

Planting in reed canarygrass: Two decades of progress in the Bull River

Brita Olson, Coordinator
Lower Clark Fork Watershed Group
December 2022











- Invasive, ubiquitous grass in the Bull River
- Was likely either planted directly or spread from nearby areas

“I read with interest the Sanders County Ledger article about canary grass on Bull River. For your information, my dad, Al Leeson first introduced canary grass in the valley in approximately 1946-47. A sizeable portion of meadowland on the 160 acre Bull River Ranch he purchased in 1945 grew only slough grass, as did much of the rest of the valley.

Dad learned from US Agricultural bulletins he got at the courthouse in Thompson Falls that canary grass was not only excellent fodder for cattle, it thrived in sodden ground. I believe he planted ten acres on an area at the base of the mountains. Bull River bordered the other side of our meadowland. Thus, we were able to begin haying there on the 4th of July, instead of near the end of July, as previously was the case.”

Mona Vanek, personal communication, October 24, 2016

- Not necessarily nonnative, but genetic studies show that its at least hybridized with European cultivars and has become increasingly invasive. Paleoecological sampling in northwestern wetlands suggest it came to dominance following agricultural disturbances. (Townsend and Hebda 2013).



Typical of invasive species:

- high allocation to reproduction (seed and vegetative),
- clonal growth (phalanx and guerilla),
- long growing period,
- rapid growth,
- high productivity,
- and a broad tolerance to environmental variability

Maurer et al 2003; Annen 20XX



Characteristics / considerations for planting in RCG:

- Eradication is generally unrealistic, and there is no magic bullet. Degradation occurs until degradation threshold; restoration must occur until recovery threshold is met. Will take a minimum 5-7 years, probably longer. (Annen 20XX; NRCS 2009).
- Weak competitor for nutrients; responds readily to nutrient inputs (Annen 20XX; Green and Galotowitsch 2002)
- Strong competitor for light (Annen 20XX)
- RCG-litter feedback loop

Characteristics / considerations for modern era:

- Restoration to historical condition limited by infrastructure, expense, new species, climate... focus on restoring process (Keane et al 2018)




Approach:

- Invade monocultures with native woody vegetation (Foster and Wetzel 2005)
- Shade reed canarygrass – tiller attached to unshaded parental clones are not affected by even heavy shade (Maurer et al 2003)
- Restart riparian succession – broader area, not just the “hairy eyebrow” on the streambank... restore process (Keane et al 2018)



NRCS Reed Canarygrass (*Phalaris arundinacea*) Management Guide (NRCS 2009)

- Burning – not effective by itself; short-term effect; can reduce seedbank; can stimulate RCG growth; liability (Adams and Galatowitsch 2006; Foster and Wetzel 2005)
- Excavation
- **Tree/shrub planting – long-term solution if open to vegetative change (Healy et al 2010)**
- Grazing – not compatible with other conservation goals
- Haying – limited by topography and equipment
- Mowing – limited by topography and equipment
- Herbicide - broad-spectrum or grass-specific – not effective by itself; short-term effect; requires iterative treatment; variable effectiveness; effective formulas on RCG not suitable for near-stream areas; only effective in areas without seed importation; doesn't reduce seedbank (Healy et al 2010; Adams and Galatowitsch 2006; Foster and Wetzel 2005)

<p>Tree/shrub planting</p> 	<ul style="list-style-type: none"> • When woody species overtop RCG, shade slows its growth • May change plant community • Adds structure to habitat 	<ul style="list-style-type: none"> • Where herbaceous vegetation cannot gain a competitive advantage 	<ul style="list-style-type: none"> • Where landscape is receiving RCG seed inputs • Where inflows can't be diverted • To connect existing woody patches 	<ul style="list-style-type: none"> • Where management goal is to maintain grassland habitat 	<ul style="list-style-type: none"> • Apply herbicide/mulch around newly planted trees/shrubs • Conifers may be the most effective at shading RCG • Need to control RCG for 3-5 years to allow trees to establish
---	---	---	--	--	---





