



Range Monitoring during Drought Part II

Casey Spackman



Extension Range Management Specialist

Monitoring Methods

- RAM is not the only method of monitoring available
- Quick, Easy, DEFENSIBLE

Monitoring in General

- Objective
- Repeatable
- Quantifiable

RaDAR - Rangeland Data Analysis & Record				
Producer Name: Jo Rancher		Pasture Name: North 40		
Date: 12/20/2019		Collector Names: Casey		
Transect Number: 1		GPS Coordinates: -112.83 N, 38.5 W (120°)		
Notes: This is a test message for assessment of the rangeland condition and a monitoring record				
Biomass Availability		Pasture Size		Stocking Rate
2000.0 ± 353.6 lbs/acre		2240 acres		188.8 acres/AUY
Cover %			Vegetation Cover Composition	
Bare Ground	25.0		Common Name	Percent
Litter	39.0		BOGR1	5
Vegetation	13.0		BOCU	3
Rock (>3/4")	23.0		Arist	2
			LYPH	2
			100.0	
Forage Composition				
Common Name	Symbol	%	Avg. Height (inches)	Minimum Stubble Height Guideline
Blue Grama1	BOGR1	41	2.5	0.75
Threeawns	Arist	19	5.4	2.5
Common Wolftail	LYPH	16	4.3	2.5
Sideoats Grama	BOCU	14	7.4	4
Little Bluestem	SCSC	5	13.0	4
Pine Dropseed	BLTR	4	6.5	4
Soil Moisture Depth	6 ± 1.4 inch(s)		Annual Forage Biomass	1400 ± 70 lbs per acre
Photos				
 <p>GROUND PHOTO</p>		 <p>LANDSCAPE PHOTO</p>		



Drought Webinar: Monitoring Part I review

- Drought can decrease rangeland grass abundance by greater than 50 %
- Numerical (quantitative) monitoring can decrease the variability of forage estimates
- Rapid Assessment Methodology (RAM) is a quick effective monitoring strategy that can be tailored to producer time availability
- Not all measurements needs to be taken (3 stage approach)
- The data entry and production of an assessment record needs to be simple and easy (RaDAR).

Data collected. Now what?



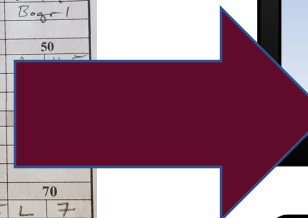
Data collected. Now what?

- Entering the data
- Interpretation of Record
- Management Decisions

RaDAR - Data Worksheet											
Producer Name <i>Jo Rancheur</i>					Pasture Name <i>North 40</i>						
Date <i>12-20-2019</i>					Collector Name(s) <i>Casly</i>						
Transect Number <i>1</i>					GPS Coordinates <i>-121.83, 38.5</i>						
Pasture Size (acres) <i>2240</i>					Heading <i>120</i>						
Measurements											
1	2	3	4	5	6	7	8	9	10		
B 5	L 5.5	B 2.5	B 3	B 6	L 4	V 10	B 2	B 2.5	B 1.25		
Arist	Arist	Bogr1	Bogr1	lyph	lyph	Bocu	Bogr1	Bogr1	Bogr1		
11	12	13	14	15	16	17	18	19	20 (clip)		
L 1	L 2	L 9	R 1	R 3	R 3.5	L 7	L 4	L 2.5	L 4		
Bogr1	Bogr1	lyph	Bogr1	lyph	lyph	lyph	lyph	Bogr1	Bogr1		
21	22	23	24	25	26	27	28	29	30		
B 5.5	B 2	L 3.5	L 4	V 9	R 3	B 2.5	B 1.5	V 3.5	R 2		
Bogr1	Bogr1	lyph	Bogr1	Bogr1	Bogr1	Bogr1	Bogr1	lyph	lyph		
31	32	33	34	35	36	37	38	39	40 (clip)		
B 4	L 7	R 4	B 4	L 3.5	L 7	R 3.5	B 2	B 3	L 4		
Bogr1	Bocu	arist	arist	lyph	Bocu	arist	arist	Bocu	Bogr1		
41	42	43	44	45	46	47	48	49	50		
R 17	L 2.5	V 4.5	V 1.5	V 1	L 4	B 5	R 4	L 3.5	R 4.5		
Scsc	Bocu	arist	Bogr1	Bogr1	lyph	arist	arist	Bogr1	arist		
51	52	53	54	55	56	57	58	59	60 (clip)		
L 7	L 14	L 10	B 1.5	B 3	V 1.5	B 1.5	B 4	L 6	V 1		
Bocu	Scsc	Bocu	Bogr1	Bogr1	Bogr1	Bogr1	lyph	arist	Bogr1		
61	62	63	64	65	66	67	68	69	70		
L 1	B 1.5	R 2	V 4	L 2	R 3	R 2	L 1.5	R 2.5	L 7		
Bogr1	Bogr1	Bogr1	lyph	Bogr1	Arist	Bogr1	Bogr1	Bogr1	Arist		
71	72	73	74	75	76	77	78	79	80 (clip)		
V 8	L 2	B 8	L 3	L 4.5	V 5.5	B 4	L 4	V 8	R 2.5		
arist	Bogr1	Arist	Bogr1	lyph	Bocu	Bogr1	Bogr1	Bocu	Bogr1		
81	82	83	84	85	86	87	88	89	90		
L 2.5	B 7	R 1	V 7	R 11	L 9	B 7	L 10	L 3	L 7		
Bogr1	arist	Bogr1	Bltr	Scsc	arist	Bocu	Bocu	lyph	Bocu		
91	92	93	94	95	96	97	98	99	100 (clip)		
L 7	R 7	L 12	R 2	R 9	L 4.5	R 5	R 17	L 7	R 6		
Bocu	Bltr	Bocu	Bogr1	arist	arist	Bltr	Scsc	Bltr	Scsc		
Dot Tally		Soil Moisture Depth (inches)				2 4 6 8 10				Comment or Notes	
Horse	2	Biomass Availability (grams)				10 15 20 25 30				Any	
Elk	3	Annual Forage Biomass (grams)								comments can be put here	
Cattle	4	Inside of Cage				12 13 14 15 16				or there or	
Deer	5	Outside of Cage				3 4 5 6 7				everywhere	
New Mexico State University - ACES - EASNR										Sampling Hoop Conversion Factor	
										100	

