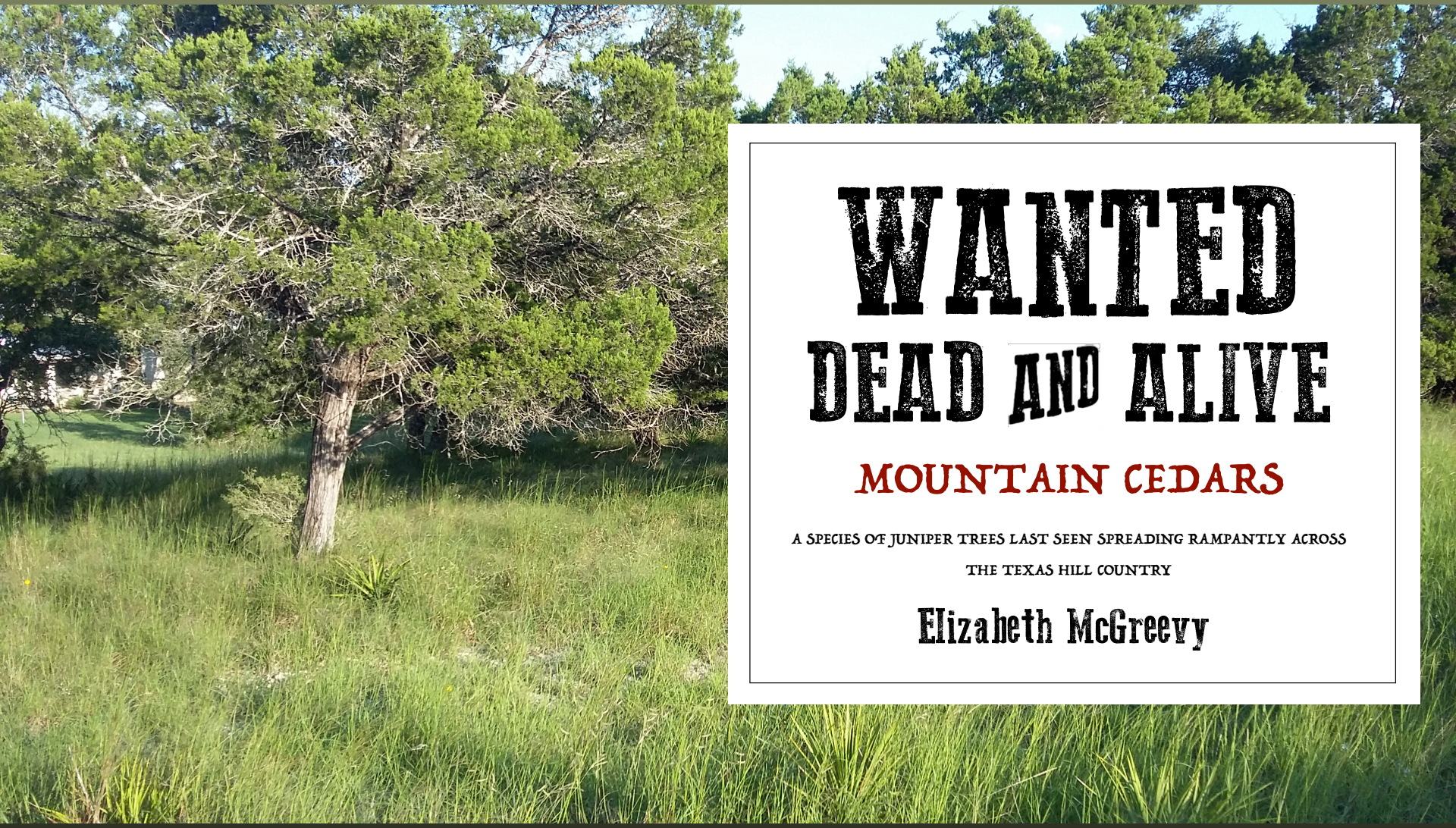


WANTED

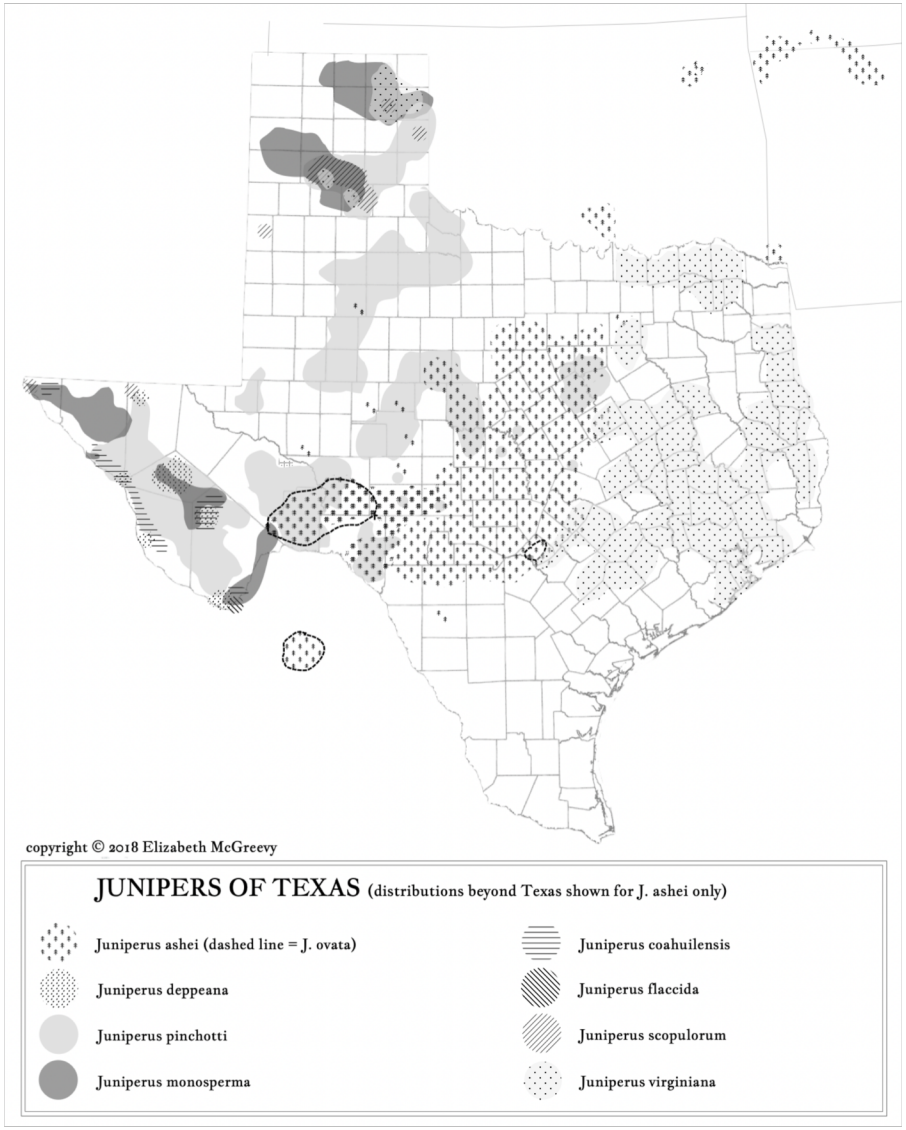
DEAD AND ALIVE

MOUNTAIN CEDARS

A SPECIES OF JUNIPER TREES LAST SEEN SPREADING RAMPANTLY ACROSS THE TEXAS HILL COUNTRY

Elizabeth McGreevy

WHAT ARE MOUNTAIN CEDARS?





They are junipers.

Botanical name: *Juniperus ashei*

Common names: Mountain Cedar, Ashe Juniper, Ozark White Cedar, Post Cedar, Blueberry Juniper, and 'damn cedar'

WE LOVE TO HATE MOUNTAIN CEDARS



Typical cedar hater, *artwork by Tom Curry*



They plague us with cedar fever.

They invade our grasslands.

We think they're stealing our water.

They interfere with property rights since we can't clear them all because of an endangered bird, the Golden-cheeked Warbler.

THE RESULTING CEDAR TALL TALES

1. They're not native
2. They're just bushes
3. They're highly flammable
4. They're pollen is toxic
5. They're invasive
6. They were historically uncommon
7. They prevent plant growth
8. They're choking our oaks
9. They intercept most rains
10. They reduce aquifer recharge

