

# Fire on the Malheur National Forest

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Harney County Restoration Collaborative | May 1, 2018



Year	No. of Fires	Acres Burned	Dollar Damage	Suppression Cost Dollars
1908		0	40	10
1909	4	233	360	66
1910	14	26,769	10,790	1,778
1911	19	3,240	2,500	622
1912	3	0	0	17
1913	8	58	0	50
1914	22	1,187	1,476	310
1915	30	5,386	32,690	1,584
1916	27	20	32	71
1917	47	2,182	2,520	443
1918	36	2,536	2,947	530
1919	54	31,493	42,753	3,486
1920	29	3,481	873	1,839

# **Today:**

- 1. Fire trends in Oregon and the Malheur National Forest**  
**How much is burning and where?**
- 2. Biophysical context of fires**  
**What accounts for these trends?**
- 3. Management implications for the future**  
**What do we know and what do we do with it?**

# **Fire trends in Oregon and the Malheur National Forest**



## Legend

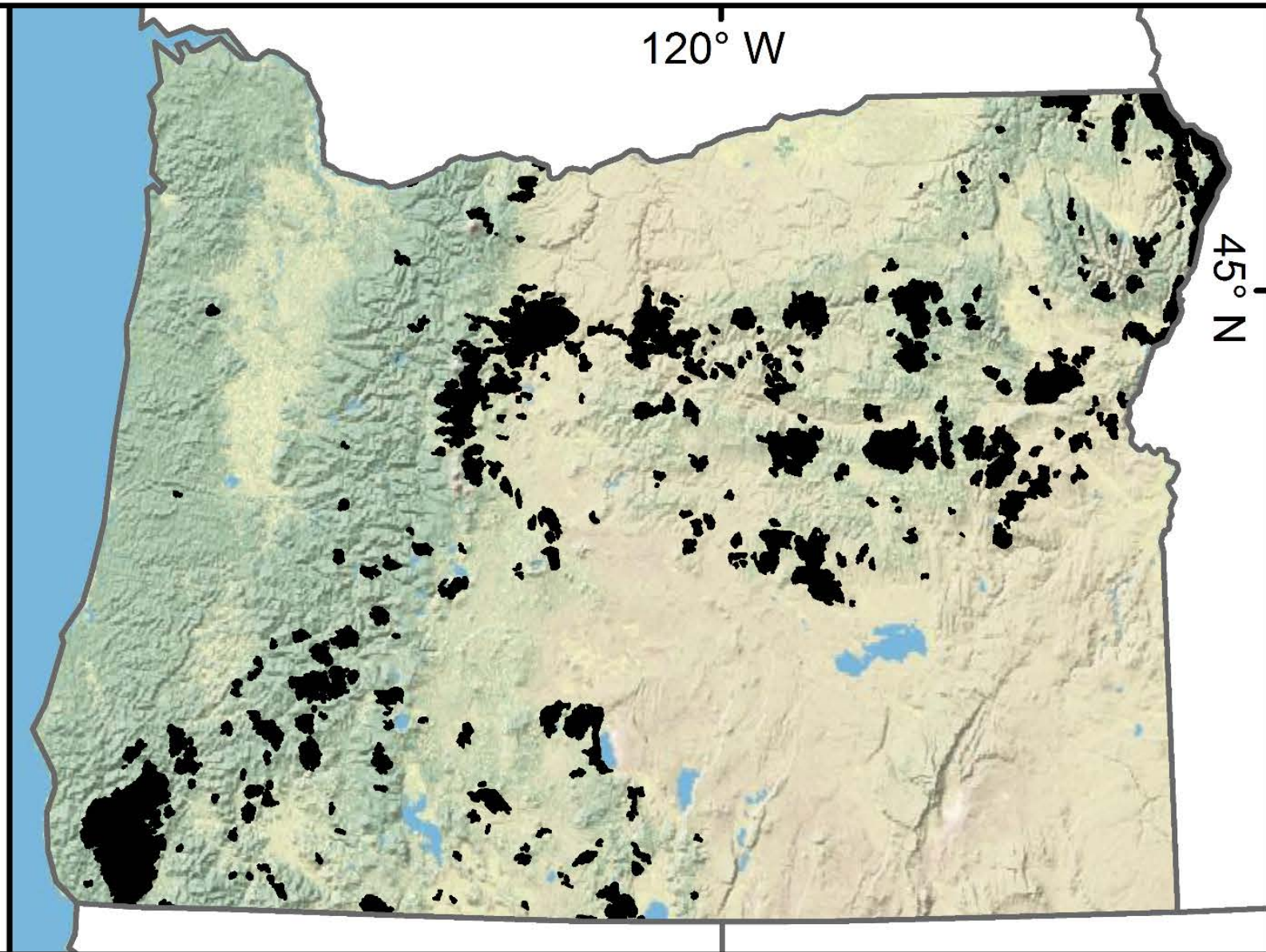


Large fires (1984-2015)  
in forested ecoregions



0

100 km



120° W

45° N



## Legend



Large fires (2017)  
in forested ecoregions

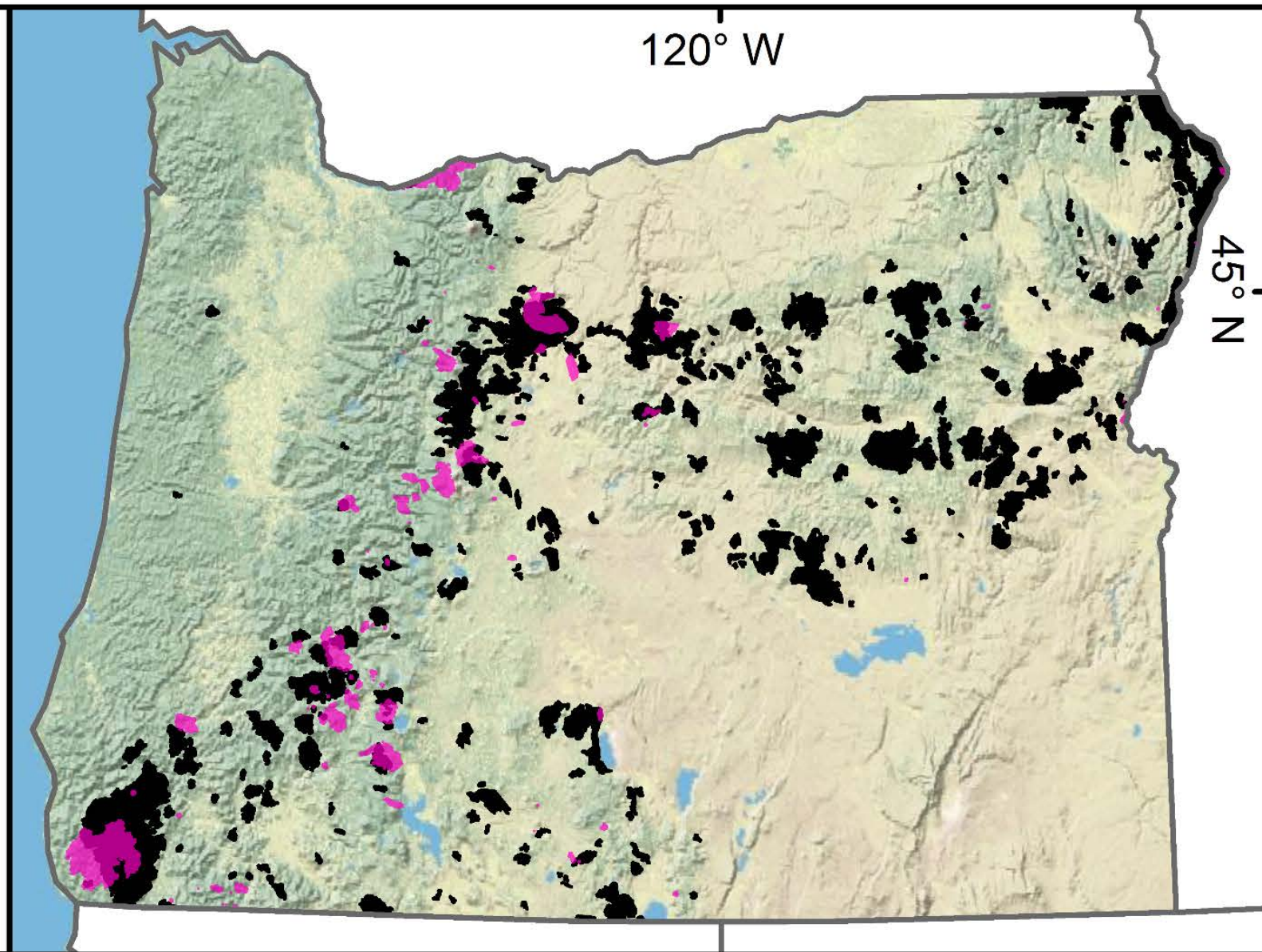


Large fires (1984-2015)  
in forested ecoregions

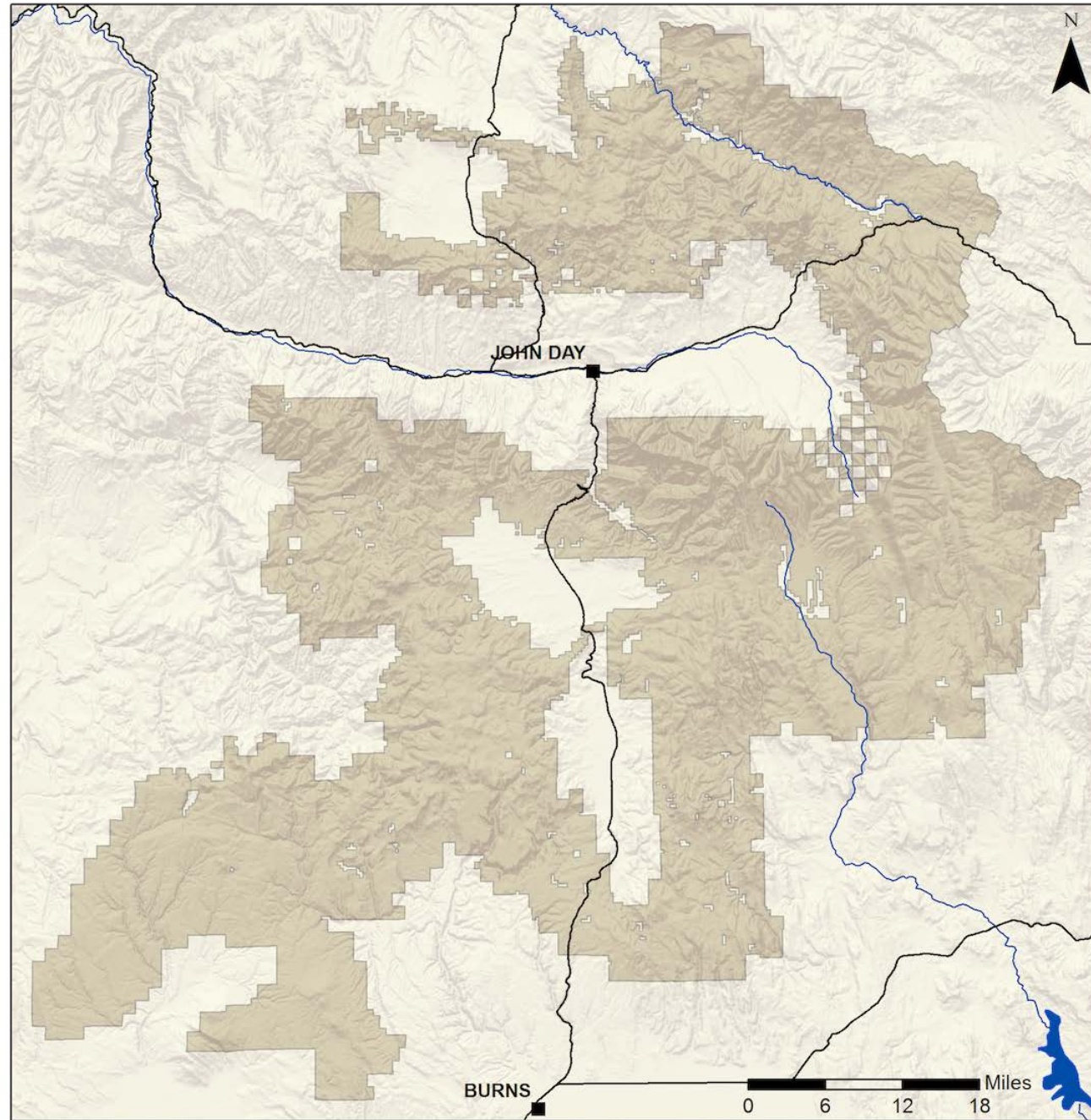


0

100 km

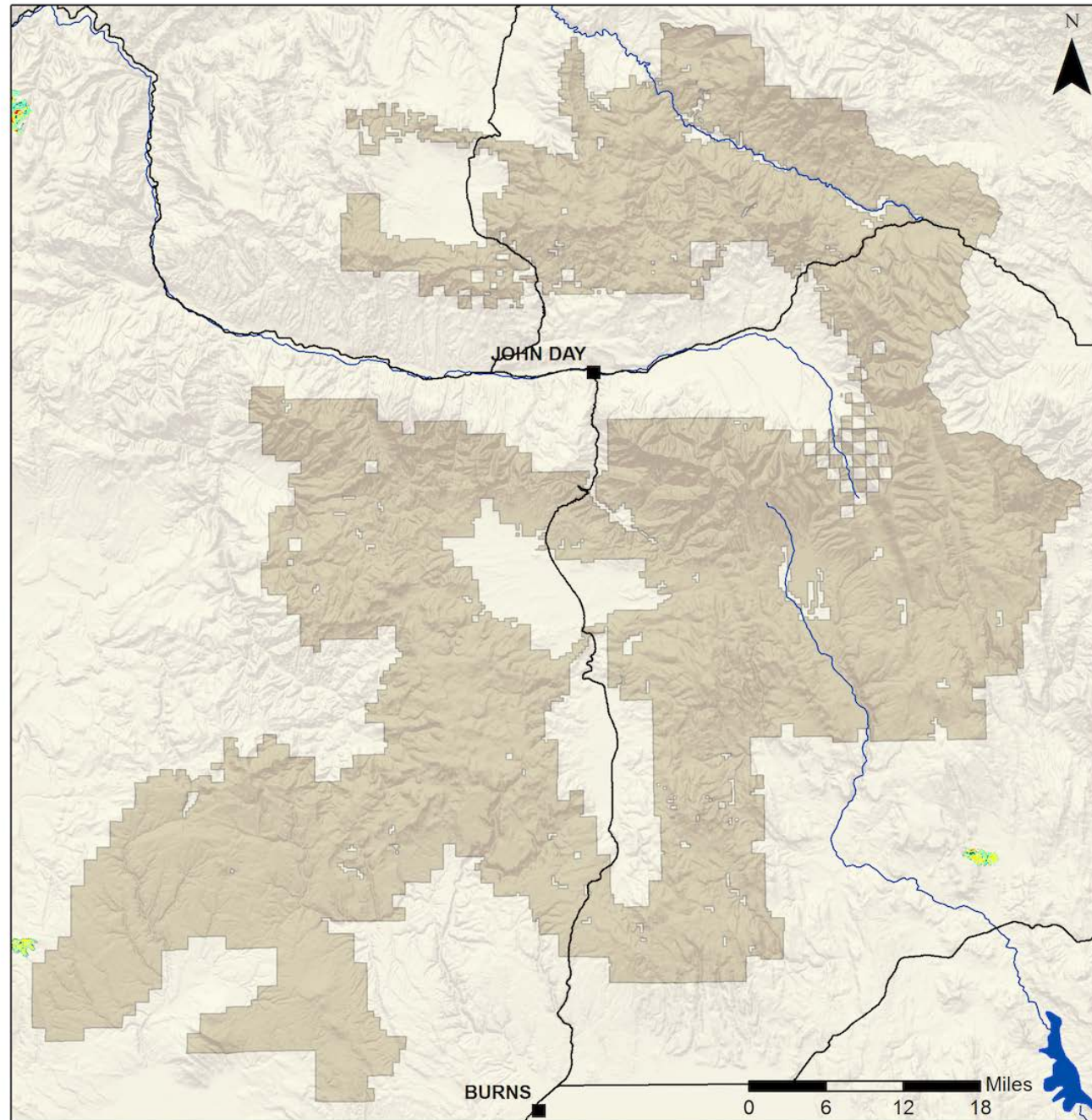


1984



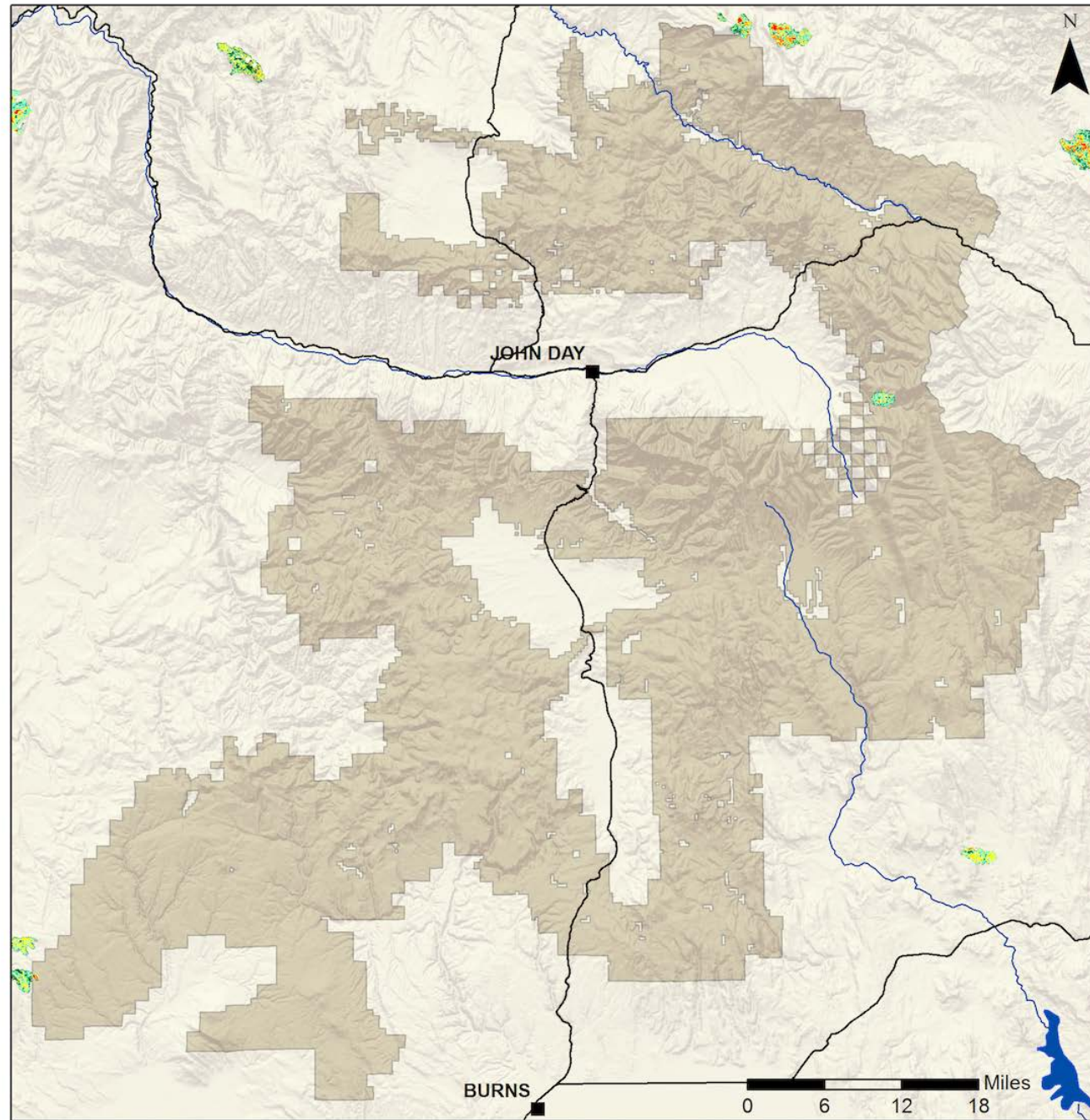


# 1985



- Unburned to low severity
