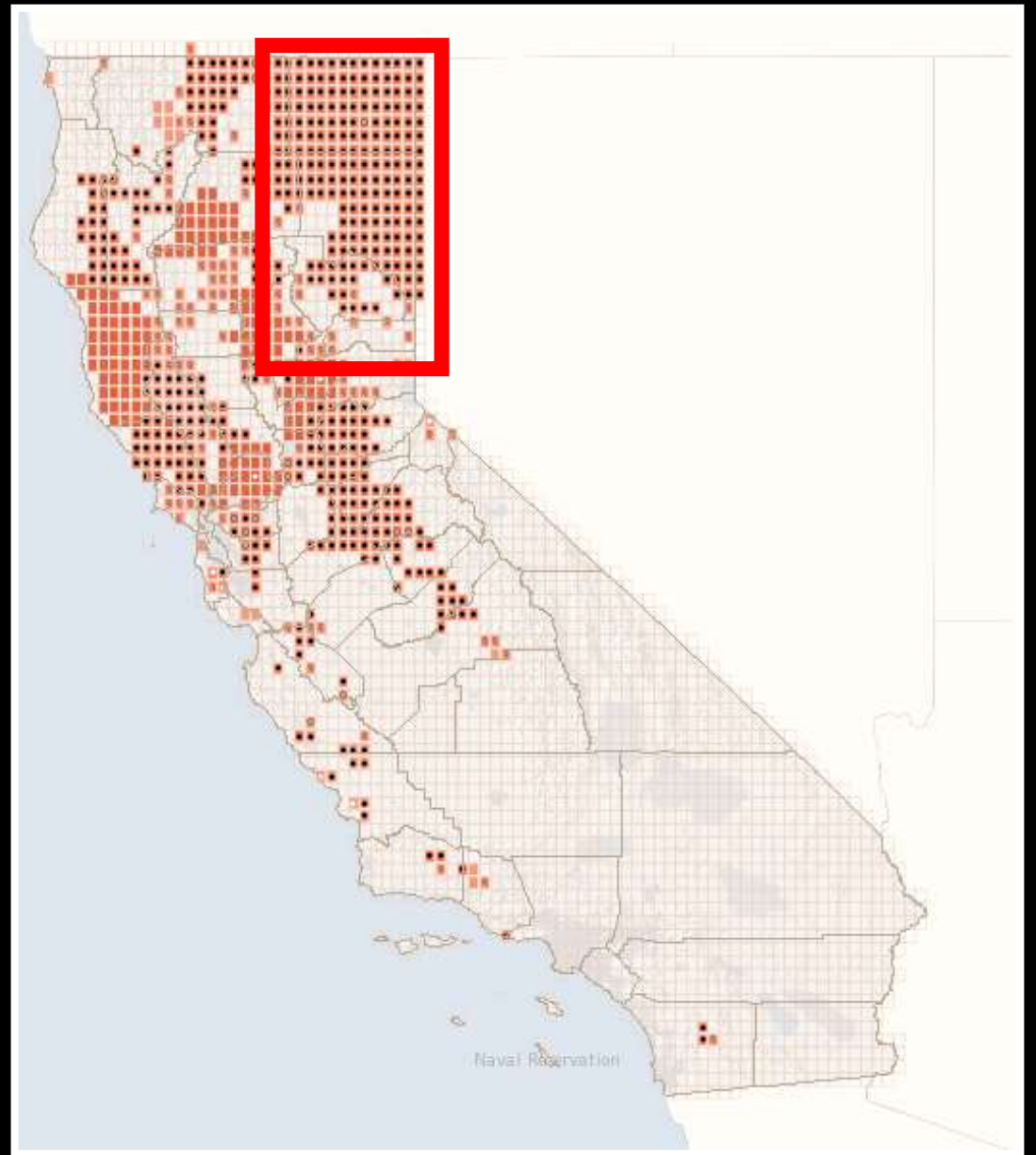


Winter Annual Grass Control: Experiences with Indaziflam in NE California

Tom Getts – UCCE Weed Ecology and Cropping Systems Advisor

Where I work

- Lassen
- Modoc
- Sierra
- Plumas
- Lots of Cows- Not a lot of people
- Invasive Weeds
- Agronomic Pests
- Other Issues



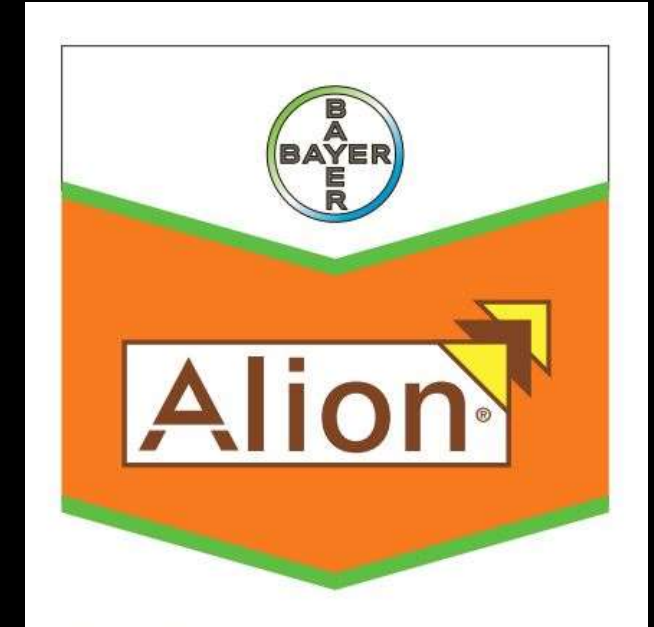
Cal Flora Medusahead Map

Outline

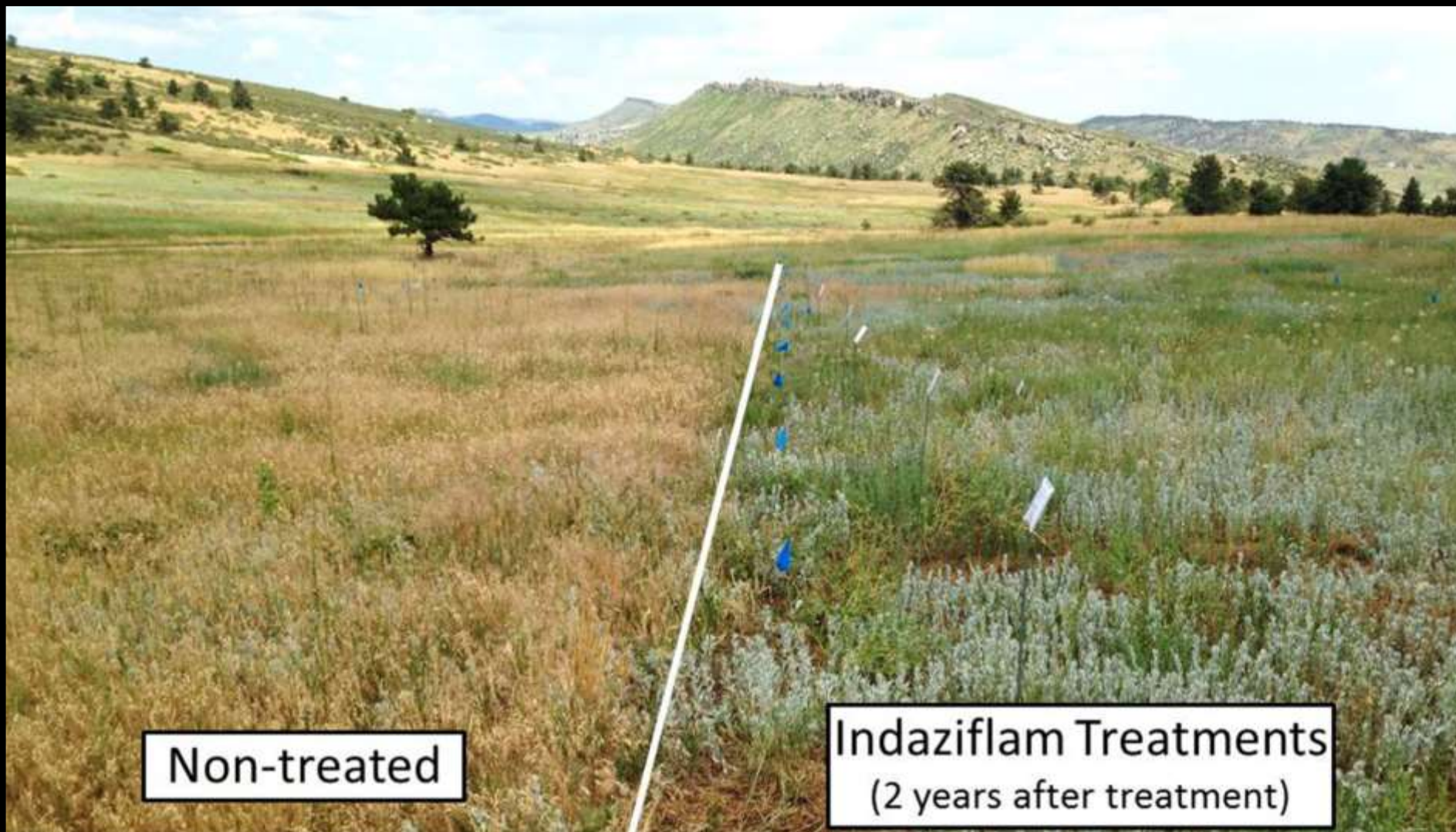
- Indaziflam
- My experiences
 - 2016-2017 trials
 - 2019-2022 trials
 - General take aways

Indaziflam

- Group 29 herbicide
 - Inhibit Cellulose Biosynthesis
- Alion
 - Tree and Vine Market
- Esplanade 200 SC or F
 - Non-Crop, Wildlife/Natural areas
- Marengo
 - Ornamentals
- Spectacle
 - Turf
- Rejuvra
 - Grazing lands
 - 5 oz/acre rate for grazed areas
 - Late 2021