Data Input

RaDAR - Data Worksheet											
Producer Name <i>Jo Pancher</i>					Pasture Name <i>North 40</i>						
Date <i>12-20-2019</i>					Collector Name(s) <i>Casly</i>						
Transect Number <i>1</i>					GPS Coordinates <i>-121.83, 38.5</i>						
Pasture Size (acres) <i>2240</i>					Heading <i>100</i>						
Measurements											
1	2	3	4	5	6	7	8	9	10		
B 1.5	L 5.5	B 2.5	B 3	B 1.6	L 4	V 10	B 1.2	B 2.5	B 1.25		
Arist	Arist	Bogr1	Bogr1	lyph	lyph	Bocu	Bogr1	Bogr1	Bogr1		
11	12	13	14	15	16	17	18	19	20 (clip)		
L 1.1	L 2	L 9	R 1	R 3	R 3.5	L 7	L 4	L 2.5	L 4		
Bogr1	Bogr1	lyph	Bogr1	lyph	lyph	lyph	lyph	Bogr1	Bogr1		
21	22	23	24	25	26	27	28	29	30		
B 1.5.5	B 1.2	L 3.5	L 4	V 9	R 3	B 2.5	B 1.5	V 3.5	R 2		
Bogr1	Bogr1	lyph	Bogr1	Bogr1	Bogr1	Bogr1	Bogr1	lyph	lyph		
31	32	33	34	35	36	37	38	39	40 (clip)		
B 4	L 7	R 4	B 4	L 3.5	L 7	R 3.5	B 2	B 3	L 4		
Bogr1	Bocu	arist	arist	lyph	Bocu	arist	arist	Bocu	Bogr1		
41	42	43	44	45	46	47	48	49	50		
R 1.7	L 2.5	V 4.5	V 1.5	V 1	L 4	B 5	R 4	L 3.5			
Scsc	Bocu	arist	Bogr1	Bogr1	lyph	arist	arist	Bogr1			
51	52	53	54	55	56	57	58	59			
L 7	L 1.4	L 10	B 1.5	B 3	V 1.5	B 1.5	B 4	L 6			
Bocu	Scsc	Bocu	Bogr1	Bogr1	Bogr1	Bogr1	lyph	arist			
61	62	63	64	65	66	67	68	69	70		
L 1	B 1.5	R 2	V 4	L 2	R 3	R 2	L 1.5	R 2.5	L 7		
Bogr1	Bogr1	Bogr1	lyph	Bogr1	Arist	Bogr1	Bogr1	Bogr1	Arist		
71	72	73	74	75	76	77	78	79	80 (clip)		
V 8	L 2	B 8	L 3	L 4.5	V 5.5	B 4	L 4	V 8	R 2.5		
arist	Bogr1	arist	Bogr1	lyph	Bocu	Bogr1	Bogr1	Bocu	Bogr1		
81	82	83	84	85	86	87	88	89	90		
L 2.5	B 7	R 1	V 7	R 11	L 9	B 7	L 10	L 3	L 7		
Bogr1	arist	Bogr1	Bltr	Scsc	arist	Bocu	Bocu	lyph	Bocu		
91	92	93	94	95	96	97	98	99	100 (clip)		
L 7	R 7	L 1.2	R 2	R 9	L 4.5	R 5	R 1.7	L 7	R 6		
Bocu	Bltr	Bocu	Bogr1	arist	arist	Bltr	Scsc	Bltr	Scsc		
Dot Tally	Soil Moisture Depth (inches)				2	4	6	8	10	Comment or Notes	
Horse	2	Biomass Availability (grams)				10	15	20	25	30	Comments can be put here or there or everywhere
Elk	3	Annual Forage Biomass (grams)									
Cattle	4	Inside of Cage				12	13	14	15	16	
Deer	5	Outside of Cage				3	4	5	6	7	
New Mexico State University - ACES - EASNR											
Sampling Hoop Conversion Factor											
100											



File Home Insert Page Layout Formulas Data Review View Developer ACROBAT Tell me what you want to do...

Clipboard: Cut, Copy, Paste, Format Painter

Font: Calibri, 11, Bold, Italic, Underline, Text Color, Background Color

Alignment: Wrap Text, Merge & Center

Number: Currency, Percentage, Decimals

Styles: Conditional Formatting, Format as Table

Cells: Insert, Delete, Format

Editing: AutoSum, Fill, Clear, Sort & Filter, Find & Select

V7

RaDAR - Data Entry Form										
Producer Name						Pasture Name				
Date						Collector Names				
Transect Number						GPS Coordinates				
Pasture Size (acres)						Heading				
Measurements										
1	2	3	4	5	6	7	8	9	10	
11	12	13	14	15	16	17	18	19	20 (Clip 1)	
21	22	23	24	25	26	27	28	29	30	
31	32	33	34	35	36	37	38	39	40 (Clip 2)	
41	42	43	44	45	46	47	48	49	50	

File Home Insert Page Layout Formulas Data Review View Developer ACROBAT Tell me what you want to do...

