

# LPCI Vegetation Monitoring for LEPC Habitat

Gene A. Fults USDA NRCS WNTSC

Reggie Blackwell CNTSC

Philip Barbour CNTSC

Marcus Miller WNTSC

CEAP Conservation Benefits of Rangeland Practices  
Chapters 1, 3, 6 & 8

West, Neil E. , (2003) 'History of Rangeland Monitoring  
in the U.S.A.', Arid Land Research and Management,  
17:4, 495 – 545  
(1891 to present)

## USFWS 06-11 Conference Report for NRCS LPCI

### APPENDIX III - LPCI Science Support Element Monitoring LPCI Effectiveness

**Baseline assessments** of vegetation will be collected at project areas **consistent** with NRCS **NRI protocols** to assess vegetation response at the individual ranch level. In turn, as multiple projects are completed a portfolio of habitat change can readily be quantified and linked back to changes in abundance and/or distribution of populations.

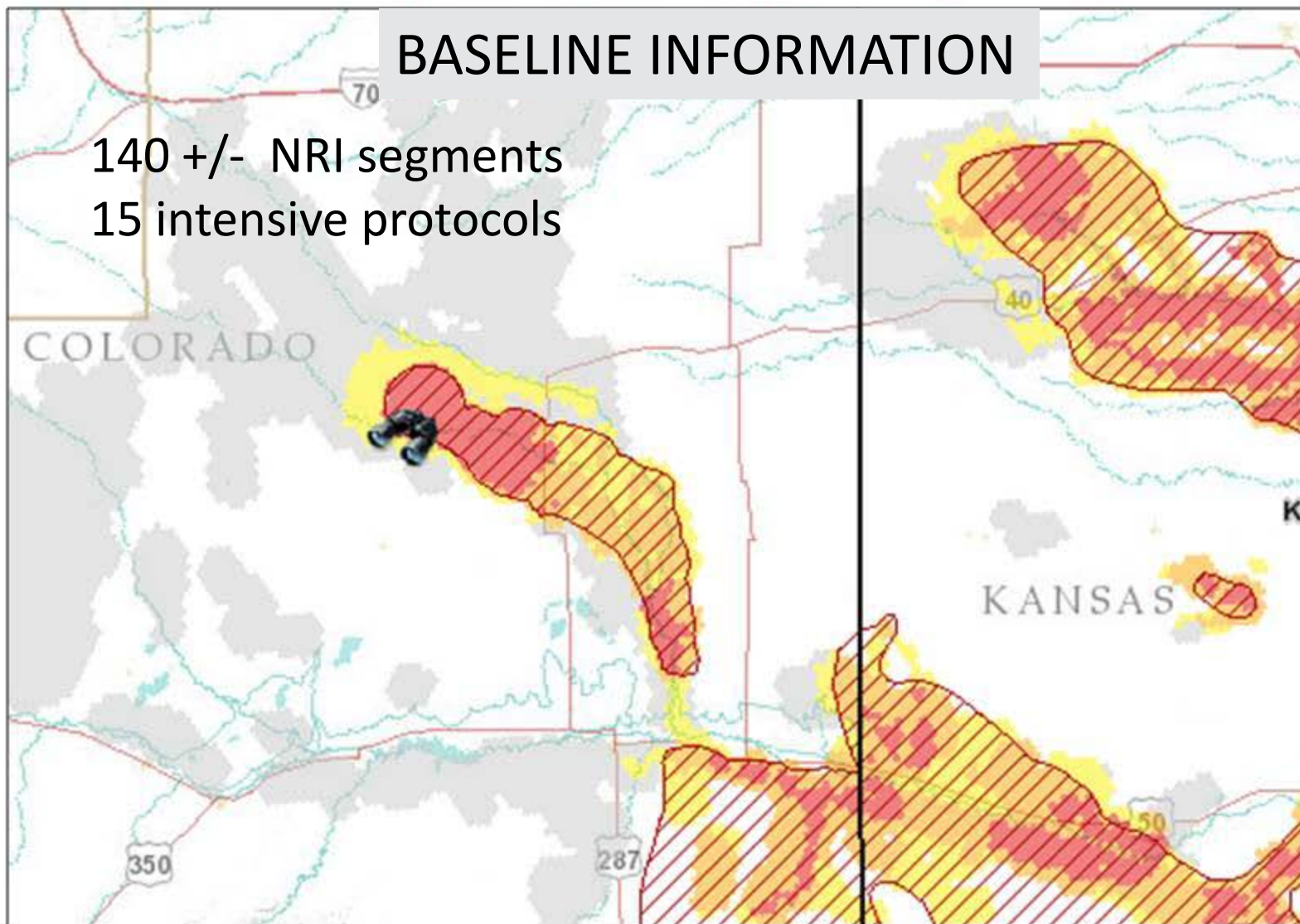
NRCS will seek to develop Wildlife Habitat Evaluation Guidelines that are specific to the three major habitat types (i.e., mixed-grass prairie, sand sagebrush prairie, and shinnery oak grasslands) but are **consistent** across the range of the LPC. This approach will ensure that baseline information is reported **consistently** both internally and to partners.

# Rationale: Field Consistency

- A. Baseline information
- B. Monitoring Protocol
- C. Vegetation Protocol
- D. Field Preparation

## BASELINE INFORMATION

140 +/- NRI segments  
15 intensive protocols



<http://www.kars.ku.edu/maps/sgpchat/>  
Connected with segment area of on-site grazing land study NRI

PRISM Climate Group - Windows Internet Explorer

File Edit View Favorites Tools Help

http://www.prism.oregonstate.edu/

PRISM CLIMATE GROUP

HOME PRODUCTS PROJECTS DOCUMENTATION HELP | Print Friendly

TERMS OF USE

What's New!

1/26/2011: Added [US Virgin Islands](#) data.

[Complete History](#)

Quick Links

- [Data Alerts!](#)
- [Monthly Data](#)
- [800m Normals \(1971-2000\)](#)
- [Internet Map Server](#)

Latest PRISM Data - Jan 2011

[Precipitation](#)  
[Max Temp](#)  
[Min Temp](#)  
[Dewpoint](#)  
[PPT %](#)



Click to see full-size map. [More...](#)

The data sets available on this web site were created using the PRISM (Parameter-elevation Regressions on Independent Slopes Model) climate mapping system, developed by Dr. Christopher Daly, PRISM Climate Group director. PRISM is a unique knowledge-based system that uses point measurements of precipitation, temperature, and other climatic factors to produce continuous, digital grid estimates of monthly, yearly, and event-based climatic parameters. Continuously updated, this unique analytical tool incorporates point data, a digital elevation model, and expert knowledge of complex climatic extremes, including rain shadows, coastal effects, and temperature inversions. PRISM data sets are recognized worldwide as the highest-quality spatial climate data sets currently available. PRISM is the USDA's official climatological data.

**Important notice:**

PRISM data sets were developed through projects funded mostly by the [USDA Natural Resources Conservation Service](#), [USDA Forest Service](#), [NOAA Office of Global Programs](#), and others. However, there is little operational funding for maintaining and updating or expanding the data sets. Data are provided as a public service for a limited time. If you find them valuable, please consider doing your part to support the PRISM Climate Group. [Contact us](#) for details at 541-737-2531.

Use this site to [access](#) up-to-date and historical monthly climate data sets and graphics for the US, [explore](#) our data online with our Internet Map Server, [view](#) related papers and presentations, or [contact](#) us.

Best viewed with Internet Explorer 5.0+ or Netscape 6.0+ (Updated 6 May 2007.)

OSU Oregon State University

Start | Inbox - Micr... | C:\home\lge... | pasture\_an... | SRMA Guid... | 2 Interne...

Step 1.  
[www.prism.oregonstate.edu](http://www.prism.oregonstate.edu)

Step 2. Click on explore our data online with Internet Map Server.

Step 3. Enter longitude and latitude

Step 4.  
Parameter = precipitation.  
Month = annual.  
Start year = 2008.  
(Ideally the start year should be 3 years prior to data collection year)  
Stop year = 2012 (or year of data collection).

Step 5.  
Click for Time Series.

Optional Step 6. Month = All. Start/Stop year is year of collection. Click Time Series.

PRISM Data Explorer - Windows Internet Explorer

http://prismmap.nacse.org/hn/index.phtml?lon=-96.375&lat=39.391&vartype=ppt&month=14&year0=2003&year1=2010&units=English&layer\_

PRISM DATA EXPLORER

WARNING: This application is for analyzing timeseries for single grid-point data ONLY. If you wish to retrieve larger regions, please use the gridded data which is available for FIP from [here](#). Any abuse of this system such as writing of robots and programs that automatically query many gridcells **IS PROHIBITED** and will result in denial of access. Please [contact us](#) if you need assistance.