Sebastian et. al. 2017



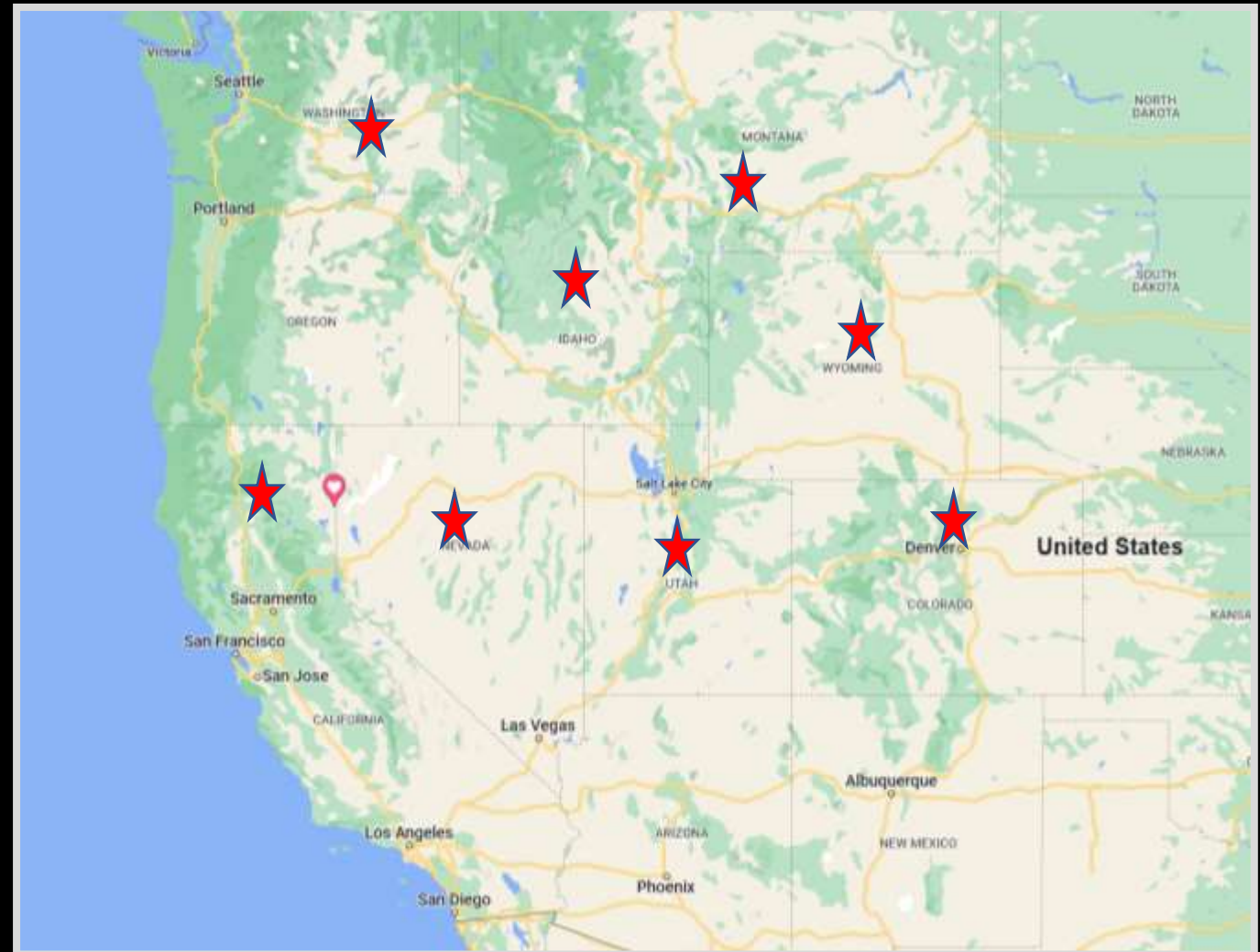
Non-treated

Indaziflam Treatments
(2 years after treatment)

Western Society of Weed Science

- Indaziflam
 - Quick count
 - Presentations Range/Natural Areas

WSWS	
Year	Number Presentations
2018	7
2019	7
2020	4
2021	11
2022	16



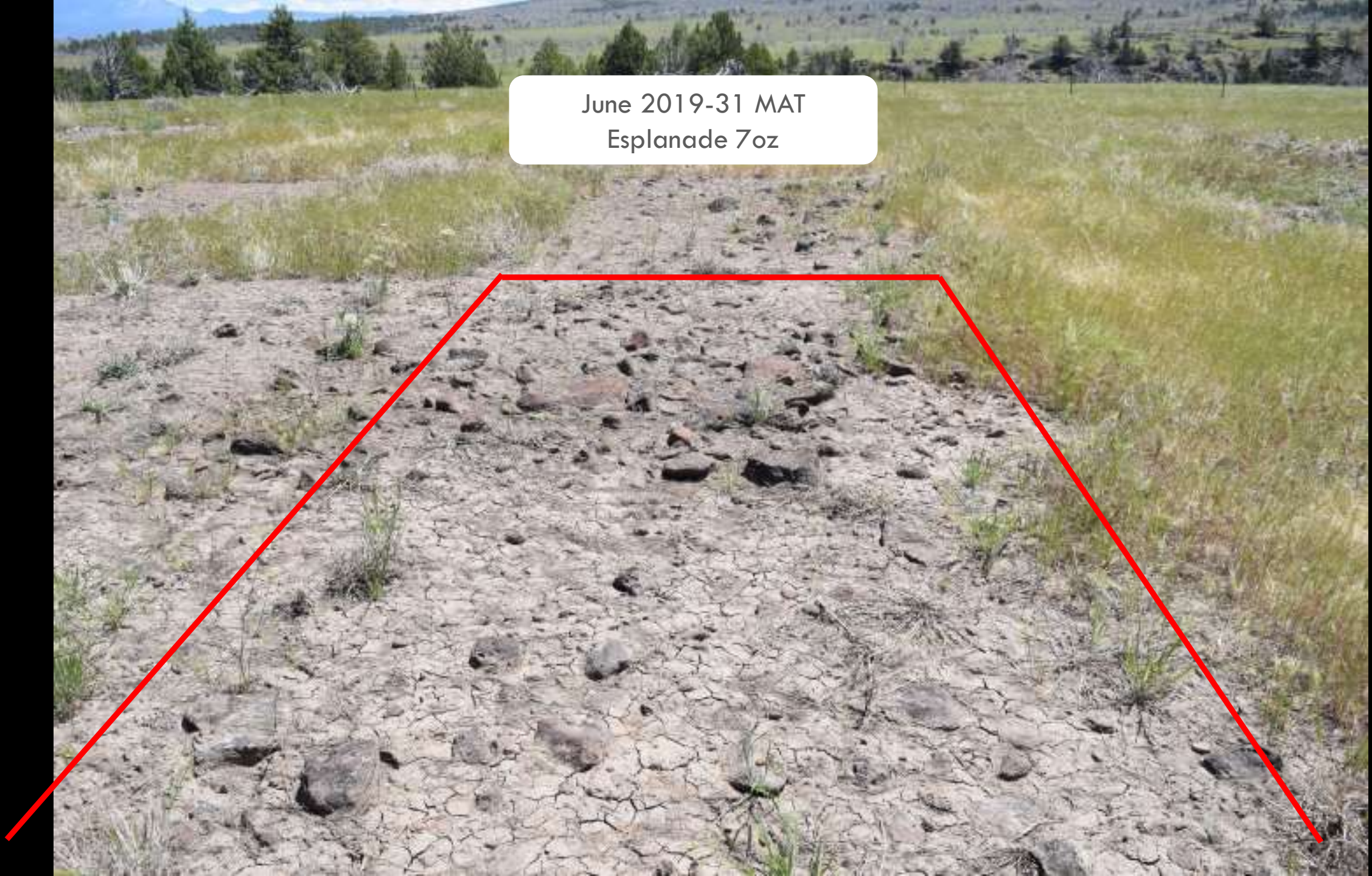
Early CA Trials- CAL IPC 2020

June 2017- 8 MAT
Esplanade 7oz





June 2019-31 MAT
Esplanade 7oz



June 2020 - 43 MAT
Esplanade 7oz +
Weathermax



Spring Method - 8 oz + Esplanade-14 MAT-June 2018



Fall-Method - 8 oz + Esplanade-21 MAT- June 2018





Take home Early Trials

- Good Annual grass control!
- Where desirable perennials established- can release them
- Also will release undesirable perennials....
- Monocultures
 - Bare ground....
 - Erosion!
 - Disturbance
 - Re-establishment?
 - Other weeds can colonize

More Recent Trials

- Sequential Treatments
 - Desirable Perennials
 - Three Sites
- Dryland pasture Case study
- Monitoring Firebreaks Clear Lake

Likely

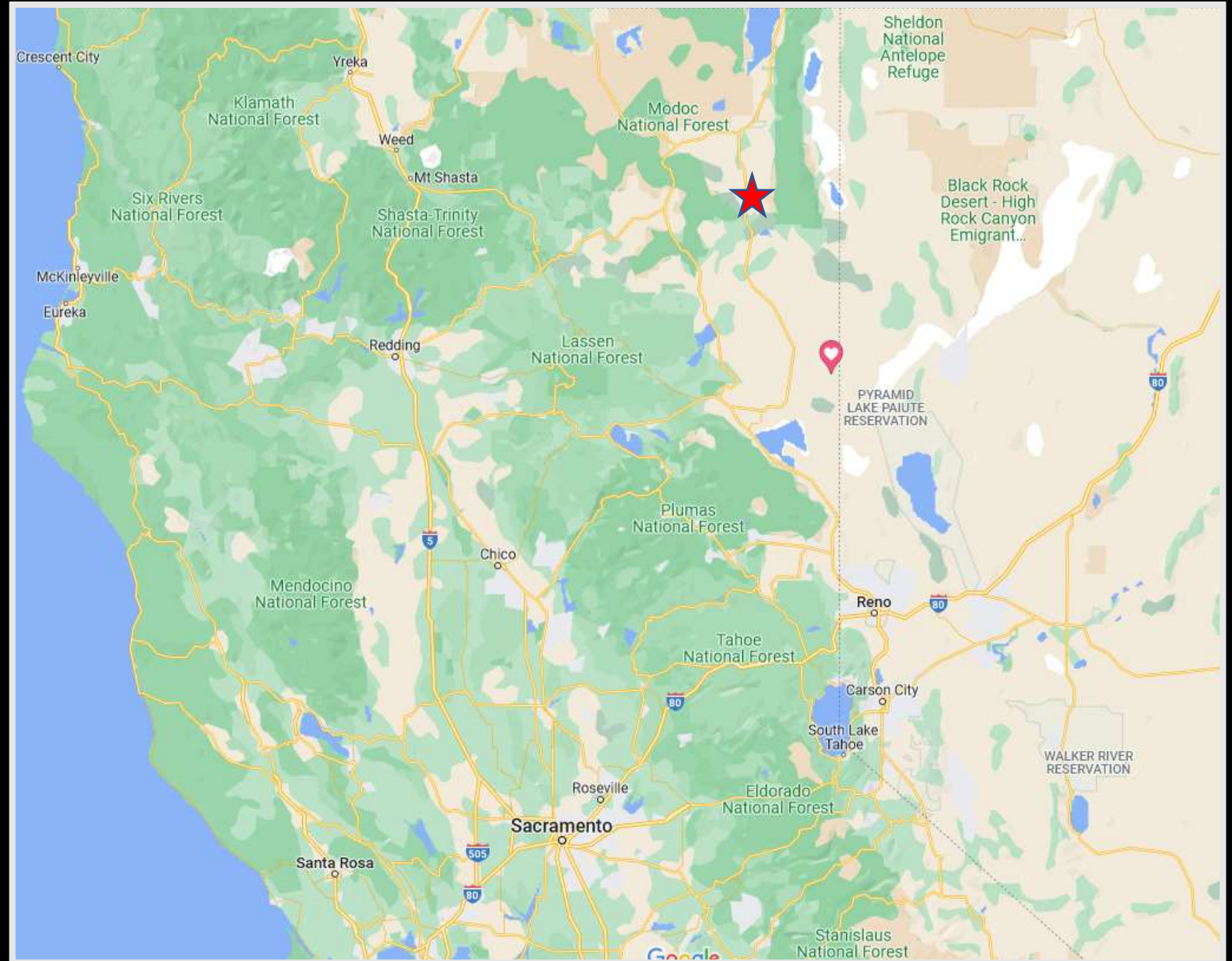
- Applications

- September 2020

- SUPER dry winter

- Little precipitation for incorporation until Nov

- Little spring precipitation



2020 Treatment Likely CA: Medusahead Control

Treatment	2021	Tukey	2022	Tukey
Untreated	0	c		
Milestone Boot-5 oz Spring 2021 and 2022	0	c		
Milestone 14 oz Fall 2020	76	ab		
Matrix 4 oz Fall 2020 and Fall 2021	95	a		
Rejuvra 7oz Fall 2020 and Fall 2021	48	abc		
Rejuvra 7oz Fall 2020	66	ab		
Rejuvra 5 oz Fall 2020 and Fall 2021	74	ab		
Rejuvra 5 oz Fall 2020	45	abc		
Rejuvra 3.5 oz fall 2020 and 3.5 oz spring 2021	40	abc		
Rejuvra 3.5 oz fall 2020	79	ab		

