Ecological Sites and the NRCS Planning Process

Mark Moseley

Ecological Site Inventory Specialist

Boerne, Texas

It will be a cold day in Hell before people will want to buy land west of the Mississippi, much less want to move out there… (Anonymous, 1832)

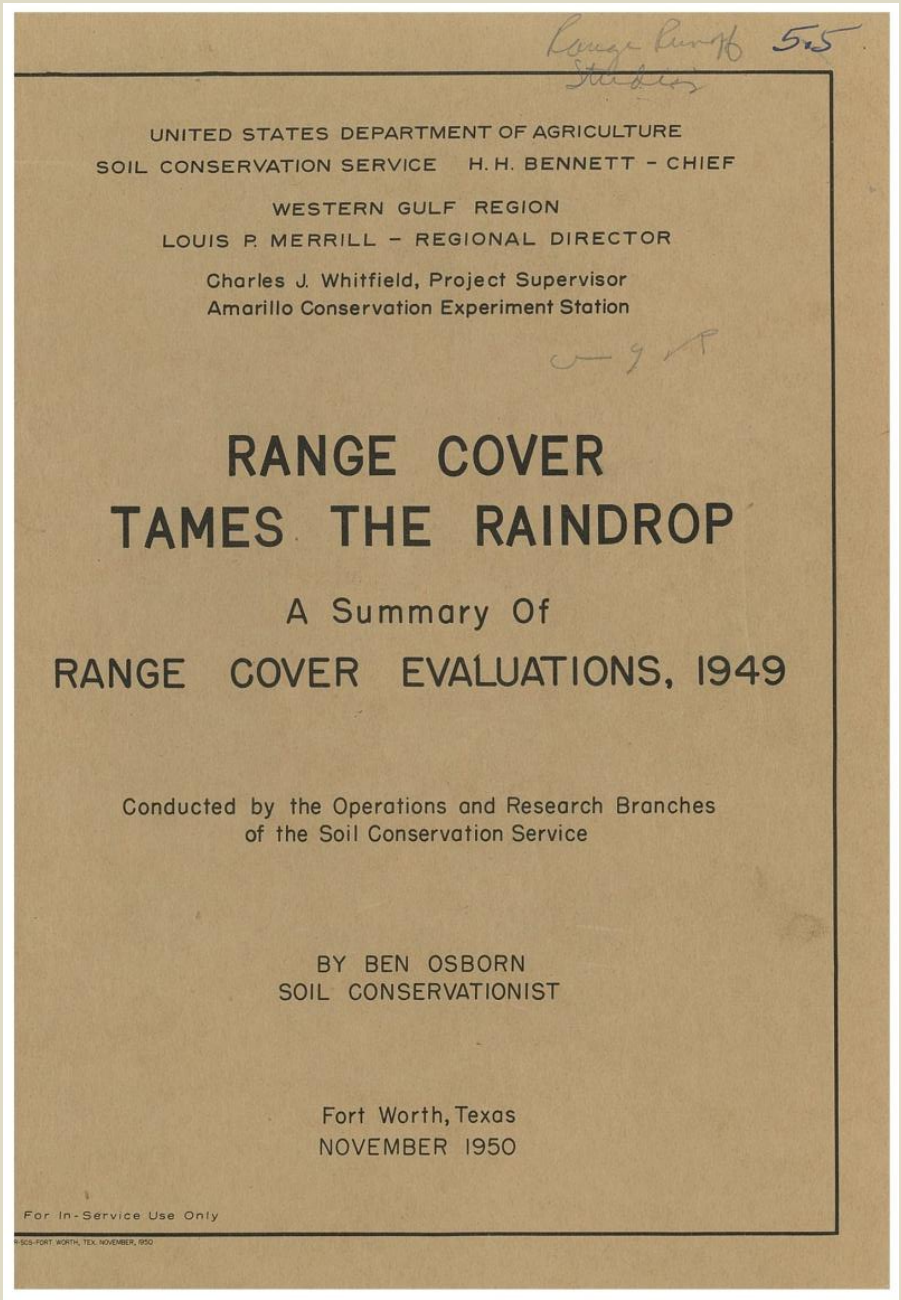
Conservation Planning

Cultural/Social Influences

Feeding A Hungry Nation

Background

Hydrology



UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE H. H. BENNETT - CHIEF
WESTERN GULF REGION
LOUIS P. MERRILL - REGIONAL DIRECTOR

Charles J. Whitfield, Project Supervisor
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RANGE COVER TAMES THE RAINDROP

A Summary Of RANGE COVER EVALUATIONS, 1949

Conducted by the Operations and Research Branches
of the Soil Conservation Service

