





Patch Burn Grazing

- What is it?
 - Using fire at different times and scales to shift grazing pressure
- What does it accomplish?
 - Allows for production of quality livestock forage
 - Controls Woody Encroachment
 - Creates Structural Diversity in Vegetation
 - Meets needs of multiple wildlife species

Cornell Lab of Ornithology



- “Grassland ecosystems are dependent on periodic disturbance for habitat maintenance.”
- “As a result, management of grassland areas is best directed toward the creation of a mosaic of grassland habitat types. This habitat mosaic is probably best maintained through some type of rotational management system in which sections of large grassland areas receive management on a regular schedule. Such a rotational system would provide a variety of habitat types in every year, would ensure the availability of suitable habitat for birds at either end of the grassland management spectrum, and also would provide habitat for birds whose preferences lie between these extremes.”

By: Brian E. Small

Provide Usable Space

- Nesting, Brood Rearing, Screening Cover
 - Quail and other birds need these in close proximity
- Habitat Patches
 - Multiple Habitat Types in a Single Location/Patch
 - Allows for use by Multiple Species
- Foraging Locations
 - Bare Ground = Granivorous Birds-mourning doves, etc
 - Invertebrates = sunny and shady; tall and short vegetation
 - Pollinators = annual, perennial, short, and long blooming species
- Germination Opportunities
 - Opens Up Root and Light Space
 - Less Competition for Moisture and Nutrients

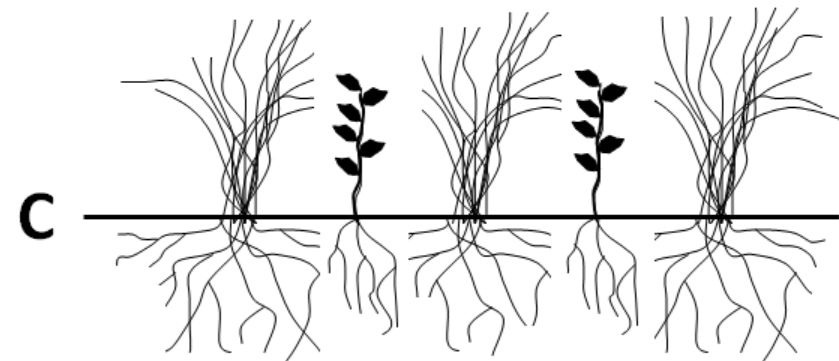
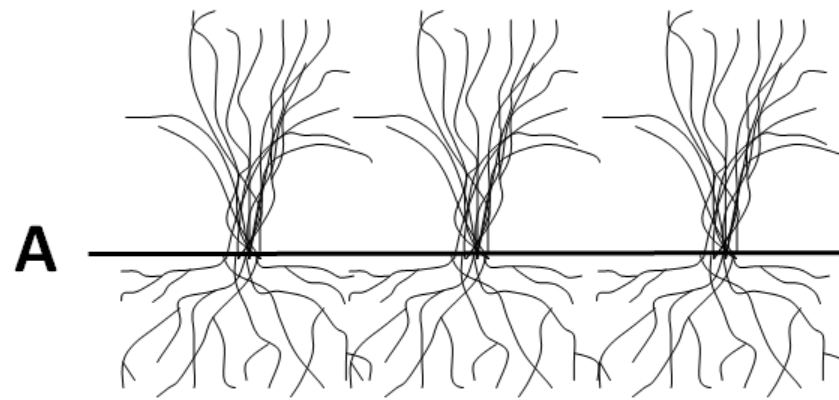




Figure 2. From Franklin Crider 1955- As grazing pressure increases, root mass decreases. Notice the second plant from the left has about 50% of its top growth removed, and root development is relatively unaffected, but a small increase in grazing pressure leads to a dramatic loss of root development for the 2 plants on the right..

Usefulness of PBG as a Tool

- Whereas the traditional model of range management (even distribution of moderate animal impact) might optimize sustainable livestock production objectives, it might not be sufficient for the maintenance of plants and animals that require habitat conditions different from those created by moderate grazing animal impact, i.e., species whose habitat needs are best provided by heavily- or lightly-impacted rangelands. -OSU Winter, Fuhlendorf, and Goes





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- Additionally, some rangeland wildlife species require markedly different habitats at different times during their life cycle. If entire landscapes are managed with similarly moderate levels of grazing animal impact, evenly distributed across all management units within the landscape, such landscapes might not provide sufficient habitat for all portions of those species' requirements. The ability of rangelands to provide habitat for wildlife and enhance biodiversity values will often depend on the ability of land managers to simultaneously optimize objectives associated with those values and objectives associated with livestock production.