BUT, THEY WERE HISTORICALLY RESPECTED

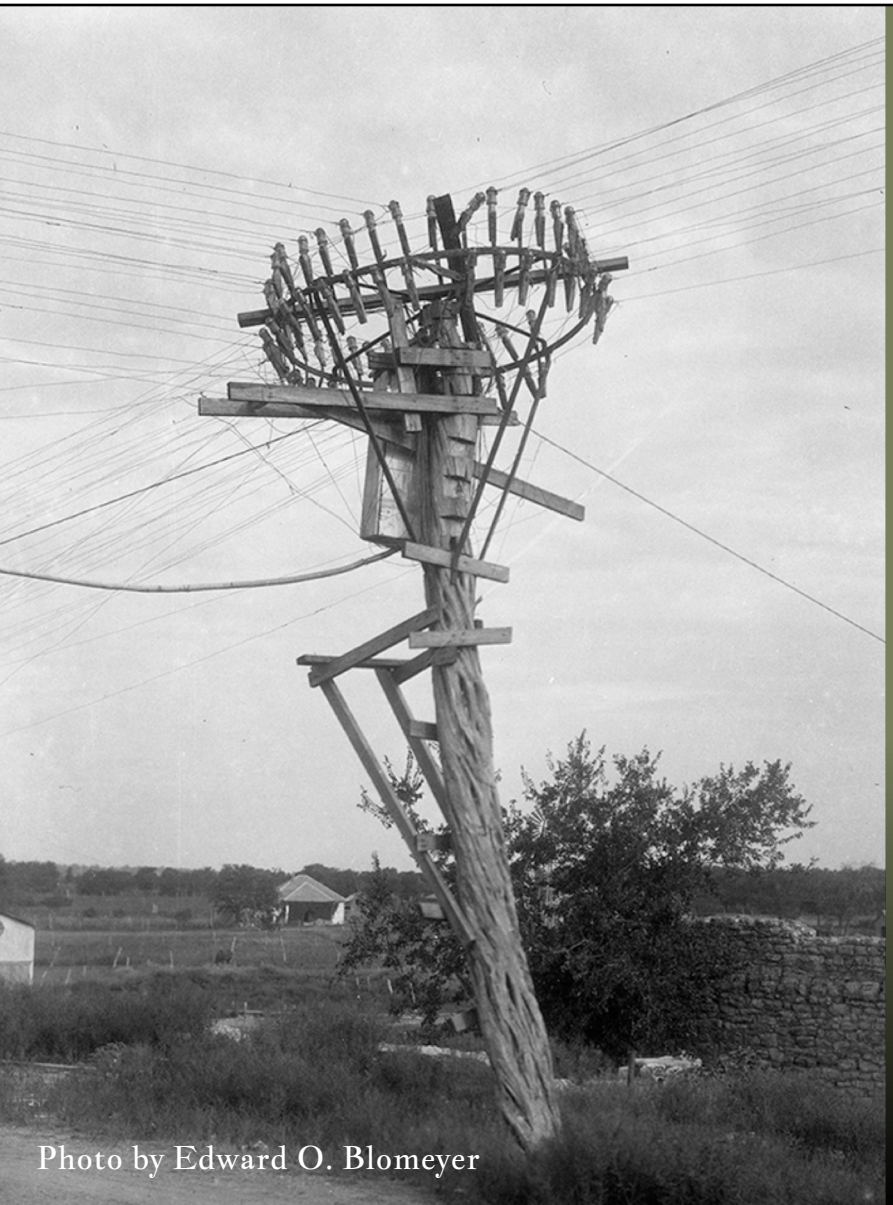


Photo by Edward O. Blomeyer





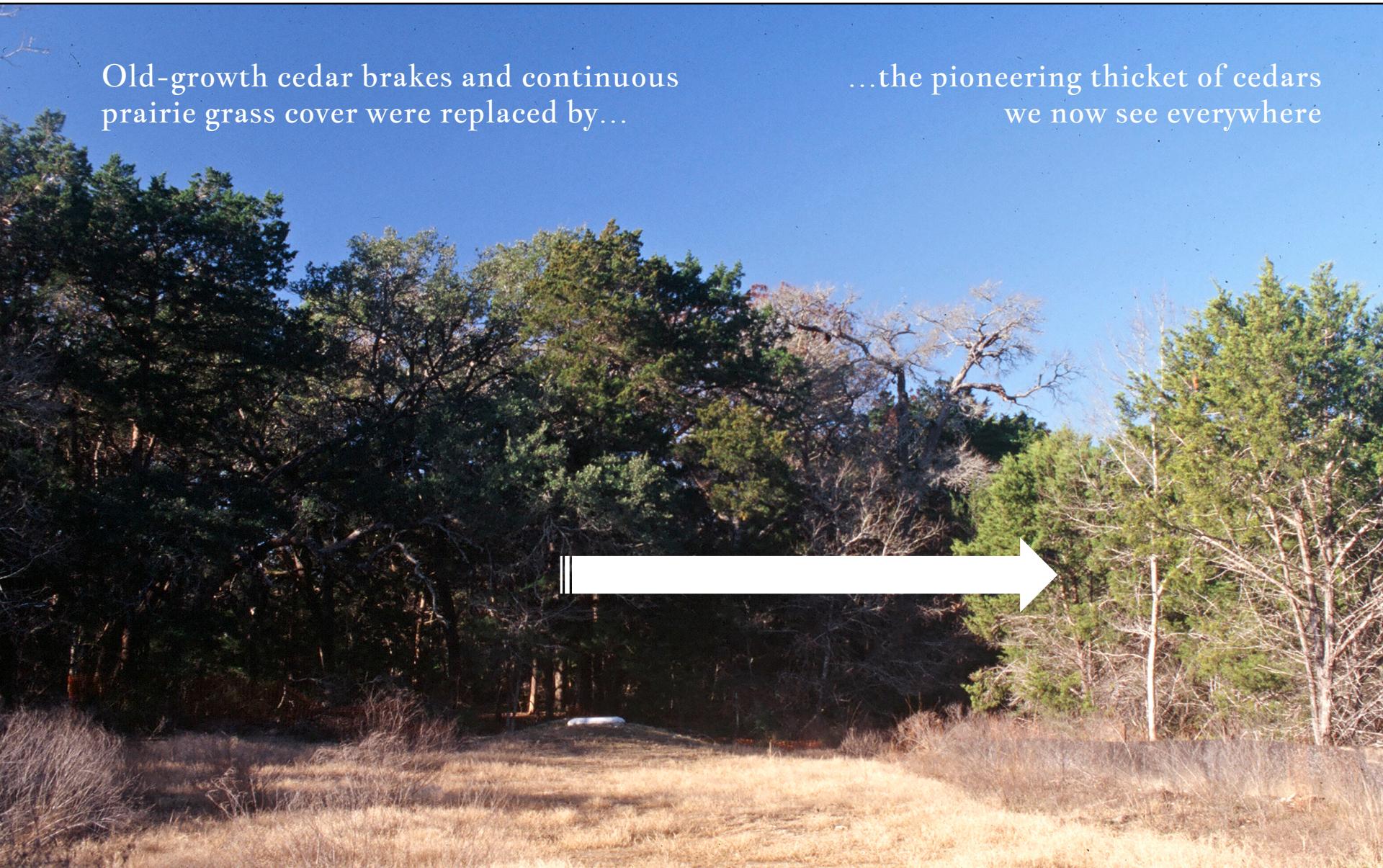
Mountain Cedars were targeted because they were abundant, extremely decay resistant, and made excellent charcoal. Tens of thousands of poles, ties and posts were cut.

"This cedar forest was a treasure to the colonists of New Braunfels…" —Dr. Roemer, 1845

"The cedar tie business has contributed largely to the growth and prosperity of the 'Hill City.'" —Austin Democratic Statesman, 1874

In the 1920s, the Uvalde Northern Railroad was built just to haul 40,000 cedar posts a day for more than a decade.

