

Principles of Targeted Grazing

Managing livestock and grazing for vegetation management goals

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Overview

- Working with Landowners and Managers: Setting and Communicating Goals
- Principles of Managed Grazing
- Practical considerations – managing livestock for multiple goals
- Grazing behavior and individual preferences
- Trade-offs – why should we get paid to feed our livestock?
- Before and After – photos of animal impacts on wildfire fuels
- Monitoring

"To be successful with sheep, even when you're not thinking about them, you need to think about them a little."



- Ivan Doig, Dancing at the Rascal Fair

The same applies to targeted grazing!

Relevant background



- Commercial targeted grazing business (sheep and goats) 2009-2015
- Managed large scale targeted grazing operation (3000+ sheep and goats) in Placer County
- Currently operate small-scale commercial sheep business
 - Trade winter forage for summer fuel-load reduction
- Livestock and Natural Resources Advisor - UCCE



Goals

Landowner/Manager Goals



- Fuel-load reduction
- Weed management
- Ecological restoration
- Aesthetic values
- Avoidance of herbicide use
- Others?

Contractor Goals



- Income
- Enterprise diversification
- Animal well-being
- Reproductive efficiency
- Labor efficiency and effectiveness
- Others?

Communicating your Goals

- Finding mutual goals is critical
- Long-term vs. short-term goals
- Multi-year vs. single entry projects
- Managing expectations – what will the project look like when you're done?





Managed Grazing

Principles of Managed Grazing

1. Adjust rest periods to match the growth rate of the plant(s).
2. Use the shortest graze period possible while maintaining adequate rest.
3. Use the highest stock density possible.
4. Use the largest herd size possible consistent with sound animal husbandry practices.
5. Adjust stocking rate to seasonal and annual changes in carrying capacity.

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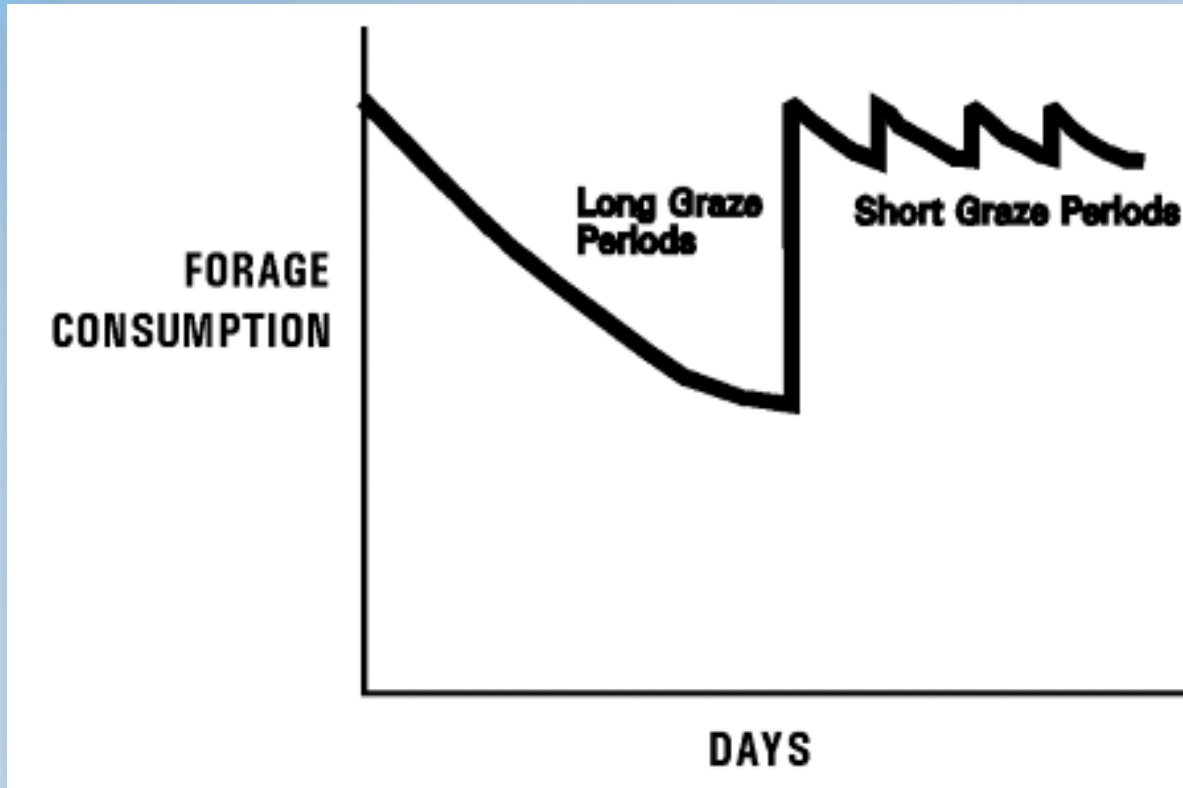
Grazing Behavior and Animal Impacts

What are the 3 impacts that grazing animals can have on a plant?

