

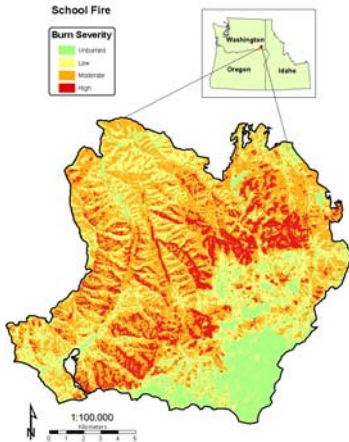


SCHOOL FIRE

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. Various mulching treatments were implemented to control erosion on steep slopes above the Tucannon River Canyon. An unprecedented native seed application (21,000 pounds on 500 acres) provided a unique opportunity to monitor the effects of seeding on native plant recovery, weed spread, and erosion control. Our research team is using a combination of field-based and remotely sensed techniques to detect and monitor vegetation response and weed spread. We installed ~ 200 monitoring sites across a range of vegetation types and burn severity conditions on the School Fire.

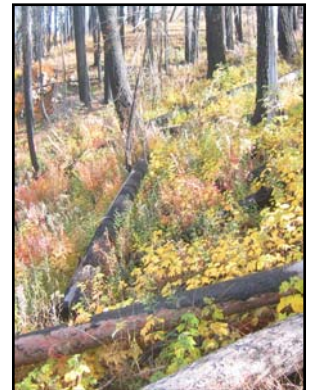
Our research projects, funded by the USDA/USDOJ Joint Fire Science Program, aim to answer the following questions:

- ✓ How do weeds respond to varying degrees of burn severity?
- ✓ How does vegetation respond to post-fire erosion control treatments? To salvage logging?
- ✓ How do post-fire treatments affect soil biology such as microbial activity?
- ✓ How effective are post-fire treatments at reducing erosion? Are there other factors besides soil erosion that need to be considered when prescribing post-fire mitigation treatments?

Weed response to fire and post-fire treatments

Ground-based monitoring of soil and vegetation response

- Thus far, we have seen some increased weed presence in the burned area
- Areas that historically had heavy human and machine traffic from camping, grazing, logging, etc. are the areas where we have seen the greatest weed response
- Vegetation abundance increased throughout the second post-fire growing season
- Seeded areas have high native grass cover which may preclude invasion of weeds, but may also be limiting native forb and shrub growth
- Wheat and wood straw mulch treatments provide the best erosion control; however wood straw decomposes slowly, tends to clump, and may inhibit native vegetation recovery
- Vegetation monitoring will continue for at least one more growing season and will give a better indication of weed response to fire and post-fire treatments, especially in the areas that were salvage logged in 2007



Remotely sensed monitoring of post-fire vegetation and mulch treatments

- We found several weedy species on national forest and state land; most are in non-forested openings
- Weeds spreading from known sources are being monitored and will be mapped
- We mapped weed, native vegetation, and mulch treatment patches (4 to 100 m²) on the ground to test remotely sensed image detection
- Wood and wheat straw were detectable and mappable in the remotely sensed imagery, indicating the likely potential for mapping similar sized patches of vegetation

Effectiveness of post-fire treatments at reducing erosion

Low erosion rates were observed in 2006 and 2007

- Low-intensity rainfall events and low rainfall totals since the fire have resulted in lower than expected sediment production collected in silt fences on severely burned steep slopes above the Tucannon River



- 2007 annual total erosion by treatment was: 0.2 tons/acre (control), 0.09 (hydromulch), 0.02 (seeded), 0.02 (wheat straw) and 0.02 (wood straw)
- These numbers represent a percent decrease from 2006 by: 58% (control), 56% (hydromulch), 88% (seeded), 26% (wheat straw) and 0% (wood straw)
- Abundant vegetation cover is part of the reason for the low erosion rates: 62% (wheat straw), 59% (hydromulch), 50% (seeded), 41% (wood), and 38% (control)
- These numbers indicate an increase in mean vegetative cover ranging from 2% (seeded) to 23% (wood straw) from the previous year

Work in progress

In 2007 we:

- Relocated plots that had been disturbed by the salvage logging operation
- Resampled ~200 sites in summer of 2007 (June-July) to assess the second-year vegetation response
- Monitored 35 silt fences for erosion, and collected sediment in the spring and fall
- Led three field trips: Idaho Native Plant Society-White Pine Chapter, WA State Resource Advisory Committee, and Univ. of Idaho Fire Management and Ecology course to educate interested individuals and professionals on our research findings
- We presented preliminary results on "Monitoring and mapping invasive species spread using remotely sensed imagery" at the Joint Conference of the Society for Ecological Restoration and Society of Wetland Scientists

In year 3 (summer 2008-summer 2009) we will:

- Continue field monitoring of treated, untreated, and salvaged sites
- Provide updated reports and have an annual meeting with land managers to report our progress and findings
- Present results on using QuickBird imagery for mapping burn severity at the Forest Service Remote Sensing Applications Center biennial meeting

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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