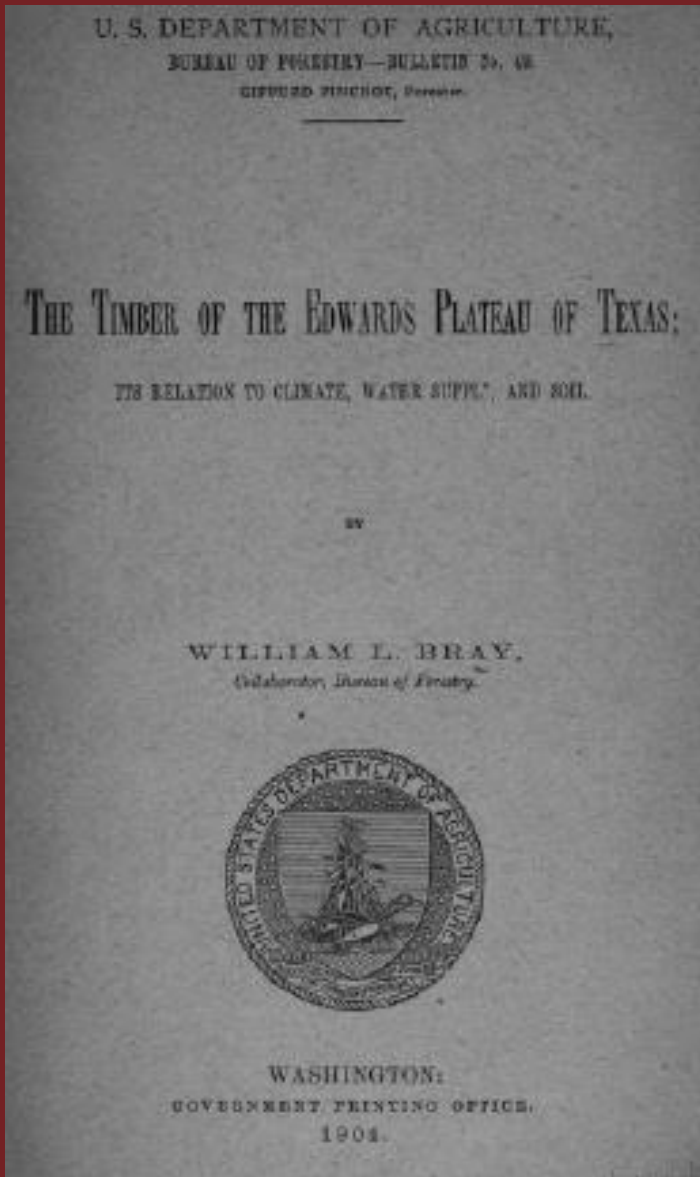




**NEW CHEMISTRIES FOR
WEED & BRUSH
CONTROL
ON RANGELAND**

*Morgan Treadwell
Associate Professor
Extension Range
Specialist*

THE TIMBER OF THE EDWARDS PLATEAU OF TEXAS 1904



TRANSFORMATION OF PRAIRIE INTO TIMBERLAND.

It is of fundamental importance to note that the type of vegetation in this region is undergoing a change. This change, broadly indicated, consists in a transition from grass to woody growth. This transition is very apparent even to the casual observer. Everyone has observed how the mesquite captures the open pastures (Pl. IV, fig. 2), and many have watched the scrub oak timber occupy uplands that formerly were open prairies.

THE SPREAD OF MESQUITE AND CHAPARRAL.

By no means the least striking phenomenon in this campaign of encroachment of timber upon prairie land has been the spread of the mesquite over the cattle country. Mesquite is essentially an occupant of flat prairie lands; hence its extension in the hill country proper is

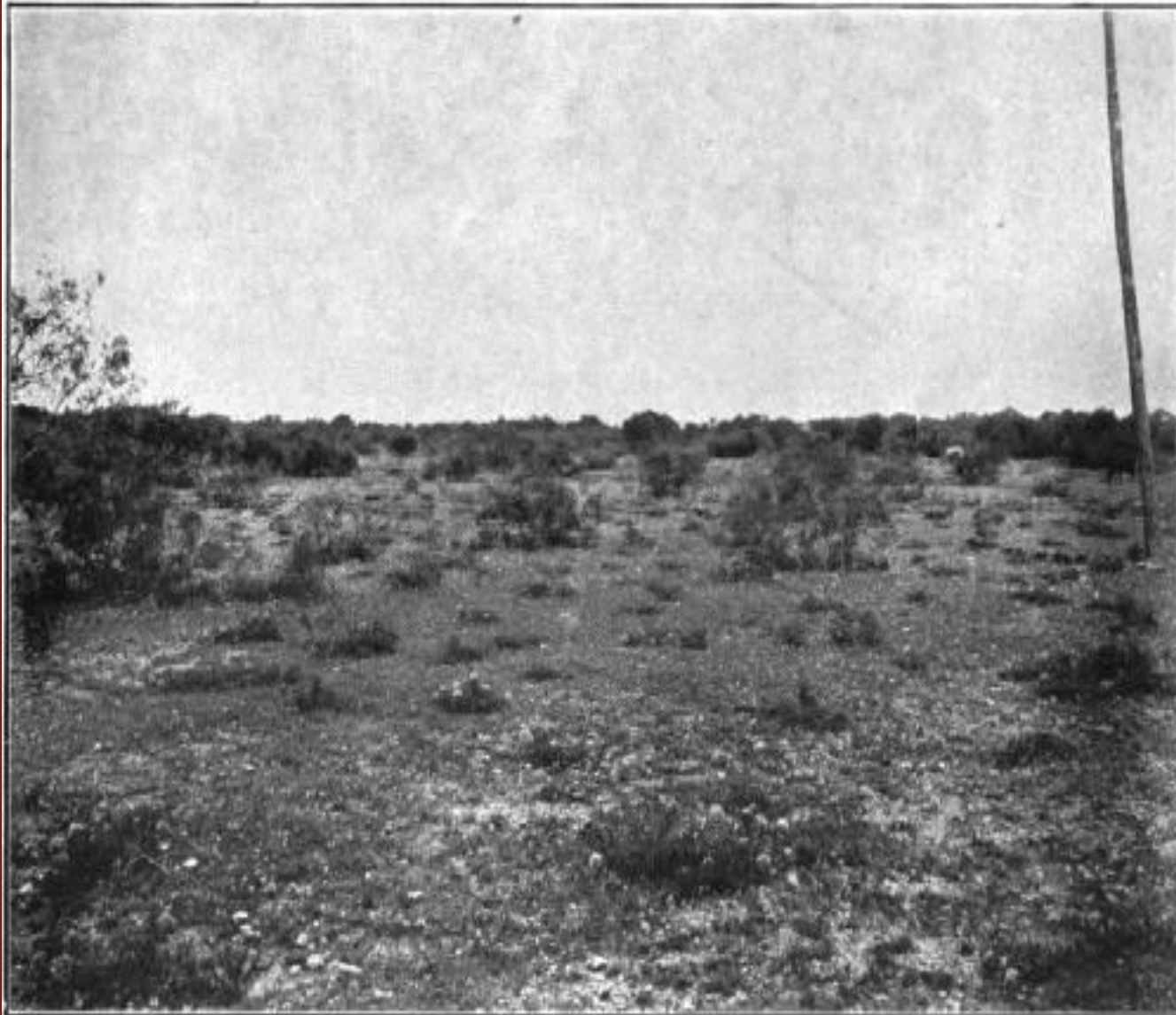


FIG. 2.—CHARACTERISTIC ENCROACHMENT OF MESQUITE ON PASTURE LAND IN CENTRAL TEXAS.

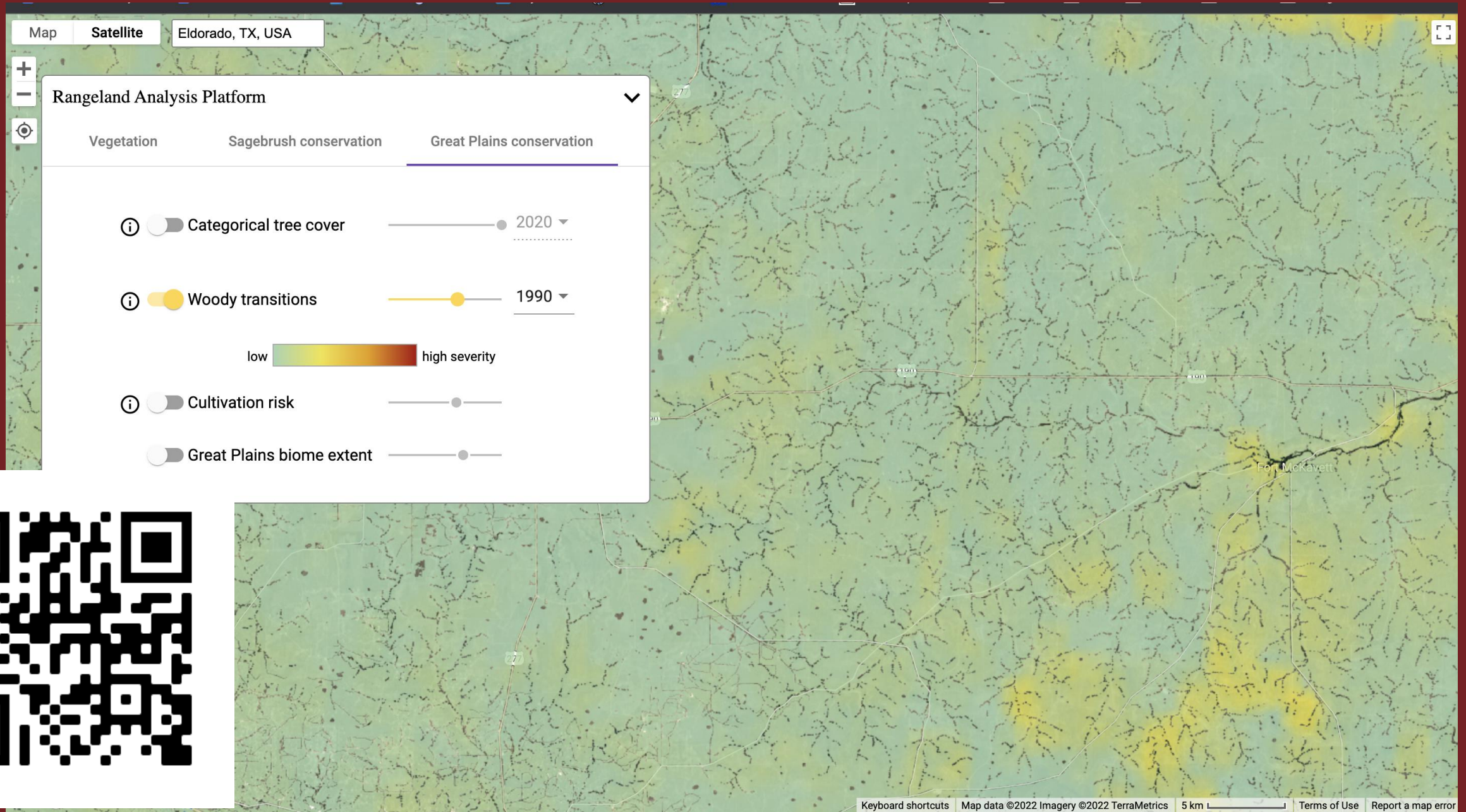
With the exception of a few scattered live oaks this was a clean prairie a few years ago.