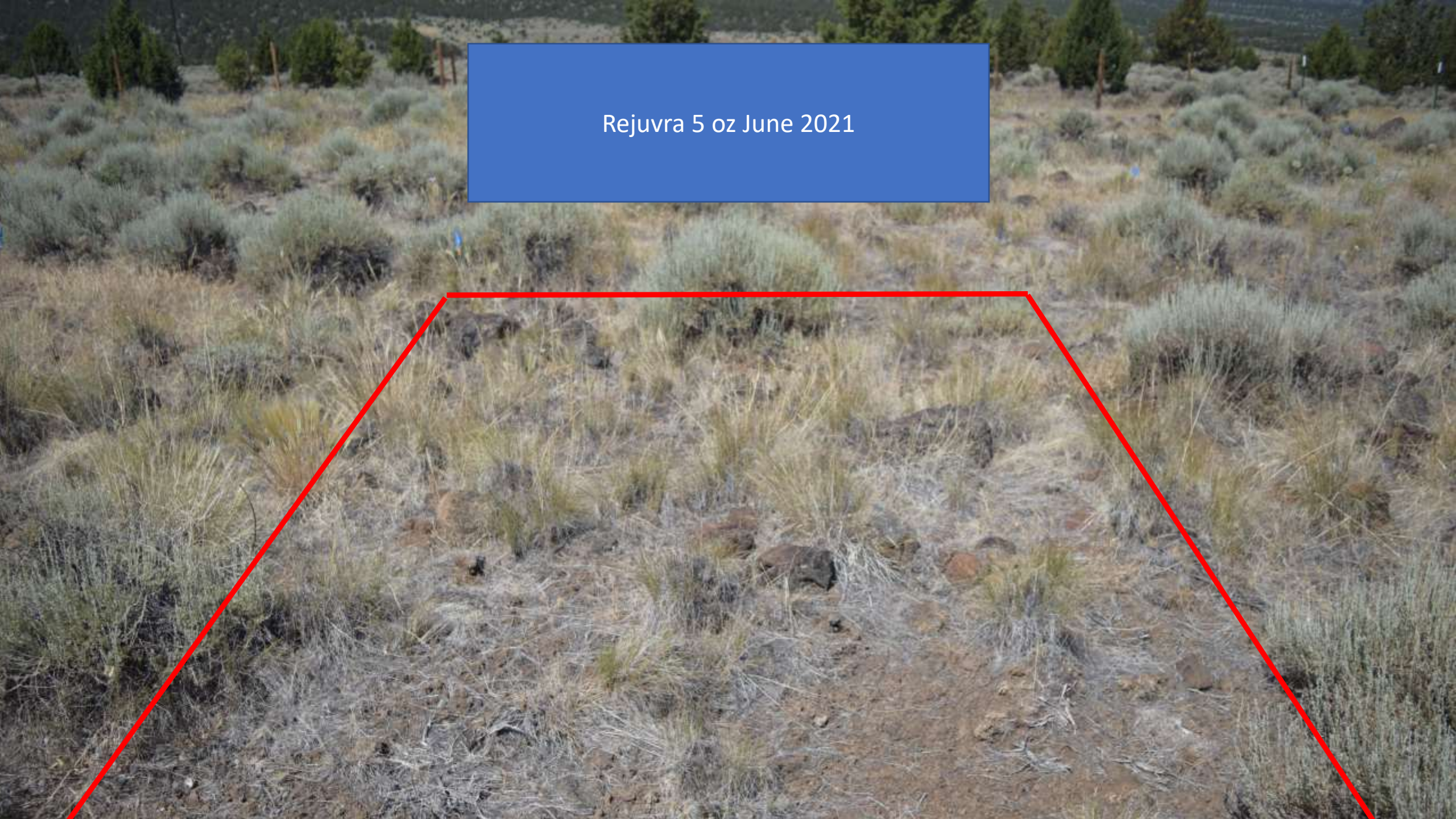
A photograph of a field with a red trapezoidal outline and a blue text box. The field contains dry, yellowish-brown grass and several green, bushy shrubs. In the background, there are more shrubs and a fence line with wooden posts. The text box is blue with white text.

Untreated Check June 2021

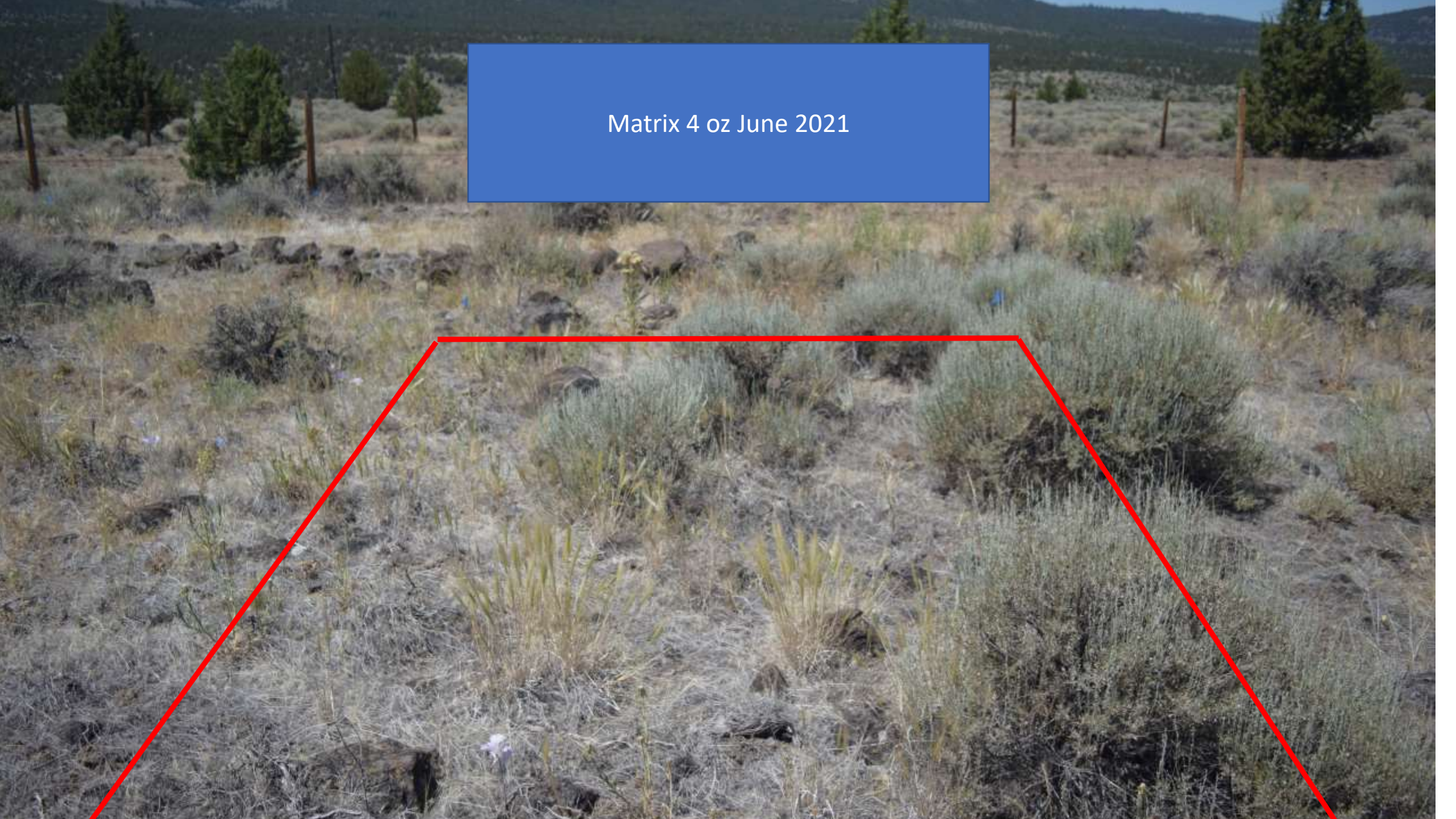
Rejuvra 7 oz June 2021



Rejuvra 5 oz June 2021



Matrix 4 oz June 2021



2020 Treatment Likely CA: Medusahead Control

Treatment	2021	Tukey	2022	Tukey
Untreated	0	c	0	b
Milestone Boot-5 oz Spring 2021 and 2022	0	c	75	a
Milestone 14 oz Fall 2020	76	ab	13	b
Matrix 4 oz Fall 2020 and Fall 2021	95	a	98	a
Rejuvra 7oz Fall 2020 and Fall 2021	48	abc	98	a
Rejuvra 7oz Fall 2020	66	ab	97	a
Rejuvra 5 oz Fall 2020 and Fall 2021	74	ab	97	a
Rejuvra 5 oz Fall 2020	45	abc	76	a
Rejuvra 3.5 oz fall 2020 and 3.5 oz spring 2021	40	abc	74	a
Rejuvra 3.5 oz fall 2020	79	ab	86	a

