

COMPOSITE BURN INDEX (CBI) PHOTO SERIES

Southwest Other – New Mexico, Ponderosa / Mixed Conifer Forest

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The Composite Burn Index (CBI) Photo Series uses plot photos and data to illustrate the range of burn severity encountered across ecosystems of the U.S. We selected examples from over 2,500 plots and 85 fires, spanning very low to very high degrees of ecological change from fire. The series offers managers and scientists a way to calibrate their field interpretations, providing a sense of what the CBI represents visually on the ground. It also provides insight into the variety of fire effects and combinations of effects that make up the overall post-fire condition on a site. One can see that low and high severity conditions may be relatively distinctive and consistent, while there are many possible ways involving different combinations of dissimilar levels of effect that can end up in the moderate range of severity overall. Hence, mid-range CBI values often translate into variable and broader ranges of possible conditions that may be more difficult to interpret. This poster covers the Cerro Grande and Viveash fires (2000) in New Mexico. The fires were field sampled by National Park Service and USGS in 2001 and 2002.

The CBI is a 0.0 to 3.0 field rating of burn conditions averaged over a site. It is based on averaging 4-5 rating factors within each of 5 strata (A - E), and within Understory (A - C), Overstory (D - E) and over all for rating the Total Plot (A - E.)

Viveash Fire 2000
2001 Plot V1B



85% burn; consistent low impacts over all strata. Litter and light fuels <50% consumed; duff lightly charred; larger fuels 10% loss. No increase in exposed soil. About 95% herbs and grass resprouting, no colonizers. Stratum C 60% scorched or charred with >90% green or resprouting. Overstory strata crowns 80% green, 15% scorched, no char. Ground char up to 1.8 m. Perhaps up to 5% latent mortality. Ponderosa/Limber Pine/White Fir/Douglas Fir mixed conifer community.

PLOT V1B

A. Substrates	0.65
B. Vegetation < 1 m.	0.17
C. Vegetation 1-5 m.	0.88
D. Intermediate Trees	0.63
E. Big Trees	0.75
Understory CBI	0.60
Overstory CBI	0.69
Total Plot CBI	0.64

Viveash Fire 2000
2001 Plot V3



100% burn; mixed low to moderate impacts. Sapling trees impacted the most; big trees the least. Litter and light fuels <75% consumed; duff 30%; larger fuels 20%-30%. 25% increase in exposed soil. About 70% herbs and grass resprouting, notable colonizers. Stratum C 85% scorched or charred with 50% surviving; high mortality of sapling conifers. Overstory strata crowns 60-70% green, 30-40% scorched, no char. Ground char 1-1.5 m; <20% canopy mortality. Ponderosa Pine/Douglas Fir mixed conifer community.

PLOT V3

A. Substrates	1.41
B. Vegetation < 1 m.	1.40
C. Vegetation 1-5 m.	1.95
D. Intermediate Trees	1.00
E. Big Trees	0.63
Understory CBI	1.52
Overstory CBI	0.81
Total Plot CBI	1.20

Cerro Grande Fire 2000
2001 Plot CG2B



100% burn; moderate-high impacts to substrates and trees are offset by lower impacts to herbs and shrubs. Litter and light fuels essentially consumed; duff >70%; larger fuels >50%. Notable increase in exposed soil. About 70% herbs and grass resprouting with moderate new colonizing grasses and forbs. 60-90% Shrub crowns charred or consumed but >90% resprouting. Overstory crowns about 30% charred and 70% scorch-girdled, no green. Ground char height > 5 m. Ponderosa Pine community.

PLOT CG2B

A. Substrates	2.75
B. Vegetation < 1 m.	1.50
C. Vegetation 1-5 m.	0.63
D. Intermediate Trees	2.38
E. Big Trees	N/A
Understory CBI	1.73
Overstory CBI	2.38
Total Plot CBI	1.89

Cerro Grande Fire 2000
2001 Plot CG1



100% burn; high charring and consumption throughout is moderated by significant herb/grass regrowth and suckering of aspen. High consumption of litter and light fuels > 95%; duff 75%; larger fuels >35% with deep char. About 60% increase in soil cover with color change. 90% stratum B survival with contribution from suckering aspen. Taller shrubs and small trees largely charred or consumed; 25-30% resprouting. Intermediate and big trees high 100% mortality due to torch-char with notable branch loss. Ponderosa Pine/Aspen community.

