

COMPOSITE BURN INDEX (CBI) PHOTO SERIES

Southwest Other – Utah, Piñon/Juniper/Sage Communities



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 two Utah fires from 2002 that were field sampled in 2003 by National Park Service and USGS crews.

Carl Key, USGS Northern Rocky Mountain Science Center; Nate Benson, NPS Fire Management Program Center; Scott Lang, NPS Glacier. 2007.

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

Sanford Fire 2002
2003 Plot 51 CBI = 0.74



Patchy 25% burn with light understory charring throughout. Low 10% consumption of litter and duff. Small change in soil cover and color 10%. Regenerated forbs/grasses and sage dominate understory. Mostly Juniper and some piñon counted in shrub and small tree mortality of 25%, 75% green. No overstory counted. Pinyon/Juniper/Sage Grassland community.

PLOT 51

A. Substrates	0.60
B. Vegetation < 1 m.	0.15
C. Vegetation 1-5 m.	1.67
D. Intermediate Trees	N/A
E. Big Trees	N/A
Understory CBI	0.74
Overstory CBI	N/A
Total Plot CBI	0.74

Sanford Fire 2002
2003 Plot T-A CBI = 1.30



Patchy 30% burn with light charring throughout. Low consumption of litter and duff 15%. Small 10-15% increase in soil cover. Regenerated forbs/grasses and sage dominate understory with some patches of sprouting shrubs and colonizers. Mostly Juniper counted in shrub and small tree mortality of 55%, mostly due to scorch. Pinyon/ Juniper/Sage Grassland community.

PLOT T-A

A. Substrates	0.17
B. Vegetation < 1 m.	1.10
C. Vegetation 1-5 m.	2.40
D. Intermediate Trees	N/A
E. Big Trees	N/A
Understory CBI	1.30
Overstory CBI	N/A
Total Plot CBI	1.30

Bear Fire 2002
2003 Plot 53 CBI = 1.95



85% burn with moderate-high charring or consumption of understory throughout. Moderate-high >70% consumption of litter and duff. Consumption of down fuels 30%. 50% increase in soil cover. Some patches of sage, sprouting shrubs and colonizing grasses. Effects on Juniper elevated stratum C score; 80% scorched, 20% charred. Pinyon/Juniper/Sage Grassland community.

PLOT 53

A. Substrates	1.70
B. Vegetation < 1 m.	1.23
C. Vegetation 1-5 m.	2.93
D. Intermediate Trees	N/A
E. Big Trees	N/A
Understory CBI	1.95
Overstory CBI	N/A
Total Plot CBI	1.95

Bear Fire 2002
2003 Plot 03A CBI = 2.59



Consistent 100% burn with high consumption or charring throughout. High consumption of litter and duff > 80%. High consumption of down fuels > 40%. 70% increase in soil cover and some color change. Some sprouting shrubs and colonizing grasses; sage consumed. Juniper 50% scorched, 50% charred. Juniper/ Sage Grassland community.

PLOT 03A

A. Substrates	2.85
B. Vegetation < 1 m.	2.00
C. Vegetation 1-5 m.	2.93
D. Intermediate Trees	N/A
E. Big Trees	N/A
Understory CBI	2.59
Overstory CBI	N/A
Total Plot CBI	2.59

Bear Fire 2002
2003 Plot 45 CBI = 2.86



Consistent 100% burn with high consumption or charring throughout. High consumption of litter and duff > 95%. High consumption of down fuels > 80%. High > 80% increase in soil cover with change in color. Essentially no resprouting. Piñon and less juniper counted in stratum C mortality of 100% with significant branch loss. Pinyon/Juniper/Sage Grassland community.

PLOT 45

A. Substrates	2.93
B. Vegetation < 1 m.	2.75
C. Vegetation 1-5 m.	2.93
D. Intermediate Trees	N/A
E. Big Trees	N/A
Understory CBI	2.86
Overstory CBI	N/A
Total Plot CBI	2.86

Bear Fire 2002
2003 Plot 12 CBI = 0.69



30% burn mostly in the foreground plot quarter section. About 25% litter consumed plotwide. Sage Grassland community. About 90% pre-fire vegetation resprouting with some loss of sage in burned section.

