Impact of Wildfire and Seeding on the Range Plant Community in the Dry Forests of Southern British Columbia

W. Gardner
Thompson Rivers University, Canada

J. Karakatsoulis
Thompson Rivers University, Canada

P. Youwe
Ministry of Forests and Range, Canada

The 21st International Grassland Congress / 8th International Rangeland Congress took place in Hohhot, China from June 29 through July 5, 2008.

Proceedings edited by Organizing Committee of 2008 IGC/IRC Conference

Published by Guangdong People's Publishing House

Impact of wildfire and seeding on the range plant community in the dry forests of southern British Columbia

W . Gardner[1] , *J . Karakatsoulis*[1] , *P . Youwe*[2]
[1] *Department of Natural Resource Sciences , Thompson Rivers University , PO Box 3010 , Kamloops , BC , Canada V2C 5N3 , E-mail :wgardner@ tru .ca .* [2] *British Columbia Forest Service , Ministry of Forests and Range , 1265 Dalhousie Drive , Kamloops , BC , Canada V2C 5Z5 .*

Key words : seeding ,wildfire ,weed invasion , species richness

Introduction Much controversy exists over the use of seeding as a rehabilitation tool after wildfires . The role of using seeding to limit invasive weed spread is poorly understood and some findings suggest that the seed mixes themselves could be considered invasive and lead to a decrease in species richness of the native plant community (Keeley 2006) . Also , it has been well documented that , although much postfire seeding occurs , not much quantitative monitoring occurs to assess whether or not the seeding was effective (Robichaud et al . 2000) . The objective of this study was to track vegetation change in seeded versus unseeded areas that had been impacted by wildfires and specifically to determine if seeding after wildfire 1) is an effective method to reduce weed invasion and 2) impacts the native plant community that may become established on the site .

Materials and methods In late summer of 2003 three large wildfires burned through the dry forests in the southern interior of BC . In 2004 two treatments , burned and seeded (seeded) and burned and unseeded (unseeded) , were established as paired plots and replicated at seven sites in the burned areas . At each site 20-1×1 m quadrats were systematically sampled along 2-50 metre transects to determine% cover and frequency by species in 2004 , 2005 and 2006 and 2-1×1 m (per sample line) areas were clipped , dried and weighed to determine total biomass production .

Results The seeded sites had a significantly ($P < 0.05$) higher total cover (Table 1) than the unseeded sites in 2004 and 2005 . Not displayed on the table is the information that grass cover was also significantly higher in the seeded sites in 2004 (41 .3 vs 4 .8%) and 2005 (84 .8 vs 11 .7%) . Seeding also significantly increased the overall species richness in all years (Table 1) but when the seeded species were removed from total species there was no significant difference between treatments . There was no treatment effect on weed cover (%) although weed cover on all treatments in all years remained low (Table 1) . In general the plant community components did not differ between treatments (forb cover , shrub cover , and tree cover) . One of the main species used in the seed mixes , *Lolium multiflorum* , significantly decreased ($p = 0.017$) from 2004 (19 .4%) to 2006 (3. 3%) .

Table 1 *Total cover , species richness and% weed cover in the seeded versus unseeded sites in* 2004 ,2005 *and* 2006 .

Variable	Year	Seeded	Unseeded	SEM	P Value
Total Cover (%)	2004	72 .3	43 .2	6 .10	0 .005
	2005	170 .5	116 .6	20 .08	0 .036
	2006	102 .7	89 .2	13 .41	0 .339
Species Richness (no .)	2004	20 .7	26 .0	1 .90	0 .014
	2005	36 .4	29 .7	3 .52	0 .025
	2006	39 .9	29 .7	3 .96	0 .043
Weed Cover (%)	2004	0 .6	1 .2	0 .56	0 .304
	2005	7 .4	7 .9	2 .44	0 .849
	2006	3 .5	5 .8	1 .96	0 .301

Conclusions Seeding in this environment did not alter weed cover but overall weed cover was low in both treatments indicating weeds may not have been a major problem at these sites . Seeding did temporarily increase total cover which could be beneficial in areas where erosion is a concern or where weeds might be present in higher amounts . The plant species seeded did not indicate invasive qualities . The long term effects of seeding after wildfire on plant community change needs to be investigated further and monitoring on these sites will continue for a ten year period post fire .

References

Keeley , J . 2006 . Fire management impacts on invasive plants in the Western United States . *Conservation Biology* 20 :375-384 .
Robichaud , P . , Beyers , J . and Neary , D . 2000 . Evaluating the effectiveness of post fire rehabilitation treatments . Rocky Mountain Research Station (RMRS)-GTR-63 , online publication .