Maintaining Forest Trail Corridors in the Post Fire Environment

What to Expect When Your District is on Fire
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The Significance of Trails

- Earliest infrastructure
- Navigable routes
- Precursor to contemporary travel corridors
- A primary recreation resource

The Significance of Fire

- Community ecology
- Biophysical environment
- Community structure and function

Recent Trends in Trail Management

- Increasing in popularity since the end of WWII
- Decreasing budgets despite increasing use.
- Large portions of recreation budgets.
  - Fires complicate recreation management by impacting soils and vegetation.

Some General Trends in Fire Research

- Fires will increase from climate change.
- Research focuses on soils and vegetation.
- Very little research on fire and recreation.
- Nothing on fires and trails

Brief History of Trails:

- From many sources, including:
  - Game trails
  - Traditional paths
  - Abandoned transportation
  - Administrative access
Recreation trails are a relatively recent development. Most were built in the Appalachian Mountains. Usually quite steep.

Administrative access. Fire suppression. Built to accommodate pack animals.


Effects on Soils and Hydrology
- Increased snow accumulation and melt
  - Avalanching
- Higher peak flows of streams and rivers
  - Washouts near water (bank scour)
- Increased seasonal availability of soil water
- Longer season of soil movement
- Hydrophobic soils increase surface runoff
  - Increased overland flow amplifies the effects of erosion.

Effects on Forest Vegetation
- Vegetation is consumed by fire.
- Post-fire plant community composition depends on local plants’ ability to respond to fire
- Vegetative encroachment
  - Problematic until canopy closure.
  - Additional maintenance is required.

PostFire Vegetative Succession

Effects on Soils and Trails
- Fire kills trees whose roots hold soil together.
  - Mass wasting of soils
- Increased surface runoff
- Bank scour near rivers and streams
- Increased maintenance needs
- Relocation and reconstruction is often necessary.

Effects of Residual Woody Biomass
- Significant barriers to travel
  - Costly to remove.
  - Persistent

Effects of Residual Woody Biomass Continued
- Hazard trees and blowdown can persist for up to 30 years
Fires affect plant species and communities differently. Environments respond accordingly.

Noxious weeds
Exposes garbage
Alters animal habitats.

Evacuation is often necessary
Fire damages recreation sites
More hikers, fewer stock users and anglers
Displaces some recreation activities

Edible wild mushrooms often proliferate after fires.
Attractive to mushroom pickers.

Forest visitors support management ignited fires more often than they oppose it.
Short lived interest in immediate effects of fire.
Implications for public educational opportunities.
Visitor Perceptions of Fire Affected Trails

- Difficult to traverse
- Dangerous
- Interesting
- Less pleasant
- Increased visibility

Law and Policy

- Guiding policies for Federal land management agencies:
  - National Park Service Organic Act of 1916 (USC §16 §§1—18f3)
  - National Forest Management Act of 1976 (P.L. 94-588)
  - National Environmental Policy Act of 1970 (P.L. 91-190)
    - Requires comprehensive analysis for major projects

- Wilderness Act of 1964 (U.S. Public Law 88-577)
  - Provides for a primitive and unconfined type of recreation
  - Legally limits management options

- Disaster Relief Act of 1974
  - Amended by Stafford Disaster Relief and Emergency Assistance Act of 1988
  - Provides some funding for rebuilding infrastructure
  - Funding only good for a single year

Tools and Technology

- GPS/GIS integration
- Method of collecting trail monitoring data
- Attractive presentation

- Landscape level maps can illustrate where fires have potentially impacted trails.
Tools and Technology (continued)

- The resulting data can be used to prioritize current work and estimate future maintenance needs.

Possible Solutions for the 21st Century

- Increase or reinstate funding
  - Agency employees or long-term contracts
  - Organize volunteer efforts
  - Develop partnerships
  - Relocate or close trails

Conclusions:

- 2007 was the worst fire season in Idaho since 1910.
- Many affected trees will begin falling this year.
- Mass wasting will also increase.
- Forest Service budgets are declining rapidly.
- USDA 2013 budgets are $66 million less than 2012.

Literature Cited (continued)


Mike Reavis: slides 6, 8, 14, 23

Eric Kroeger: slide 12, 15, 22, 25, 28, 32

Gara et al.: slide 16

Vaux, Gardiner, and Mills: Slide 20

All other photos taken by Riley Stark