Clipboard: Cut, Copy, Paste, Format Painter

Font: Calibri, 11, Bold, Italic, Underline, Text Color, Background Color

Alignment: Wrap Text, Merge & Center

Number: General, Currency, Percentage, Decimals

Styles: Normal, Bad, Good, Neutral, Calculation, Check Cell

Cells: Insert, Delete, Format

Editing: AutoSum, Fill, Clear, Sort & Filter, Find & Select

114

RaDAR - Data Entry Form											
2	Producer Name				Jo Rancher			Pasture Name		North 40	
3	Date				12/20/2019			Collector Names		Casey	
4	Transect Number				1			GPS Coordinates		-112.83 N, 38.5 W	
5	Pasture Size				2240			Heading		120	
Measurements											
7	1	2	3	4	5	6	7	8	9	10	
8	b 5	l 5.5	b 2.5	b 3	b 6	l 4	v 10	b 2	b 2.5	b 5	
9	Arist	arist	bogr1	bogr1	lyph	lyph	bocu	bogr1	bogr1	bogr1	
10											
11	11	12	13	14	15	16	17	18	19	20 (Clip 1)	
12	l 1	l 2	l 9	r 1	r 3	r 3.5	l 7	l 4	l 2.5	l 4	
13	bogr1	bogr1	lyph	bogr1	lyph	lyph	lyph	lyph	bogr1	bogr1	
14											
15	21	22	23	24	25	26	27	28	29	30	
16	b 5.5	b 2	l 3.5	l 4	v 9	r 3	b 2.5	b 1.5	v 3.5	r 2	
17	bog1	bogr1	lyph	bogr1	bogr1	bogr1	bogr1	bogr1	lyph	lyph	
18					yucca						
19	31	32	33	34	35	36	37	38	39	40 (Clip 2)	
20	b 4	l 7	r 4	b 4	l 3.5	l 7	r 3.5	b 2	b 3	l 4	
21	bogr1	bocu	arist	arist	lyph	bocu	arist	arist	bocu	bogr1	
22											
23	41	42	43	44	45	46	47	48	49	50	
24	r 17	l 2.5	v 4.5	v 1.5	v 1	l 4	b 5	r 4	l 3.5	r 4.5	
25	scsc	bocu	arist	bogr1	bogr1	lyph	arist	arist	bogr1	arist	
26											
27	51	52	53	54	55	56	57	58	59	60 (Clip 3)	

Clipboard: Paste, Cut, Copy, Format Painter

Font: Calibri, 11, Bold, Italic, Underline, Text Color, Background Color, Font Color

Alignment: Wrap Text, Merge & Center, Left, Center, Right, Indent, Decrease Indent, Increase Indent

Number: \$, %, ', Left, Right, Center, Decrease Decimal, Increase Decimal

Styles: Conditional Formatting, Format as Table


Cells: Insert, Delete, Format

Editing: AutoSum, Fill, Clear, Sort & Filter, Find & Select

L1

Formula Bar

A B C D E F G H I J K L M N O P Q R S T U V

RaDAR - Rangeland Data Analysis & Record				
Producer Name:		Pasture Name:		
Date:		Collector Names:		
Transect Number:		GPS Coordinates: (°)		
Notes:				
Biomass Availability		Pasture Size		Stocking Rate
#DIV/0!	lbs/acre	acres		#DIV/0! acres/AUY
± #DIV/0!				
Cover %		Vegetation Cover Composition		
Bare Ground	#DIV/0!	Common Name		Percent
Litter	#DIV/0!	#N/A		#N/A
Vegetation	#DIV/0!	#N/A		#N/A
Rock (>3/4")	#DIV/0!	#N/A		#N/A
	#DIV/0!	#N/A		#N/A
Forage Composition				
Common Name	Symbol	%	Avg. Height (inches)	Minimum Stubble Height Guideline
Soil Moisture Depth	#DIV/0!	#DIV/0!	Annual Forage Biomass	#DIV/0! #DIV/0!



File Home Insert Page Layout Formulas Data Review View Developer ACROBAT Tell me what you want to do... Casey Spackman

Clipboard Font Alignment Number Styles Cells Editing

Calibri 11 A A Wrap Text General

B I U Merge & Center \$ % .00 .00

Normal Bad Good Neutral Calculation Check Cell

Insert Delete Format AutoSum Fill Clear Sort & Find & Filter Select

N48

A B C D E F G H I J K L M N O P Q R S T U V


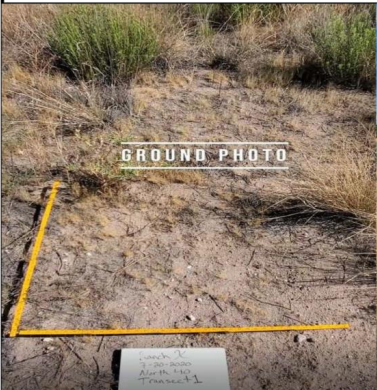
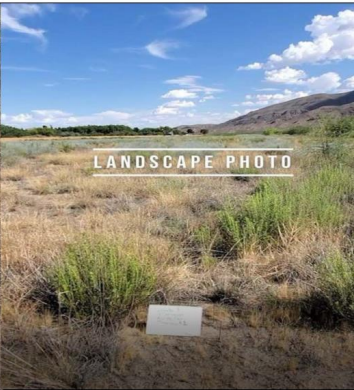
RaDAR - Rangeland Data Analysis & Record					
Producer Name:		Jo Rancher		Pasture Name: North 40	
Date:		12/20/2019		Collector Names: Casey	
Transect Number:		1		GPS Coordinates: -112.83 N, 38.5 W (120°)	
Notes:	This is a test message				
	for assessment				
	of the rangeland condition				
	and a monitoring record				
Biomass Availability		Pasture Size		Stocking Rate	
2000.0 ± 353.6 lbs/acre		2240 acres		188.8 acres/AUY	
Cover %			Vegetation Cover Composition		
				Common Name	Percent
Bare Ground		25.0		BOGR1	5
Litter		39.0		BOCU	3
Vegetation		13.0		Arist	2
Rock (>3/4")		23.0		LYPH	2
		100.0			
Forage Composition					
Common Name	Symbol	%	Avg. Height (inches)	Minimum Stubble Height Guideline	
Blue Grama1	BOGR1	41	2.5	0.75	
Threeawns	Arist	19	5.4	2.5	
Common Wolftail	LYPH	16	4.3	2.5	
Sideoats Grama	BOCU	14	7.4	4	
Little Bluestem	SCSC	5	13.0	4	
Pine Dropseed	BLTR	4	6.5	4	
Soil Moisture Depth	6 ± 1.4 inch(s)		Annual Forage Biomass		1400 ± 70 lbs per acre