Miletson 5 oz (2021 and 2022) boot 2022



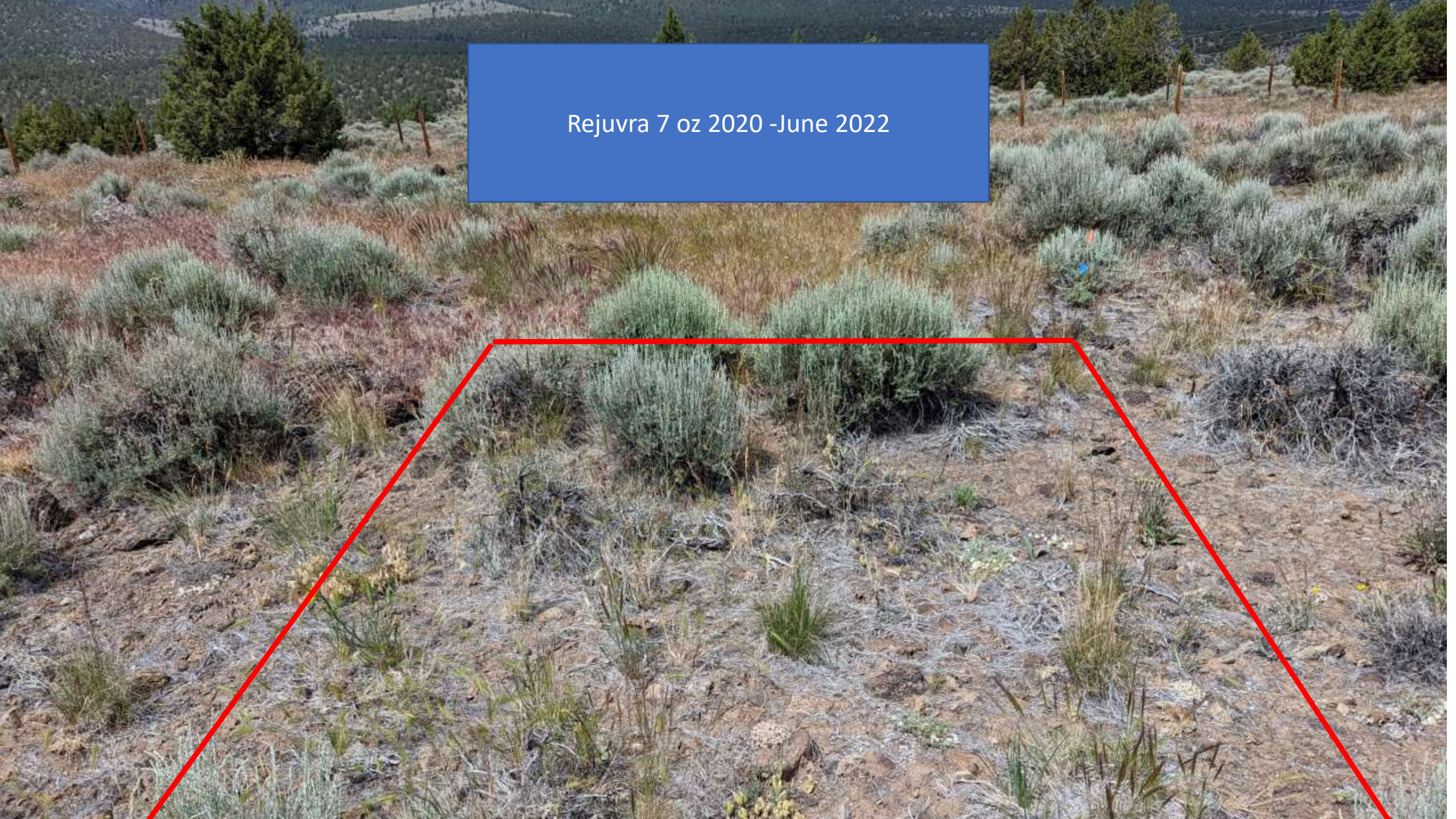
Matrix 4 oz (2020, and 2021) June 2022



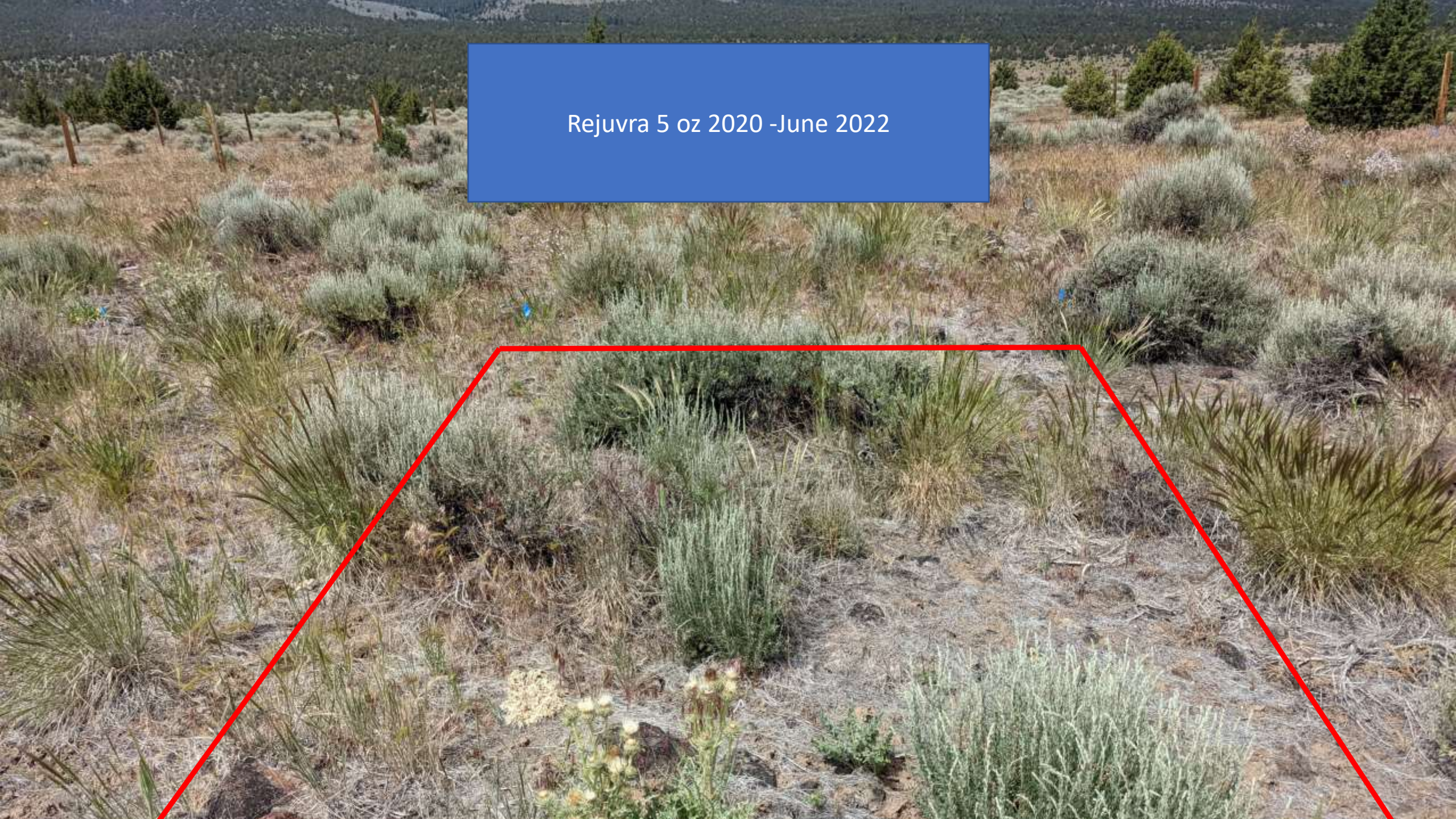
Untreated June 2022



Rejuvra 7 oz 2020 - June 2022



Rejuvra 5 oz 2020 - June 2022





Perennial Grass safety?

- Peter Rice Montana State
 - WSWS 2021
 - “Uprooted perennial grass”
- Wyoming, Colorado No signs....

Rejuvra 5 oz fall 2020 root club





Willow Creek

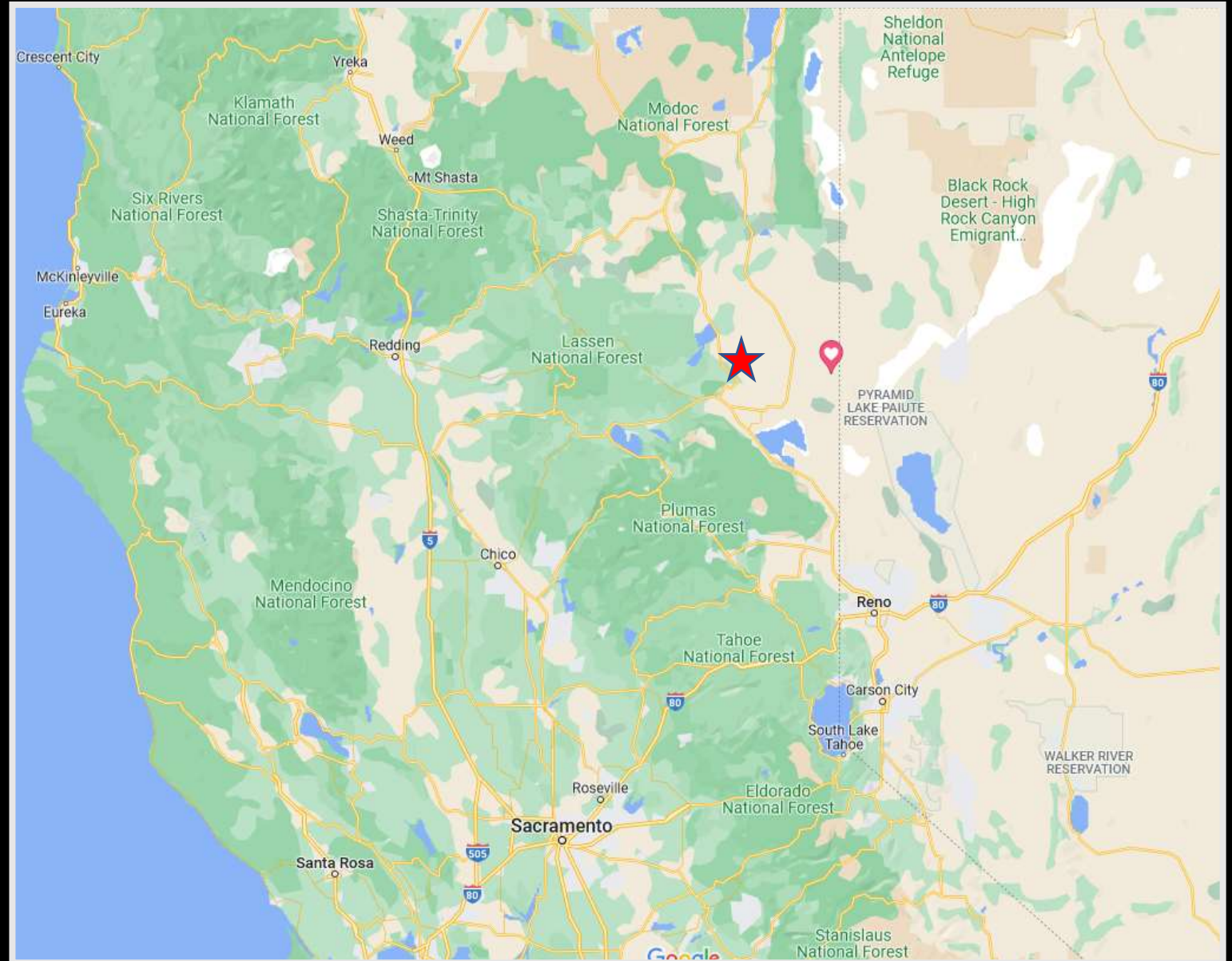
- Applications

- September 2020

- SUPER dry winter

- Little precipitation for incorporation until Nov


- Little spring precipitation



Medusahead Control				
Treatment	2021	Tukey	2022	Tukey
Untreated	0	c	[Blue shaded area]	
Milestone Boot-5 oz Spring 2021 and 2022	15	c		
Milestone 14 oz Fall 2020	71.25	b		
Matrix 4 oz Fall 2020 and Fall 2021	100	a		
Rejuvra 7oz Fall 2020 and Fall 2021	90	ab		
Rejuvra 7oz Fall 2020	91.25	ab		
Rejuvra 5 oz Fall 2020 and Fall 2021	85	ab		
Rejuvra 5 oz Fall 2020	82.5	ab		
Rejuvra 3.5 oz Fall 2020 and 3.5 oz Spring 2021	90	ab		
Rejuvra 3.5 oz Fall 2020	87.5	ab		

Untreated June 2021



A photograph of a rocky, sparsely vegetated landscape. The ground is covered with dark, irregularly shaped rocks of various sizes, interspersed with dry, light-colored grasses and small, green, scrubby plants. A blue rectangular text box is positioned in the upper center of the image, containing the text "Rejuvra 7 oz June 2021". Two red lines extend from the corners of this text box, forming a wide, shallow V-shape that points downwards towards the bottom edge of the frame. The background shows a continuation of the rocky terrain under a clear sky.

Rejuvra 7 oz June 2021

Rejuvra 7 oz June 2021



Medusahead Control

Treatment	2021	Tukey	2022	Tukey
Untreated	0	c	15	c
Milestone Boot-5 oz Spring 2021 and 2022	15	c	21.25	c
Milestone 14 oz Fall 2020	71.25	b	59	b
Matrix 4 oz Fall 2020 and Fall 2021	100	a	100	a
Rejuvra 7oz Fall 2020 and Fall 2021	90	ab	100	a
Rejuvra 7oz Fall 2020	91.25	ab	100	a
Rejuvra 5 oz Fall 2020 and Fall 2021	85	ab	100	a
Rejuvra 5 oz Fall 2020	82.5	ab	92.5	a
Rejuvra 3.5 oz Fall 2020 and 3.5 oz Spring 2021	90	ab	97	a
Rejuvra 3.5 oz Fall 2020	87.5	ab	97.5	a