PLOT 12

A. Substrates	0.83
B. Vegetation < 1 m.	0.57
C. Vegetation 1-5 m.	N/A
D. Intermediate Trees	N/A
E. Big Trees	N/A
Understory CBI	0.69
Overstory CBI	N/A
Total Plot CBI	0.69

Bear Fire 2002
2003 Plot 13 CBI = 1.83



100% burned. 75% litter consumed; 40% increase in exposed soil. About 70% forbs and grasses resprouting with loss of most but not all pre-fire low-density sage. Low amount of new colonizers. Sage Grassland community.

PLOT 13

A. Substrates	2.03
B. Vegetation < 1 m.	1.68
C. Vegetation 1-5 m.	N/A
D. Intermediate Trees	N/A
E. Big Trees	N/A
Understory CBI	1.83
Overstory CBI	N/A
Total Plot CBI	1.83

Sanford Fire 2002
2003 Plot 103 CBI = 2.17



100% burn with fairly high charring or consumption of understory throughout. >70% consumption of litter. No down fuels > 100-hour. 60% increase in soil cover. Sage mostly consumed, 60% forbs resprouting with colonizing grasses. Effects on Juniper elevated stratum C score; 70% scorched, 10% charred, 20% green. Pinyon/ Juniper/Sage Grassland community.

PLOT 103

A. Substrates	1.85
B. Vegetation < 1 m.	1.63
C. Vegetation 1-5 m.	2.88
D. Intermediate Trees	N/A
E. Big Trees	N/A
Understory CBI	2.17
Overstory CBI	N/A
Total Plot CBI	2.17

Sanford Fire 2002
2003 Plot 32 CBI = 2.72



95% burn with high charring or consumption of understory throughout. High >90% consumption of litter and duff. No down fuels > 100-hour. 70% increase in soil cover. Sage mostly consumed, forbs and colonizing grasses resprouting frequency is only 20%. Effects on Juniper elevated stratum C score; 100% mortality, 50% scorched, 50% charred. Pinyon/ Juniper/Sage Grassland community.

PLOT 32

A. Substrates	2.55
B. Vegetation < 1 m.	2.70
C. Vegetation 1-5 m.	2.87
D. Intermediate Trees	N/A
E. Big Trees	N/A
Understory CBI	2.72
Overstory CBI	N/A
Total Plot CBI	2.72