Data Input




RaDAR - Data Worksheet																
Producer Name: <u>Jo Rancher</u>					Pasture Name: <u>North 40</u>											
Date: <u>12-20-2019</u>					Collector Name(s): <u>Casey</u>											
Transect Number: <u>1</u>					GPS Coordinates: <u>-101.83, 38.5</u>											
Pasture Size (acres): <u>2240</u>					Heading: <u>100</u>											
Measurements																
1	2	3	4	5	6	7	8	9	10							
B 1.5	L 5.5	B 2.5	B 3	B 1.6	L 4	V 1.0	B 1.2	B 2.5	B 1.25							
Arist	Arist	Bogr1	Bogr1	Lypb	Lypb	Bocu	Bogr1	Bogr1	Bogr1							
11	12	13	14	15	16	17	18	19	20 (clip)							
L 1.1	L 1.2	L 1.9	R 1.1	R 1.3	R 3.5	L 1.7	L 1.4	L 2.5	L 1.4							
Bogr1	Bogr1	Lypb	Bogr1	Lypb	Lypb	Lypb	Lypb	Bogr1	Bogr1							
21	22	23	24	25	26	27	28	29	30							
B 1.5.5	B 1.2	L 3.5	L 1.4	V 1.9	R 3	B 2.5	B 1.5	V 3.5	R 1.2							
Bogr1	Bogr1	Lypb	Bogr1	Bogr1	Bogr1	Bogr1	Bogr1	Lypb	Lypb							
31	32	33	34	35	36	37	38	39	40 (clip)							
B 1.4	L 1.7	R 1.4	B 1.4	L 3.5	L 1.7	R 3.5	B 1.2	B 3	L 1.4							
Bogr1	Bocu	arist	arist	Lypb	Bocu	arist	arist	Bocu	Bogr1							
41	42	43	44	45	46	47	48	49	50							
R 1.7	L 2.5	V 4.5	V 1.5	V 1.1	L 4	B 1.5	R 1.4	L 3.5								
SCSC	Bocu	arist	Bogr1	Bogr1	Lypb	arist	arist	Bogr1								
51	52	53	54	55	56	57	58	59								
L 1.7	L 1.4	L 1.0	B 1.5	B 1.3	V 1.5	B 1.5	B 1.4	L 1.6								
Bocu	SCSC	Bocu	Bogr1	Bogr1	Bogr1	Bogr1	Lypb	arist								
61	62	63	64	65	66	67	68	69	70							
L 1	B 1.5	R 1.2	V 1.4	L 1.2	R 1.3	R 1.2	L 1.5	R 2.5	L 1.7							
Bogr1	Bogr1	Bogr1	Lypb	Bogr1	Arist	Bogr1	Bogr1	Bogr1	Arist							
71	72	73	74	75	76	77	78	79	80 (clip)							
V 1.8	L 1.2	B 1.8	L 1.3	L 4.5	V 1.5.5	B 1.4	L 1.4	V 1.8	R 2.5							
arist	Bogr1	arist	Bogr1	Lypb	Bocu	Bogr1	Bogr1	Bocu	Bogr1							
81	82	83	84	85	86	87	88	89	90							
L 2.5	B 1.7	R 1	V 1.7	R 1.1	L 1.9	B 1.7	L 1.0	L 1.3	L 1.7							
Bogr1	arist	Bogr1	Bltr	SCSC	arist	Bocu	Bocu	Lypb	Bocu							
91	92	93	94	95	96	97	98	99	100 (clip)							
L 1.7	R 1.7	L 1.2	R 1.2	R 1.9	L 4.5	R 1.5	R 1.7	L 1.7	R 1.6							
Bocu	Bltr	Bocu	Bogr1	arist	arist	Bltr	SCSC	Bltr	SCSC							
Dot Tally		Soil Moisture Depth (inches)		2		4		6		8		10		Comment or Notes		
Horse		Biomass Availability (grams)		10		15		20		25		30		Any comments can be put here or there or everywhere		
Elk		Annual Forage Biomass (grams)		12		13		14		15		16				
Cattle		Inside of Cage		3		4		5		6		7				
Deer		Outside of Cage		3		4		5		6		7				
New Mexico State University - ACES - EASNR													Sampling Hoop Conversion Factor			100



RaDAR - Rangeland Data Analysis & Record				
Producer Name: <u>Jo Rancher</u>		Pasture Name: <u>North 40</u>		
Date: <u>12/20/2019</u>		Collector Names: <u>Casey</u>		
Transect Number: <u>1</u>		GPS Coordinates: <u>-112.83 N, 38.5 W (120°)</u>		
Notes: This is a test message for assessment of the rangeland condition and a monitoring record				
Biomass Availability		Pasture Size		Stocking Rate
2000.0 ± 353.6 lbs/acre		2240 acres		188.8 acres/AUY
Cover %			Vegetation Cover Composition	
Bare Ground		25.0	Common Name	
Litter		39.0	Percent	
Vegetation		13.0	BOGR1	
Rock (>3/4")		23.0	BOCU	
		100.0	Arist	
			LYPH	
Forage Composition				
Common Name	Symbol	%	Avg. Height (inches)	Minimum Stubble Height Guideline
Blue Grama1	BOGR1	41	2.5	0.75
Threeawns	Arist	19	5.4	2.5
Common Wolftail	LYPH	16	4.3	2.5
Blue Grama	BOCU	14	7.4	4
Sagestem	SCSC	5	13.0	4
Droopseed	BLTR	4	6.5	4
Soil Moisture Depth		6 ± 1.4 inch(s)		Annual Forage Biomass
				1400 ± 70 lbs per acre
Photos				
				




- Basic Record Information (TOP)
- Biomass Availability
- Potential Stocking Rate
- Ground Cover Percentages
- Vegetation Composition (from ground cover)
- Forage Composition (from all plants)
- Soil Moisture Depth
- Annual Forage Biomass (Pasture Potential)
- Photo-Points

