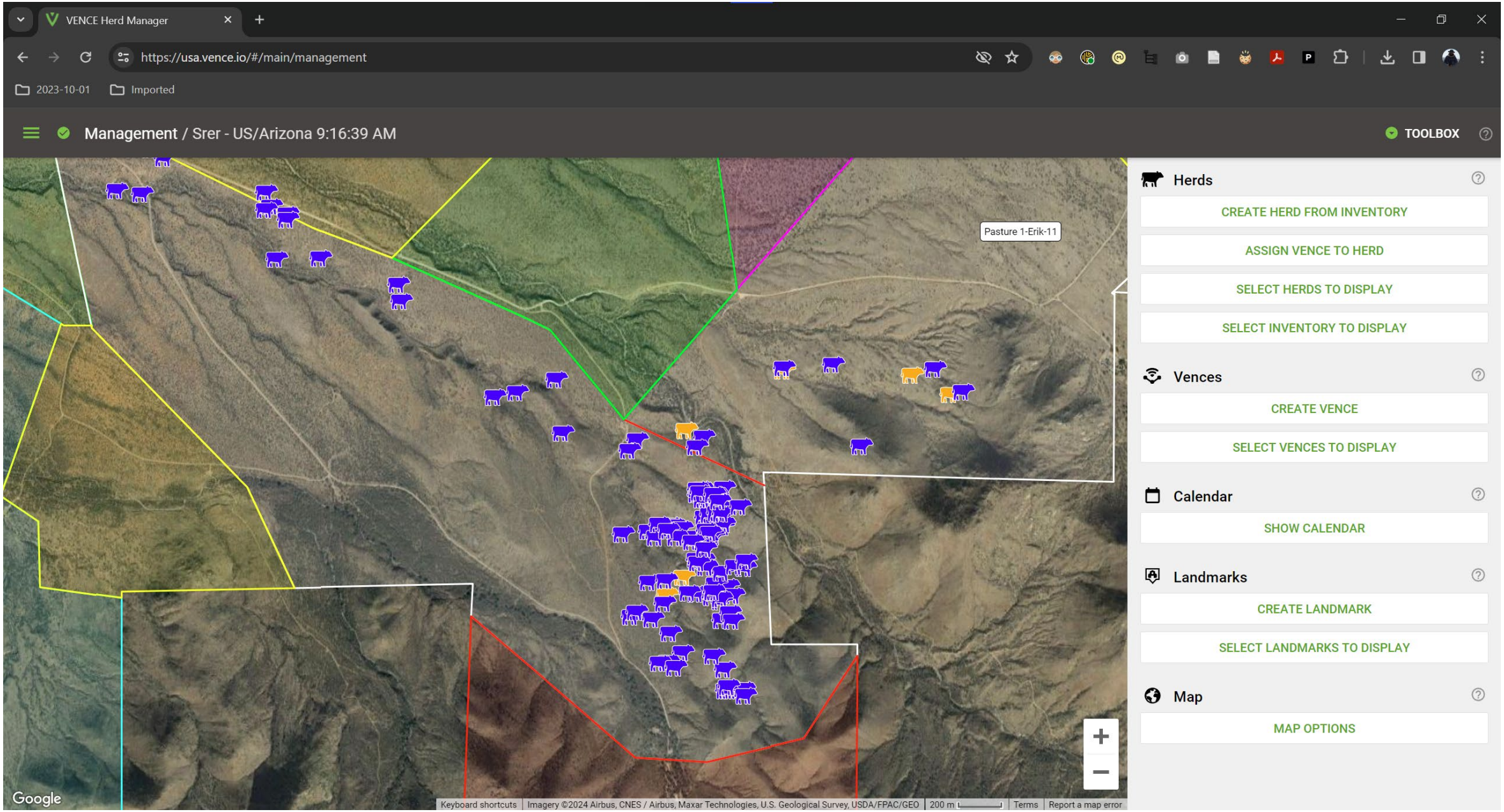
Vence Radio Base Stations



Virtual Fence Software

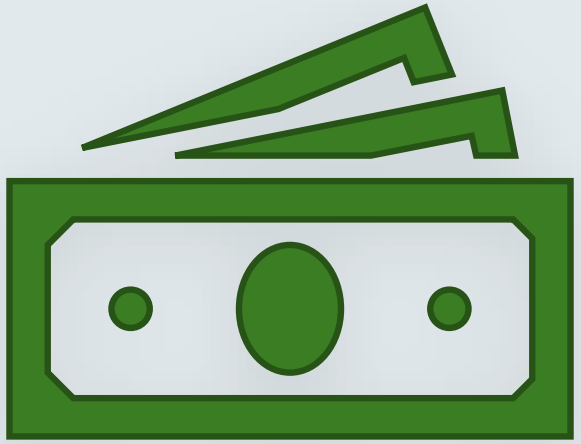





VENCE Herd Manager
https://usa.vence.io/#/main/management
2023-10-01
Imported
Management / Srer - US/Arizona 9:16:39 AM
TOOLBOX
Pasture 1-Erik-11
Herds
CREATE HERD FROM INVENTORY
ASSIGN VENCE TO HERD
SELECT HERDS TO DISPLAY
SELECT INVENTORY TO DISPLAY
Vences
CREATE VENCE
SELECT VENCES TO DISPLAY
Calendar
SHOW CALENDAR
Landmarks
CREATE LANDMARK
SELECT LANDMARKS TO DISPLAY
Map
MAP OPTIONS
Google
Keyboard shortcuts
Imagery ©2024 Airbus, CNES / Airbus, Maxar Technologies, U.S. Geological Survey, USDA/FPAC/GEO
200 m
Terms
Report a map error