Gridcell Time Series Analysis

Location: Decimal-degrees Lon: -114.884 Lat: 44.802

Parameter: Precipitation

Month: Annual

Start Year: 2003

Stop Year: 2010

Units: English

Click for TimeSeries

Click for 1971-2000 Normals

Refresh Map

Precipitation (in.)

0	16-20	36-40	80-100
4-4	20-24	40-50	100-120
4-8	24-28	50-60	120-140
8-12	28-32	60-70	140-160
12-16	32-36	70-80	160+

Copyright (C) 2010, PRISM Climate Group, Oregon State University / 199 156 165 161

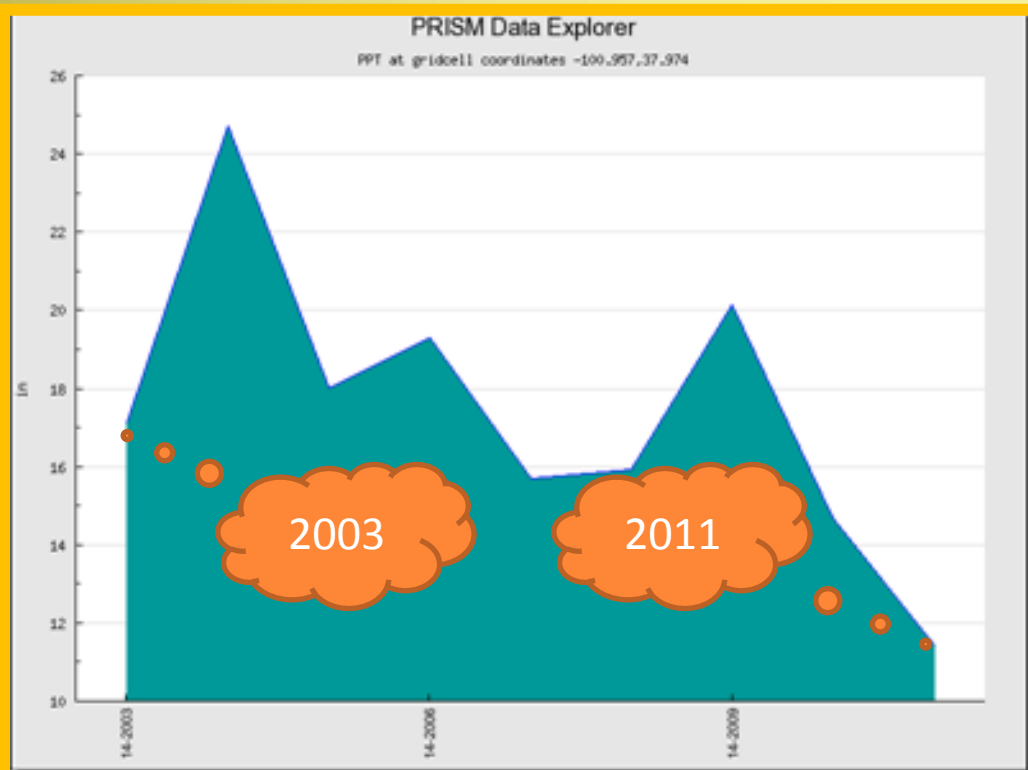
Mozilla/4.0 (compatible; MSIE 7.0; Windows NT 5.1; NET CLR 2.0.50727; NET CLR 3.0.04506.648; NET CLR 3.5.21022; NET CLR 3.0.4506.2152; NET CLR 3.5.30729; InfoPath 2; MS-RTC LM 8)

http://prismmap.nacse.org/hn/index.phtml?lon=-96.375&lat=39.391&vartype=ppt&month=14&year0=2003&year1=2010&units=English&

Internet 100%

Start | Inbox - Micr | C:\home\elge | pasture\_an... | SRMA Guid... | 2 Interne... | Microsoft P... | 2:37 PM

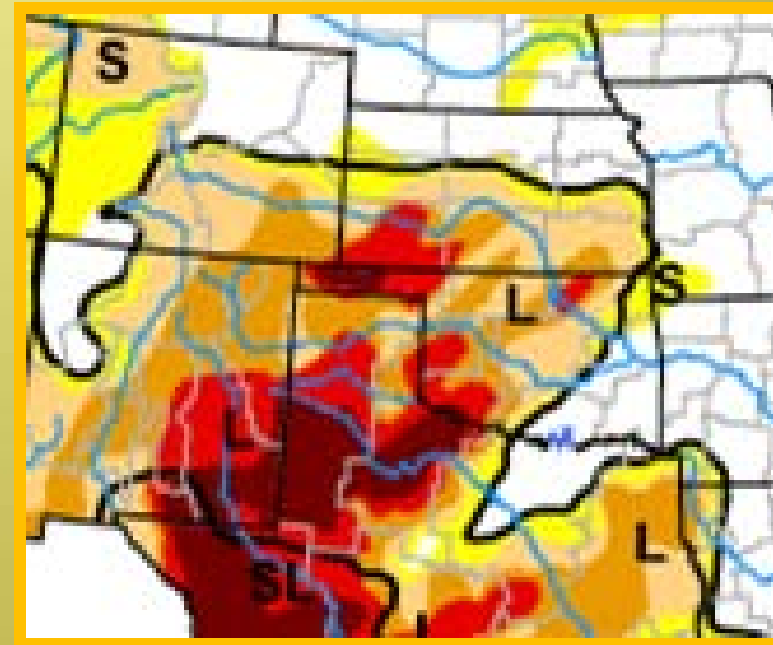
# PRISM multi-year for Garden City, KS



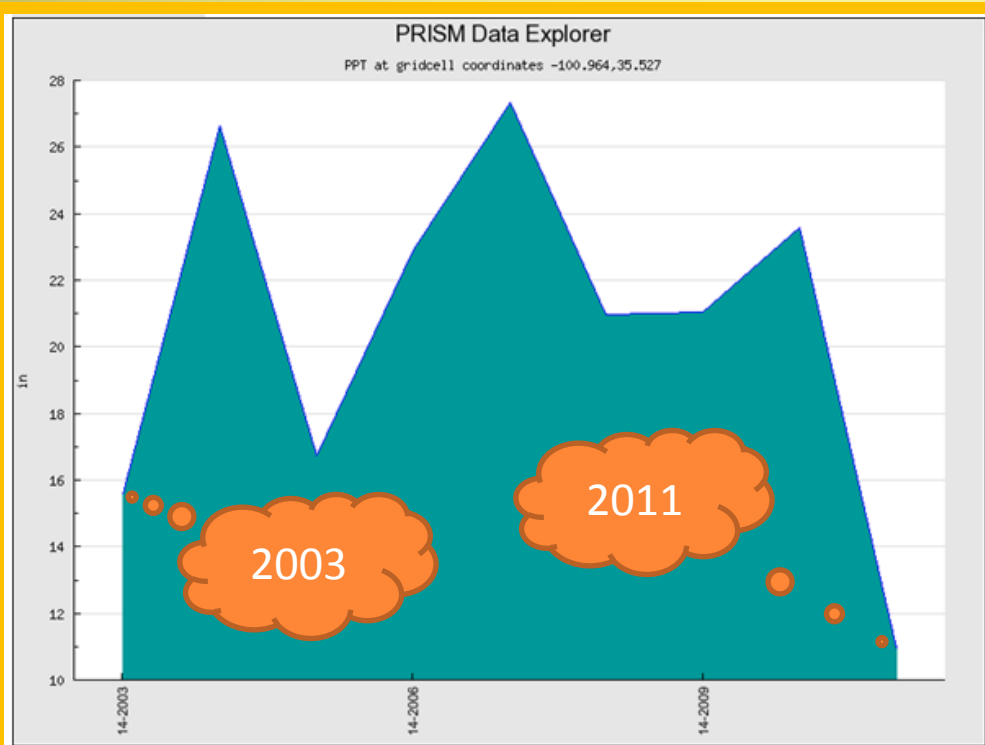
Year	Month	Value
2003	14	17.14
2004	14	24.74
2005	14	18.01
2006	14	19.28
2007	14	15.68
2008	14	15.92
2009	14	20.14
2010	14	14.67
2011	14	11.43