Cattle Performance?

- “We found that cattle performance in pastures managed with patch-burn grazing did not differ from that found in pastures managed with a traditional range management strategy. This suggests that land managers who adopt patch-burn grazing in our study region might be able to maintain levels of cattle performance they are accustomed to. Simultaneously, they might also be able to achieve wildlife habitat objectives that might not have been possible with the application of traditional range management strategies.”
- Results affirmed other results from studies in Oklahoma and Colorado
 - Fuhlendorf, S. D., and D. M. Engle. 2004. Application of the fire-grazing interaction to restore a shifting mosaic on tallgrass prairie. *Journal of Applied Ecology* 41:604–614.
 - Limb, R. F., S. D. Fuhlendorf, D. M. Engle, J. R. Weir, R.D. Elmore, and T. G. Bidwell. 2011. Pyric-herbivory and cattle performance in grassland ecosystems. *Rangeland Ecology & Management* 64:659–663.
 - Augustine, D. J., and J. D. Derner. 2013. Controls over the strength and timing of fire–grazer interactions in a semi-arid rangeland. *Journal of Applied Ecology* 51:242–250.



- Estimated Cost
- \$3-7/foot
 - 5 strand barbed wire fence
 - ¼ mile = \$3,960-\$9,240



Brush Control



Photo by USDA

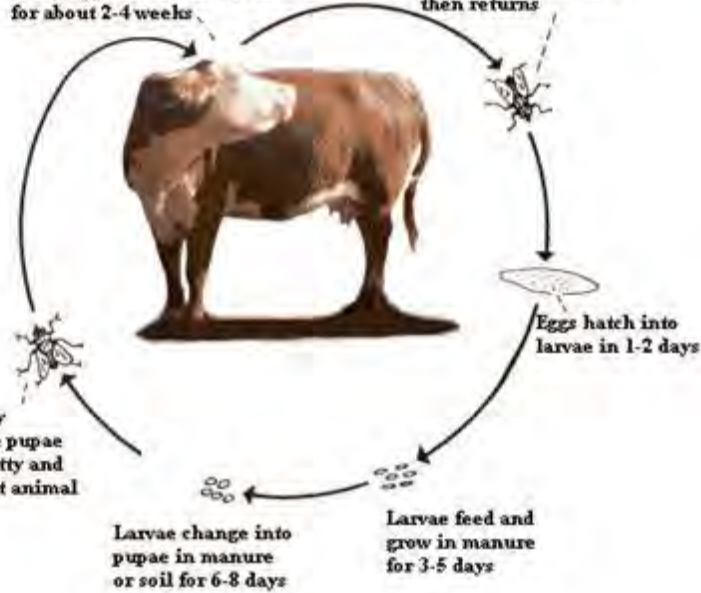


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Parasite Reduction

Female adult fly sucks blood day and night - leaving only to lay eggs in manure - lives for about 2-4 weeks

Female fly leaves animal for a few seconds to lay eggs in fresh manure - then returns



Important Considerations

- Stocking Rates
 - Need for Income
 - Impacts on Vegetation/Resources
- Flexibility
 - Burn Size/Timing/Frequency
 - Ability to Move Cattle
 - Ability to Respond to Drought
 - Ability to Respond to Abundant Rainfall
- Scale
 - Single Pasture or Entire Property
- Rest
 - How long? How often?

Stocking Rate

- Greatest Impact on Results
 - Will Vary by Soil, Rainfall, Year and Vegetation
 - Maximize Impact in Burn Zone
 - Minimize Impact Outside of Burn Zone
 - THERE IS NO MAGIC NUMBER!