Cost Breakdown

Our Cost Breakdown



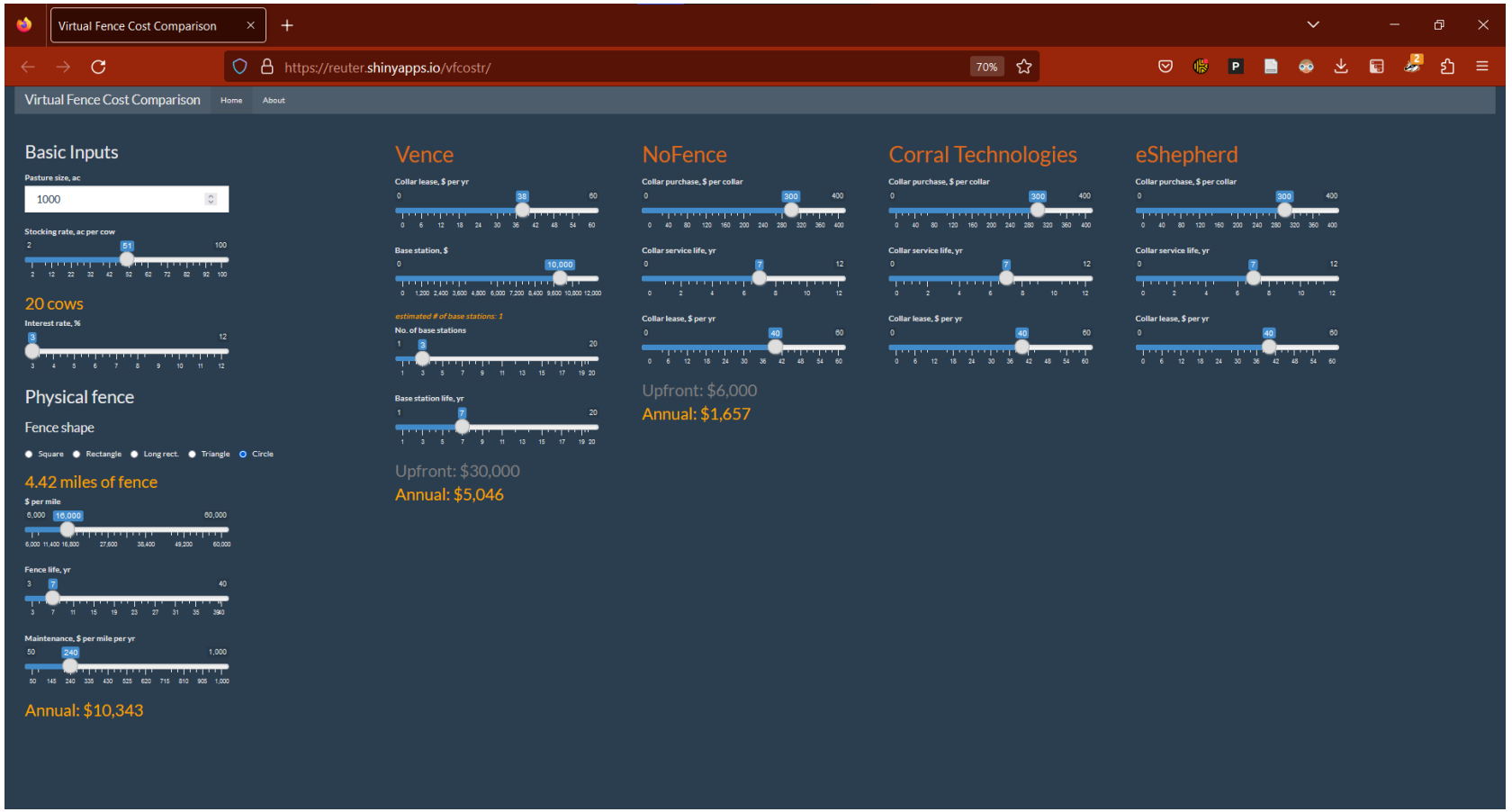
3 base stations & 500 collars

$36,000 base stations (upfront)

$20,000 collars (yearly lease)

$10,000 batteries (yearly)