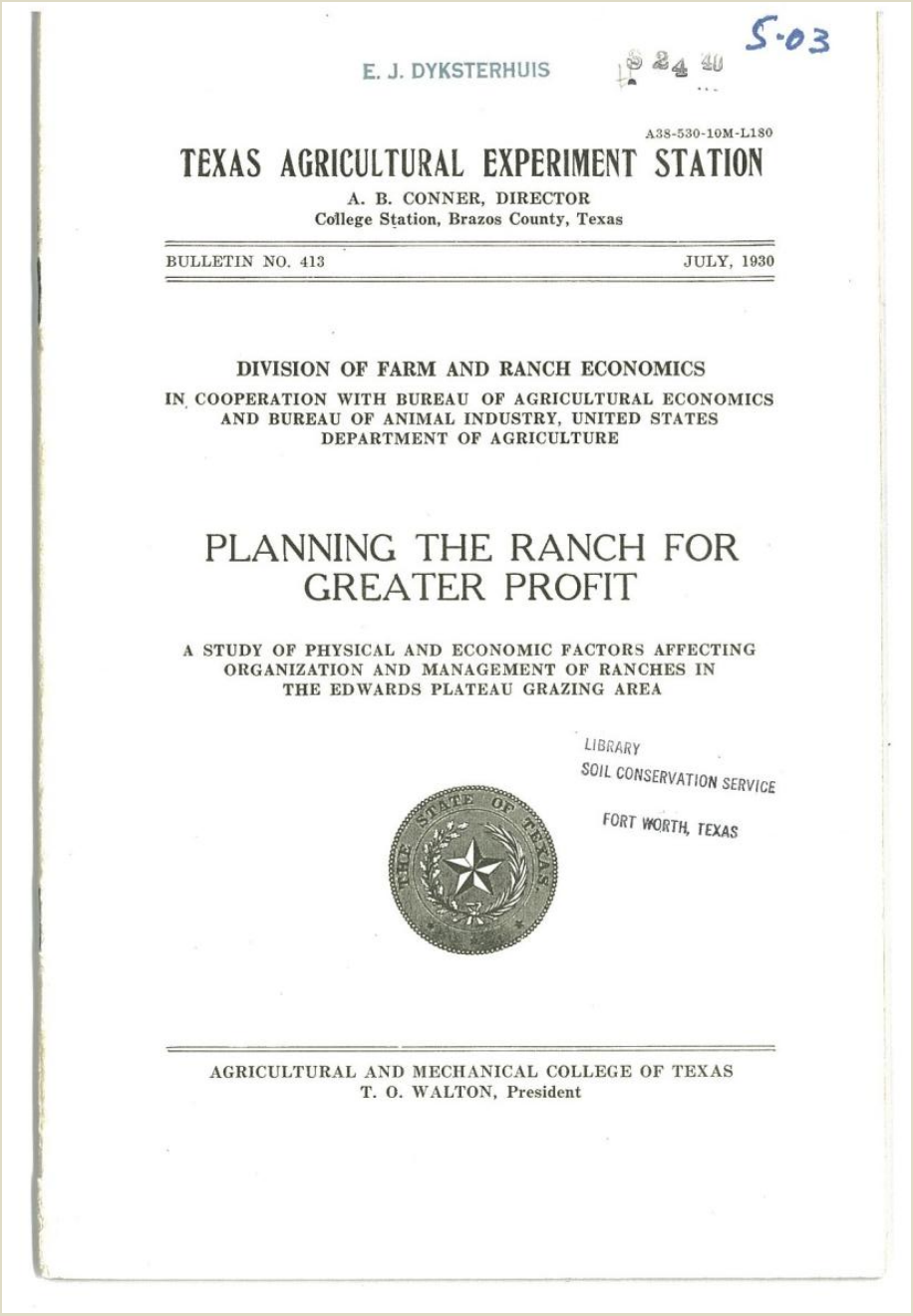
BY BEN OSBORN
SOIL CONSERVATIONIST

Fort Worth, Texas
NOVEMBER 1950

For In-Service Use Only

4-SCS-FORT. WORTH, TEX. NOVEMBER, 1950

Communication Products



E. J. DYKSTERHUIS

5-03

A38-530-10M-L180

TEXAS AGRICULTURAL EXPERIMENT STATION

A. B. CONNER, DIRECTOR

College Station, Brazos County, Texas

BULLETIN NO. 413 JULY, 1930

DIVISION OF FARM AND RANCH ECONOMICS

IN COOPERATION WITH BUREAU OF AGRICULTURAL ECONOMICS AND BUREAU OF ANIMAL INDUSTRY, UNITED STATES DEPARTMENT OF AGRICULTURE

PLANNING THE RANCH FOR GREATER PROFIT

A STUDY OF PHYSICAL AND ECONOMIC FACTORS AFFECTING ORGANIZATION AND MANAGEMENT OF RANCHES IN THE EDWARDS PLATEAU GRAZING AREA

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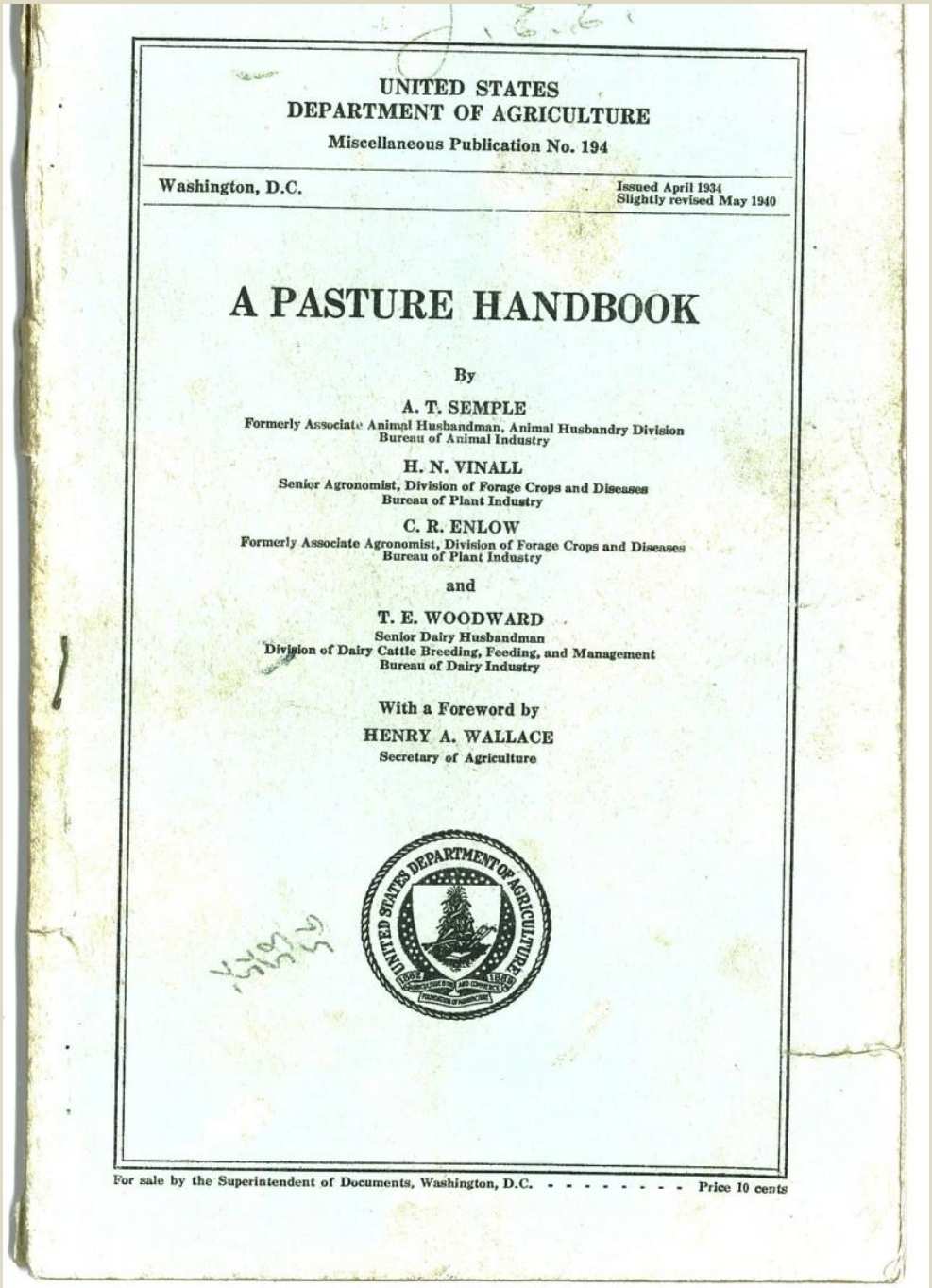
Communication Products



UNITED STATES
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Miscellaneous Publication No. 194

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A PASTURE HANDBOOK

By

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Senior Dairy Husbandman
Division of Dairy Cattle Breeding, Feeding, and Management
Bureau of Dairy Industry