IT'S JUST NOT WORKING OUT....

WHAT WE ARE DOING IS NOT WORKING.

ELDORADO, TEXAS, USA



Map

Satellite

Eldorado, TX, USA



Rangeland Analysis Platform

Vegetation

Sagebrush conservation

Great Plains conservation

Categorical tree cover 2020

Woody transitions 2000

low  high severity

Cultivation risk

Great Plains biome extent





Rangeland Analysis Platform

Vegetation Sagebrush conservation **Great Plains conservation**

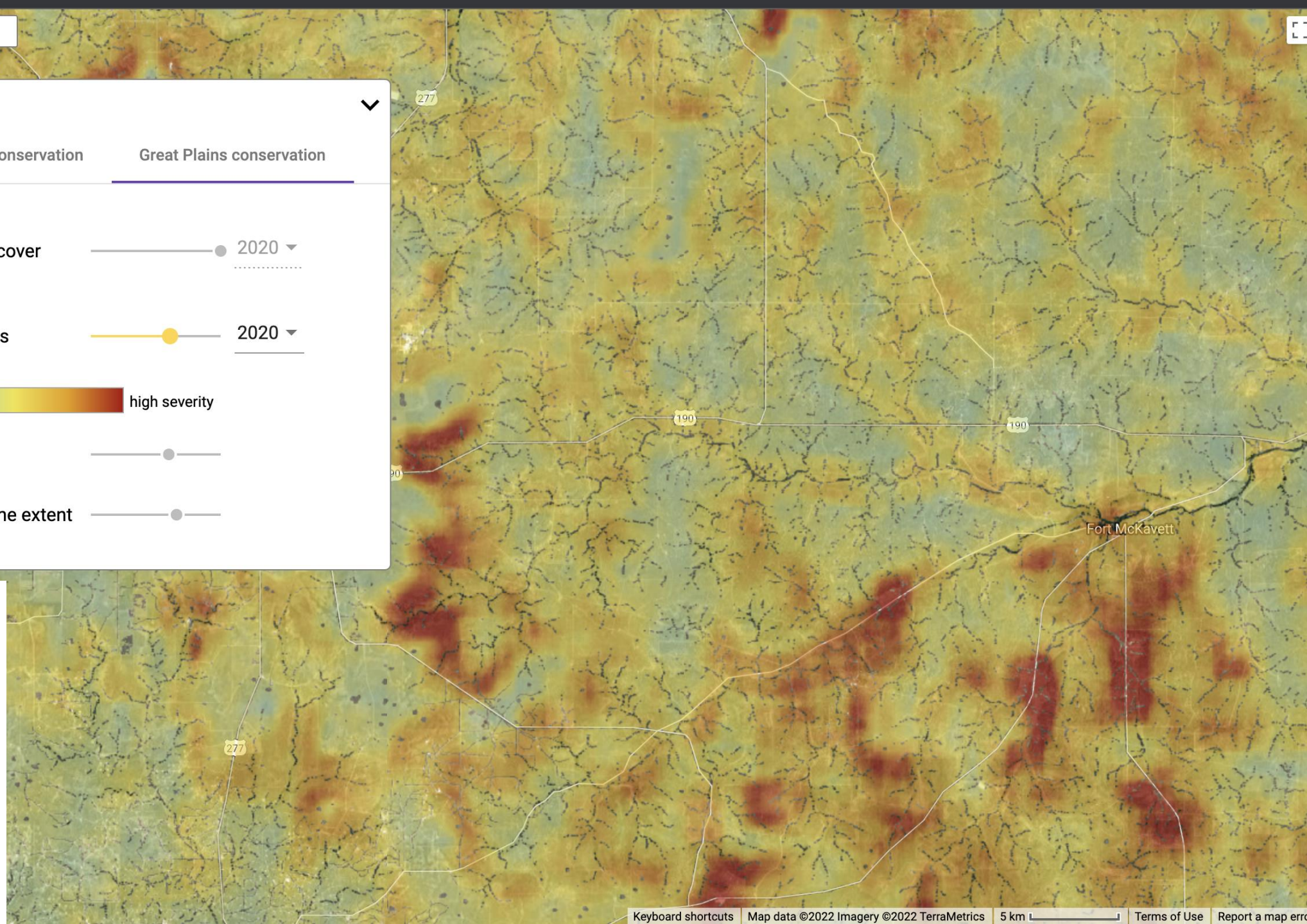
Categorical tree cover 2020

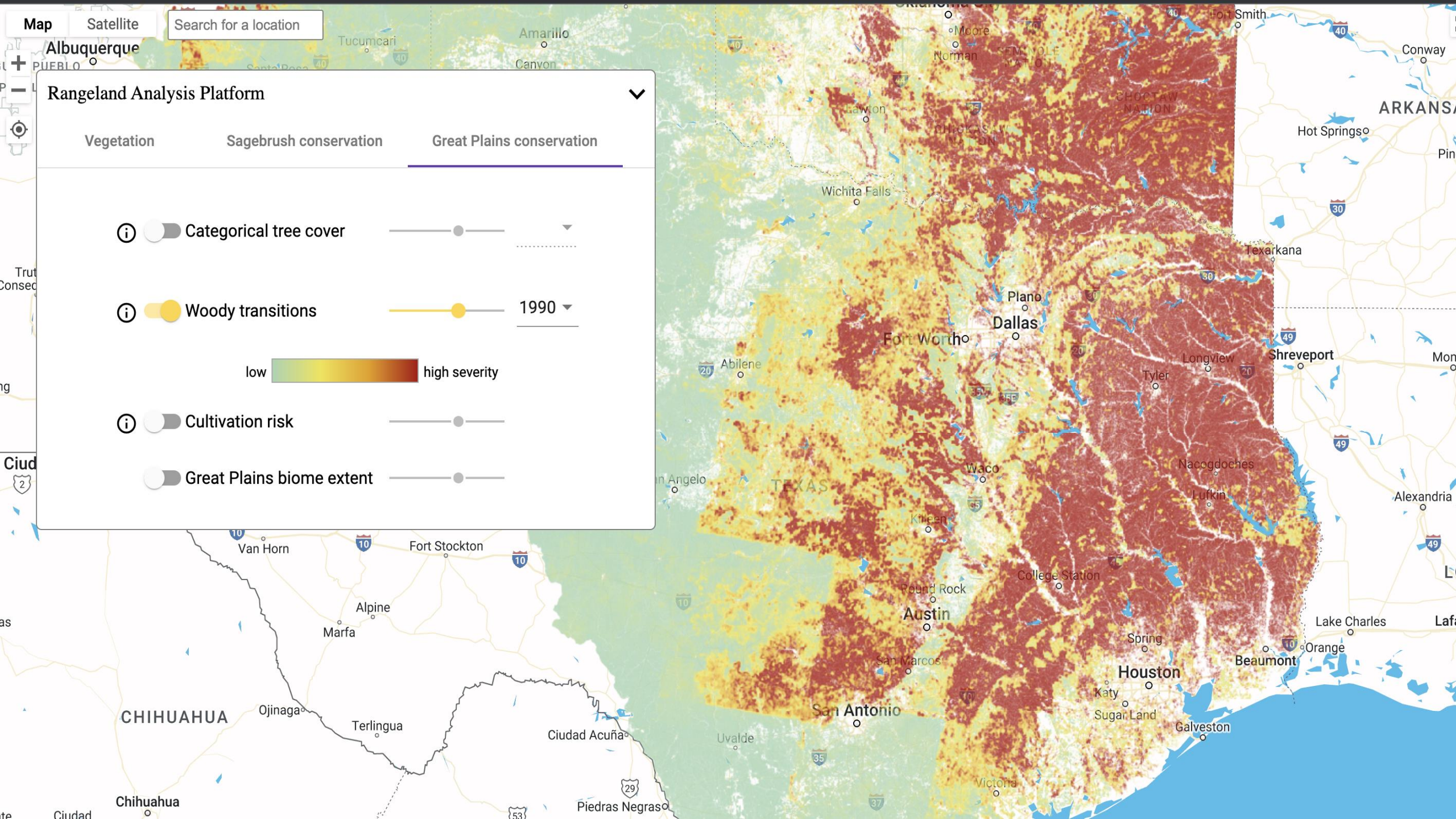
Woody transitions 2020

low high severity

Cultivation risk

Great Plains biome extent





Map Satellite Search for a location

Rangeland Analysis Platform

Vegetation Sagebrush conservation **Great Plains conservation**

Categorical tree cover

Woody transitions

low  high severity

Cultivation risk

Great Plains biome extent

1990

Rangeland Analysis Platform

Vegetation Sagebrush conservation **Great Plains conservation**

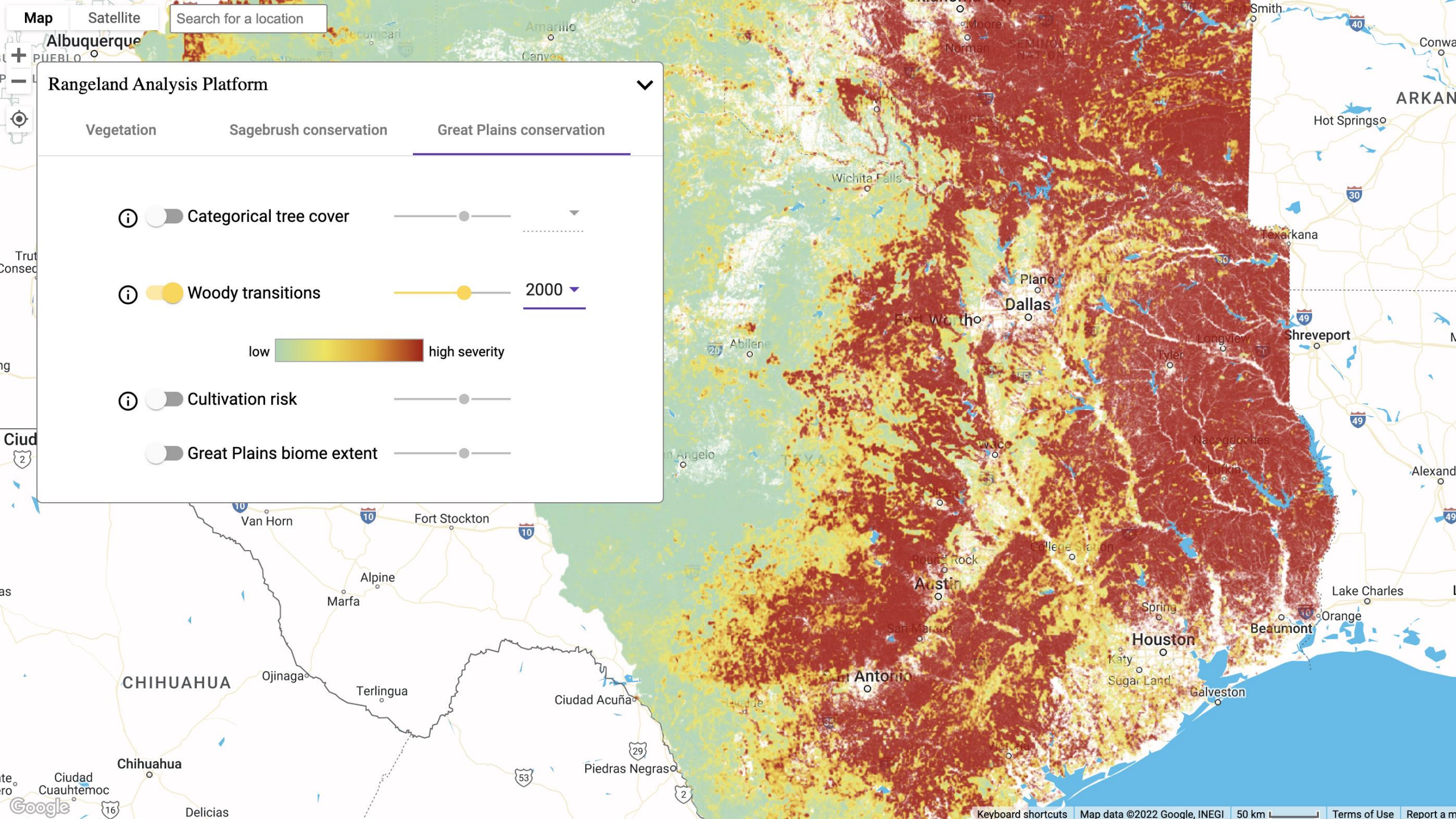
Categorical tree cover

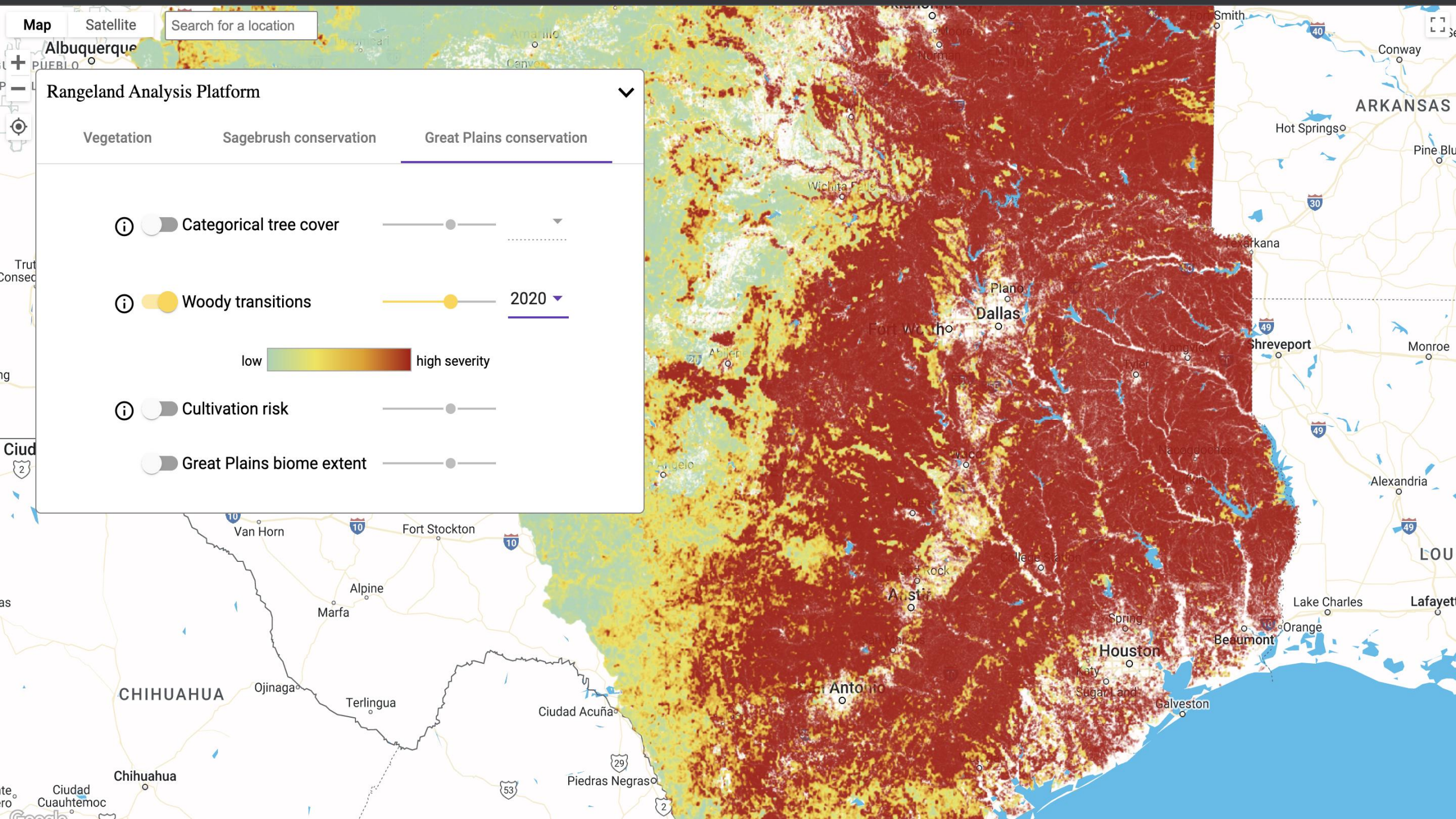
Woody transitions 2000



Cultivation risk

