

COMPOSITE BURN INDEX (CBI) PHOTO SERIES

Rockies – Tetons, Sagebrush / Grassland

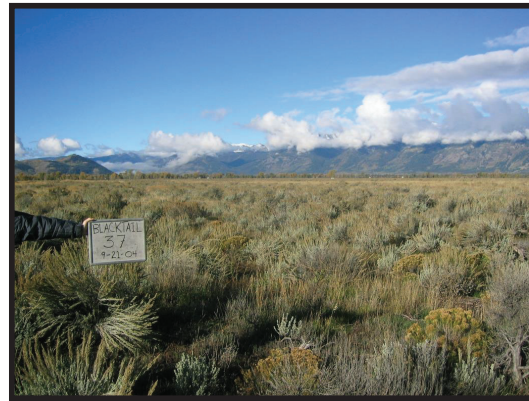
Carl Key, USGS Northern Rocky Mountain Science Center; Nate Benson, NPS Fire Management Program Center; Scott Lang, NPS Glacier. 2008.



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 Blacktail (2003), Wolff Ridge RX (2002), and Kelly RX Fires (2002) in Wyoming. The fires were field sampled by National Park Service Field Crews in 2003 and 2004.

The CBI is a 0.0 to 3.0 field rating of burn conditions averaged over a site. It is based on averaging 3-5 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.)

Blacktail Fire 2003
2004 Plot 37 CBI = 0.26



Only 10% burn. Litter and light fuel consumption 10% with 5% increase in soil cover. > 95% regrowth of pre-fire vegetation. A few colonizers noted. Sage/grass-forb community.

PLOT BLACKTAIL 37

A. Substrates	0.27
B. Vegetation < 1 m.	0.23
C. Vegetation 1-5 m.	N/A
D. Intermediate Trees	N/A
E. Big Trees	N/A
Understory CBI	0.26
Overstory CBI	N/A
Total Plot CBI	0.26

Blacktail Fire 2003
2004 Plot 42 CBI = 1.07



95% burn, light charring throughout. 50% consumption of litter and light fuels. 15-20% increase in soil cover. Stratum B survivorship near 100%; Sage only 5% pre-fire cover. Stratum C, Serviceberry charred/scorched with low change in cover. Serviceberry/Snowberry/Sage/grass-forb community.

PLOT BLACKTAIL 42

A. Substrates	1.15
B. Vegetation < 1 m.	0.35
C. Vegetation 1-5 m.	1.75
D. Intermediate Trees	N/A
E. Big Trees	N/A
Understory CBI	1.07
Overstory CBI	N/A
Total Plot CBI	1.07

Blacktail Fire 2003
2004 Plot 21 CBI = 1.40



100% burn. Consumption of litter/light fuels 80-90%; about 30-40% increase in newly exposed soil. Above-ground pre-fire herbs, grass and sage 90-95% charred or consumed; 80% survival. No colonizers; low-moderate change in species composition due to loss of some sage. Most sage was killed by fire in 1999. Sage/grass-forb community.

PLOT BLACKTAIL 21

A. Substrates	1.75
B. Vegetation < 1 m.	0.90
C. Vegetation 1-5 m.	N/A
D. Intermediate Trees	N/A
E. Big Trees	N/A
Understory CBI	1.40
Overstory CBI	N/A
Total Plot CBI	1.40

Blacktail Fire 2003
2004 Plot 16 CBI = 2.28



100% burn. Consumption of litter and light fuels 75-85%. About 70% increase in exposed soil cover. Above-ground pre-fire herbs, grass and sage 95% charred or consumed; 50% survival. Sage tops killed and about 80% consumed. Moderate change in species composition due to colonizer establishment and loss of sage. Sage/grass-forb community.

PLOT BLACKTAIL 16

A. Substrates	2.60
B. Vegetation < 1 m.	2.00
C. Vegetation 1-5 m.	N/A
D. Intermediate Trees	N/A
E. Big Trees	N/A
Understory CBI	2.28
Overstory CBI	N/A
Total Plot CBI	2.28

Blacktail Fire 2003
2004 Plot 24 CBI = 2.95



100% burn with all litter and light fuels consumed. > 80% increase in exposed soil cover. Above-ground pre-fire herbs, grass and sage essentially 100% consumed. Rudimentary signs of pre-fire species; 5-10% survival. Sage tops essentially consumed only scattered stubs remain. High change in species composition due to dominant colonizer establishment and loss of sage. Sage/grass-forb community.