- Low severity
- Moderate severity
- High severity

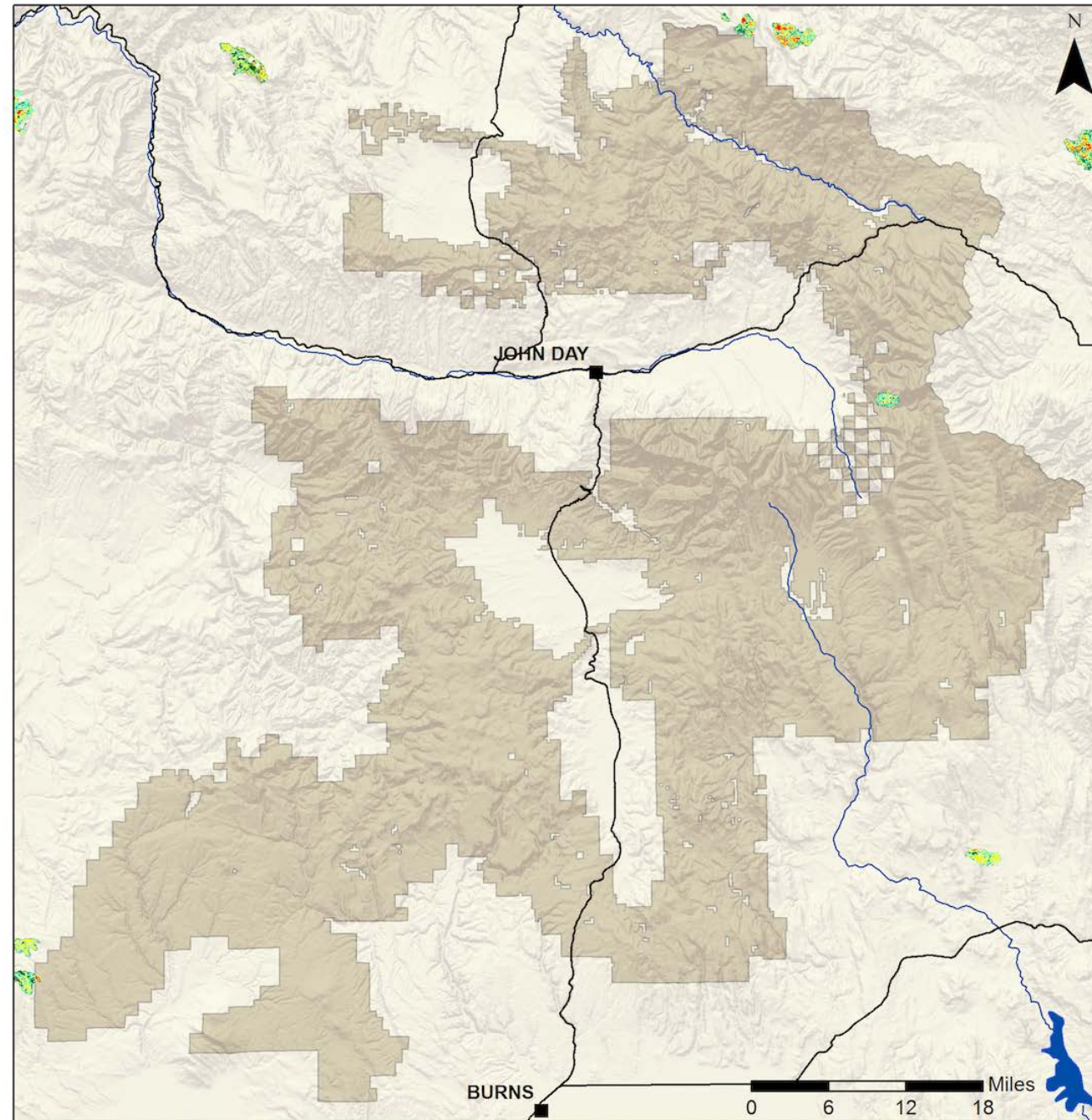
1986



- Unburned to low severity
- Low severity
- Moderate severity
- High severity

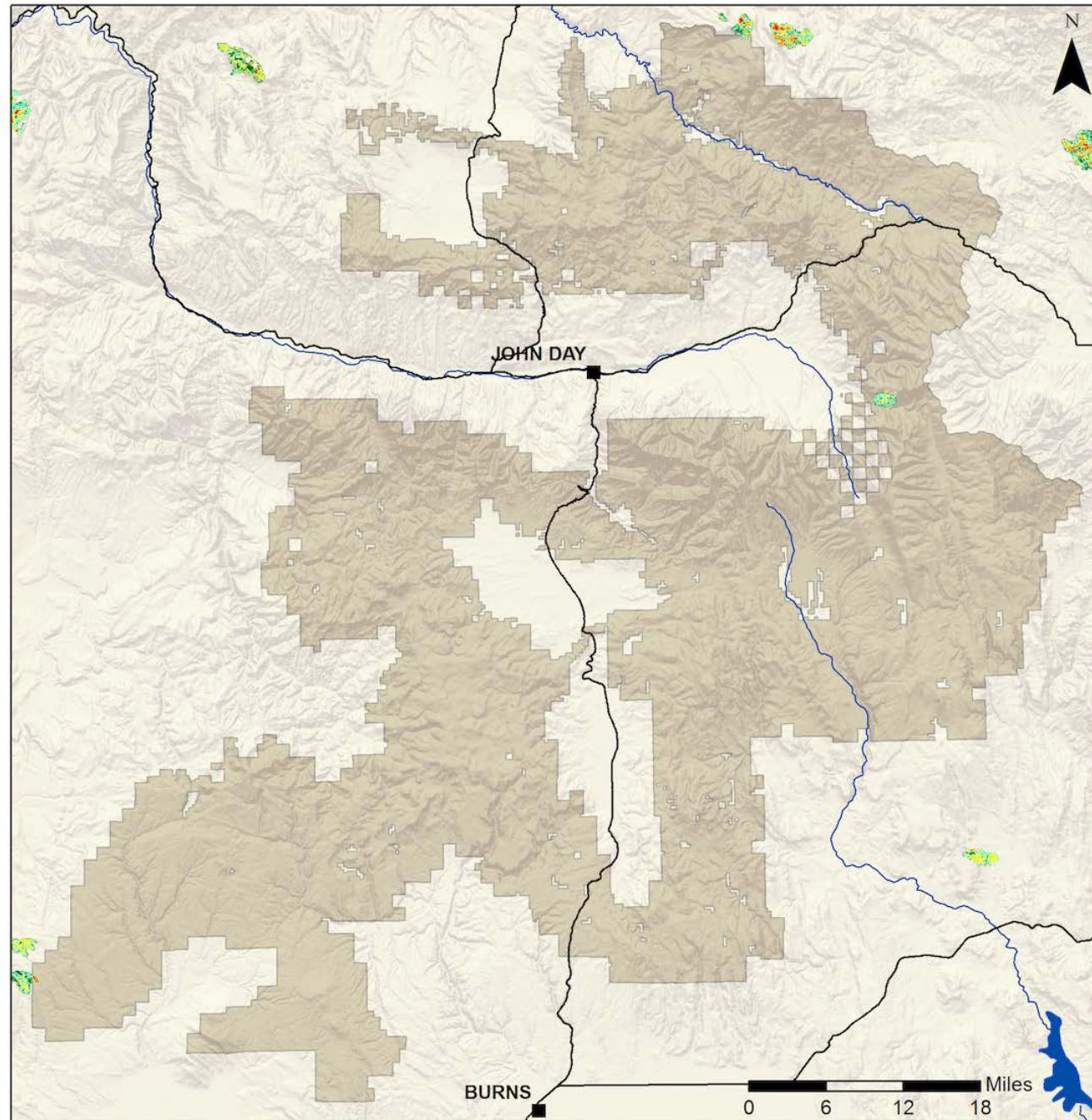


1987



- Unburned to low severity
- Low severity
- Moderate severity
- High severity

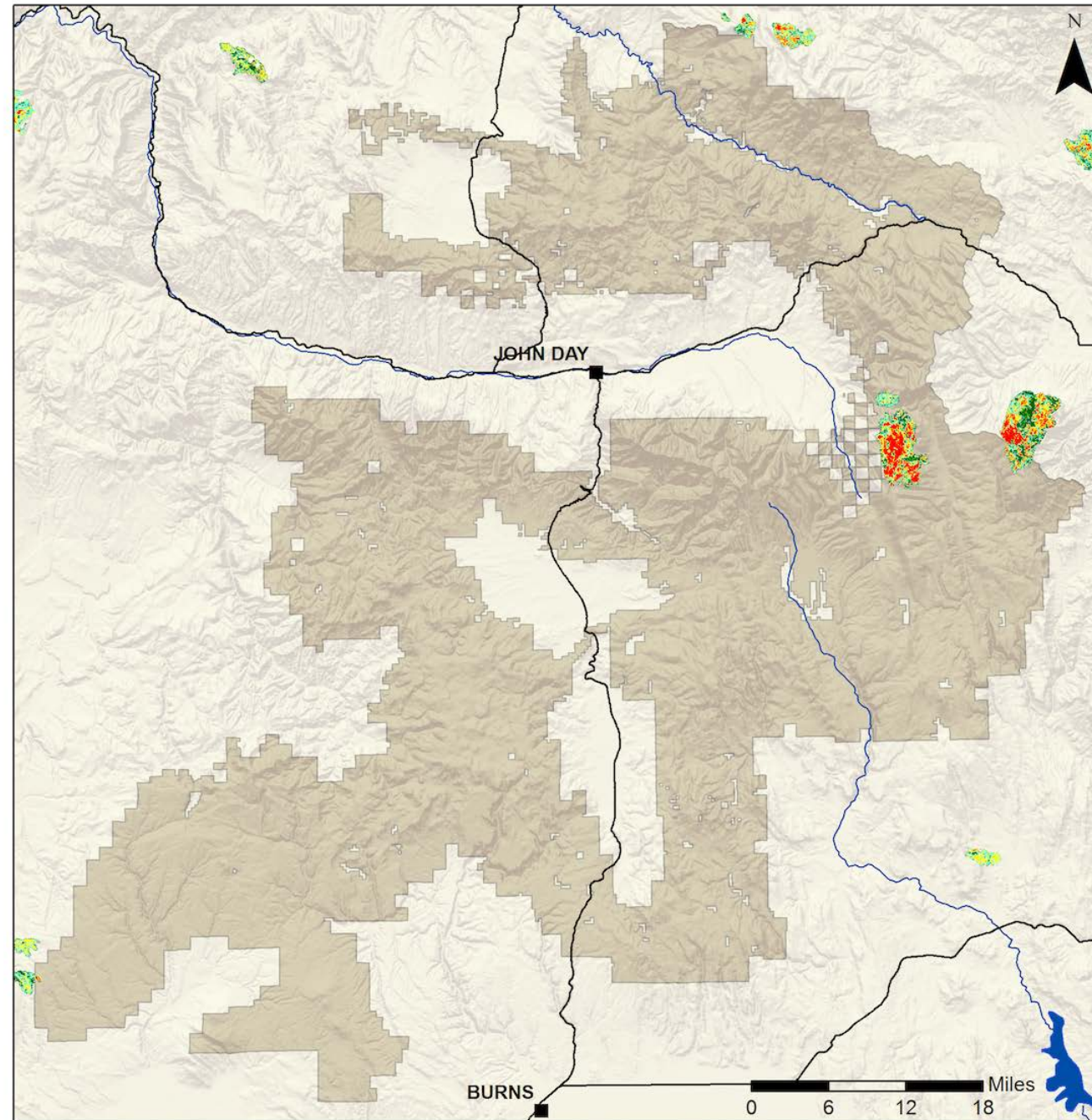
1988



- Unburned to low severity
- Low severity
- Moderate severity
- High severity



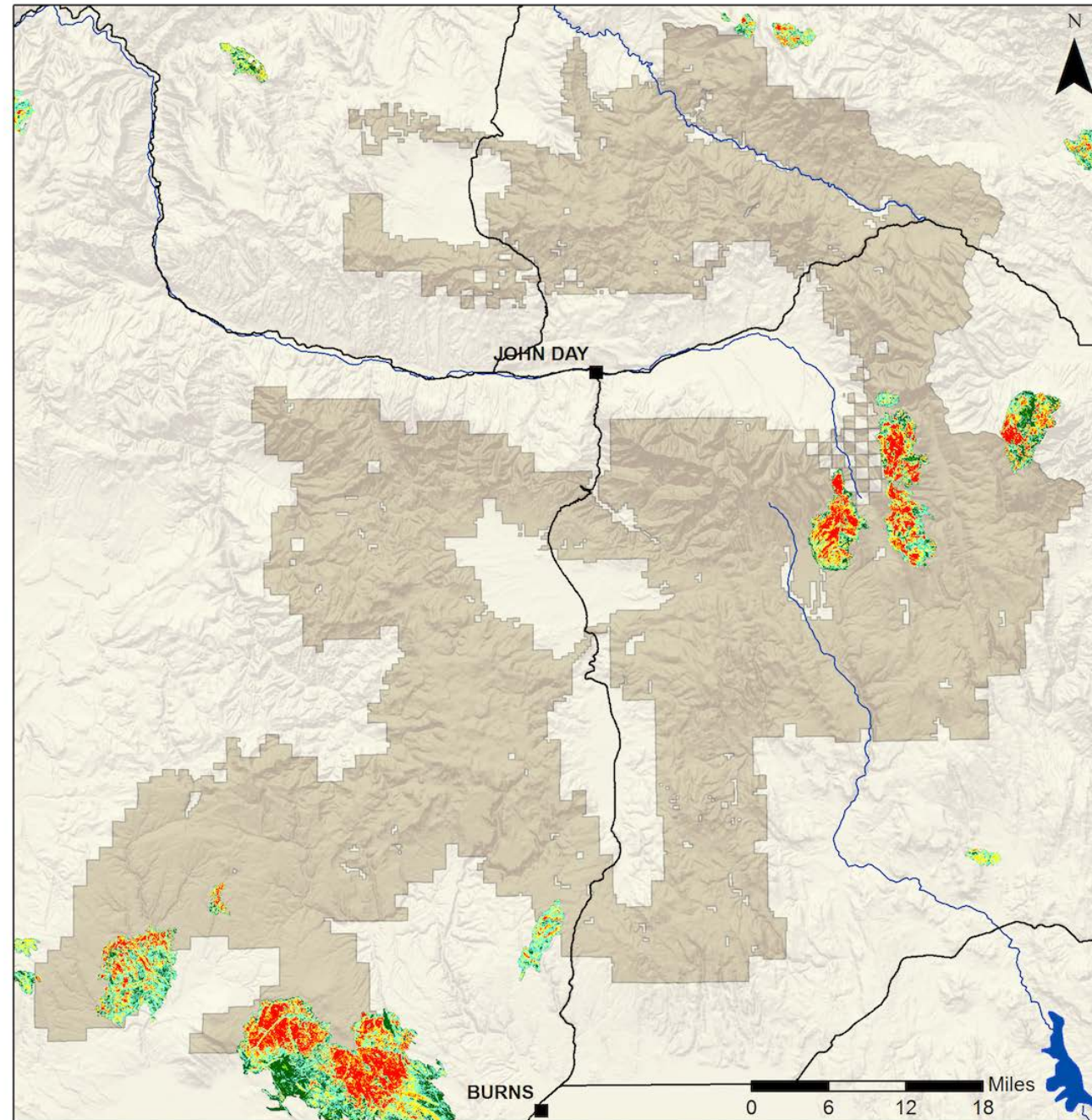
1989



- Unburned to low severity
- Low severity
- Moderate severity
- High severity

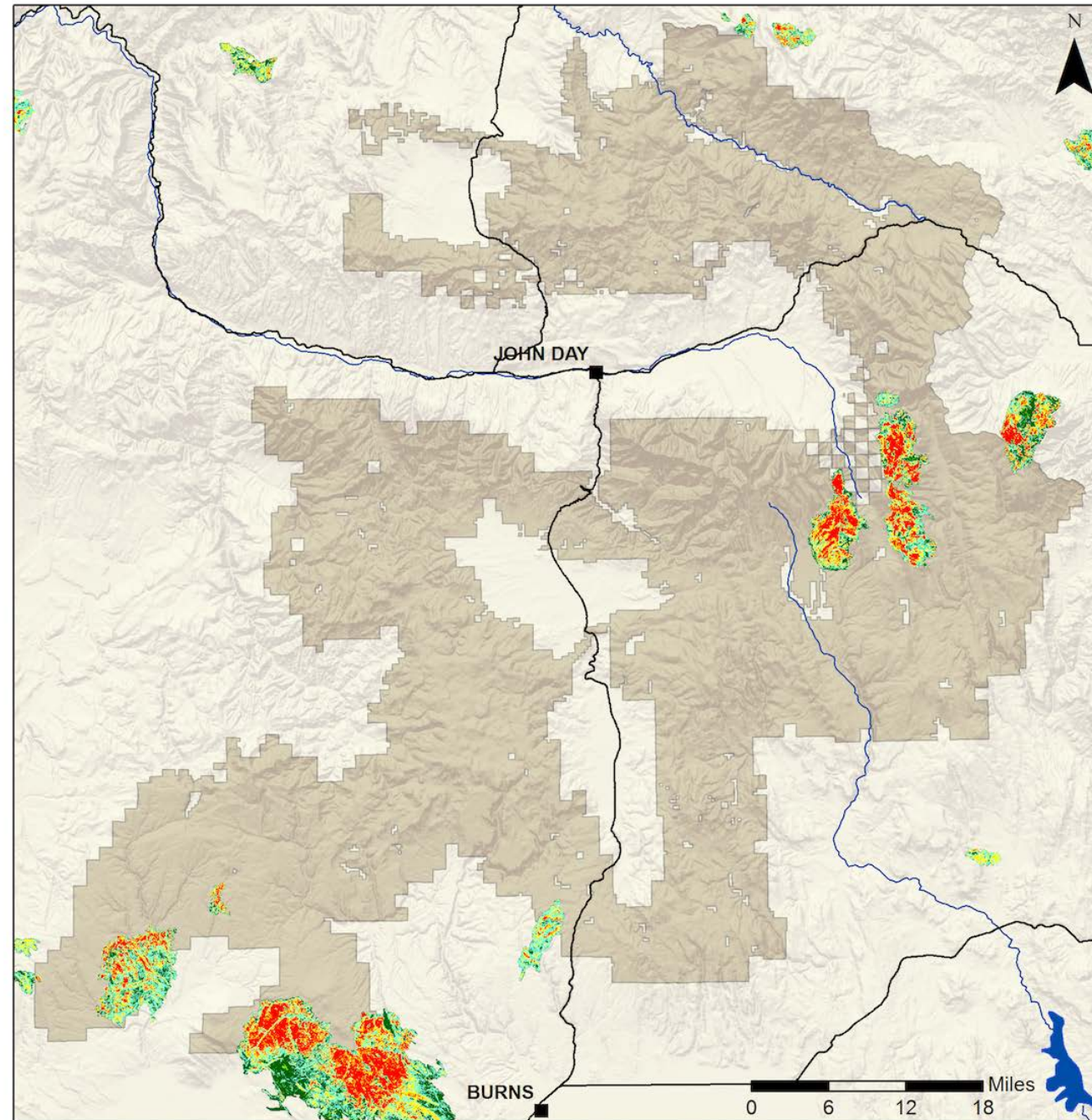


1990



- Unburned to low severity
- Low severity