**Each of these impacts can be
used in targeted grazing
situations!**



Short graze periods...



- Maintaining forage intake is critical!
- Voluntary forage intake is controlled by 3 factors:
 - Grazing time
 - Biting rate
 - Bite size
- Short graze periods maintain higher intake rates because animals are always going into novel forage.

High stock density...

- High stock density can help increase consumption uniformity
 - “If I don’t eat this plant, my neighbor will!”
- Stock density can optimize the 3 impacts (grazing, trampling, manure deposition)
- Higher stock densities can help utilize lower quality forages more effectively



Largest herd size possible...



- Larger herd size can also optimize animal impacts
- Since most jobs pay by the acre, a larger herd allows the contractor to cover ground more quickly (maximizing grazing revenue per day while holding overhead constant)

Overgrazing – really?!

- Definition
 - Grazing a plant before it has recovered from the previous grazing.
- Overgrazing is a function of time, not animal numbers.
- Overgrazing can occur in 2 ways:
 - Animal(s) stay too long and get a second bite before the plant has recovered.
 - Animal(s) come back too soon (e.g., the rest period is too short for the plant to recover).
- Is there a reason to overgraze in the context of targeted grazing?



How do we estimate graze periods? And why is this important?



- Most jobs pay by the acre
- Our overhead costs are relatively fixed regardless of how big/small our operation is
- In general, the more acreage grazed per day, the more profit we can generate!



Estimating Graze Period = Estimating Carrying Capacity

The Basic Math

- A non-lactating ruminant will graze approximately 2.5% of her body weight (on a dry matter basis) per day.
- Annual rangelands in the Sierra foothills will grow 2,500-5,000 lbs of forage per acre.
- We need to leave 600-1000 lbs of dry matter post grazing to protect the soil.

Species	DM Intake (lbs)
Cow (1,000 lbs)	25 lbs
Ewe (150 lbs)	3.75 lbs
Doe (100 lbs)	2.5 lbs

Graze Period per Acre (estimated)	3500 lbs forage
10 Cows	10 days
50 Ewes	13 days
50 Does	20 days

Note: This depends on forage quality, slope, individual animal preferences, and a variety of other factors.

Practical Steps for Estimating Graze Period

- Pace off an area that you think has enough forage to feed 1 animal for 1 day
- Calculate the square yards
- Divide the square yards per acre by the square yards required per animal per day
- The result is the number of stock 1 acre can support for 1 day.

Training your eye...

Image Name: heredia culdesac-2018-Jun-23 plot 2
GPS co-ordinates: 38.956230,-121.183067
Date: Jun 23, 2018 at 9:57:56 AM PDT
Direction: 275 N



- Tracking grazing over time is critical to improving the accuracy of your grazing period estimates! But what should you track?
 - Livestock number and class
 - Vegetation type
 - Vegetation quantity
 - Vegetation quality
 - Acres/day



< BACK



EDIT

... MORE



Bel_5-17-19



Location



MAPS

Area: 1.737 ac



[View on map](#)



 Irrigated Pasture



Outstanding tasks

There are no outstanding tasks for this field.

[Add a task](#) [Add a note](#)