RaDAR - Rangeland Data Analysis & Record				
Producer Name: Jo Rancher		Pasture Name: North 40		
Date: 12/20/2019		Collector Names: Casey		
Transect Number: 1		GPS Coordinates: -112.83 N, 38.5 W (120°)		
Notes: This is a test message for assessment of the rangeland condition and a monitoring record				
Biomass Availability		Pasture Size		
2000.0 ± 353.6 lbs/acre		2240 acres		188.8 acres/AUY
Cover %			Vegetation Cover Composition	
Bare Ground	25.0		Common Name	Percent
Litter	39.0		BOGR1	5
Vegetation	13.0		BOCU	3
Rock (>3/4")	23.0		Arist	2
	100.0		LYPH	2
Forage Composition				
Common Name	Symbol	%	Avg. Height (inches)	Minimum Stubble Height Guideline
Blue Grama ¹	BOGR1	41	2.5	0.75
Threeawns	Arist	19	5.4	2.5
Common Wolftail	LYPH	16	4.3	2.5
Sideoats Grama	BOCU	14	7.4	4
Little Bluestem	SCSC	5	13.0	4
Pine Dropseed	BLTR	4	6.5	4
Soil Moisture Depth	6 ± 1.4 inch(s)		Annual Forage Biomass	1400 ± 70 lbs per acre
Photos				
				

Basic Record Information

RaDAR - Rangeland Data Analysis & Record			
Producer Name:	Jo Rancher	Pasture Name:	North 40
Date:	12/20/2019	Collector Names:	Casey
Transect Number:	1	GPS Coordinates:	-112.83 N, 38.5 W (120°)
Notes:	This is a test message for assessment of the rangeland condition and a monitoring record		



REPEATABILITY!

Biomass Availability & Stocking Rate

Boyu	Bltr	Boyu	Boyr	arist	arist	Bltr	Scsc	Bltr	Scsc								
Dot Tally	Soil Moisture Depth (inches)					2		4		6		8		10		Comment or Notes	
Horse	2	Biomass Availability (grams)					10	15	20	25	30	Any comments can be put here or there or everywhere					
Elk	3	Annual Forage Biomass (grams)															
Cattle	4	Inside of Cage					12	13	14	15	16						
Deer	5	Outside of Cage					3	4	5	6	7						
New Mexico State University - ACES - EASNR											Sampling Hoop Conversion Factor		100				

Conversion factor and Averaged with Standard Error

$$\frac{\text{Biomass X Pasture Size}}{26 \text{ lbs X } 365 \text{ days}} = \text{acres per animal unit year (AUY)}$$

Notes: *for assessment of the rangeland condition and a monitoring record*

Biomass Availability	Pasture Size	Stocking Rate
2000.0 ± 353.6 lbs/acre	2240 acres	188.8 acres/AUY
Cover %		Vegetation Cover Composition
Bare Ground	17	Common Name Percent

Standard Calculation

$$\frac{\text{Biomass X Pasture Size}}{26 \text{ lbs X } 365 \text{ days}}$$

= acres per animal unit year (AUY)

$$\frac{\text{Biomass X Pasture Size}}{26 \text{ lbs X } 61 \text{ days}}$$

= acres per animal unit (AU) **in a given amount of time**

$$\frac{\text{Biomass X Pasture Size}}{40 \text{ lbs X } 365 \text{ days}}$$

= acres per animal unit year (AUY);
*adjusting for animal & forage type,
location, slope, closeness to water*

$$\frac{\text{Biomass X Pasture Size}}{20 \text{ lbs X } 365 \text{ days}}$$

See Holechek et al. 2011 “Range Management: Principles and Practices”.

Standard Calculation

$$\frac{\text{Biomass X Pasture Size}}{26 \text{ lbs X } 365 \text{ days}} = \text{acres per animal unit year (AUY)}$$

$$\frac{\text{Biomass X Pasture Size}}{26 \text{ lb per day}} = \text{acres per animal unit day (AUD)}$$

See Holechek et al. 2011 “Range Management: Principles and Practices”.

- **Used to determine soil stability an erosion potential**
 - as bare ground increases, erosion potential increases
 - litter is an indicator of soil organic matter
 - more vegetation cover the better

Cover %		Vegetation Cover Composition	
Bare Ground	25.0	Common Name	Percent
Litter	39.0	Blue Grama1	5
Vegetation	13.0	Sideoats Grama	3
Rock (>3/4")	23.0	Threeawns	2
	100.0	Common Wolftail	2

Forage Composition

- **Species composition as a percentage of vegetation cover**
 - Certain species are more palatable to livestock (more desirable for grazing)
 - Certain species are more drought tolerant
 - Certain species can be indicators of range health

Cover %		Vegetation Cover Composition	
Bare Ground	25.0	Common Name	Percent
Litter	39.0	Blue Grama1	5
Vegetation	13.0	Sideoats Grama	3
Rock (>3/4")	23.0	Threeawns	2
	100.0	Common Wolftail	2

Forage Composition

- **Species composition as a percentage of all forages**
 - Certain species are more palatable to livestock (more desirable for grazing)
 - Certain species are more drought tolerant
 - Certain species can be indicators of range health

Forage Composition				
Common Name	Symbol	%	Avg. Height (inches)	Minimum Stubble Height Guideline
Blue Grama ¹	BOGR1	41	2.5	0.75
Threeawns	Arist	19	5.4	2.5
Common Wolftail	LYPH	16	4.3	2.5
Sideoats Grama	BOCU	14	7.4	4
Little Bluestem	SCSC	5	13.0	4
Pine Dropseed	BLTR	4	6.5	4

Soil Moisture Depth

6 ± 1.4 inch(es)

Annual Forage Biomass

1400 ± 70 lbs per acre



- Indicates water holding capacity in times of dry conditions (drought)
- Indicates available moisture for plants
 - May be dry on top but moist deeper
 - Survival of deeper rooted forages

Soil Moisture Depth	6 ± 1.4 inch(s)	Annual Forage Biomass	1400 ± 70 lbs per acre
----------------------------	-----------------	------------------------------	------------------------



- NOT UTILIZATION!!!
- Estimates the potential annual forage production

Soil Moisture Depth	6 ± 1.4 inch(s)	Annual Forage Biomass	1400 ± 70 lbs per acre
----------------------------	---------------------	------------------------------	----------------------------



