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Targeted Grazing: An Alternative for Managing Vegetation

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Overview

- My background
- Targeted grazing defined
- Managing Vegetation versus Raising Livestock
- Key considerations
- Pictures are worth a 1000 words!



Professional Background

- UCCE Livestock & Natural Resources Advisor
 - Research and Extension focus
 - Help rangeland ag producers adapt to climate change
 - Improve the economic viability of foothill/mountain ranching operations
 - Reduce conflicts between wildlife and livestock
- Assistant Specialist – UC Rangelands
- Beef Herdsman – UC SFREC
- General Manager – McCormack Sheep and Grain
- Founding Executive Director – California Rangeland Trust



Personal Background



- Flying Mule Sheep Company
 - ~100 commercial ewes near Auburn, CA
 - Produce lambs, wool, and grazing services
 - 25+ years of commercial sheep production experience
 - Including managing several large (2000+ sheep and goats) targeted grazing projects
- Immediate past president – California Wool Growers Association

Targeted Grazing Defined...

“Targeted grazing is the application of a specific kind of livestock at a determined season, duration and intensity to accomplish defined vegetation or landscape goals.... The major difference between good grazing management and targeted grazing is that targeted grazing refocuses outputs of grazing from livestock production to vegetation and landscape enhancement.”

Targeted Grazing Handbook

- Targeted Grazing manages the:
 - **Type and Number** of livestock
 - **Duration** of grazing
 - **Season** of grazing
 - **Frequency** of grazing
 - **Spatial Distribution** of livestock



Vegetation Management vs. Livestock Production

	Vegetation Management	Livestock Production
Flock characteristics & species	<ul style="list-style-type: none"> Mixed (sheep/goats) Mixed age classes May include older wethers (castrated males) to impact brush and low quality vegetation 	<ul style="list-style-type: none"> Sheep or goats Breeding flock + replacement females often grazed separately. Wethers are marketed to generate income
Primary income stream(s)	<ul style="list-style-type: none"> Grazing contracts 	<ul style="list-style-type: none"> Sale of lambs/kids Sale of fiber
Secondary income stream(s)	<ul style="list-style-type: none"> Sale of lambs/kids Sale of fiber 	<ul style="list-style-type: none"> Seasonal targeted grazing (usually when females are not lactating or pregnant).
Management emphasis	<ul style="list-style-type: none"> Make animals available for grazing contracts Maximize days on paid contracts High stock density to impact vegetation May accept some nutritional stress 	<ul style="list-style-type: none"> Reproduction and lbs of lambs/kids marketed Wool quality and weight High stock density to improve forage quality Focus on nutrition at key times
Reproduction	<ul style="list-style-type: none"> Timed to allow maximum days on contracts Lower conception/weaning weights in exchange for increased grazing income 	<ul style="list-style-type: none"> Timed to match peak demand (late gestation/lactation) with peak forage quality/quantity Nutrition is critical pre-breeding

Key Considerations



- Managing expectations (visual appearance, ability to impact decadent brush, etc.)
- Timeframe (may require multiple years)
- Livestock ARE NOT equipment – they can't be shut down when not in use!
- Sheep and goats may be somewhat non-selective (that is, they may impact saplings)
- Not necessarily low cost or low labor

More Key Considerations

- Generally, CEQA is not required (unless state funding is being used)
- Can typically graze riparian areas without over-impacting them



Before & After Photographs

Image Name: heredia culdesac-2018-Jun-18 point
GPS co-ordinates: 38.956231,-121.183065
Date: Jun 18, 2018 at 9:36:11 AM PDT
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



Before & After Photographs

Image Name: mattevi italian this-2018-Jul-12 point
GPS co-ordinates: 38.961494,-121.189243
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



Before & After Photographs



Photo: Roger Ingram

Further Reading

- Brown, D. 2014. Plants poisonous to livestock and other animals. Cornell University, Department of Animal Science. Available at www.ansci.cornell.edu/plants)
- Davy, J., et al. 2015. Introducing cattle grazing to a noxious weed-dominated rangeland shifts plant communities. *California Agriculture*.
- George, M., B. Frost, and N. McDougald. 2014. *Annual Rangeland Handbook*. Chapter 8. Grazing management.
- Howery, L.D., F.D. Provenza, and B. Burrit. 2010. Herbivores learn to forage in a world where the only constant is change. University of Arizona Cooperative Extension Publication AZ1518
- Launchbaugh, K., and J. Walker. 2006. *Targeted Grazing Handbook*. Chapter 1. Targeted Grazing – a new paradigm for livestock management.

Alternatives to herbicide in forestry



Dr. Robert York

Three alternatives that I have thought about

- Manual control (motor or human powered)
 - High cost makes it considered as unfeasible
- 1. Managing edge effect and competition
- 2. Fire
- 3. Planting and patience

1. Managing edge effect and competition

Can canopy gap size be used to “naturally” control shrubs?

