

# CONSERVATION PLANNING ON GRAZING LANDS

Analysis, Alternatives and Prescribed Grazing

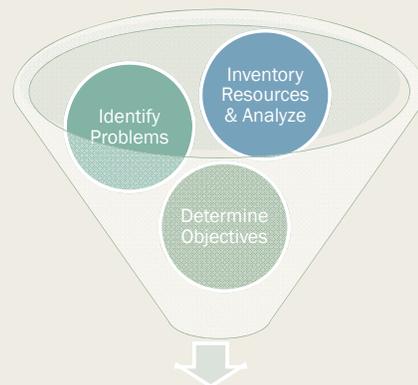
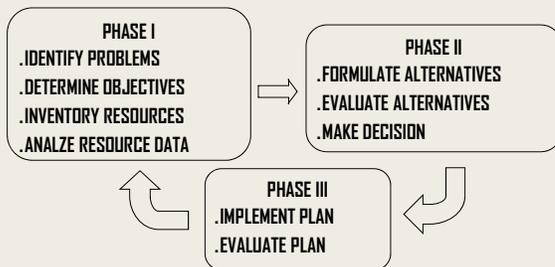
Reminders:

- ✓ Sign in
- ✓ Mute your computer
- ✓ Mute your phone unless you have a question

Mahalo!

## 9 steps of Conservation Planning

### THE PLANNING PROCESS:



## Analysis – NRCS assists the client to analyze inventory data to identify resource problems and opportunities

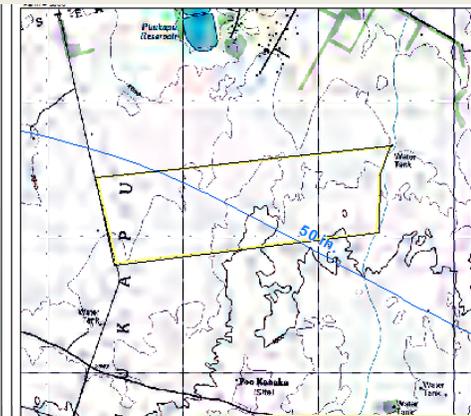


## Inventory & Analysis

- Maps / Shapefiles
- Graz-able acres
- Stock water
- Livestock Inventory
- Veg Inventory
- GLCS/GLTW/CPTN1
- Estimated Total Forage Production

*Client ID problems:*  
Major trailing, access difficult  
LOTS of fireweed  
Poor animal performance

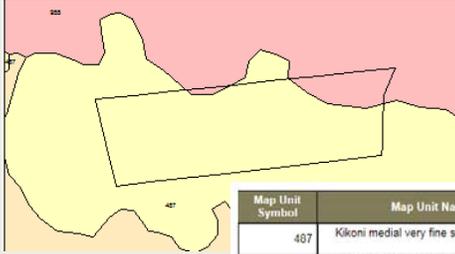
*Client objectives:*  
Improve pastures, less fireweed  
Improve herd production  
Reduce trailing, improve access



*Cow-calf producer*  
34 cows  
1 bull  
1 horse  
18 cows with calves  
1 paddock  
1 trough  
Breed year-round



# Inventory & Analysis



Map Unit Symbol	Map Unit Name	Acres	Percent
487	Kikoni medial very fine sandy loam, 0 to 6 percent slopes	293.1	88%
955	Honokaa highly organic hydrous silty clay loam, 0 to 10 percent	38.7	12%
Total:		331.8	100%

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year Lb/ac	Normal year Lb/ac	Unfavorable year Lb/ac
487: Kikoni	---	3,000	2,000	700
955: Honokaa	---	16,000	14,000	10,000



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# Inventory & Analysis



-Trails 16 inches deep.  
Most severe in the old gates.  
- Heavy use at the trough.

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# Inventory & Analysis

**GRAZING LAND TREND DETERMINATIONS**

Ecological Site: \_\_\_\_\_  
 Location: \_\_\_\_\_  
 Cooperator: \_\_\_\_\_

Initial Trend Determinations: Date: \_\_\_\_\_  
 Conservationist: \_\_\_\_\_

Plant Factors (circle as appropriate):

Forage Plant Relative Density: Dominant: High Sub-dominant: None  
 Forage Plant Diversity: High: None Moderate: None Low: None  
 Vigor of Forage Plants: Good: None Fair: None Poor: None  
 Seedlings and young forage plants: Many: None Few: None None: None  
 Dead, dying, or unhealthy plants: None-Few: None Moderate: None Abundant: None  
 Plant residue and litter amounts: Abundant: None Moderate: None None-Few: None  
 Noxious, invasive, or undesirable plants: None-Few: None Moderate: None Abundant: None

Soil Factors (circle as appropriate):

Surface (plant) erosion: High: None Moderate: None None: None  
 Rills: High: None Moderate: None None: None  
 Surface crusting (soil cracks): High: None Moderate: None None: None  
 Soil compaction: High: None Moderate: None None: None  
 Bare ground: High: None Moderate: None None: None  
 Overall Soil Degradation: High: None Moderate: None None: None

Other Factors: Noxious, invasive, or undesirable species: \_\_\_\_\_  
 Present canopy cover: \_\_\_\_\_  
 Overall trend rating (circle as appropriate): Stable  
 WIND DIRECTION: Is there a detectable change in the plant community?  
 YES: None NO: None YES: None NO: None  
 Is the current plant community moving toward or away from the historic plant community?  
 YES: None NO: None YES: None NO: None  
 Is the current plant community moving toward or away from the desired plant community?  
 YES: None NO: None YES: None NO: None  
 PLANNED TREND DIRECTION: None  
 Does the current management promote the plant community moving toward or away from the desired plant community?  
 YES: None NO: None YES: None NO: None

See the reverse side for follow-up grazing land trend subsequent years following the trend.

Species	GPS at 75' across tree		Initial or Post-Treatment Assessment?		Initial	Total	Density																					
	Transect 1 @ 44' MN	Transect 2 @ 120' MN	Transect 3 @ 200' MN	Transect 4 @ 200' MN																								
Standing	1	1	1	1	0	0	0																					
Growing	10	12	20	19	14	10	0																					
Dead	7	5	6	4	12	10	0																					
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-About 3,000 fireweed plants per acre.  
 -Toe step = 20-30% canopy cover is fireweed  
 -Kikuyu throughout, but grazing very uneven. Some kikuyu heavily grazed, some (in FW) hardly touched.  
 -Trace amounts of white clover.  
 - Grazing pressure appears highest in front paddocks nearer the trough. Lighter towards the back (less fireweed too).  
 -Client lives >50 mi away. Has a day job. Most ranch work must occur on weekend.  
 -Shortest grazing rotation they can do = 1 week.

Overall Pasture Condition Score	Individual Indicator Score	Management Change Suggested	Overall Pasture Condition Score =
45 to 50	5	No changes in management needed at this time.	26.9
35 to 45	4	Minor changes would enhance, do most beneficial first.	
25 to 35	3	Improvements would benefit productivity and/or environment.	
15 to 25	2	Needs immediate management changes, high return likely.	
10 to 15	1	Major effort required in time, management and expense.	

# Inventory & Analysis

**GRAZING LAND TREND DETERMINATIONS**

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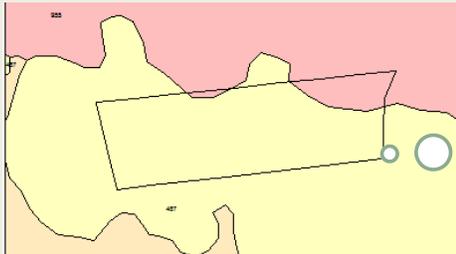
The main plant related issues were increasing invasives, patchy, uneven grazing, thick build up of kikuyu mat that was affecting plant vigor. Overall pasture did not look overstocked (didn't look like a golf course), but plants are being overgrazed.