PLOT BLACKTAIL 24

A. Substrates	3.00
B. Vegetation < 1 m.	2.90
C. Vegetation 1-5 m.	N/A
D. Intermediate Trees	N/A
E. Big Trees	N/A
Understory CBI	2.95
Overstory CBI	N/A
Total Plot CBI	2.95

Kelly Fire 2002
2003 Plot 2 CBI = 0.85



Patchy 20% burn. Litter and light fuels 20% consumed; about 5% increase in soil cover. 15% char or consumption of pre-fire grass, forbs and sage; 90% survival. Little change to species composition, due to low frequency of colonizers and slight removal of sage. Sage counted in Stratum C. Sage/grass-forb community.

PLOT KELLY CBI-02

A. Substrates	0.45
B. Vegetation < 1 m.	0.88
C. Vegetation 1-5 m.	1.03
D. Intermediate Trees	N/A
E. Big Trees	N/A
Understory CBI	0.85
Overstory CBI	N/A
Total Plot CBI	0.85

Wolff Ridge Fire 2002
2003 Plot 1 CBI = 1.49



85% burn. Consumption of litter and light fuels 50%; < 10% increase in newly exposed soil. Above-ground pre-fire forbs and grass 80% charred or consumed; 90% survival. Trace of colonizers; low anticipated change in species composition. Sage counted separately as Stratum C was largely charred, with top branching intact. 15-20% resprouting, and some seedlings. Sage/grass-forb community.

PLOT WOLFF RIDGE CBI-01

A. Substrates	0.70
B. Vegetation < 1 m.	0.98
C. Vegetation 1-5 m.	2.40
D. Intermediate Trees	N/A
E. Big Trees	N/A
Understory CBI	1.49
Overstory CBI	N/A
Total Plot CBI	1.49

Kelly Fire 2002
2003 Plot 1 CBI = 1.86



100% burn. Consumption of litter and light fuels 50%; trace of duff, and 15% increase in newly exposed soil. Above-ground pre-fire forbs and grass largely charred or consumed, with about 80% survival and a few colonizers. Sage counted separately as Stratum C was largely charred and consumed; little branching remains. No resprouts or seedlings. Sage/grass-forb community.

PLOT KELLY CBI-01

A. Substrates	0.77
B. Vegetation < 1 m.	1.43
C. Vegetation 1-5 m.	3.00
D. Intermediate Trees	N/A
E. Big Trees	N/A
Understory CBI	1.86
Overstory CBI	N/A
Total Plot CBI	1.86

Wolff Ridge Fire 2002
2003 Plot 18 CBI = 2.07



95% burn. Consumption of litter and light fuels 60%; 10% increase in newly exposed soil. Above-ground pre-fire forbs and grass 95% charred or consumed, with 90% survival. Low-moderate change to species composition is anticipated due to shifts in pre-fire species abundance as well as addition of colonizers. Sage counted separately as Stratum C was largely charred and consumed; mostly stubs remain. No resprouts or seedlings. Sage/grass-forb community.

PLOT WOLFF RIDGE CBI-18

A. Substrates	1.10
B. Vegetation < 1 m.	1.63
C. Vegetation 1-5 m.	3.00
D. Intermediate Trees	N/A
E. Big Trees	N/A
Understory CBI	2.07
Overstory CB	N/A
Total Plot CB	2.07