PLOT CG1

A. Substrates	2.44
B. Vegetation < 1 m.	1.00
C. Vegetation 1-5 m.	2.57
D. Intermediate Trees	3.00
E. Big Trees	3.00
Understory CBI	2.08
Overstory CBI	3.00
Total Plot CBI	2.47

Cerro Grande Fire 2000
2001 Plot CG3A



100% burn; high charring and consumption throughout. Complete consumption of litter, light fuels, and duff; larger fuels >80%. Increase in soil cover >80% with color change. Stratum B survival <20%, a few colonizers. Stratum C largely charred or consumed; 30-35% basal sprouting. Intermediate and big trees high 100% mortality mostly due to torch-char with notable branch loss, but 5-10% scorched crowns remain. Ponderosa Pine community.

PLOT CG3A

A. Substrates	2.90
B. Vegetation < 1 m.	2.73
C. Vegetation 1-5 m.	2.53
D. Intermediate Trees	2.93
E. Big Trees	2.93
Understory CBI	2.73
Overstory CBI	2.93
Total Plot CBI	2.81

Cerro Grande Fire 2000
2002 Plot CG517



Patchy burn with light charring of understory throughout. Consumption of litter and light fuels 50%; duff 25%; larger fuels 10%. Small 10% change in soil cover. Regenerated forbs and grasses dominate understory. Sapling tree mortality is 40%. Little to no change in species composition. Tree char height is < 1.5 m. Overstory trees show < 5% torch-char, 10-25% scorch-girdle. Ponderosa Pine community.

PLOT CG517

A. Substrates	0.90
B. Herbs and Shrubs	0.17
C. Tall Shrubs and Trees	1.35
D. Intermediate Trees	0.90
E. Big Trees	1.40
Understory CBI	0.87
Overstory CBI	1.15
Total Plot CBI	0.98

Cerro Grande Fire 2000
2002 Plot CG202



95% burn; mostly low-moderate effects reduced overall by very low big tree score. Consumption of litter and light fuels 70%; duff 50%; no larger fuels present. 25% change in soil cover. About 90% regenerated forbs and grasses. Moderate colonizer establishment. Slight change in species composition. Stratum C mostly Gambel oak; tops charred branches largely remaining, 90%+ survival. Intermediate tree crowns 60% green; 35% scorched; 5% char; Big trees only 5% scorched. Overall tree mortality 5%. Ponderosa Pine/Gambel oak community.

PLOT CG202

A. Substrates	1.60
B. Herbs and Shrubs	1.33
C. Tall Shrubs and Trees	1.60
D. Intermediate Trees	1.33
E. Big Trees	0.35
Understory CBI	1.51
Overstory CBI	0.84
Total Plot CBI	1.19

Cerro Grande Fire 2000
2001 Plot CG4A



100% burn; moderate-high impacts throughout. Litter, light fuels and duff 80-90% consumed; larger fuels near 50%. Increase in exposed soil 60%. About 60% herbs and grass resprouting; moderate new colonizers. 95% Shrub crowns charred or consumed; 90% viable and resprouting. Intermediate trees about 90% charred, 10% scorched. Big trees 40% charred, 50% scorched, 10% green. Ground char height > 6 m. Ponderosa Pine community.

PLOT CG4A

A. Substrates	2.49
B. Vegetation < 1 m.	1.70
C. Vegetation 1-5 m.	1.87
D. Intermediate Trees	2.88
E. Big Trees	2.25
Understory CBI	2.10
Overstory CBI	2.52
Total Plot CBI	2.27

Cerro Grande Fire 2000
2001 Plot CG5



100% burn; consistent moderate-high impacts. Litter, light fuels and duff 80-90% consumed; larger fuels near 60%. Increase in exposed soil >60%. About 60% herbs and grass regrowth; new colonizers moderate. Stratum C crowns 95% consumed-charred; Gambel oak 90% resprouting; dead conifer saplings. Intermediate trees 90% charred, 10% scorched. Big trees 80% charred, 20% scorched, no green. Ground char height > 6 m. Mostly young Ponderosa Pine/Gambel oak community.