Bear Fire 2002
2003 Plot 05B CBI = 2.75



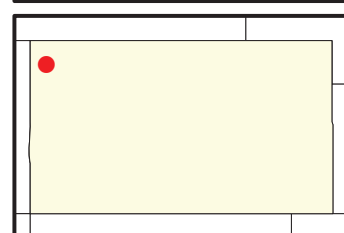
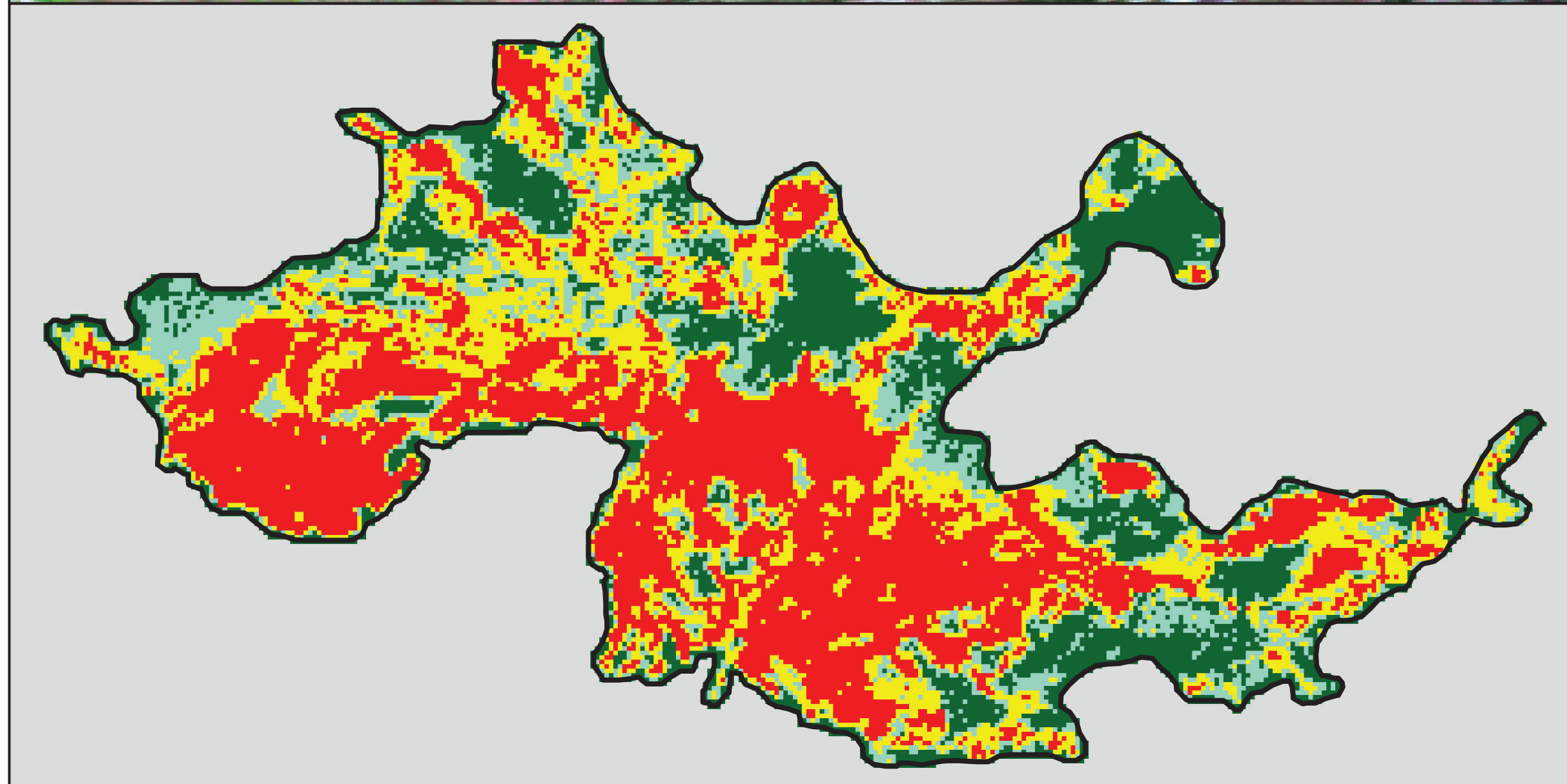
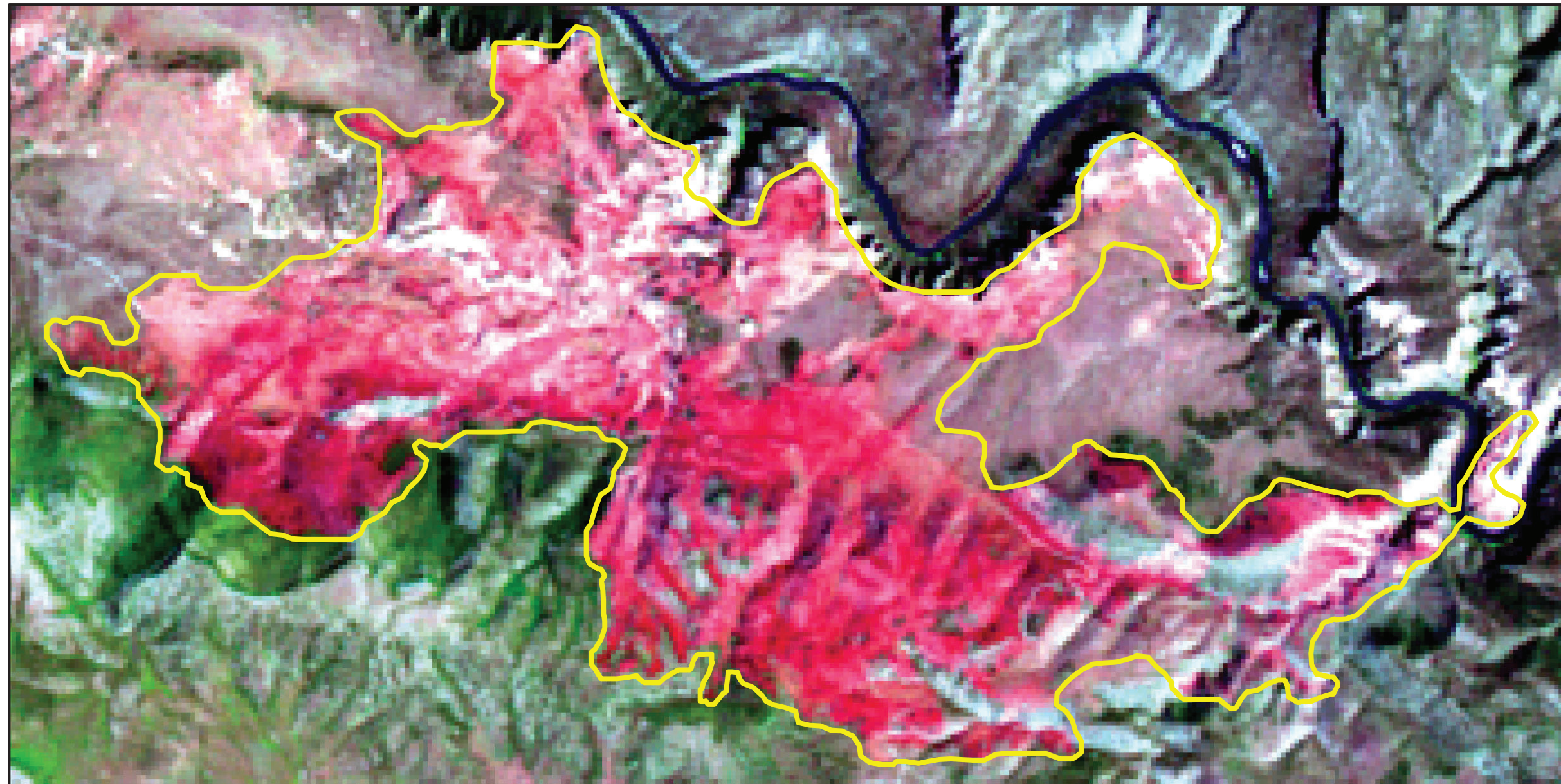
100% burned. Pre-fire was predominantly sage with a few small junipers. All litter consumed; about 80% increase in exposed soil. High degree of new colonizer species, and change in species composition. Little resprouting of pre-fire vegetation. Sage Grassland community.