Time: 1 seconds

## Drought Monitor map



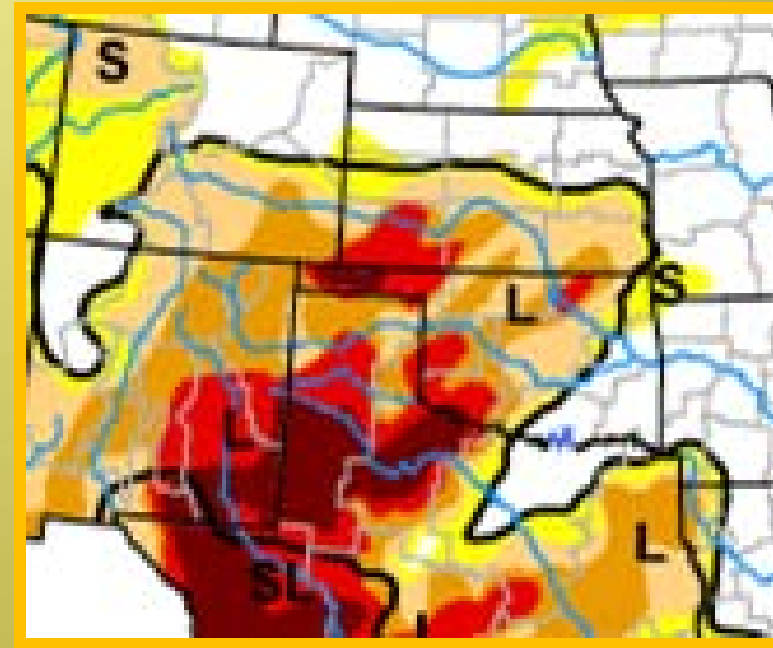
# PRISM multi-year for Pampa, TX



Year	Month	Value
2003	14	15.60
2004	14	26.64
2005	14	16.74
2006	14	22.91
2007	14	27.32
2008	14	20.97
2009	14	21.05
2010	14	23.59
2011	14	10.94

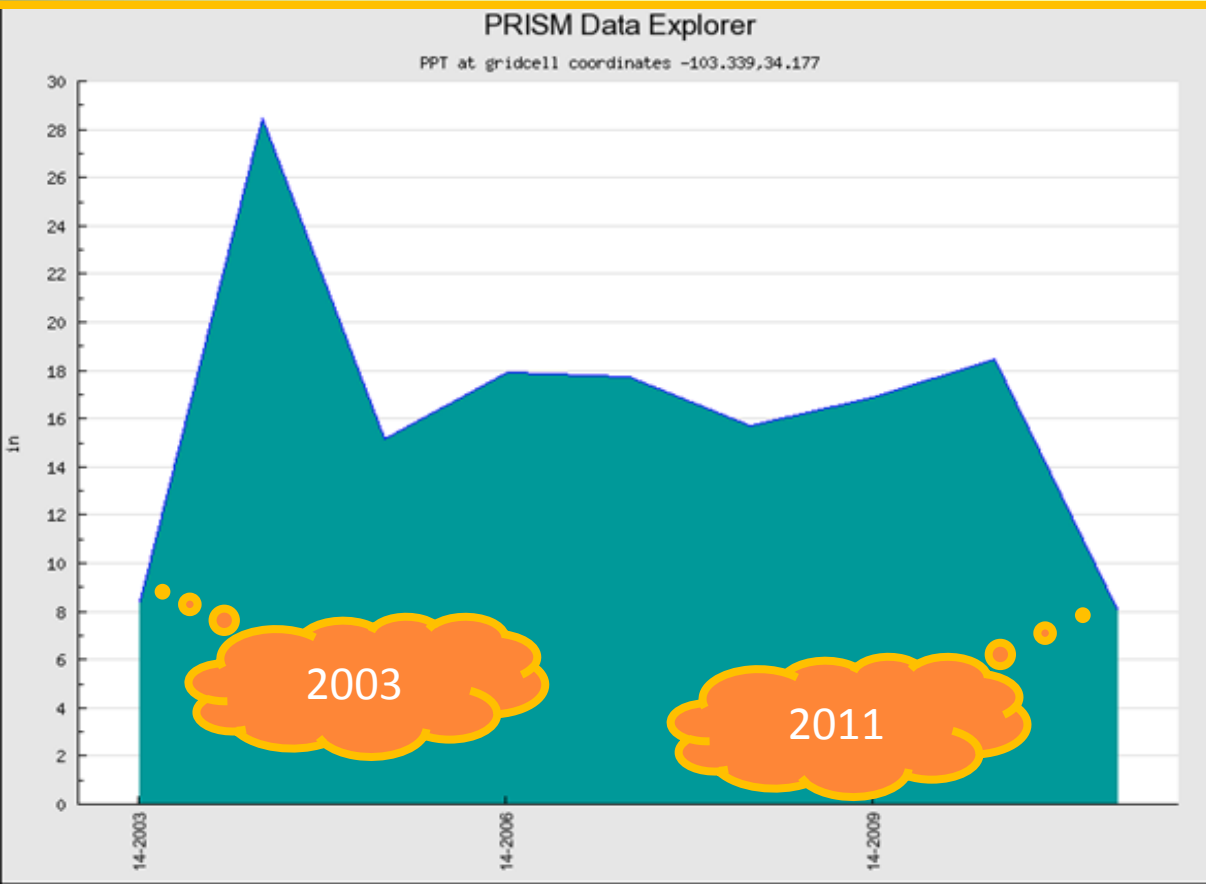
Time: 1 seconds

## Drought Monitor map



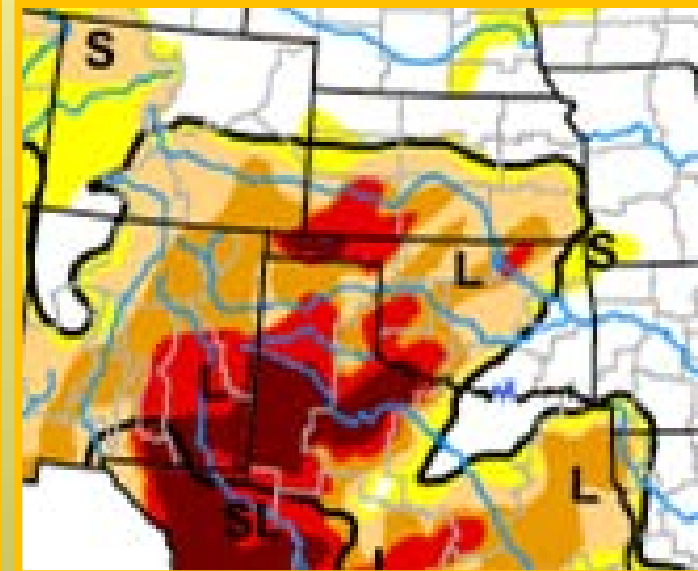


# PRISM multi-year Portales, NM



Year	Month	Value
2003	14	8.43
2004	14	28.45
2005	14	15.15
2006	14	17.89
2007	14	17.74
2008	14	15.69
2009	14	16.88
2010	14	18.47
2011	14	8.09

## Drought Monitor map





# Monitoring Protocol

- Prescribed Grazing Plan inventory
- Past and present weather
- Careful to avoid disturbance
- Pick a monitoring site
- Schedule follow-up (rates of changing phenology)