THIS LED TO MASS CLEARCUTTING



TALL TALE #1

THEY'RE NOT NATIVE



Archaeologists have discovered:

In 1762, large Mountain Cedar poles were used to construct roofs for the Mission San Lorenzo de la Santa Cruz (Camp Wood today).

Tonkawas used Mountain Cedar for cooking more than 4000 years ago.

10,000 year old juniper pollen was fossilized in a northwestern Bexar County cave.

TALL TALE #2

THEY'RE JUST BUSHES





White bark fungus (*Robergea albicedrae)* on trunks indicate trees are less than 30-40 years old.

THEY CAN GET LARGER THAN WE THINK





Photo by Pete Van Dyck

Tree on left is growing in Bull Creek Park in west Austin.

Top tree was found outside Brownwood on a plateau in the northwestern Hill Country.

AND EVEN LARGER





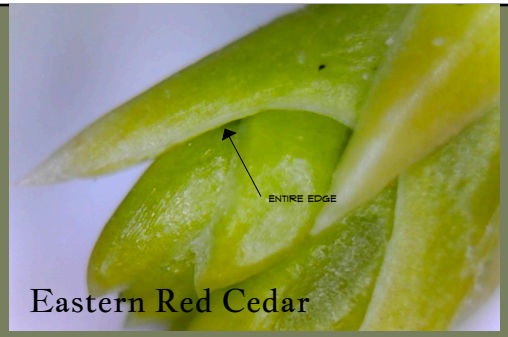
Photo by Texas A&M Forest Service

Tree on left is growing at Shield Ranch.

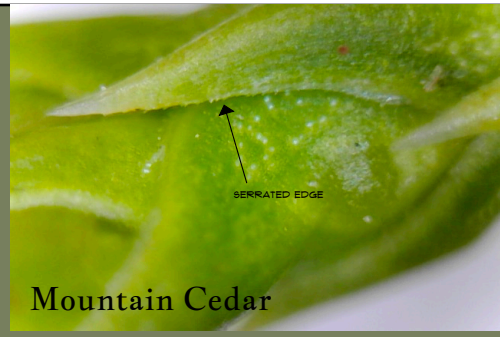
Top tree (Texas State Champion) was found west of New Braunfels
(44’ tall, 49’ wide, 44” dbh trunk).

THEY CAN GROW AS SINGLE TRUNK TREES





Eastern Red Cedar



Mountain Cedar

I call these “pole-cedars.”

Not Eastern Cedar or ERC hybrids according to Dr. Robert Adams.

These formed the majority of bottomland cedar brakes and produced 30-40’ long x 2-3’ wide poles that served as telegraph and telephone poles in the late 1800s.

MOST PEOPLE DON'T SEE THE OLDER CEDARS

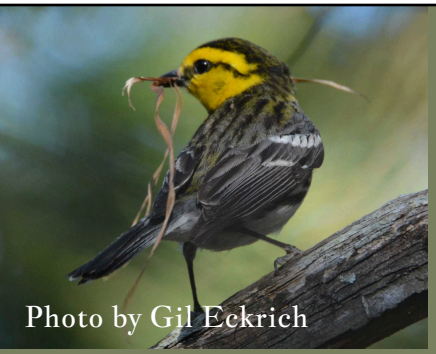


Photo by Gil Eckrich


Photo by Marc Opperman





The heartwood matures at 30-50 years old and the white bark fungus starts to disappear. At that point, the bark can start shredding and providing nesting material for wildlife.

Trunks and branches twist after 100+ years

TALL TALE #3

THEY'RE HIGHLY FLAMMABLE





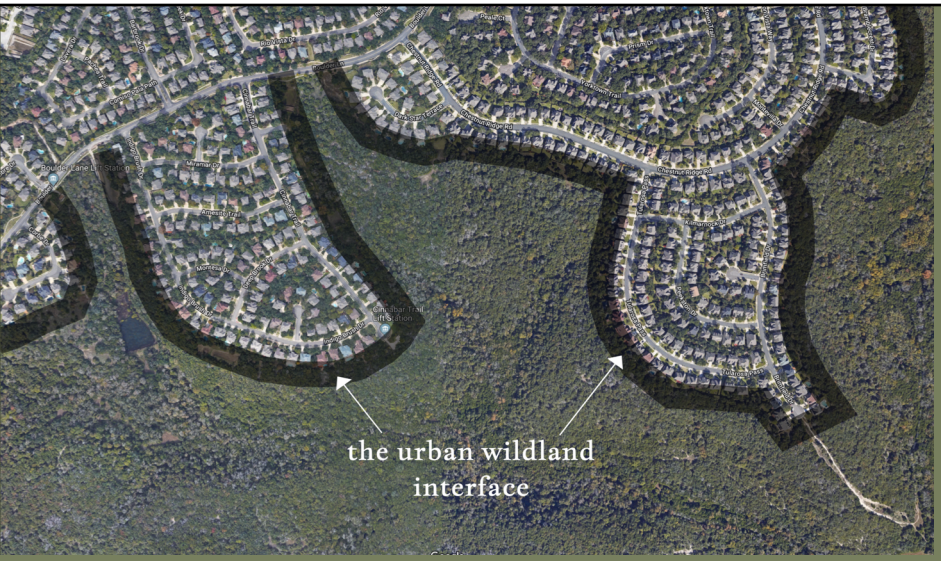
Dead to severely dehydrated Mountain Cedars are highly flammable. This is true of any plant.