Great Plains biome extent





Map Satellite Search for a location

Rangeland Analysis Platform

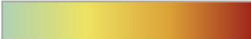
Vegetation

Sagebrush conservation

Great Plains conservation

Categorical tree cover

Woody transitions

low  high severity

Cultivation risk

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2020



Rangeland Analysis Platform

Vegetation Sagebrush conservation **Great Plains conservation**

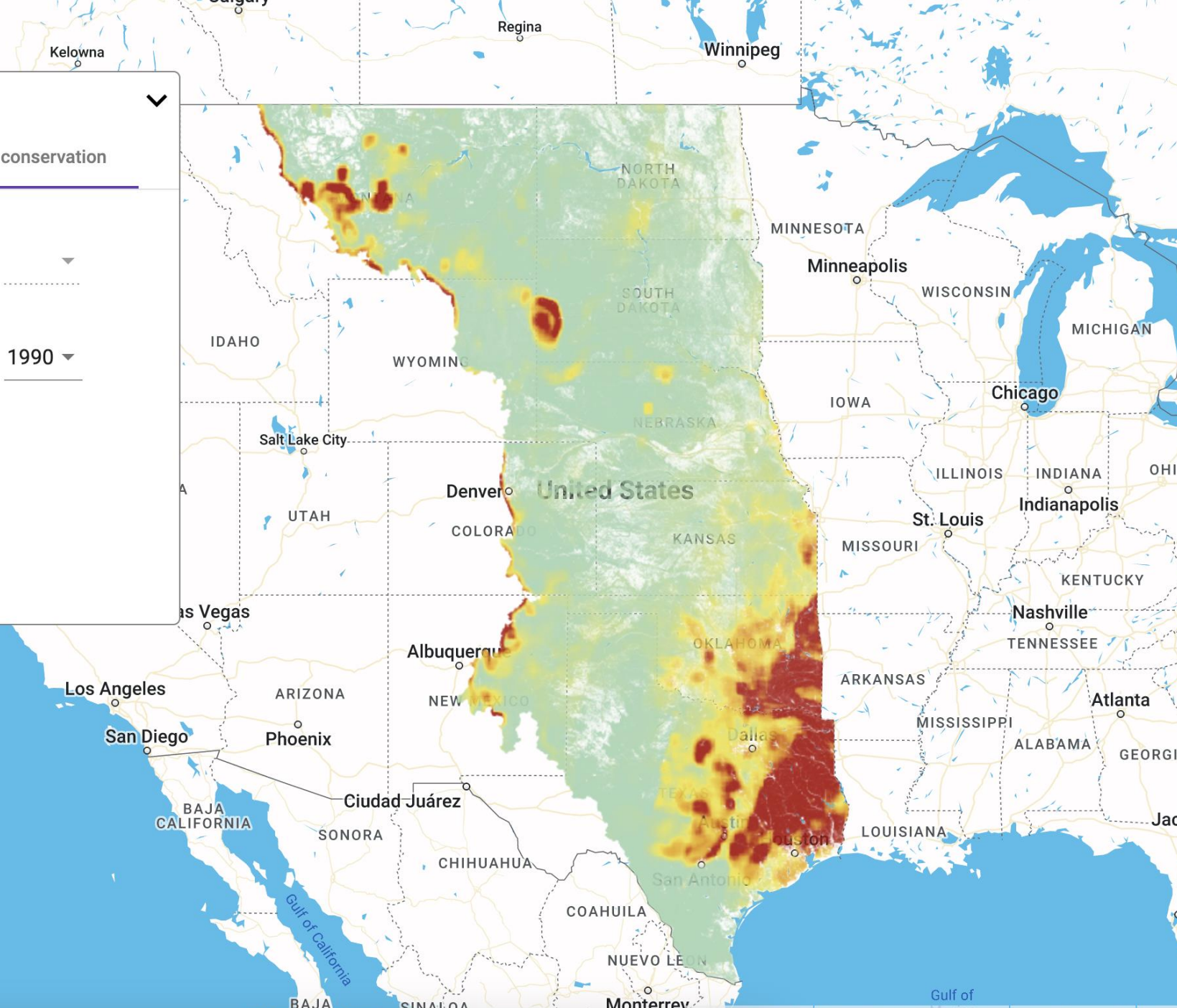
Categorical tree cover

Woody transitions

low high severity

Cultivation risk

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Rangeland Analysis Platform

Vegetation

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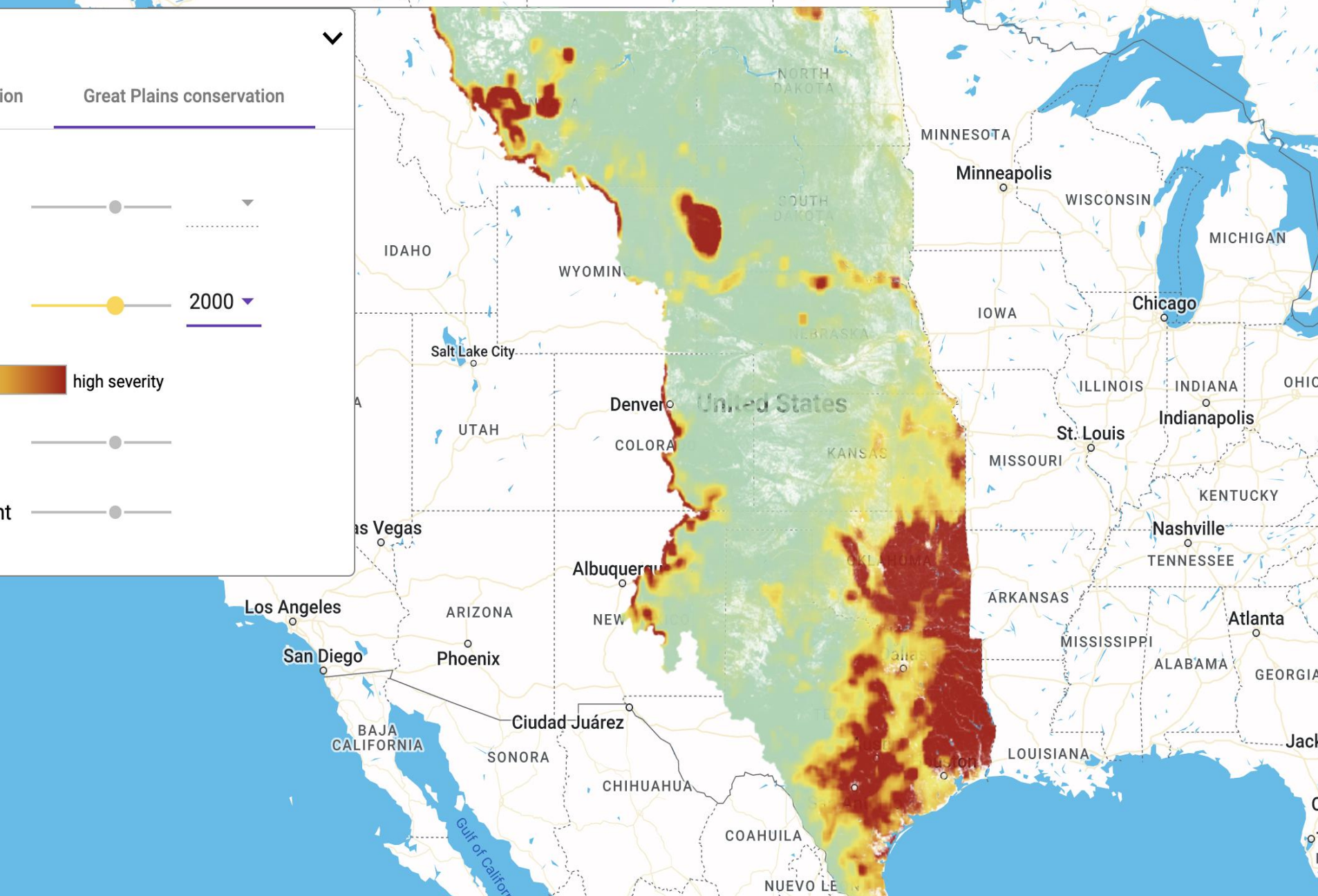
Categorical tree cover

Woody transitions 2000

low  high severity

Cultivation risk

Great Plains biome extent





Rangeland Analysis Platform

Vegetation

Sagebrush conservation

Great Plains conservation

Categorical tree cover



Woody transitions



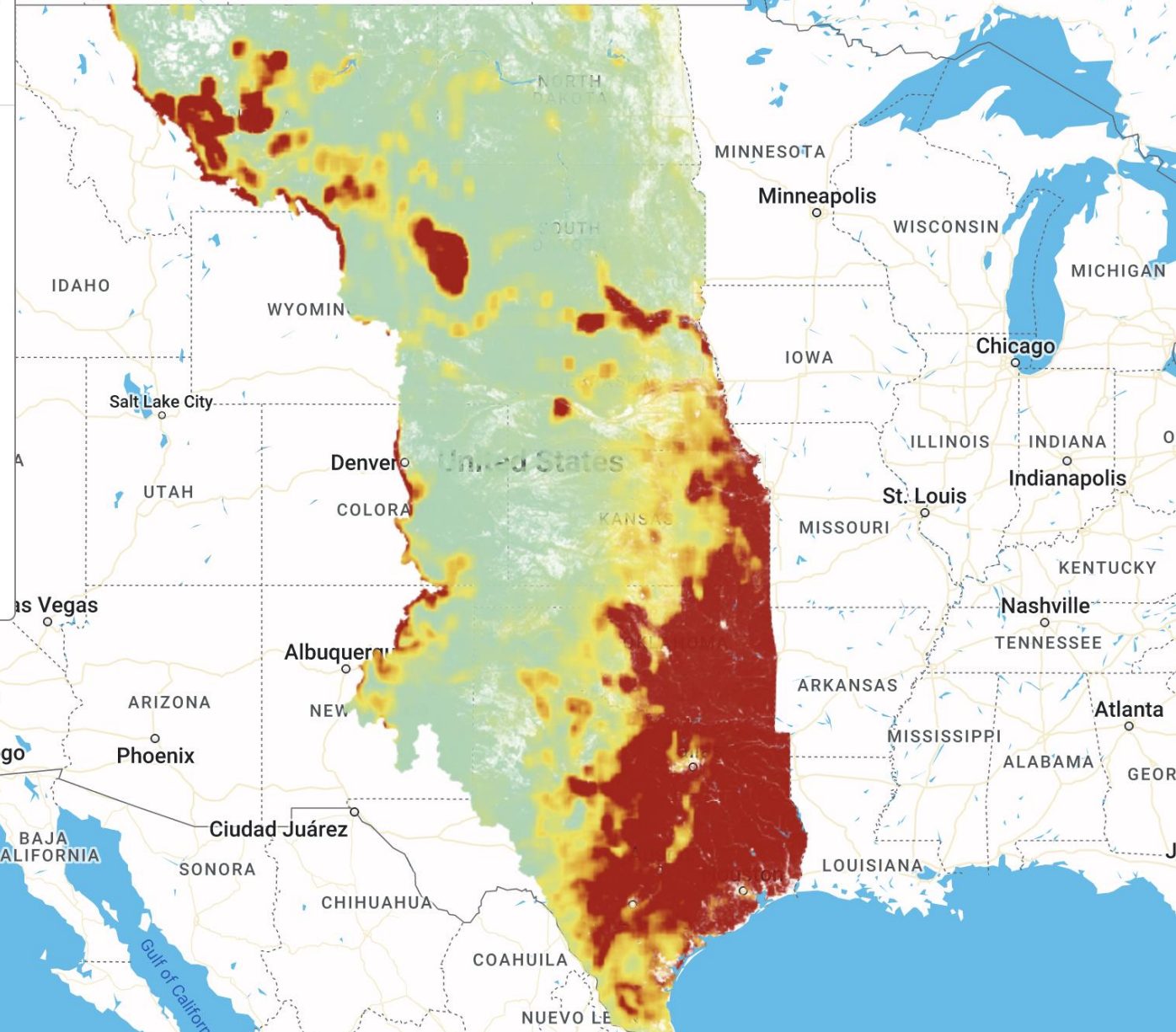
2020



Cultivation risk



Great Plains biome extent





PROACTIVE VS. REACTIVE

- Rapid brush and weed establishment and invasion is occurring.
- Pockets of grassland need to be protected.
 - *Reactive*
 - *Proactive*
- Paradigm shift for EVERYONE
- The reality is:
 - *Integrated*
 - *Invested*
 - *Every. Freaking. Year.*

SOME NEW, SOME NOT-SO-NEW, AND SOME NEW WAYS


1. Invora from ENVU newest and most impactful chemistry for R&P
2. Clopyralid+Picloram for Honey Mesquite
 - Not new, it is all old chemistry, but we are looking at it in a new way
3. Honey Mesquite treatment at pre-75 degree soil temp
4. Brush suppression
 - Honey Mesquite and Huisache
 - Moving the focus away from killing brush to growing grass/forage production

Invora - Envu

- Active Ingredients: Aminocyclopyrachlor + triclopyr amine
- EPA issued grazing label early 2020; Restricted herbicide
- TDA approved Texas registration
- Rolled out in 2021; Envu purchased in 2022

RESTRICTED USE PESTICIDE
May Injure (Phytotoxic, Susceptible, Non-Target Plants). For retail sale to and use only by Certified Applicators or persons under their direct supervision and only those uses covered by the Certified Applicator's certification.