Cost Comparison Tool



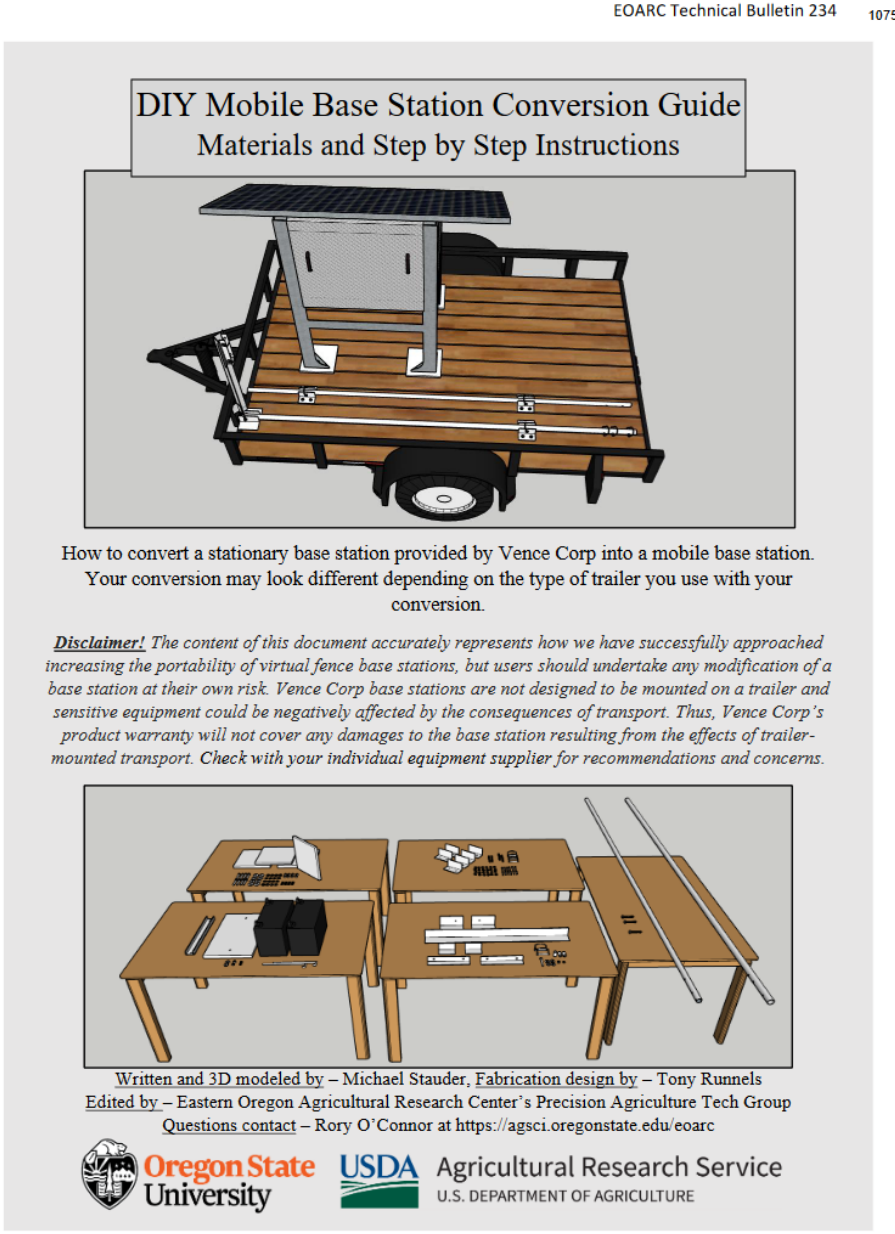
Currently in Beta Testing

Ryan Reuter – Oklahoma State University

https://reuter.shinyapps.io/vfcostr/

Mobile Base Station

- Not officially supported by Vence Corp.
- Move to new location as herd moves
- Setup in < 1 hour
- Saves $$$



EOARC Technical Bulletin 234 1075

DIY Mobile Base Station Conversion Guide
Materials and Step by Step Instructions

How to convert a stationary base station provided by Vence Corp into a mobile base station. Your conversion may look different depending on the type of trailer you use with your conversion.

Disclaimer! *The content of this document accurately represents how we have successfully approached increasing the portability of virtual fence base stations, but users should undertake any modification of a base station at their own risk. Vence Corp base stations are not designed to be mounted on a trailer and sensitive equipment could be negatively affected by the consequences of transport. Thus, Vence Corp's product warranty will not cover any damages to the base station resulting from the effects of trailer-mounted transport. Check with your individual equipment supplier for recommendations and concerns.*

Written and 3D modeled by – Michael Stauder, Fabrication design by – Tony Runnels
Edited by – Eastern Oregon Agricultural Research Center's Precision Agriculture Tech Group
Questions contact – Rory O'Connor at https://agsci.oregonstate.edu/eoarc

Oregon State University USDA Agricultural Research Service U.S. DEPARTMENT OF AGRICULTURE

Step-by-Step Instructions on How to Assemble Your Own Mobile Base Station

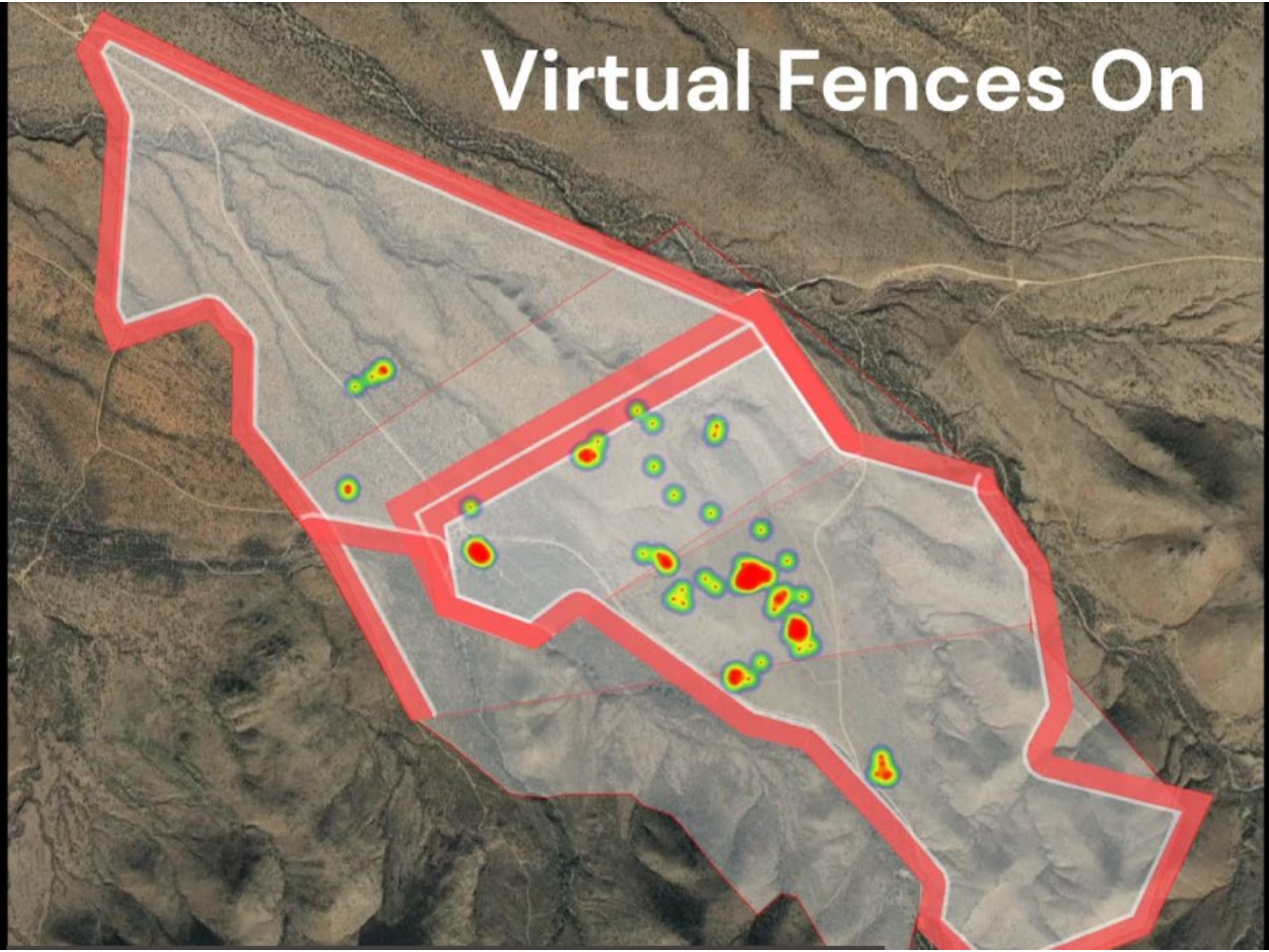
Link: https://agsci.oregonstate.edu/biblio/diy-mobile-base-station-conversion-guide-0