Mountain Cedars that are at least 60% hydrated are barely flammable. At 70%, they can be used as fire breaks (Dr. Bill Armstrong, Kerr Wildlife Management Area).

Mountain Cedars are "extremely drought tolerant…difficult to ignite." —Austin Fire Department, 2020

Tall grasses under Mountain Cedars increase chance of torching.

THE BIGGER PROBLEM IS WHAT WE'RE DOING







People cause 95% of wildfires in Texas (Texas A&M Forest Service). Mostly from careless brush pile burning.

People build along the Urban Wildland Interface without taking precautions.

People add features that make homes more fire prone.

TALL TALE #4

THEY'RE POLLEN IS TOXIC







It's not toxic, but it is highly problematic.

Made worse by urban pollution, hot showers with chloramine/chlorine water, and sugar (and other harmful eating habits).

Best treatments are acupuncture, allergy drops, neti pot, and removing chlorine/chloramine.

TALL TALE #5

THEY'RE INVASIVE



New growth



Regrowth

"Invasive" does not mean Mountain Cedars are not native.

Mountain Cedars can spread as pioneering thickets.

New growth = those spreading across large areas that have been degraded and dehydrated (such as clearcutting, overgrazing, and bulldozing). Damage is too extensive for woodland regrowth or prairie grass regeneration. It's a response to large-scale disturbances.

Regrowth = those regrowing after sections of woodlands are removed. If soil and seed bank is still viable, so regrowth will happen quickly. Most thickets are "stick cedars" that will grow into single trunk trees. It's a response to small-scale disturbances.

CEDAR THICKETS ARE NOT CEDAR BRAKES

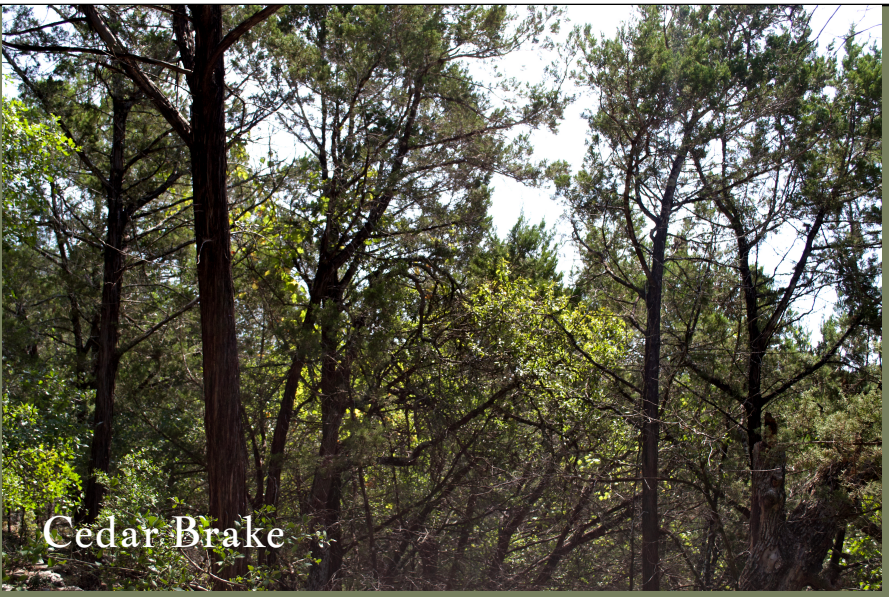

Cedar Thicket


Cedar Brake

Cedar thickets are pioneering thickets of bushy-cedars. Diversity is low and the leaf litter will be matted. Currently, most of the Hill Country is covered by cedar thickets.

Cedar brakes are old-growth woodlands dominated by large, older, densely spaced Mountain Cedars.

CEDAR BRAKES ARE NOT JUNIPER-OAK WOODLANDS


Cedar Brake


Juniper-Oak Woodland

Cedar brakes are dense growths dominated by Mountain Cedars.

Juniper-oak woodlands are characterized by both Mountain Cedars and Oaks.

OLD-GROWTH CEDAR BRAKES WERE ONCE COMMON



Bottomland Cedar Brake



Upland Cedar Brake

Two types of cedar brakes: upland and bottomland.

Historically, many hillsides were covered with upland cedar brakes. And the canyons and ravines were filled with bottomland cedar brakes that were dominated by “pole-cedars.”

TALL TALE #6

THEY WERE HISTORICALLY UNCOMMON

The Texas Hill Country is the eastern Edwards Plateau. When Europeans arrived, the Hill Country was dominated by tree growth; the western Edwards Plateau was dominated by prairie grass cover:

"Mountains are of third and fourth magnitude…they are clothed with forests of [plateau pinyon pine], oak, cedar, and other trees, with a great deal of shrubbery." -William Kennedy, 1841

"Live oak, holly, many kinds of cactus…and the millions of cedar that cover the Comal hills like a mantle…" -Victor Bracht, 1848