Indicator/Weight	1 Points	2 Point	3 Points	4 Point	5 Points	Points
<b>1. Desirable Forage Plants</b> 20% of score	Desirable species <20% of stand. Weeds and/or woody non-desirable invasives are dominant. <b>Undesirable-woody-vegetation-canopy-cover-exceeds-35%.</b>	Desirable species 20-40% of stand. Mostly weedy and/or woody non-desirable invasives present and expanding. <b>Undesirable-woody-vegetation-canopy-cover-is-between-20-and-35%.</b>	Desirable species 40-60% of stand. Weeds and non-desirable weedy grasses present but not dominant. Some invasive woody plants present. <b>Undesirable-woody-vegetation-canopy-cover-is-between-10-and-20%.</b>	Desirable species 60-80% of stand. Remainder mostly intermediates with few undesirables present. <b>Undesirable-woody-vegetation-canopy-cover-is-less-than-10%.</b>	Desirable species exceed 80% of plant community with scattered intermediates. <b>No-undesirables-present.</b>	2.5
<b>3. Plant diversity</b> 5% of score	1 desirable dominant forage species are present. <b>Poor-grazing-distribution;</b> plants are not evenly grazed. OR Most plant species are avoided by livestock.	1-2 forage species are present from one dominant functional group. Species distribution is patchy, and some species are avoided by livestock.	2-3 dominant forage species are present from one dominant functional group OR 1-2 forage species each are present from two functional groups. None are avoided.	3-4 forage species representing two functional groups are present with at least one being a legume. None are avoided. Well intermixed, compatible growth habit and comparable palatability.	4-5 forage species representing three functional groups are present with at least one being a legume. Well intermixed, compatible growth habit, and comparable palatability.	2.0
<b>4. Plant Residue</b> 10% of score	No identifiable organic residue present on soil surface. Patches of exposed bare soil are	Patches of bare ground are few and scattered. 1-10% of the ground between living plants is covered with dead leaves or stems. <b>SODGRASSES:</b> Vegetative mat is < 2 inches thick and bare soil is visible beneath stolons OR the mat is >8 inches thick and inhibits plant regrowth and water infiltration OR dead/decadent plants 15-25% <b>RIINCHGRASSES:</b> Dead or	Bare ground is limited to animal trails and areas of concentration. 10-20% of the ground between living plants is covered with dead leaves or stems. <b>SODGRASSES:</b> Vegetative mat is 2-3 inches thick and no bare soil is visible beneath stolons OR dead/decadent plants 5-15% <b>BUNCHGRASSES:</b> Standing dead or decadent plants 5-15% of forage mass. Slight thatch buildup	Bare ground is limited to animal trails and areas of concentration. 20-30% of the ground between living plants is covered with dead leaves or stems. <b>SODGRASSES:</b> Vegetative mat thickness is within the S28-Prescribed Grazing specification recommendations for the dominant specie(s) OR dead/decadent plants are absent. <b>BUNCHGRASSES:</b> Standing dead or decadent plants absent	Bare ground is virtually absent. 30-70% of the ground between living plants is covered with dead leaves or stems. <b>SODGRASSES:</b> Vegetative mat thickness is within the S28-Prescribed Grazing specification recommendations for the dominant specie(s) OR dead/decadent plants are absent. <b>BUNCHGRASSES:</b> Standing dead or decadent plants absent	1.0
<b>Severity of Use (Domestic Livestock)</b>	All desirable species grazed out OR absence of grazing has resulted in heavy thatch and/or standing dead accumulation and woody plant invasion	All edible forage plants grazed to lowest level possible OR pasture is undergrazed with excessively stemmy overgrowth and much standing dead plant matter	Spot grazing is common, with approximately an equal amount of close-grazed and little-grazed areas. Closely-grazed areas are grazed to the lowest point possible.	Some spot-grazing is apparent. Avoided areas are primarily at dung and urine spots. Closer-grazed areas are not grazed below proper height needed to maintain plant vigor.	Forage species are grazed at or above the recommended stubble height. Forage stand is dense, healthy, and near maximum production.	2.0

# Inventory & Analysis

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Our soils map and data indicate production is either 2,000 lb/ac or 14,000 lb/ac! WHAT?!? What the heck does THAT mean?

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# Inventory & Analysis

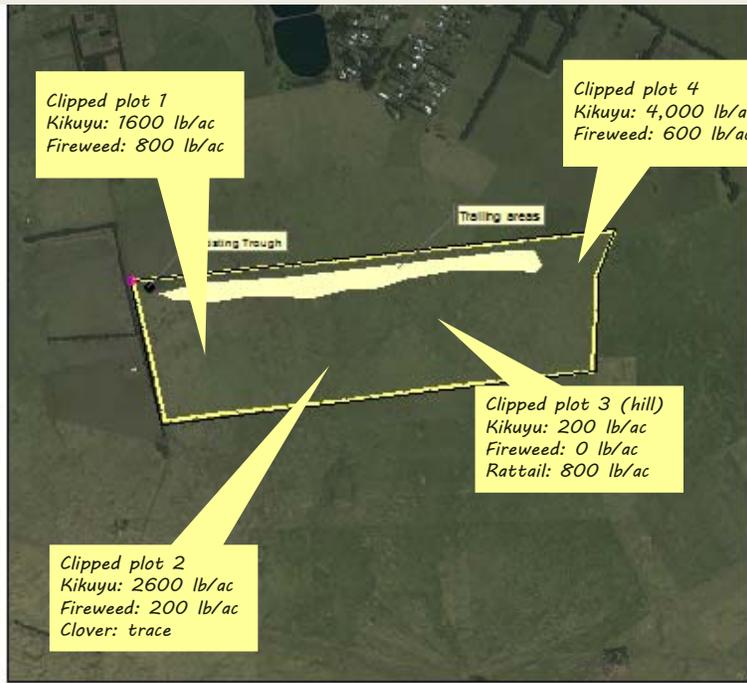
Hmmm... How we gonna measure production out here? Nothing is rested. There's a lot of fireweed in there... The hillsides are mostly rattail... How do I clip to represent the whole pasture?



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# Inventory

- Select sites that represent the variability out there.
- Recognize it's all grazed, so nothing is rested.
- Compare this data to soils and book values to determine a decent estimate to use in baseline forage-animal balance.



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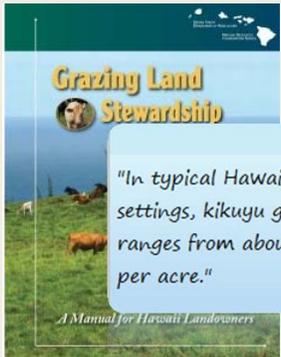
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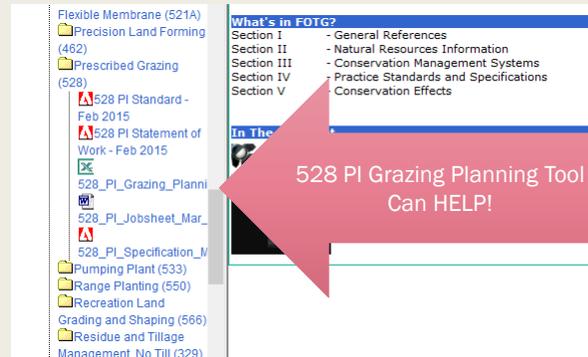
Clipping data for kikuyu ranged from 200 - 4000 lb/ac total production under constantly grazed, lightly stocked conditions.



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## Analysis

- Need to process information from inventory
  - *Grazable acres*
  - *Animals in the operation*
  - *Pastures they graze on*
  - *Pasture conditions*
  - *Estimated production per acre*



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Analysis – go to live 528 grazing tool.

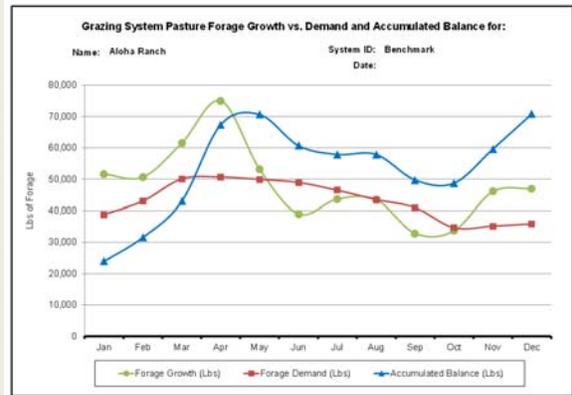
Any Questions?

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# Benchmark Forage-Animal balance

- Pasture is not OVERSTOCKED, but forage plants ARE being OVERGRAZED.
- Grazing intensity on individual plants is uncontrolled, duration is too long and frequency is too much.

Client ID problems:  
Major trailing, access difficult  
LOTS of fireweed  
Poor animal performance