UTILIZATION

- Can be used for short-term assessment and management changes but should NOT be used as a sole source in regulator standards.
- Highly dependent upon stocking rate, timing of grazing, livestock distribution, and forage type (individual vs. diverse community), environmental fluctuations...
- Gives a relative estimate of “use” (i.e., 40%) but SHOULD include other measurements (stubble height, ground cover, species composition) to develop management plans/regulations.
- Compare with multiple years (trends) to estimate stocking rates (greater than 7 years)

RaDAR_Sheet_Pr

File Home **Insert** Page Layout Formulas Data Review View Developer ACROBAT Tell me what you

Clipboard Font Alignment Number

Calibri 11

General

Wrap Text

Format Painter

Clipboard Font Alignment Number

G20 =IFERROR(Input!F267,"")

	A	B	C	D	E	F	G	H	I	J	K
25	Pine Dropseed	BLTR	4		6.5		4				
26											
27	Soil Moisture Depth	6 ± 1.4 inch(s)			Annual Forage Biomass		1400 ± 70 lbs per acre				
28	Photos										
29	Ground					Landscape					
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
41											
42											
43											
44											
45											
46											
47											
48											
49											
50											
51											
52											

Instructions Input **Record**

Ready



Monitoring during Drought

- Short-term management decisions
 - Temporary stocking rate adjustments
- Long-term management decisions
 - Increase/decrease targeted forage species
 - Record of effort towards management objectives
 - Conflict resolution (Insurance Policy!)

RaDAR - Rangeland Data Analysis & Record				
Producer Name: Jo Rancher		Pasture Name: North 40		
Date: 12/20/2019		Collector Names: Casey		
Transect Number: 1		GPS Coordinates: -112.83 N, 38.5 W (120°)		
Notes:		This is a test message for assessment of the rangeland condition and a monitoring record		
Biomass Availability		Pasture Size		Stocking Rate
2000.0 ± 353.6 lbs/acre		2240 acres		188.8 acres/AUY
Cover %		Vegetation Cover Composition		
Bare Ground	25.0	Common Name		Percent
Litter	39.0	BOGR1		5
Vegetation	13.0	BOCU		3
Rock (>3/4")	23.0	Arist		2
	100.0	LYPH		2
Forage Composition				
Common Name	Symbol	%	Avg. Height (inches)	Minimum Stubble Height Guideline
Blue Grama1	BOGR1	41	2.5	0.75
Threeawns	Arist	19	5.4	2.5
Common Wolftail	LYPH	16	4.3	2.5
Sideoats Grama	BOCU	14	7.4	4
Little Bluestem	SCSC	5	13.0	4
Pine Dropseed	BLTR	4	6.5	4
Soil Moisture Depth	6 ± 1.4 inch(s)		Annual Forage Biomass	1400 ± 70 lbs per acre
Photos				
<p>GROUND PHOTO</p>		<p>LANDSCAPE PHOTO</p>		





Monitoring Methods

- RAM is not the only method of monitoring available
- Quick, Easy, DEFENSIBLE

Monitoring in General

- Objective
- Repeatable
- Quantifiable

RaDAR - Rangeland Data Analysis & Record				
Producer Name: Jo Rancher		Pasture Name: North 40		
Date: 12/20/2019		Collector Names: Casey		
Transect Number: 1		GPS Coordinates: -112.83 N, 38.5 W (120°)		
Notes:		This is a test message for assessment of the rangeland condition and a monitoring record		
Biomass Availability		Pasture Size		Stocking Rate
2000.0 ± 353.6 lbs/acre		2240 acres		188.8 acres/AUY
Cover %		Vegetation Cover Composition		
Bare Ground	25.0	Common Name		Percent
Litter	39.0	BOGR1		5
Vegetation	13.0	BOCU		3
Rock (>3/4")	23.0	Arist		2
	100.0	LYPH		2
Forage Composition				
Common Name	Symbol	%	Avg. Height (inches)	Minimum Stubble Height Guideline
Blue Grama1	BOGR1	41	2.5	0.75
Threeawns	Arist	19	5.4	2.5
Common Wolftail	LYPH	16	4.3	2.5
Sideoats Grama	BOCU	14	7.4	4
Little Bluestem	SCSC	5	13.0	4
Pine Dropseed	BLTR	4	6.5	4
Soil Moisture Depth	6 ± 1.4 inch(s)		Annual Forage Biomass	1400 ± 70 lbs per acre
Photos				
 <p>GROUND PHOTO</p>		 <p>LANDSCAPE PHOTO</p>		