- Moderate severity
- High severity

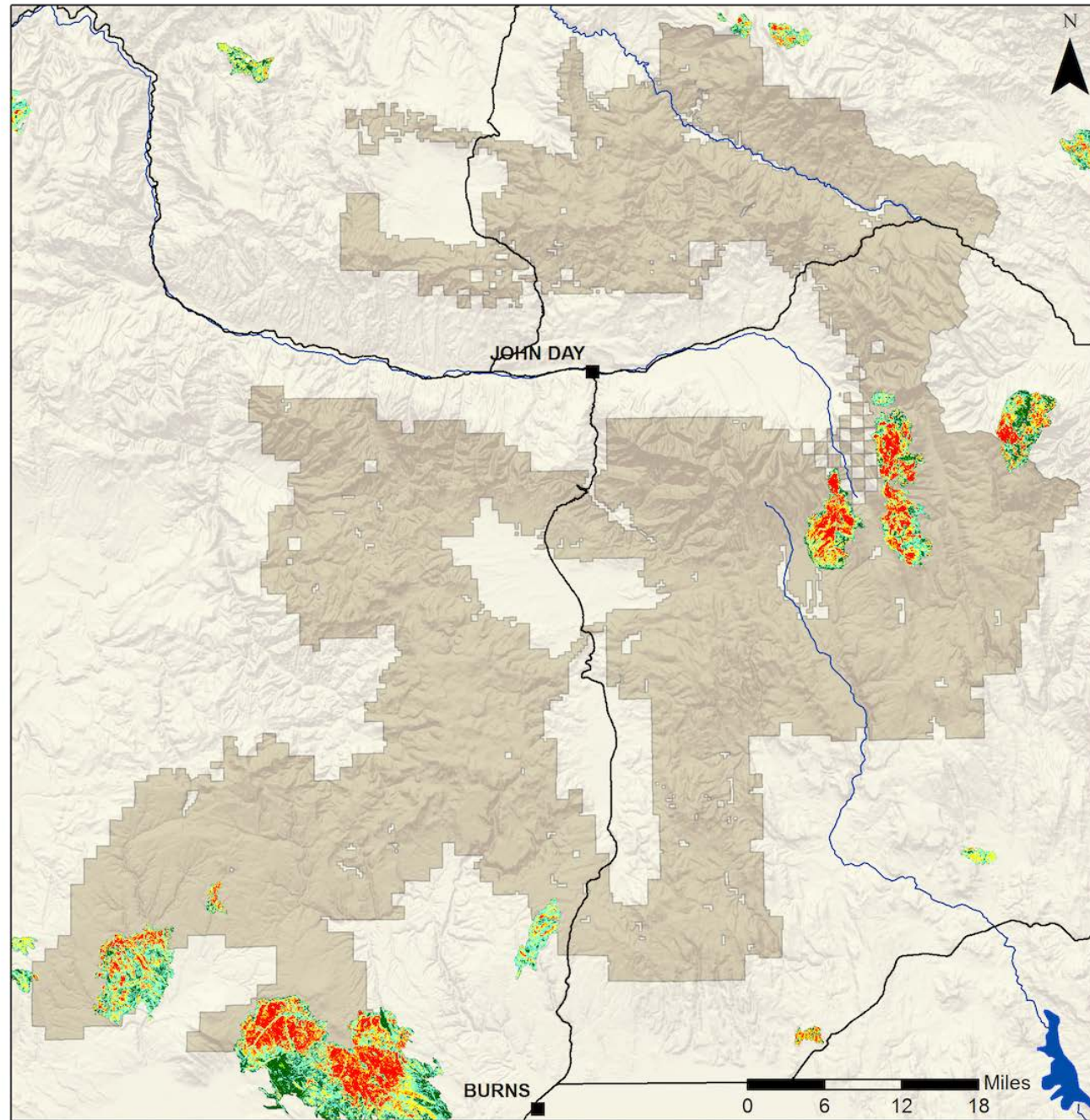
1991



- Unburned to low severity
- Low severity
- Moderate severity
- High severity

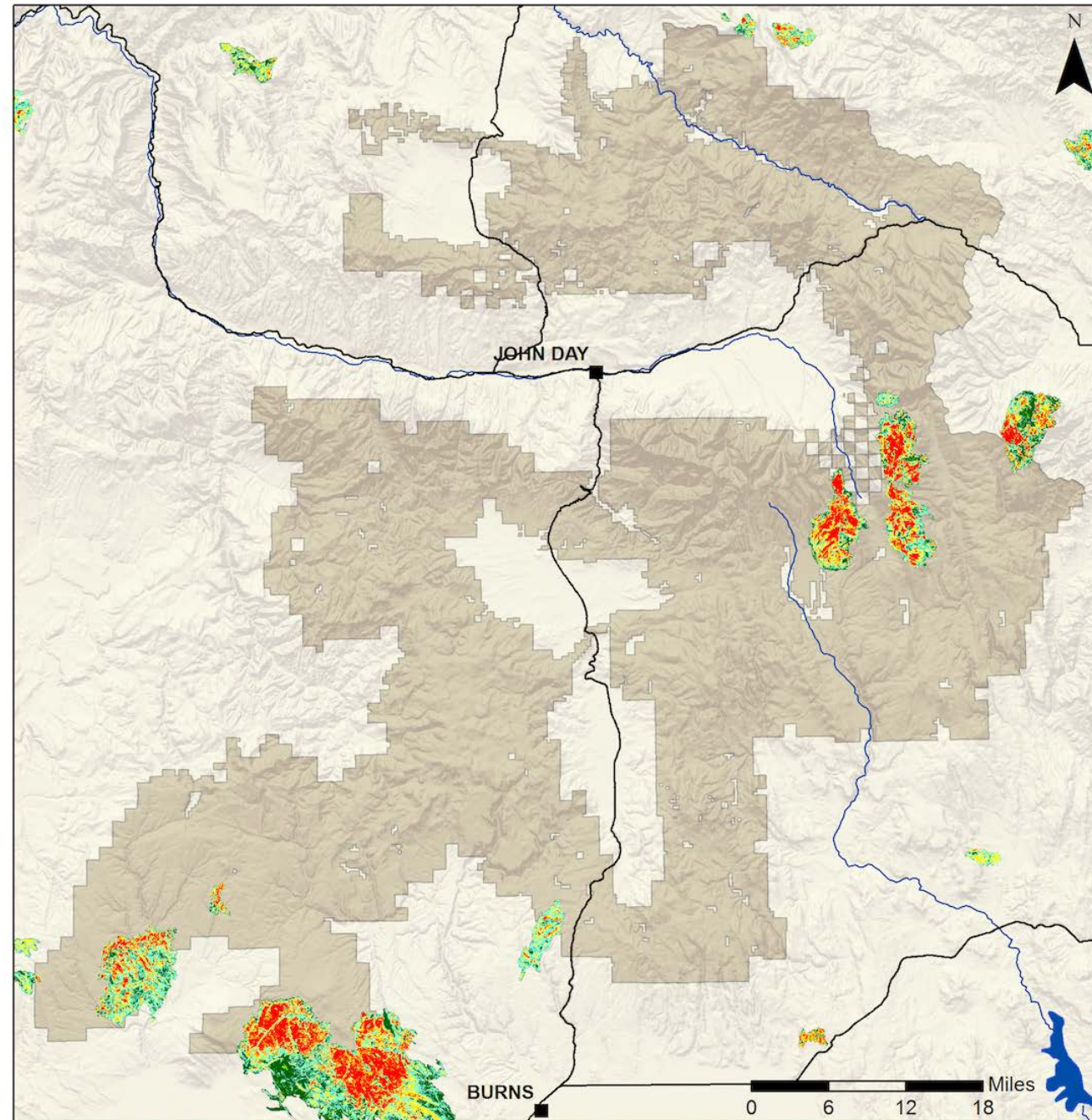


1992



- Unburned to low severity
- Low severity
- Moderate severity
- High severity

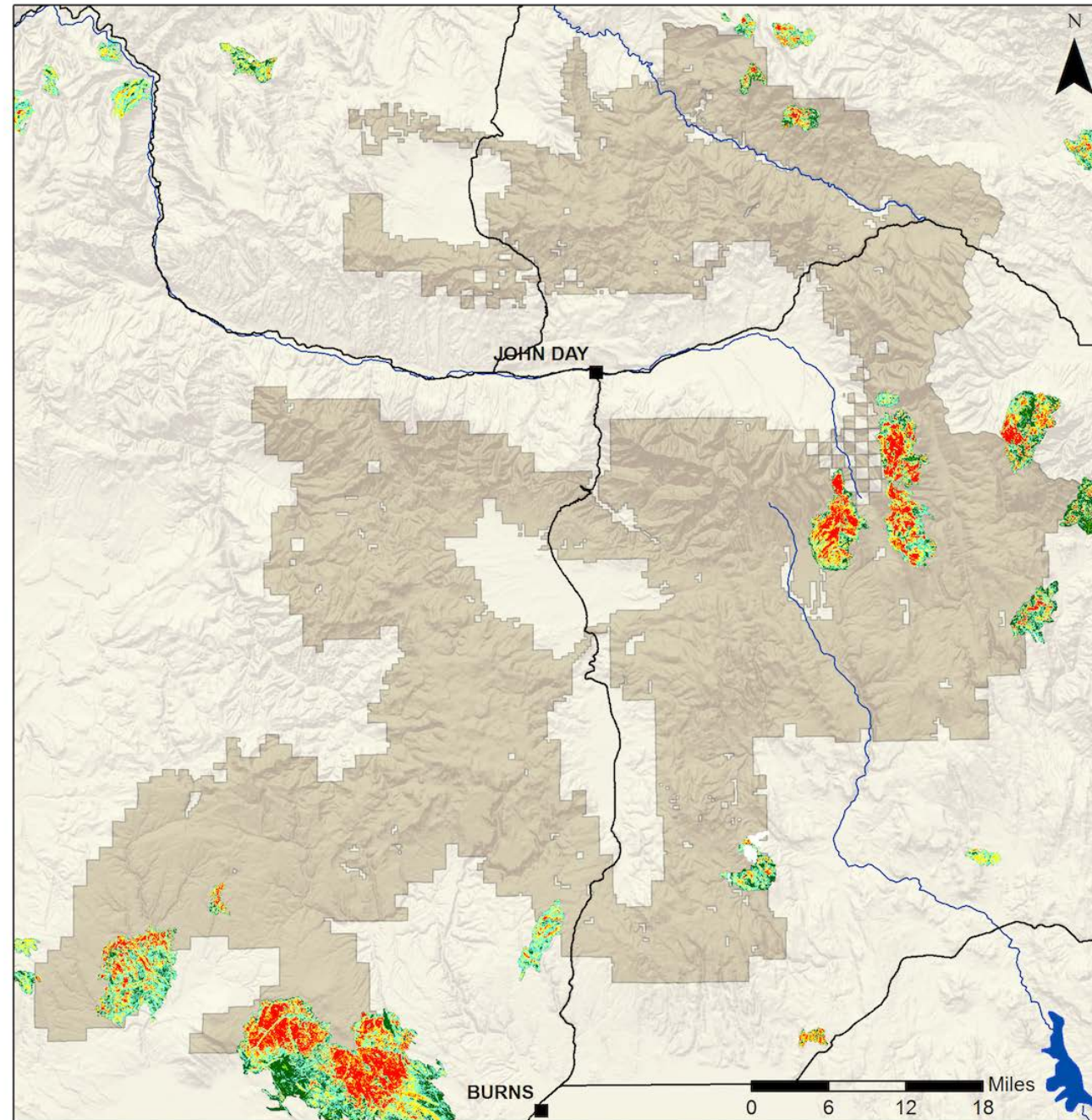
1993



- Unburned to low severity
- Low severity
- Moderate severity
- High severity



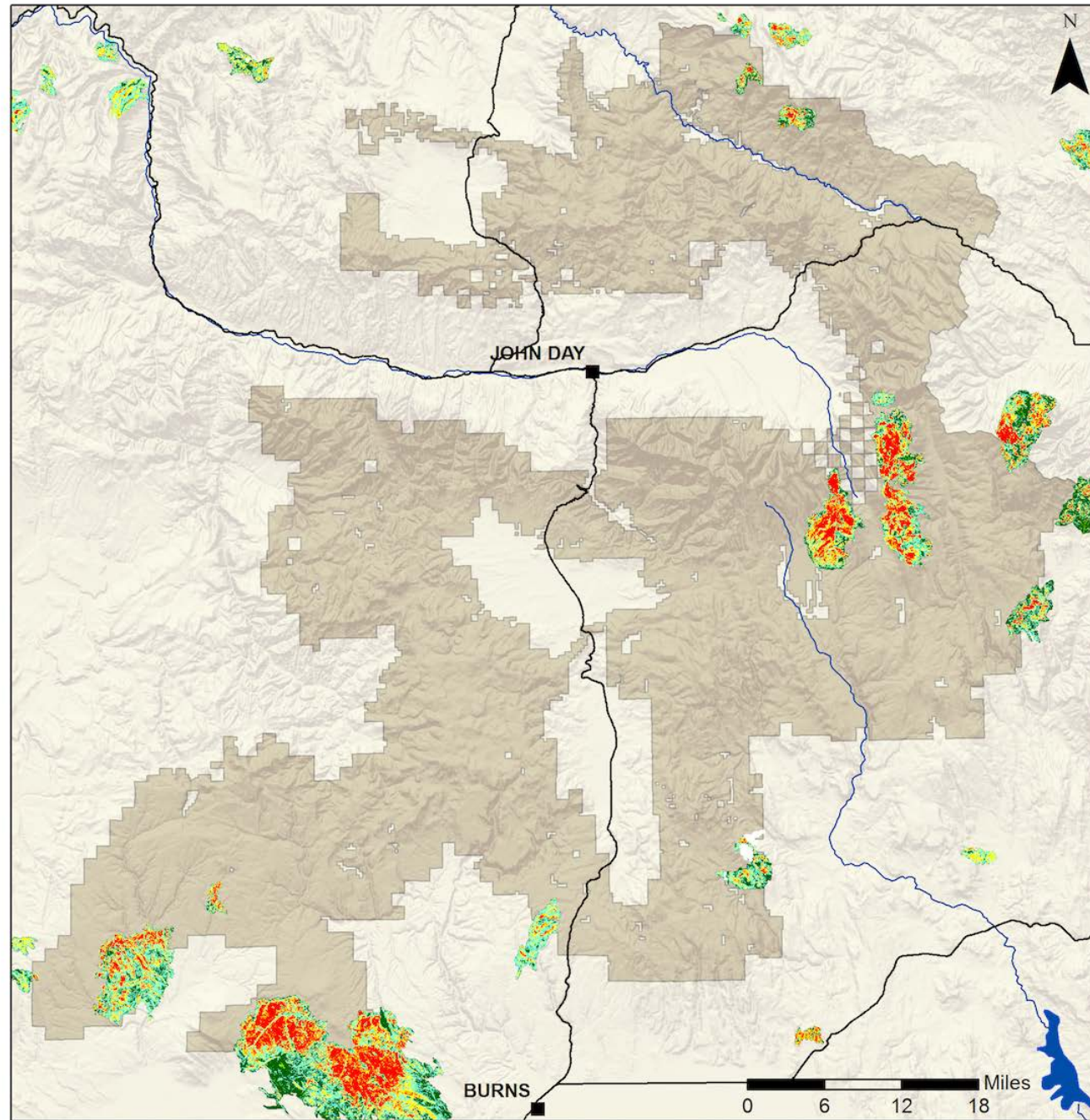
1994



- Unburned to low severity
- Low severity
- Moderate severity
- High severity



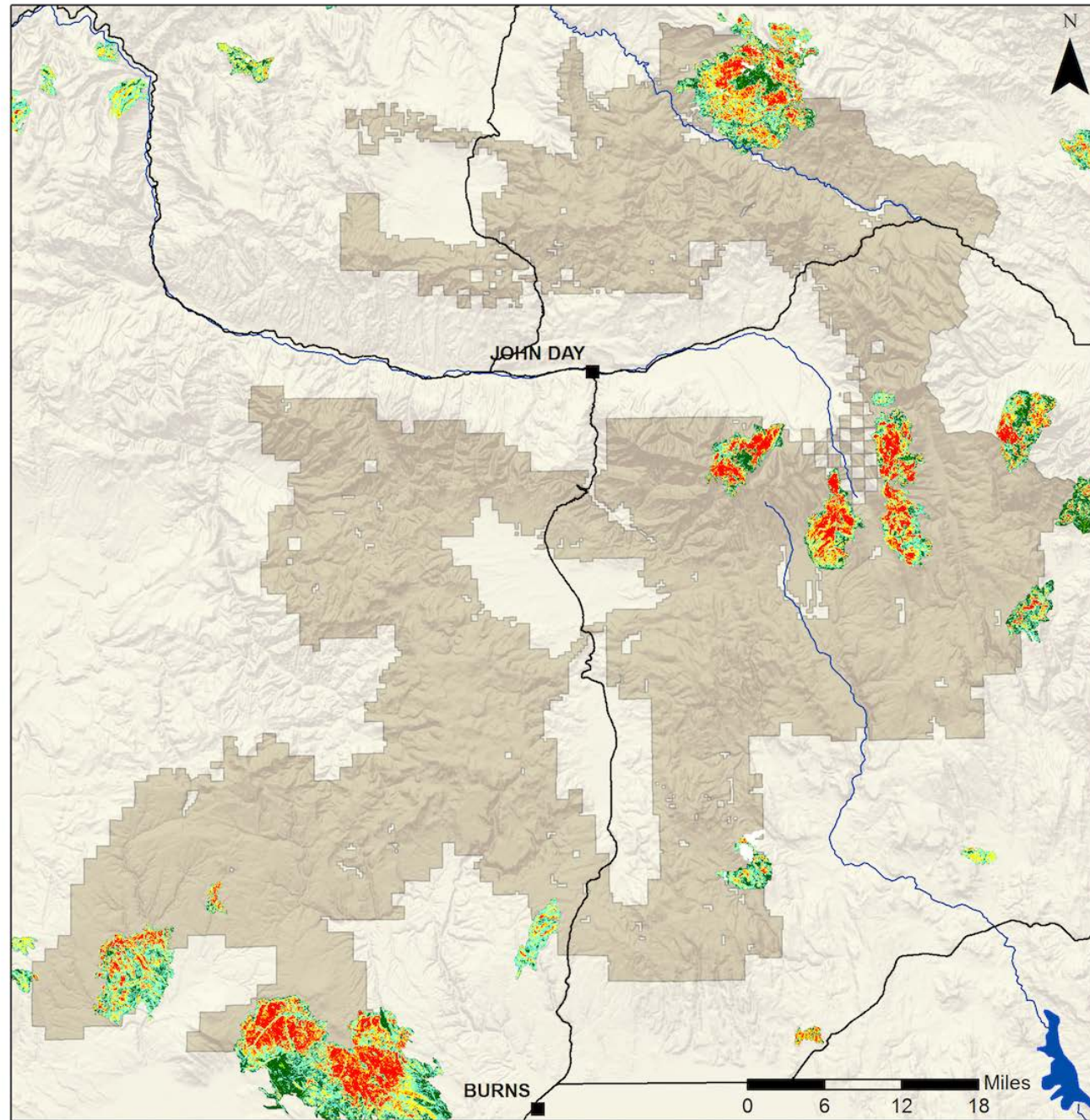
# 1995



- Unburned to low severity
- Low severity
- Moderate severity