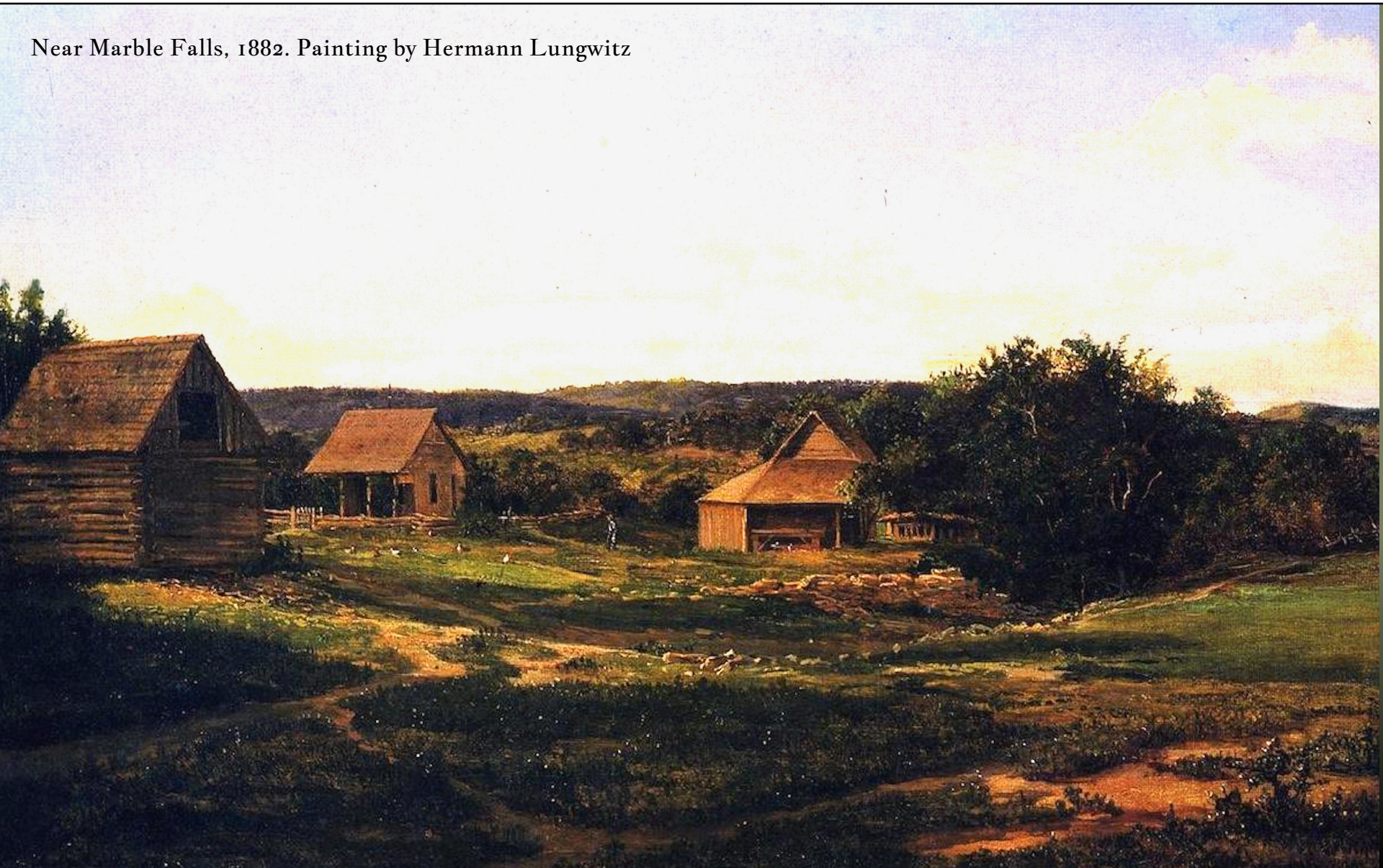
"I saw a region of ridges, mountains, ravines, valleys and table lands, all covered with a thin growth of oak or thickets of cedar…it is populous of bears, panthers, wolves and peccaries…" -Colonel Nathaniel A. Taylor, 1877

"Cedar…also forms a large part of the timber north and west of the Colorado River, and is usually found on the sides and apexes of the hills and mountains…west of the one hundredth meridian the timber growth is very limited…" [Foster, 2001—from 1887 Texas Census]

ARTWORK SHOWS TREES WERE COMMON



PAINTING SHOWS TREES WERE COMMON



Near Marble Falls, 1882. Painting by Hermann Lungwitz

PHOTO SHOWS TREES WERE COMMON



PHOTO SHOWS TREES WERE COMMON



TALL TALE #7

THEY PREVENT PLANT GROWTH







They grow where nothing else can.

Main culprits: dehydrated or no soil, matted leaf litter, and deer.

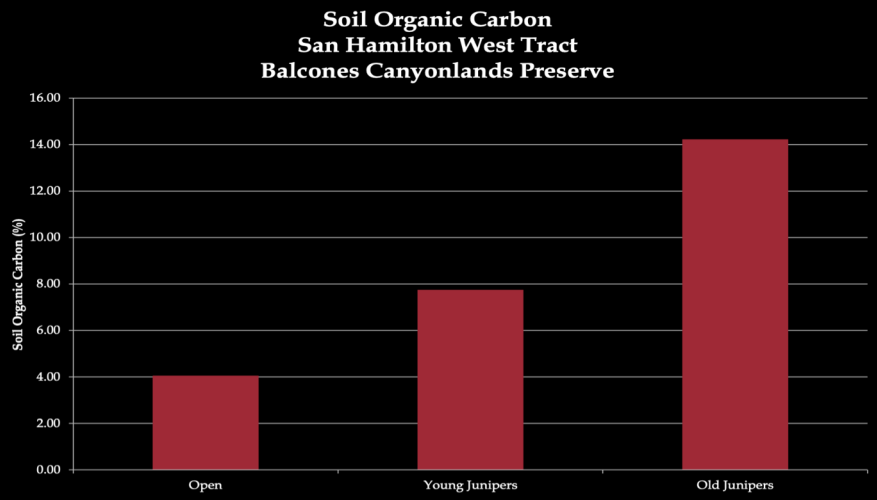
20-30 years after pioneering thickets cover dehydrated lands, soil conditions will begin to improve.