PLOT 05B

A. Substrates	2.98
B. Vegetation < 1 m.	2.53
C. Vegetation 1-5 m.	N/A
D. Intermediate Trees	N/A
E. Big Trees	N/A
Understory CBI	2.75
Overstory CBI	N/A
Total Plot CBI	2.75

2002 Colorado: BEAR

co4044610867120020627



Latitude: 40° 26' 45.6"
 Longitude: -108° 40' 15.6"
 Fire Ignition Date: June 27, 2002
 Assessment Type: Extended
 Pre-Fire Image Date: June 13, 2002 (Landsat 5)
 Post-Fire Image Date: July 02, 2003 (Landsat 5)



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.

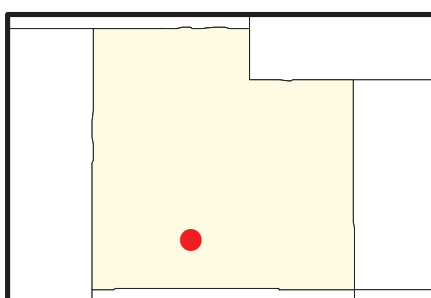
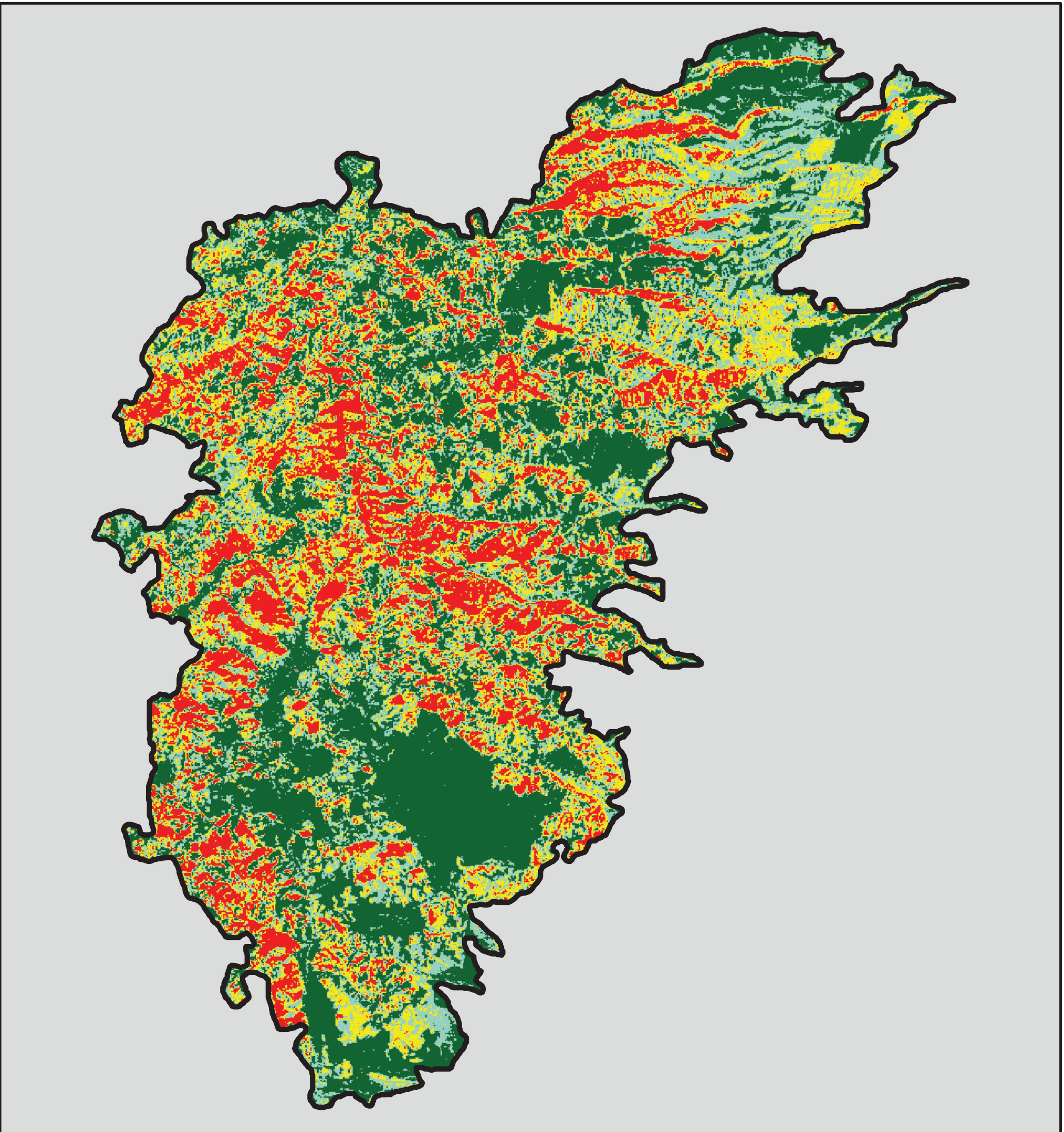
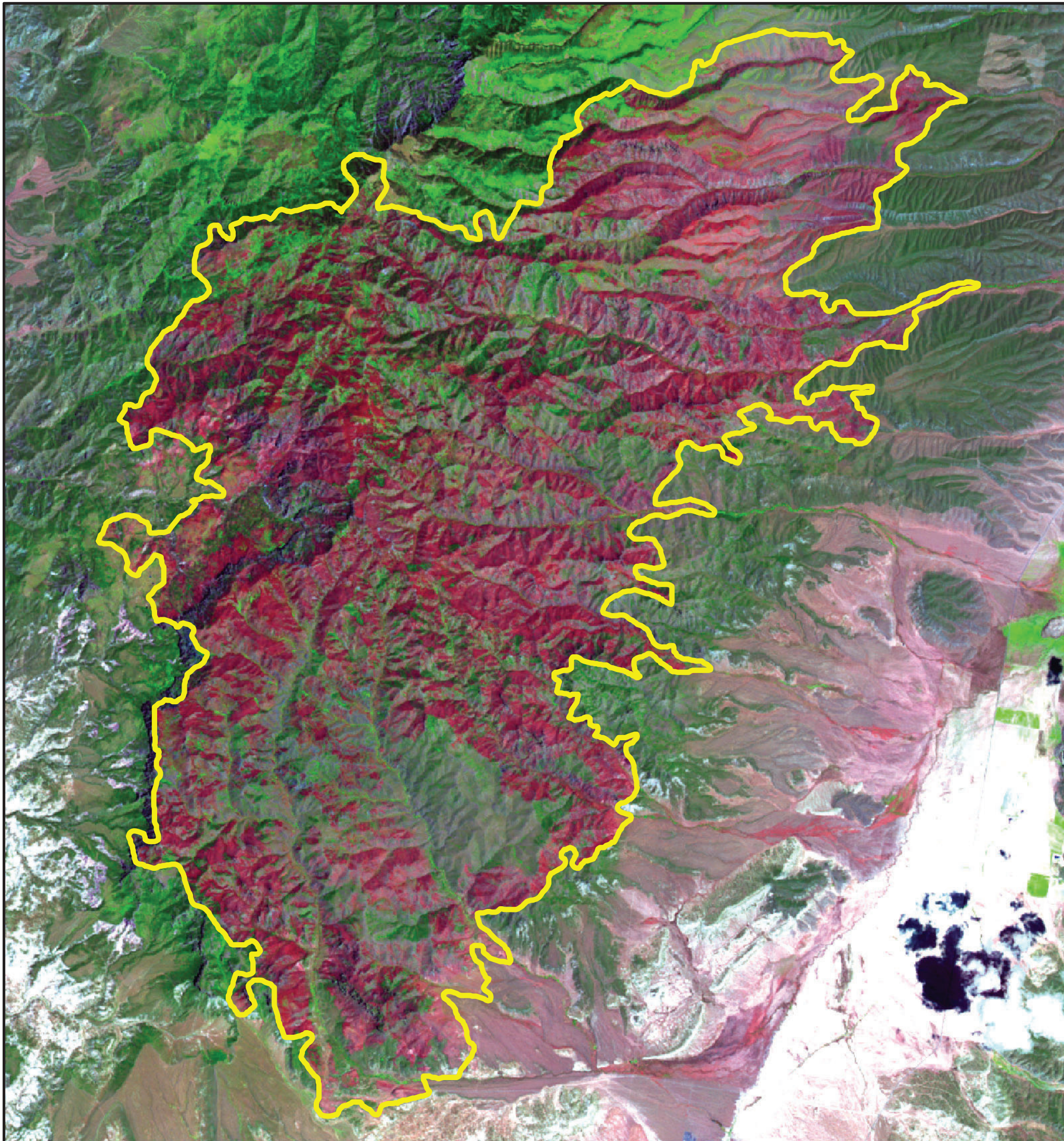


Acreage of Burn Severity

Burn Severity	Acres
Unburned to Low	1,062
Low	772
Moderate	1,300
High	1,842
Increased Greenness	1
Non-Processing Area Mask*	0
Total	4,977

2002 Utah: SANFORD

ut3793611217320020531



Latitude: 37° 56' 09.6"
 Longitude: -112° 10' 22.8"
 Fire Ignition Date: May 31, 2002
 Assessment Type: Extended
 Pre-Fire Image Date: June 16, 2001 (Landsat 7)
 Post-Fire Image Date: June 14, 2003 (Landsat 5)



Acreage of Burn Severity

Burn Severity	Acres
Unburned to Low	29,460
Low	18,838
Moderate	18,810
High	14,722
Increased Greenness	23
Non-Processing Area Mask*	0
Total	81,852

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