History

Satellite (Bing) ▾

BEL_4-19-19
1,488 ac

BEL_4-22-19
2,412 ac

Bel_5-16-19
4,354 yd²

BEL_5-4-19
1,316 ac



100 m



Tracking Forage Consumption

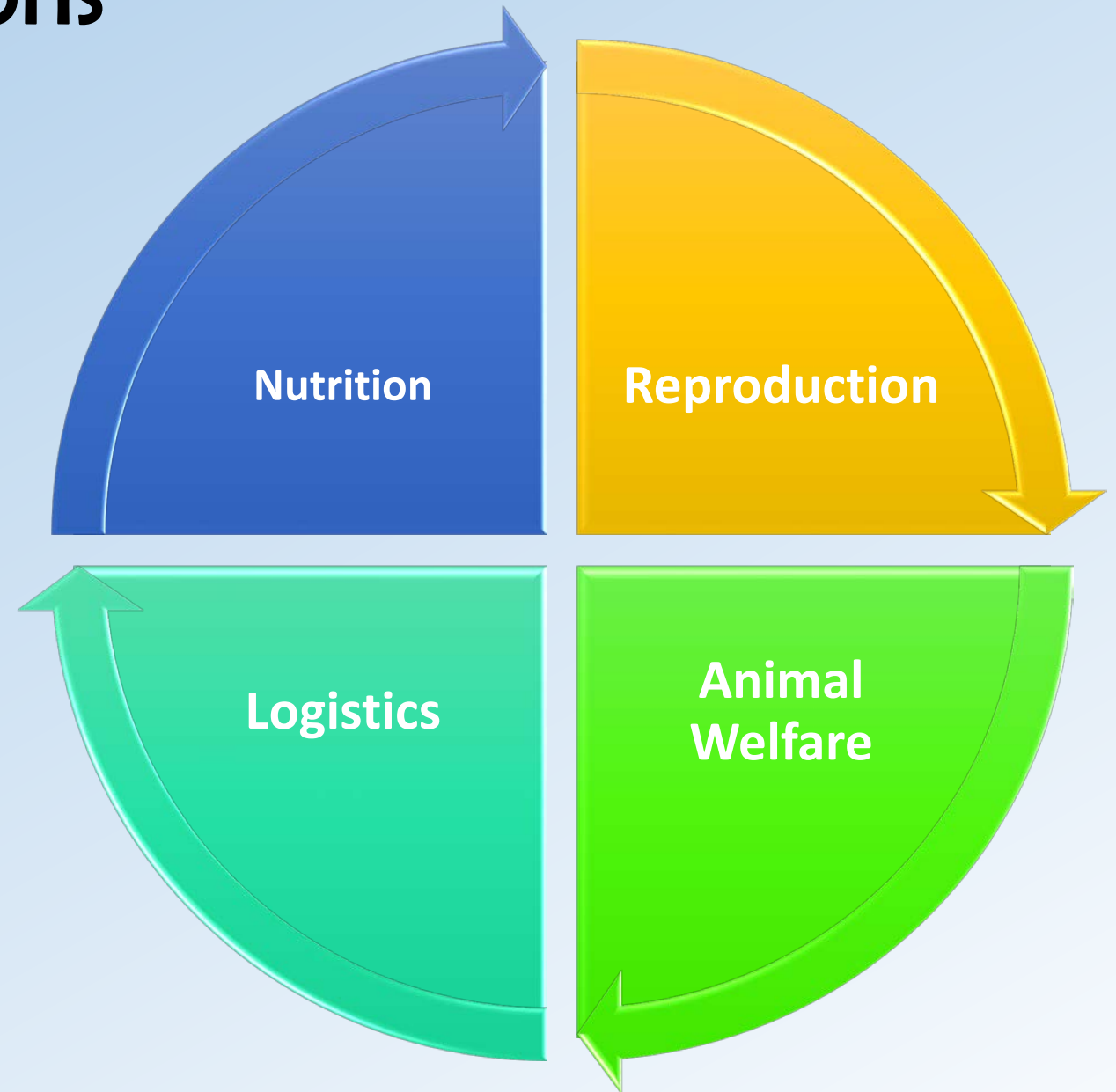
Location	Forage Type Quality	Animal Class	Acres/Day	Sheep Days/Acre
Blue Oak Ranch (Summer)	Annual Rangeland Dry Forage	Dry Ewes	0.44 ac/day	157 sheep days/acre
Oak Hill Ranch (Summer/Fall)	Irrigated Pasture Moderate Quality	Flushing & Breeding Ewes	0.49 ac/day	268 sheep days/acre
Blue Oak Ranch (Late Fall)	Annual Rangeland Dry Forage Some Germination	Early Gestation Ewes	1.14 ac/day	86 sheep days/acre
Blue Oak Ranch (Winter)	Annual Rangeland Winter Green Forage	Late Gestation Ewes	1.26 ac/day	123 sheep days/acre
Blue Oak Ranch (Spring)	Annual Rangeland Spring Flush	Early Lactation Ewes	1.4 ac/day	142 sheep days/ac
Oak Hill Ranch (Spring)	Irrigated Pasture Spring Flush	Late Lactation Ewes	0.62 ac/day	319 sheep days/ac