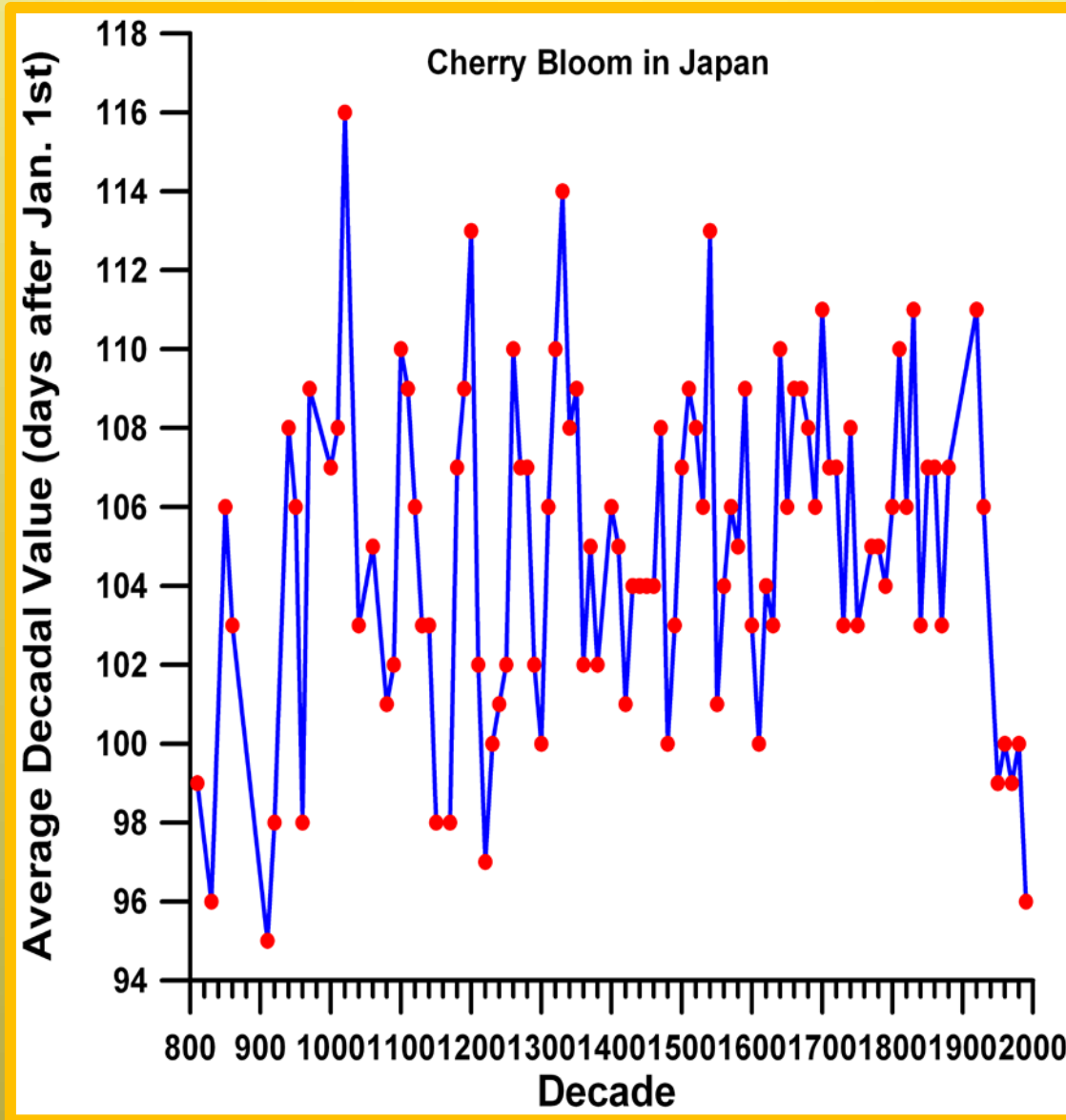
# New Appointment

Set reminder to pop up 10 days in advance

The screenshot shows the Outlook calendar interface with the following elements:

- Navigation:** Buttons for "Day", "Week", and "Month" (selected). A "Details" section shows radio buttons for "Low", "Medium", and "High" (selected).
- Calendar Header:** "March 2013" with left and right navigation arrows. A "Search Calendar" input field is on the right.
- Calendar Grid:** A grid showing days from Feb 24 to Mar 30. Days are labeled by day of the week (Sunday to Saturday).
  - Feb 24 - 3/1:** A blue event bar for "10:00am FGDC Vegeta" is visible on Thursday, Feb 28.
  - 3/3 - 8:** A green event bar for "8:00am tcas" is visible on Friday, Mar 8.
  - 3/10 - 15:** A blue event bar for "9:00am WNTSC Staff I" is visible on Monday, Mar 11.
  - 3/17 - 22:** A green event bar for "9:00am tcas" is visible on Friday, Mar 22.
  - 3/24 - 29:** A blue event bar for "10:00am FGDC Vegeta" is visible on Thursday, Mar 28.
- Buttons:** A "Click to add event" button is visible on Friday, Mar 22.
- Status Bar:** At the bottom, it says "All folders are up to date." and "Connected to Microsoft Exchange".

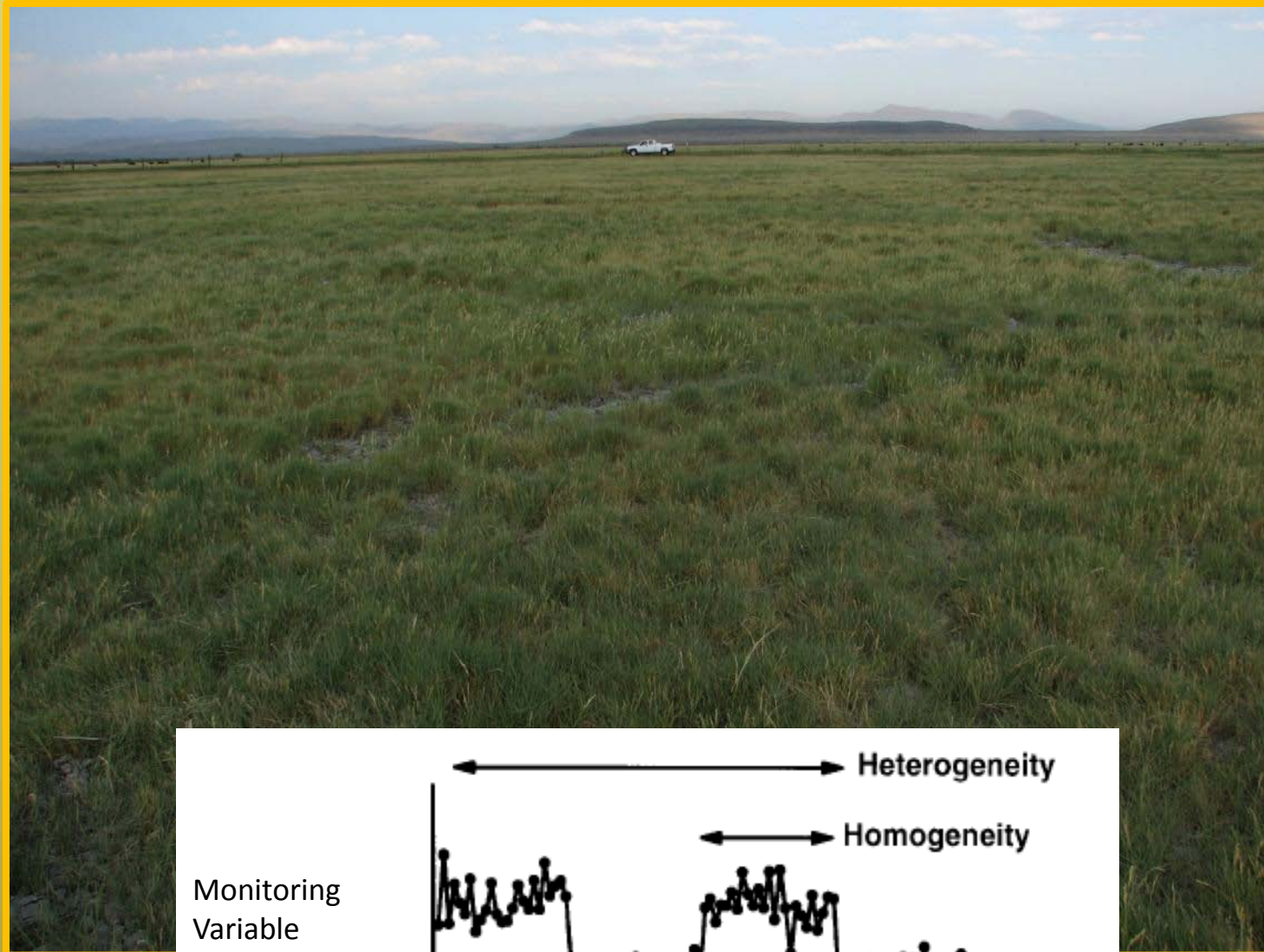
# Decadal Averaged Cherry Bloom in Kyoto, Japan



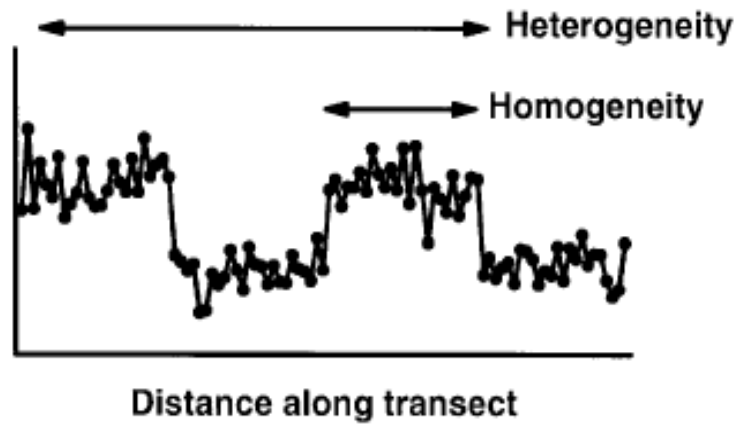
# Difference between Inventory and Monitoring