AMINOCYCLOPYRACHLOR & TRICLOPYR GROUP 4 HERBICIDE



Invora™

HERBICIDE

Soluble Liquid
For use only in the states of Arizona, New Mexico, Oklahoma, and Texas for control of mesquite, huisache, and associated susceptible brush (woody plants) and weed species on privately-owned NON-HAYED rangeland and privately-owned NON-HAYED perennial grasslands managed as rangeland.

ACTIVE INGREDIENT(S):

Triethylamine salt of aminocyclopyrachlor (Triethylamine salt of 6-amino-5-chloro-2-cyclopropyl-4-pyrimidinocarboxylic acid)	10.8%
Triethylamine salt of triclopyr (Triethylamine salt of 3,5,6-trichloro-2-pyridinoyloxyacetic acid)	20.4%
OTHER INGREDIENTS:	68.8%
TOTAL:	100.0%

Contains 0.67 pounds acid equivalent of aminocyclopyrachlor per gallon and 1.33 pounds acid equivalent of triclopyr per gallon
EPA Reg. No. 432-1582
Shake Well Before Using

**KEEP OUT OF REACH OF CHILDREN
DANGER/PELIGRO**

Si usted no entiende la etiqueta, busque a alguien para que se le explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

See Panel for First Aid Instructions and Booklet for Complete Precautionary Statements and Directions for Use. See back panel for manure and vegetation management restrictions.
For MEDICAL and TRANSPORTATION Emergencies ONLY, Call 24 Hours a Day 1-800-334-7577
For PRODUCT USE Information Call 1-800-331-2967

FIRST AID	
If in eyes:	<ul style="list-style-type: none">• Hold eye open and rinse slowly and gently with water for 15-20 minutes.• Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.• Call a poison control center or doctor for treatment advice.
If swallowed:	<ul style="list-style-type: none">• Call a poison control center or doctor immediately for treatment advice.• Have person sip a glass of water if able to swallow.• Do not induce vomiting unless told to do so by a poison control center or doctor.• Do not give anything by mouth to an unconscious person.

In case of emergency call toll free the Bayer CropScience LP Emergency Response Telephone No. 1-800-334-7577. Have a product container or label with you when calling a poison control center, doctor, or going for treatment.
Note to Physician: Probable mucosal damage may contraindicate the use of gastric lavage.

86735598B 200203AV2

Current Brush Species Spectrum for Invora Herbicide

- ⊙ Species included in suggested broadcast applications:
 - ⊙ Mesquite
 - ⊙ Huisache
- ⊙ Species included in suggested IPT leaf-spray applications:
 - ⊙ Mesquite
 - ⊙ Huisache
 - ⊙ Whitebrush
 - ⊙ Lotebush
 - ⊙ Agarito
 - ⊙ Yucca (spp.)
 - ⊙ Tasajillo
- ⊙ Mesquite stem-spray & cut-stump in water

Schleicher County, North of Eldorado, TX





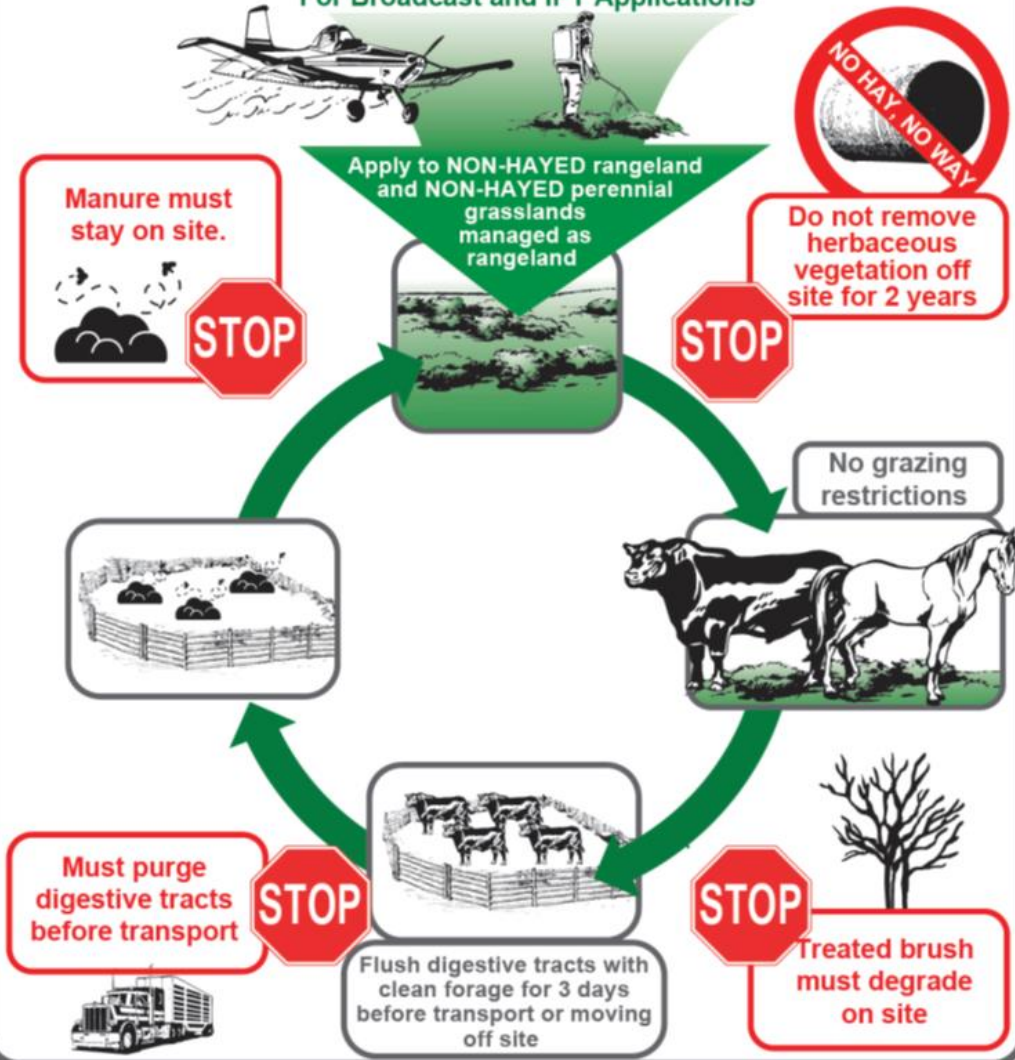
Picolinic Acid Required Training

- ⦿ Prior to application on rangeland all applicators must
- ⦿ Complete picolinic acid training every two years
- ⦿ Training completed through
 - ⦿ State authorized provider or
 - ⦿ Registrant or registrant approved provider
- ⦿ Certified applicator must
 - ⦿ Keep record of training for 3 years
 - ⦿ Training date, provider, & proof of completion
 - ⦿ Make records available upon request by TDA or EPA

Stewardship Management

INVORA™ HERBICIDE MANURE & VEGETATION MANAGEMENT

For Broadcast and IPT Applications



- Apply to privately-owned **NON-HAYED** rangeland and privately-owned **NON-HAYED** perennial grasslands managed as rangeland in AZ, NM, OK & TX, only
 - **DO NOT** apply to hay, silage, haylage, baylage, or green chop fields
 - **DO NOT** remove herbaceous (non-woody) vegetation for 2 years following treatment
 - **DO NOT** use in areas where animals are confined **AND** manure is collected
 - **DO NOT** compost any vegetation or manure for 2 years after treatment
 - **DO NOT** remove treated woody plants (brush). Treated woody plants (brush) must degrade on site
 - **CLEAN OUT ANIMALS** 3 days before transport or moving to sites other than non-hayed rangeland and non-hayed perennial grasslands managed as rangeland
 - **MANURE MUST STAY** in clean out area or be returned to treatment site
- See booklet for additional manure & vegetation management restrictions*

Land Ownership Requirements for Invora

- ⦿ Privately owned & operated lands: no public land
- ⦿ Privately owned & managed through lease
- ⦿ Landowner must be notified
- ⦿ Only applied when lease has 2 years remaining at application
 - ⦿ 5-year lease, not later than year 3
 - ⦿ 7-year lease, no later than year 5
 - ⦿ 10-year lease, no later than year 8
- ⦿ Allows 2 years for vegetation & manure mgt. stewardship

Buffer Zones for Invora

- ⊙ Property lines
 - ⊙ Aerial & ground broadcast: 100 feet
 - ⊙ IPT: fenceline
- ⊙ Free-flowing water
 - ⊙ Aerial & ground broadcast: 100 feet
 - ⊙ IPT: water's edge
- ⊙ Non-free-flowing water
 - ⊙ Wholly w/i treatment site: water's edge
 - ⊙ Not wholly w/i treatment site
 - ⊙ Aerial & ground broadcast: 100 feet
 - ⊙ IPT: water's edge

OLD CHEMISTRY, NEW WAYS

- Clopyralid+Picloram for Honey Mesquite mortality
- Alligare Range and Pasture
 - *2021*
Tom Green and Mitchell Counties
 - *2022*
Coleman County