Untreated June 2022



Rejuvra 7 oz June 2021



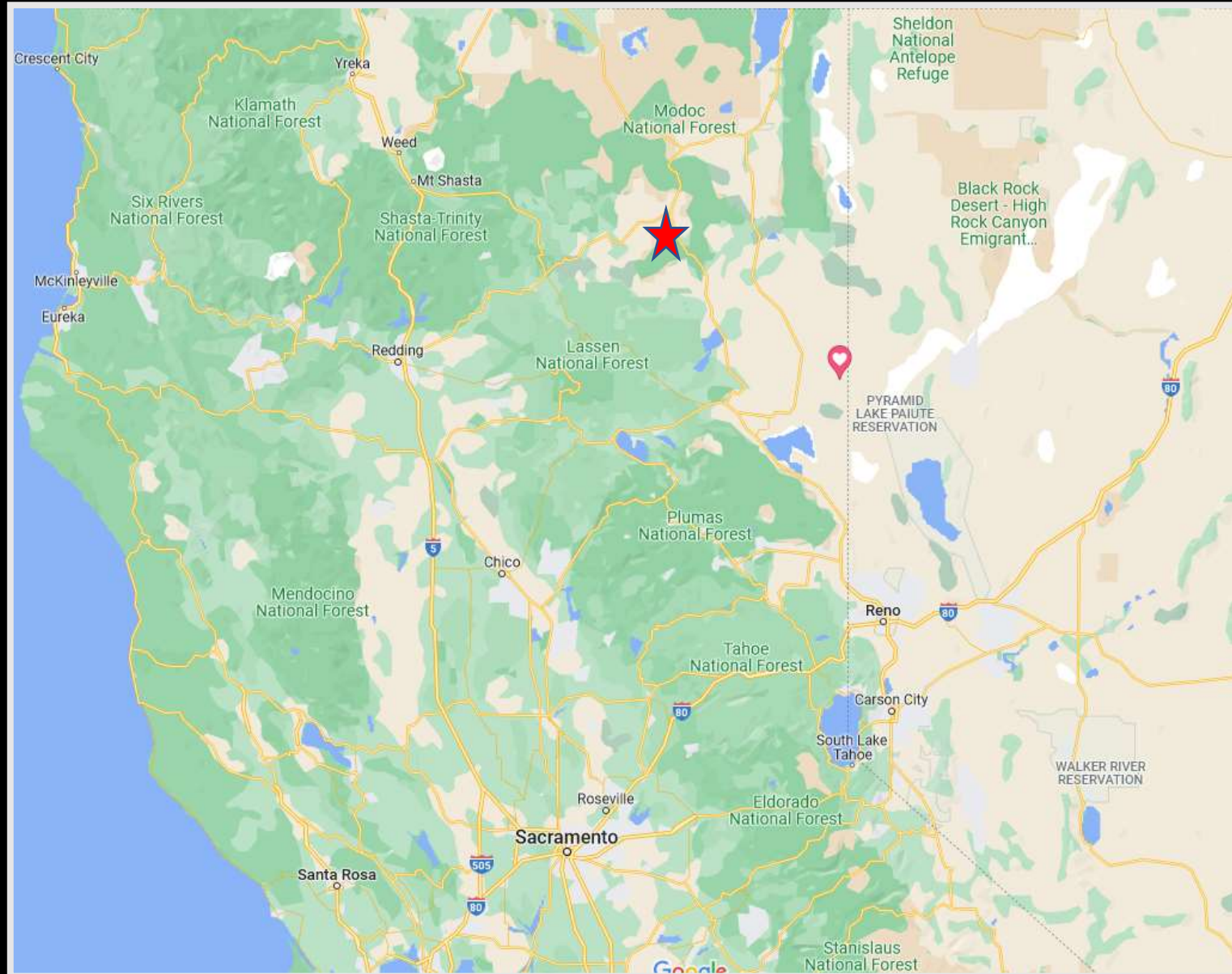






Dryland Pasture

- Applied September 2020
- Wetter Location
- Alfalfa and Bromegrass
- VERY dry year



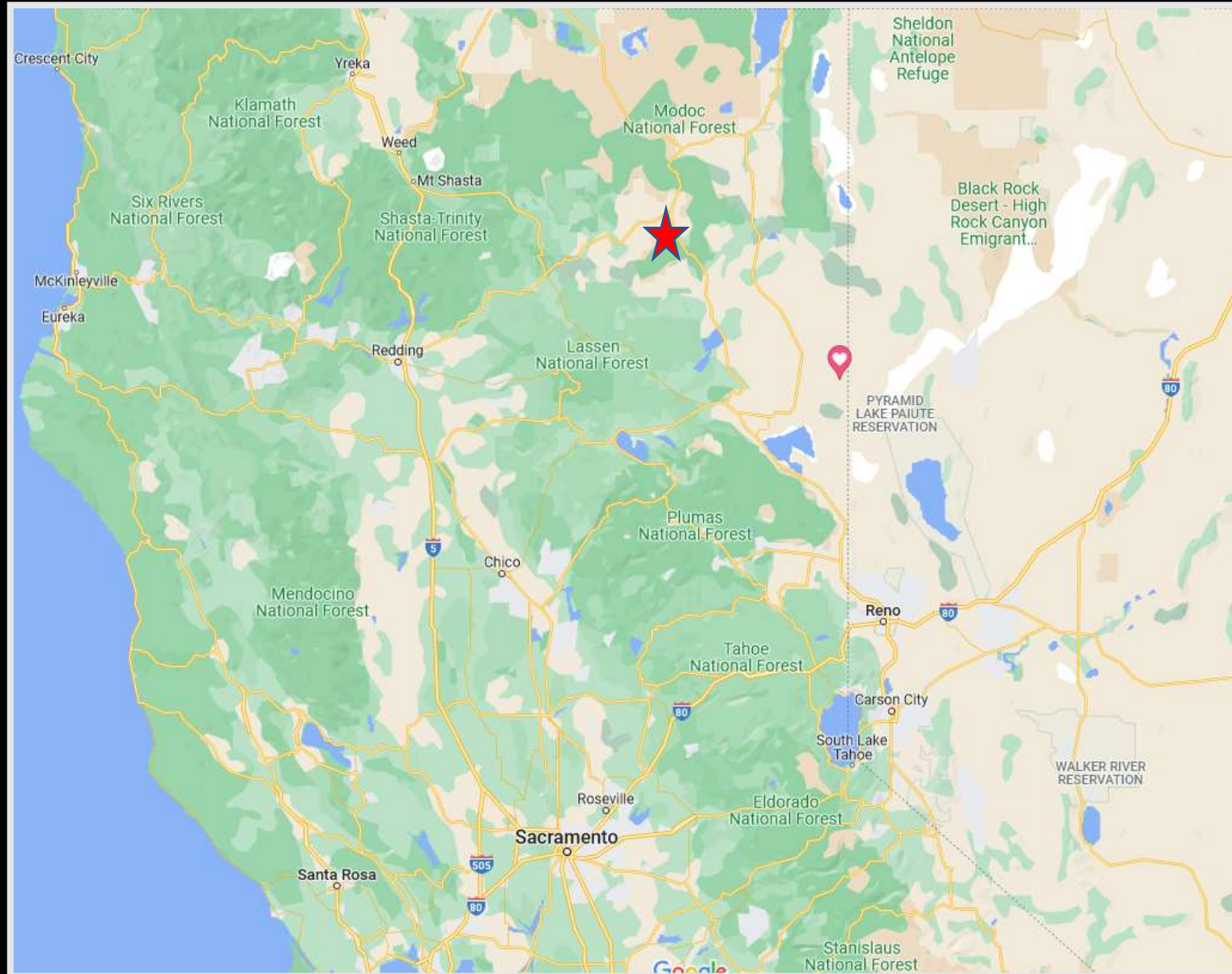
Dryland Pasture

- Released
Perennials



Dryland Pasture

- 2021
- Wetter year
 - (still dry)
 - Had some spring rain
 - Cool April and May