Practical Considerations



Photo: Roger Ingram

Practical Considerations



Nutrition



- Timing of grazing vs. palatability of forage
 - Ideal timing for fuel reduction is typically when nutritional value and palatability are declining
- Nutritional demands change
 - Maintenance
 - Growth
 - Reproduction/Lactation
- Toxicity potential
 - Toxic plants
 - “Helpful” public
 - Environmental toxins

Reproduction



- Related to nutrition
 - Targeted grazers may accept lower conception rates in exchange for getting paid to manage vegetation
- Length of gestation vs. length/timing of grazing
 - Small ruminants have greater flexibility than cattle
- What drives production calendar – reproduction or availability for grazing ? More to follow on this...
- Parturition in public?!
 - Production calendar can impact availability of livestock for grazing projects
 - Do you have winter forage?

Animal Welfare

- May also be related to nutrition
- Shade and shelter
- Managing animal health issues in a public setting
- Predator protection
- Natural disasters (especially fire and flood)
- Wool vs. hair sheep
- Goats vs. sheep vs. cattle



Logistics

- Access and terrain
- Loading facilities
- On-site labor (herders) – 24/7 on-call
- Shearing
- Hospital pens
- Water!
- Livestock-urban interface





Grazing Behavior & Individual Preferences

All sheep (and goats) are NOT created equal!

- Goats, sheep, and cattle have different (but overlapping) forage preferences.
- There is as much variation between individuals as between species.
- Dr. Fred Provenza's work is critical to understanding how to develop and manage dietary preferences.



Mother knows best!

Goats vs. Sheep vs. Cattle



- Matching animals to the vegetation type is a good place to start.
 - Exceptions to the rule (browsers vs. grazers) – or “Sheep don’t read the books.”
 - Cattle – 80:20 (grass:broadleaf)
 - Sheep – 50:50 (grass:broadleaf)
 - Goats – 20:80 (grass:broadleaf or brush)
- Managing the other impacts (trampling and manure deposition) varies by species.
- Class of animal can also be important:
 - Dry females
 - Feeders/stockers
 - Pairs
 - Wether mobs

Training the Grazing Animals

- Early exposure to variety of forage types - a mix of age classes can help train the next generation of vegetation management specialists!
- We can manage preferences through supplemental feeding.
 - Protein supplementation
 - Mineral supplementation
- Spatial memory is important – the animals remember the landscape (and so do the humans). This makes multi-year projects more effective.
- Strategic water, supplement, and salt placement can draw animals to specific locations, concentrate impacts, and provide nutrients absent in the forage.



Are we missing opportunities by ignoring other domestic grazers?



Are we missing opportunities by ignoring other domestic grazers?



Timing – palatability and preferences can change!



- Observations: Milk Thistle, Coyote Bush and Poison Oak
- Initial treatment? Or maintenance? Decadent brush is difficult to manage with livestock alone!
- Boredom is a factor – animals get tired of eating the same plant day-in and day-out (regardless of nutritional value)

