Using an Interactive Scenario-Planning Tool for Ranchers and Forest Service to Prepare for Drought

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1. Introduction

Drought on Southwest Rangelands

a. Drought creates risk by reducing forage and water resources

b. Drought is highly spatially variable and difficult to predict on time

Challenges to Livestock Grazing on National Forests

c. Rancher and Forest Service (FS) both involved in decisions; differing priorities

d. Federal regulations, e.g. National Environmental Policy Act (NEPA), lengthen approval process for management practices and limit flexibility

e. Variability in discretionary decision-making by FS District Rangers

2. Goal and Objectives

Long-Term Project Goal

a. For ranchers and FS to work together to increase preparation for drought on national forest livestock grazing allotments by increasing management flexibility

Workshop Objectives – for Ranchers and Forest Service to:

b. Co-develop realistic solutions to drought that increase management flexibility

c. Develop realistic expectations of FS decision-process and NEPA

d. Improve interactions and communication

e. Develop greater understanding of Standardized Precipitation Index (SPI) used in FS Region 3 (Southwest – AZ and NM) drought policy

3. Approach

a. Workshop with Tonto NF ranchers (n=17), District Rangers (n=5), range staff (n=6)

b. Hypothetical but realistic grazing allotment to avoid personal bias (Figure 1)

c. Challenging scenarios with drought and policy constraint components (Table 1)

Table 1: Scenarios assigned to small groups

Scenario D	1) SPI -1 summer in Preacher Tom, Old Homestead, Miner's Camp and Timber Top pastures 2) No drinking water from June-December in Preacher Tom and Old Homestead pastures 3) No grazing 1 year after fire in Old Homestead, and 4) No grazing Riparian pasture May-September to avoid conflict with high recreation use
Scenario E	1) SPI -1 winter for all pastures 2) No drinking water from January-June in Son of a Gun, Preacher Tom, and Old Homestead 3) No grazing 1 year after fire in Miner's Camp and Timber Top pastures.

d. Four small groups find solutions to scenarios using interactive Excel© Tool (Figure 1) and record solutions on worksheets.

e. Solutions identify practices and expected FS decision process to approve practices

f. Post-workshop evaluation, notes, and group solutions used to measure results

g. Scenario exercise structure based on Protection Motivation Theory (PMT) appraisals (Figure 2), expecting increased *motivation* to prepare for drought

Figure 2: PMT Approach to Preparation for Drought

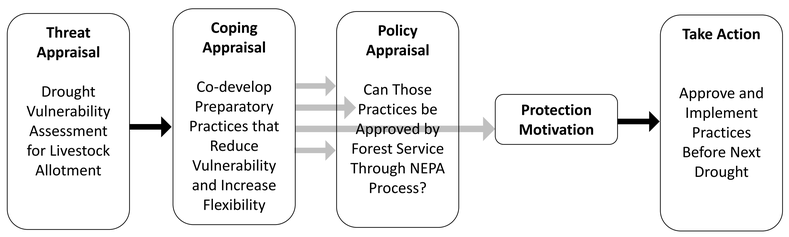


Figure 1: Drought Scenario Planning Tool

Drought Scenario Planning Tool

Reference Values for Drought Severity Effects on Seasonal Forage Production

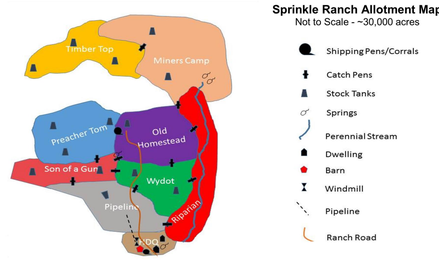
	Winter*		Summer	
Standard Precipitation Index (SPI)	-1	-2	-1	-2
Estimated Forage Production (% of Average)**	0.58	0.34	0.72	0.52

*Winter = October - May; Summer = June - September

**Simplified 1:1 relationship between precip and forage

Herd Composition

	Jan - May	June - Dec
Cows	300	300
Bulls	20	20
Yearlings	150	40
Total Herd AU's	**440**	**363**



Drought Factors

SPI Value (pasture level)	
Winter Season	Summer Season
-1	0
-1	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0