East Elevation

☉ 268°W (T) ● 48.110075°, -115.783028° ±13ft ▲ 2293ft



Planting area
Brita, LCFWG

Edwards
12 May 2022 10:31:23

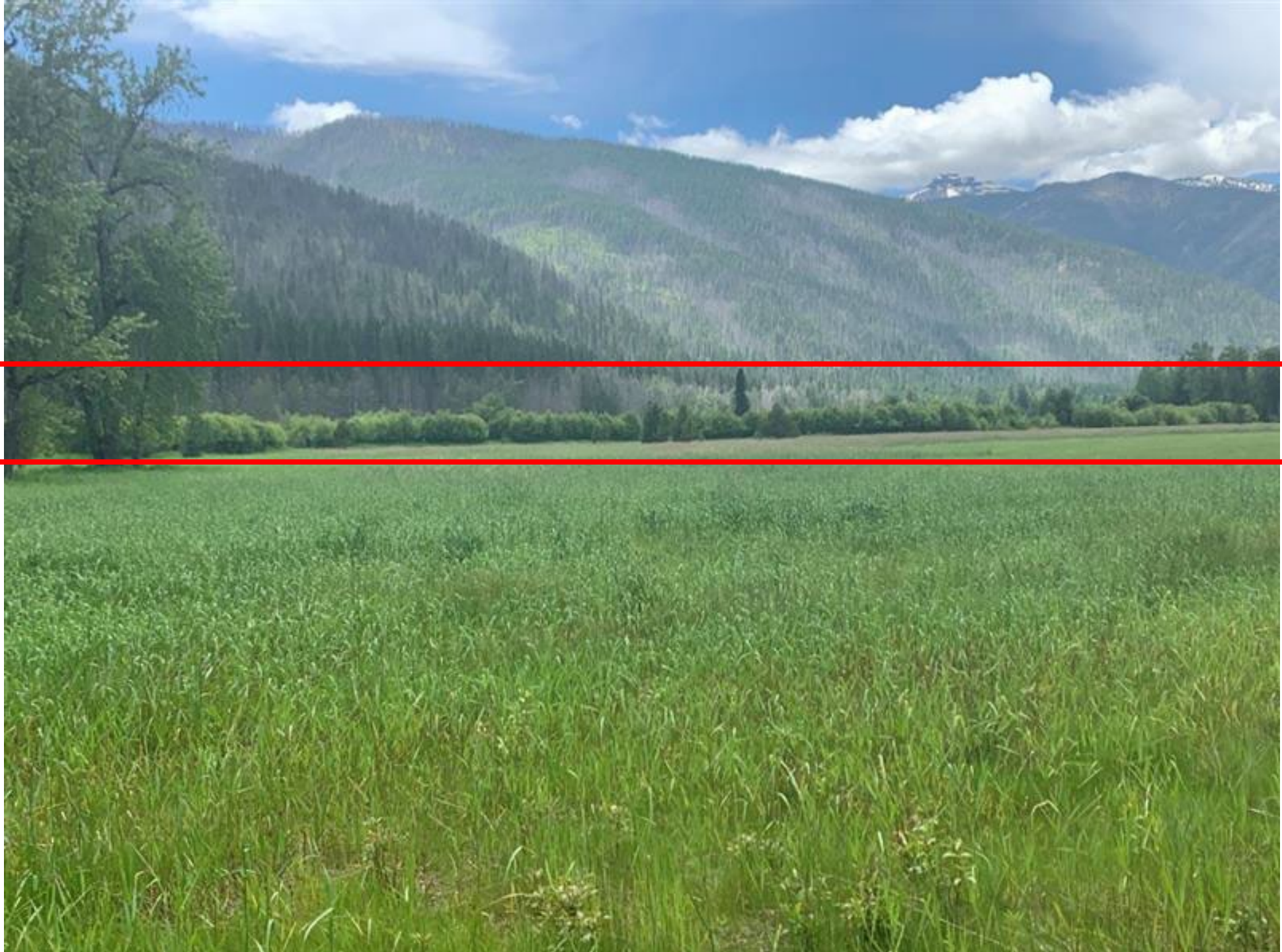
North Elevation

☉ 185°S (T) ● 48.137805°, -115.868141° ±13ft ▲ 2309ft



Planting area
Brita, LCFWG

Warrington
06 May 2022 12:28:33















Comparison

900+ completed to-date

Individual Plantings x 5 trees

- 10 ft spacing: 80 (circle) - 100 sq. ft. (square) per tree x 5 = 400-500 sq. ft of tree canopy cover
- 16 ft spacing: 200 (circle) - 256 sq. ft. (square) per tree x 5 = 1000-1280 sq. ft of tree canopy cover
- 900 trees: 80 (circle)-200 sq ft x 900 trees / 43560s sq ft = 1.65-4.13 acres...