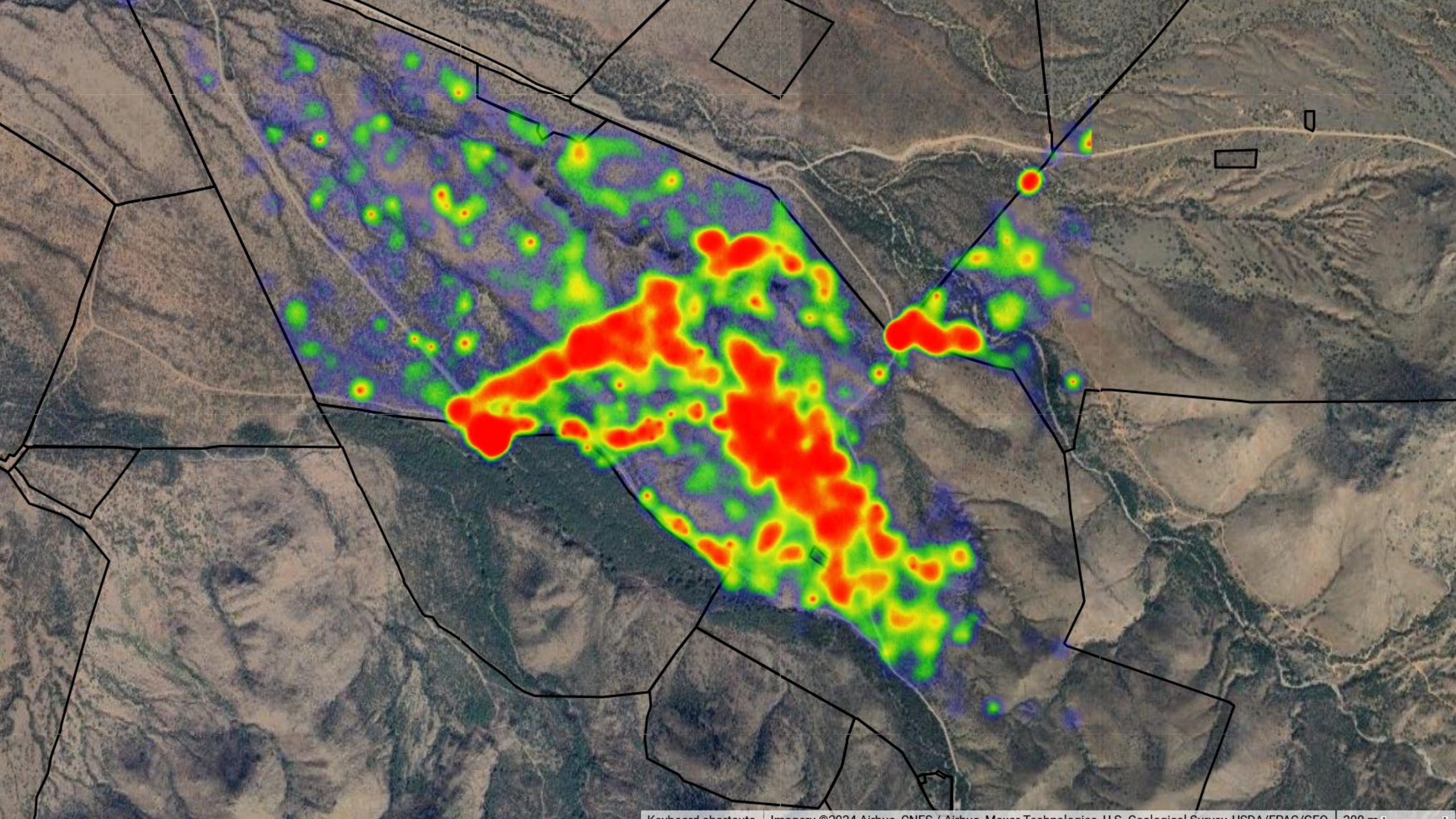
All resources will be linked here:

https://rangelandsgateway.org/virtual-fence

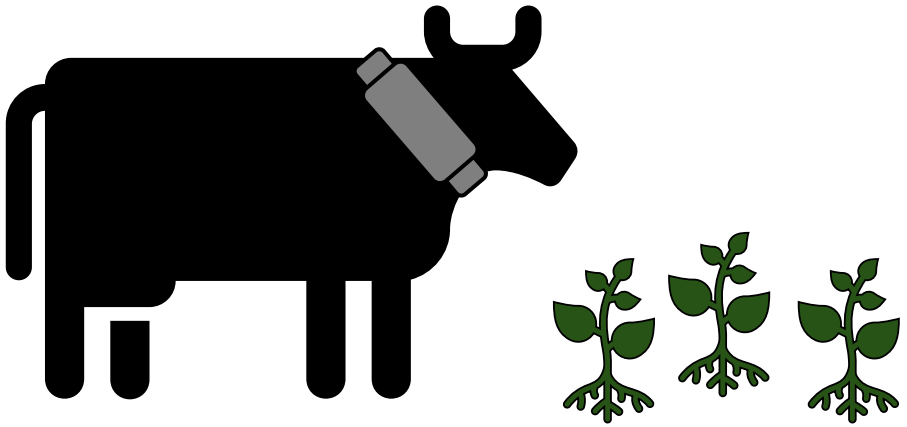
Potential Applications

1. Improve Grazing Distribution

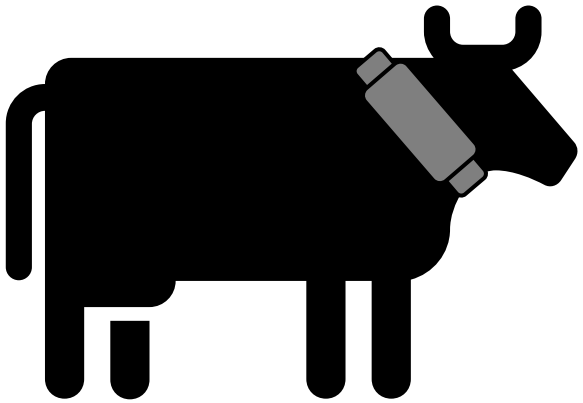

Virtual Fences On

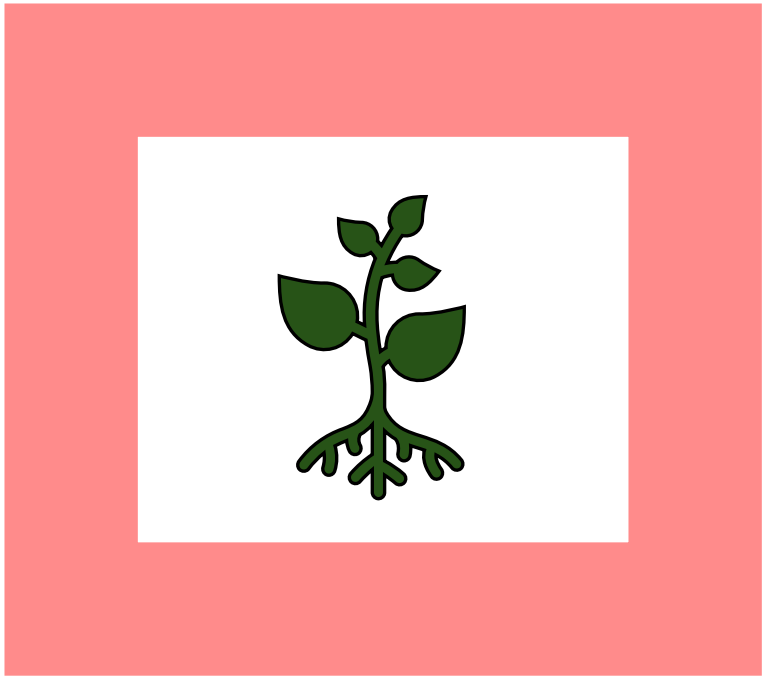

Keyboard shortcuts
Imagery ©2024 Airbus, CNES / Airbus, Maxar Technologies, U.S. Geological Survey, USDA/FPAC/GEO
200 m

