

Evaluation of Grazed Prairie Land for Critical Species Protection in Western Washington

2018-2020

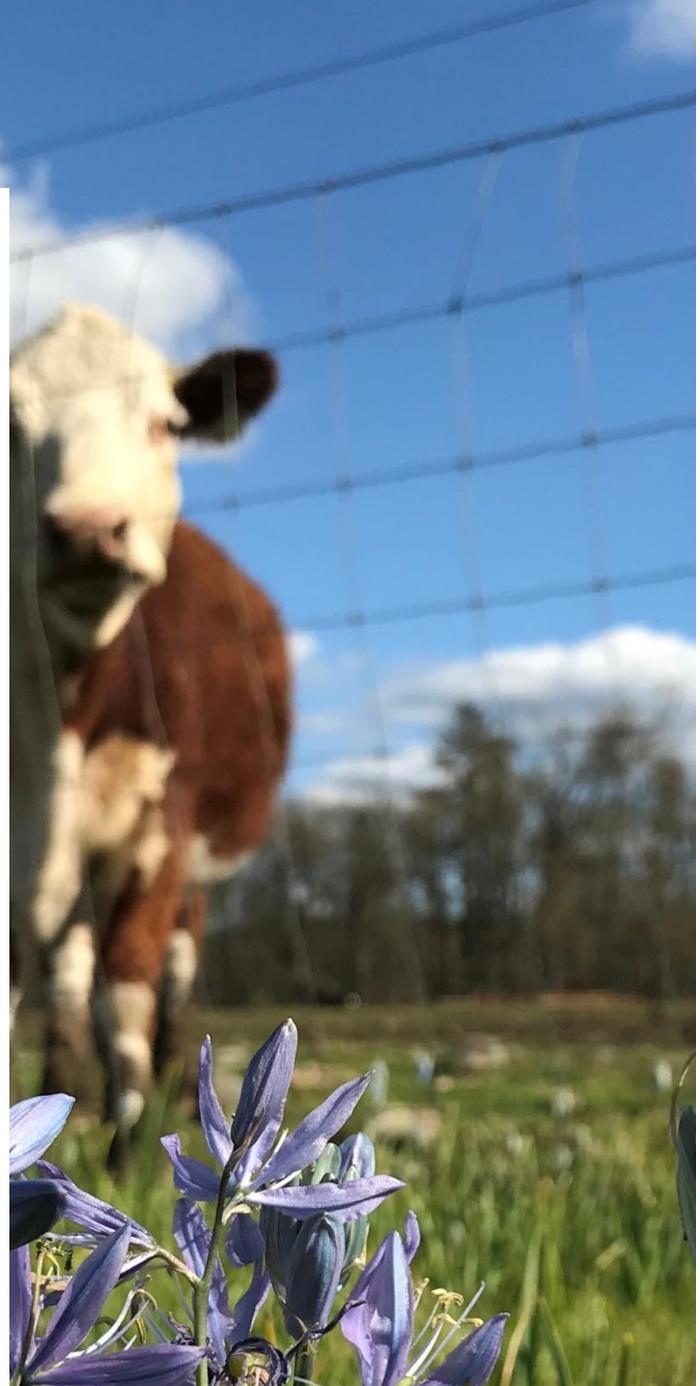
*Please find a summary of project activities and
reporting at:*

<https://extension.wsu.edu/thurston/agriculture/on-farm-conservation/prairie/>

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Enhancing Native Prairie on Working Lands

- Over 90% of the prairies in SW Washington have been converted to agriculture or lost to development
- Over 100,000 acres, or ~64% of farmland has been lost in Thurston County, most to low-density urban sprawl
- Most remaining rangelands west of the Cascades in the Pacific Northwest occur on sites that historically supported native prairie
- One promising option to restore and reconnect remnant prairies is to partner with private livestock businesses to combine native prairie habitat conservation with compatible Conservation Grazing Practices (CGPs).

Effective conservation of remnant native prairie ecosystems can be facilitated by identifying opportunities for ranchers to increase the conservation value of their properties while maintaining or enhancing their bottom line.

The aim of this 3-year study was to quantify the conservation value generated by Conservation Grazing Practices (CGP) including spring grazing deferments, rotational grazing regimes, and seeding native plant species.

On three working ranches, replicated 1-acre plots that received the CGPs were compared to 'Business as Usual' (BAU) plots **and three Native Upland Prairie (NUP)** preserves.