216 completed to-date

15'x30' Enclosure: 4-5 trees

- 450 sq. ft. matting
- Realistically they aren't planted much farther apart than 10 ft, so 400-500 sq. ft on a per tree basis as well
- 216 enclosures: 400-500 sq. ft. x 216 / 43560 sq ft = 1.98-2.48 acres...

Comparison – up front materials costs

Individual Plantings x 5 = \$218.30

Weed Matting: 4x4 ft mat, precut with slit	\$ 2.55	1 mat	1	\$ 2.55
6.5' T-posts: 1 per tree (clips included)	\$ 6.29	1 post	1	\$ 6.29
Fencing: 14 gauge welded wire fencing	\$1.97	1 foot	10	\$ 19.70
Staples	\$ 0.16	1 staple	7	\$ 1.12
Plant	\$14.00	1 plant	1	\$ 14.00
				Subtotal per site \$ 43.66
				Total for five sites \$ 218.30

15x30 Exclosure: 4-5 tree outcome = \$315.83

Product Description	Unit Cost	Unit	Measurement	Requirement	Subtotal
Fabric: \$572.09 / 300 ft roll, adjusting \$460/roll in 2015 costs to 2022 prices	\$ 572.09	1 roll		0.1	\$ 57.21
6.5' T-posts: 7-8 ft spacing (clips included)	\$ 6.29	1 post		6	\$ 37.74
Fencing: 14 gauge welded wire fencing	\$1.97	1 foot		90	\$177.30
Staples	\$ 0.16	1 staple		38	\$6.08
Plants	\$2.50	1 plant		15	\$37.50
					Total per exclosure \$ 315.83

Comparison: other notes

Individual Plantings x 5

- Can implement in a short period in spring or fall
- Less maintenance, more approachable task
- Favors up front labor costs which are easier to fund (everybody likes new projects) and more rewarding
- Matting is slit to edge so it is unlikely to girdle trees
- Less beaver browse, more large diameter trees

15x30 Exclosure: 4-5 trees

- Requires minimum two years for implementing
- Significant maintenance to keep fencing on landscape
- Can lead to significant maintenance... one exclosure cost LCFWG \$750 in labor to remove in spring of 2022, not accounting for material disposal costs
- Fabric will inevitably girdle trees
- Eggs (trees) are all in one woven wire basket









Questions?

References

- Adams, C.R. and S.M. Galatowitsch. 2006. Increasing the Effectiveness of Reed canary grass (*Phalaris arundinacea* L.) Control in Wet Meadow Restorations. *Restoration Ecology* 14:3, pp. 441-451.
- Annen, Craig. 20XX. Reversing Reed canarygrass Invasions Requires a Multiple-method Systems Approach. Integrated Restorations, LLC.
- Foster, R.D. and P.R. Wetzel. 2005. Invading Monotypic Stands of *Phalaris arundinacea*: A test of Fire, Herbicide, and Woody and Herbaceous Native Plant Groups. *Restoration Ecology* 13:2, pp. 318-324.
- Green, E.K., and S.M. Galatowitsch. 2002. Effects of *Phalaris arundinacea* and nitrate-N addition on the establishment of wetland plant communities. *Journal of Applied Ecology* 39, pp. 134-144.
- Healy, M.T. and J.B. Zedler. 2010. Setbacks in Replacing *Phalaris arundinacea* Monotypes with Sedge Meadow Vegetation. *Restoration Ecology* 18:2, pp. 155-164.
- Keane, R.E., M.F. Mahalovich, B.L. Bollenbacher, M.E. Manning, R.A. Loehman, T.B. Jain, L.M. Holsinger, A.J. Larson, and M.M. Webster. 2018. Effects of Climate Change on Forest Vegetation in the Northern Rockies. USDA Forest Service.
- Maurer, D.A., R. Lindig-Cisneros, K.J. Werner, S. Kercher, R. Miller and J.B. Zedler. 2003. The Replacement of Wetland Vegetation by Reed Canarygrass (*Phalaris arundinacea*). *Ecological Restoration* 21:2, pp. 116-119.
- Mona Vanek, personal communication, October 24, 2016
- Townsend, L., and R.J. Hebda. 2013. Pollen and Macro-Fossil Assemblages in Disturbed Urban Wetlands on South Vancouver Island Reveal Recent Invasion of Reed Canarygrass (*Phalaris arundinacea*) and Guide Restoration. *Restoration Ecology* 21:1, pp. 114-123.
- Wisconsin Reed Canary Grass Management Working Group (NRCS). 2009. Reed Canary Grass (*Phalaris arundinacea*) Management Guide: Recommendations for Landowners and Restoration Professionals