- High severity



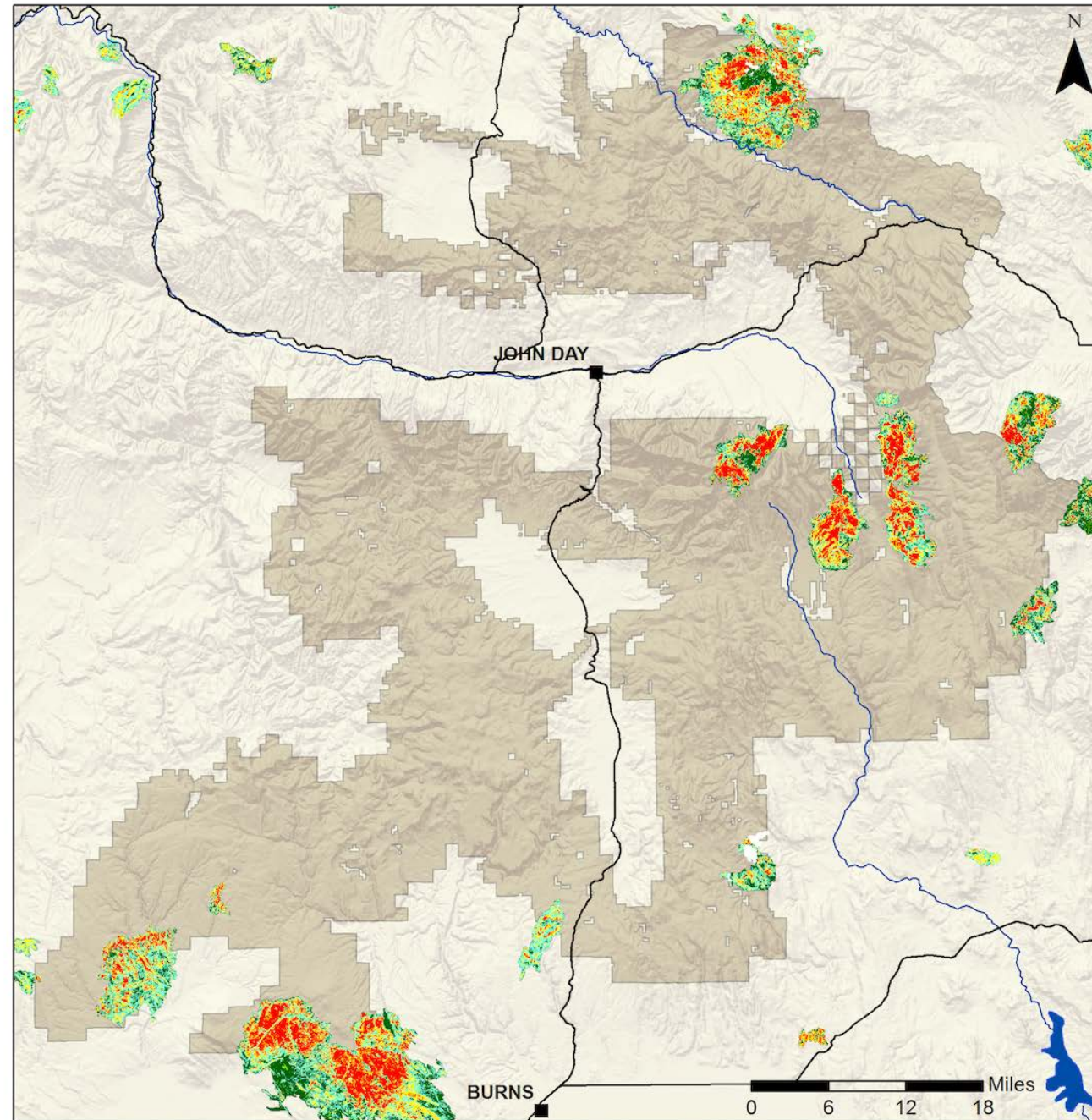
1996



- Unburned to low severity
- Low severity
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- High severity



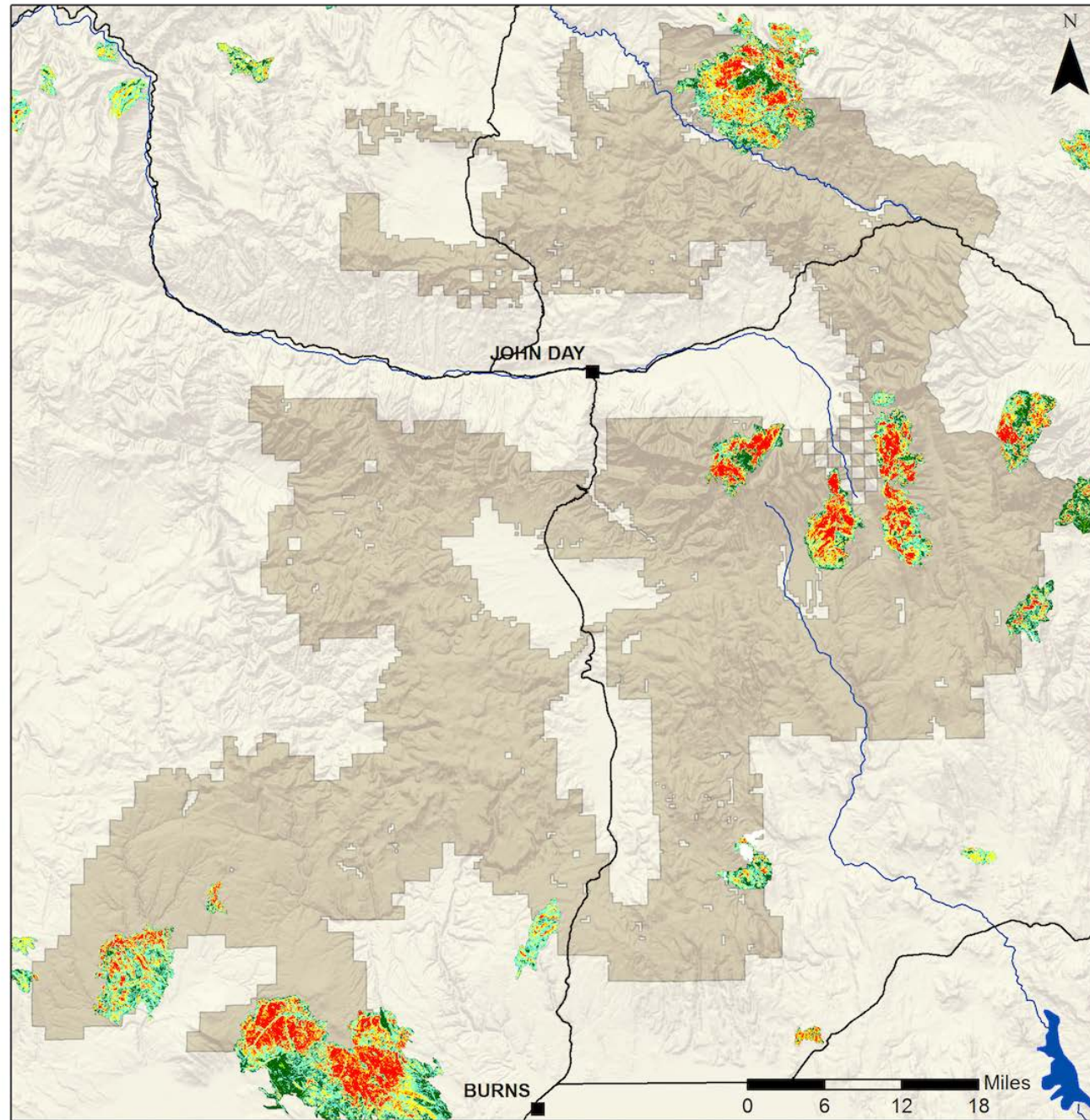
1997



- Unburned to low severity
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- Moderate severity
- High severity



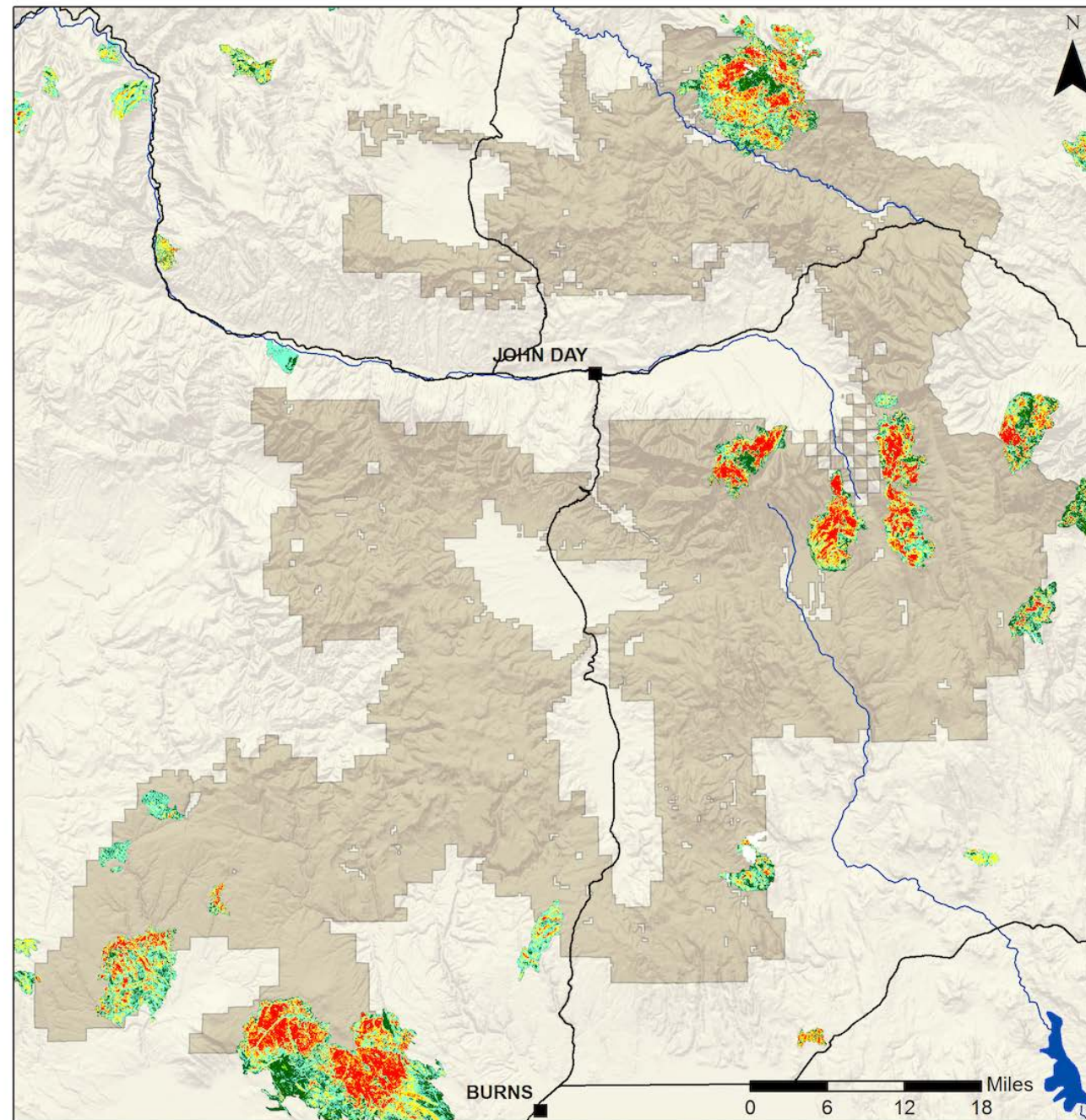
1998



- Unburned to low severity
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- Moderate severity
- High severity



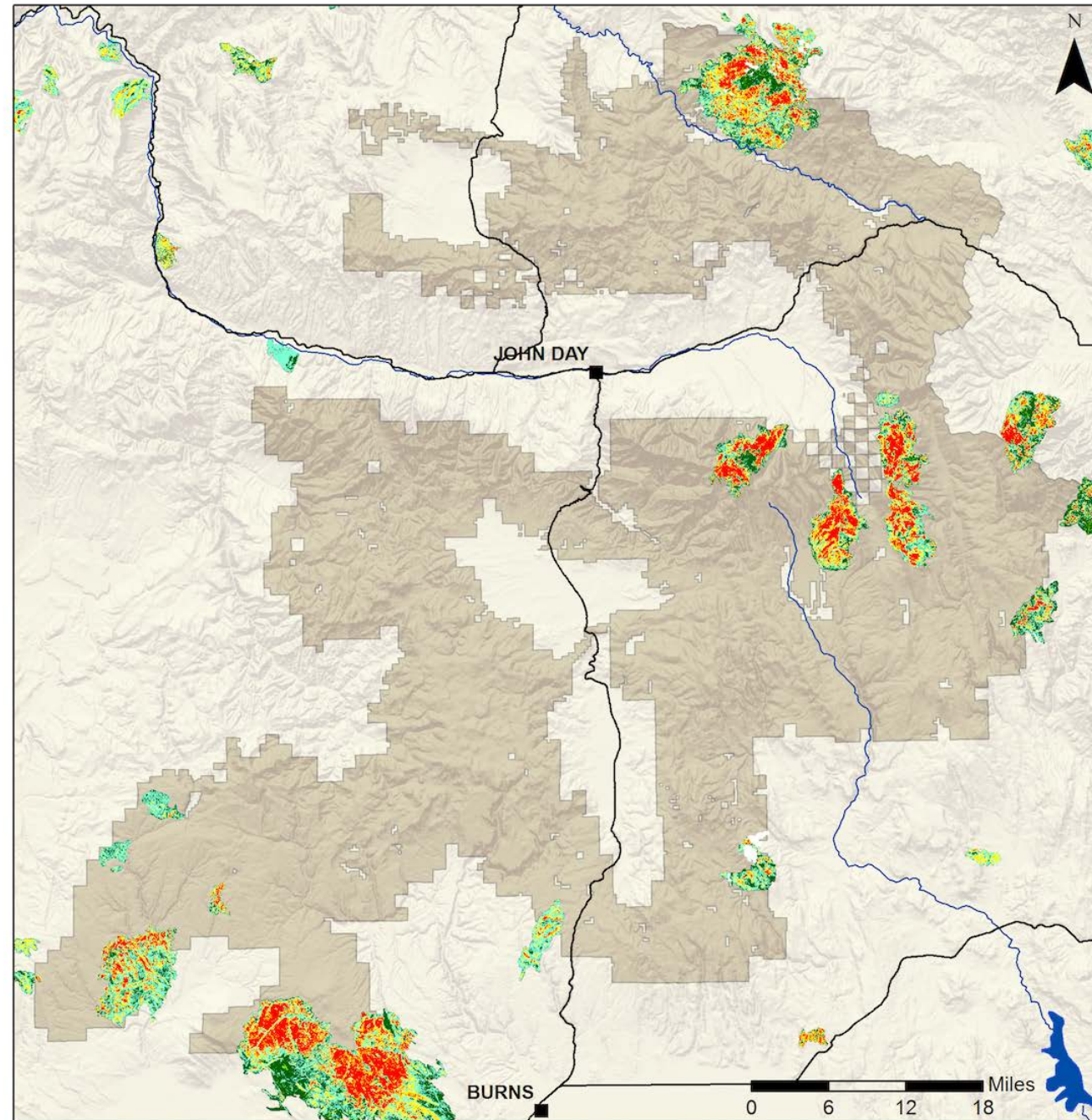
1999



- Unburned to low severity
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- High severity



