

COMPOSITE BURN INDEX (CBI) PHOTO SERIES

California Other – Southern Sierra Chaparral / Open Conifer 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 the 2002 McNally Fire in California southern Sierra Nevada that was field sampled the following summer (2003) by National Park Service and USGS crews.

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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.

McNally Fire 2002
2003 Plot 73A CBI = 0.00



Unburned. 40% litter cover; 5-10% duff; 20-30% pre-fire exposed soil and rock. 35% cover bunch grasses, perennial herbs and annuals. Open 25-30% cover large shrubs, with a few oak and pine trees (15% cover), Mountain mahogany, Cercocarpus, Flannel brush, Manzanita mixed Chaparral/Oak/Pine community.

PLOT 73A

A. Substrates	0.00
B. Vegetation < 1 m.	0.00
C. Vegetation 1-5 m.	0.00
D. Intermediate Trees	0.00
E. Big Trees	N/A
Understory CBI	0.00
Overstory CBI	0.00
Total Plot CBI	0.00

McNally Fire 2002
2003 Plot 24 CBI = 1.38



100% burn with light charring throughout. Litter 50% consumed, duff 30%. Down fuels over 100-hour not present. Small 15% change in soil cover and color. Regenerated forbs and grasses dominate understory with some patches of sprouting shrubs and colonizers. Large shrub mortality is low near 15%, but moderate-high change in cover. No overstory trees. Mountain mahogany, Cercocarpus, Flannel brush, Manzanita mixed Chaparral/grass type.

PLOT 24

A. Substrates	1.07
B. Vegetation < 1 m.	0.87
C. Vegetation 1-5 m.	2.00
D. Intermediate Trees	N/A
E. Big Trees	N/A
Understory CBI	1.38
Overstory CBI	N/A
Total Plot CBI	1.38

McNally Fire 2002
2003 Plot 2 CBI = 1.84



100% burn with 60% litter and light fuel consumed, and about 20% increase in exposed soil/rock. Stratum B shows 70% survival with a moderate amount of colonizing grasses and annuals. Larger shrubs top-killed by torch-char with branch consumption, and about 40% resprouting. Moderate-high potential change in species composition. No trees. Mountain mahogany, Cercocarpus, Flannel brush, Manzanita mixed Chaparral/Oak grass type.

PLOT 2

A. Substrates	1.17
B. Vegetation < 1 m.	1.65
C. Vegetation 1-5 m.	2.45
D. Intermediate Trees	N/A
E. Big Trees	N/A
Understory CBI	1.84
Overstory CBI	N/A
Total Plot CBI	1.84

McNally Fire 2002
2003 Plot 65 CBI = 2.10



100% burn with moderate charring in understory, and relatively high effects in the overstory. Moderate consumption of litter and duff 40-60%. Down fuels over 100-hour not present. Moderate 35% change in soil cover and color. Small patches of sprouting shrubs and colonizing grasses. Shrub and small tree mortality is high > 80% with high change in cover. Tree mortality is 100% from 85% scorch-girdle, 15% torch-char. One tree stratum. Mountain mahogany, Cercocarpus, Flannel brush, Manzanita mixed Chaparral/Oak/Pine community.

PLOT 65

A. Substrates	1.27
B. Vegetation < 1 m.	1.67
C. Vegetation 1-5 m.	2.80
D. Intermediate Trees	2.30
E. Big Trees	N/A
Understory CBI	2.00
Overstory CBI	2.30
Total Plot CBI	2.10

McNally Fire 2002
2003 Plot 11 CBI = 2.33



100% burn with 100% litter, 75% light fuel and duff consumed. About 40% increase in exposed soil. Stratum B shows < 20% survival, with moderate-high potential change in species composition. Larger shrubs top-killed by torch-char with some branch loss; close to 70% surviving. No green trees; 100% canopy mortality; 40-50% torch-char; 50-60% scorch-girdle. Mountain mahogany, Cercocarpus, Flannel brush, Manzanita mixed Chaparral/Oak/Pine type.

