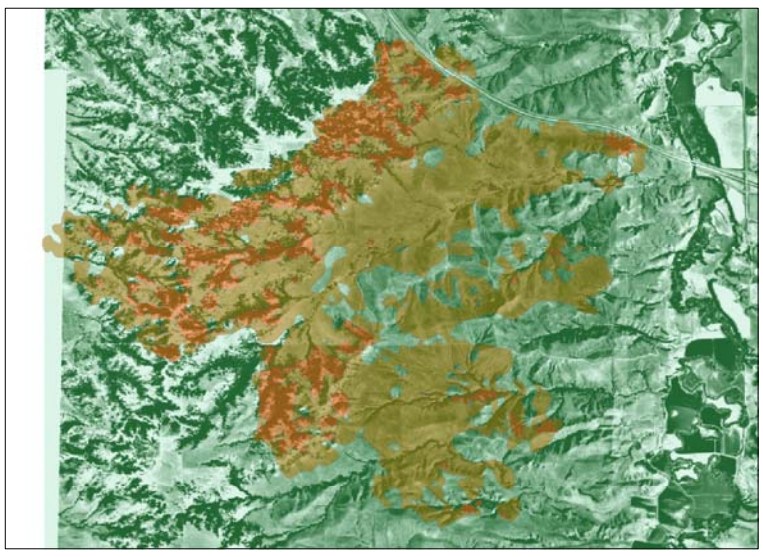
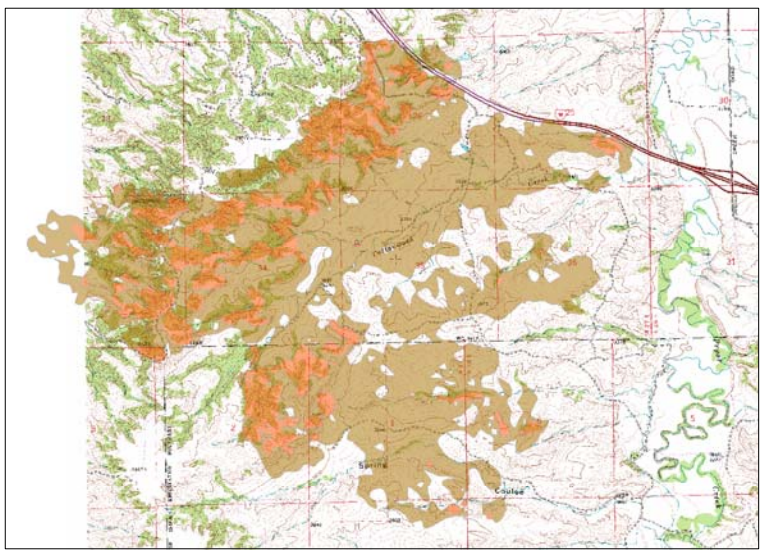
Emerald Hills Fire, Montana: Preliminary Burned Area Mapping using LANDSAT 7 Imagery and Burned Area Reflectance Classes (BARC)
August 29, 2006

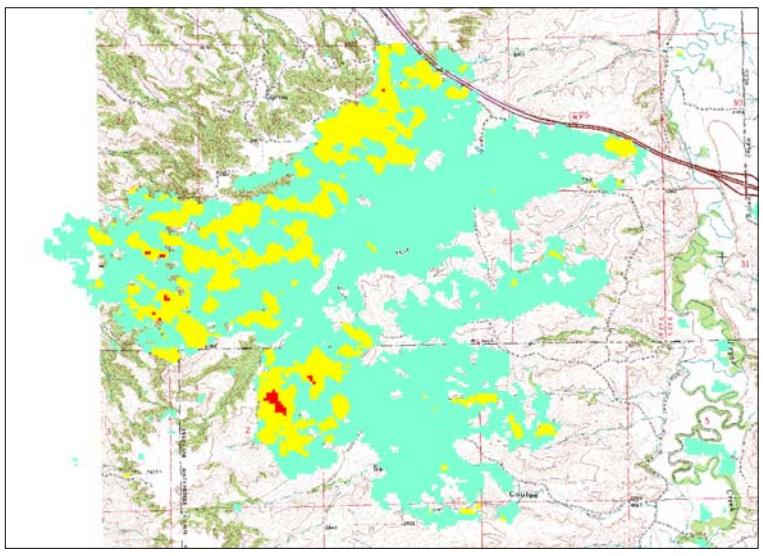
Two Interpreted Burn Classes Over An Orthophoto
Probable classes are: Brown = grassland, high intensity low severity and Orange = forest/grassland, high intensity, moderate severity (see definitions below).