# Monitor Captures Change



Monitoring  
Variable





# Picking the place to measure AND monitor

- Random, Objective, Subjective, Purposeful, Representative
  - Must have rejection criteria for the site before going to the field
  - A lot depends upon the private landowner. They should have a say in the pick.
- Stay within the Ecological Site boundary and away from edges and/or aeolian landform variation
- Keep distance from ranch facilities

Monitor 2 transects/treatment area/ecological site/year

## Considerations:

1. Monitor the Ecological Site (ES) rated HIGH for LEPC use or highest rated ES
2. Nesting and Brood Raising habitat will be prioritized over Leks
3. The ES that is the KEY AREA as identified in the Prescribed Grazing Plan

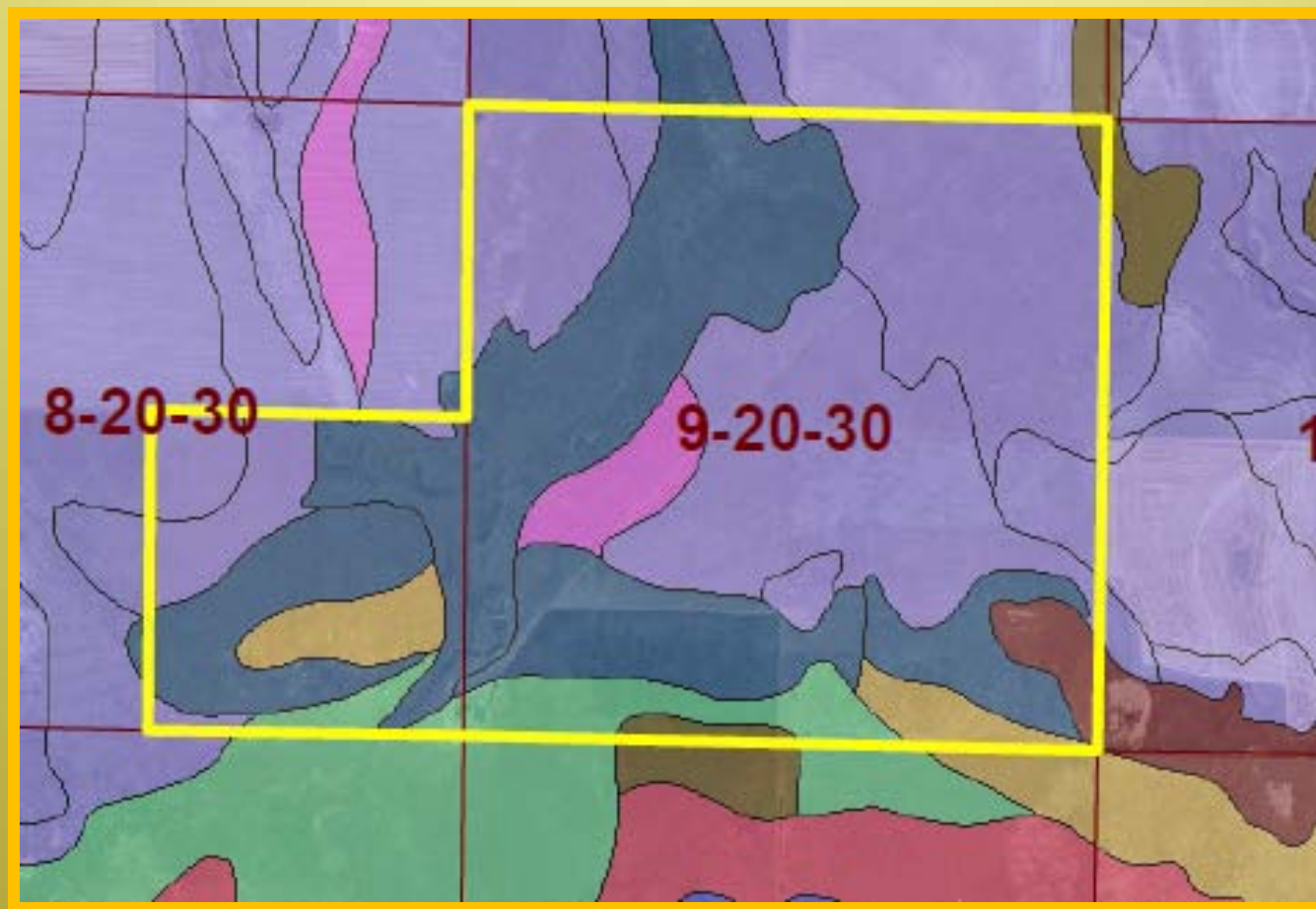


Monitor 2 transects/treatment area/ecological site/year

## Considerations:

4. Review Ecological Site Descriptions when multiple rated ES occur within the treatment area. If expected management responses are similar then monitor only one ES. Otherwise, all rated ESs will be monitored
5. Expected change in monitored indicators will occur relatively fast due to treatment
6. Accessibility
7. Relative size