Before

&

After

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Direction: 275 N

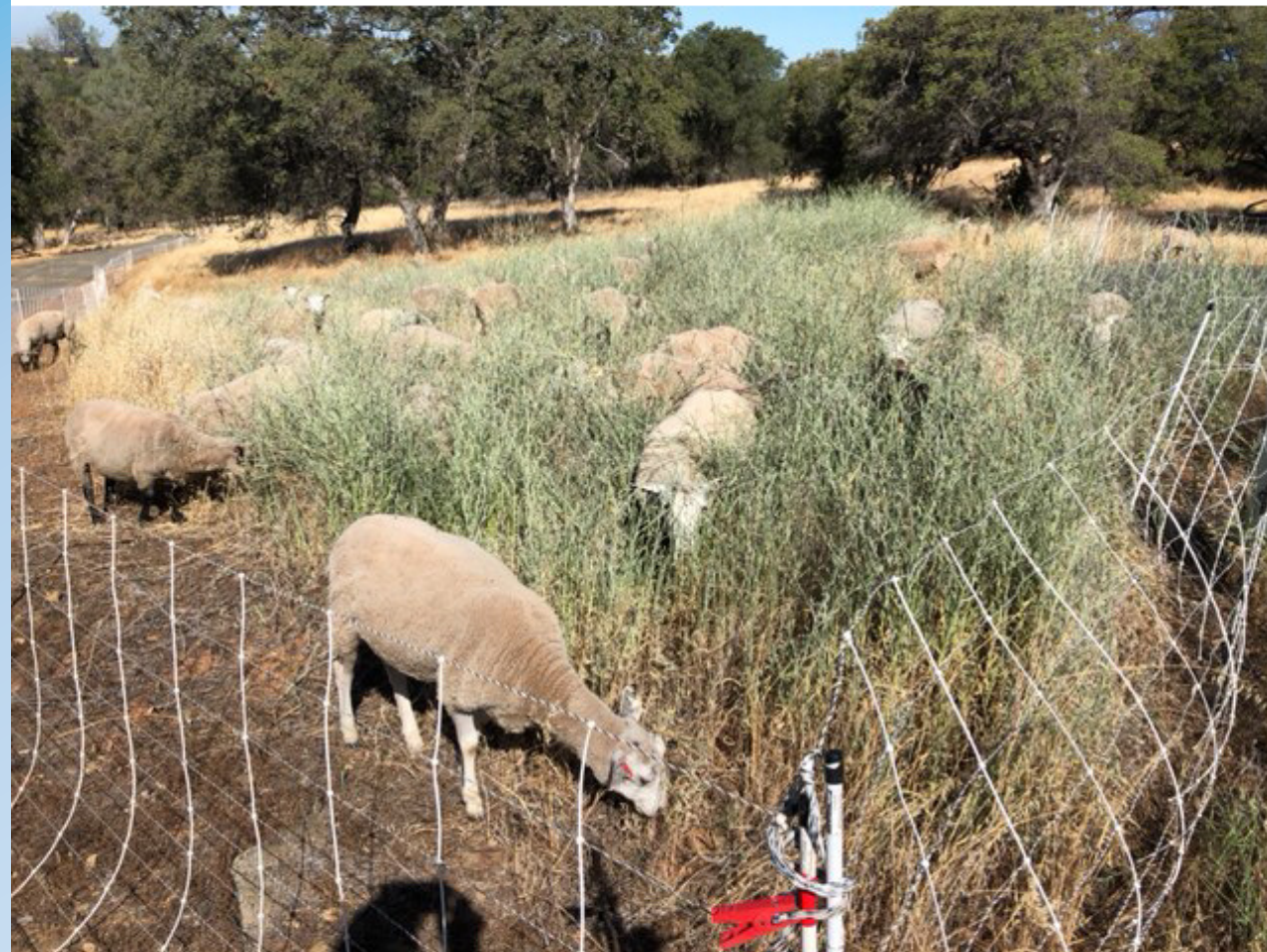


Image Name: heredia culdesac-2018-Jun-23 plot 2
GPS co-ordinates: 38.956230,-121.183067
Date: Jun 23, 2018 at 9:57:56 AM PDT
Direction: 275 N



Photo: Roger Ingram

Image Name: mattevi italian this-2018-Jul-12 point
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Date: Jul 12, 2018 at 8:58:13 AM PDT
Direction: 320 N



Image Name: mattevi italian this-2018-Jul-13 point
GPS co-ordinates: 38.961494,-121.189247
Date: Jul 13, 2018 at 9:09:00 AM PDT
Direction: 320 N



Photo: Roger Ingram

Image Name: claude lower corral-2018-Jul-24 plot 2
GPS co-ordinates: 38.959788,-121.180117
Date: Jul 24, 2018 at 8:56:05 AM PDT
Direction: 85 N



Image Name: claude lower corral-2018-Jul-30 point
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Date: Jul 30, 2018 at 8:39:23 AM PDT
Direction: 46 N