Management Decisions

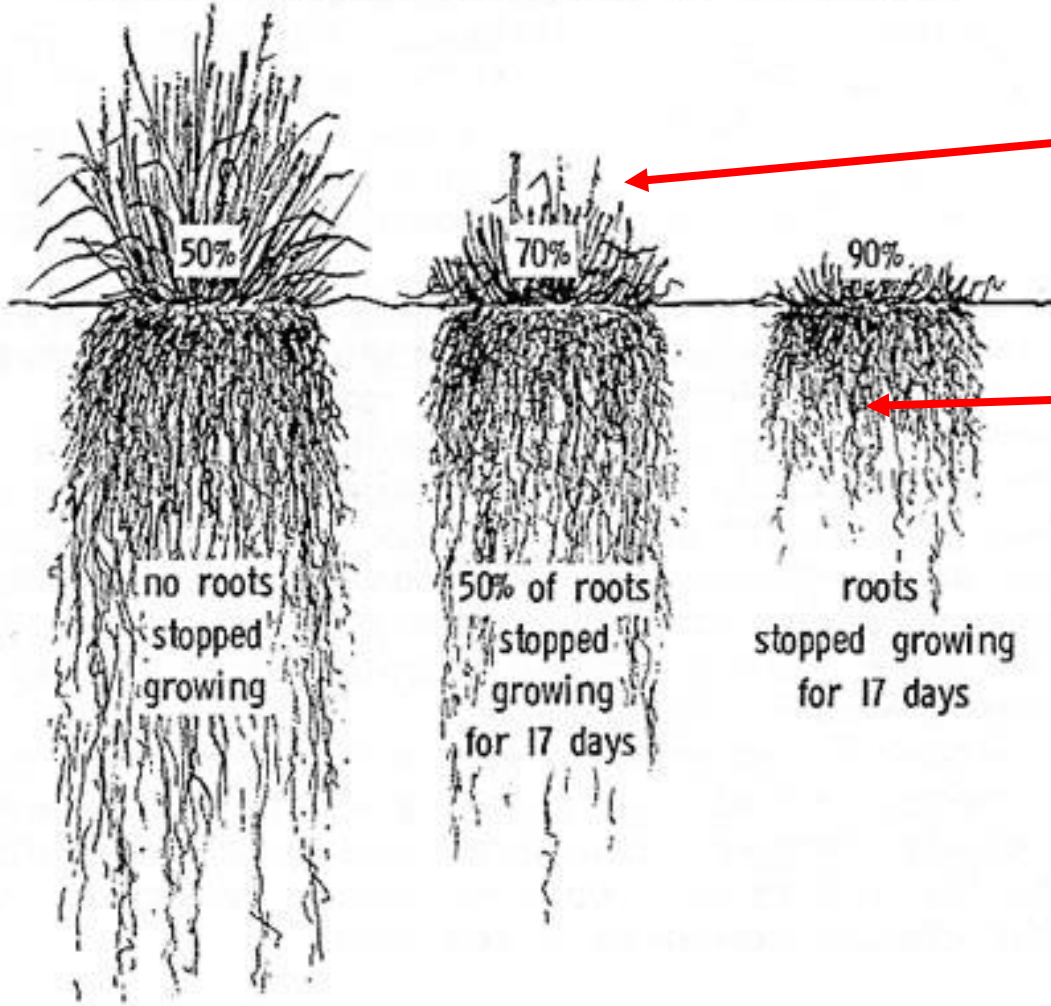
Drought in New Mexico

- 43% of the time in the Southwest
- 27% of the time in the Southern Great Plains
- Other sources estimate 66%

OR:

- Generally 3 out of every 10 years
- Even more in the Southwest

ROOT DEVELOPMENT IN RELATION TO TOP REMOVAL

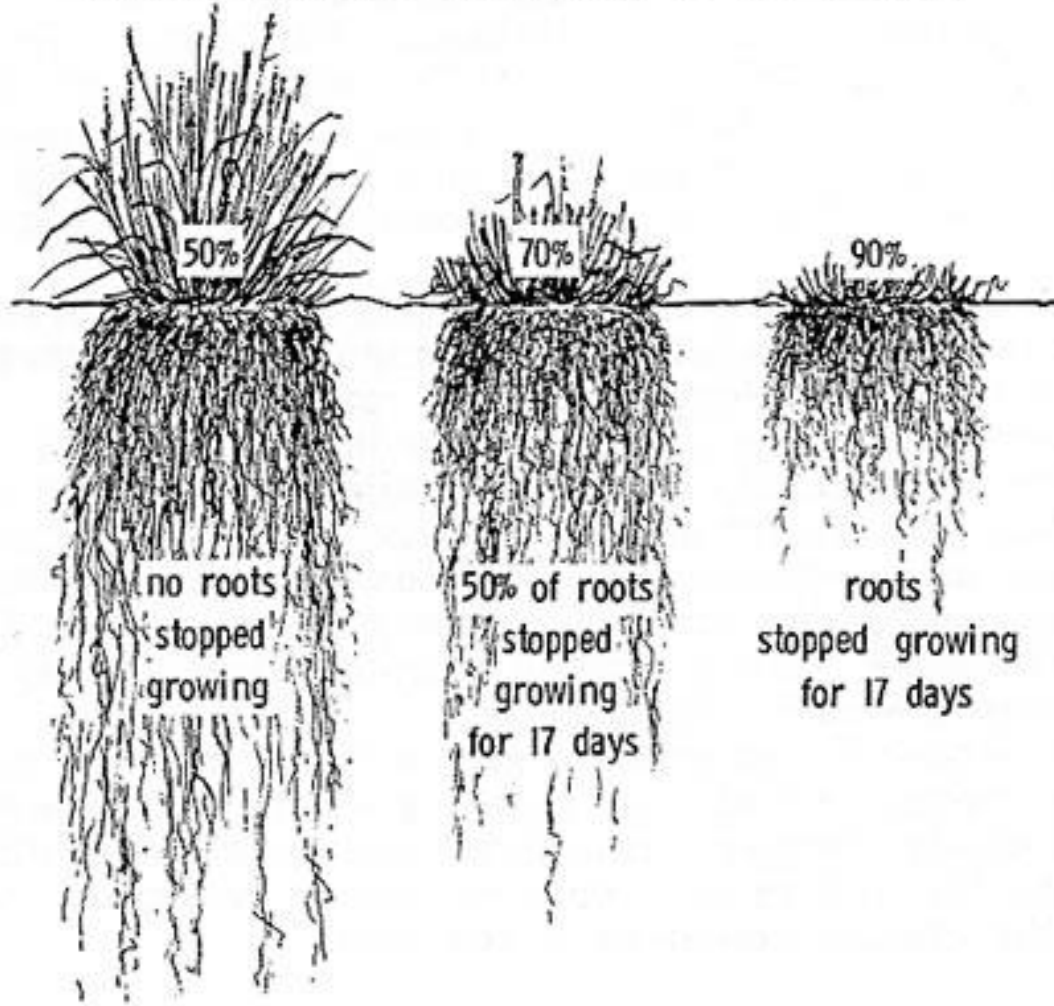


Food processing during (photosynthesis)

Food storage during drought

Light to Conservative grazing during drought has a 66% higher survival rate than moderate to heavy stocking rates