# Picking the place to Monitor





BLM PHOTO



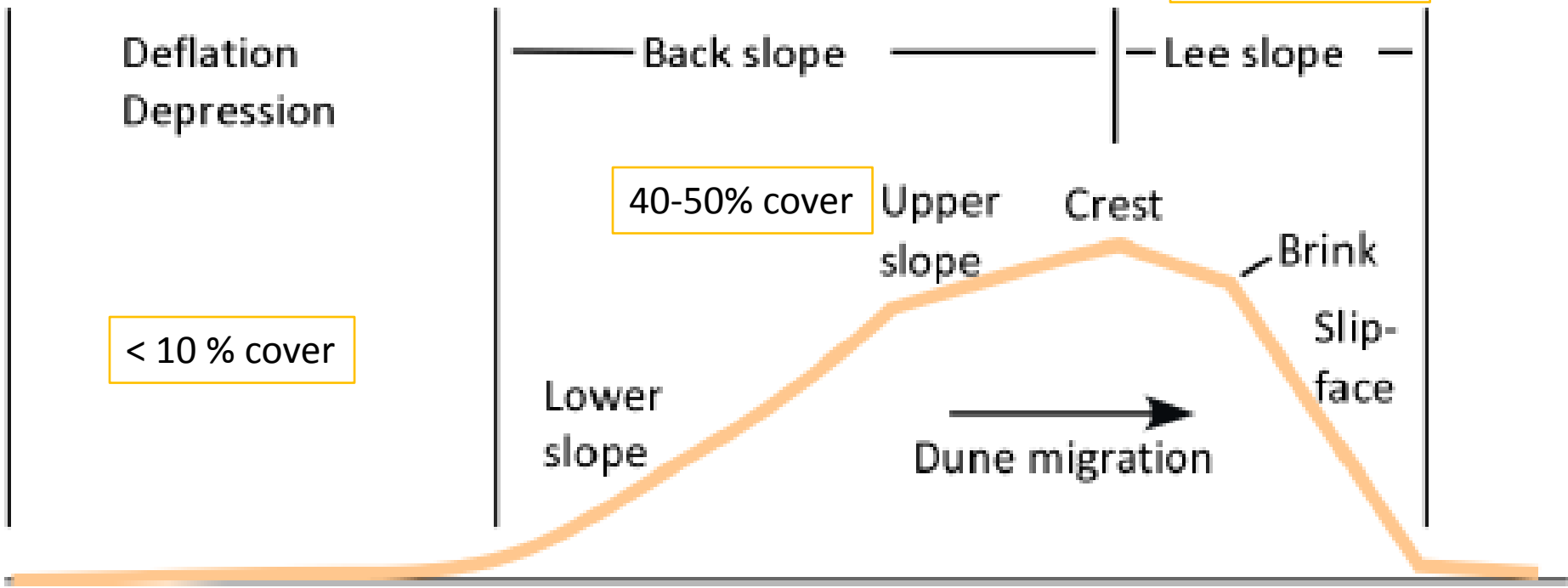
Wind direction

Direction of growth



Crest has cover changes due to sporadic annuals

50-75% cover



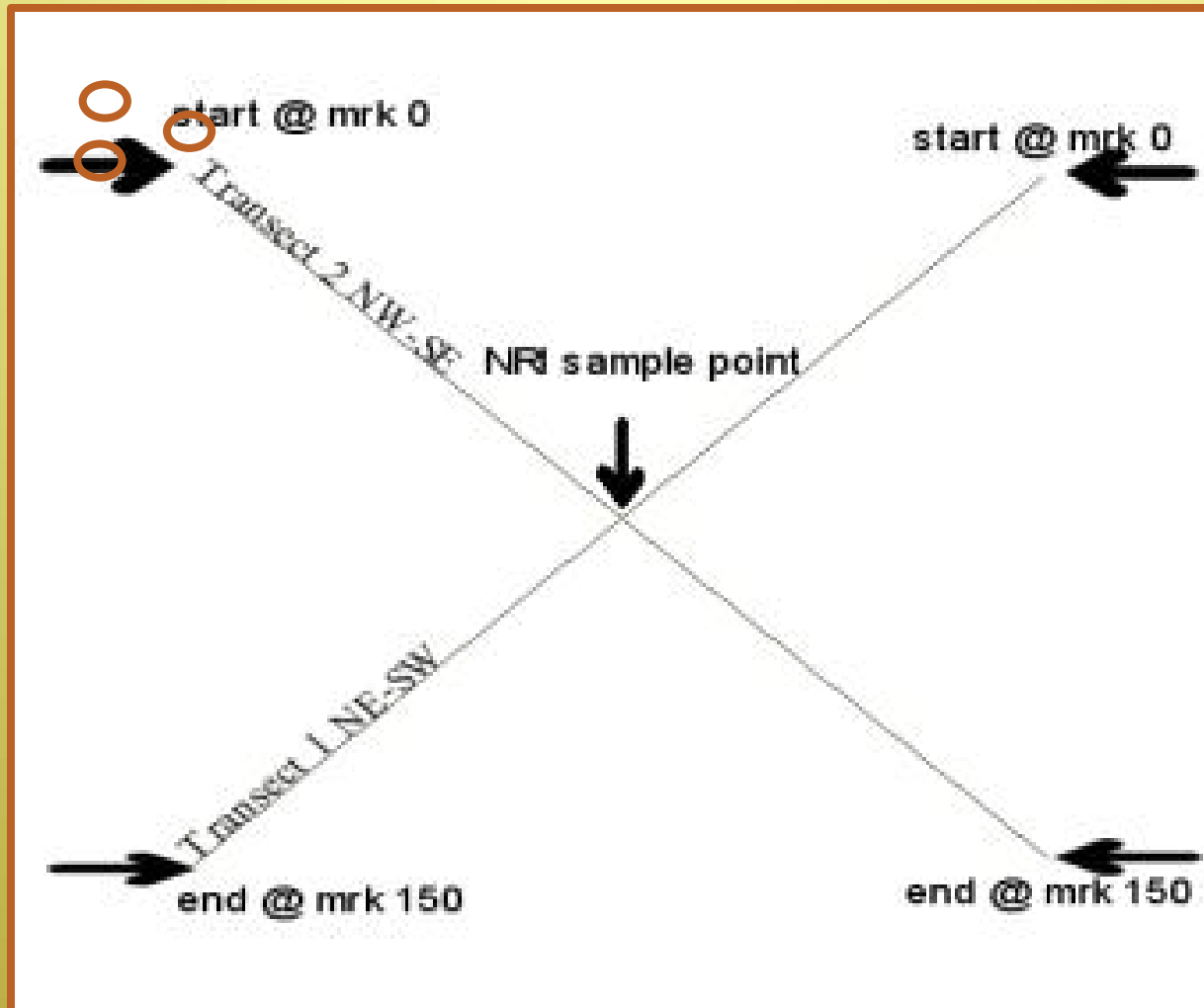


BLM PHOTO

# Vegetation Protocol

- Photos
- Plant Height
- Visual Obstruction Reading (VOR)
- Line Point Intercept
- Phenological condition

# Standard NRI Transect Layout



Two single 150 foot transects with a NE to SW orientation. 0.0 foot mark at the NE end.



Layout the tape close to the ground  
Keep it straight  
More consistent from year to year





# Photo Monitoring 'DON'T'S'

No shadows, people, hands, glare

Photo board not obscured or floppy in the wind



At least one photo of the site centered down the transect tape with photo board visible