PLOT CG5

A. Substrates	2.55
B. Vegetation < 1 m.	2.02
C. Vegetation 1-5 m.	1.85
D. Intermediate Trees	2.86
E. Big Trees	2.64
Understory CBI	2.18
Overstory CBI	2.75
Total Plot CBI	2.43

Cerro Grande Fire 2000
2002 Plot CG201



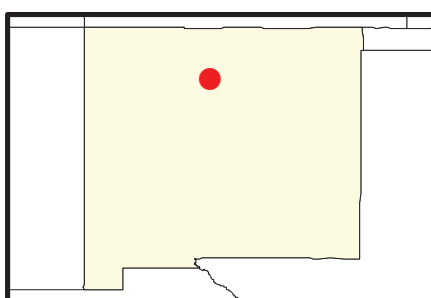
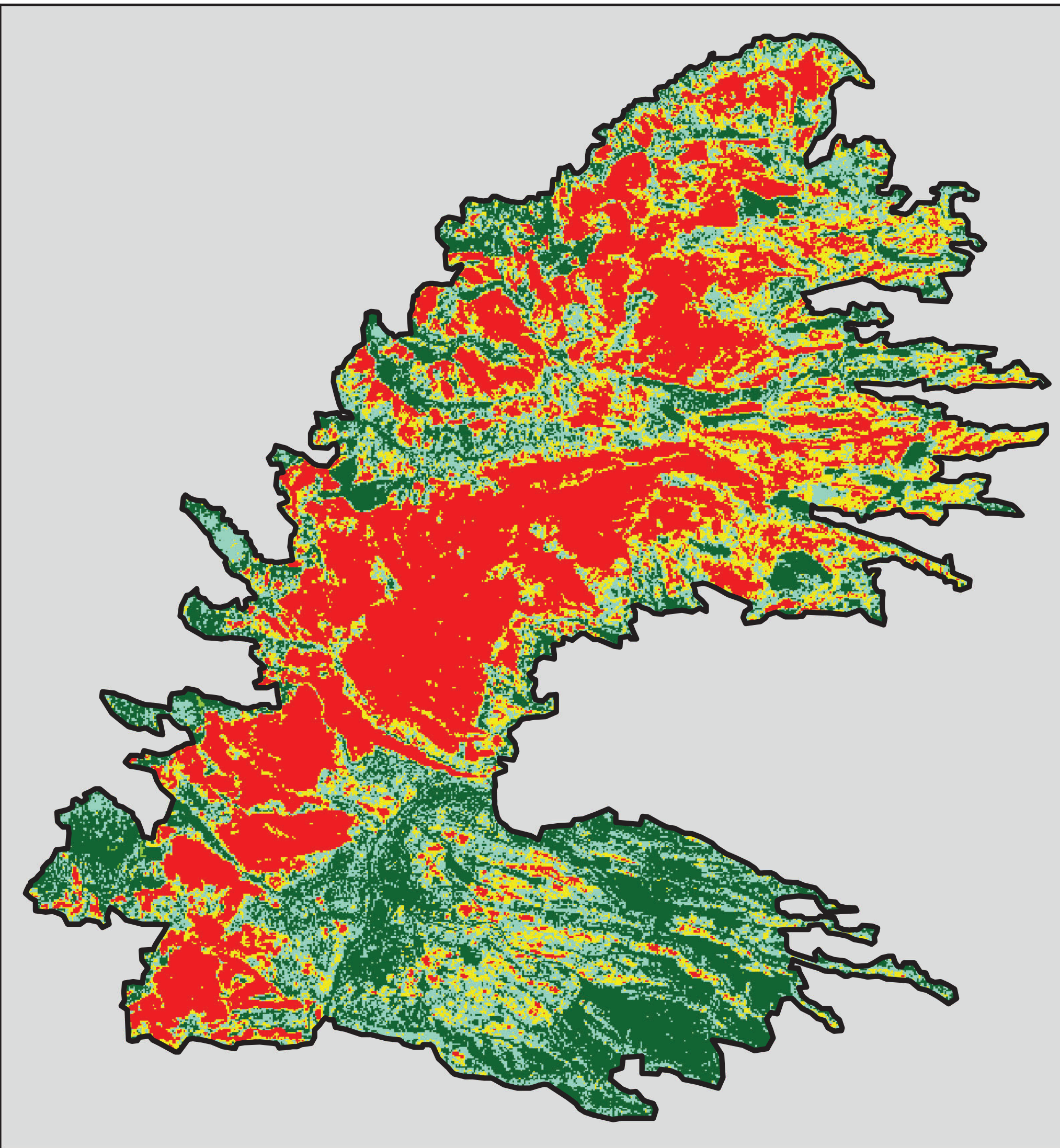
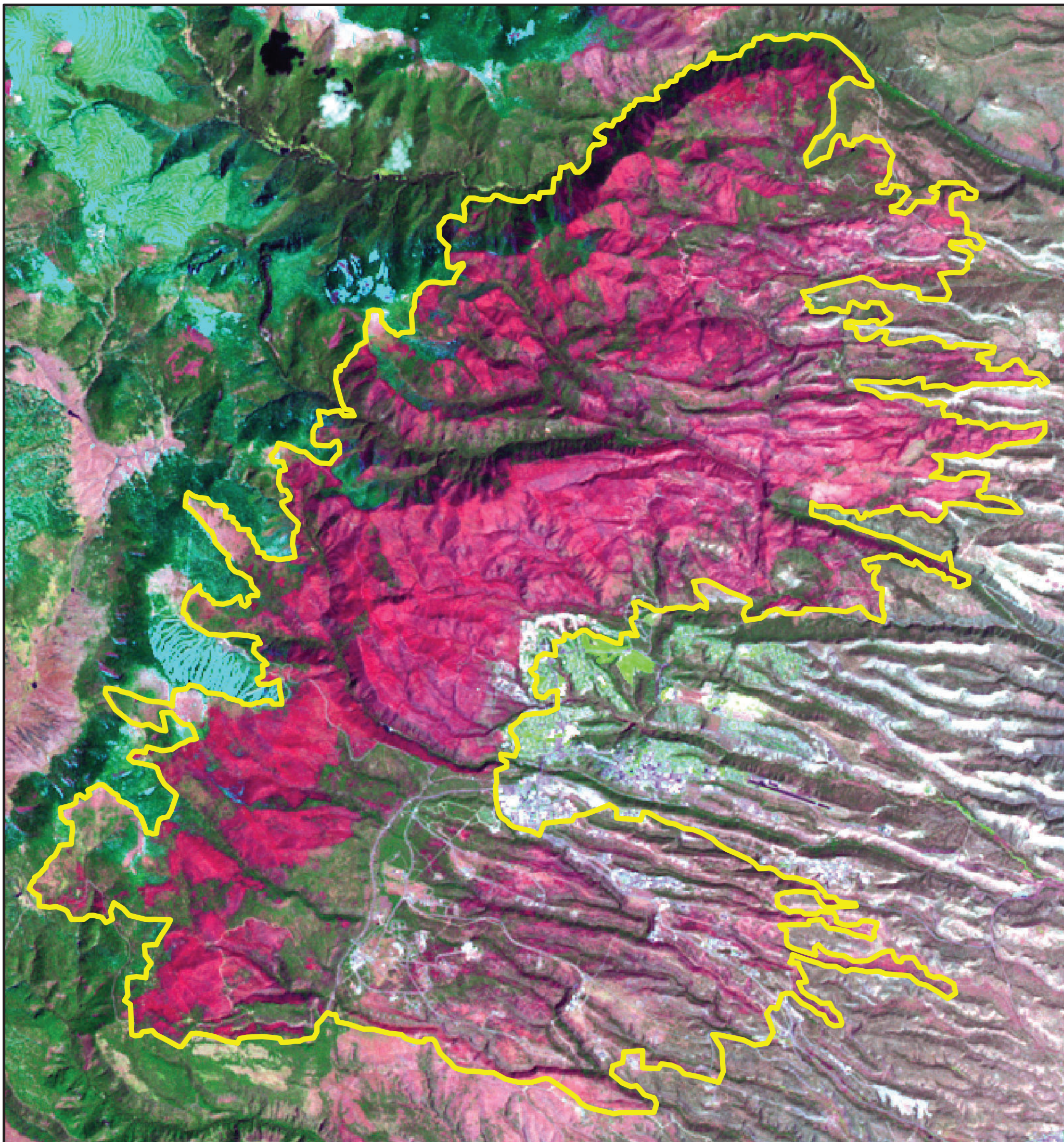
100% burn; high consumption and charring throughout. Complete consumption of litter, light fuels, and duff; larger fuels >80%. Increase in soil cover 80% with color change. Stratum B survival 20%, a few colonizers. Stratum C saplings charred or consumed; no shrubs evident. Intermediate and big trees 100% mortality due to torch-char with notable branch loss, except 5% big tree crowns scorched. Young Ponderosa Pine community.