Targeted Grazing



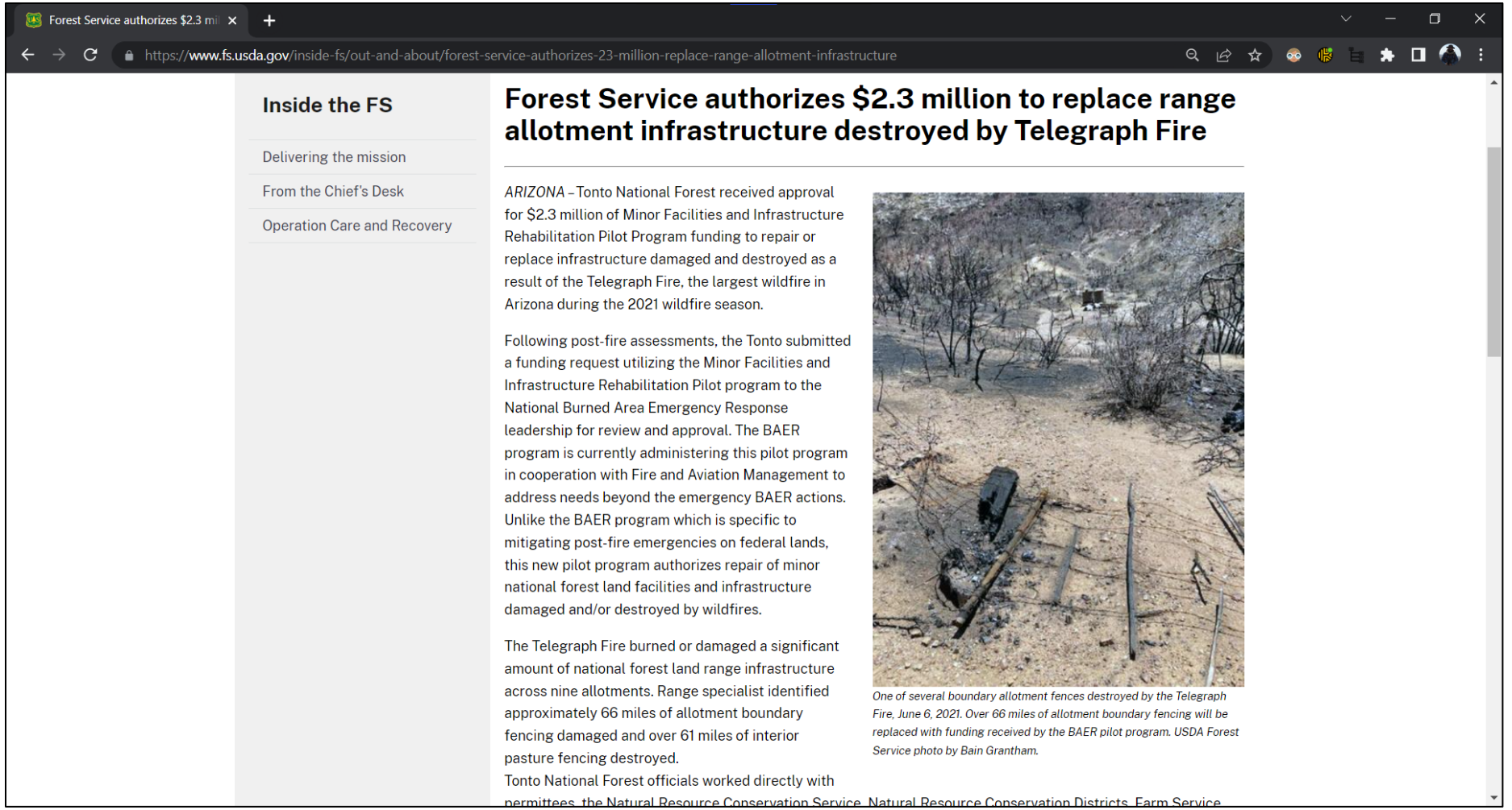
Avoid Toxic/Noxious Weeds



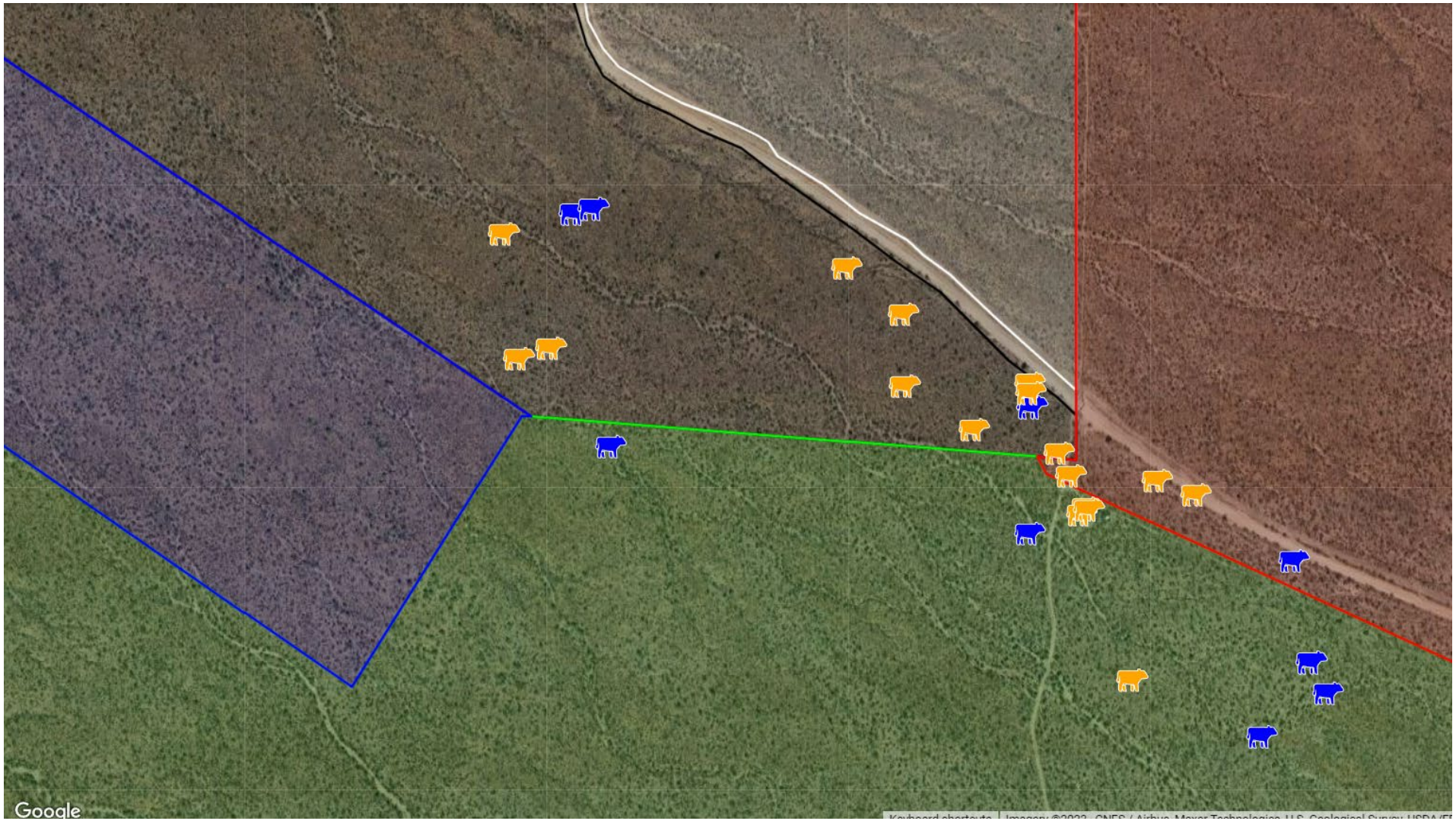


Post-Fire or Disturbance

Supplement Existing Fences



Easier to Locate and Gather Cattle



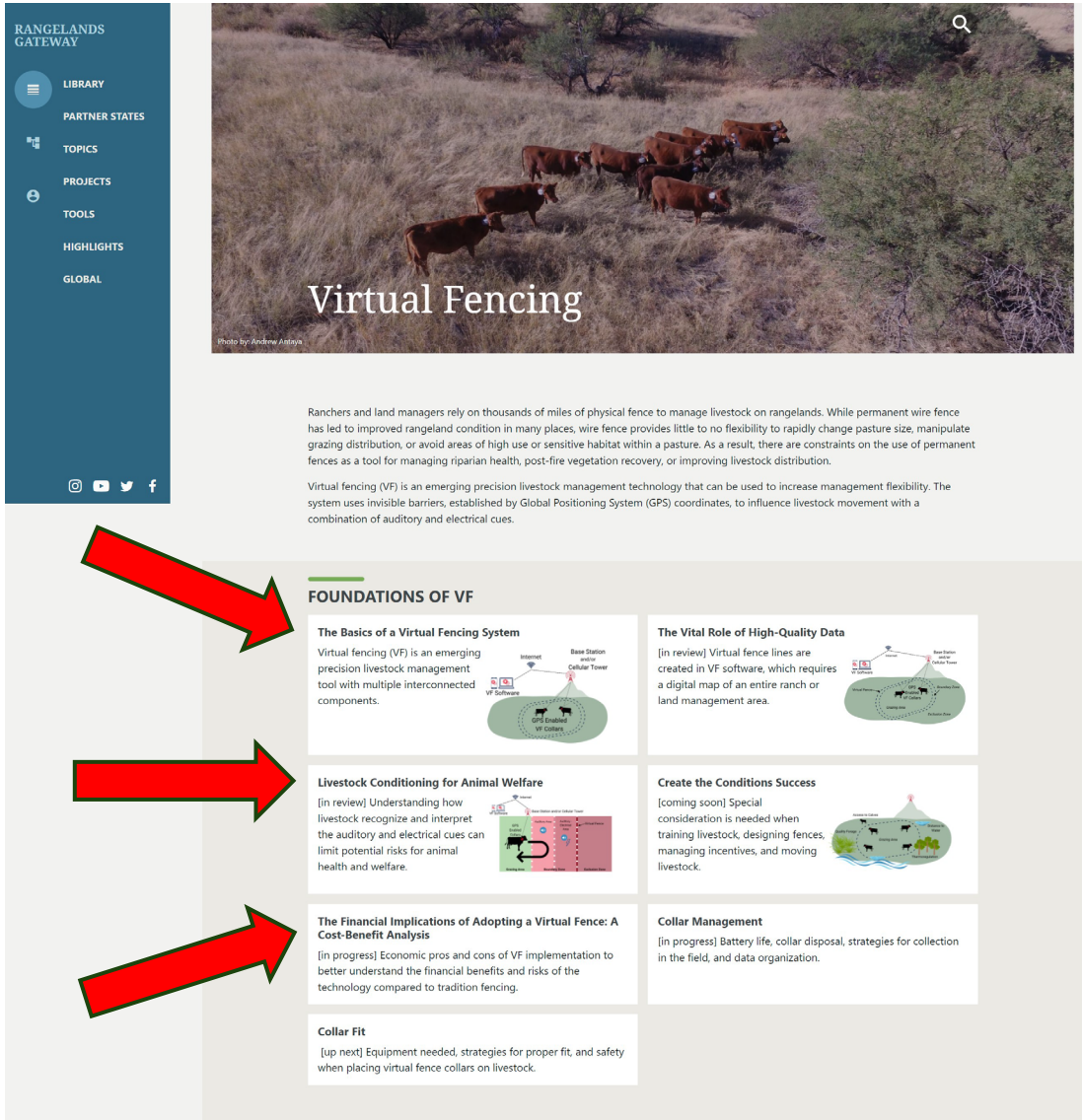
Reduce Use in Sensitive Areas