PLOT 11

A. Substrates	2.10
B. Vegetation < 1 m.	2.50
C. Vegetation 1-5 m.	2.15
D. Intermediate Trees	2.38
E. Big Trees	2.50
Understory CBI	2.24
Overstory CBI	2.44
Total Plot CBI	2.33

McNally Fire 2002
2003 Plot 3 CBI = 0.81



Patchy 50% burn with only light charring of understory throughout. 10% consumption of down fuels. Small 5% increase in soil cover. Regenerated forbs and grasses dominate understory. Shrub and small tree mortality is only 10%. Overstory tree mortality is 15% with char height < 1 m. One tree stratum. Mountain mahogany, Cercocarpus, Flannel brush, Manzanita mixed Chaparral/Oak/Pine community.

PLOT 3

A. Substrates	0.80
B. Vegetation < 1 m.	0.30
C. Vegetation 1-5 m.	1.25
D. Intermediate Trees	N/A
E. Big Trees	0.86
Understory CBI	0.78
Overstory CBI	0.86
Total Plot CBI	0.81

McNally Fire 2002
2003 Plot 37 CBI = 1.78



100% burn with 70% litter and light fuel consumed, and about 30% newly exposed soil. Stratum B survival 80% with a moderate amount of colonizing grasses and annuals. Larger shrubs mostly top-killed by scorch-girdle, little branch consumption, and 85% resprouting. Big trees show 50% char and 50% scorch with 100% canopy mortality. Mountain mahogany, Cercocarpus, Flannel brush, Manzanita mixed Chaparral/Oak/Pine community.

PLOT 37

A. Substrates	1.37
B. Vegetation < 1 m.	1.30
C. Vegetation 1-5 m.	1.73
D. Intermediate Trees	N/A
E. Big Trees	2.50
Understory CBI	1.49
Overstory CBI	2.50
Total Plot CBI	1.78

McNally Fire 2002
2003 Plot 22 CBI = 2.04



100% burn with 100% litter and 70% light fuel consumed; about 20% newly exposed soil. Stratum B survival 40% with a moderate amount of colonizing grasses and annuals, and low-moderate change in species composition. Larger shrubs top-killed by scorch and char; modest branch loss; 75% resprouting. No overstory trees. Flannel brush, Mountain mahogany, Cercocarpus, Manzanita, mixed Chaparral shrub/grass community.

PLOT 22

A. Substrates	2.13
B. Vegetation < 1 m.	2.10
C. Vegetation 1-5 m.	1.90
D. Intermediate Trees	N/A
E. Big Trees	N/A
Understory CBI	2.04
Overstory CBI	N/A
Total Plot CBI	2.04

McNally Fire 2002
2003 Plot 18B CBI = 2.26



100% burn except 25% pre-fire rock cover. 95% litter, light fuel and duff consumed. About 35% increase in exposed soil/rock. Stratum B shows 80-90% survival, but moderate amount of colonizing grasses and annuals. Moderate-high potential change in species composition. Larger shrubs top-killed by torch-char with some branch loss, and 20% surviving. About 10% pre-fire tree cover was 100% killed mostly by scorch and a trace amount of char. Mountain mahogany, Cercocarpus, Flannel brush, Manzanita mixed Chaparral/Oak/Pine type.

PLOT 18B

A. Substrates	2.53
B. Vegetation < 1 m.	1.95
C. Vegetation 1-5 m.	2.48
D. Intermediate Trees	N/A
E. Big Trees	2.15
Understory CBI	2.30
Overstory CBI	2.15
Total Plot CBI	2.26