0.2 acre gaps harvested in 2012

Herbicide applied



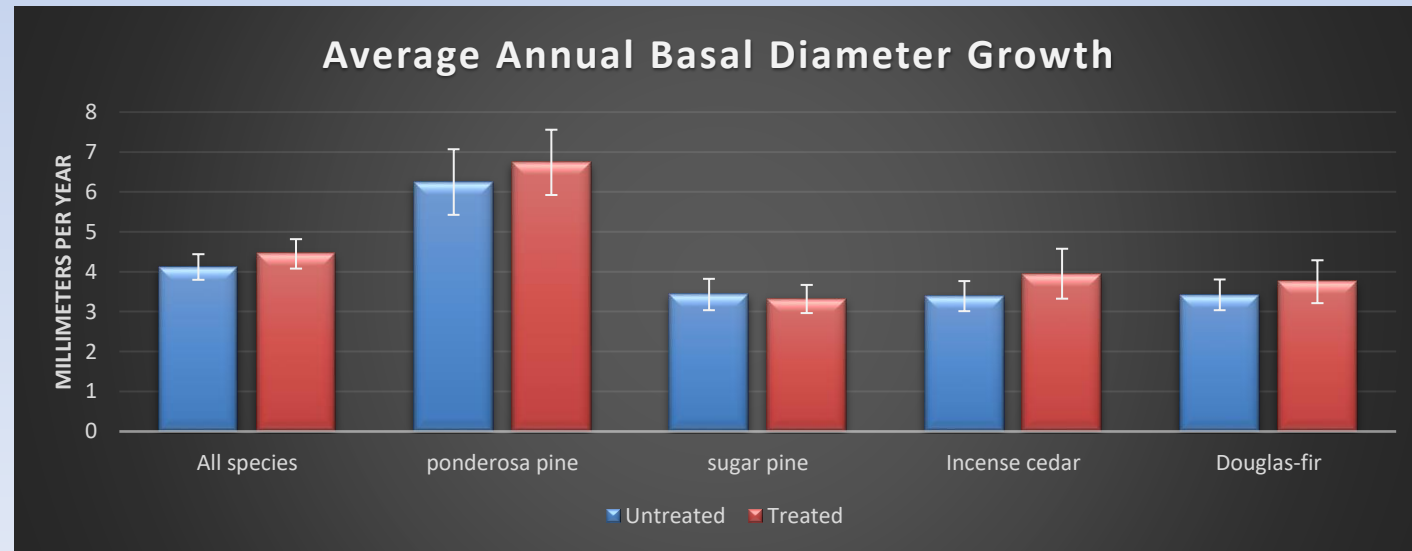
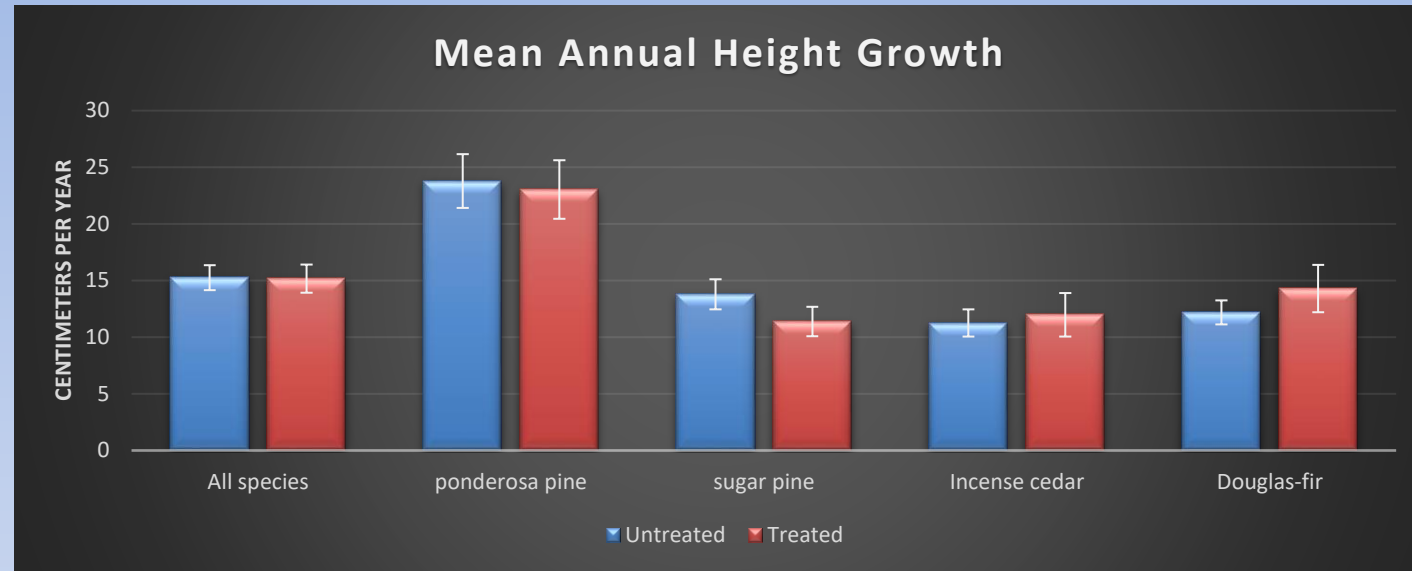
Herbicide NOT applied