SOILS REBUILD & REHYDRATE UNDER CEDARS





Source: Lisa O'Donnell, City of Austin biologist



Levels of soil organic carbon increase with increasing woodland stand age

Wrinkle dams develop to slow overland water flows.

Wildlife eventually break up matted leaf litter and break branches.

Thick leaf litter adds organic matter and carbon to soil and reduce moisture evaporation and erosion.

THEY ACT AS NURSERY TREES





On the left is an 18’ tall Texas Ash growing vigorously through a cedar thicket.

The top photo shows Texas Red Oaks, Mustang Grapevine, Poison Ivy, and Turks Cap emerging through the lower branches of a mature Mountain Cedar.

AND HELP PLANTS ESTABLISH
~ OVER TIME











TALL TALE #8

THEY'RE CHOKING OUR OAKS





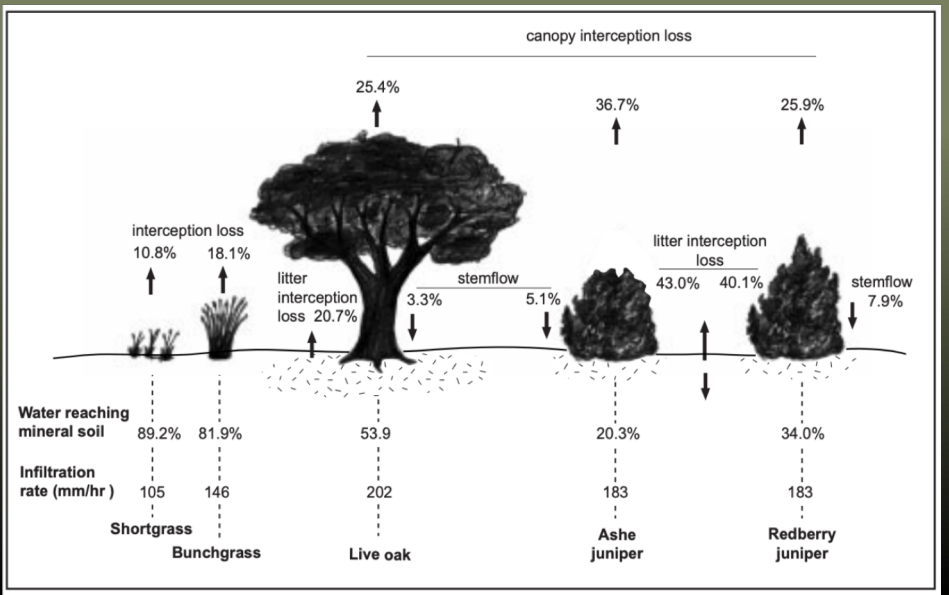
Established Mountain Cedars and Plateau Live Oaks get water from different depths (59-66' deep for oaks; 20-26' deep for cedars).

Oaks need mycorrhizae interactions and shade provided by spreading pioneering thickets of bushy-cedars to start growing.
-Lisa O'Donnell, City of Austin biologist

TALL TALE #9

THEY INTERCEPT MOST RAINS



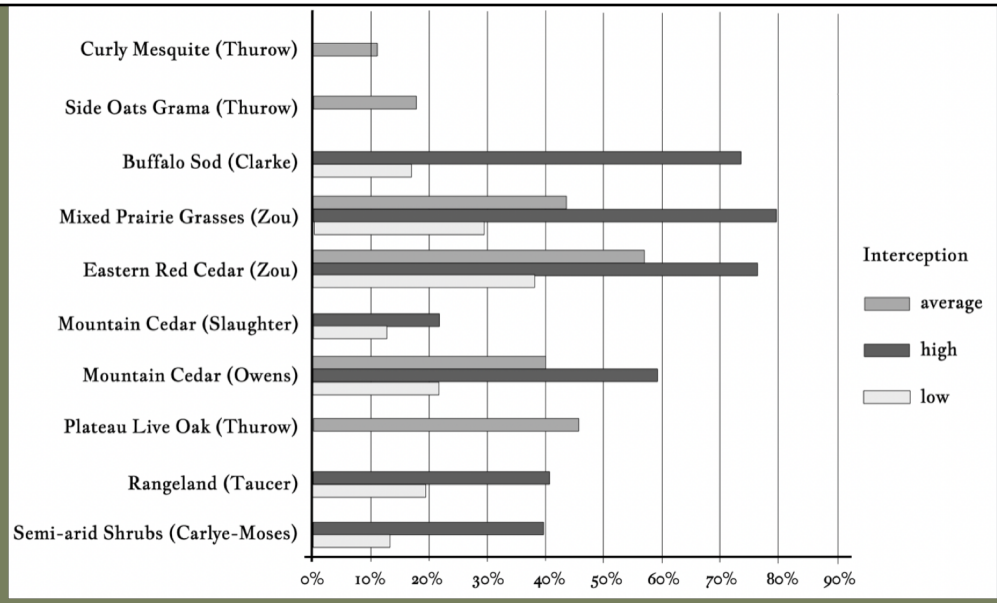


Interception measures amount of rain captured by the canopy and leaf litter.