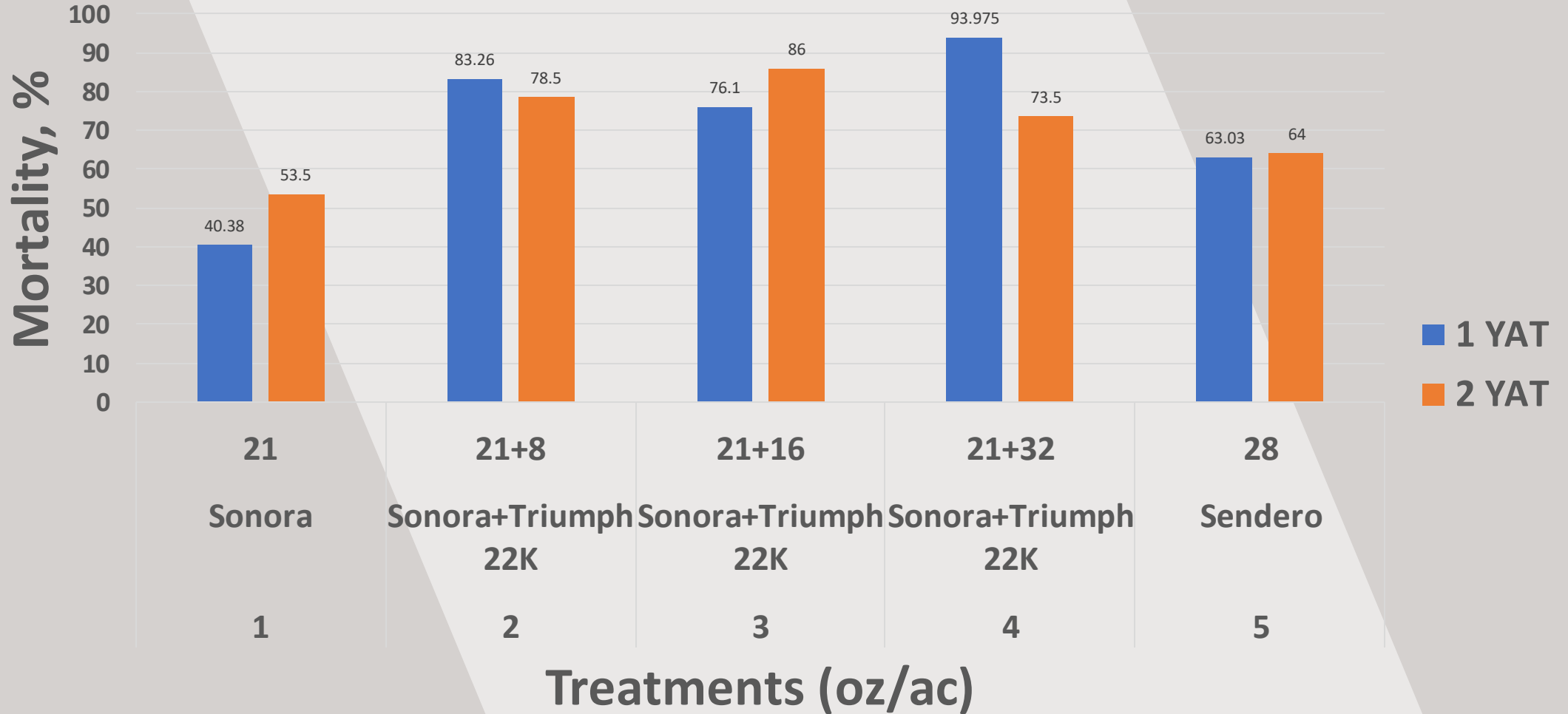




Alligare

A member of the ADAMA Group

Tom Green County



21

21+8

21+16

21+32

28

Sonora

Sonora+Triumph

Sonora+Triumph

Sonora+Triumph

Sendero

22K

22K

22K

1

2

3

4

5

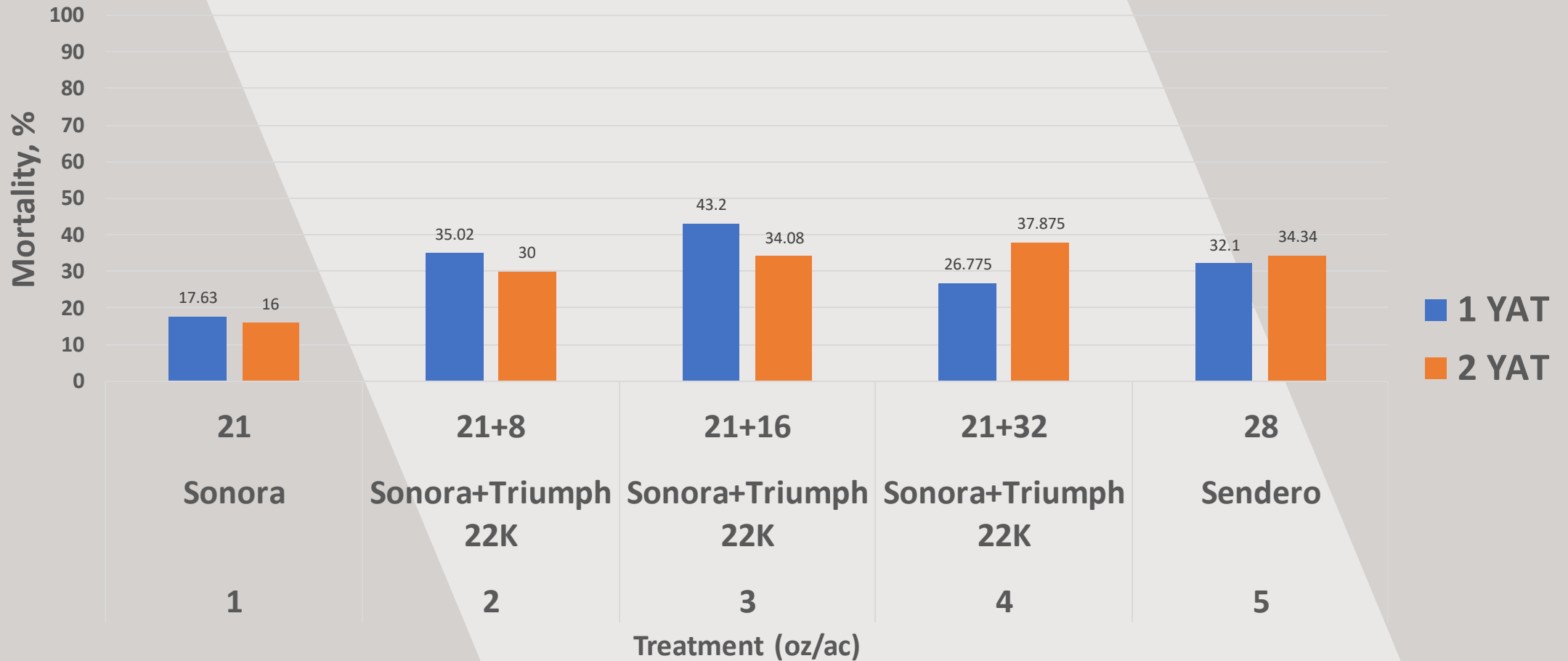
Treatments (oz/ac)