Grazing Plan

Pasture	Pasture Rotation Sequence	Planned % Utilization	Water (dates when unavailable)	Seasonal Use Restrictions (dates)	Number Days in Pasture	First Day in Pasture	Last Day in Pasture	Maximum Seasonal Grazing Days	Drought Season Affecting Forage Production	Pasture Warnings
Riparian	1	20%			43	1/1/2016	2/12/2016	25.9	Winter	Exceeds Available Forage
Headquarters	2	40%			19	2/13/2016	3/2/2016	11.4	Winter	Exceeds Available Forage
Pipeline	3	40%			60	3/3/2016	5/1/2016	76.9	Winter	
Wydot	4	40%			50	5/2/2016	6/20/2016	88.6	Winter	
Son of A Gun	5	40%			40	6/21/2016	7/30/2016	71.2	Summer	
Miners Camp***	6	20%			25	7/31/2016	8/24/2016	30.5	Summer	
Timber Top***	7	0%			0	8/24/2016	8/24/2016	0.0	Summer	
Preacher Tom	8	40%			76	8/25/2016	11/8/2016	93.2	Summer	
Old Homestead	9	40%			52	11/9/2016	12/30/2016	81.4	Summer	
Total					365			479		

***Rest rotation every other year, summer use

Pasture Sequence Re-Sort

4. Results

a. Groups successfully co-developed solutions to scenarios. Not surprisingly, FS decision process for same type of practice varies depending on District Ranger (Table 2).

Table 2: Co-developed Practices and Expected FS Decision Process

Type of Practice	No. Times	Expected FS Decision Type to Approve Practices
Change Pasture Rotation	9	None; AOI update; Negotiation
Reduce herd size (e.g. selling yearlings)	9	None; AOI update; Negotiation
Permanent Water (pipe, well, spring, pond, trick tank)	7	AOI update; AMP renewal (EA); Emergency outside AMP renewal (CE); EA grouping projects
Temporary Water (haul water, pipe)	5	None; AOI update; archaeology clearance
Increase herd size or % forage utilization within grazing permit terms	4	None; AOI update; DR inspection & consultation with specialists
Improve Rangeland Condition (reduce use, land treatment)	4	AOI update; CE; EA
Supplemental Feed	1	AOI update

Key to Acronyms

AOI = Annual Operating Instructions
AMP = Allotment Management Plan
EA = Environmental Assessment
EIS = Environ. Impact Statement
CE = Categorical Exclusion (CE, EA, and EIS as part of NEPA)

b. **>70%** participants better understand FS decision process and want to learn more (Table 3, #1), but **>40%** still frustrated with the variability (Table 3, #2).

c. **100%** participants felt improved interactions and communication (Table 3, #3-5).

d. **>97%** participants better understand SPI and its use in drought decisions (Table 3, #6).

Table 3: Common Responses on Post-Workshop Evaluation

1. The personnel explained their positions and what we can do to expedite projects; understand constraints
2. Discretion is based on level of risk they wish to take – very frustrating. Great latitude to interpret policy
3. We had great interactions and exchange of ideas; group as a whole is getting more comfortable interacting
4. Always important to communicate with FS…willing to work with you if you are being a good manager
5. Seemed like more trust and less animosity
6. Tool allowed everyone to understand consequences of drought…and how frequent SPI -1 happens

5. Discussion

Are participants likely to become more prepared for drought?

a. PMT approach was useful; starting to see evidence of motivation to prepare for drought: "I want to create a 2016 contingency drought plan for my ranch".

b. Participants' interest in learning more about FS decision process is evidence of motivation to take steps to prepare and increase management flexibility.

Interactive Tool was essential to success of workshop

c. Realistically represented physical, operational, and administrative qualities.

d. Using SPI in the scenarios and Tool allowed participants to better understand Region 3 policy and interpret potential implications for an SPI -1.

e. Brainstorming different solutions helped participants understand the potential flexibility in both the practices and the FS decision process.

Challenges

f. The type of NEPA analysis the District Ranger chooses affects the length of time to approve practices (e.g. none, CE, EA), likely delaying approval for many years.

Therefore, start the approval process early especially because SPI -1 or lower occurs 16% of the time (1 in 6 years).

g. High turnover in FS staff is a challenge to sustaining good relationships and long-term drought preparation planning on livestock allotments.

h. Successful improvement in interactions and communication not surprising because all rancher participants were voluntary, representing only 25% of Tonto ranchers; those missing might have benefited the most.

i. **Next steps:** *Guide to Drought Prep for Livestock Allotments SW National Forests*

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