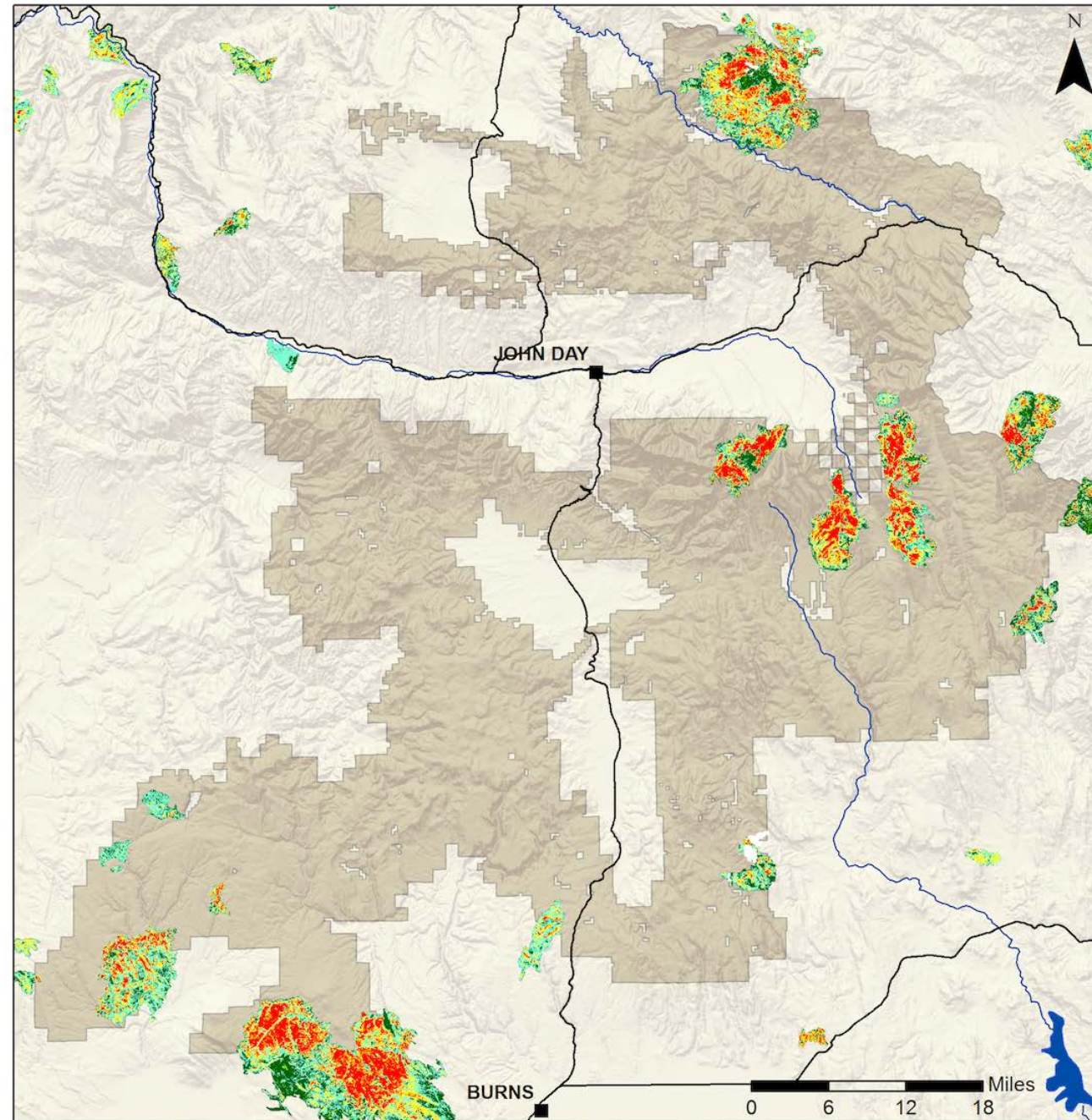
**2000**



- Unburned to low severity
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- High severity



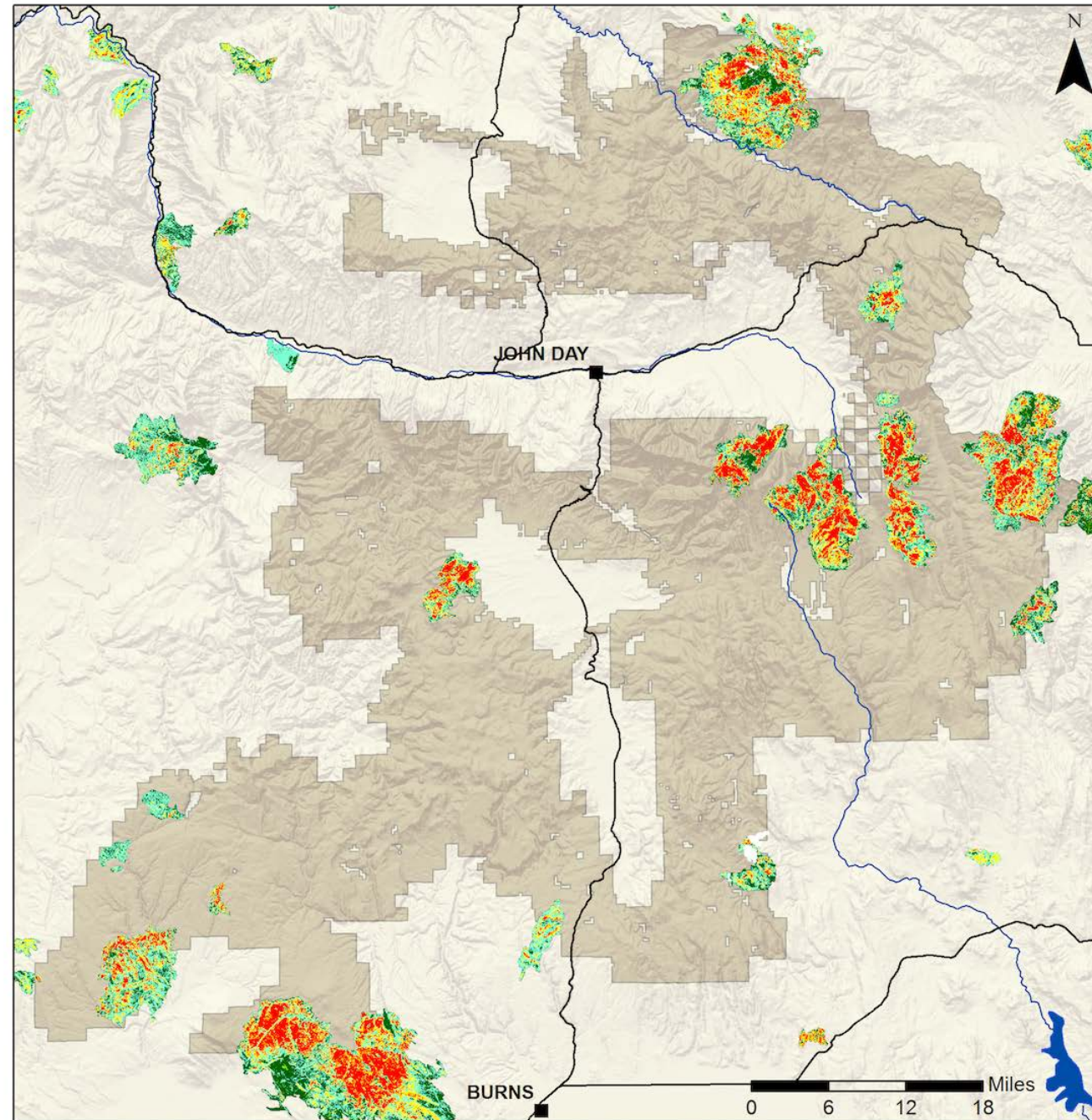
**2001**



- Unburned to low severity
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- High severity



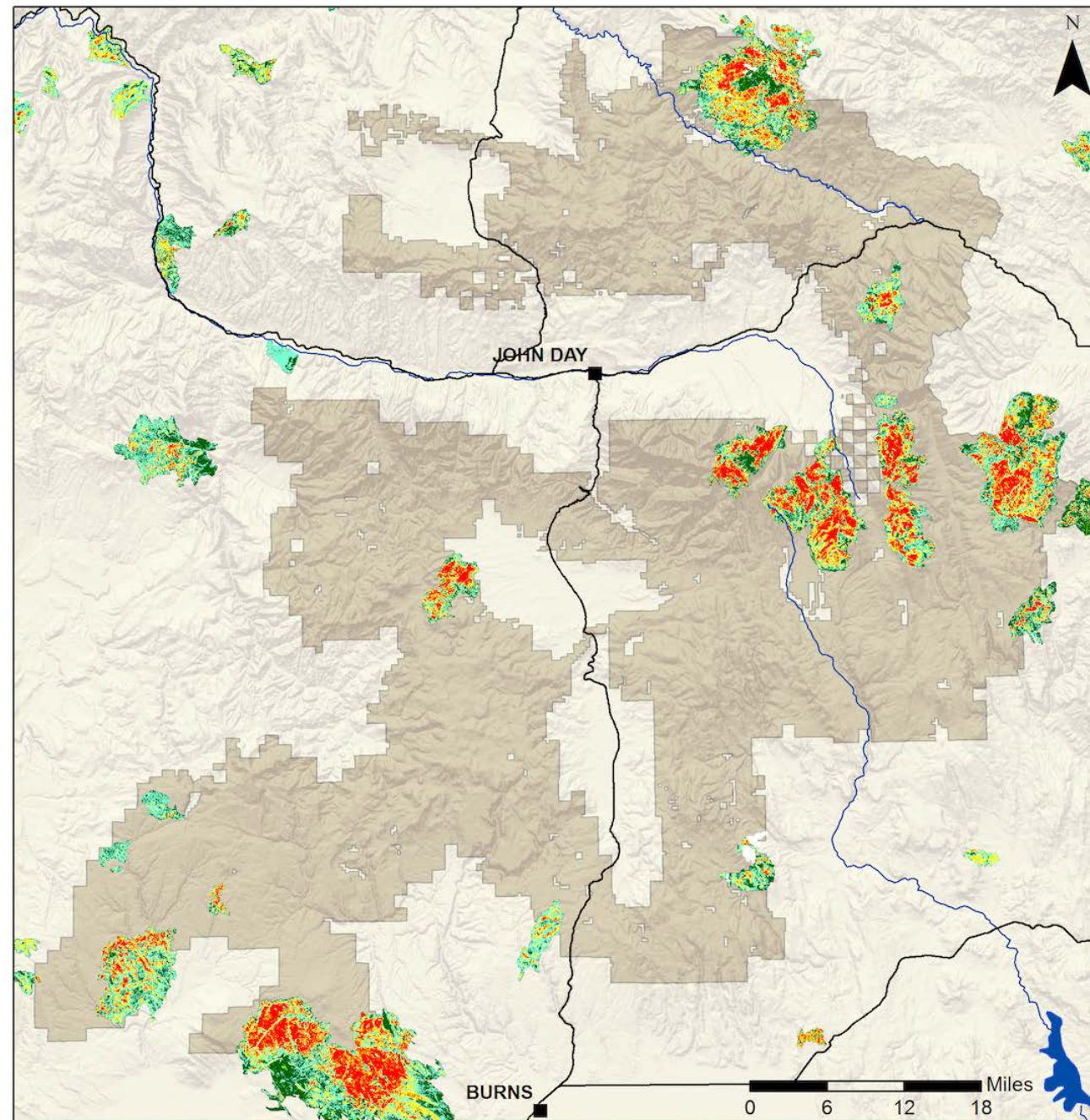
**2002**



- Unburned to low severity
- Low severity
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- High severity