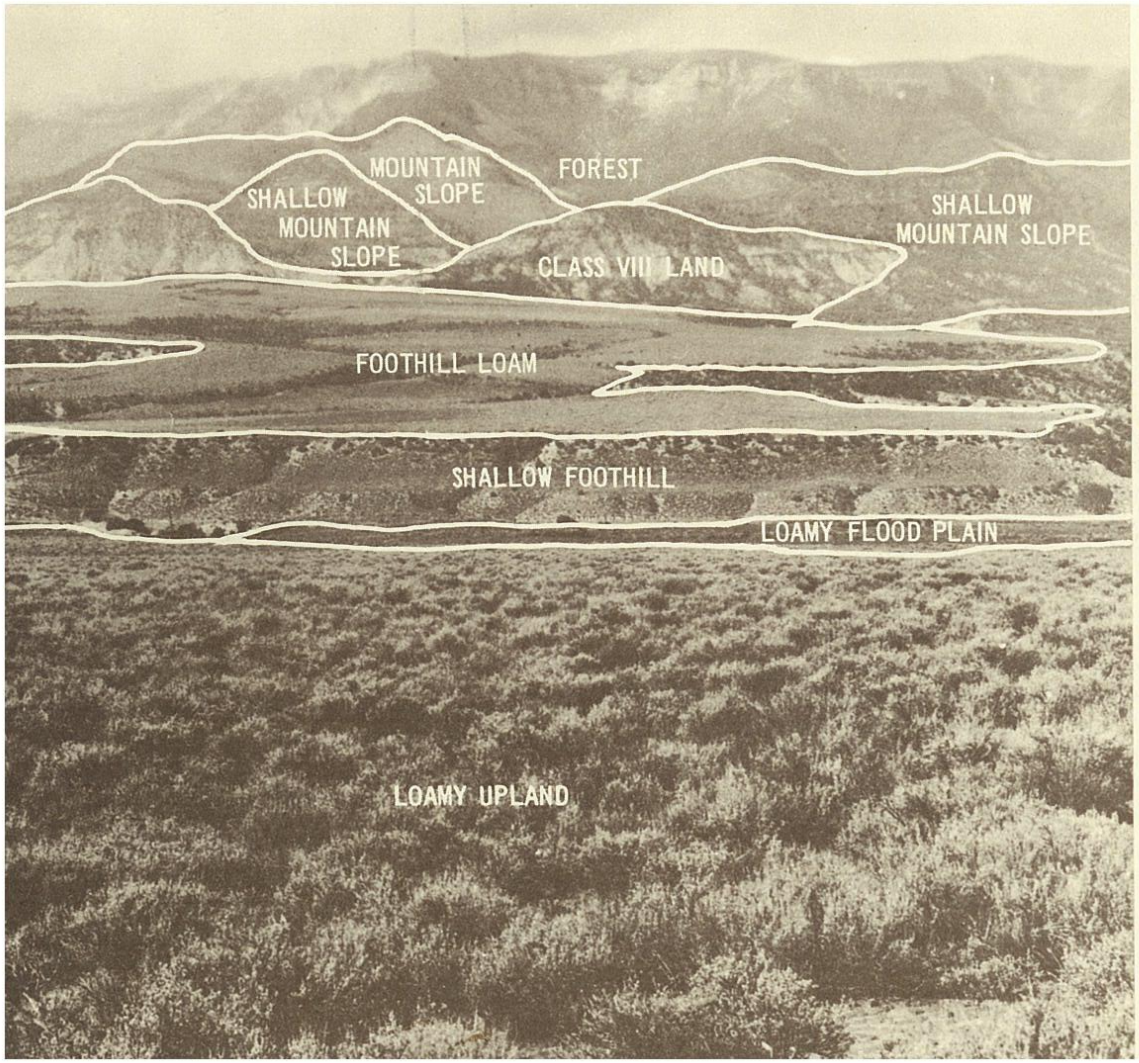
With a Foreword by

HENRY A. WALLACE
Secretary of Agriculture

For sale by the Superintendent of Documents, Washington, D.C. - - - - - - - - - Price 10 cents

Communication Products

The Range Site Description



CLASSIFYING RANGELAND FOR CONSERVATION PLANNING

Agriculture Handbook No. 235

U.S. Department of Agriculture
Soil Conservation Service

Range Condition Concept

Early Range Site Description

USDA, SCS
Section II-E
rea_____

STONY LOAM SITE

RANGE SITE DESCRIPTION

PE-31-44 +

Land Resource Area Edwards Plateau

Location_____

Date 1-1-72

1. TOPOGRAPHY AND ELEVATION: This site occupies upland areas. Slopes are convex and range from 1 to 20 percent generally ranging from 1 to 8 percent. Elevation varies between 1500 and 1800 feet.

2. SOILS:

a. This is a very shallow, stony loam soil developed over limestone bedrock. Soil depth ranges from 4 to 14 inches with a few deeper pockets. Coarse fragments comprise from 40 to 75 percent of the surface and from 35 to 60 percent of the soil. This soil is well drained and moderately permeable. Production on this site is limited due to the low water storage capacity. However, the soil makes effective use of small rains. Much of the large rain is lost through deep percolation or runoff.

b. Some soil taxonomic units which characterize the site are:

Eckert stony loam

c. Specific site location:

3. CLIMAX VEGETATION:

a. The climax plant community consists of scattered scrubby live oak and elm associated with mid and tall grasses and forbs. The major grasses are little bluestem, sideoats grama (bunch type), sand lovegrass and green sprangletop. Grasses make up about 80 percent of the total annual yield on the site. Woody plants and forbs make up about 10 percent each.

EP-31-44 Stony Loam

RELATIVE PERCENTAGE

Grasses	80%	Woody	10%	Forbs	10%
Little bluestem Sideoats grama	35	Live oak Elm	5	Orange zexmenia Louisiana sagewort Lespedeza Chalkhill woollywhite Snoutbean Dalea species Polygala Knotweed leaf-flower Bush sunflower	7
Green sprangletop	15	Kidneywood Texas persimmon Cactus Catclaw acacia Yucca	5		
Arizona cottontop Sand lovegrass	5				
Wright & purple threeawn	3				
Curlymesquite Buffalograss	T				
Fall witchgrass	5			Annual forbs	3
Texas wintergrass	T				
Hooded windmillgrass	5				
Fringeleaf paspalum Pinhole bluestem Vine-mesquite	10				
Annual grasses	2				

b. As retrogression occurs, numerous woody species increase on the site, such as persimmon, cedar, whitebrush and agarita. Other invaders are tasajillo, pricklypear, red lovegrass, red grama, sneezeweed and croton. Annuals increase greatly.

c. Approximate total annual yield of this site in excellent condition ranges from 1000 pounds in poor years to 2000 pounds of air-dry vegetation in good years.

4. WILDLIFE NATIVE TO THE SITE: This site is inhabited by deer, dove and quail.

5. GUIDE TO INITIAL STOCKING RATE:

a.

Condition Class	Climax Vegetation	Ac/AU/Yearlong
Excellent	76 - 100	12 - 16
Good	51 - 75	14 - 20
Fair	26 - 50	19 - 25
Poor	0 - 25	25+

Early Range Site Description

RELATIVE FORAGE QUALITY OF SPECIES 1/

a. Cattle

Primary	Secondary	Low Value
Little bluestem	Texas wintergrass	Live oak
Sideoats grama	Hooded windmillgrass	Elm
Arizona cottontop	Fringeleaf paspalum	Juniper
Green sprangletop	Vine-mesquite	Persimmon
Sand lovegrass	Threeawn	Hairy tridens
Pinhole bluestem	Sedges	Red lovegrass
	Kidneywood	Croton
	Orange zexmenia	Agarita
		Whitebrush

b. Sheep

Primary	Secondary	Low Value
Green sprangletop	Fall witchgrass	Elm
Sideoats grama	Fringeleaf paspalum	Persimmon
Little bluestem	Arrowleaf sida	Cedar
Bush sunflower	Orange zexmenia	Croton
Leafflower	Hooded windmillgrass	Pricklypear
Sagewort		Threeawn
Selected annuals		Noseburn
Kidneywood		Whitebrush
		Gummy lovegrass
		Other annuals
		Live oak

c. Goats

Primary	Secondary	Low Value
Elm	Arizona cottontop	Persimmon
Kidneywood	Whitebrush	Agarita
Orange zexmenia	Little bluestem	Pricklypear
Bush sunflower	Sideoats grama	Yucca
Sagewort	Pinhole bluestem	Croton
Leafflower	Live oak	Threeawn
Green sprangletop		Red grama
Selected annuals		Red lovegrass
Fall witchgrass		Hairy tridens
		Annuals

1/ See legend on separate sheet for definitions of interpretations made for each animal.