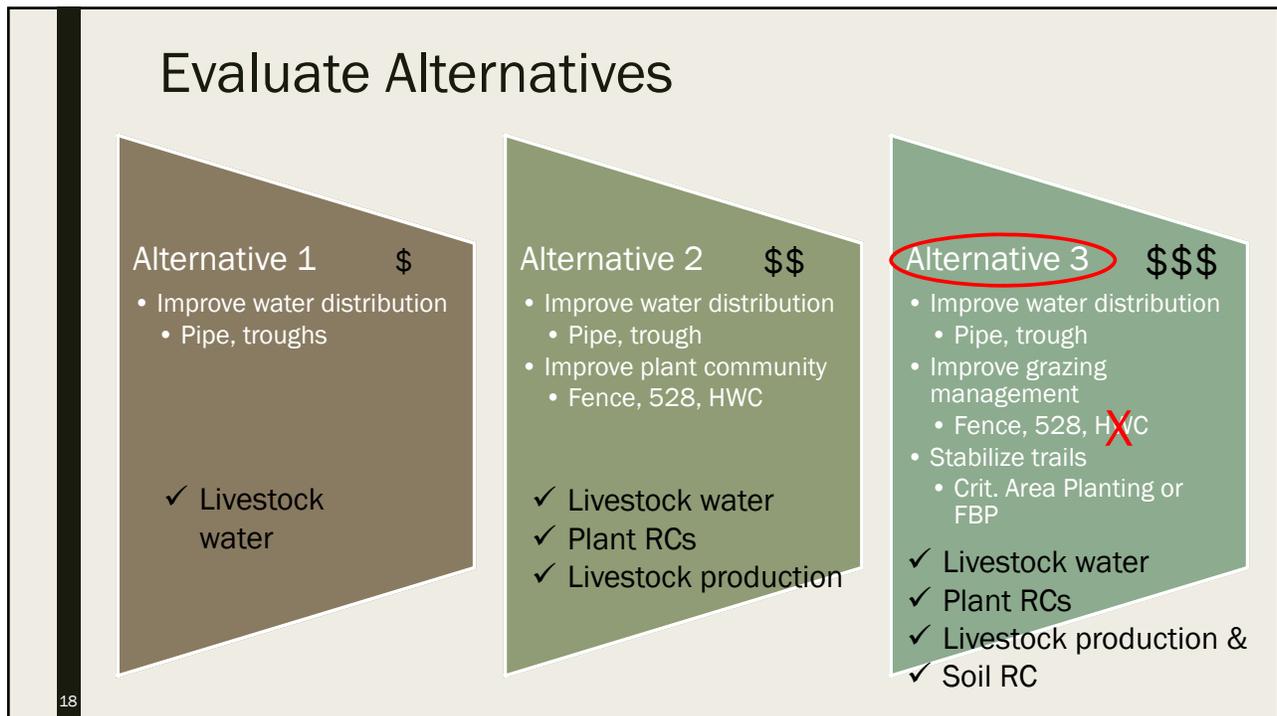
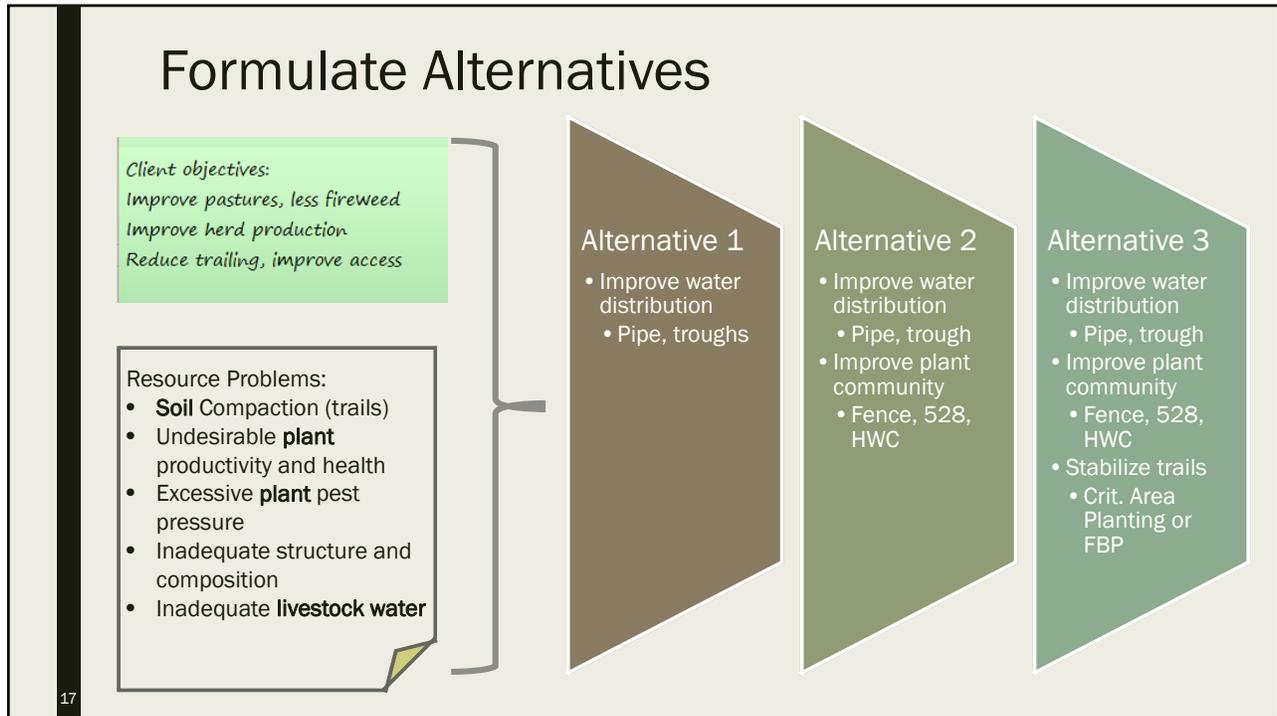


- Help client understand
  - Trailing due to lack of water distribution
  - Fireweed increasing due to spot overgrazing and no recovery
  - Poor animal performance may be related to inconsistent forage quality, distance between water and forage, and maybe he needs to evaluate his herd for poor performers...

Document Benchmark F-A balance by printing pages from 528 planning tool and put in file as part of inventory