Brite Hue Blue  
paper color name

Additional photos at the site would not need photo board



Suggested file name

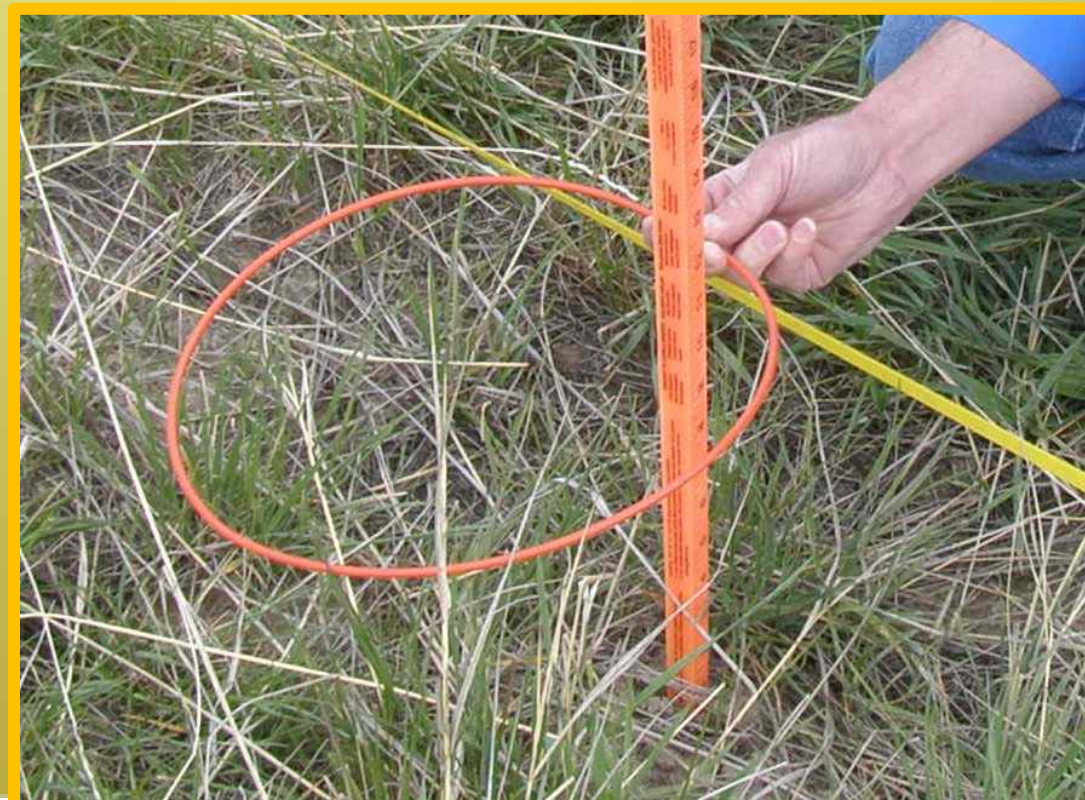
R042XC005NM\_031212\_PG3\_f3t1\_xxx

ESD#\_Date\_phenology\_field\_transect\_contract #

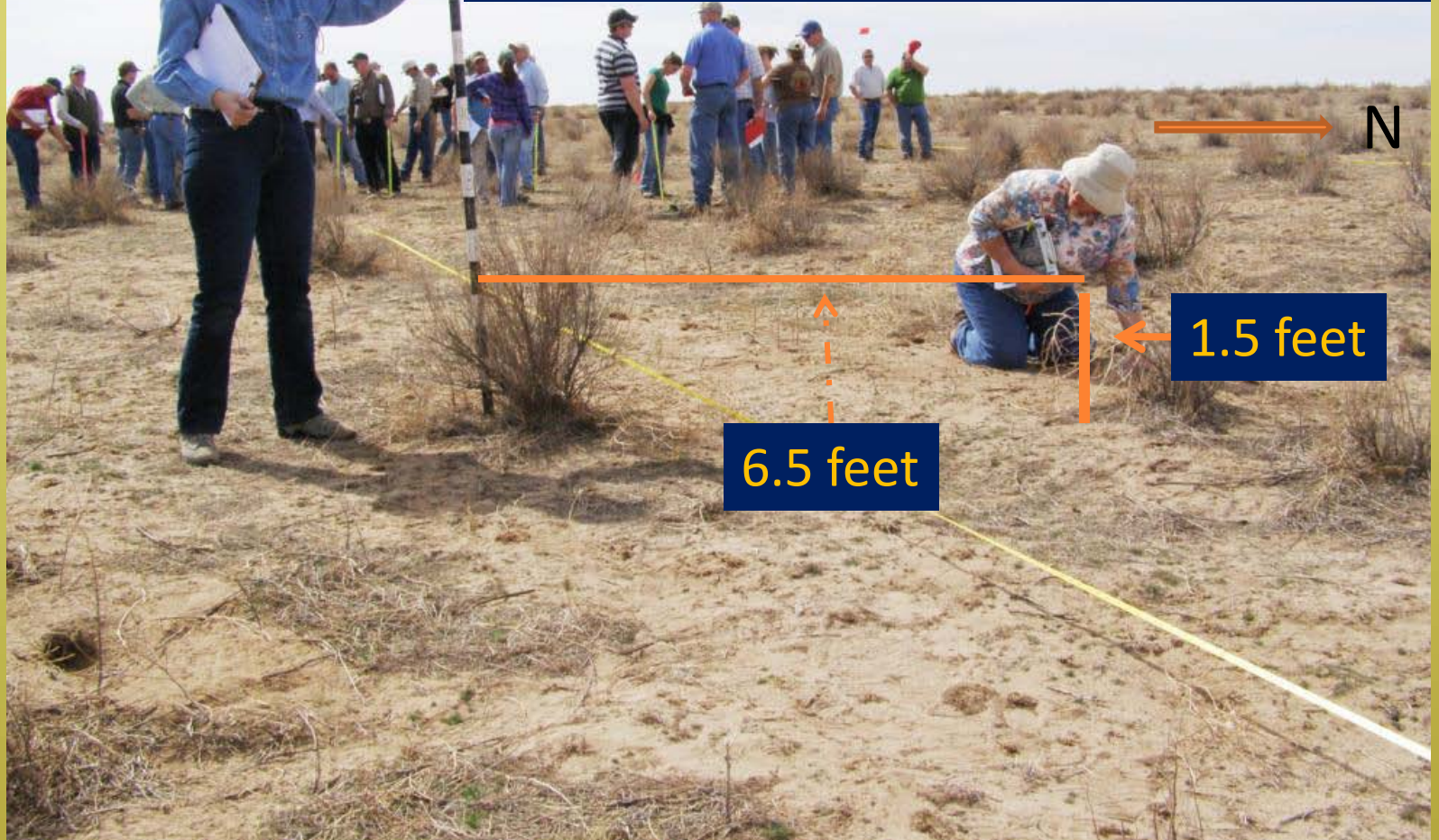


**PLANT  
HEIGHT**

Tallest woody and  
Tallest herbaceous  
At each mark



Place next to the tape at the mark a 5.0 foot tall pole with alternating color bands 4 inch wide



Visual Obstruction Reading (VOR)