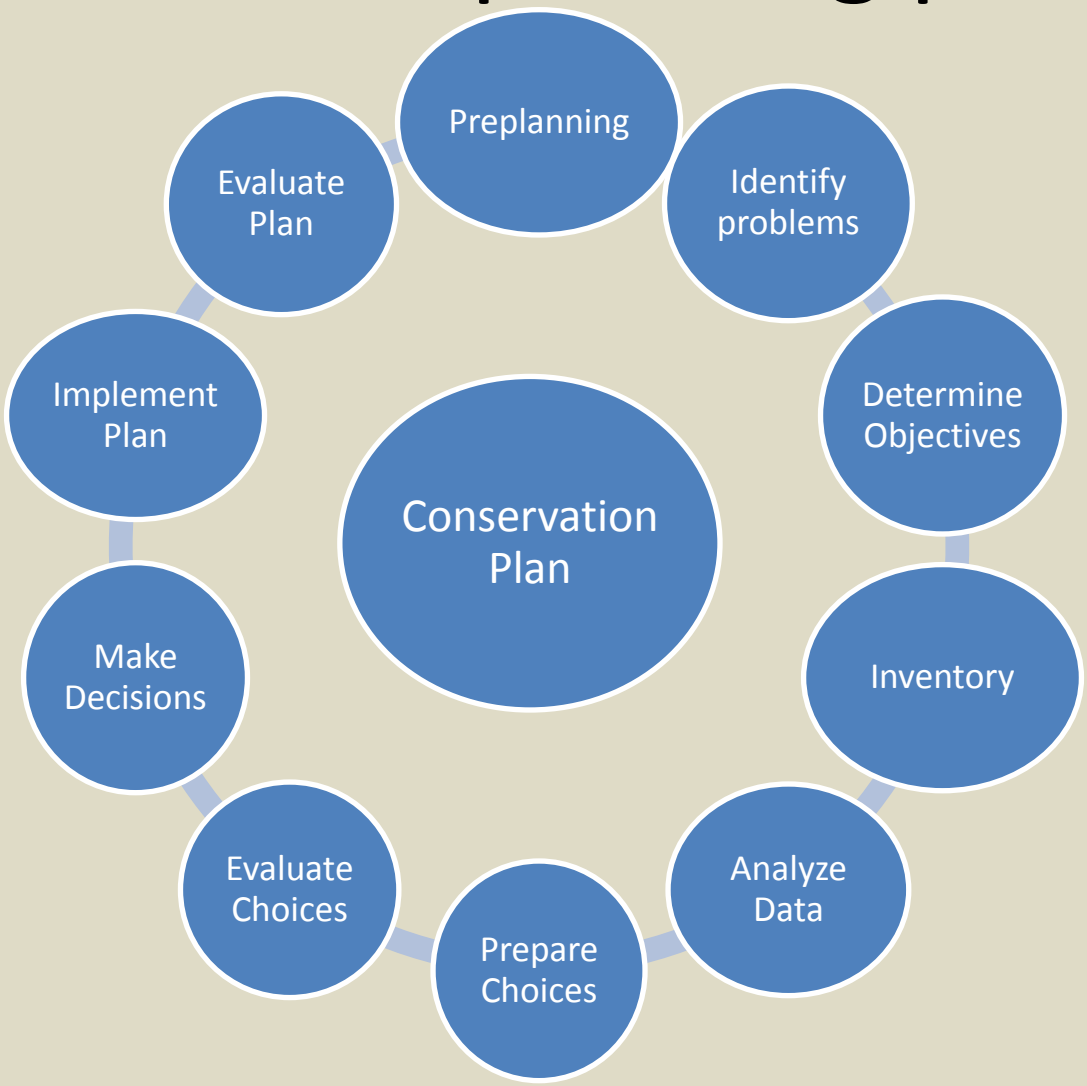
d. Deer

Primary	Secondary	Low Value
Kidneywood	Live oak	Most grasses
Elm	Cedar	Croton
Louisiana sagewort	Whitebrush	Agarita
Bush sunflower	Sedge	Tasajillo
Knotweed leafflower	Texas wintergrass	Persimmon
Selected Annuals		Cactus
Chalkhill woollywhite		

e. Dove and Quail

Primary	Secondary	Low Value
Croton	Arrowleaf sida seed	Other grasses
Leavenworth vetch	Woody plant seed	
Forb & grass seed (Annual & perennial)		
Canada wildrye seed		

Conservation planning process



Conflicting Technical Information

Community Economics

New Interpretations

USDA

United States Department of Agriculture

Natural Resources Conservation Service

Grazing Lands Technology Institute

Conservation Planning on Grazing Lands

The Art of Communication

Transferring the technology

Let’s expose ourselves to ESD’s!

The Ecological Site Description

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ECOLOGICAL SITE DESCRIPTION

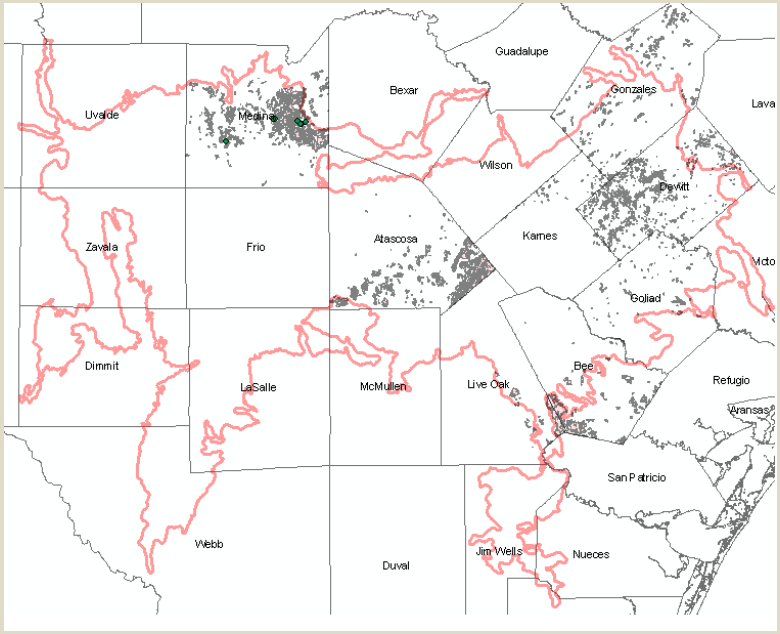
ECOLOGICAL SITE CHARACTERISTICS

Site Type: Rangeland

Site ID: R083AY379TX

Site Name: Blackland

Precipitation or Climate Zone: 25-35” PZ



Historical Perspective

In the *Report of the National Range Workshop* 1958:

"*On ranges where it is the goal to manage for species other than the climax, the desired vegetation should be described*."