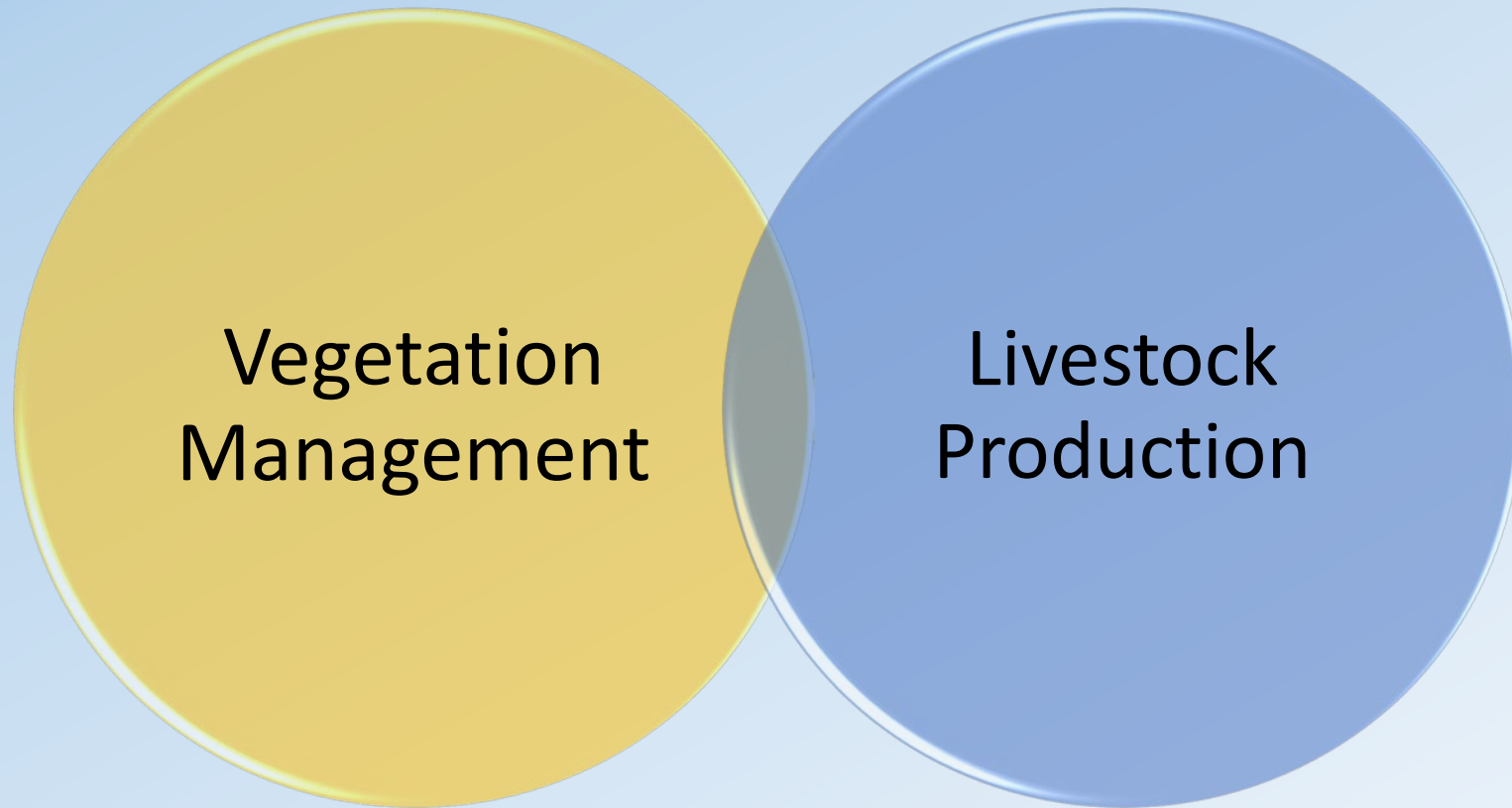
Photo: Roger Ingram



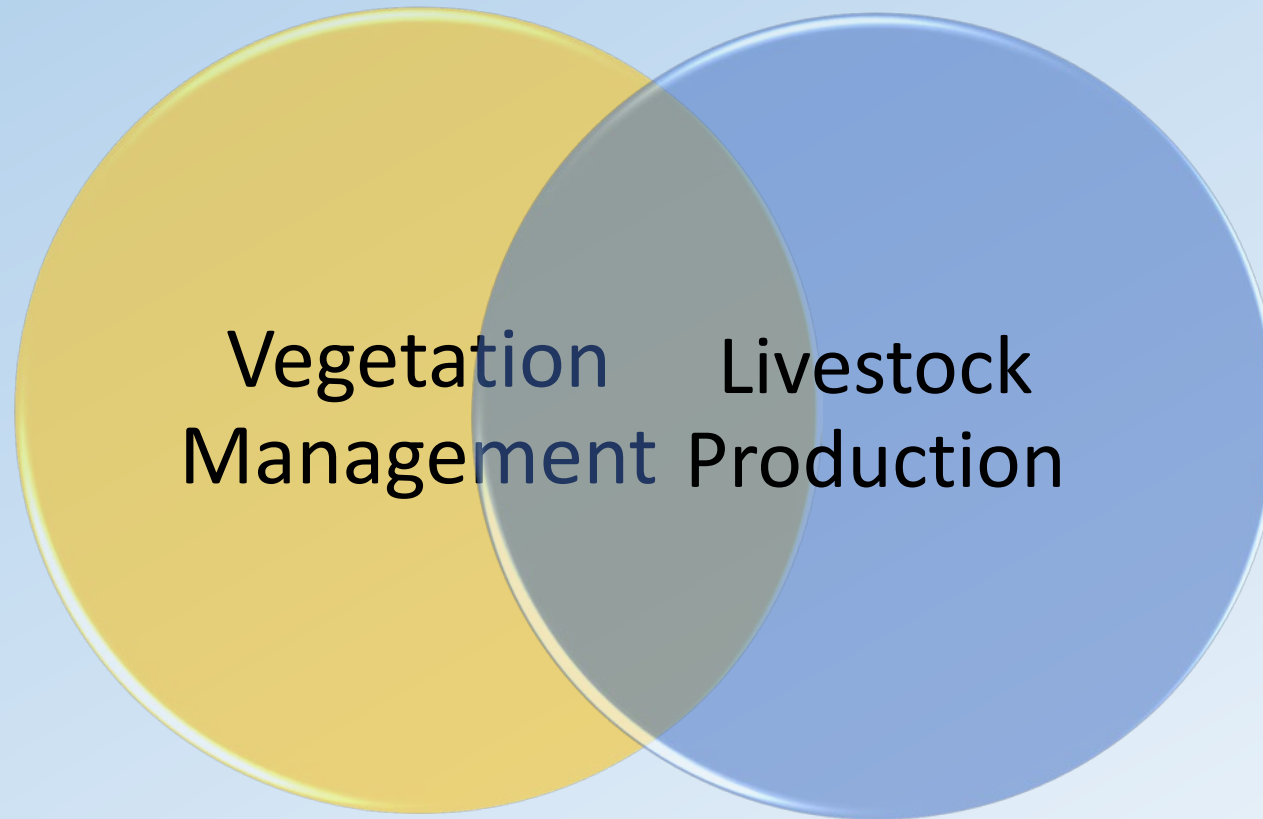
Trade-offs