Image Credit: https://www.gettingmoreontheground.com/2019/06/09/livestock-exclusion-is-it-time-for-the-big-r/

Additional Resources

The Virtual Fence User Guide

https://rangelandsgateway.org/virtual-fence



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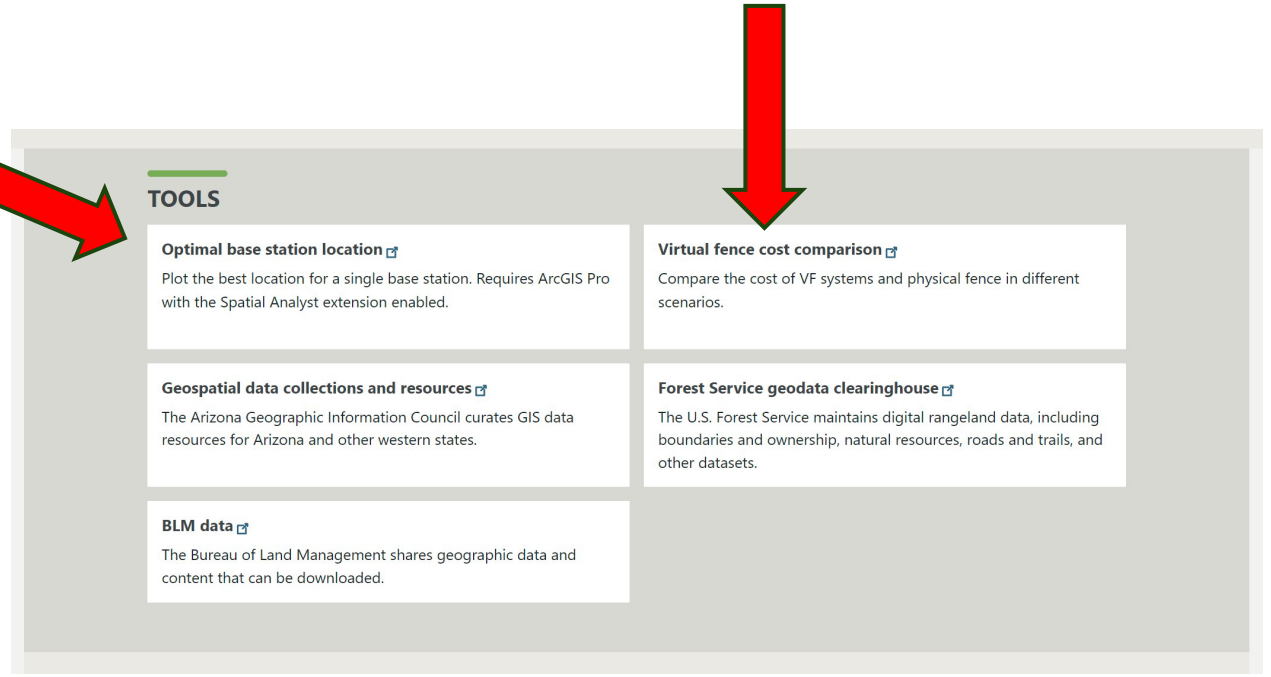