Ecological Dynamics

- During the settlement period of the late 1800’s, the deeper soil portions of the site was often put to the plow for the planting of food, hay, and grazing.
- Early accounts consistently describe this region as a vast expanse of hills covered with "cedar" from San Antonio to Austin. Accounts also describe an abundance of clean, flowing water and abundant wildlife.

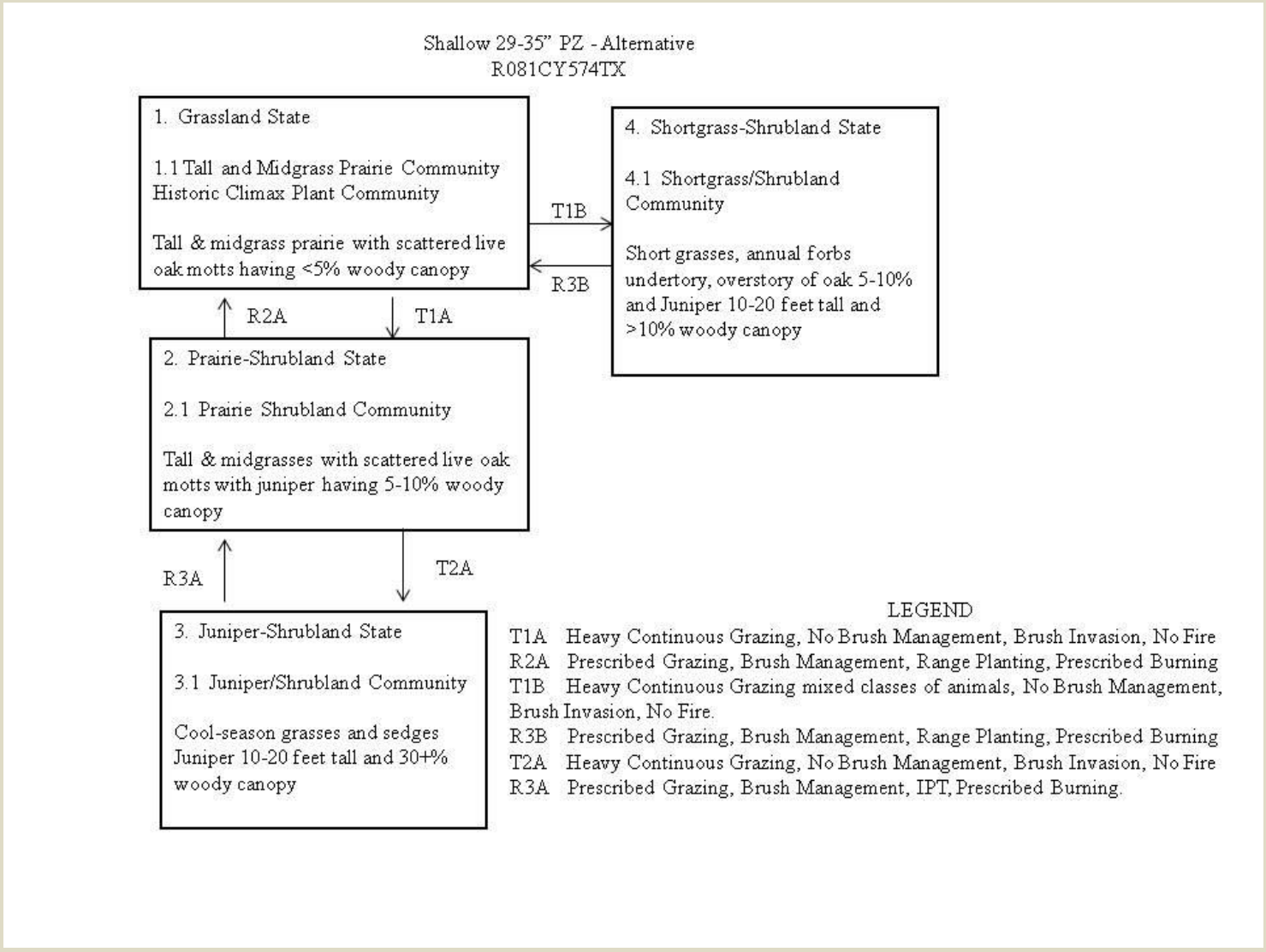
Ecological Dynamics

- These fires would have resulted from lightning during the hot, dry summer months or were set by Native Americans during other times of the year for various purposes.
- Historical accounts prior to the 1800's identify grazing by herds of wild horses, followed by heavy grazing by sheep and cattle as settlement progressed.

Ecological Dynamics

- The screwworm (*Cochilomyia hominivorax*) was essentially eradicated by the mid-1960s, and while this was immensely helpful to the livestock industry, this removed a significant control on deer populations
- Bison were not documented in the historical record as being present in any significant amount.

State and Transition Model



1.1

2.1

3.1

4.1

Plant Community Composition and Group Annual Production:

Group Number	Name	Spp. Production	Group Production
1	big bluestem	600-1000	800-2000
	little bluestem	600-1200	
	switchgrass	200-600	
2	Sideoats grama	150-750	500-1000
	dropseed	50-350	
	tridens	0-250	

Stocking Rates

5. GUIDE TO INITIAL STOCKING RATE:

a. Condition Class	Percent Climax Vegetation	Ac/AU/Yearlong
Excellent	76 - 100	15 - 18
Good	51 - 75	18 - 22
Fair	26 - 50	20 - 25
Poor	0 - 25	25+

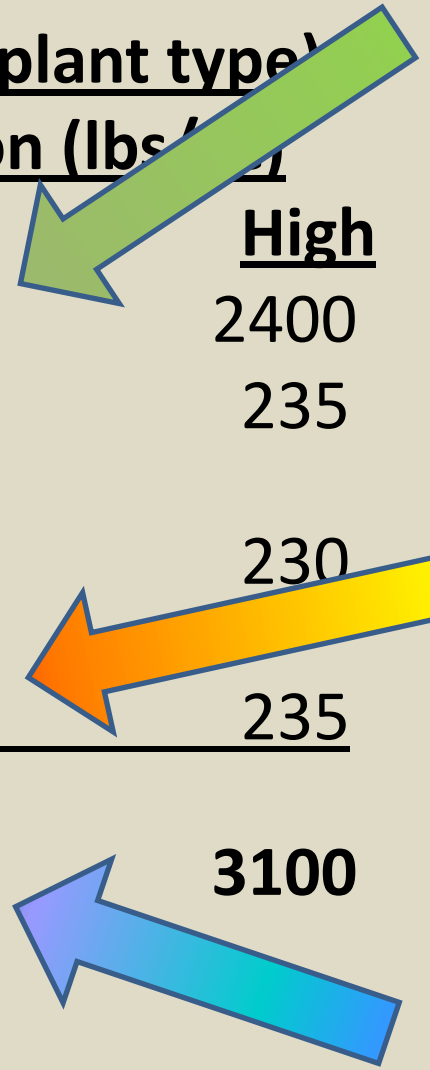
b. Introduced Species — Percent of the Area Established