Wolff Ridge Fire 2002
2003 Plot 14 CBI = 2.36



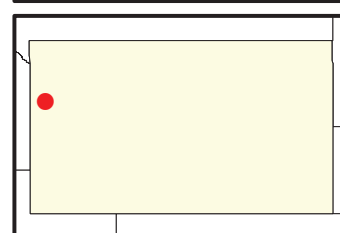
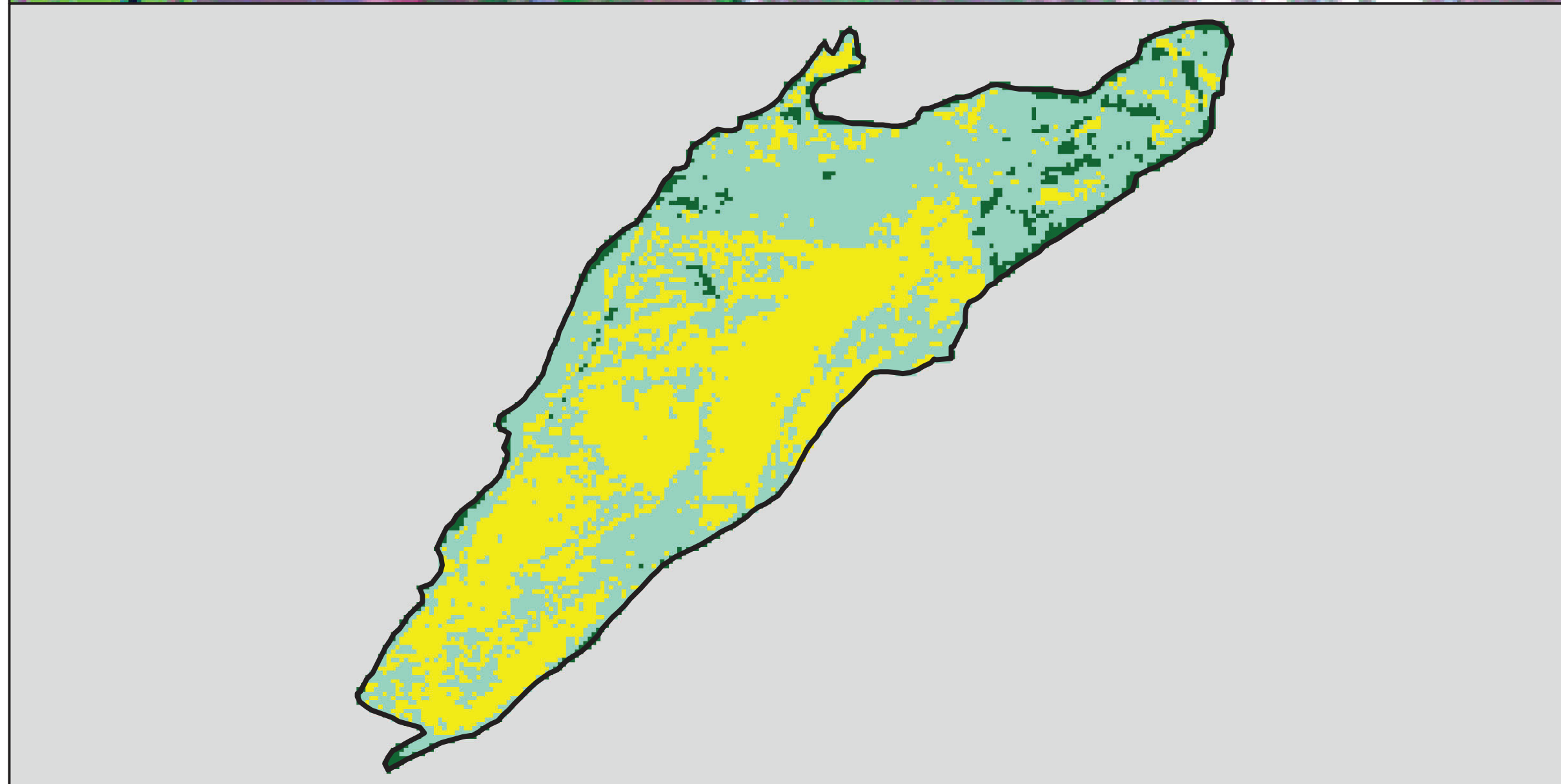
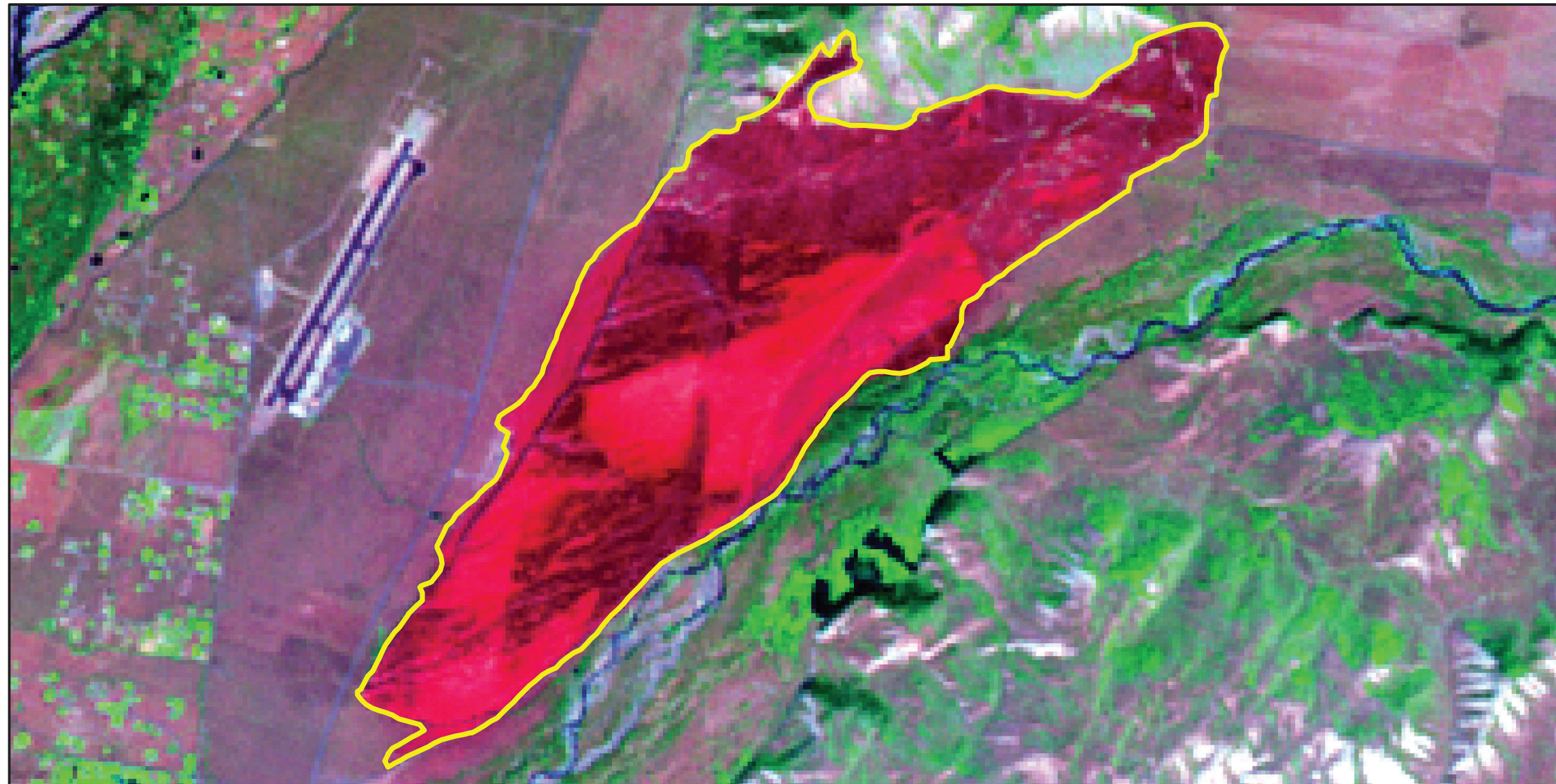
100% burn. Consumption of litter and light fuels 80-100%; 25% increase in newly exposed soil. All above-ground pre-fire forbs and grass charred or consumed, with low survival. Moderate-high change to species composition is anticipated due to reduction in pre-fire species, and moderate establishment of new colonizers. Sage counted separately as Stratum C was largely charred and consumed; mostly stubs remain. No resprouts or seedlings. Sage/grass-forb community.