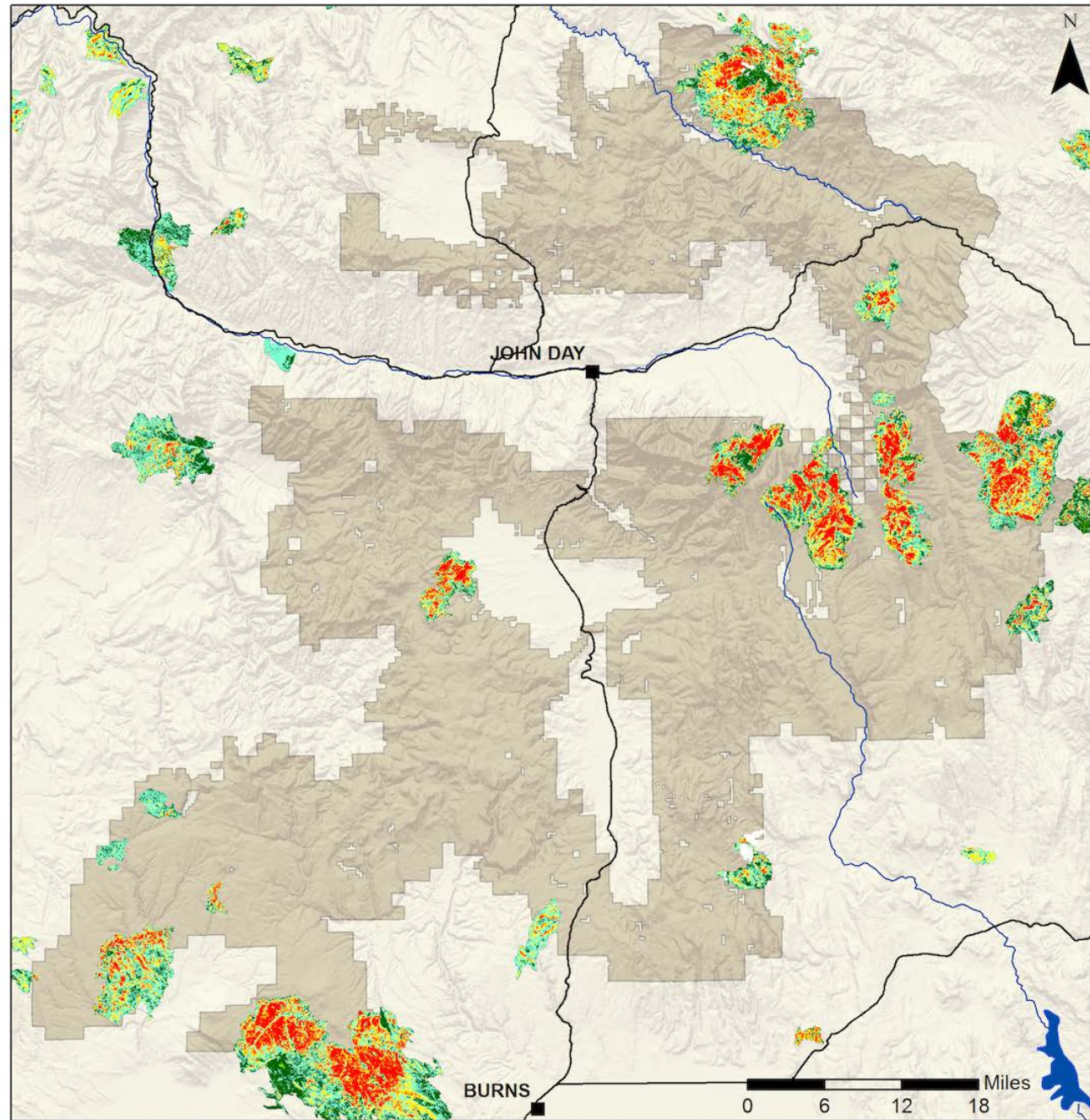
**2003**



- Unburned to low severity
- Low severity
- Moderate severity
- High severity



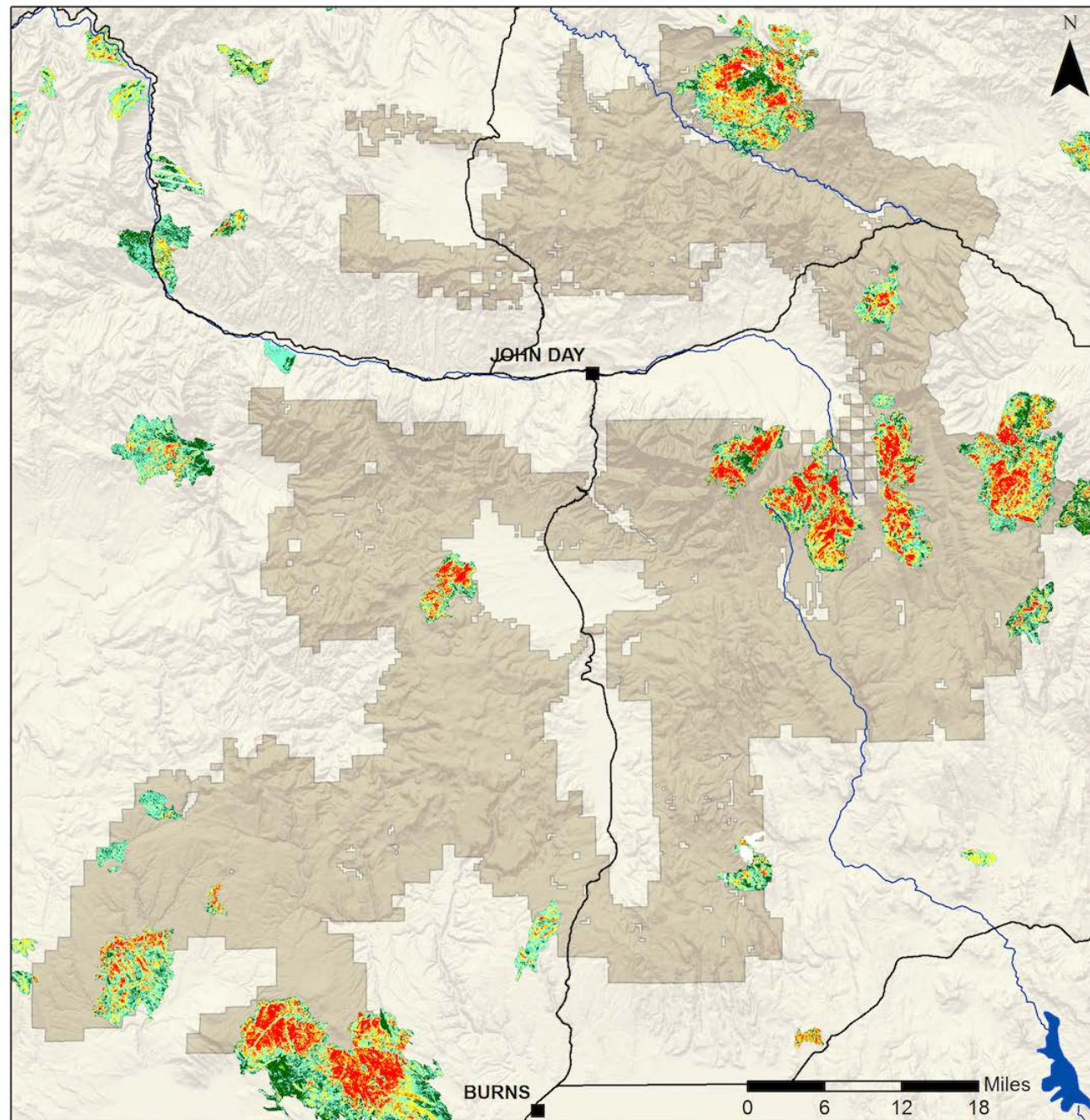
2004



- Unburned to low severity
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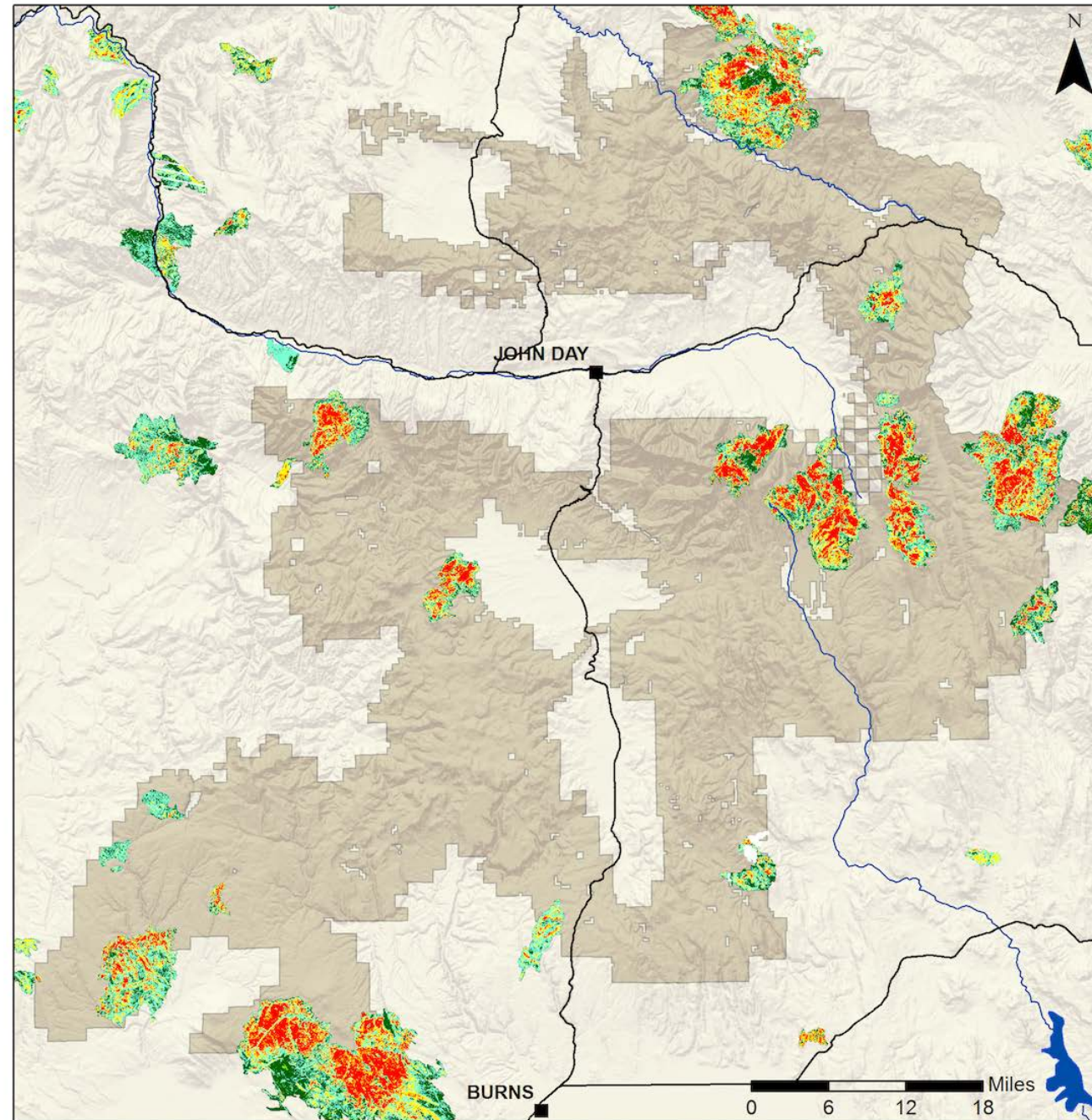
**2005**



- Unburned to low severity
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- High severity



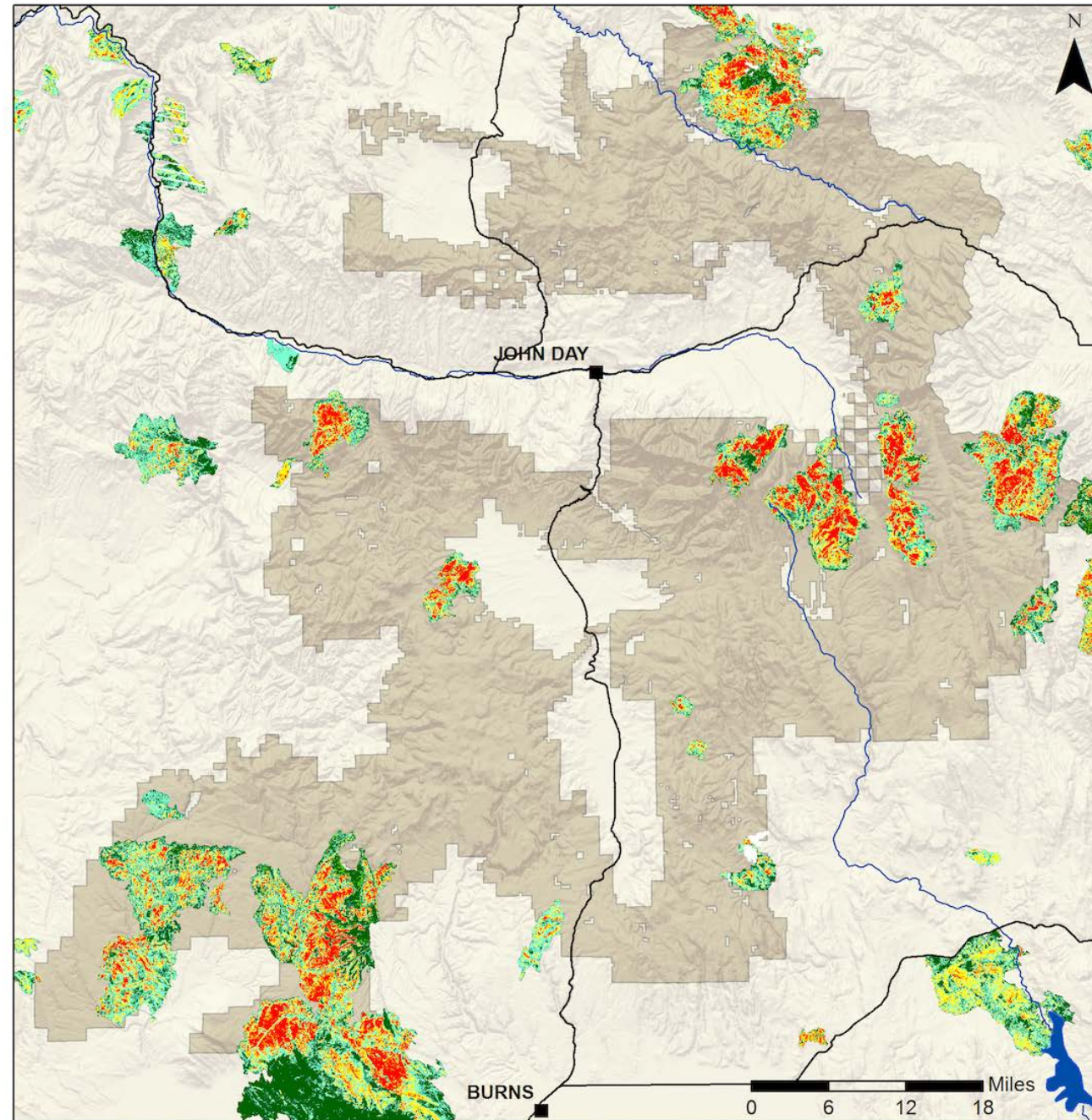
**2006**



- Unburned to low severity
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- High severity