The 1990s interception study that reported almost 80% interception had an error: it included soil moisture. Without the soil moisture, the interception is only about 40%.

NO MORE THAN MOST VEGETATION COVER







Lower interception studies on grasses studied sparse, not dense cover.

Interception by dense prairie grasses and Buffalo sod is about the same as interception by Mountain Cedars.

TALL TALE #10

THEY REDUCE AQUIFER RECHARGE





We've been taught for decades we need to maximize surface runoff by managing for sparse grass cover.

Mass brush removal increases erosion and dehydrates the land.

"A dense cover of [Mountain Cedar] is better watershed protection than a poor cover of grass." —Steve Nelle, former NRCS biologist

AQUIFER RECHARGE OCCURS REGARDLESS OF COVER





Aquifer recharge happens during flooding rains. Since most rain bypasses all vegetation during a flooding rain, including Mountain Cedars, vegetation cover doesn't affect aquifer recharge.

However, continuous vegetation cover reduces erosion and protects soils.

CEDARS ALSO INCREASE RAIN INFILTRATION





Hillside spring averages 500 gallons/day and hasn't gone dry

Infiltration is higher under Mountain Cedars than surrounding grass cover. It's why clearing will increase spring flows for a few years.

Older trees improve soils and increase deep carbon storage. Deeper roots move carbon and water deep to dissolve limestone. This increases groundwater storage capacity over time.

ITS TIME TO PUSH THE RESET BUTTON.







Doing what we've been doing hasn't been sustainable. We're stuck in an endless cycle of clearing-burning.

Stop hating the Mountain Cedar.

Shift our focus from trees to rebuilding and rehydrating our soils.

STEP 1:

EXPLORE USES TO OFFSET COSTS







Calcium in one gram of juniper ash = one glass of milk, according to Daniel Begay at Northern Arizona University.

Dried juniper can replace up to 50% of regular livestock feed- Dr. Travis Whitney, Texas Agrilife San Angelo.

Use Mountain Cedar to make activated charcoal or biochar.

Find more uses for berry, leaf, and sapwood oils. For instance, juniper leaf oil can be used to treat asthma. Berries contain high amounts of camphor and vitamin C.

STEP 2:

INCREASE GOVERNMENT FUNDING





To rebuild and rehydrate our soils.

To manage for continuous vegetation cover.

To manage for old-growth deep rooted tree cover on shallow soils to increase infiltration, groundwater storage capacity, deep carbon, and soil hydration. This will reduce microclimate temperatures, fire risk, erosion, and the impacts of downslope flooding.

To manage for continuous prairie grass cover and woody plants on deeper soils to stabilize and filter soil waters, as well as to increase infiltration.

STEP 3:

START REBUILDING & REHYDRATING SOILS!



Photo by Elenore Goode

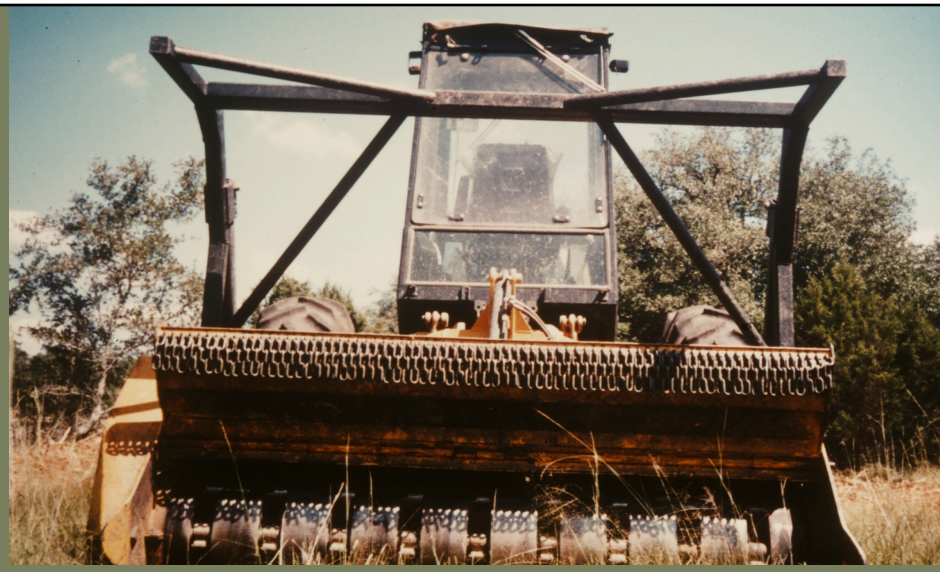




Photo by grainews.com

Install contour-trenches to rehydrate the land-bring back the CCC of the 1930s.

Shred and brush sculpt to create vegetation mosaics, not eradicate Mountain Cedars.

Incorporate rotation grazing Get more animals on the land-bring back the beaver.

TAKEAWAY POINTS



Pioneering thickets of bushy-cedars are a symptom, not the cause of eroded, dehydrated lands.

New growth thickets are acting as mega-soil building machines. *Overtime*, pioneering thickets increase infiltration, soil carbon, and groundwater storage.

Old-growth and recovering old-growth tree cover in the Hill Country needs to be valued and protected as more than scenic beauty and wildlife habitat; it needs to be valued as vital green infrastructure.

QUESTIONS?



Elizabeth McGreevy • website: www.landsteward.net

Like my Facebook page “Wanted Dead and Alive, Mountain Cedars” for updates