Alligare

A member of the ADAMA Group

Mitchell County

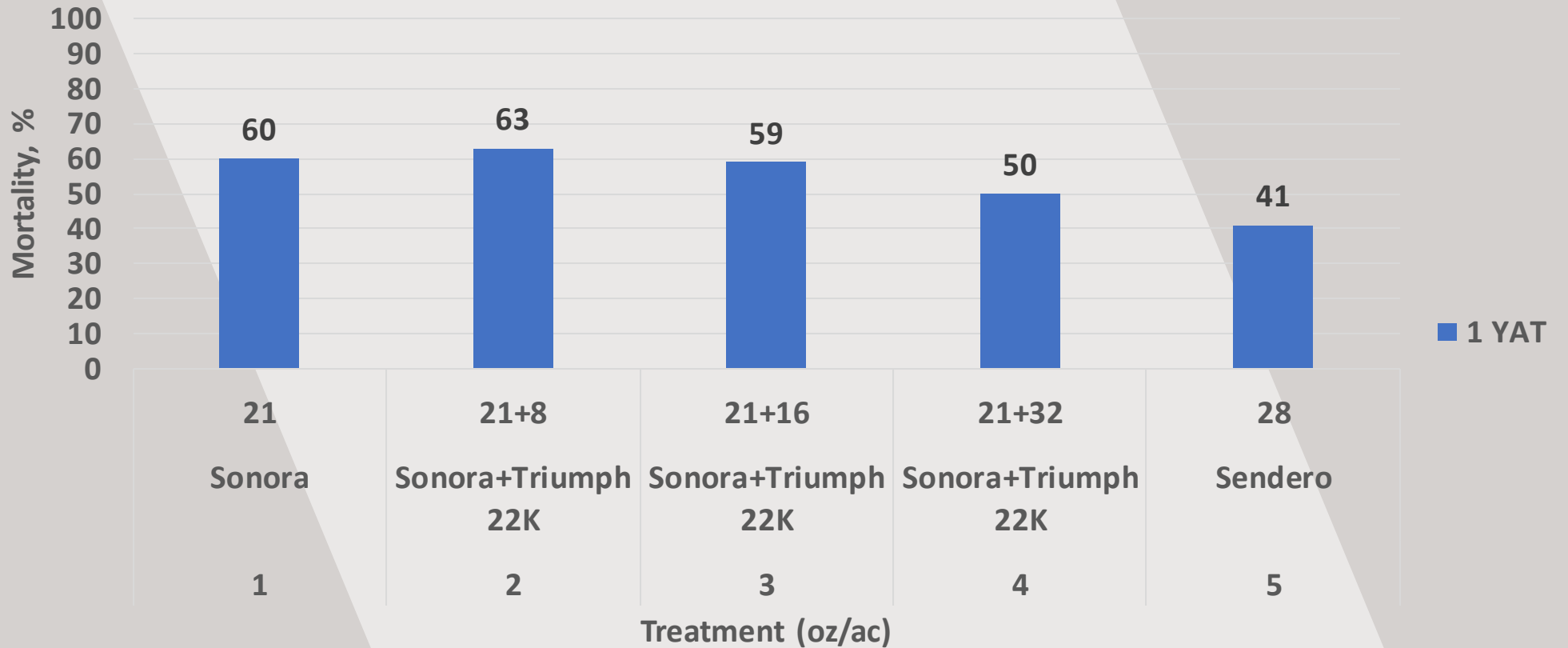




Alligare

A member of the ADAMA Group

Clay County

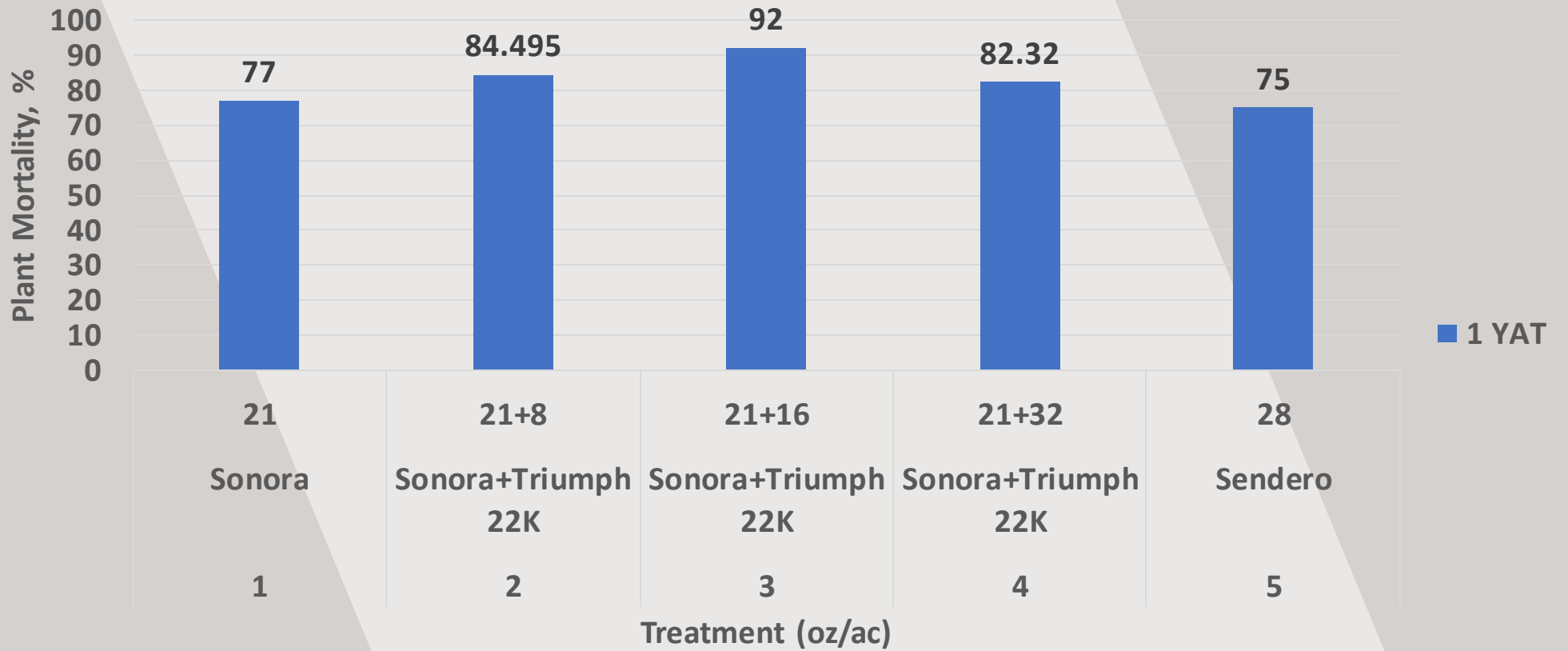




Alligare

A member of the ADAMA Group

Coleman County

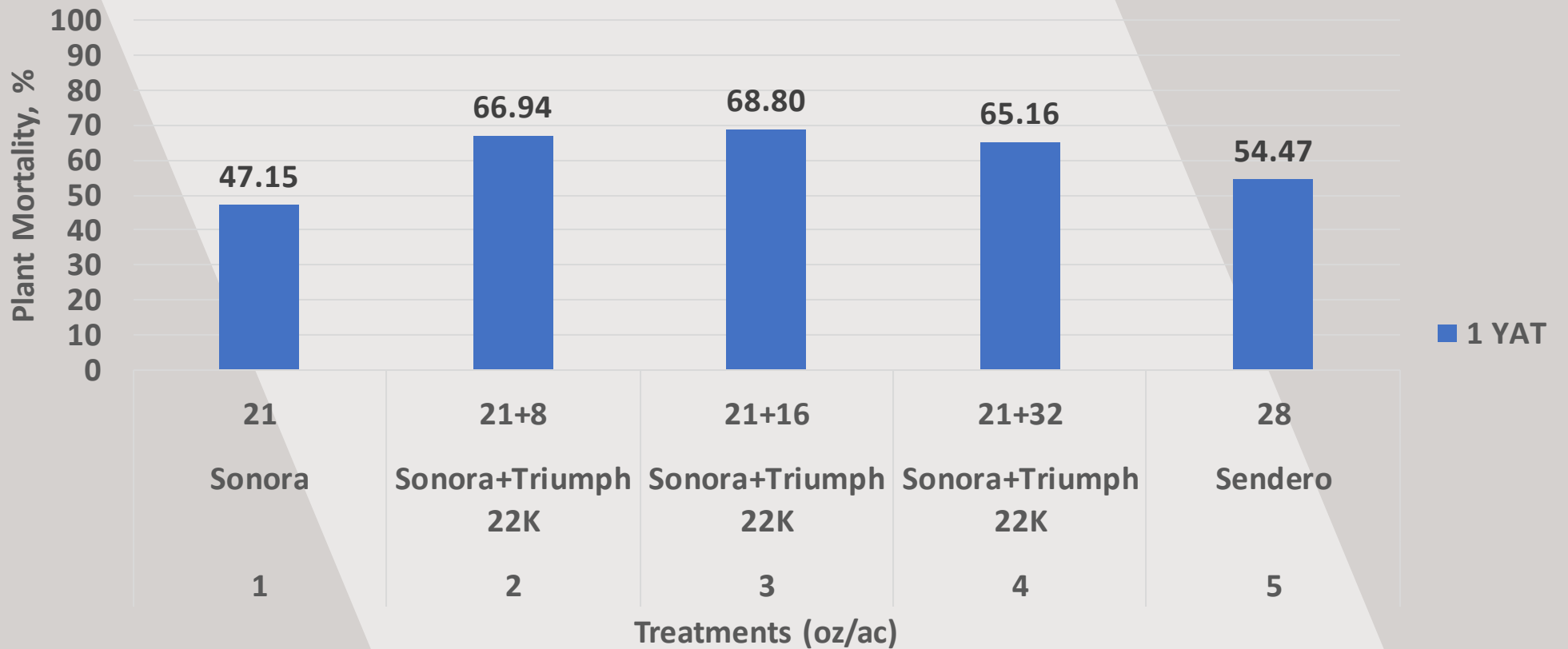




Alligare

A member of the ADAMA Group

All 4 Sites 1 YAT



CAN WE SPRAY HONEY MESQUITE BEFORE 75F SOIL TEMPERATURE?

- Earlier window of application means increased application times
 - *Important in the rangeland, cotton intersection*
 - *Before insect damage*
 - *Availability of applicators*