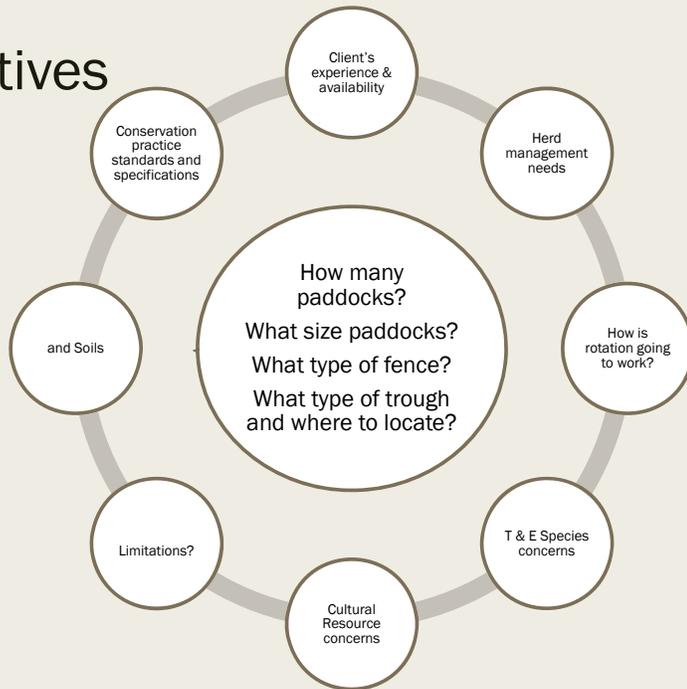
# Inventory & Analysis

Natural Resources Conservation Service		Client: _____	
Planner: _____		Field Office: _____	Date: _____
<b>SOIL RESOURCES</b>			
<b>SOIL EROSION: Sheet, rill and wind erosion (REQUIRED)</b>			
Is there active sheet, rill or wind erosion on the site?	No	This is NOT a resource concern.	
<b>SOIL EROSION: Concentrated flow erosion (REQUIRED)</b>			
Are classic gullies present?	No	This is NOT a resource concern. 1. Trails are	
<b>SOIL EROSION: Excessive bank erosion from streams, shorelines or water conveyance channels (REQUIRED)</b>			
Are streams, shorelines or conveyance channels adjacent to the site?	No	This is NOT a resource concern.	
<b>SOIL QUALITY DEGRADATION: Compaction</b>			
Is soil compaction a problem or do current agricultural/anchoring activities cause soil compaction problems?	Yes	The Assessment below MUST be completed.	
Is the GLTW - Soil Compaction = "slight"?	No	This is a resource concern in Field(s): 1. Animal Trails	
Is the GLCS Soil Compaction indicator score > 3?	No	Not Applicable	
<b>WATER RESOURCES</b>			
<b>INSUFFICIENT WATER: Inefficient use of irrigation water (REQUIRED)</b>			
Is the planned/land unit irrigated?	No	This is NOT a resource concern.	
<b>WATER QUALITY: Excess nutrients in surface and ground waters (REQUIRED)</b>			
Are surface water bodies present or are they less than 1/2 mile away from the FLU without good vegetative cover?	No	This is NOT a resource concern.	
<b>WATER QUALITY DEGRADATION: Excess pathogens and chemicals from manure, biosolids or compost applications (REQUIRED)</b>			
Are potential sources of pathogens or pharmaceuticals applied on the land?	No	This is NOT a resource concern.	
<b>WATER QUALITY DEGRADATION: Excessive sediment in surface water (REQUIRED)</b>			
Are there untreated sources of erosion or are stream/shoreline on or adjacent to site?	No	This is NOT a resource concern.	
<b>EXCESS WATER: Ponding/flooding, seasonal high water table, and seeps</b>			
Is there untreated sources of erosion or are stream/shoreline on or adjacent to site?	No	This is NOT a resource concern.	
<b>WATER QUALITY DEGRADATION: Pesticides transported to surface and ground waters</b>			
Are potential sources of pathogens or pharmaceuticals applied on the land?	No	This is NOT a resource concern.	
<b>WATER QUALITY DEGRADATION: Petroleum and heavy metals and other pollutants transported to receiving waters</b>			
Are potential sources of pathogens or pharmaceuticals applied on the land?	No	This is NOT a resource concern.	
<b>WATER QUALITY DEGRADATION: Elevated water temperature</b>			
Are potential sources of pathogens or pharmaceuticals applied on the land?	No	This is NOT a resource concern.	
<b>PLANT RESOURCES</b>			
<b>DEGRADED PLANT CONDITION: Undesirable plant productivity and health (REQUIRED)</b>			
Are plant production and health a client concern?	Yes	The Assessment below MUST be completed.	
Is the GLTW - vigor of key forage plants = "Fair to Good"?	No	This is a resource concern in Field(s): 1. Overgrazing increasing fireweed	
Is the GLTW - Desir. plant or unweedy plants = "Fair to None"?	No	Not Applicable	
Is the GLCS Desirable Forage Plants element score > 3?	No	Not Applicable	
Is the GLCS Plant Vigor element score > 3?	No	Not Applicable	
<b>DEGRADED PLANT CONDITION: Excessive plant pest pressure (REQUIRED)</b>			
Is plant productivity limited from pest pressure?	Yes	The Assessment below MUST be completed.	
Is the GLTW - Noxious, invasive or undesirable plants = "None-Few"?	No	This is a resource concern in Field(s): 1. Overgrazing increasing fireweed	
Is the GLTW - vigor of key forage plants = "Good"?	No	Not Applicable	
Is the GLCS Desirable Forage Plants element score > 3?	No	Not Applicable	
Is the GLCS Plant Vigor element score > 3?	No	Not Applicable	
Is the GLCS Invasive or Desirable Pressure Causative Factor element score > 3?	Yes	This is a resource concern in Field(s): 1. Overgrazing increasing fireweed	
Is the GLCS Severity of Use (Foral Animals) Causative element score > 3?	Yes	This is a resource concern in Field(s): 1. Overgrazing increasing fireweed	
<b>DEGRADED PLANT CONDITION: Inadequate structure and composition</b>			
Could changes to the plant community structure or composition better support the desired ecological functions and intended land use?	Yes	Applicable	
<b>DEGRADED PLANT CONDITION: Wildfire hazard, excessive biomass accumulation</b>			
Is the GLTW - Forage Plant Relative Diversity = "Constant"?	No	The Assessment below MUST be completed.	
Is the GLTW - Forage Plant Diversity = "Moderate" to "High"?	No	This is a resource concern in Field(s): 1	
Is the GLTW - Noxious, invasive or undesirable plants = "None to Few"?	No	Not Applicable	
Is the GLCS Desirable Forage Plants element score > 3?	No	Not Applicable	
Is the GLCS Live Plant Cover element score > 3?	No	Not Applicable	
<b>ANIMAL RESOURCES</b>			
<b>LIVESTOCK PRODUCTION LIMITATION: Inadequate feed and forage (Grazing Modifier)</b>			
Is the client actively grazing animals?	Yes	The Assessment below MUST be completed.	
Are livestock forage, roughage and supplemental nutritional requirements addressed?	Yes	This is NOT a resource concern.	
<b>LIVESTOCK PRODUCTION LIMITATION: Inadequate livestock shelter (Grazing Modifier)</b>			
Are there untreated sources of erosion or are stream/shoreline on or adjacent to site?	No	This is NOT a resource concern.	
<b>LIVESTOCK PRODUCTION LIMITATION - Inadequate livestock water (Grazing)</b>			
Is the client actively grazing animals?	Yes	The Assessment below MUST be completed.	
Is water of acceptable quality and quantity adequately distributed to meet animal needs?	No	This is a resource concern in Field(s): 1. Distribution is lacking	
<b>AIR RESOURCES</b>			
<b>AIR QUALITY IMPACTS: Objectionable Odors</b>			
Are there untreated sources of erosion or are stream/shoreline on or adjacent to site?	No	This has not been assessed.	
<b>DESCRIPTION OF RESOURCE CONCERNS</b>			
Severe animal trailing problems along north boundary of pastures, especially at old gate locations. Trail gullies 16 inches deep. Only one trough, in NW corner, animals set stock grazing and trail to water every day. Fireweed is a concern - about 3000 plants/ac and 20-30% canopy cover. Pastures are spot overgrazed. Overall stocking appears light.			



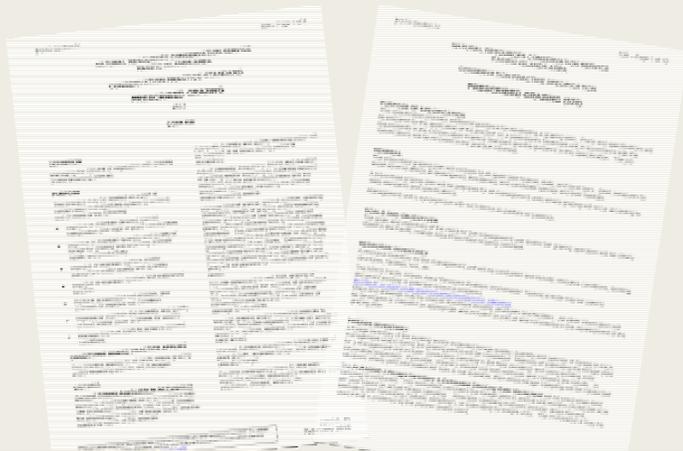
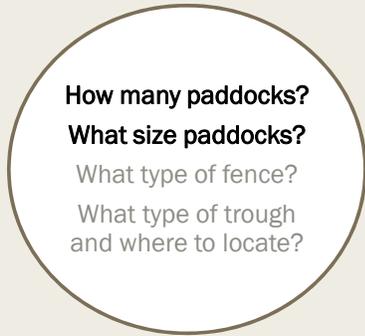
# Evaluate Alternatives

- Once client decides which resource concerns he wants to address in the plan, we need to work out the site specific details of the practices.
- Again, need to consider inventory information



# 528 Prescribed Grazing

- Some of these questions lead right to the 528 Prescribed Grazing practice...



# 528 Prescribed Grazing Standard



## PURPOSE

This practice may be applied as a part of conservation management system to achieve one or more of the following:

- Improve or maintain desired species composition and vigor of plant communities.
- Improve or maintain quantity and quality of forage for grazing and browsing animals' health and productivity.
- Improve or maintain surface and/or subsurface water quality and quantity.
- Improve or maintain riparian and watershed function.
- Reduce accelerated soil erosion, and maintain or improve soil condition.
- Improve or maintain the quantity and quality of food and/or cover available for wildlife.
- Manage fine fuel loads to achieve desired conditions.

# 528 Prescribed Grazing Standard

## CRITERIA

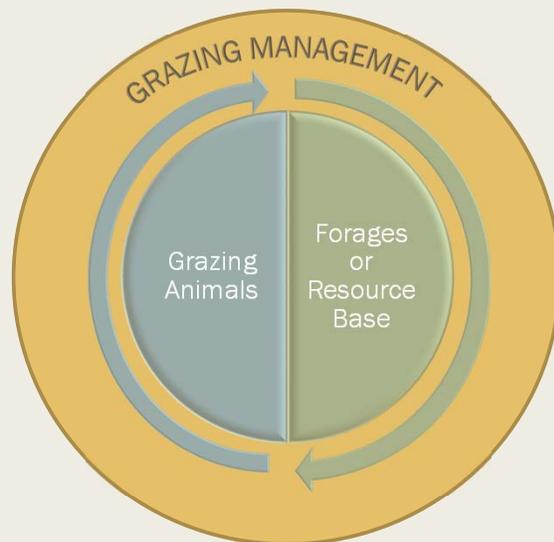
### General Criteria Applicable to All Purposes

Removal of herbage will be in accordance with site production limitations, rate of plant growth, the physiological needs of forage plants and the nutritional needs of the animals.

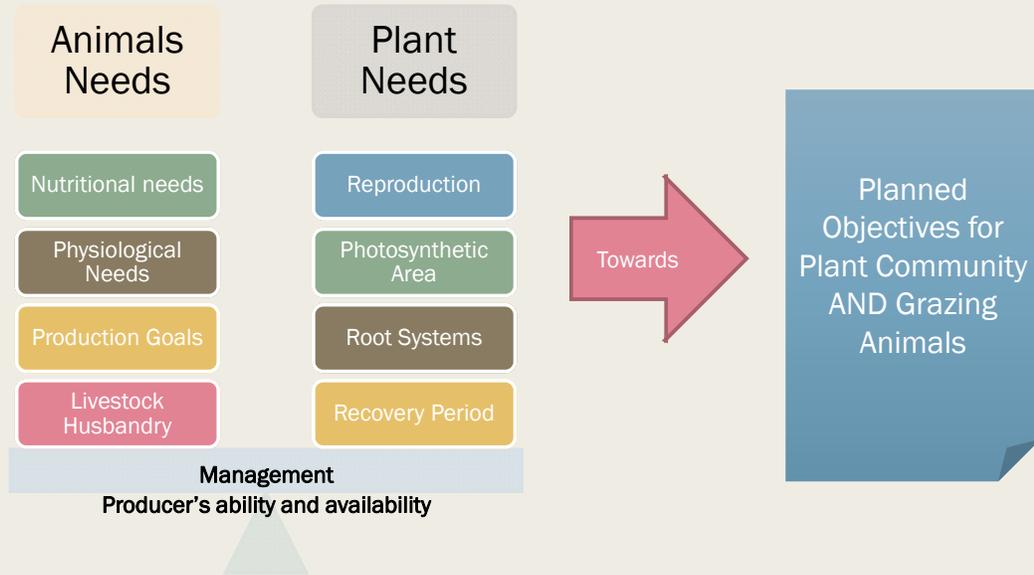
Adjust intensity, frequency, timing and duration of grazing and/or browsing to meet the desired objectives for the plant communities and the associated resources, including the grazing and/or browsing animal.