	100-76	75-51	50-26	25-0
Introduced grasses	13-16	15-20	18-25	25+

Stocking Rates (RPC)

Plant Community Annual Production (by plant type)

Plant Type	Annual Production (lbs/ac) Low	RV	High
Grass/Grasslike	970	***1705***	2400
Forb	95	165	235
Shrub/Vine	90	165	230
Tree	95	***165***	235
Total	**1250**	***2200***	**3100**

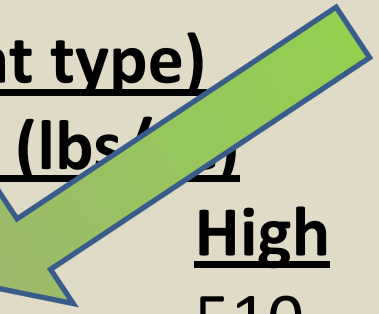


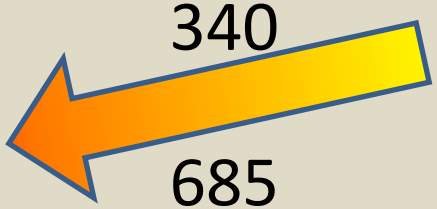
Reference Plant Community

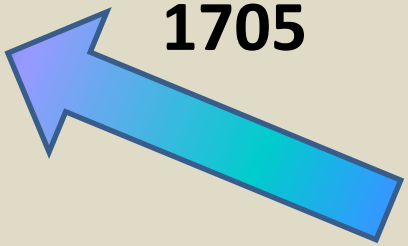
Stocking Rates (3.1)

Plant Community Annual Production (by plant type)

Plant Type	Annual Production (lbs/ac) Low	RV	High
Grass/Grasslike	205	***365***	510
Forb	70	120	170
Shrub/Vine	140	240	340
Tree	275	***485***	685
Total	**690**	***1210***	**1705**







3.1 Plant Community

Forage Preferences

Animal Kind: Sheep
Animal Type: Ewe-lamb

Name	J	F	M	A	M	J	M	A	S	O
buffalograss	D	D	D	P	P	P	P	P	P	P
red grama	U	U	U	U	U	U	U	U	U	U
daisy	P	P	P	D	D	D	U	U	U	D

Field Office Technical Guide

Brush Management

"On rangeland, do not remove more woody species than what is listed as historic for the site in the Ecological Site Description"

Prescribed Grazing

"The site is somewhat accessible to use by cattle but is more accessible to deer, sheep, Angora goats and meat goats…slopes above 11 percent are generally less accessible to cattle while sheep and goats can utilize slopes up to 45 percent. ..cattle will avoid a site once it contains about 30 percent surface rocks."

TABLE 3

PANHANDLE 7/

Ecological sites: deep sand, sandy bottomland, and dune

GRASS SPECIES	MIN. PERCENT	MAX. PERCENT
little bluestem	10	40
sand bluestem	10	40
Indiangrass	0	20
switchgrass	10	30
Minimum of total of above	**40**	**75**
sideoats grama	0	30
blue grama	0	20
forbs, legumes and/or shrubs	0	10

Hydrology

Model Predictions return periods based on 50 years climate data.

(50 yr) (52.7) (9.6) (2.3)
(25 yr) (49.5) (3.8) (2.0)
(10 yr) (44.5) (2.9) (1.4)
(5 yr) (40.1) (1.5) (0.7)
(2.5 yr)(35.6) (0.4) (0.2)

"Based on 50 years of climate data, there is a 85 percent chance there will be runoff and delivered sediment for these conditions. [Rangeland Hydrology and Erosion Model (RHEM) predictions] Model calibrated from field data]. The average sediment to runoff ratio is (0.4/0.8 = 0.5). For every 1.0 inch of runoff, 0.5 tons/acre soil erosion."

