

Impacts of pre-fire site conditions, burn severity, and post-fire treatments on plant regeneration following the 2005 School Fire



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Objectives

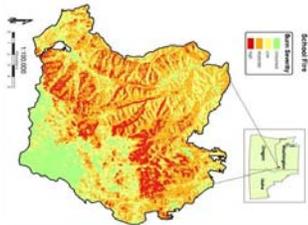
This research aims to assess and understand post-fire vegetation response and succession for five years following the 2005 School Fire, which burned in a variety of vegetation types and structures.

- Determine how burn severity, and post-fire salvage influenced post-fire abundance of plants with differing regeneration strategies.
- Determine whether post-fire native grass seeding on high severity burns affected plant abundance.
- Determine whether post-fire BAER rehabilitation treatments (wood straw, wheat straw, hydromulch, seeding, and control) on high severity burns affected plant abundance.

Methods

Data collection

- Five-sub plots per 74 total plots.
- Total ground cover over the 1 x 1m sub-plot (green vegetation, non-photosynthetic organic, miscellaneous vegetation, ash, rock, and soil)
- Percent canopy cover by species



Tree Density		Low	Moderate	High	Unseeded	Unburned
Low	(2/7)	(6/9)	(0/2)	(1/2)	(1/2)	(0/2)
Moderate	(2/5)	(2/6)	(0/2)	(2/1)	(2/1)	(0/2)
High	(2/6)	(3/6)	(1/2)	(1/2)	(1/2)	(0/2)
Totals	(6/18)	(10/12)	(1/4)	(4/20)	(0/4)	

(Salvaged / Not Salvaged)

Burn Severity Classifications

Burned Areas Reflectance Classification (BARC) burn severity map derived from dNBR techniques using Landsat-5 TM (24 July 2005 and 25 Aug 2005).



Additional Analysis

- Vegetation data was collected annually four years post-fire, but only 2009 data is currently being presented.
- Additional analysis will be conducted to examine post-fire vegetation response in relation to burn severity, tree density, and other pre-fire site conditions as well as species richness and diversity measures.

References

Sticker, P.F., and R.B. Campbell Jr. 2000. Data Base for Early Postfire Succession in Northern Rocky Mountain Forests. USDA Forest Service, General Technical Report RMRS-GTR-6-CD. Fire Effects Information System. [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: <http://www.fs.fed.us/database/feis>.



High burn severity seeded site



FES (forb) straw treatment

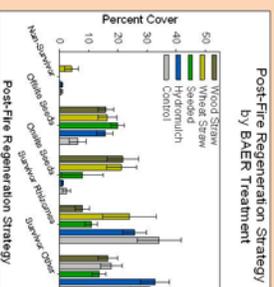
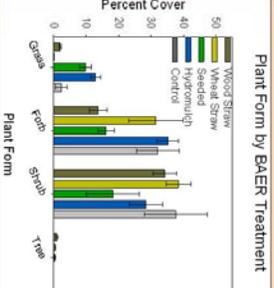
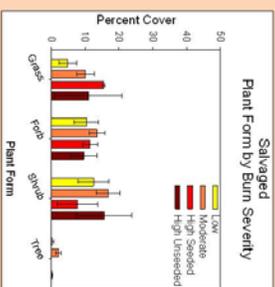
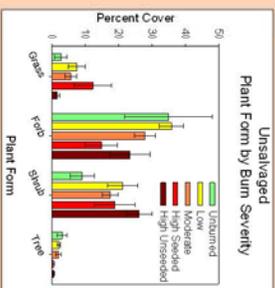
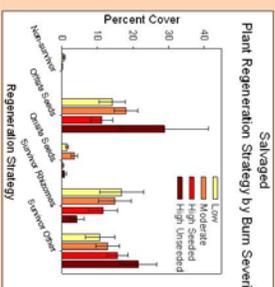
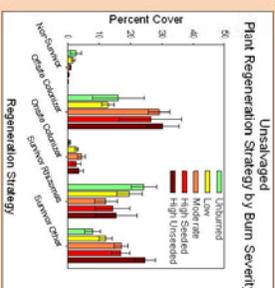


Burned site on high burn severity site



Post fire salvaged site

Results



Conclusions

- Five years post-fire, vegetation recovered rapidly on all burn severity classes
- In 2008, Non-native species occurred in less than 20% of high burn severity plots with a maximum percent cover of 2%. Non-natives were absent in control plots.
- Seeding native grasses increased grass cover but it didn't alter shrub, forb, and tree cover. Seeding did not inhibit establishment of off-site colonizers.
- More off-site colonizers were found on high and moderate burn severities.
- Plants re-sprouted on all burn severities. We expected more rhizomatous plants on low and moderate severities.
- Shrub and forb cover was less on sites salvaged 1-3 years post-fire than on sites not salvaged.
- Less forb cover on seeded and woodstraw much than on sites with hydromulch, wheat, and control sites.