Native and non-native species richness and diversity, forage productivity, gopher activity, soil parameters, and butterfly behavior were evaluated using combinations of paired 15m x 15m subplots and grazing exclusion cages within the treatments. A **Conservation on Working Lands Survey** evaluated farmer interest in varying incentive programs.

Results

Summary

Prairies grazed with conservation practices can provide a significant contribution to critical species habitat. The relative contribution varies by the specific measure of habitat value and by the history of conservation work at the ranch site. A summary of these native plant, gopher and butterfly contributions on three ranches over three years provides preliminary quantification of the value of working lands to species conservation:

- 5 out of 10 native prairie species seeded into CGP treatments successfully established over the 3-yr study (2018-2020).
- The abundance (# plants) of seeded species in CGP treatments ranged from 4.5% (new CGP ranch) to 38.1% (mid-quality CGP ranch) to 67.0% (high quality CGP ranch) of that in NUP.
- Native species richness at ranch sites was 10 to 50% of that at Native Upland Prairies (2-12 species depending on the ranch sites compared to 15-23 species on average in NUPs).
- Overall plant species richness increased the most in the CGP treatment (35%) over the 3-yr study.
- Mazama Pocket Gopher occupancy was equivalent or greater on grazed prairies as compared to native upland prairie. Conservation grazing practices led to the greatest increase in gopher occupancy from 2018-20: from 56% occupancy (2018) to 83% occupancy (2020).
- Forage production was not negatively affected by CGP treatments and tended to increase under rotational grazing.
- Average daily high soil temperature was lower under CGP treatments than conventional grazing, indicating enhanced resilience to heat extremes of CGPs
- No significant differences were detected in butterfly diffusion rates (measure of habitat quality) between prairie management types, although females appeared to move faster in conventional grazing as compared to CGP and NUP sites
- Rural landowners were most interested in tax incentives and cost-share programs for participating in conservation on working lands, but (as a group) were least interested in selling their property for conservation. Perspectives were mixed on conservation easements and development rights transfers.

Key Finding: Seeding Natives into Grazing Land

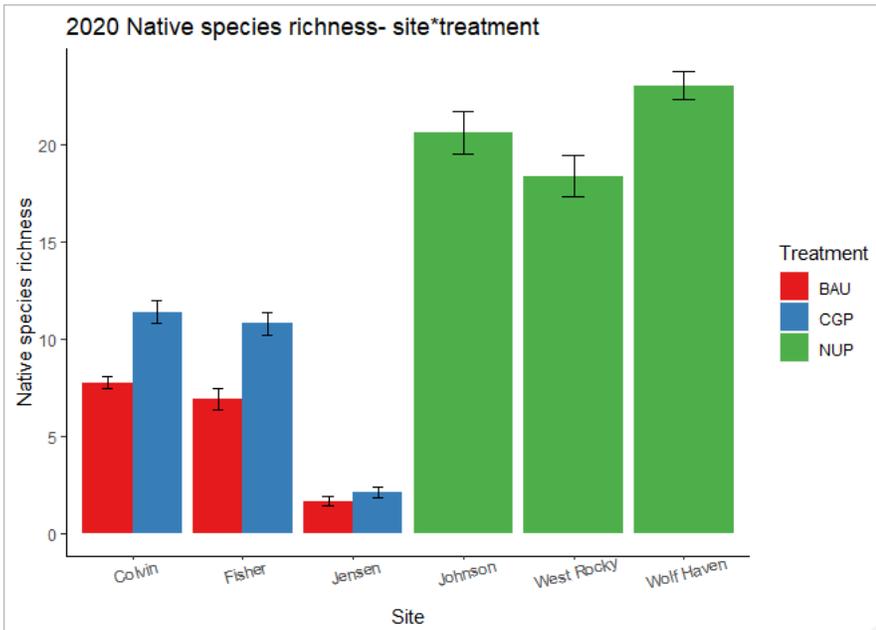


Figure 1. Native species richness across study sites and treatments in 2020. Error bars represent ± 1 SE.



Figure 2. *Plectritis congesta*, among species successfully established at ranch sites.



Figure 3. *Lupinus bicolor*, *Collinsia parviflora* and *Ranunculus occidentalis*, also established at ranch sites.

Out of the 10 species we seeded into Conservation Grazing treatments, 5 successfully established: Castilleja levisecta (golden paintbrush), Collinsia parviflora (maiden blue-eyed Mary), Plectritis congesta (sea blush), Ranunculus occidentalis (western buttercup), and Lupinus bicolor (bicolor lupine).