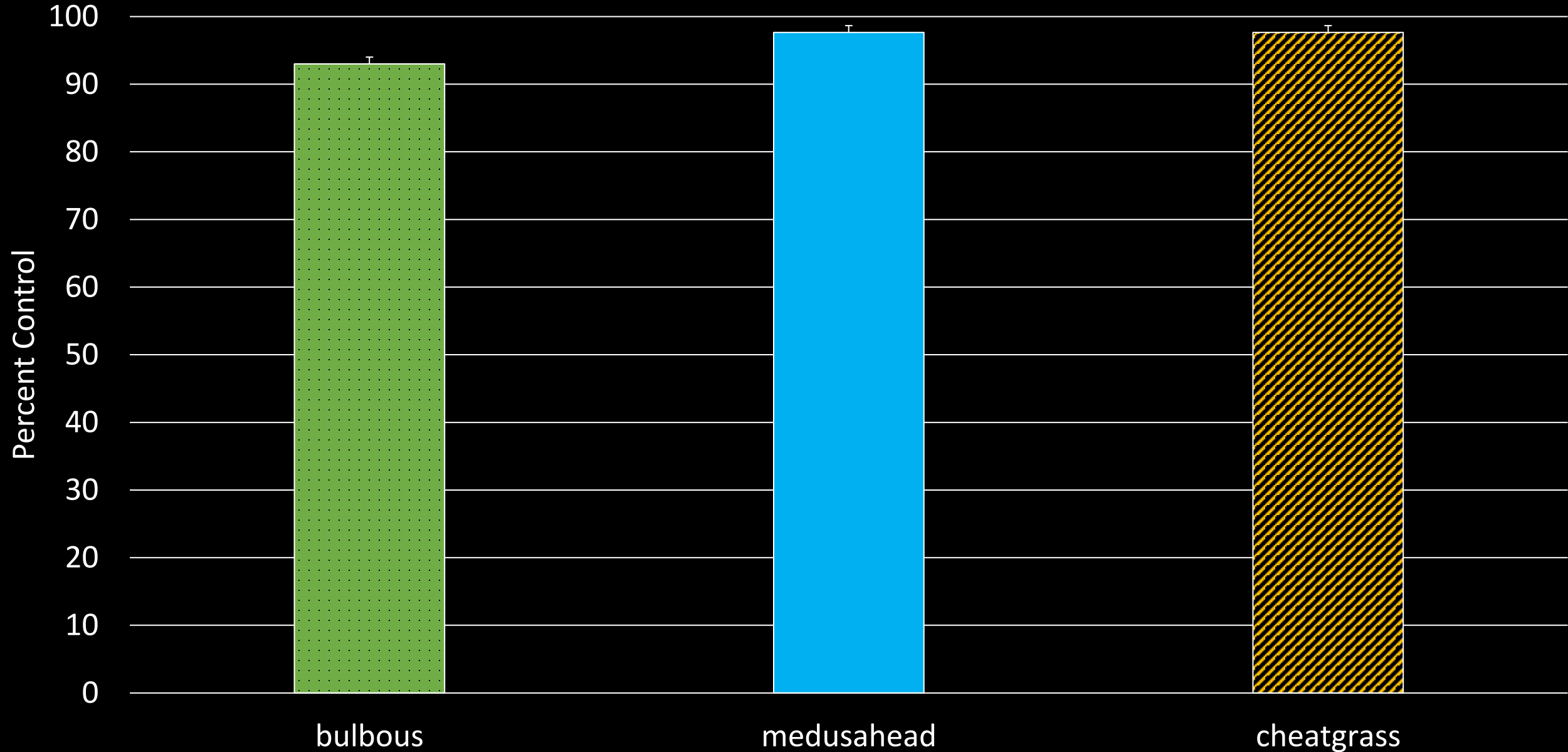




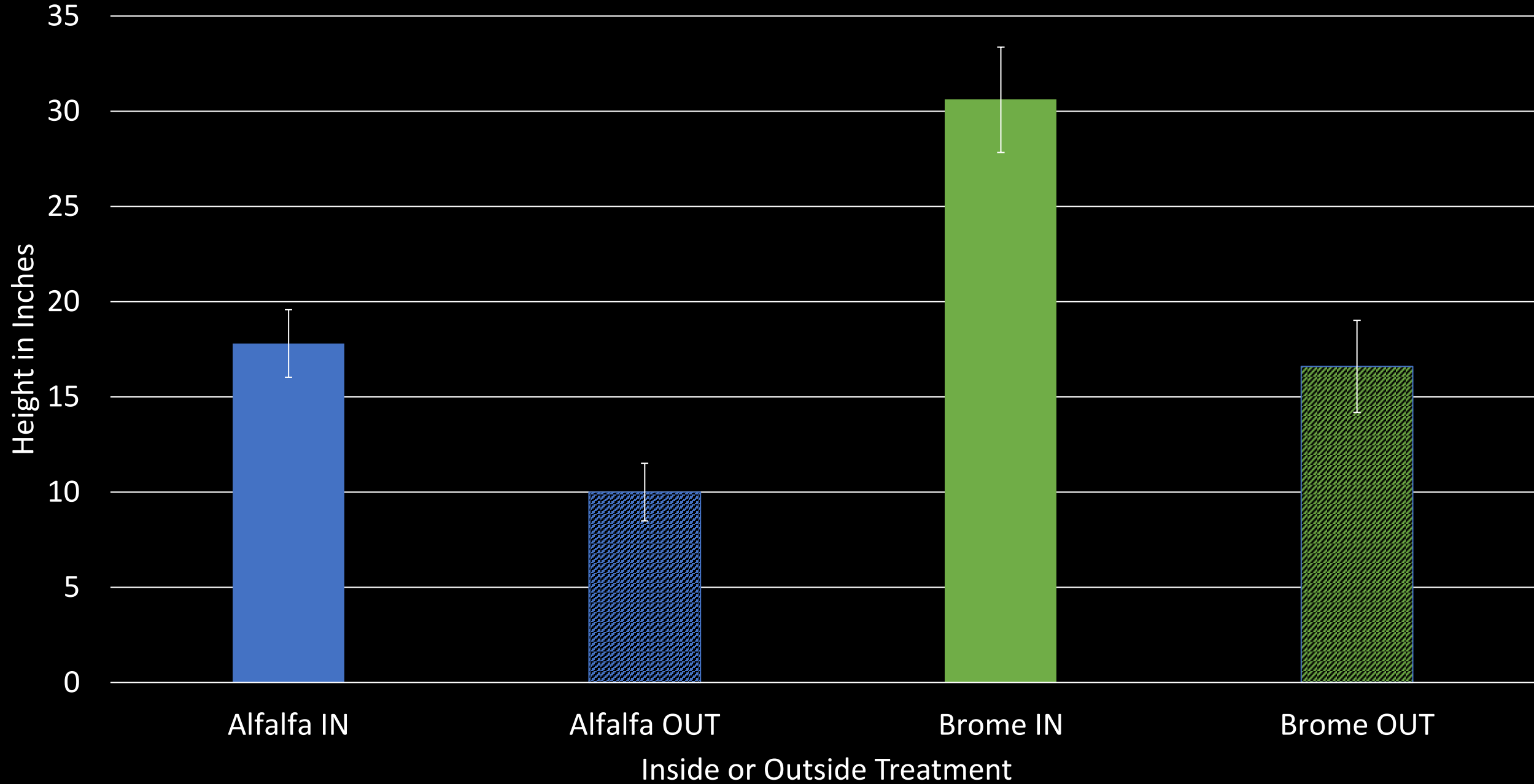


Undesirable Grass Control Two Years after Treatment

bulbous medusahead cheatgrass

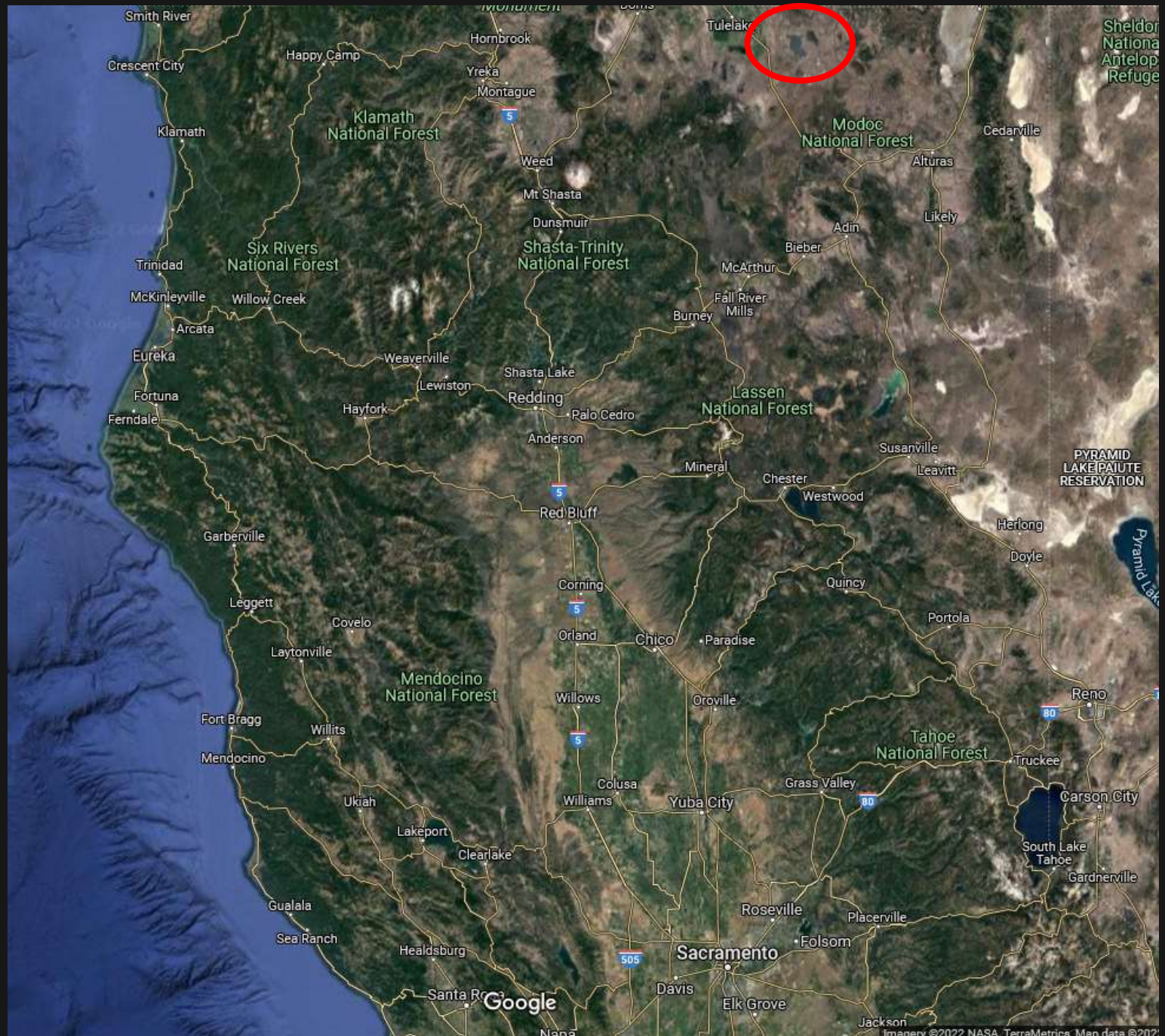


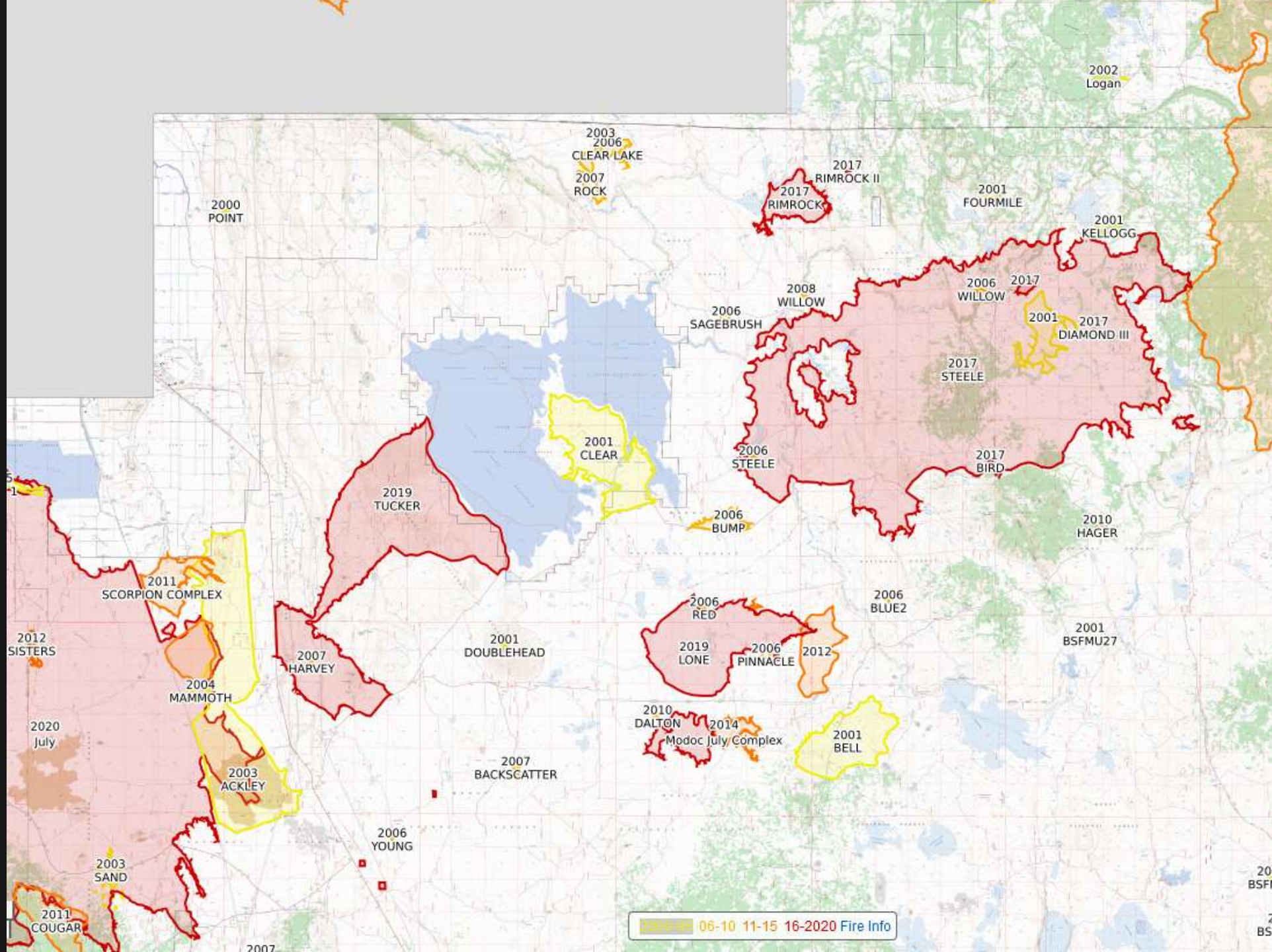
Plant Height Two Years After Treatment



Clear Lake National Wildlife Refuge

- Sage grouse
 - Declining populations
 - Invasive annuals
- Large Priority





Boulder County

Photo
Courtesy
of
Western
IPM
Center



Jim Sebastian shows where he sprayed long-acting herbicide for cheatgrass control