New Technology

Riparian/Watersheds

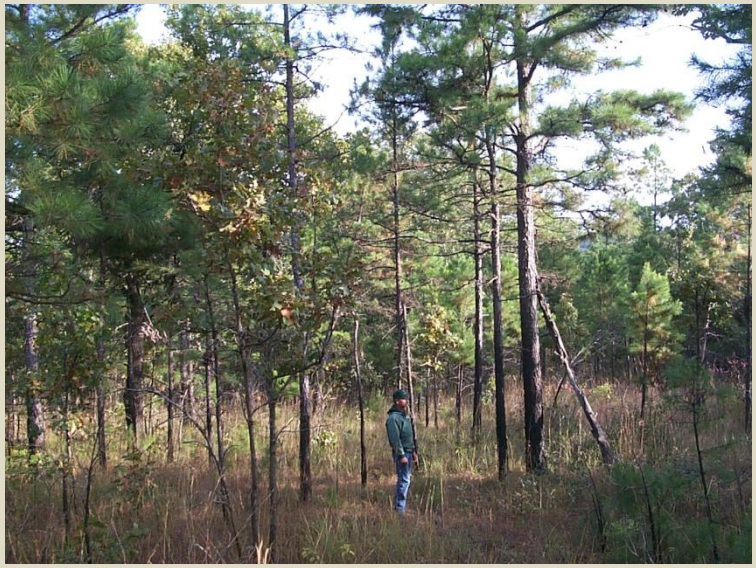
Let’s See Some Examples

Landscape Architecture

Job Market

Fire Management

Fire interpretations

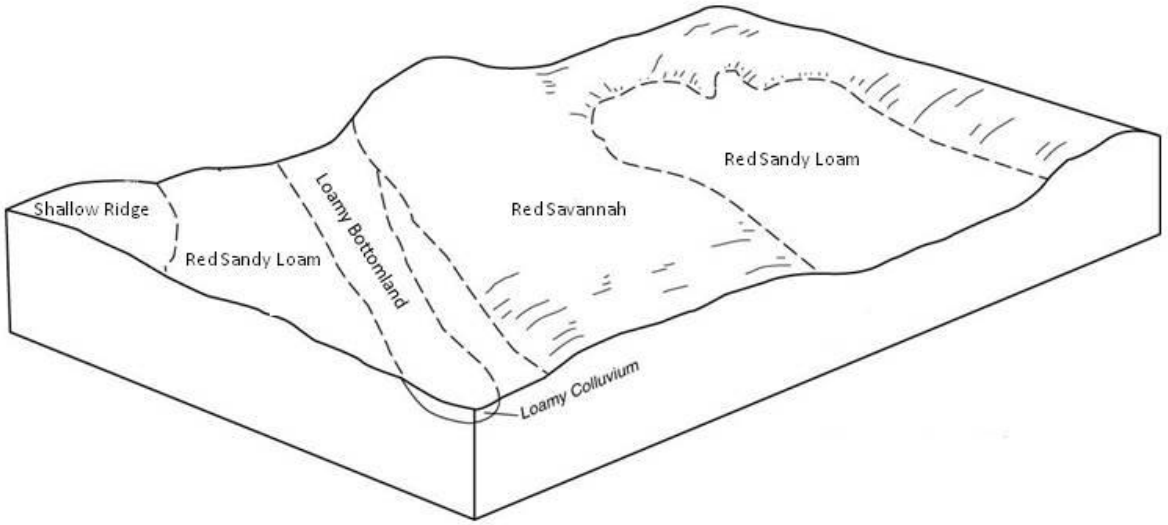


4 year fire return interval

2 year fire return interval

Managing Public Lands

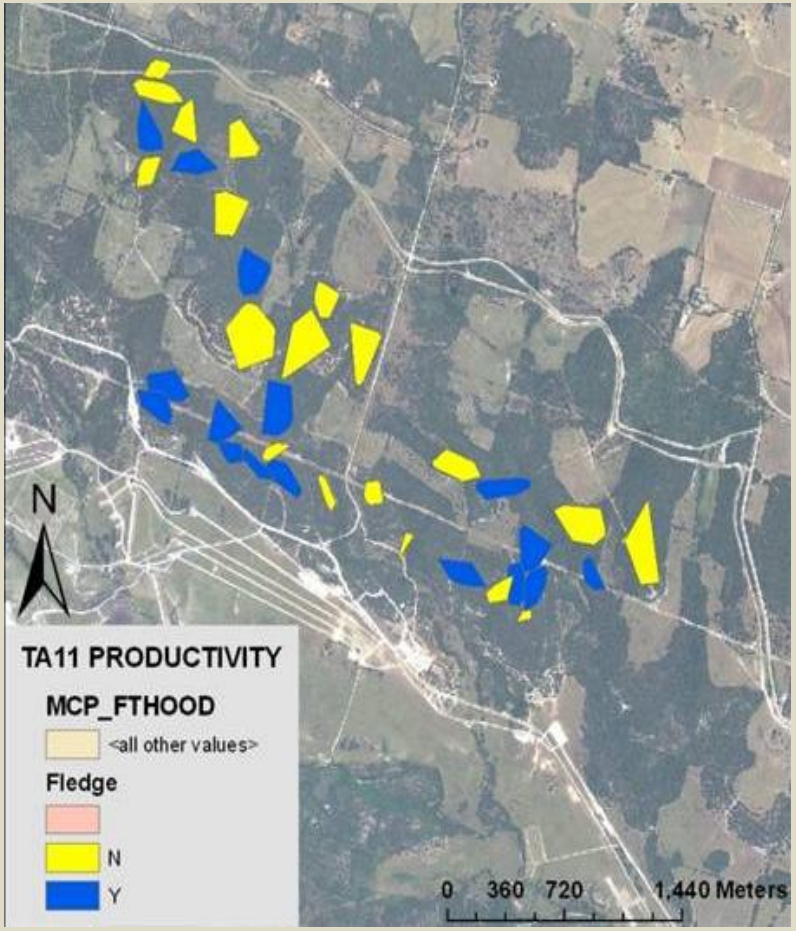
Endangered Species in Military



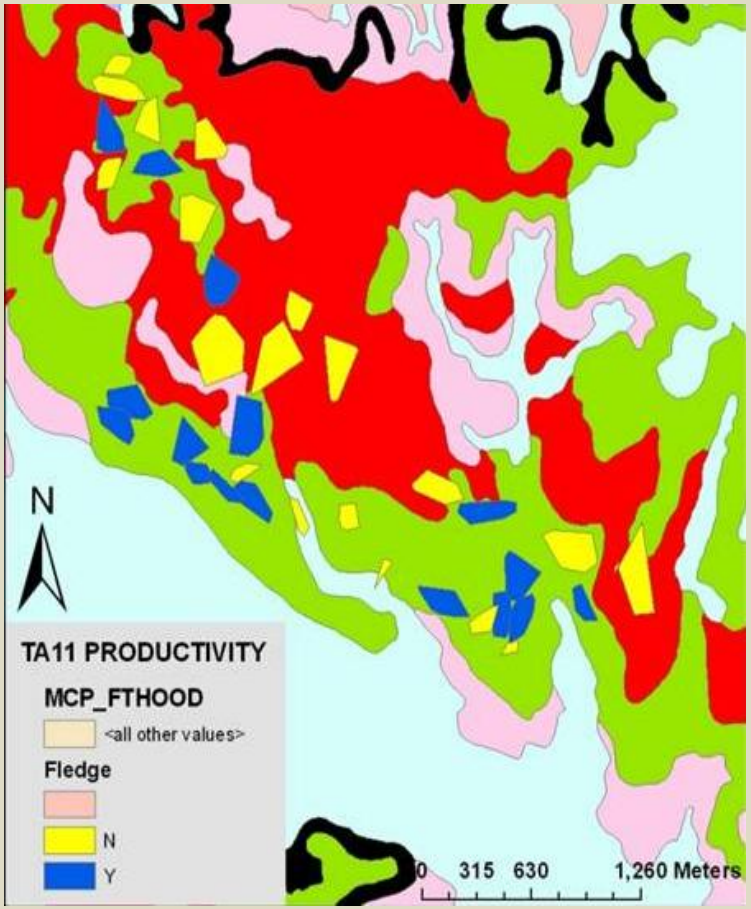
Formed in material weathered from schist, sandstone and limestone on uplands

Golden-cheeked Warbler reproductive success is strongly affected by ecological site

Redlands: reproductive success= 31%



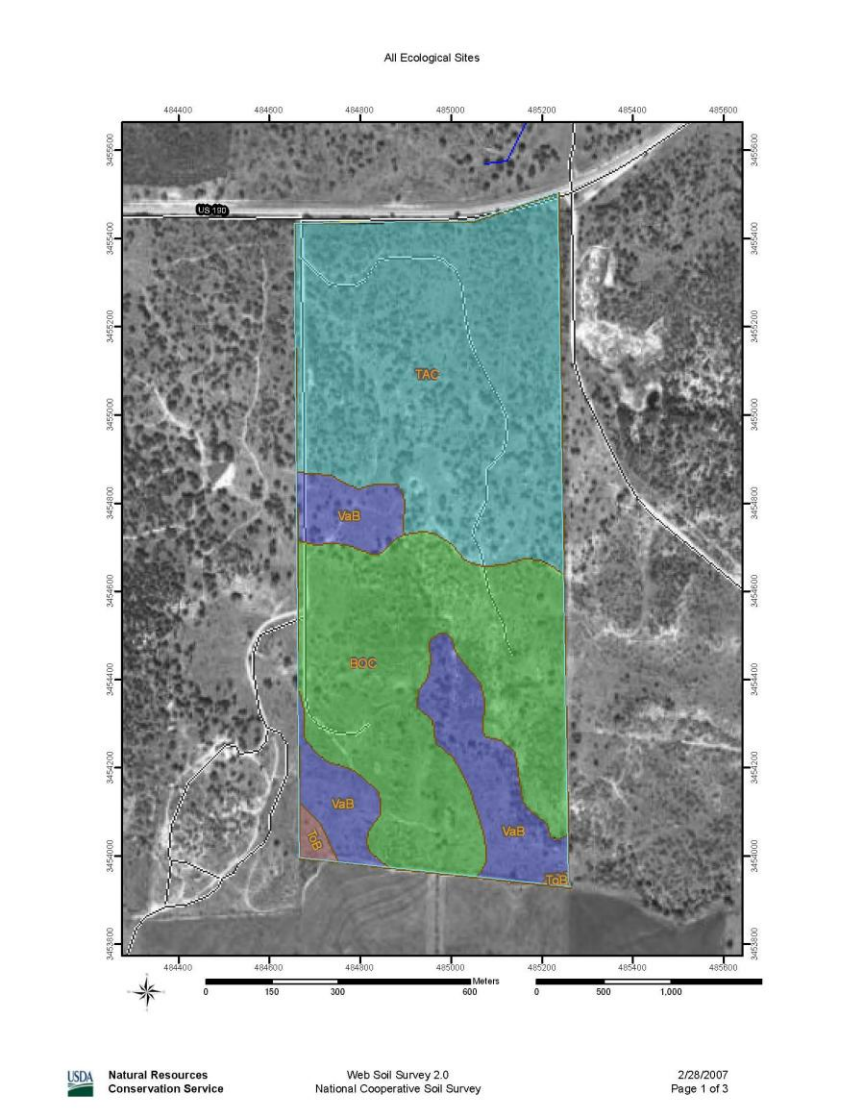
Low Stony Hill: reproductive success= 63%