Manage kind of animal, animal number, grazing distribution, length of grazing and/or browsing periods and timing of use to provide grazed plants sufficient recovery time to meet planned objectives. The recovery period of non-grazing can be provided for the entire year or during the growing season of key plants. Deferment (non-

Manage livestock movements based on rate of plant growth, available forage, and allowable utilization target.



## 528 Prescribed Grazing Standard



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## 528 Prescribed Grazing Specification

### PURPOSE OF SPECIFICATION

This specification provides additional guidance for developing a grazing plan. Plans and specifications will be prepared for the application of the practice on a participant's treatment unit in accordance with the requirements in the Conservation Practice Standard and the guidance in this Specification. The job specifications will be recorded in the practice Jobsheet.

**Table 2. General Guidelines for Judging Proper Grazing Use on Grass Pasture 6'**

Key Grass Species	Minimum Height to Begin Grazing (inches)	Minimum Height to Remove Livestock (inches) <sup>2f</sup>	Recovery Period (days) <sup>4f</sup>
Giant Bermudagrass	4 - 6	3	18 - 40
Buffelgrass	8 <sup>2f</sup>	3	30 - 60
Californiagrass <sup>1f</sup>	24	6 - 8	18 - 40
Dallisgrass	8 <sup>2f</sup>	3	30 - 60
Green panicgrass	12 <sup>2f</sup>	4	25 - 40
Guineagrass	18 - 24 <sup>2f</sup>	8 - 10 <small>(note: the grass often performs better when defoliated heavily once or twice per year, to a 3-inch height).</small>	25 - 40
Kikuyugrass	5 - 9	4 <sup>2f</sup>	18 - 40
Limnagrass	6	3	30 - 60

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# 528 Prescribed Grazing

BOTH the Standard and the Specification list the required elements of a 528 Prescribed Grazing Plan.

Prescribed Grazing Plan will include:

- **Goals and Objectives** clearly stated.
- **Resource Inventory** that identifies:
  - existing resource conditions and concerns
  - ecological site or forage suitability group
  - identifies opportunities to enhance resource conditions
  - location and condition of structural improvements such as fences, water developments, etc, including seasonal availability and quality of watering sites.
- **Forage Inventory of the expected forage quality, quantity and species** in each management unit(s).
- **Forage-Animal Balance** developed for the grazing plan, which ensures forage produced or available meets forage demand of livestock and/or wildlife.
- **Grazing Plan** developed for livestock that identifies periods of grazing and/or browsing, deferment, rest, and other treatment activities for each management unit.
- **Contingency plan** developed that details potential problems (i.e., severe drought, flooding, insects) and serves as a guide for adjusting the grazing prescription to ensure resource management and economic feasibility without resource degradation.
- **Monitoring plan** developed with appropriate records to assess in determining whether the grazing strategy is resulting in a positive

# 528 Prescribed Grazing Job sheet or IR

- Our current Job sheet prompts planners to document most of those elements. -

FOTG Section IV 528 - Page 1 of 6

**NATURAL RESOURCES CONSERVATION SERVICE  
PACIFIC ISLANDS AREA**

**CONSERVATION PRACTICE JOBSHEET  
PREScribed GRAZING (528)**



**Definition**  
Managing the controlled harvest of vegetation with grazing and/or browsing animals.

**Purpose**

- Improve or maintain desired species composition and vigor of plant communities.
- Improve or maintain quantity and quality of forage for grazing and browsing animals (health and productivity).
- Improve or maintain surface and/or subsurface water quality and quantity.
- Improve or maintain riparian and watershed function.
- Reduce accelerated soil erosion, and maintain or improve soil conditions.
- Improve or maintain the quantity and quality of food and/or cover available for wildlife.
- Manage fire fuel loads to achieve desired conditions.
- Promote economic stability through grazing and sustainability.

**Conditions Where Practice Applies**  
This practice applies to all lands where grazing and/or browsing animals are managed.

**Conservation Management System**  
Prescribed Grazing is implemented as part of a conservation management system to meet the client's objectives and address the soil, water, air, plant, and wildlife/terrestrial animal needs.

**Plans and Specifications**  
The following section of this jobsheet shall be completed to put together all the elements of the grazing plan including operation and maintenance requirements and discussed with the client.  
All conservation practices that assist in achievement of Prescribed Grazing will be identified and maintained properly.  
All jobsheet details are prepared in accordance with requirements in the Conservation Practice Standard (Code 528) and the guidance in the Conservation Practice Specification (Code 528).

FOTG Section IV 528 - Page 2 of 6

**Prescribed Grazing - Jobsheet**

Client Name: \_\_\_\_\_

Tract(s): \_\_\_\_\_ TMR(s): \_\_\_\_\_ Field(s): \_\_\_\_\_

CPI(s): \_\_\_\_\_ UNIT Size (ACRES): \_\_\_\_\_

Planner Name: \_\_\_\_\_ Date Prepared: \_\_\_\_\_

**Purpose(s) for Implementing Prescribed Grazing**  
The client's goals for resource health and sustainability, livestock health and production, wildlife habitat, quality of family life, etc. are as follows: \_\_\_\_\_

**Forage Inventory and Forage Animal Balance**  
A forage inventory was conducted in a representative amount of the paddocks within the grazing plan, or from the soil seed banks if field conditions were less than optimal. The inventory results are shown on the PI-Range-2 (if applicable). The animal balance and recommended number of pastures results are shown on the PI-Range-2. The NRCIS Grazingland Spatial Analysis Tool (GSAT) or the PI-Range-6 can be used in lieu of the PI-Range-2.  
Client's current stocking rate prior to implementation of the prescribed grazing plan: \_\_\_\_\_  
Initial NRCIS recommended stocking rate (AU/Volacre) for the management unit, based on available forage from the forage inventory or soil seed banks: \_\_\_\_\_  
One Animal Unit Month (AUM) equals approximately 701 pounds of air-dry forage and represents the monthly amount of forage needed for a 1,000 pound cow and her calf up to 18 months old. This also equates to 28 pounds per day of air-dry forage (which is one AUM).  
Additional information needed, if any: \_\_\_\_\_

**Grazing Plan**  
The following grazing plan identifies periods of grazing and/or browsing, deferment, rest, and other treatment activities for each management unit. One management unit is typically comprised of multiple paddocks that receive similar management.  
The grazing plan can be described and documented in a number of ways. If the PI-Range-3 (Grazing Plan Worksheet) was utilized to develop the plan, it should be attached to this jobsheet. For example, if the conservation plan was used as the basis for determining the grazing rotation, it will be attached and read show for at least 1 year the desired grazing rotation, including: 1) which paddocks will be grazed at approximately what time; 2) NRCIS recommended stocking rate for each paddock; 3) type and size of rest period for each paddock. The client agrees to keep forage, animal, and wildlife data, and provide them to NRCIS annually.  
A general description of the grazing plan follows: \_\_\_\_\_

Prescribed Grazing 528 - Page 3 of 6

FOTG Section IV Jobsheet

**Contingency Plan**  
A contingency plan shall be developed that details potential problems (i.e., severe drought, flooding, insects) and serves as a guide for adjusting the grazing prescription to ensure resource management and economic feasibility without resource degradation.  
This will include contingency plans to evaluate or de-stock all grazing management units except a "herdless lot" in order to remove damage to the greater grazing resource.  
The contingency plan for the management unit is as follows: \_\_\_\_\_

**Monitoring Plan**  
A monitoring plan shall be developed with appropriate records to assess in determining whether the grazing strategy is resulting in a positive or desired trend and a desirable outcome. Identify the key areas and key plants that the manager should evaluate - naming grazing management documents in the Pacific Islands area. The monitoring plan will include use of the PI-RANGE-4 (Stable Height & Frequency Worksheet) and/or the PI-RANGE-5 (Browse Resource Evaluation Worksheet). Only use the PI-RANGE-4 if the prescribed grazing forage resource and key plants are mixed species. If the prescribed forage base and the key grazing plants are herbaceous (not woody), use the PI-RANGE-4.  
If or describe the type of worksheet(s) to be completed as part of the monitoring plan (to be attached to this jobsheet when completed).  
PI-RANGE-4 Stable Height & Frequency Worksheet (optional)  
PI-RANGE-5 Browse Height & Stand Gap Worksheet (required) - Photo Documentation (required)  
PI-RANGE-414 Prescribed Grazing Certification Worksheet (required)  
PI-RANGE-416 Browse Resource Evaluation Worksheet (optional)

Other, as described: \_\_\_\_\_

**Key Grazing Species and Key Grazing Areas for Management Unit**

Age, Unit Name or #	Key Forage or Browse Species	Key Grazing Areas (shown on map)	Measurement Table & Time of Year (e.g., stable height, base gap frequency, etc. in the month of October)

?? Yeah but how do we answer these questions??