McNally Fire 2002
2003 Plot 18 CBI = 2.63



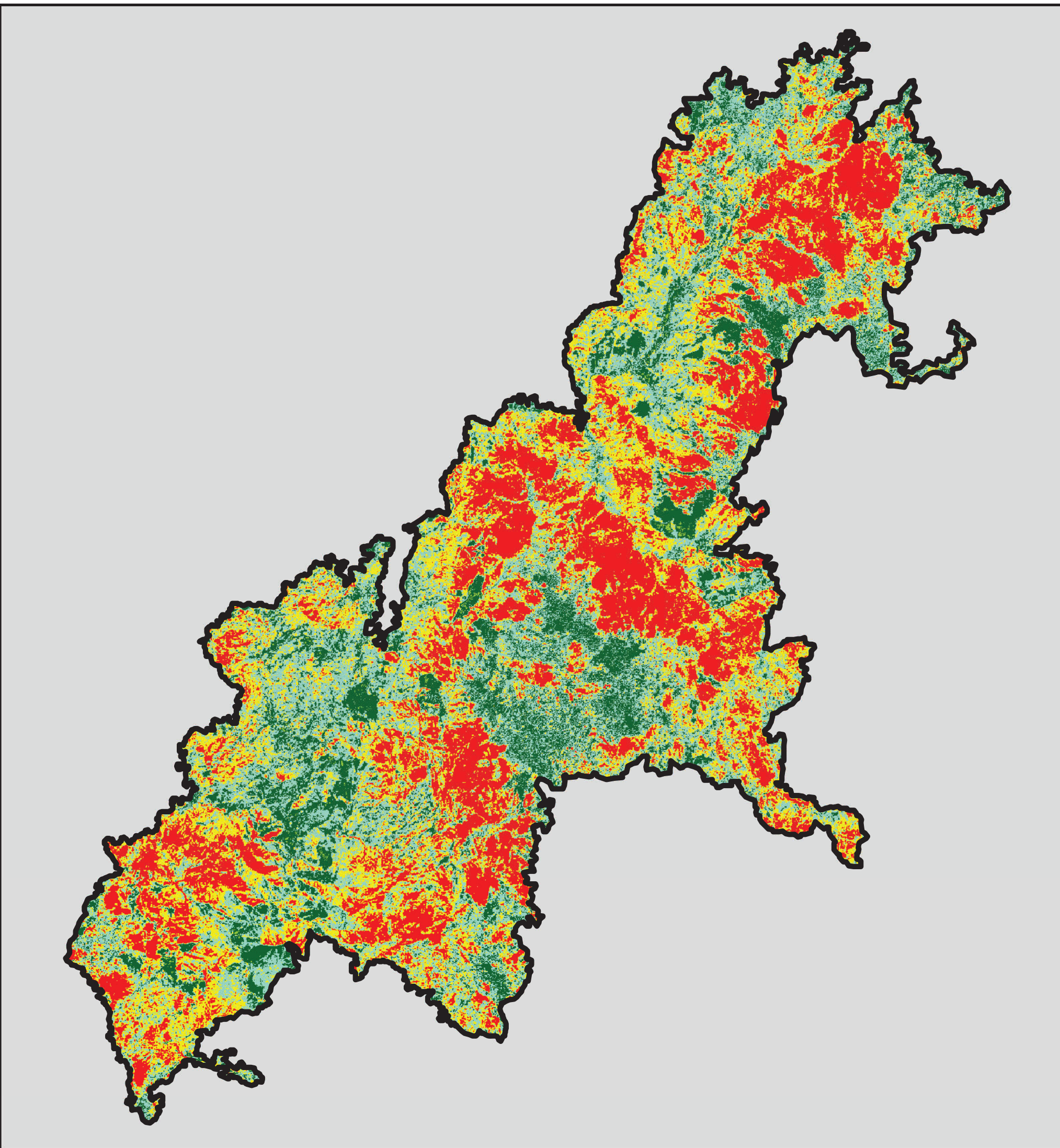
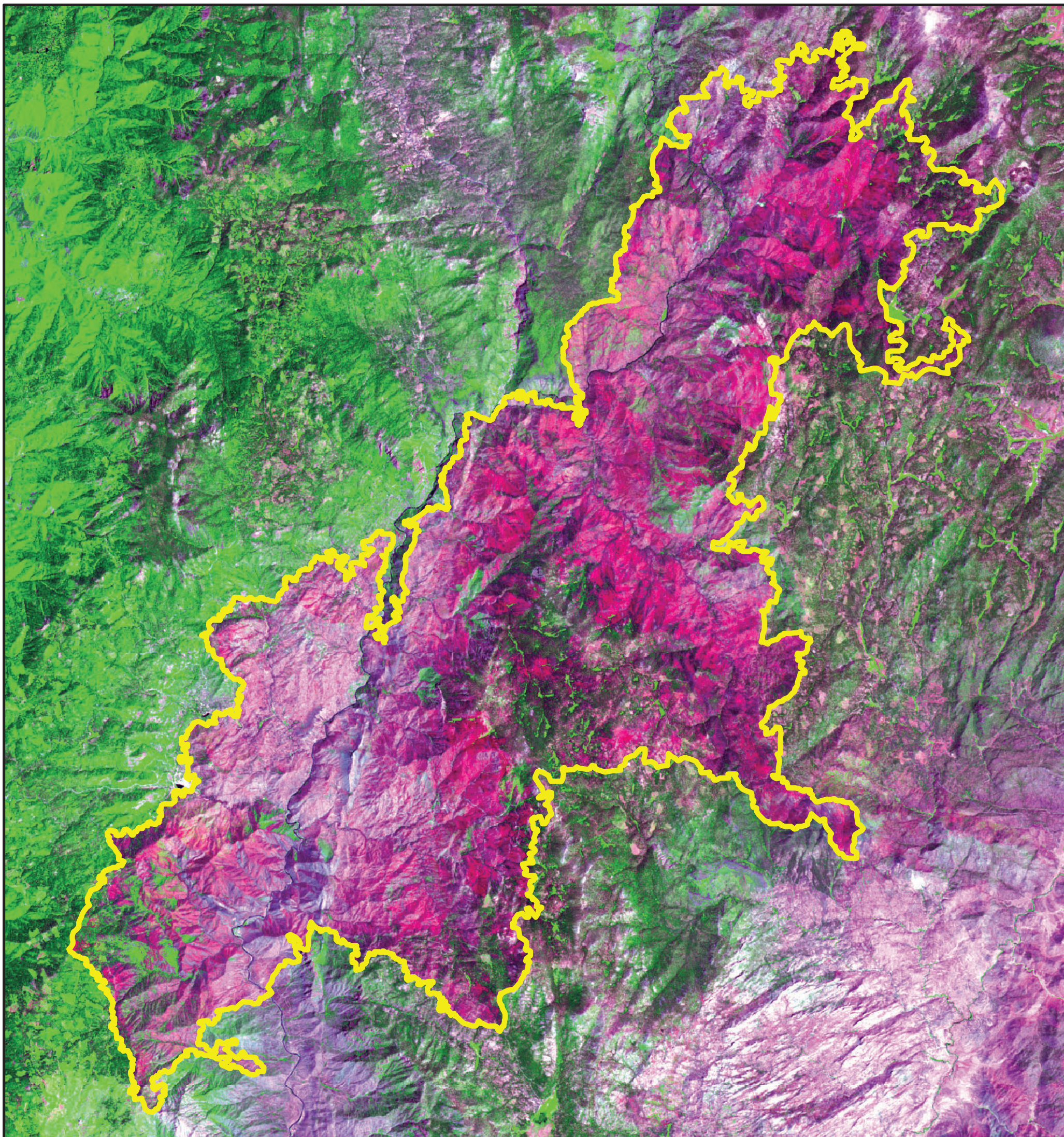
Consistent 100% burn with high charring throughout. High consumption of litter and duff > 98%. Down fuels over 100-hour not present. High change in soil cover and color > 70%. Very small patches of sprouting low shrubs and some colonizing grasses. Some tall shrubs resprouting though tops are charred and largely consumed; large change in cover; mortality around 65%. No overstory trees. Mountain mahogany, Cercocarpus, Flannel brush, Manzanita mixed Chaparral/Oak community.

PLOT 18

A. Substrates	2.83
B. Vegetation < 1 m.	2.55
C. Vegetation 1-5 m.	2.55
D. Intermediate Trees	N/A
E. Big Trees	N/A
Understory CBI	2.63
Overstory CBI	N/A
Total Plot CBI	2.63

2002 California: MCNALLY

ca3606711840020020721



Latitude: 36° 04' 01.2"
 Longitude: -118° 24' 00.0"
 Fire Ignition Date: July 21, 2002
 Assessment Type: Extended
 Pre-Fire Image Date: July 15, 2001 (Landsat 5)
 Post-Fire Image Date: July 05, 2003 (Landsat 5)



Acreage of Burn Severity

Burn Severity	Acres
Unburned to Low	22,730
Low	45,141
Moderate	40,695
High	37,642
Increased Greenness	313
Non-Processing Area Mask*	0
Total	146,522

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.