Other Species

- Lesser Prairie Chicken
- Attwater Prairie Chicken
- Black Capped Vireo
- Golden Cheeked Warbler
- Long Leaf Pine Initiative
- Red Cockaded woodpecker

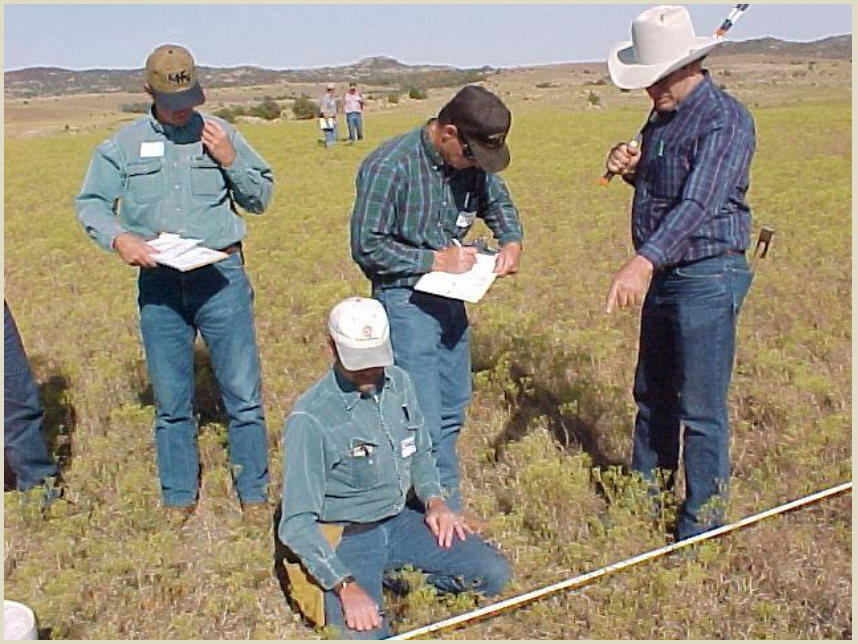
Taxing Authorities and Appraisers



Training

Helping Landowners Make Decisions

Research and Teaching



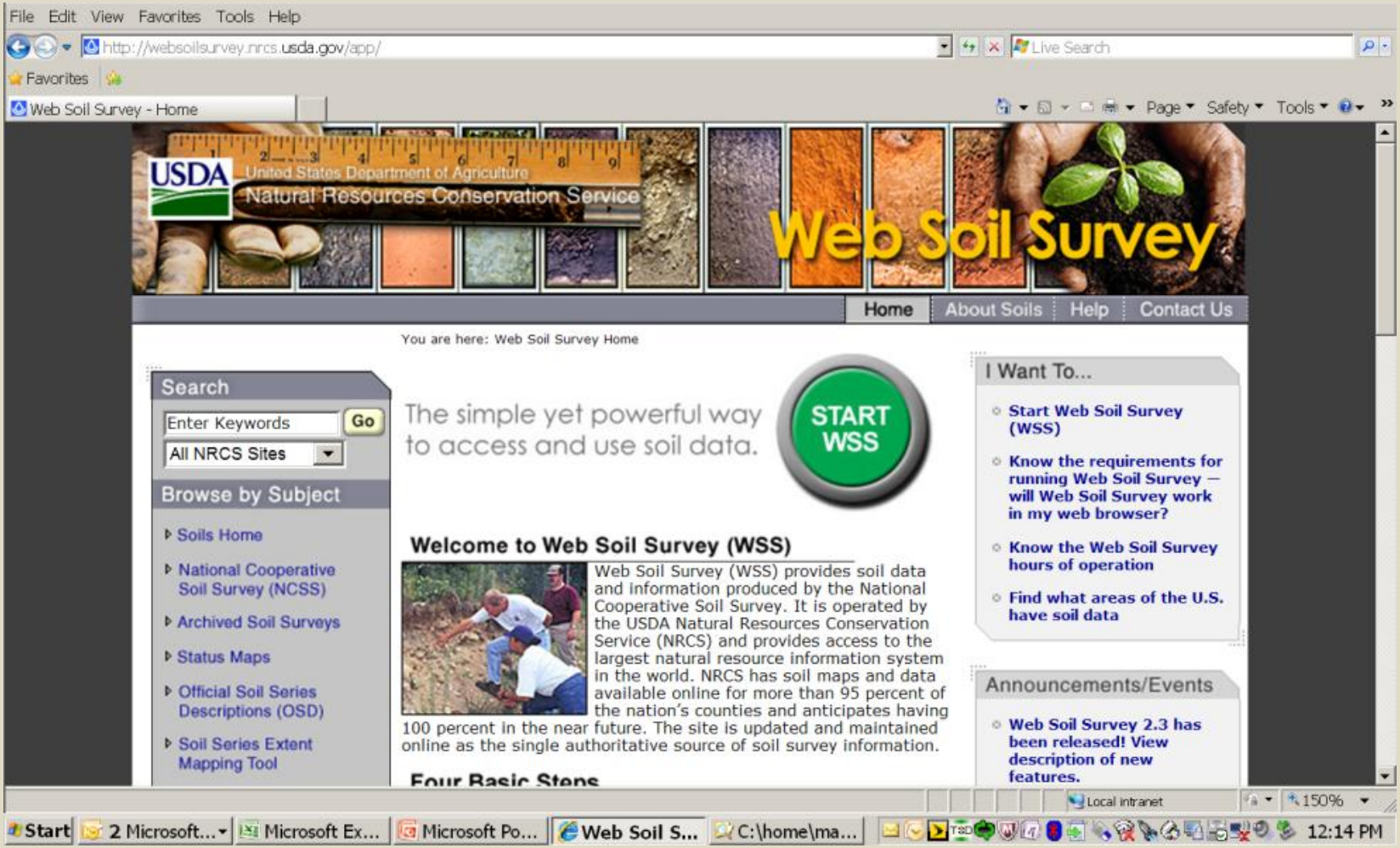
Range Health

Seventeen indicators to help ranchers determine if their land management choices are sustainable.

Medical

Legacy

Web Soil Survey

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Historical perspectives