June 2019 - 31 MAT
Esplanade 7oz





Clear Lake

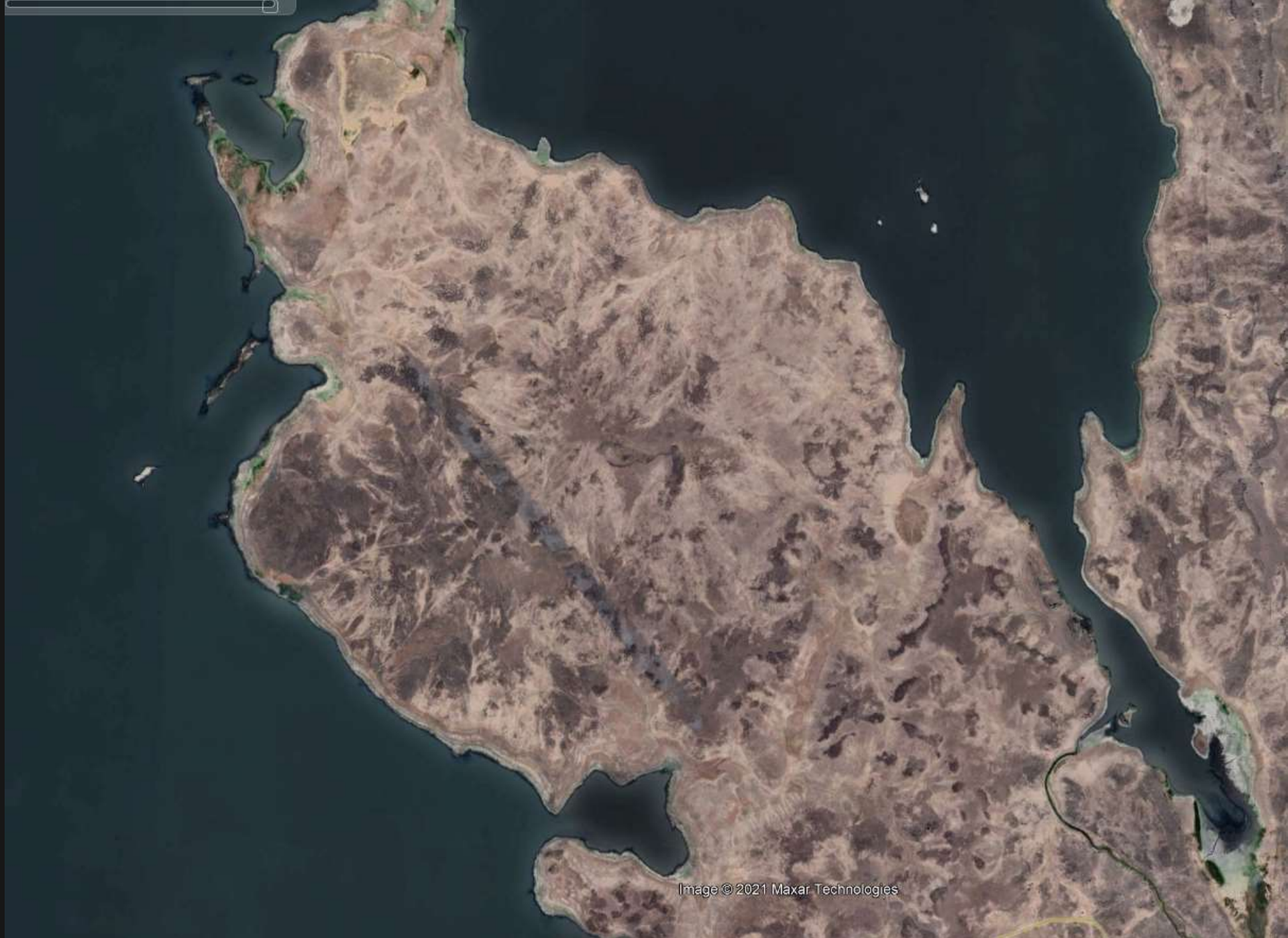
- 2019 Fire Break
 - Rimsulfuron + Indaziflam
 - Post

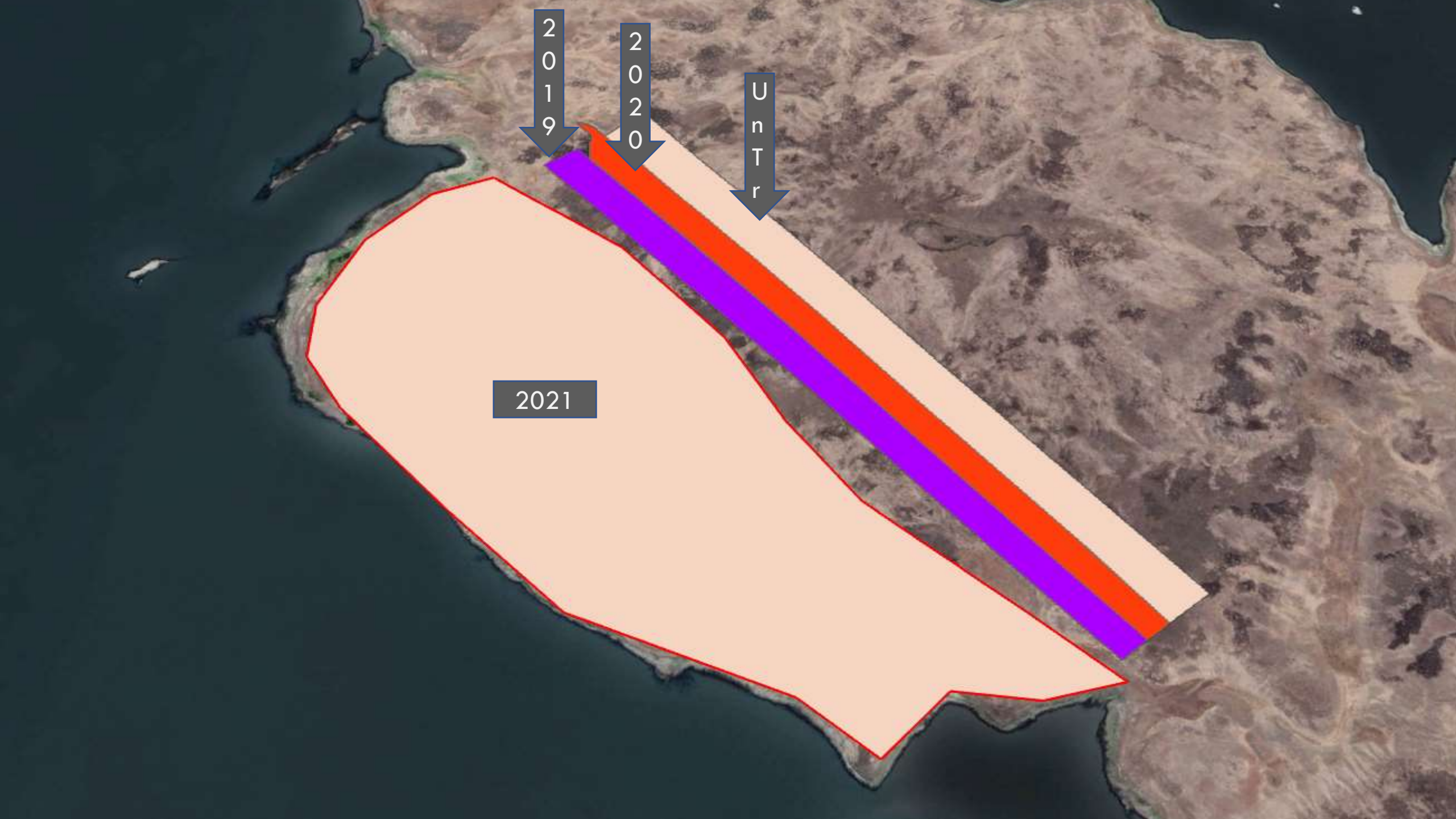




Clear Lake

- 2019 Fire Break
 - Rimsulfuron + Indazifalm
 - Post
- 2020 Fire Break
 - Indazifalm
 - Pre?
- 2021
 - Indaziflam
 - Pre?
 - Intact Sage





2019

2020

UnTr

2021

Transects

- 10 in each treatment
 - 2019, 2020, 2021, Untreated
- Random Orientation
- Random Placement
 - 50 meters from edge of treatments
- Species Richness
 - 30m*6meter
- Cover
 - 10 1m² Quadrats
 - Every 3 meters