PLOT WOLFF RIDGE CBI-14

A. Substrates	2.05
B. Vegetation < 1 m.	1.88
C. Vegetation 1-5 m.	3.00
D. Intermediate Trees	N/A
E. Big Trees	N/A
Understory CBI	2.36
Overstory CBI	N/A
Total Plot CBI	2.36

2003 Wyoming: BLACKTAIL

wy4360711070120030810



Latitude: 43° 36' 25.2"
 Longitude: -110° 42' 03.6"
 Fire Ignition Date: August 10, 2003
 Assessment Type: Initial
 Pre-Fire Image Date: August 01, 2003 (Landsat 5)
 Post-Fire Image Date: August 17, 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.

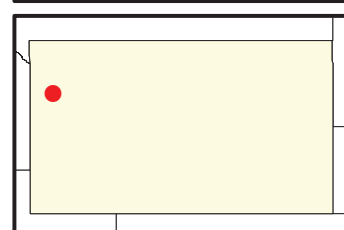
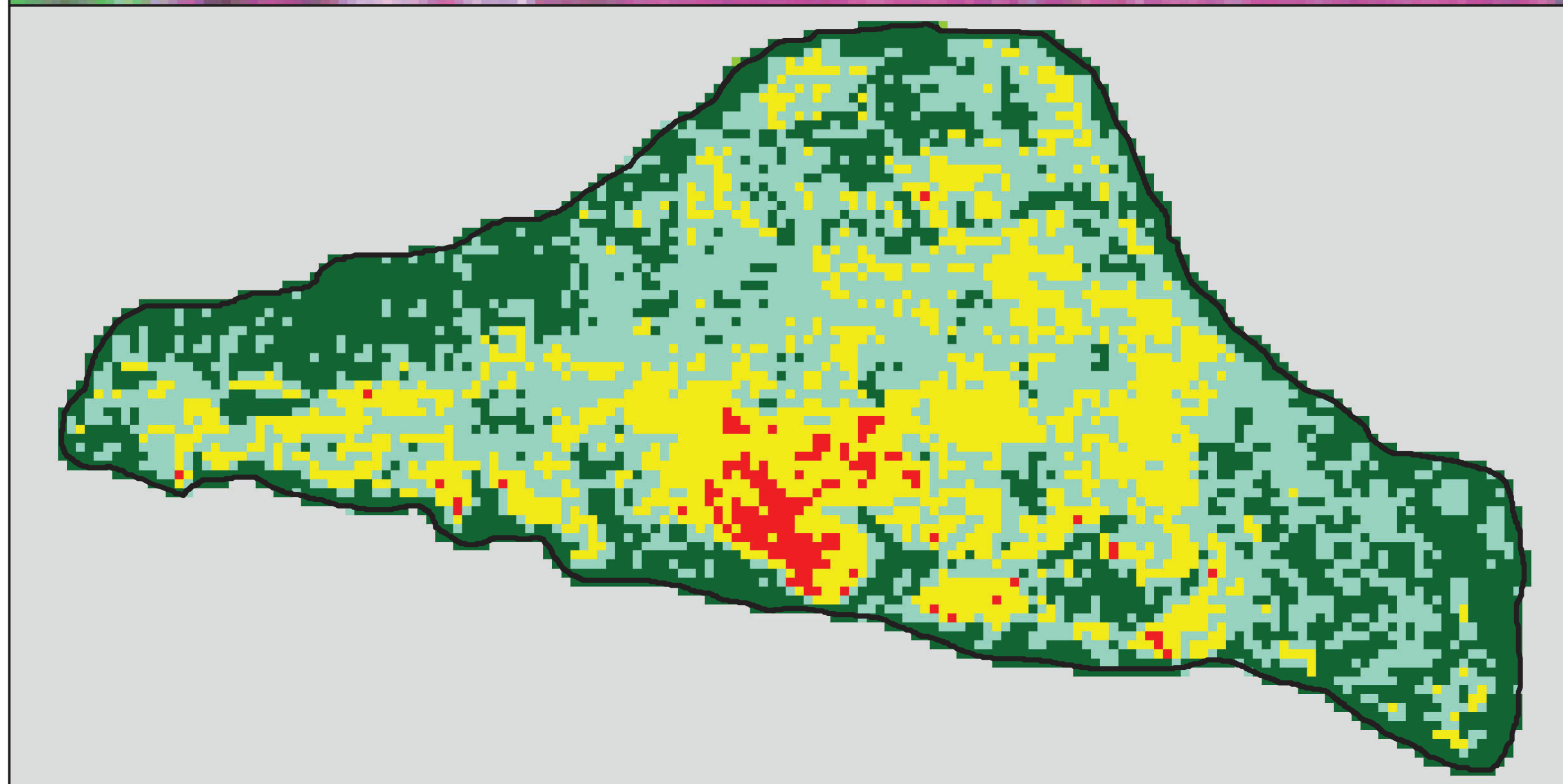
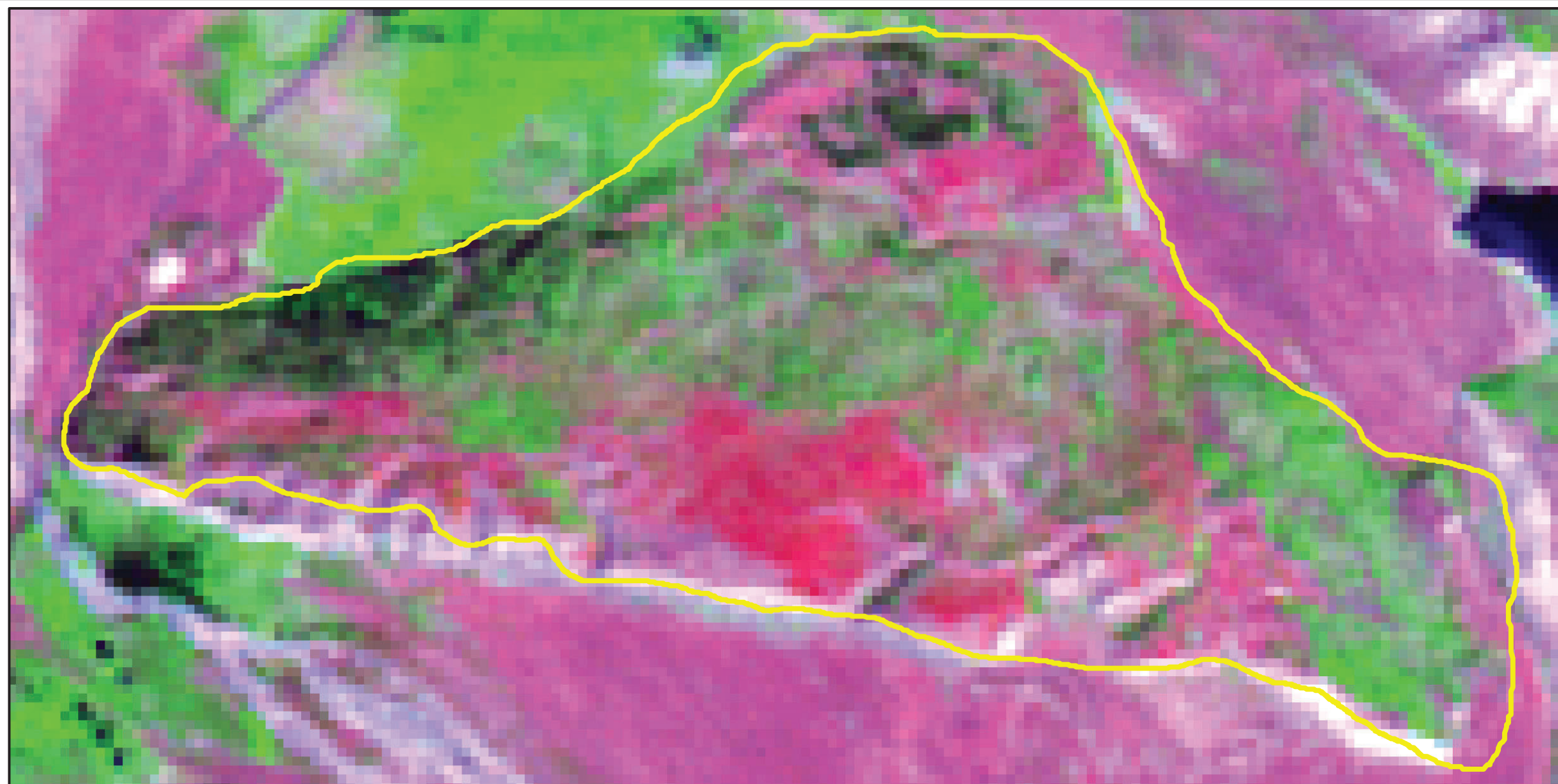


Acreage of Burn Severity

Burn Severity	Acres
Unburned to Low	157
Low	1,329
Moderate	1,155
High	0
Increased Greenness	0
Non-Processing Area Mask*	0
Total	2,641

2002 Wyoming: WOLFF RDGE

wy4379811050520020924



Latitude: 43° 47' 52.8"
 Longitude: -110° 30' 18.0"
 Fire Ignition Date: September 24, 2002
 Assessment Type: Extended
 Pre-Fire Image Date: July 02, 2001 (Landsat 7)
 Post-Fire Image Date: August 01, 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.

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Acreage of Burn Severity

Burn Severity	Acres
Unburned to Low	477
Low	634
Moderate	372
High	33
Increased Greenness	0
Non-Processing Area Mask*	0
Total	1,517