After 6 years, herbicide has had NO effect

In 0.2 acre gaps:

- Shrub cover was 30% when no herbicide applied
- Shrub cover was 2% when it was applied
- A nearby clearcut with herbicide had 50% taller seedlings (*all* seedlings considered)



What does this mean?

Gap-based silviculture can be a way to reduce the use of herbicides because:

- Competition is dominated by surrounding trees (edge effect), not shrubs
- All species can regenerate, albeit slower than in a clearcut (on average)



2. Fire... it works, if you can do it.

Plantation burning research

3 30-yr old stands burned in Feb, 2019

Winter burning reduced shrub cover by 93%, on average

Tree mortality <3%, crown scorch 25%



Masticate only



Masticate + burn



3. Plant quick and then be patient

McDonald and Fiddler 2010

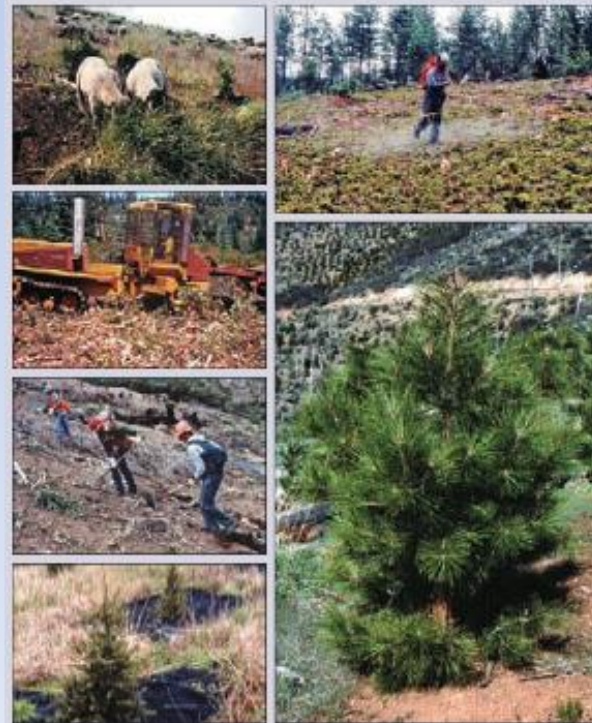
Most widely-cited literature that supports herbicide use in forestry

Important to understand the context and details of the study:

- Study sites were >20 acre plantations
- Mostly P. pine, some Douglas-fir
- Most results are through 10 years
- 250 trees per acre were *chosen* at the beginning of the study as trees to follow

Twenty-Five Years of Managing Vegetation in Conifer Plantations in Northern and Central California: Results, Application, Principles, and Challenges

Philip M. McDonald and Gary O. Fiddler



Today's context:

- Multiaged silviculture (e.g. gap based silviculture) is more common
- More mixed-species stands, including in 20 acre plantations
- Long-term dynamics is more relevant (e.g. longer rotation ages)
- Large, well spaced trees is often the objective (e.g. < 250 trees per acre)

When we spray, are we just helping the losers?

When considering the “crop trees” /
“fire resistant trees”

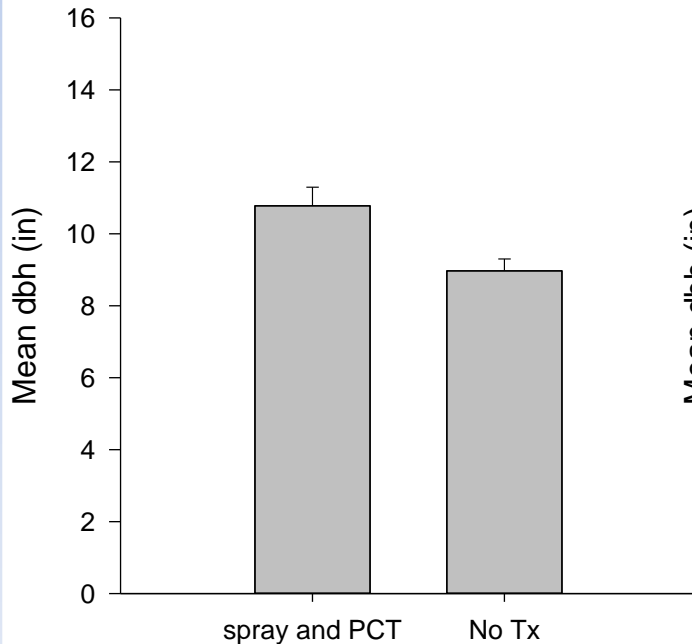
After 24 years at Blodgett Forest:

- No difference in dbh or height

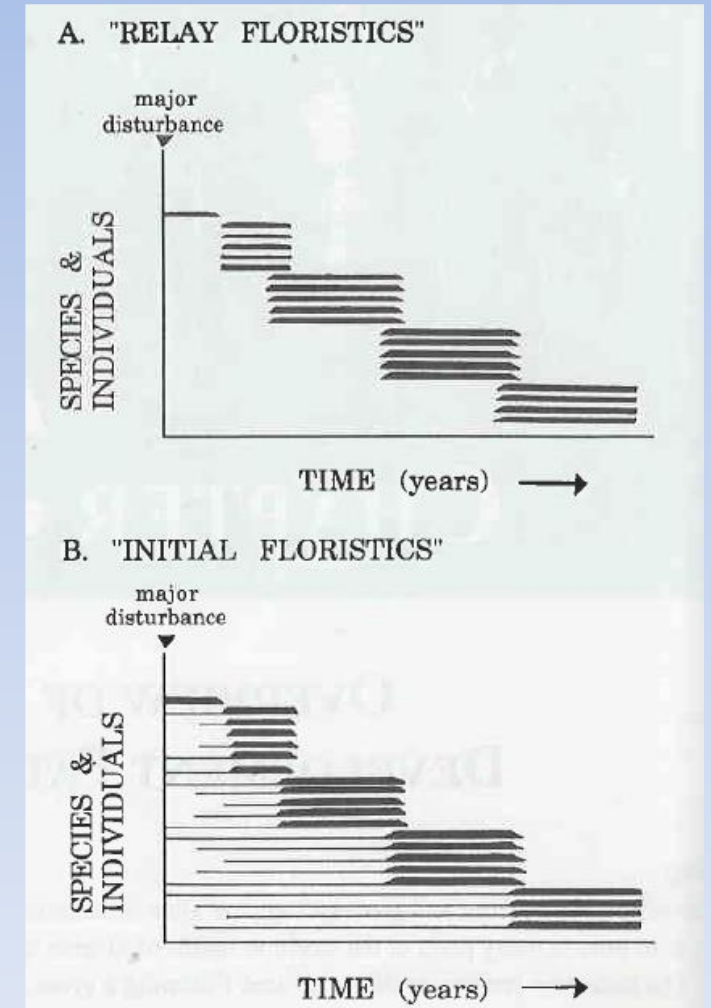
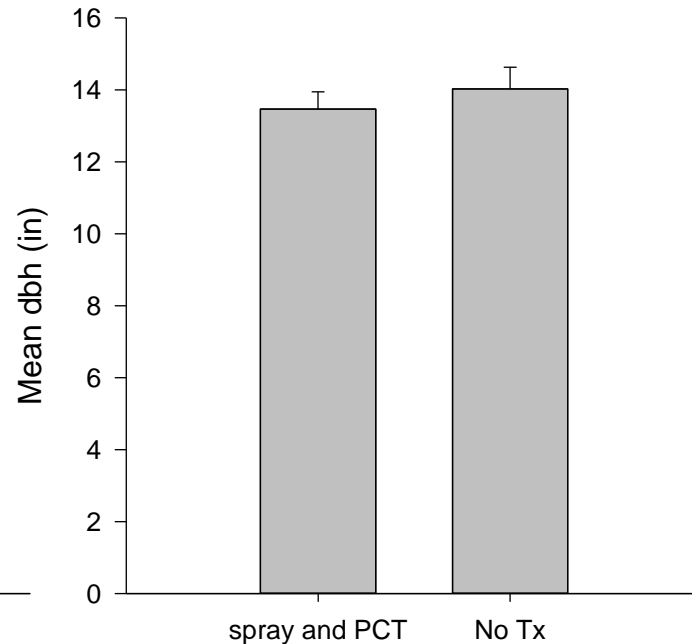
Key processes:

- Initial floristics
- Growth differentiation

Trees > 4.5" dbh



Largest 100 trees / acre



Integrative Pest Management

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Integrative Vegetation Management

- IPM- does not ban pesticide use completely
- Seeks to reduce the use of pesticides by:
 - Understanding ecological roles of “pests”
 - Understanding the long-term effects of applications
 - Managing forests so that, over the long-term, less pesticide will be needed