Rest

- Important
 - Allows Perennial Grasses to Recover
- Impacted by Climate
 - Longer in Dry Cycles
 - Shorter in Wet Cycles
- Impacted by Stocking Rate
 - Heavier Grazing Pressure = Longer Rest



By: Jay Whiteside



02/19/2015 16:08



By: Taylor Garrison



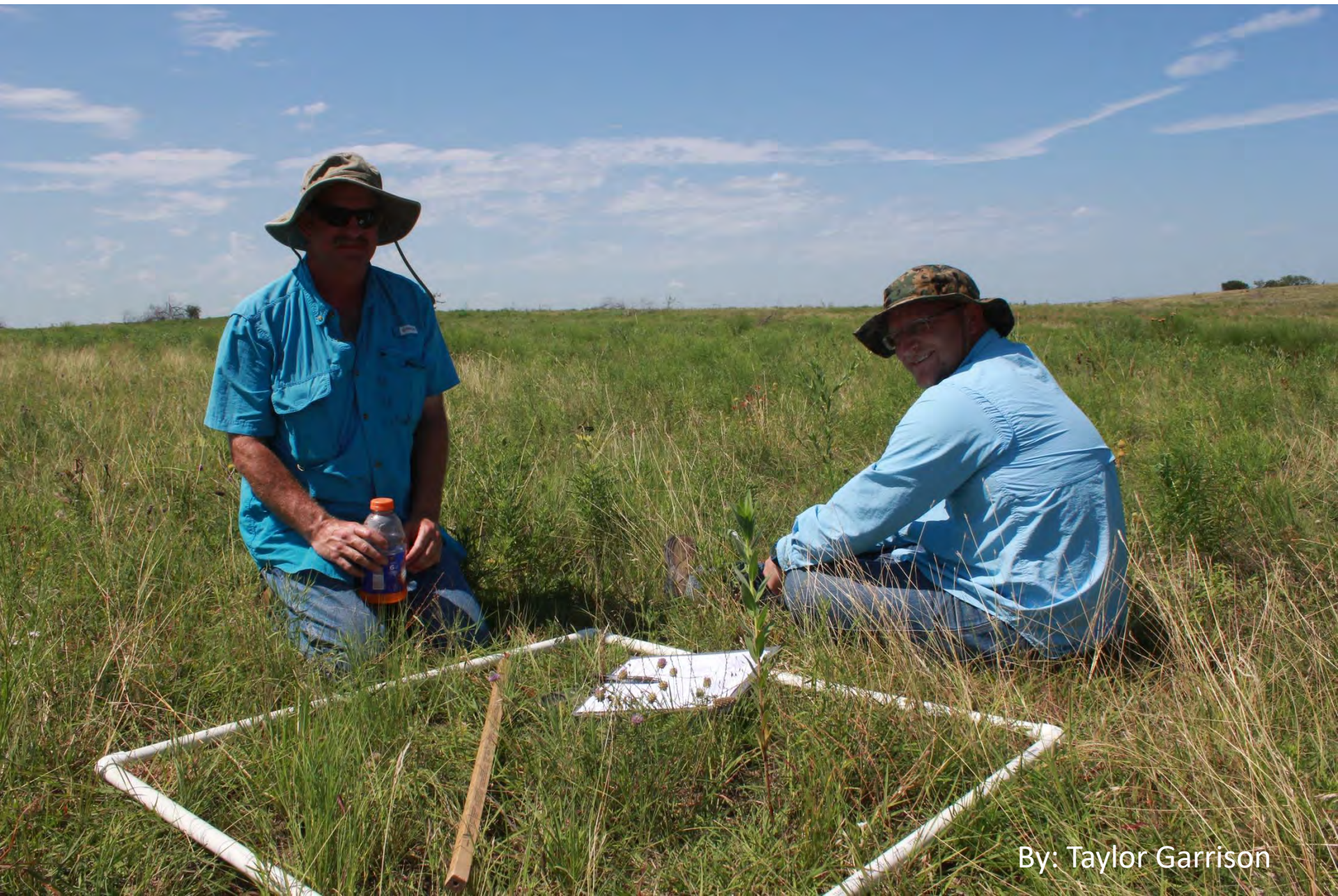
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Plotwise Floristic Quality Analysis

- <https://theprairieecologist.files.wordpress.com/2011/10/plotwise-fqi-description-short.pdf>
- Meter squared plots
 - List all species
 - Compare over time
 - Use Nature Conservancy Derived Conservatism Values for North-Central Texas
 - Long term comparison Burned-Unburned and Frequency Data