Key Findings: Species Richness & Gopher Activity

Native richness significantly increased within CGP treatments at ranch sites over 2018-2020 ($p < 0.001$), but was still lower than native ungrazed prairies

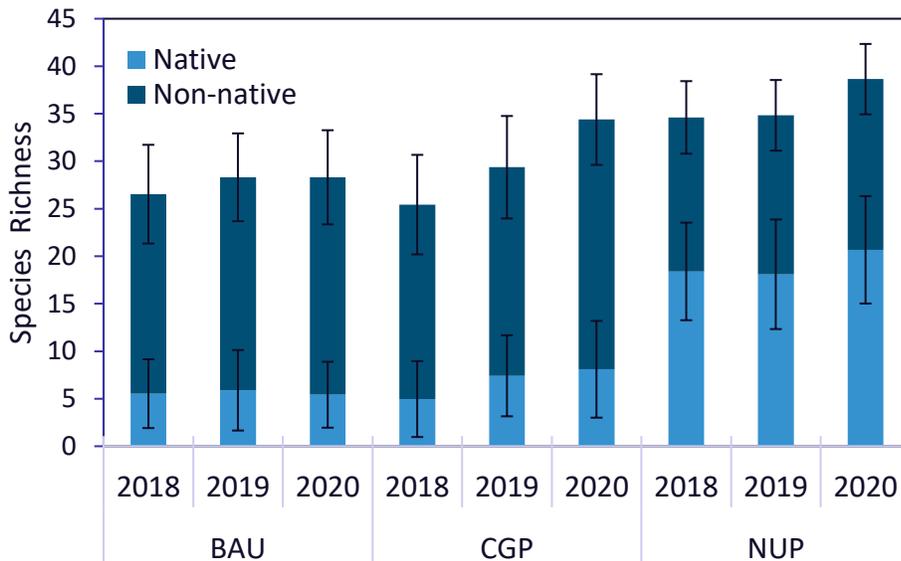
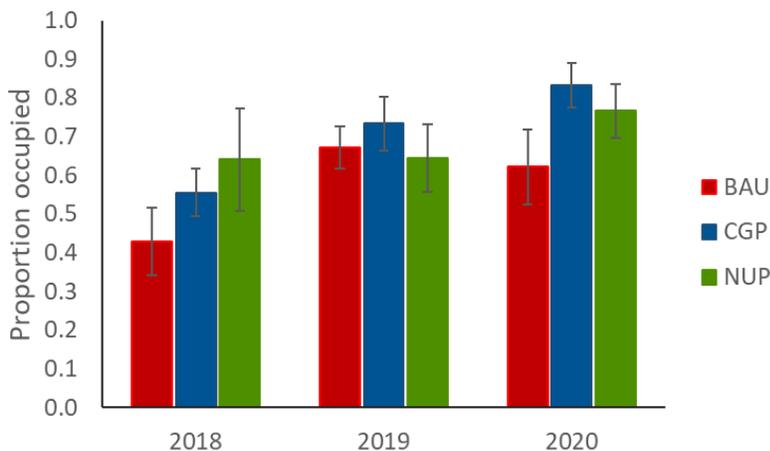


Figure 4. Native and non-native species richness across treatments from 2018 to 2020. Error bars represent ± 1 SD.



Gopher activity on grazed prairies was comparable (not different) to gopher activity at ungrazed sites

Figure 5. Average proportion of monitoring plots occupied by gophers from 2018 to 2020 across all treatments. Error bars represent ± 1 SE.

Key Findings: Forage Productivity and Soil Parameters

CGP practices did not depress overall forage production and thereby native seeding is unlikely to negatively affect productivity in grazed systems.