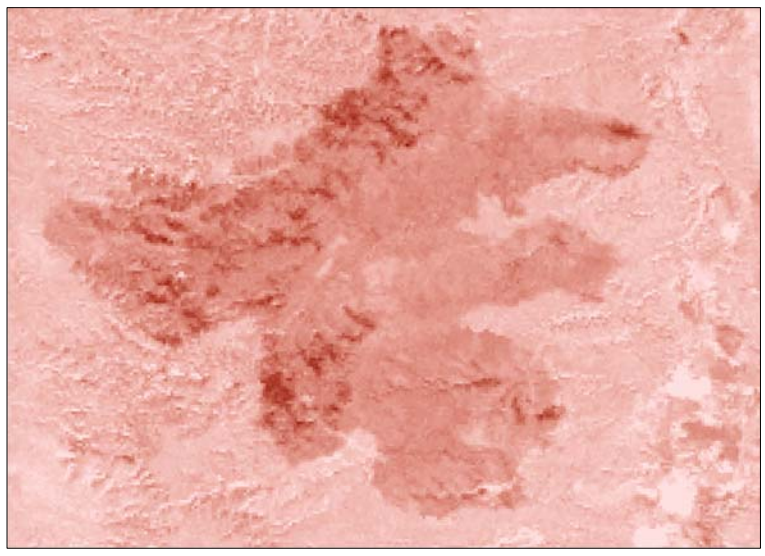
Two Interpreted Burn Classes Over A Topo Map
(Same classes as the previous map)



Four Burn Classes Over A Topo Map



Unclassified Burn Classes from BARC (256)



Burn Perimeter over Pre-Fire LANDSAT as of 09-29-2004

Burn Perimeter over Post-Fire LANDSAT as of 08-29- 2006

2006 FIRE SEASON
BURN AREA MAPPING DEFINITIONS
08/28/06
M.Nienow

INTENSITY – Fire effects on shrub or timber canopy.

1.? LOW– Leaves and needles intact and mostly green. Less than 20% mortality of shrub/timber canopy likely.

2.? MODERATE– Partial combustion of overy-story canopy, most of under-story consumed. Leaves and needles intact, but brown. 20 to 80% mortality of shrub/timber canopy likely.

3.? HIGH– Leaves and needles intact and brown with minimal consumption. More than 80% mortality of shrub/timber canopy likely.

4.? VERY HIGH– Total combustion of needles and branches up to 3/4 inch resulting in more than 80% mortality of shrub/timber canopy.

SEVERITY – Fire effects on soils and ground cover.

1.? LOW– Litter is scorched, charred or partially consumed, but duff is largely intact. Needles, cones and small branches partially consumed. Mineral soil unchanged. Black ash present.

2.? MODERATE– Duff deeply charred or consumed, but underlying mineral soil not visibly altered. Needles, cones, small branches still present, but mostly consumed. Light colored ash present.

3.? HIGH– Duff totally consumed and mineral soil visibly altered- reddish or orange colored. White ash present. Large logs are all that remain for ground fuels.

HYDROPHOBICITY- Water repellent soils

DEGREE - Time required for the absorption of a drop of water on a dry soil surface:

1.? WEAK- Less than 10 seconds.

2.? MODERATE- Between 10 and 40 seconds.

3.? STRONG - Longer than 40 seconds.

DEPTH - Depth of repellency down into soil horizon:

1.? SHALLOW- No strong repellency except at the immediate soil surface and no moderate repellency below 1/2 inch. Repellency is very spotty in occurrence.

2.? MODERATE- Some moderate repellency below 1/2 inch, but no strong repellency below 1 inch.

3.? DEEP- Moderate repellency between 3 and 6 inches or strong repellency below 1 inch. The degree of repellency is uniform in extent.

The purpose of this set of maps is to show the potential for rapid delineation of fire effects using satellite imagery.
The Emerald Hills fire occured near Billings, Montana in the Cottonwood Creek Drainage, on private land. Burned Area maps are commonly used in BAER (Burned Area Emergency Response) work in the US Forest Service to aid in determining
risks to property and life from post-fire effects.

Imagery and preliminary interpretations by RSAC (Remote Sensing Applications Center) USFS, in Salt Lake City.

Burned Area Map by Henry Shovic, Gallatin National Forest,and Mark Nienow, Custer National Forest, using limited field checking and additional remote sensing data provided
by NRIS (Montana Natural Resources Information Center)

August 29, 2006

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