



SCHOOL FIRE

Assessing soil and vegetation recovery

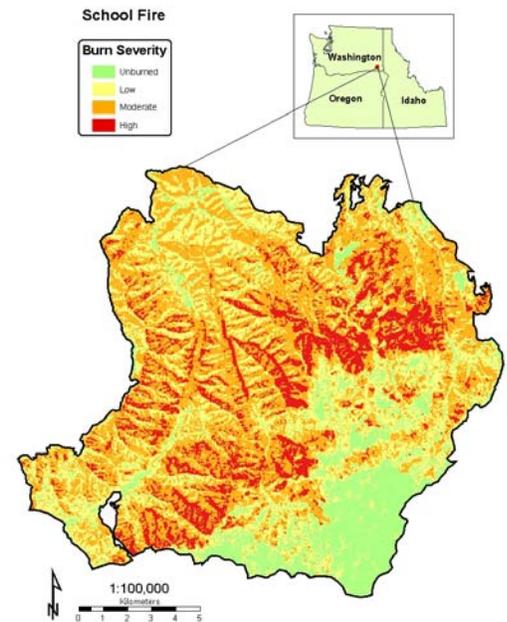
following the 2005 School Fire, Umatilla National Forest

Introduction

Following the 2005 School Fire which burned ~ 50,000 acres across forest and grasslands, managers were particularly concerned with treating areas that were severely burned to control soil erosion and to mitigate weed spread. After the fire, various mulching and native seed treatments were implemented to control erosion and improve native re-vegetation. The native seed collection program on the UNF and subsequent application of ~ 21,000 pounds of native seed on severely burned slopes was unprecedented, providing a unique opportunity to monitor native plant recovery, as well as weed spread. Our research team is using a combination of field-based and remotely sensed techniques to detect and monitor vegetation response and weed spread. To date, we have installed ~ 200 monitoring sites across a range of vegetation types and burn severity conditions on the School Fire.

Our research projects, funded by the USDA/USDOJ Joint Fire Science Program aim to answer the following questions:

- ✓ How do weeds respond to burn severity?
- ✓ How do weeds respond to the various post-fire erosion control treatments? To salvage logging?
- ✓ How do post-fire treatments affect soil biology such as microbial activity, and will native plant recovery be affected?
- ✓ How effective are post-fire treatments at reducing erosion? What is most effective?



Weed response to fire and post-fire treatments

Ground-based monitoring of soil and vegetation response

- Thus far, we have not seen increased weed presence in severely burned areas
- Seeded areas have high vegetation cover which may preclude invasion of weeds in these areas
- Areas that historically had heavy human and machine traffic from camping, grazing, logging, etc. are the main areas where we have seen weeds
- Plant abundance increased dramatically from early to late summer in the first year post-fire
- More changes in vegetation are expected in the upcoming seasons and will give a better indication of weed response to fire and post-fire treatments
- We found very little soil water repellency after fire, except below the soil surface in some areas severely burned

Remotely sensed monitoring of weed response

- We found several weed species on national forest and state land; most are in non-forested openings
- We mapped weed and native vegetation patches (4 to 100 m²) on the ground to test remotely sensed image detection
- Weed spread from known weed patches will be monitored and mapped

Effectiveness of post-fire treatments at reducing erosion

Low erosion rates were observed in 2006

- The event causing the most erosion occurred on June 15, 2006 had a max 10-min rainfall intensity of 1.3 in/hr
- Annual total erosion by treatment was: 0.5 tons/acre (control), 0.2 (hydromulch), 0.2 (seeded), 0.03 (wheat straw) and 0.02 (wood straw)
- Vegetation increased from early to late season on the monitored sites: 52% (hydromulch), 48% (seeded), 47% (wheat straw), 26% (control), and 18% (wood straw)

Work in progress

In year one we:

- Sampled ~200 sites in summer of 2006 (June-September) to assess early and late-season vegetation response
- Collected immediate and one-year post-fire high resolution images from the Quickbird satellite
- Installed 35 silt fences and collected sediment after five rain events on seeded, mulched, and control hillslopes
- Led two field trips with forest and district weed specialists, and UI Fire Ecology and Management class
- Participated in a panel discussion with forest and fire managers on remote sensing of burn severity and the tools managers would like to see at the Remote Sensing Application Conference in Salt Lake City, Utah
- Contributed to a forthcoming JFSP highlight article focusing on the collaboration of forest managers and researchers regarding weeds and erosion after the School Fire

In years 2-3 (summer 2007-summer 2009) we will:

- Continue field monitoring of treated, untreated, and salvaged sites
- Provide annual reports and have annual meetings with land managers to update our progress and findings

For more information

RMRS Moscow website: <http://forest.moscowfsl.wsu.edu/>

Invasive species response (coming soon) will be linked to: <http://www.cnrhome.uidaho.edu/burnseverity>

Who We Are

We are Forest Service Rocky Mountain Research Station and University of Idaho researchers working in cooperation with managers of the Umatilla National Forest and the Washington Department of Natural Resources and Department of Fish and Wildlife

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