Frequency Chart for Plants in East and West Pasture 1 m² Sampling Plots

EAST PASTURE					WEST PASTURE				
SPECIES	OCCURRENCE	N = 25	N=75	CC SCORE	SPECIES	OCCURRENCE	N=19	N=82	CC SCORE
		BURNED	UNBURNED				BURNED	UNBURNED	
Desmanthus leptolobus	93	22	71	6	Desmanthus leptolobus	100	19	81	6
Bromus catharticus*	87	21	66	0	Bromus catharticus*	93	18	75	0
Croton monanthogynus	81	20	61	1	Amphiachyris dracunculoides	87	16	71	1
Amphiachyris dracunculoides	73	19	54	1	Croton monanthogynus	80	18	62	1
Euphorbia bicolor	64	13	51	1	Sporobolus compositus	73	17	56	3
Gaillardia pulchella	64	20	44	2	Euphorbia bicolor	67	12	55	1
Nassella leucotricha	55	10	45	2	Gaillardia pulchella	59	13	46	2
Sporobolus compositus	53	6	47	3	Plantago rhodosperma	59	12	47	1
Plantago rhodosperma	42	16	26	1	Bothriochloa ischaemum*	42	7	35	0
Asclepias viridis	41	9	32	2	Nassella leucotricha	37	6	31	2
Oenothera speciosa	41	8	33	1	Monarda citriodora	36	4	32	5
Eriochloa sericea	28	5	23	3	Asclepias viridis	31	5	26	2
Monarda citriodora	26	7	19	5	Oenothera speciosa	25	7	18	1
Bouteloua curtipendula	25	13	12	4	Bothriochloa laguroides	24	4	20	2
Ambrosia psilostachya	23	7	16	2	Centaurium tenuiflorum*	22	3	19	0

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
4	Agavaceae		<i>Manfreda virginica</i> (L.) Rose ssp. <i>lata</i>		broadleaf false-aloe		N			FP		10											
5	Agavaceae		<i>Yucca arkanasana</i> Trel.		Arkansas yucca		N			S		5											
6	Agavaceae		<i>Yucca pallida</i>		blue yucca		N			S		5											
7	Anacardiaceae		<i>Rhus glabra</i> L.		smooth sumac		N			T/S		0											
8	Anacardiaceae		<i>Toxicodendron radicans</i> (L.) Kuntze		poison ivy		N			WV		0											
9	Apiaceae		<i>Bifora americana</i> Benth. & Hook.		prairie bishop, mock bishop		N			FA		3											
10	Apiaceae		<i>Chaerophyllum tainturieri</i> Hookvar. <i>dasycarpum</i> S. Wats.		hairyfruit chervil		N			FA		2											
11	Apiaceae		<i>Chaerophyllum tainturieri</i> Hookvar.		Chervil		N			FA		2											
12	Apiaceae		<i>Cynosciadium</i>		finger dogshade		N			FA		3											
13	Apiaceae		<i>Daucus carota</i> L.		Queen Anne's lace		E			FB		-2											
14	Apiaceae		<i>Daucus pusillus</i> Michx.		little carrot		N			FA		2											
15	Apiaceae		<i>Eryngium leavenworthii</i> T. &		Leavenworth eryngo		N			FA		3											
16	Apiaceae		<i>Eryngium yuccifolium</i> Michx.		rattlesnake master		N			FP		8											
17	Apiaceae		<i>Polytaenia nuttallii</i> DC.		meadow-parsnip		N			FP		5											
18	Apiaceae		<i>Ptilimnium capillaceum</i> (Michx.)		bishop's weed		N			FA		3											
19	Apiaceae		<i>Ptilimnium nuttallii</i> (DC.) Britt.		bishop's weed		N			FA		3											

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By: Taylor Garrison

Gaillardia pulchella –
firewheel/Indian blanket



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Lesquerella gracilis –
spreading bladderpod



By: Taylor Garrison

New species for project! (Found in West pasture)
Helianthus maximiliani – Maximillian Sunflower



By: Taylor Garrison



Dalea purpurea –
By: Taylor Garrison Purple prairie clover



By: Taylor Garrison

Dalea enneandra –
bigtop dalea



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Centaurea americana –
American basket flower



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