PLOT CG201

A. Substrates	2.92
B. Vegetation < 1 m.	2.30
C. Vegetation 1-5 m.	3.00
D. Intermediate Trees	3.00
E. Big Trees	2.97
Understory CBI	2.77
Overstory CBI	2.98
Total Plot CBI	2.85

2000 New Mexico: CERRO GRANDE

nm3590710632420000505



Latitude: 35° 54' 25.2"
 Longitude: -106° 19' 26.4"
 Fire Ignition Date: May 05, 2000
 Assessment Type: Extended
 Pre-Fire Image Date: April 14, 2000 (Landsat 7)
 Post-Fire Image Date: April 25, 2001 (Landsat 5)



Acreage of Burn Severity

Burn Severity	Acres
Unburned to Low	11,515
Low	10,098
Moderate	8,129
High	14,504
Increased Greenness	34
Non-Processing Area Mask*	0
Total	44,280

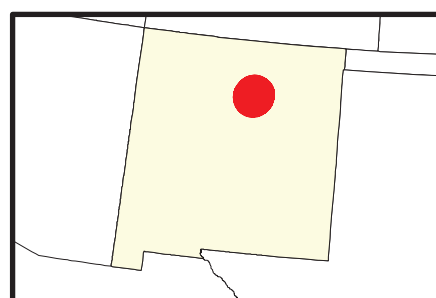
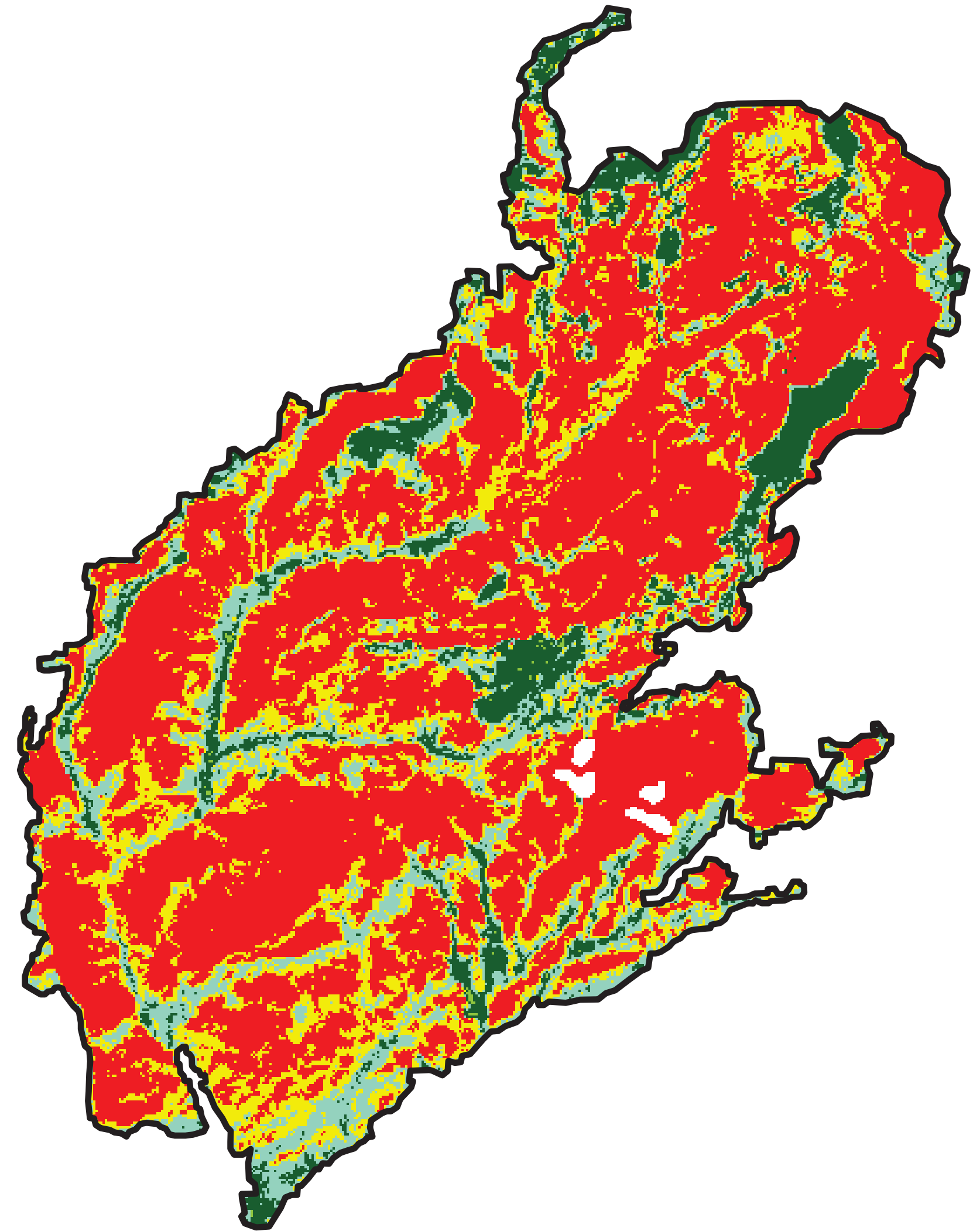
This map portrays fire severity for the fire specified in the map title and summarizes proportions of fire severity classes. These data are produced under the Monitoring Trends in Burn Severity (MTBS) project jointly implemented by the USGS EROS and the USFS RSAC. The MTBS project ascertains the locations of fires based on available fire occurrence information provided by federal and state agencies, and other reliable sources. The MTBS project reserves the right to correct, update or modify geospatial inputs to this map without notification.