Point Intercept

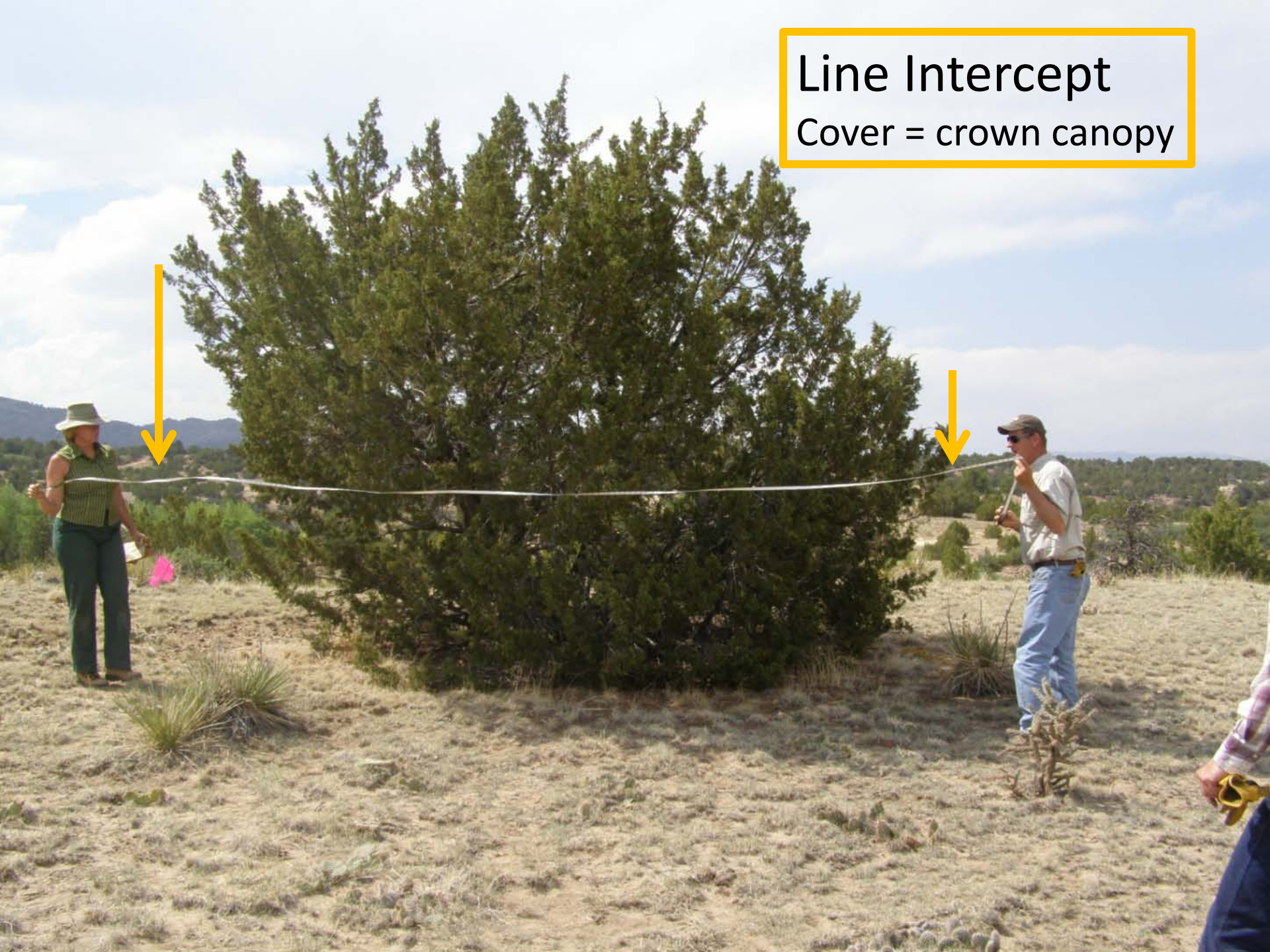


Line Intercept



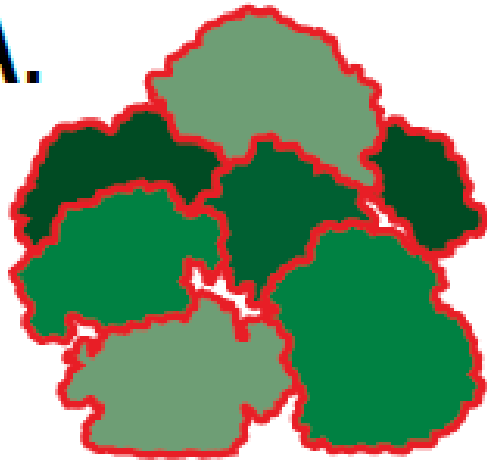
# Line Intercept

Cover = crown canopy

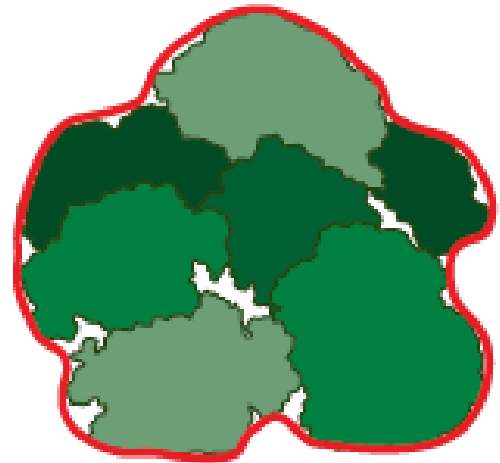


A. = foliar canopy point intercept

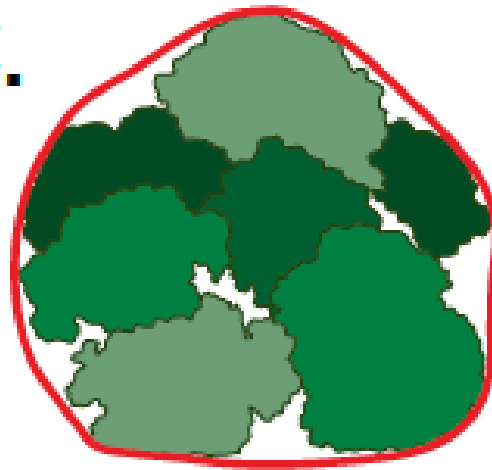
**A.**



**B.**



**C.**



B. And C. = crown canopy bias





Pin flag



Point Intercept  
foliar cover composition

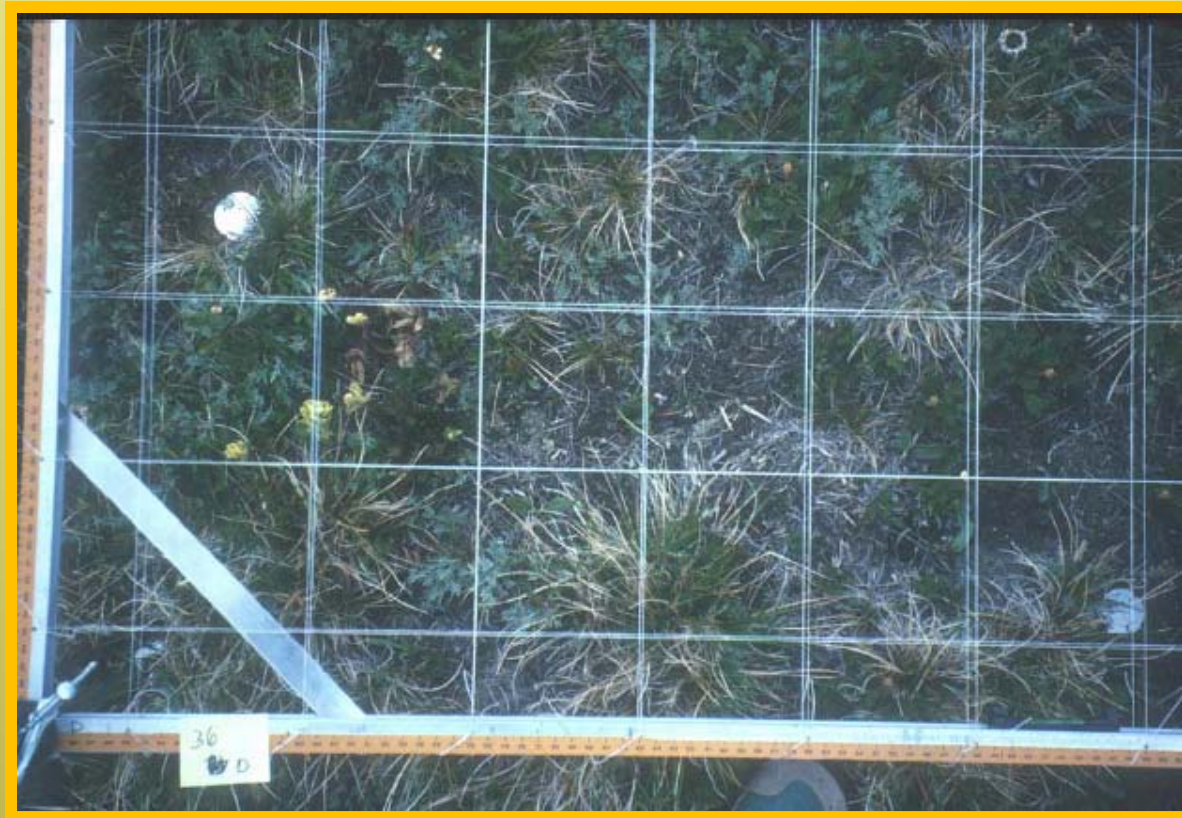


Includes tall shrub and tree



3 ft. intervals

**Parallax** apparent displacement or difference in the apparent position of an object viewed along two different lines of sight.



a.) vision left of center



b.) vision centered



c.) vision right of center

# Foliar Canopy Layer Structure %

Growth Form	1st hit	2nd hit	3rd hit	4th hit	5th hit	6th hit	basal
PG	25	14	4	2	0	0	0
SG	0	0	4	1	0	0	0
FO	8	10	6	0	0	0	0
SH	18	0	0	0	0	0	0
SS	14	2	0	0	0	0	0
SO	6	4	0	0	0	0	0
HL	10	2	6	0	0	0	0
WL	6	2	0	0	0	0	0
BG	0	0	0	0	0	0	14

BG Bare Ground different form open ground habitat term

**UNITED STATES DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE**

**ECOLOGICAL SITE DESCRIPTION (New Format Report)**

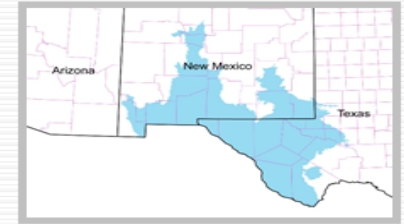
**ECOLOGICAL SITE CHARACTERISTICS**

Site Type: Rangeland

Site Name: Sandy

Site ID: R042XA051NM

Major Land Resource Area: 042-Southern Desertic Basins, Plains, and Mountains



**Structure and Cover:**

**Ground Cover**

<b>Vegetative Cover</b>	<b>Minimum</b>	<b>Maximum</b>
Grass / Grasslike	20%	20%
Forb		
Shrub/ Vine	5%	5%
Tree		
Non-Vascular Plants		
Biological Crust		
<b>Non-Vegetative Cover</b>	<b>Minimum</b>	<b>Maximum</b>
Litter	5%	5%
Surface Fragments > 0.25" and <= 3"	10%	10%
Surface Fragments > 3"		
Bedrock		
Water		
Bare Ground	60%	60%



# GRASS phenology

Annual oat just past PG2  
entering PG3

- **GR1** -GREEN LEAVES BEFORE BOOT
- **GR2**- BOOT STAGE
- **GR3**- SEED SOFT DOUGH TO RIPE
- **GR4**- SEED DESIMINATION
- **GR5**- WINTER DORMANCY CURED



# FORB Phenology

- **FO1**- GREEN BEFORE FLOWERING
- **FO2** - FULL BLOOM PETALS FALLING
- **FO3** - FRUIT RIPENING
- **FO4** - FRUIT RIPE TRANSITIONAL TO FALL DORMANCY
- **FO5** - SEED DESIMINATION TRANSITIONAL TO WINTER DORMANCY



# SHRUB Phenology

- **SH1** - GREEN LEAVES ONLY TRANSITIONAL TO FULL LEAF STAGE
- **SH2** - FLOWERS IN BUD, GREEN FLOWERING STAGE
- **SH3** - FLOWERS OPEN TRANSITIONAL TO FRUIT FORM
- **SH4** - SEED MATURITY TRANSITIONAL TO FALL DORMANCY  
\* = GREEN FRUIT WT
- **SH5** - WINTER DORMANCY TRANSITIONAL TO CURED LEAVES \*\* = DRY FRUIT WEIGHT

# SAND SAGEBRUSH PHENOLOGY

- **SS1** - BUDS SWOLLEN
- **SS2** - EARLY LEAF DEVELOPMENT
- **SS3** - STEM ELONGATION, FULL LEAF
- **SS4** – FLOWERING
- **SS5** – SEED MATURITY
- **SS6** - EARLY LEAF SENESCENCE
- **SS7** - DORMANCY



# Shinnery oak leaf phenology

April 27th



4-27



5-4



5-11



5-18



5-25



6-1



6-8


June 8th

# SHINNERY OAK PHENOLOGY

- **S01** - BUD SWELL
- **S02** - FLOWERING CATKINS
- **S03** - PISTILLATE FLOWERS &/OR LATERAL BUD FORMATION IN LEAF AXILS
- **S04** - LEAVES < 4 CM
- **S05** - LEAVES > 4 CM
- **S06** - ACORNS DISTINGUISHED FROM CAP
- **S07** - ACORNS GREEN
- **S08** - ACORNS SEPARATE FROM CAP
- **S09** - DORMANCY

# Reporting Monitoring Data

- Field Office maintains data and reports the transect pairs by ESD. Contract identification, landowner confidentiality stays at the field office level.
- First year data will be submitted with second year data. 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> year data will be submitted together...
- Monitoring period is during the growing season. A field office with 1 LPCI contract will report sooner than a field office with 10 contracts




# Technical Summary

- Plant height, growth habit, percent litter are most consistent indicators for grassland bird use (Fisher and Davis JWM 2010)
- Meets data requirements of the new Ecological Site Description format
- Tied to phenology (plant community and animal variation of seasonal use) for regional comparisons
- ‘minimum’... You can always do more!

# Consistency Summary

- Employees differ in their present plant identification knowledge
- An employee will know more plants in 3 years than one does today. We don't want you to get better. Do it the same from year to year.



# Participation Summary

- Landowners can easily become involved with straight forward measurement protocols
- Protocols are based on accepted rangeland monitoring design. Accepted by NRCS, BLM, USFS, ARS, and others.

# Questions?