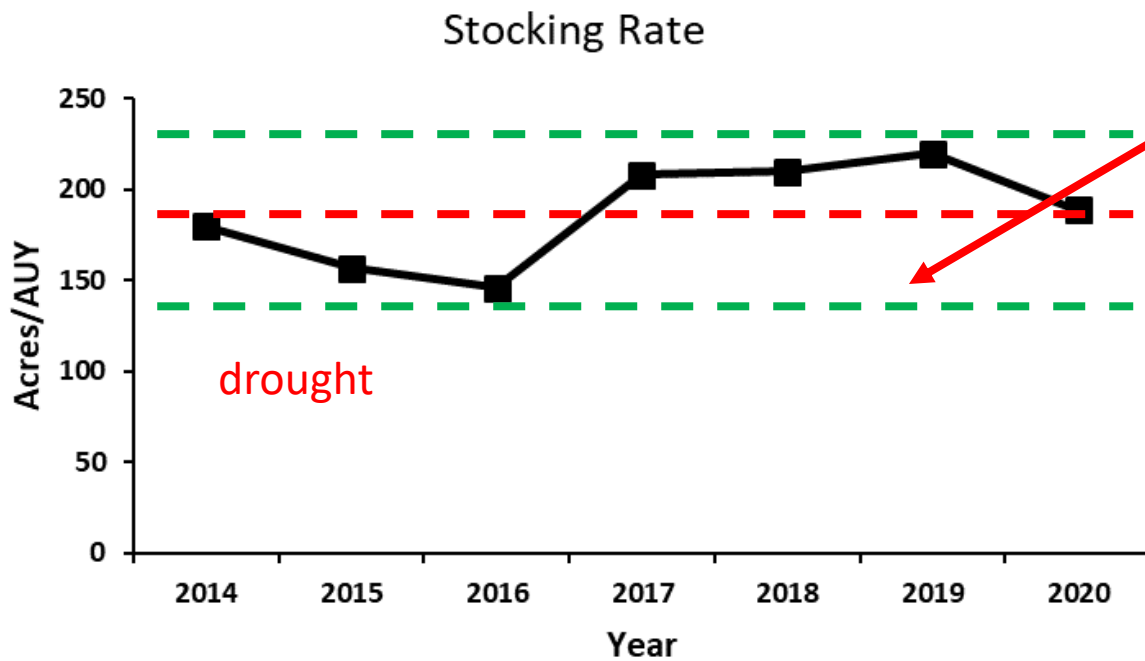
ROOT DEVELOPMENT IN RELATION TO TOP REMOVAL



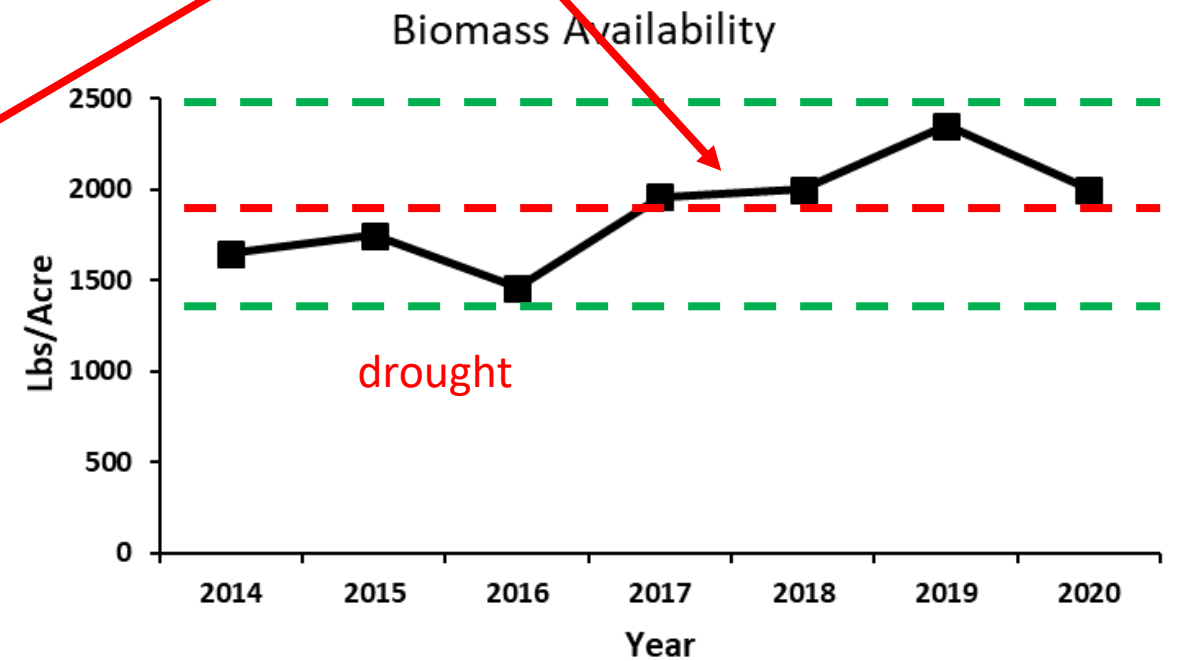
Light and Conservative grazing during drought produced on average 50% more forage than did heavy grazing and only a 25% reduction compared to 5-year average

Kipple & Costello 1960


Management Decisions



Carryover feed under light to conservative stocking rates (10 to 40% use)



QUESTIONS?

RaDAR - Rangeland Data Analysis & Record				
Producer Name: Jo Rancher		Pasture Name: North 40		
Date: 12/20/2019		Collector Names: Casey		
Transect Number: 1		GPS Coordinates: -112.83 N, 38.5 W (120°)		
Notes: This is a test message for assessment of the rangeland condition and a monitoring record				
Biomass Availability		Pasture Size		
2000.0 ± 353.6 lbs/acre		2240 acres		188.8 acres/AUY
Cover %			Vegetation Cover Composition	
Bare Ground	25.0	Common Name		Percent
Litter	39.0	BOGR1		5
Vegetation	13.0	BOCU		3
Rock (>3/4")	23.0	Arist		2
	100.0	LYPH		2
Forage Composition				
Common Name	Symbol	%	Avg. Height (inches)	Minimum Stubble Height Guideline
Blue Grama1	BOGR1	41	2.5	0.75
Threeawns	Arist	19	5.4	2.5
Common Wolftail	LYPH	16	4.3	2.5
Sideoats Grama	BOCU	14	7.4	4
Little Bluestem	SCSC	5	13.0	4
Pine Dropseed	BLTR	4	6.5	4
Soil Moisture Depth	6 ± 1.4 inch(s)		Annual Forage Biomass	1400 ± 70 lbs per acre
Photos				