What business are you in?



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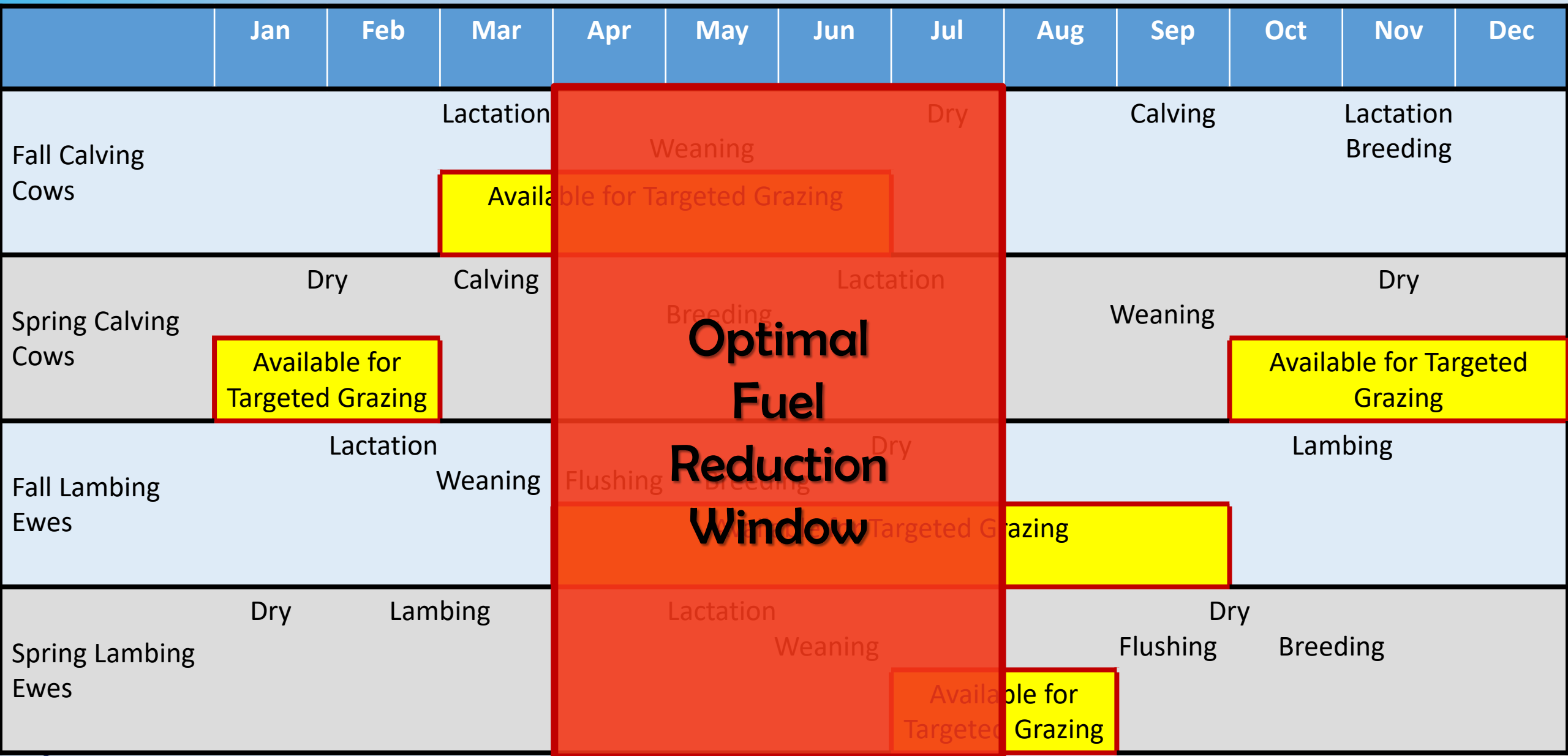