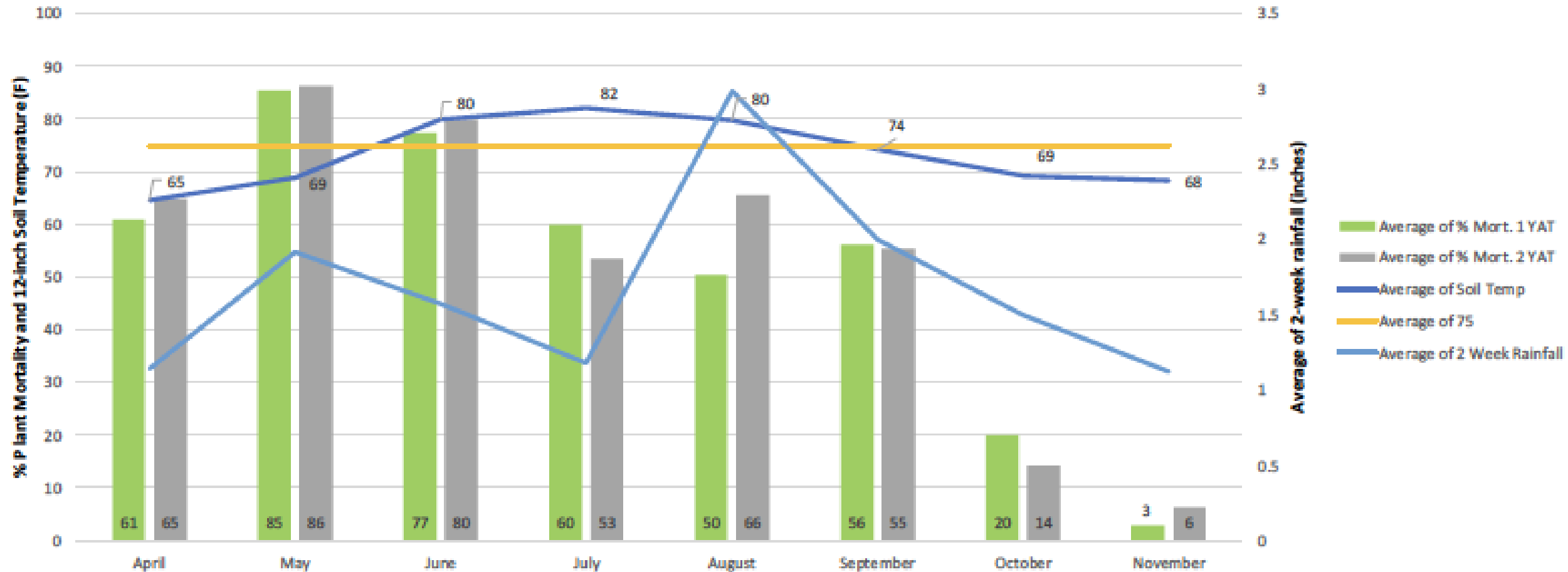


2016 – 2019 GROUND BROADCAST APPLICATIONS

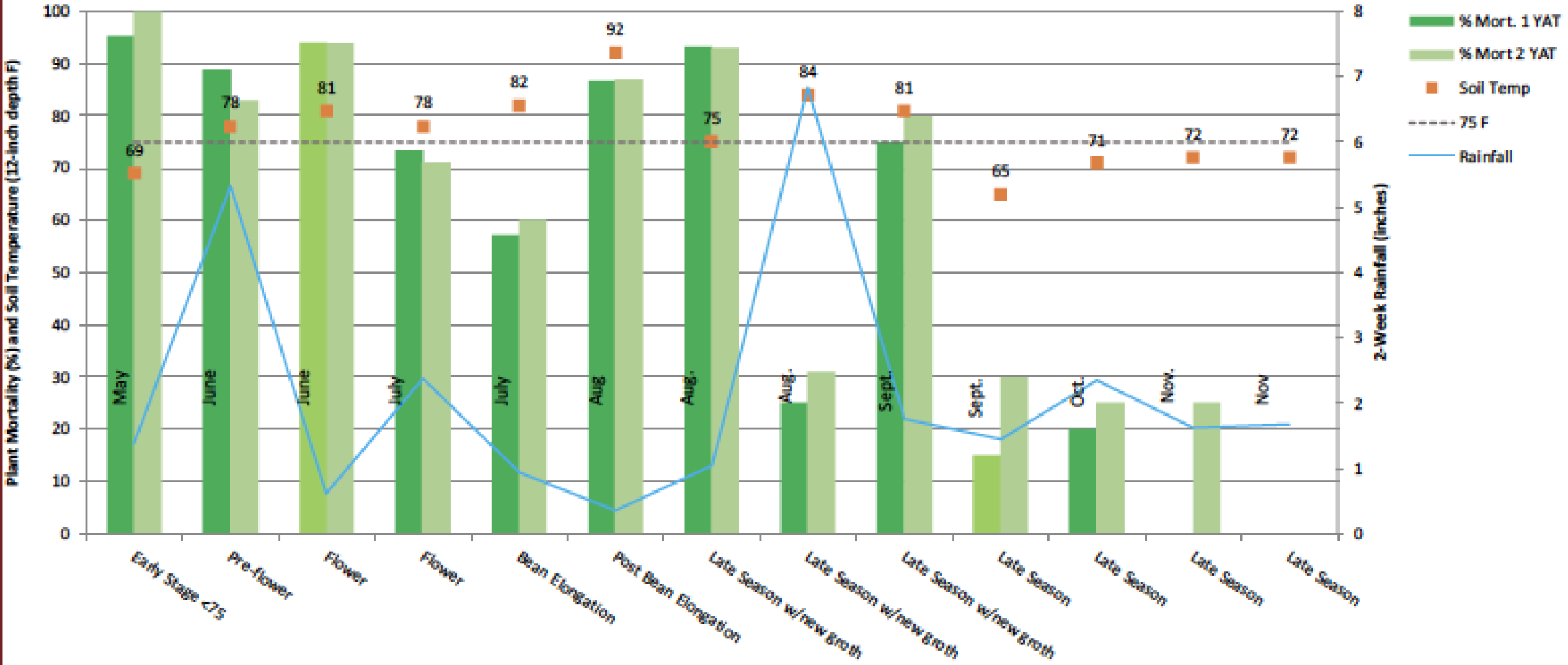
- **7 sites across West and Central Texas**
- **All treatments were applied foliar via ground broadcast with Sendero™ herbicide at 28 oz/acre with Dyne-Amic surfactant at 4 oz/acre with a total spray volume of 10 gallons/acre.**
- **All sites were established through 2016-2019.**
- **All sprayed trees were 3-5 ft in height, healthy trees with 100% leaf potential, and no insect damage**



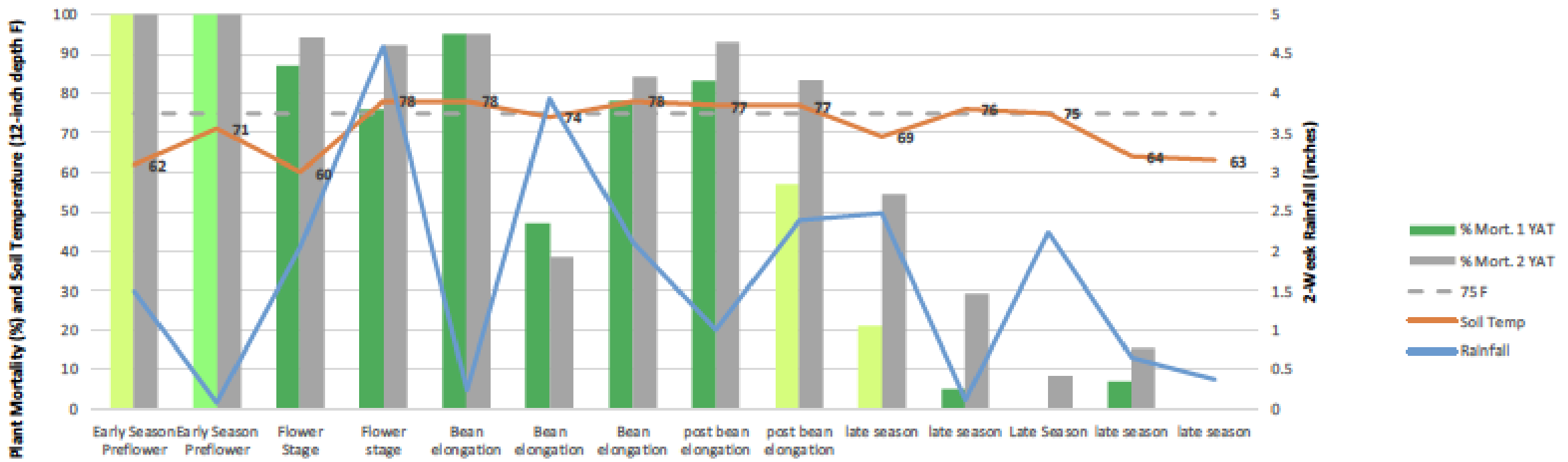
Pooled Honey Mesquite Plant Mortality Across West and Central Texas Sites 2016 - 2019 Trials



2016 Jack Mesquite Timing 1 & 2 YAT



2017 Hood County Mesquite Timing 1 and 2 YAT



READ THE TREE! NOT THE SOIL TEMPERATURE.

- This will enable more flexibility in spray windows:

- ✓ *Prior to cotton being planted.*
- ✓ *Prior to insect damage.*
- ✓ *Prior to applicators migrating to cropland applications.*

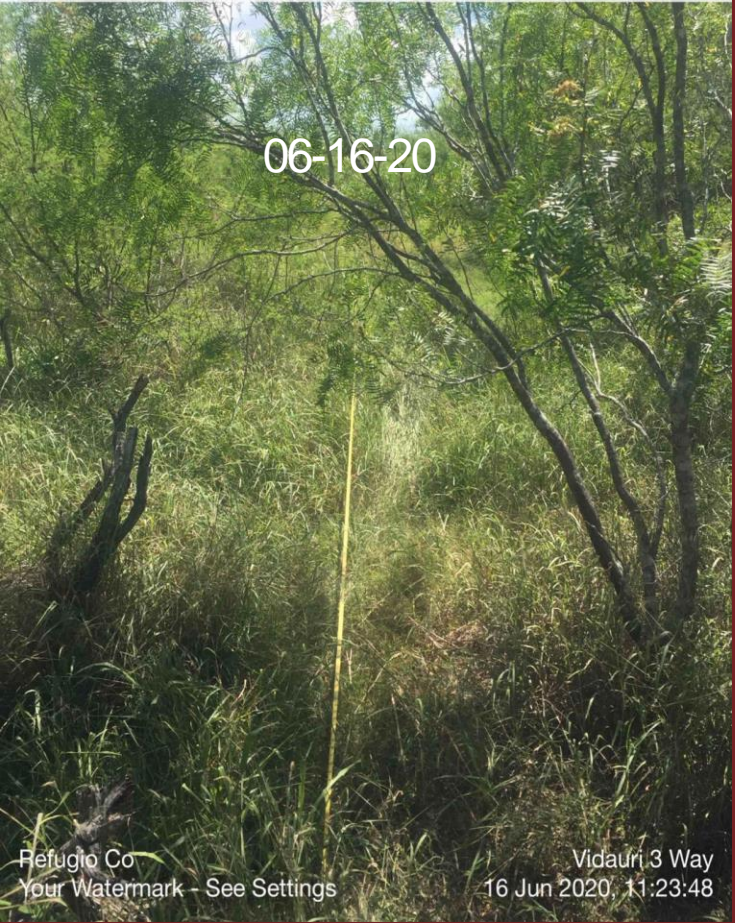


BRUSH SUPPRESSION, NOT MORTALITY

- In 2012, the Coastal Prairie Grazing Land Coalition established 52 plots in South Texas using various herbicide mixes.
- They learned that an effective way to control huisache was to spray multiple years with a lower herbicide rate.
- Spray multiple years to spread the risk out while growing more grass to offset the cost.
- 24-oz aminopyralid;2,4-D, 4-oz picloram, 0.4-oz metsulfuron methyl, 2-oz surfactant= 3 gpa
- Spray the entire pasture the first year, and then spray one, skip one for years 2 and 3



51°NE (T) 28°25'58"N, 97°9'48"W ±32ft ▲ 66ft



06-16-20

Refugio Co
Your Watermark - See Settings
Vidauri 3 Way
16 Jun 2020, 11:23:48



11-12-21



6-30-22

NW N NE
300 330 0 30 60
4°N (T) 28°10'8"N, 97°42'33"W ±16ft ▲ 147ft



06-18-20



9-30-21



6-27-22

BRUSH SUPPRESSION

- Effective treatment for large ranches on the Gulf Coast
- Stretches the ranch brush management dollar more effectively
- Allows ranchers to treat more acres each year compared to traditional approaches
- Grows more grass in the suppression process
- Exceptional control of seedling plants slows down the invasion rates



PROACTIVE VS. REACTIVE

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 - *Integrated*
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