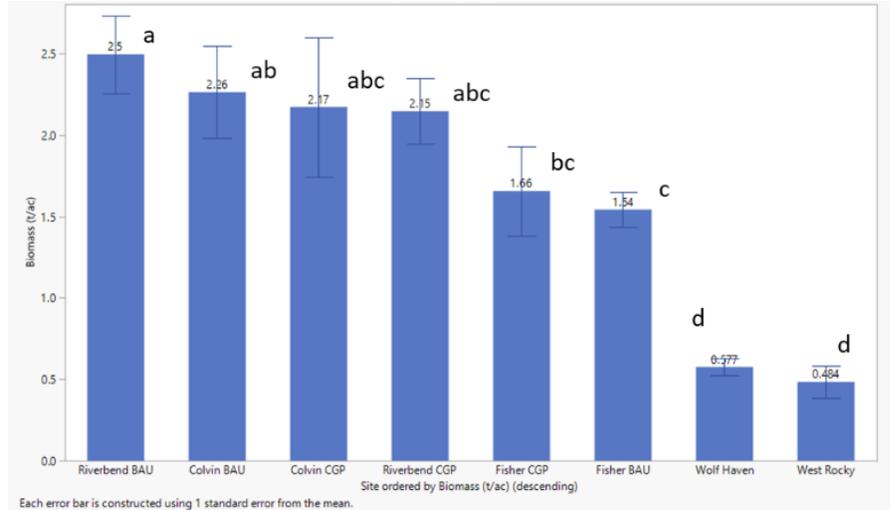


Figure 6. Total biomass production measured across sites and treatments. Error bars represent ± 1 SE.

Taller forage in Conservation Grazing plots shaded the soil, reducing daily average high soil temperatures and increasing mid-summer forage production.

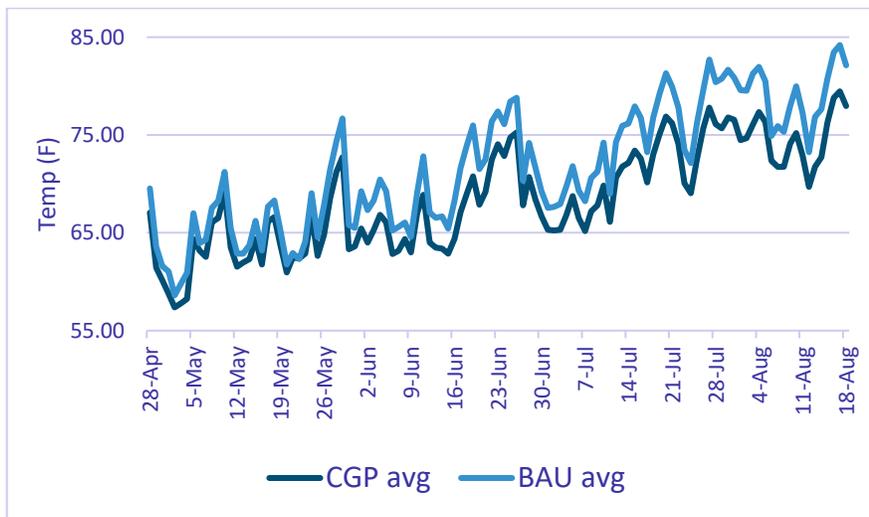


Figure 7. Daily average high soil temperatures (10cm depth) in CGP and BAU plots from April – mid August.

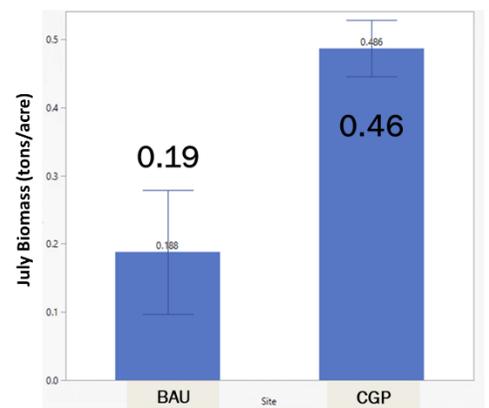


Figure 8. Average biomass production (t/ac) in July as measured under exclusion cages in CGP and BAU treatments at a ranch site – Year 3. Error bars represent ± 1 SE.