How many paddocks?  
 What size paddocks?  
 What type of fence?  
 What type of trough and where to locate?

- Answers will depend on client's objectives, 528 requirements, inventory information
  - *What is (or will be) key forage species? What does it "need"?*
  - *What is desired and do-able grazing period for client?*
  - *How many herds? What type(s) of system does client want?*
  - *What is causing the problems we are trying to solve?*
  - *Will the planned system address those causes?*

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Inventory and Analysis	<ul style="list-style-type: none"> <li>• What is causing the problems we are trying to solve in the plant community?                             <ul style="list-style-type: none"> <li>• Consistent selective grazing, no recovery period</li> </ul> </li> <li>• What is (or will be) key forage species?                             <ul style="list-style-type: none"> <li>• Kikuyu</li> </ul> </li> </ul>
528 Spec	<ul style="list-style-type: none"> <li>• What does Key Forage species need?                             <ul style="list-style-type: none"> <li>• 18-40 day recovery period</li> <li>• Minimum stubble height of 4 inches</li> </ul> </li> </ul>
Client	<ul style="list-style-type: none"> <li>• What is desired and do-able grazing period for client?                             <ul style="list-style-type: none"> <li>• Minimum weekly</li> </ul> </li> <li>• How many herds?                             <ul style="list-style-type: none"> <li>• 1 cow-calf, 1 bulls &amp; occasionally horses</li> </ul> </li> <li>• What type(s) of system does client want?                             <ul style="list-style-type: none"> <li>• Rotational</li> </ul> </li> </ul>

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## How many paddocks? And what size?

- For the Cow-calf herd:
- Key forage species: Kikuyu, target recovery period 18-40 days (per 528 spec)
- Grazing period: 7 days (reduced chance for 2<sup>nd</sup> bite vs. a 14 day grazing period)
- To calculate number of paddocks:
  - (Recovery period / grazing period) + 1
  - 40 days / 7 days = 5.7 (round up) = 6 + 1 = 7 paddocks minimum to achieve long RP
  - 18 days / 7 days = 2.5 (round up) = 3 + 1 = 4 paddocks minimum to achieve short RP
- Paddocks should be designed to provide equal number of grazable acres with similar forage production if possible.
- Whether or not paddocks will be able to be grazed for 7 days will depend on
  - Pasture Condition (productive capacity)
  - Size (grazable acres)
  - Growing conditions
  - Herd size



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## How many paddocks? And what size?

- For bulls and horses:
- Client's wants these close to the road and corral.
- There is an old dilapidated fence in front that client mentioned during inventory he'd like to remove and rebuild. Area in front of old fence is ~27 acres.
- System will be more of a "put-and-take". Bulls will need to be managed when not breeding the herd. Cousin's horses come and go
- May pull double duty and be used twice a year when bringing the herd in
- ❖ Since this area is likely to be *lightly* stocked most of the time and/or used intermittently, it does not require as intensive management. However, it does still need the ability to recover. A 2-paddock minimum is recommended so that the pastures can get some rest when animals are there.

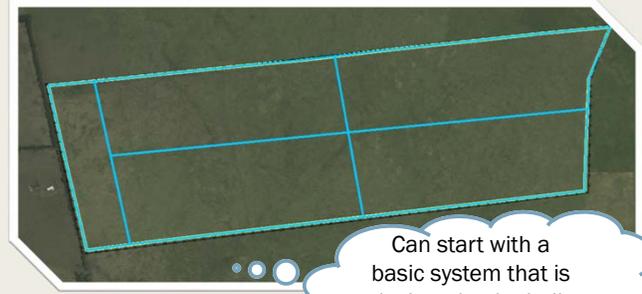
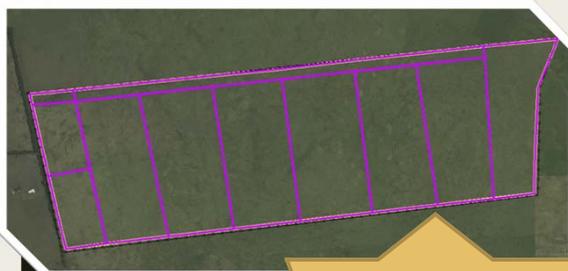


Now that you have an idea of what you have to work with and what to aim for, work with the client to help them understand the target and the "whys" and figure out what is possible and what can work for their operation.

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## Options

Start talking conceptually about options and when client decides on which direction to take, you can refine the details.



Can start with a basic system that is designed to be built upon later

Remember!  
There must be a rotation that can work for the client!



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## 528 planning

- Client selects a system to start with.
- Now can estimate new forage animal balance.
- Since system was very understocked before, we can seek to balance the system to give the client an idea of the system's carrying capacity might be.
- Go to live 528 planning tool

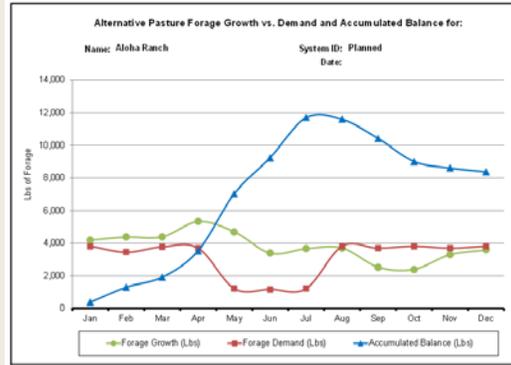
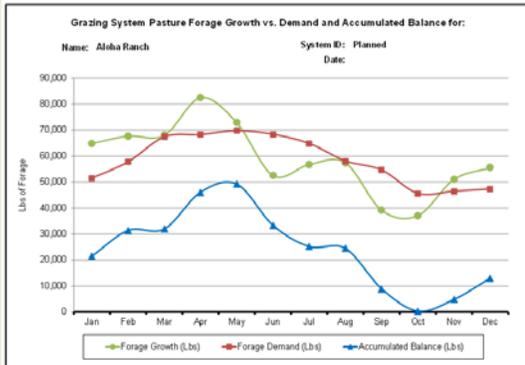


Any Questions?

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# 528 Planning – Forage-Animal Balance

- Planned system is balanced at 73 cows, 3 bulls and 1 horse.
- This F-A balance can be incorporated into the 528 job sheet



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# 528 Planning – Forage Inventory and F-A Balance

**Prescribed Grazing - Jobsheet**

Client Name: Aloha Ranch

Tract(s): \_\_\_\_\_ TMK(s): \_\_\_\_\_ Field(s): \_\_\_\_\_

CIN(s): \_\_\_\_\_ Unit Size (acres): \_\_\_\_\_

Planner Name: \_\_\_\_\_ Date Prepared: \_\_\_\_\_

**Purposes for Implementing Prescribed Grazing**

The client's goals for resource health and sustainability, livestock health and production, wildlife habitat, quality of family life, etc. are as follows:

Improve pasture condition by reducing fireweed and improving kikuyu through rotational grazing.

**Forage Inventory and Forage-Animal Balance**

A forage inventory was conducted in a representative area(s) of the paddocks within the grazing plan, or from the soil yield tables if field conditions were less than optimal. The inventory results are shown on the PI-Range-1 (if applicable). The animal balance and recommended number of pastures results are shown on the PI-Range-2. The NRCS [Grazingland Spatial Analysis Tool \(GSAT\)](#) or the PI-Range-5 can be used in lieu of the PI-Range-2.

Client's current stocking rate prior to implementation of the prescribed grazing plan: 54

Initial NRCS recommended stocking rate (AUY/acre\*) for the management unit, based on available forage from the forage inventory or soil yield tables: 77

\*One Animal Unit Month (AUM) equals approximately 791 pounds of air-dry forage, and represents the monthly amount of forage needed for a 1,000 pound cow and her calf up to 6 months old. This also equates to 26 pounds per day of air-dry forage (which is one AUD).

Additional information needed, if any:

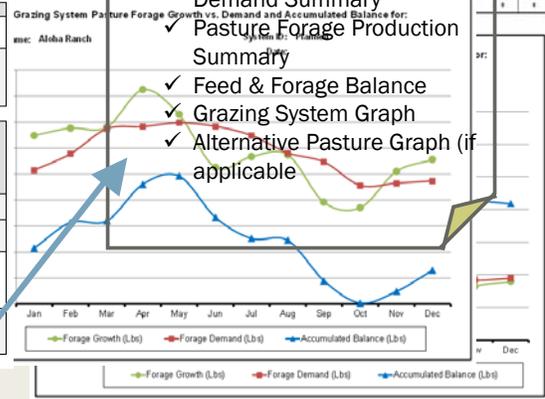
Key forage species: Kikuyu grass. Estimated production 7,000 lb/ac (Grazingland Stewardship Manual). See 528 planning tool printouts attached to this document for forage-animal balance.