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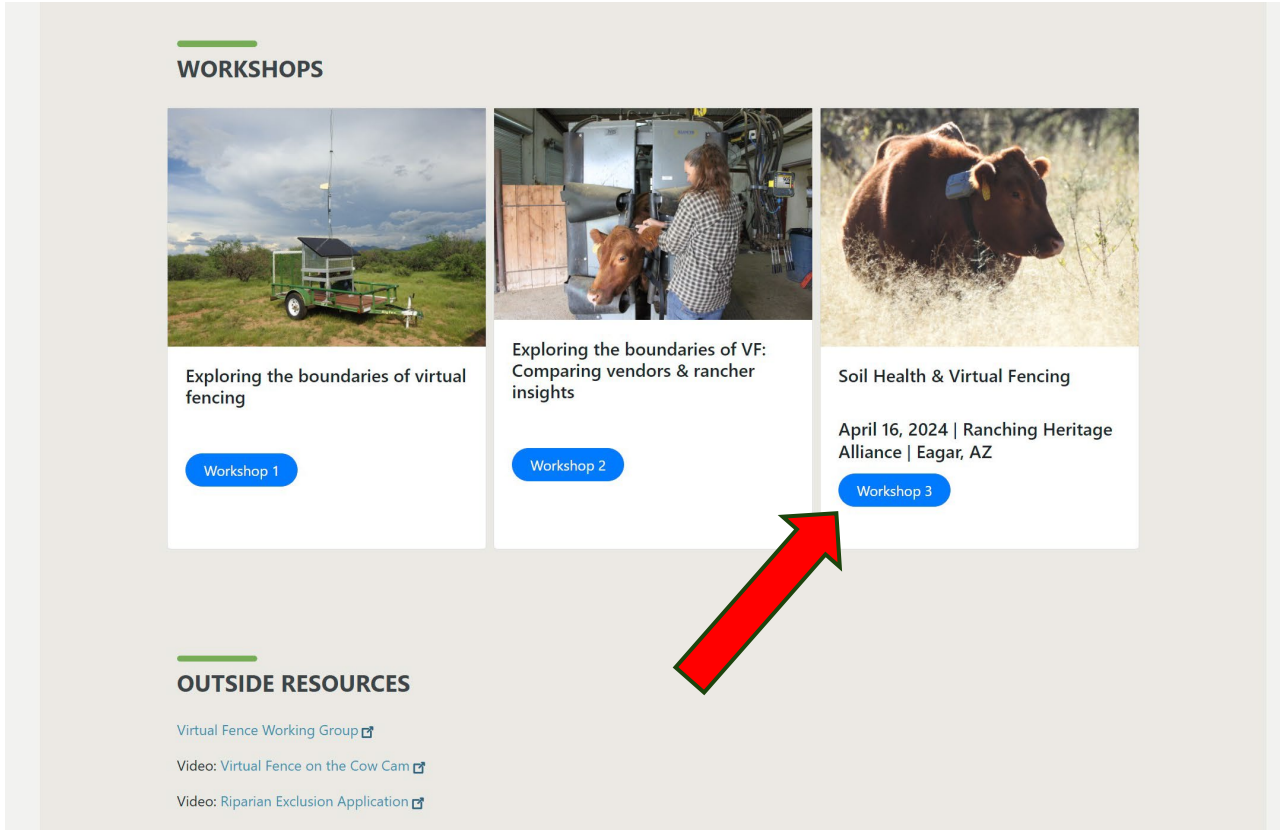

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The University of Arizona

Virtual Fence Program

Supported by

THE UNIVERSITY OF ARIZONA Cooperative Extension
Livestock Extension

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Natural Resources & the Environment

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Sarah Noelle
George Ruyle

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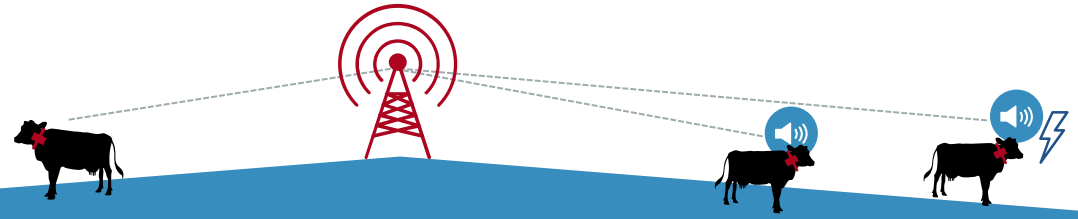

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