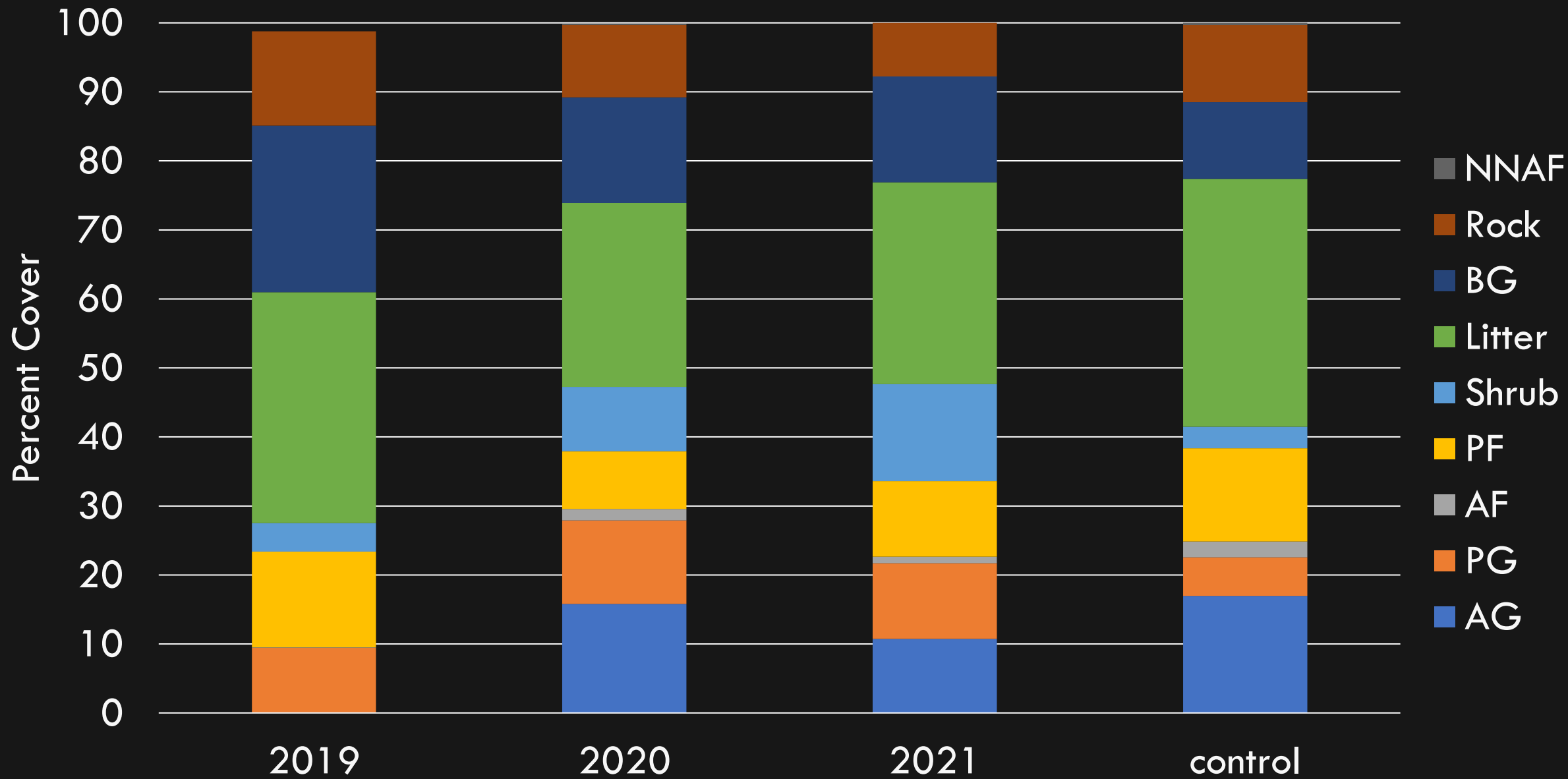




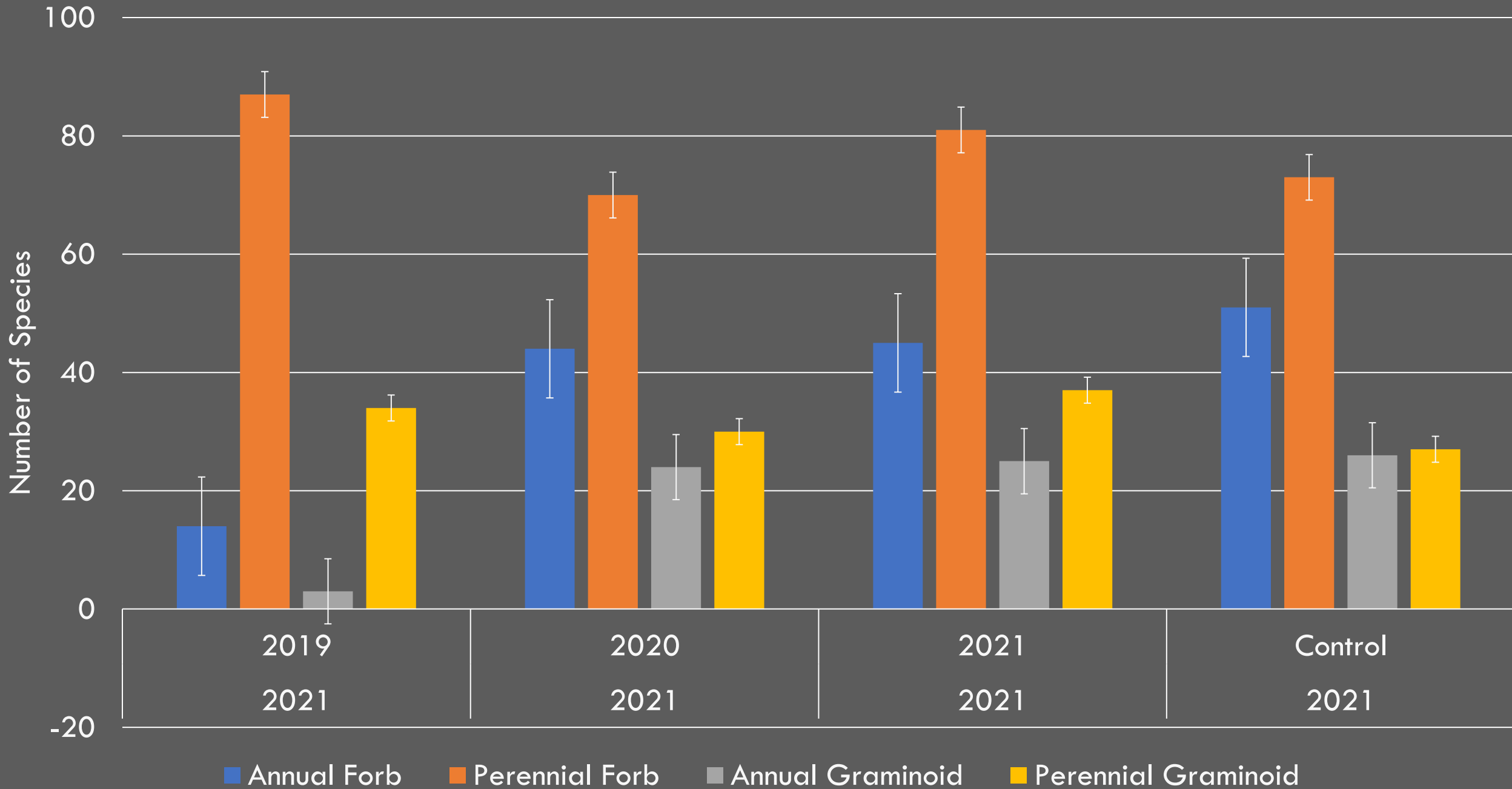
2020?

- Wasn't sure what was sprayed....
- Dry Year
- Incorporation??
 - My plots didn't look that good

Percent Cover By Species Class in 2021



Number of Species 2021



Perennial Grass safety?

- Peter Rice Montana State
 - WSWS 2021
 - “uprooted perennial grass”
- Wyoming, Colorado No signs....





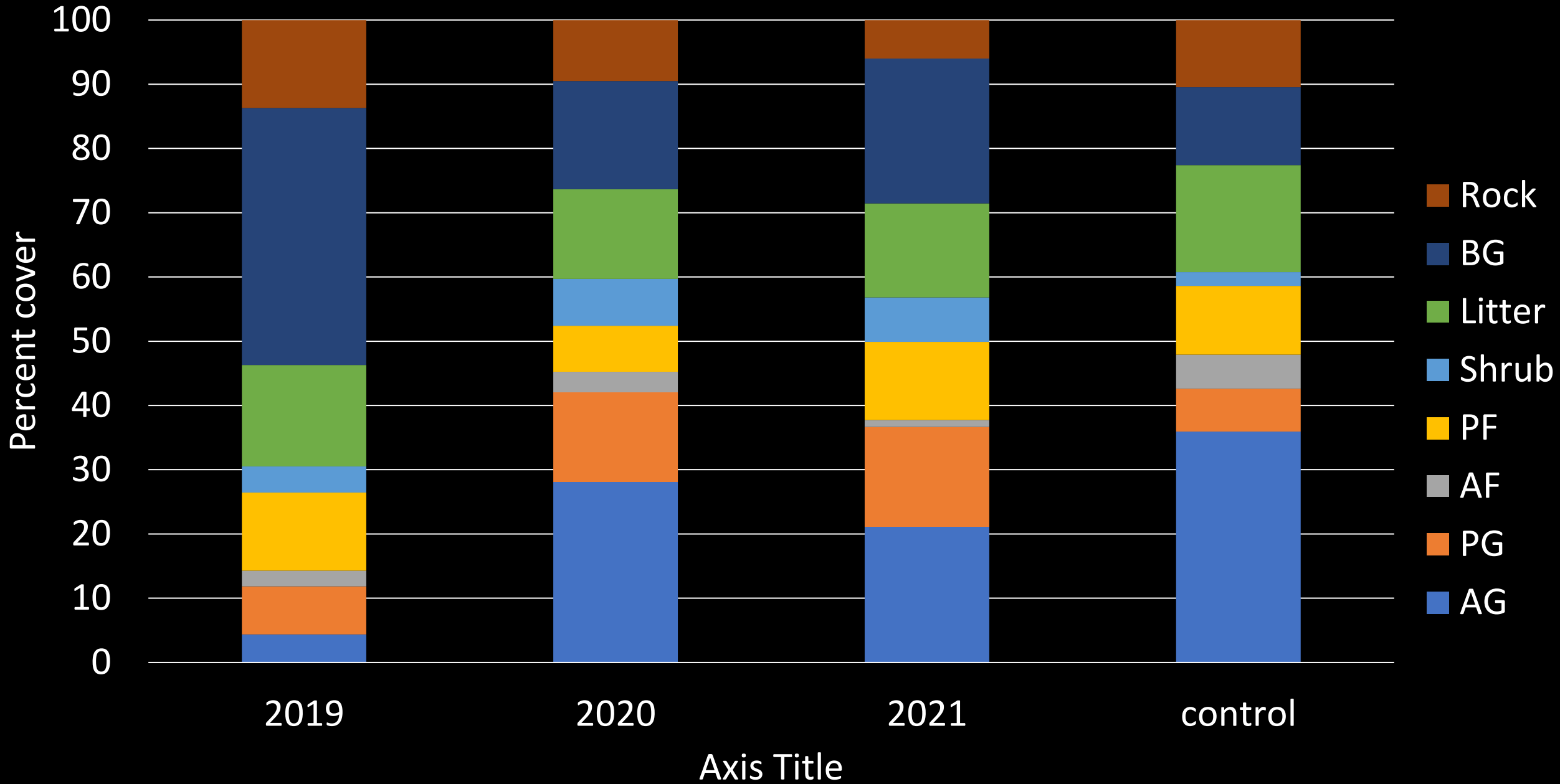




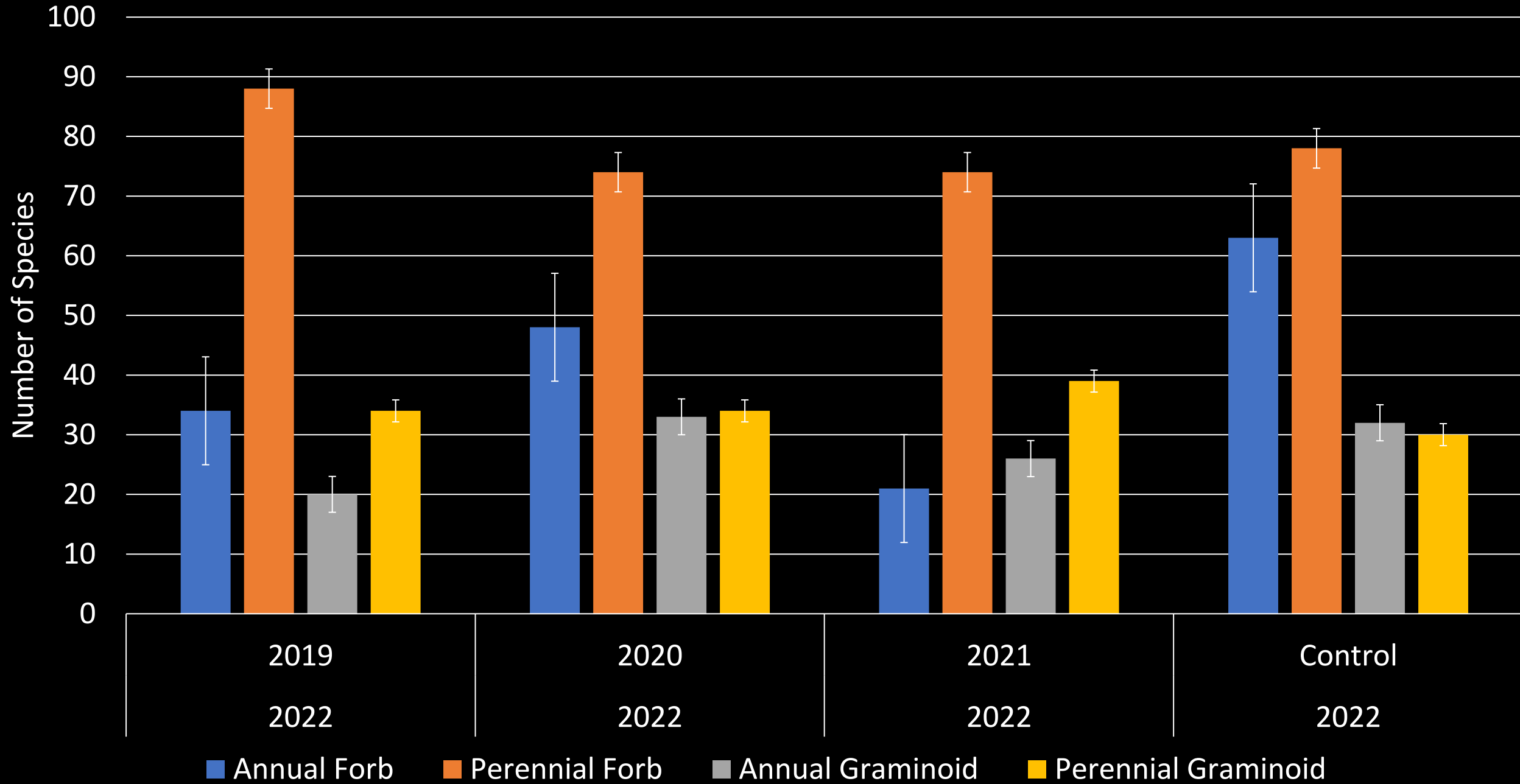
Only Saw Uprooted Grasses in 2019 Treatment

Rejuvra + Matrix

Clear Lake Percent Cover 2022



Number of Species 2022



2021
trt



2020
trt



2019
trt



2019
trt





Date

6-7-72

Plot ID

2011-24

Observer

W. J. S. S.

meters

	Grass	Shrub	Litter
3			5
6			5
9			5
12			
15	20		26
18			
21			
24			



Thoughts on Indaziflam

- Excellent multi year annual grass control
 - BUT has to be applied PRE
 - 2020 treatments? (incorporation?/dry conditions?)
- Bare ground a real possibility
- Can release perennials but will kill many annuals
 - Good safety?
 - Yes and no
- Powerful tool
 - Firebreaks
 - Roadside
 - Established perennials (small strips first?)

Questions?

- Tom Getts
- 530-251-2650
- tjgetts@ucanr.edu