Livestock Inventory and Demand Summary for: Aloha Ranch, Planned

Livestock Class	Number	Avg Weight	AUDU	Rate (%)	Lbs/Day	Lbs/Year	Management Details	All Pasture or Dry Lot
Stocking Rate	73	1,300	2.5	1,000.0	805,710	241,713	Stocking System Year Round	
Cows	1	1,400	2.0	90.0	30,600	10,200	Alternative Pasture Utilized	Jan - Apr
Horses	1	1,300	3.0	30.0	14,130	4,389	Alternative Pasture Utilized	Jan - Dec
Bulls	1	1,300	2.0	100.0	77,820	23,346		

Forage Demand by Month (Inventory)

Livestock Class	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cows	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300
Horses	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300
Bulls	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300
Total Demand	51,334	51,334	51,334	51,334	51,334	51,334	51,334	51,334	51,334	51,334	51,334	51,334



- Print and attach:
- ✓ Livestock Inventory and Demand Summary
  - ✓ Pasture Forage Production Summary
  - ✓ Feed & Forage Balance
  - ✓ Grazing System Graph
  - ✓ Alternative Pasture Graph (if applicable)

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## 528 Planning – The “Grazing Plan”

From the Specification:

A grazing plan will provide sufficient rest for the forage type throughout the year or growing season of the predetermined key forage plants, as is the case of arid and

The grazing plan should allow for vigorous plant re-growth following a period of grazing and never more than 50% use during the major growing season, and not more than 65% use during the dormant season or slowed growth period. A grazing plan should also consider the reproductive cycles and allow for successful seed set and drop of desirable forage species to ensure these species will persist and increase in the pasture. An implemented grazing plan should maintain or improve range/pasture ecological condition and rangeland and/or pasture health, reduce soil erosion, as well as improve livestock

### Grazing Plan

The livestock grazing plan identifies periods of grazing and/or browsing, deferment, rest, and other treatment activities for each management unit. One management unit is typically comprised of multiple paddocks that receive similar management.

The grazing plan can be described and documented in a number of ways. If the PI-Range-3 (Grazing Plan Worksheet) was used, attach it to this jobsheet. If other documentation was used, attach that to this jobsheet. For example, if the conservation plan map was used as the basis for determining the grazing rotation, it will be attached and must show for at least 1 year the desired grazing rotation, including: 1) which paddocks will be grazed at approximate dates; 2) NRCS recommended stocking rate for each paddock; 3) total days of rest planned for each paddock. The client agrees to keep livestock grazing records and provide them to NRCS annually.

A general description of the grazing plan follows:

A single cow-calf herd will graze in a four paddock rotation. The target grazing period will be 7 days and the recovery period will be 21 days. The target stubble height is 4 inches and grazing rotation will occur when most of the pasture has been grazed to that height. If growing conditions are such that production is low, the grazing period or herd size may need to be adjusted to avoid over utilizing the pastures. The producer can encourage better grazing uniformity by placing salt and/or mineral supplements opposite of the water in each paddock.

- Probably the hardest part of the jobsheet to write.
- Very difficult to “schedule” periods of grazing with dates in the tropics.
- Focus on describing
  - The grazing rotation
  - Planned grazing period
  - Planned recovery period
  - Targets for Proper Grazing Use (ie stubble heights)
  - Strategies for encouraging grazing uniformity (if appl.)

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## 528 Planning – Contingency Plan

### Contingency Plan

A contingency plan shall be developed that details potential problems (e.g., severe drought, flooding, wildfire) and serves as a guide for adjusting the grazing prescription to ensure resource management and economic feasibility without resource degradation.

This will include contingency plans to evacuate or de-stock all grazing management units except a “sacrifice lot” in order to minimize damage to the greater grazing resource.

The contingency plan for the management unit is as follows:

Monitoring rainfall and other climatic indicators (soil moisture, grass growth) can help to identify the beginning of a drought. For drought management, rainfall will be monitored and records kept. Well managed pastures (healthy vigorous grass with a good root system) have been shown to perform better during and after a drought than poorly managed pastures. In the event of a drought, care will be taken to avoid reducing the pasture’s ability to respond to improved conditions. Some management options to consider in order to minimize the effects of a drought on the pasture are: 1. Reduce herd or 2. Move animals off-site.

As a general rule of thumb, the drought management plan will be implemented when the rainfall for the three previous months have been <= 50% of average rainfall per location. Average monthly rainfall at the ranch is attached to this jobsheet for the client for drought monitoring.

All drought management actions must be documented in sufficient detail (dates, actions taken, numbers) to demonstrate the plan has been implemented.

- Drought management strategies → anything that reduces forage demand or provides supplemental forage. Describe whatever is appropriate and agreeable to client.
  - Reducing herd
  - Supplemental pasture
  - Accelerated culling
  - Wean early
  - Supplemental feed
  - Stockpiled feed
- Types of problems to be addressed depends on operation and the risks to it (ie wildfire, flooding, etc)
- All PIA 528 plans must address drought.
- Contingency plan should describe what will be monitored and when plan will be implemented (ie monitoring precipitation and setting a threshold whereby drought management strategies will be implemented).

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# 528 Planning – Monitoring Plan

Monitoring Plan			
A monitoring plan shall be developed with appropriate records to assess in determining whether the grazing strategy is resulting in a positive or upward trend and is meeting objectives. Identify the key areas and key plants that the manager should evaluate in making grazing management decisions.			
In the Pacific Islands Area, the Monitoring Plan will include use of the PI-RANGE-6 Stubble Height & Frequency Worksheet (optional), PI-RANGE-7 Stubble Height & Basal Gap Worksheet (required), PI-NRCS-414 Prescribed Grazing Certification Worksheet and/or the PI-NRCS-416 Browse Resource Evaluation Worksheet. Only use the PI-NRCS-416 if the predominant grazing forage resource and key plants are woody species. If the predominant forage base and the key grazing plants are herbaceous (not woody), use the PI-NRCS-414.			
"X" or describe the type of worksheet(s) to be completed as part of the monitoring plan (to be attached to this Jobsheet when completed).			
X	PI-RANGE-6 Stubble Height & Frequency Worksheet (optional)		
X	PI-RANGE-7 Stubble Height & Basal Gap Worksheet (required) + Photo Documentation (required)		
X	PI-NRCS-414 Prescribed Grazing Certification Worksheet (required)		
	PI-NRCS-416 Browse Resource Evaluation Worksheet (optional)		
Other, as described:			
Key Grazing Species and Key Grazing Areas for Management Unit			
Mgt. Unit Name or #	Key Forage or Browse Species	Key Grazing Areas (shown on map)	Measurement Taken & Time of Year (e.g., stubble height, basal gap, frequency, etc. in the month of October)
1	kikuyu		Stubble & freq, Oct
2	kikuyu		Stubble, Oct
3	Kikuyu		Stubble, Oct
4	kikuyu		Stubble, Oct

- Identify appropriate monitoring methods
- Identify and describe key forage, key grazing areas and target times of year.
- “All planners will receive training on use of these monitoring methods before attempting to apply them. Contact the State Grazing Land Management Specialist to schedule training.”

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# 528 - Certification

- Collect grazing records
- Conduct monitoring
- Compare grazing records, monitoring data and field conditions. Are conditions improving? Is the client following the plan? Are stubble heights achieved?
- If we are in a drought, gather information/evidence that client has implemented contingency plan.
- Complete PI Range 414 Prescribed Grazing Certification Worksheet



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## Conservation Planning on Grazing Land

- A good understanding of the 528 practice is critical. It affects everything else.
- Once system is selected, all other practice details can be worked out.
  - *Fences*
  - *Pipelines and Watering Facilities*
  - *Critical Area Planting*
  - *Prescribed Grazing*
- Scheduling of practices must consider livestock logistics and practice implementation needs (ie time for plantings to get established, controlling animal presence).
- Generally - water first, then fences, then (in this example) critical area planting (need to have control over livestock before planting grass). Prescribed grazing can be scheduled once adequate infrastructure is in place to allow for grazing management that will meet or exceed practice requirements (stubble height and recovery periods). (\*Exception, complete deferment can happen earlier)

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## Purple Ageratum situation



- Zero measurable forage
- Years of constant overgrazing and mowing resulted in entire plant community conversion to poisonous and/or unpalatable plants.
- Major plant resource concerns
- What should be here? (plant wise)
- If we spray all this or disc it and plant it, did we solve the problem?
- What caused the problem???

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## Purple Ageratum situation



- Three existing paddocks totaling 39 acres
- All soil type 959 with estimated production potential of 12K lb/ac (probably in guinea)
- Client mainly keeps horses (# varies, up to 20) and 5 sheep and 3 goats in these pastures.
- Client is open to possibility of cross fencing
- Water is limited. Animals water in the pond.
- Client has tractor and equipment for discing, prefers not to use herbicides
- Main weeds are purple ageratum, guava, joe...