* Areas in either the pre-fire or post-fire reflectance imagery containing clouds, snow, shadows, smoke, significantly sized water bodies, missing lines of image data, etc.



2000 New Mexico: VIVEASH

nm3570310559420000529



Latitude: 35° 42' 18.0"
 Longitude: -105° 35' 34.8"
 Fire Ignition Date: May 29, 2000
 Assessment Type: Extended
 Pre-Fire Image Date: June 13, 1998 (L5)
 Post-Fire Image Date: June 05, 2001 (L5)



This map portrays fire severity for the fire specified in the map title and summarizes proportions of fire severity classes. These data are produced under the Monitoring Trends in Burn Severity (MTBS) program jointly implemented by the USGS EROS and the USFS GTAC. The MTBS program ascertains the locations of fires based on available fire occurrence information provided by federal and state agencies, and other reliable sources. The MTBS program reserves the right to correct, update or modify geospatial inputs to this map without notification.

* Areas in either the pre-fire or post-fire reflectance imagery containing clouds, snow, shadows, smoke, significantly sized water bodies, missing lines of image data, etc.



Acreage of Burn Severity	
Burn Severity	Acres
Unburned to Low	2,050
Low	3,069
Moderate	4,495
High	12,743
Increased Greenness	22
Non-Processing Area Mask*	86
Total	22,465