Some producers have greater overlap between these elements of their business.

Reproduction vs. Vegetation Management

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Fall Calving Cows		Lactation		Weaning		Dry		Calving		Lactation Breeding		
Spring Calving Cows		Dry	Calving		Breeding	Lactation		Weaning			Dry	
Fall Lambing Ewes		Lactation		Weaning	Flushing	Breeding	Dry			Lambing		
Spring Lambing Ewes		Dry	Lambing		Lactation	Weaning		Flushing	Dry	Breeding		

Reproduction vs. Vegetation Management



Trade-Offs – or Show me the Money!

Vegetation Management

- Revenue generated by removing vegetation
 - May require some nutritional stress to achieve desired goals
 - Calves, lambs, kids are a byproduct of grazing business
- Key to business success
 - Covering as much ground as quickly as possible

Livestock Production

- Revenue generated by weight gain and reproductive efficiency
 - Nutrition is focused on growth, reproduction, and lactation
 - Optimize reproductive rate
- Key to business success
 - Lambing/kidding percentage
 - Weaning and finished weight

Producer skills are also important...

In addition to solid animal husbandry and range management skills, targeted grazing contractors need a variety of additional skills and knowledge...

Public Relations

Logistics

***Fuel and Fire
Behavior***

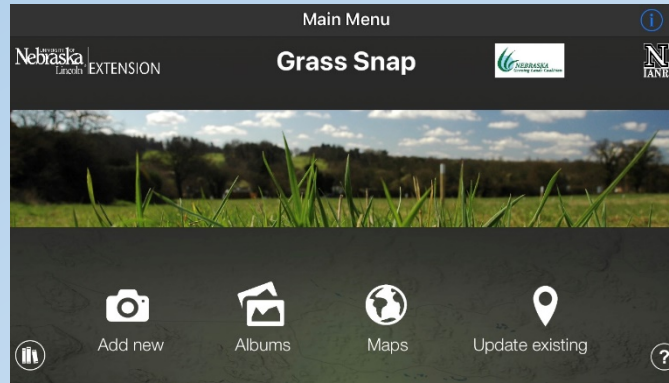
***Marketing a
Service***

Contracts

Botany

Monitoring

- Photo monitoring is a great way to demonstrate effectiveness
 - GrassSnap (Univ of Nebraska Extension)
 - Turn on location settings on cell phone camera (will provide lat/long coordinates)



- Mapping can help provide acreage estimates (and may be necessary for submitting progress invoices)
 - Field Margin
 - Measure Map
 - Planimeter
 - Google Earth

Take-aways

- As with conventional production models, targeted grazing operations must consider relationships between nutrition, reproduction, animal welfare, and logistical considerations.
- An understanding of grazing behavior and forage preferences is critical to matching livestock to landowner goals.
- There are trade-offs involved in focusing vegetation management rather than production goals.
- Targeted grazing requires a different set of producer skills.
- This is a business! It has to work financially!



Further Reading

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