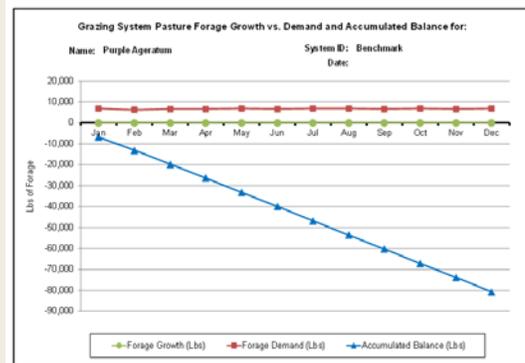
Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year Lb/ac	Normal year Lb/ac	Unfavorable year Lb/ac
959: Pasuhau	Isohyperthermic Tall Grassland, 60-95' p.z.	16,000	12,000	8,000

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## Purple Ageratum situation



- Resource Problems:**
- Undesirable **plant** productivity and health
  - Excessive **plant** pest pressure
  - Inadequate structure and composition
  - Inadequate **livestock water**
  - Inadequate feed and forage (provided from pasture)



Very low PCS, virtually all forage needs are being met by supplemental feed. Client would like pastures to produce forage again.

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## Formulate & Evaluate Alternatives

<p><b>Alternative 1</b>      \$</p> <ul style="list-style-type: none"> <li>• Improve water distribution</li> <li>• Pipe, troughs</li> </ul> <p>✓ Livestock water But does NOTHING for plant problems</p>	<p><b>Alternative 2</b>      \$\$</p> <ul style="list-style-type: none"> <li>• Improve water distribution</li> <li>• Pipe, trough</li> <li>• Improve grazing management</li> <li>• Fence, 528</li> </ul> <p>✓ Livestock water ✓ Provides for grazing management, but there is NOTHING to eat. Could be a long time for forages to come back on their own.</p>	<p><b>Alternative 3</b>      \$\$\$</p> <ul style="list-style-type: none"> <li>• Improve water distribution</li> <li>• Pipe, trough</li> <li>• Improve grazing management</li> <li>• Fence, 528</li> <li>• Restore forage plant community</li> <li>• Brush management</li> <li>• Forage &amp; Biomass planting</li> </ul> <p>✓ Livestock water ✓ Plant RCs &amp; ✓ Pastures productive again</p>
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## Plan development – Alt 3



### Alternative 3

- Improve water distribution
- Improve grazing management
- Restore forage plant community

- Pipeline
- Watering Facility
- Fence
- Brush Management
- Forage & Biomass Planting
- Prescribed Grazing



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## Plan development – Alt 3



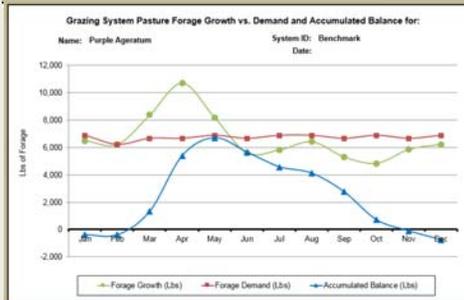
- One way it could work...
  - Confine animals to bottom two fields and keep feeding and provide temporary water.
  - Mechanical brush management in top field to remove guava and disc repeatedly to kill roots and deplete herbaceous weed seed bank
  - Plant improved forage species – signal grass and/or green panic
  - Install a pipe from ditch or pond to trough sites and cut top field in three ~6.5 ac paddocks.
  - Once forages are well established start grazing in rotation on three pastures with appropriate herd size OR confine and supplement feed.
  - Do brush management and forage and biomass planting on bottom two fields.
  - Install more pipe, troughs and cross fence, add to grazing rotation.

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## Plan development – Alt 3



Field/ Paddock Number	Kind of Forage	Acres (Usable)	TFP* lbs/ac	Total Production Pounds	Pasture Grazing Eff. (%)	Usable Pounds
1	Guineagrass (lower)	4.9			50	
2	Guineagrass (lower)	13.7			32	
3a	Californiagrass (lower) Use for signal grass	6.5	10,000	65,000	41	26,650
3b	Californiagrass (lower) Use for signal grass	6.5	10,000	65,000	41	26,650
3c	Californiagrass (lower) Use for signal grass	6.5	10,000	65,000	41	26,650
Total Usable Acres Grazed:		38				



What would “appropriate herd size look like” when top field is done?

Let’s assume 10K lb/ac from improved pastures (GLSM)

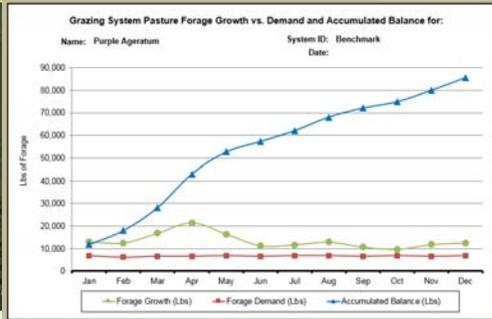
System still not balanced with benchmark herd, need to either keep supplement feeding, or reduce herd.

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## Plan development – Alt 3



Field/ Paddock Number	Kind of Forage <small>(double click for drop down menu)</small>	Acres (Usable)	TFP* lbs/ac	Total Production Pounds	Pasture Grazing Eff. (%)	Usable Pounds
1	Californiagrass (lower) <small>Use for signal grass</small>	4.9	10,000	49,000	50	24,500
2a	Californiagrass (lower) <small>Use for signal grass</small>	6.8	10,000	68,000	41	27,880
3a	Californiagrass (lower) <small>Use for signal grass</small>	6.5	10,000	65,000	41	26,650
3b	Californiagrass (lower) <small>Use for signal grass</small>	6.5	10,000	65,000	41	26,650
3c	Californiagrass (lower) <small>Use for signal grass</small>	6.5	10,000	65,000	41	26,650
2b	Californiagrass (lower) <small>Use for signal grass</small>	6.9	10,000	69,000	41	28,290
<b>Total Usable Acres Grazed</b>		<b>38</b>				

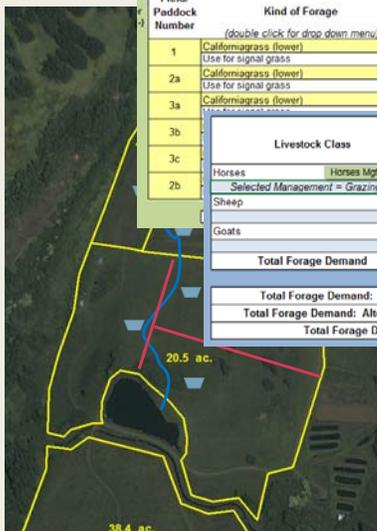


What about when it is all done?

- Now assume all pastures are producing 10,000 lb/ac (GLSM)
- Now, the model estimates we have a surplus of feed if only 5 horses, 5 sheep and 3 goats.

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## Plan development – Alt 3



Field/ Paddock Number	Kind of Forage <small>(double click for drop down menu)</small>	Acres (Usable)	TFP* lbs/ac	Total Production Pounds	Pasture Grazing ER. (%)	Usable Pounds
1	Californiagrass (lower) <small>Use for signal grass</small>	4.9	10,000	49,000	50	24,500
2a	Californiagrass (lower) <small>Use for signal grass</small>	6.8	10,000	68,000	41	27,880
3a	Californiagrass (lower) <small>Use for signal grass</small>	6.5	10,000	65,000	41	26,650
3b						
3c						
2b						

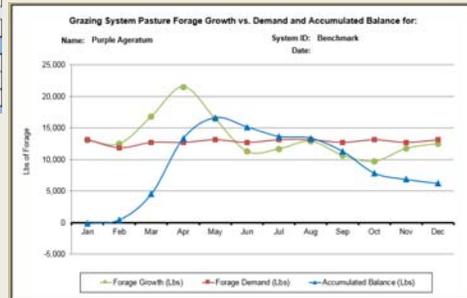
Livestock Class	Planned Number	Avg. Weight	Intake Rate (%)	Lbs/Day	Lbs/Year
Horses	10	1,350	3.0	405	147,420
Sheep	5	120	2.0	12	4,368
Goats	3	120	2.0	7	2,621
<b>Total Forage Demand</b>	<b>18</b>	<b>803</b>	<b>2.93</b>	<b>424</b>	<b>154,409</b>

Total Forage Demand: Grazing System	Total (lbs/year) = 154,409
Total Forage Demand: Alternative Pasture	Total (lbs/year) =
Total Forage Demand: Dry Lot	Total (lbs/year) =

What about when it is all done?

- Now can adjust numbers of livestock based on client's objectives and see where the system balances out.



This example shows one way it could balance with 10 horses, the 5 sheep and 3 goats.

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## 528 Grazing Plans

- Must address both needs of plant community and livestock
- Is not based on stocking rate! F-A balance is a tool to help clients manage grazing.
- Horse operations or others with changing stock numbers are challenging.
- Supplemental feeding cannot occur on pastures where utilization rate has already been achieved. Animals will keep grazing!
- Supplemental feeding must occur in a dry lot or other sacrifice area not planned under 528.
- Plan must emphasize principles of grazing management – frequency, duration, intensity, utilization rate, recovery periods and help client understand the pasture ecology to keep it healthy.
- We should only contract on acres if and when 528 is achievable!

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