Key Findings: Butterfly Behavior Results & Conservation on Working Lands Survey

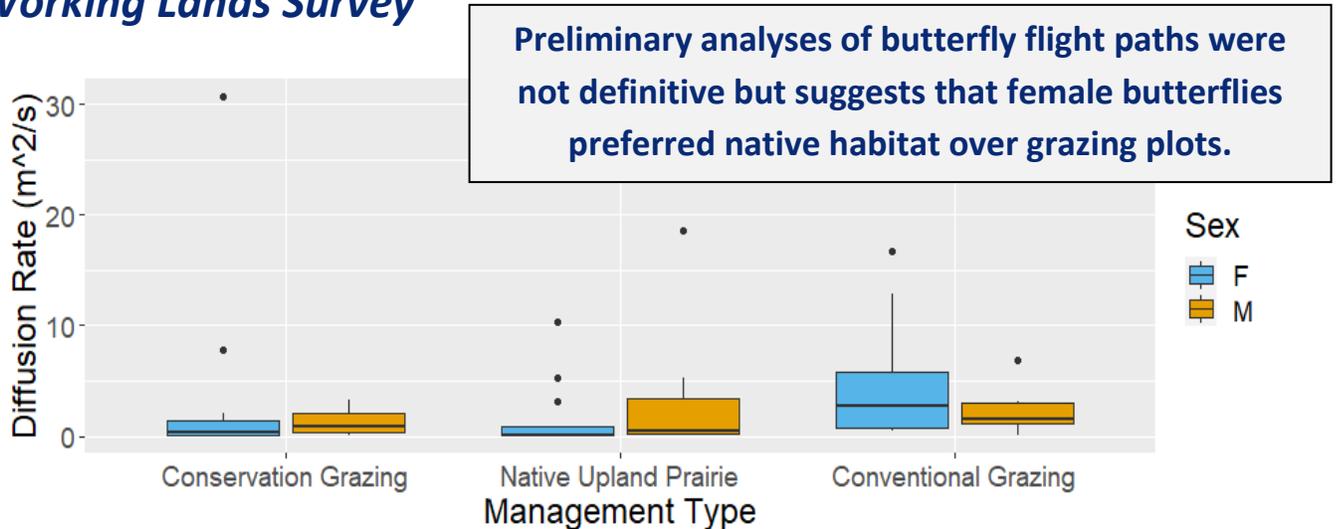


Figure 9: Silverly blue butterfly diffusion rates (lower rate signifies more preferred habitat). Differences in diffusion between management types were not detected but females appear to move faster in conventional grazing, indicating they may prefer it less than CGP or native prairie.

Respondents to a *Conservation on Working Lands Survey* were interested in financial assistance programs (on-farm cost-share, tax incentives). They were not interested in selling property for conservation, and perspectives varied widely on interest in conservation easements and transfer of development rights programs.

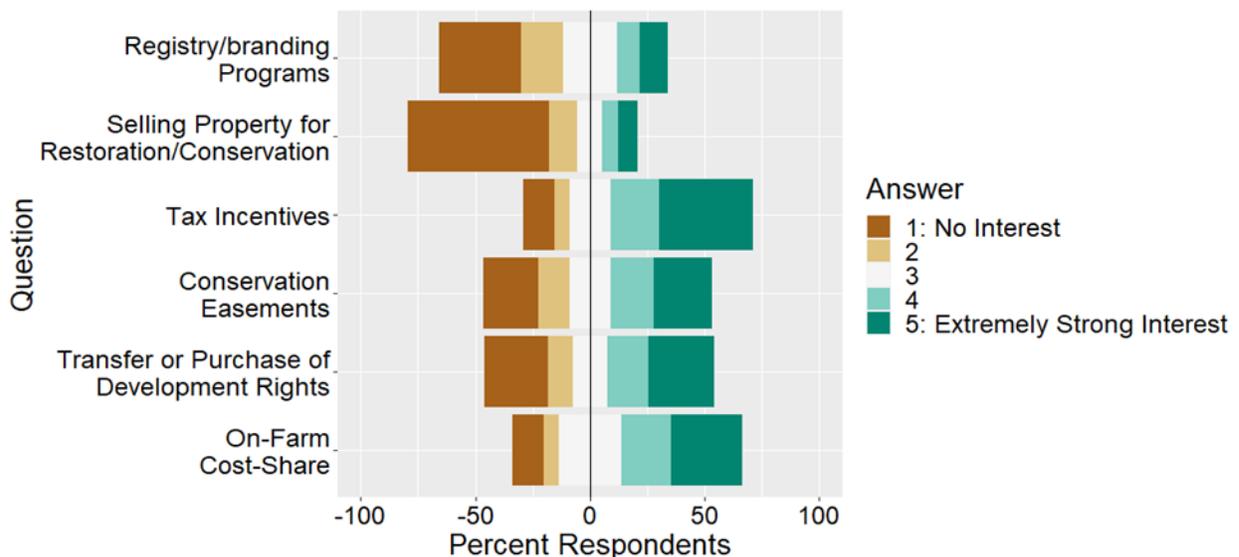


Figure 10: Ranking of farmers interest in varying approaches to Conservation on Working Lands.