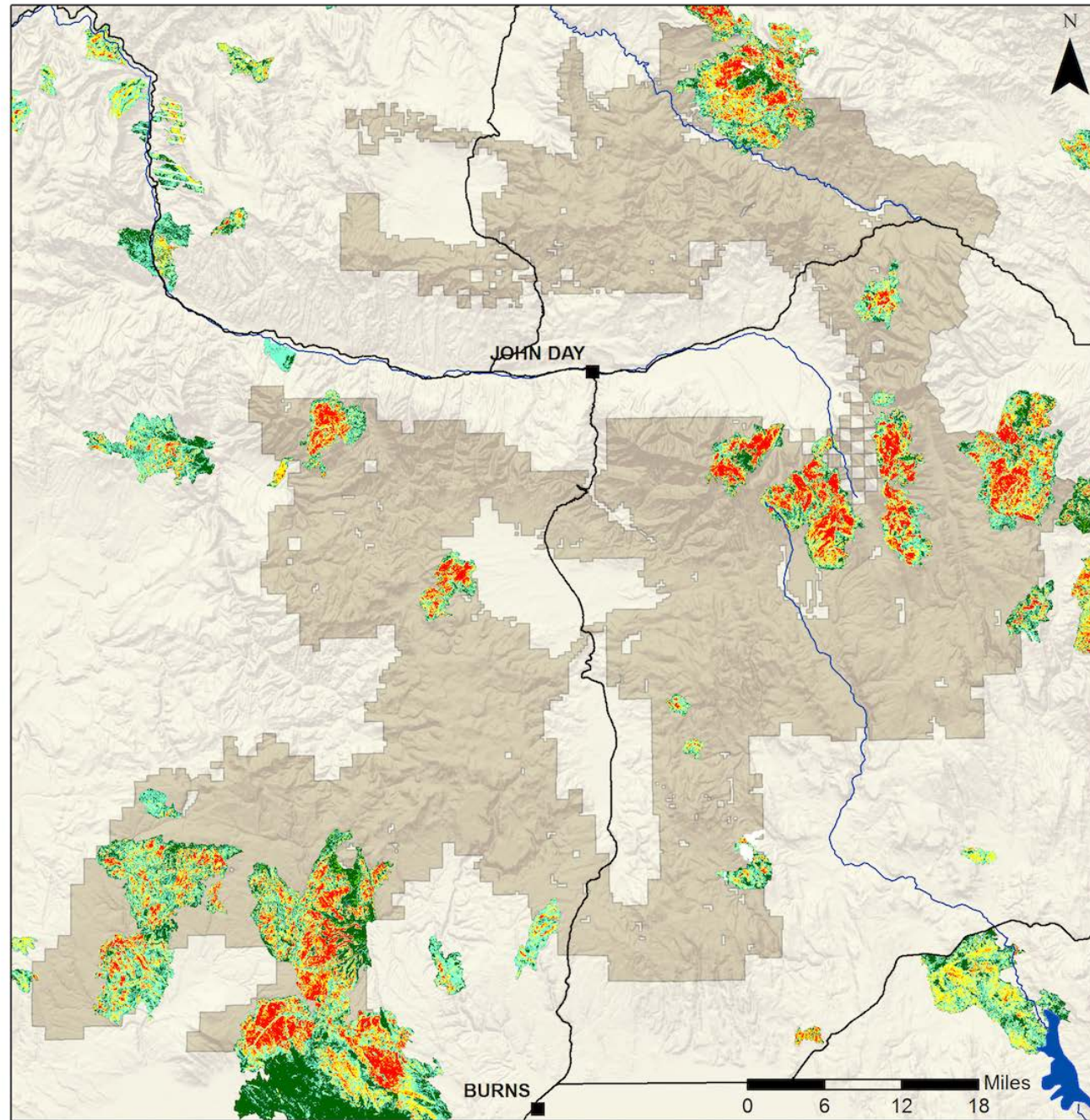
**2007**



- Unburned to low severity
- Low severity
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- High severity



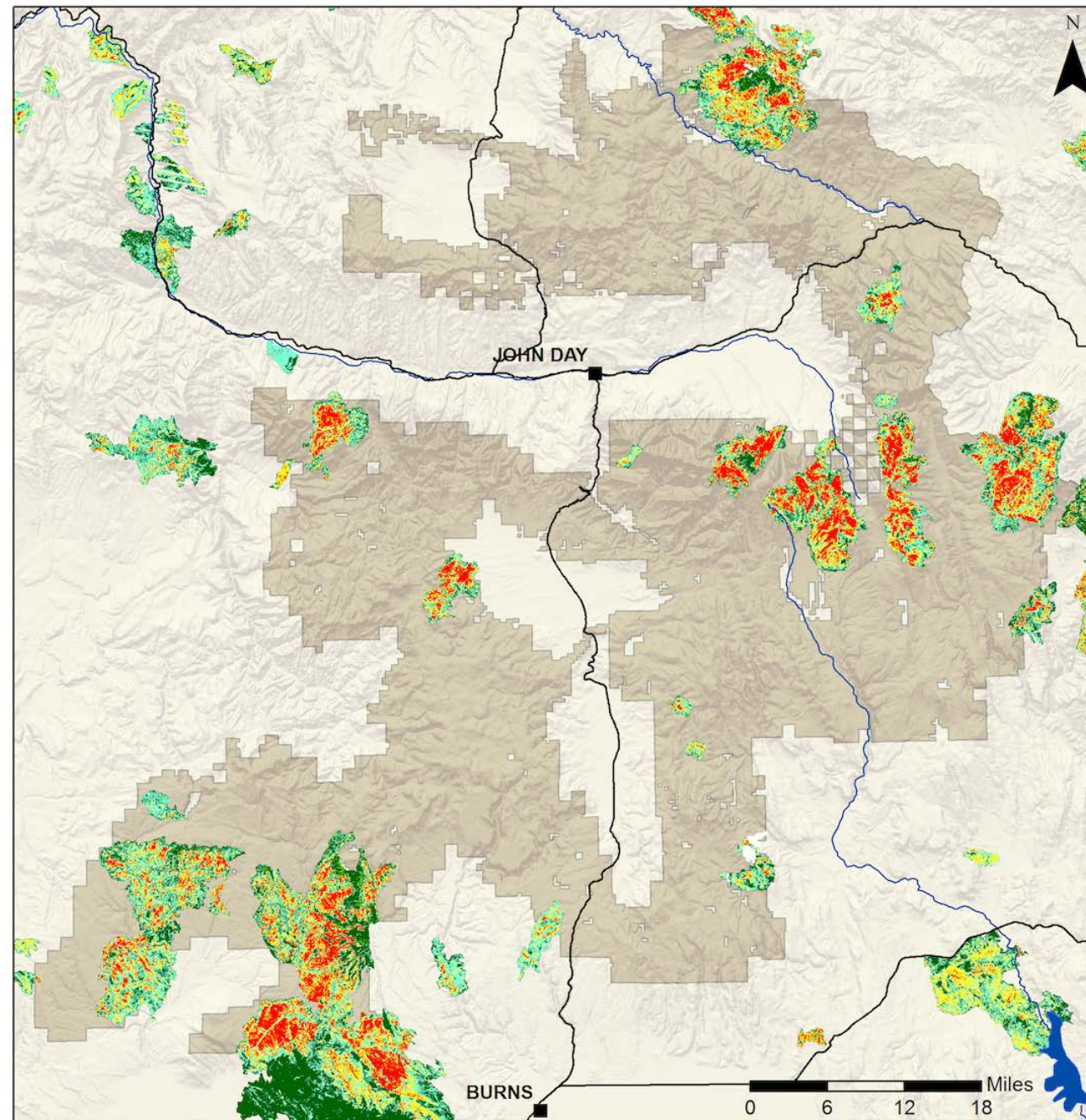
**2008**



- Unburned to low severity
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- High severity



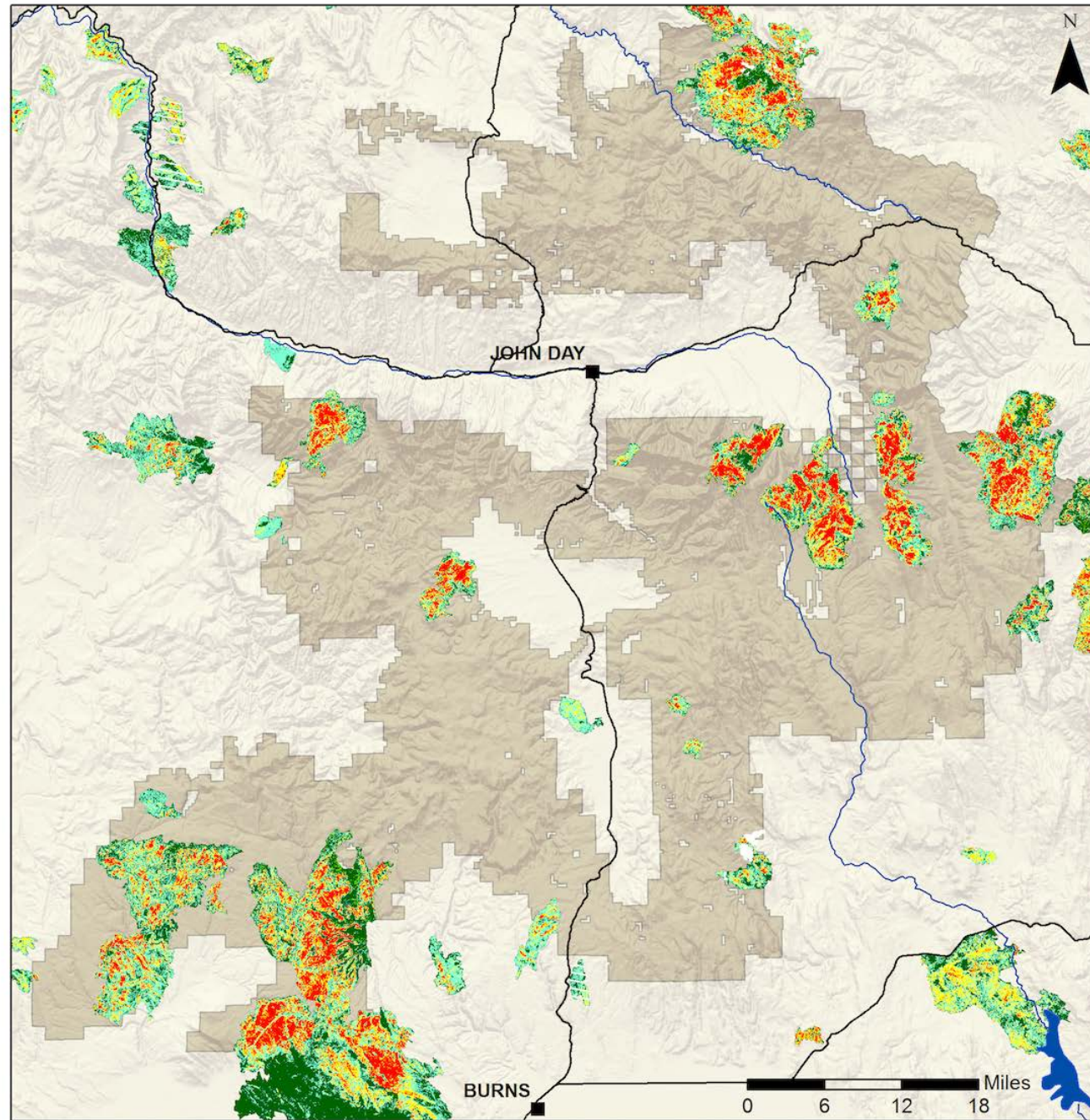
**2009**



- Unburned to low severity
- Low severity
- Moderate severity
- High severity



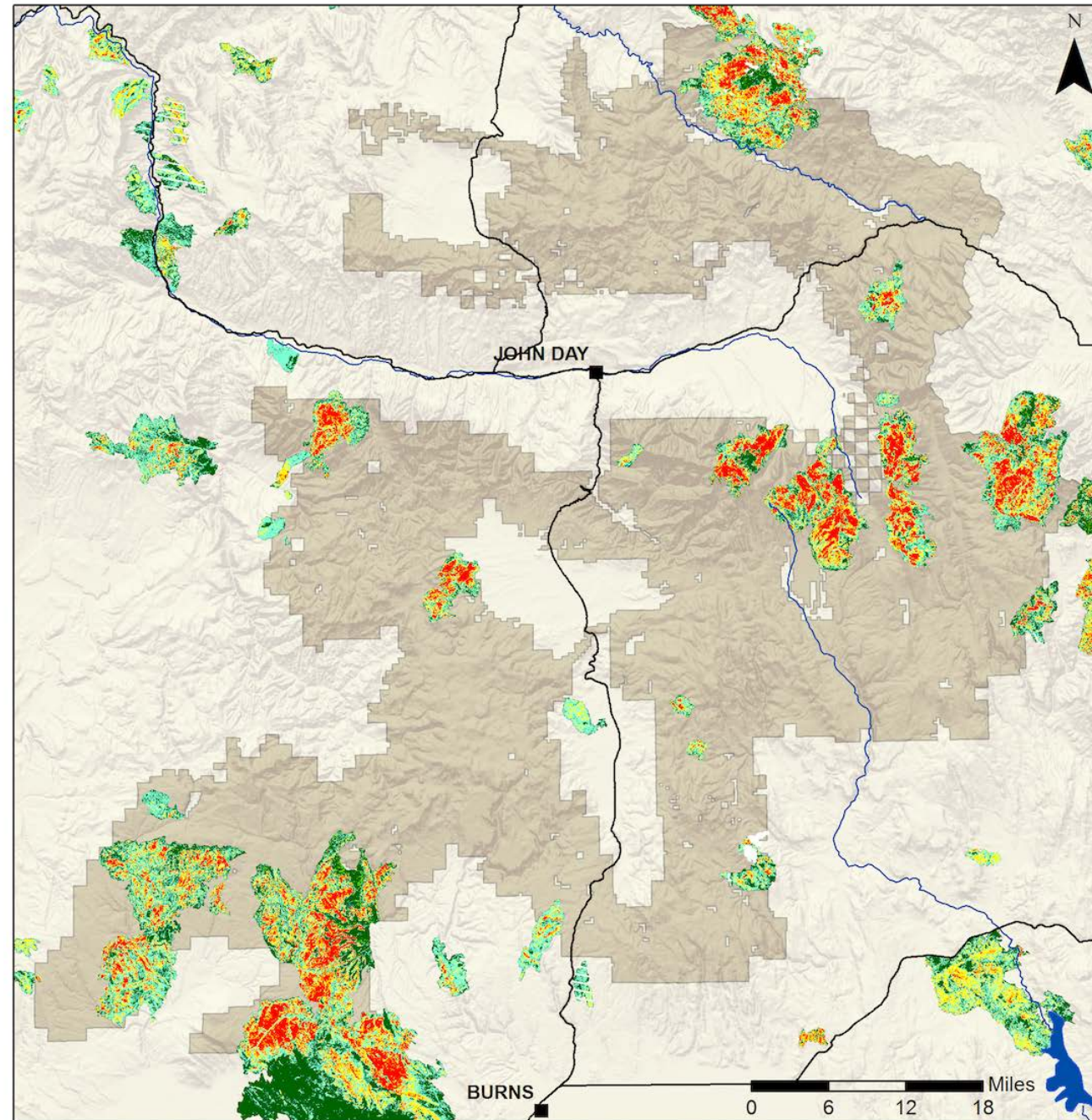
2010



- Unburned to low severity
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- High severity



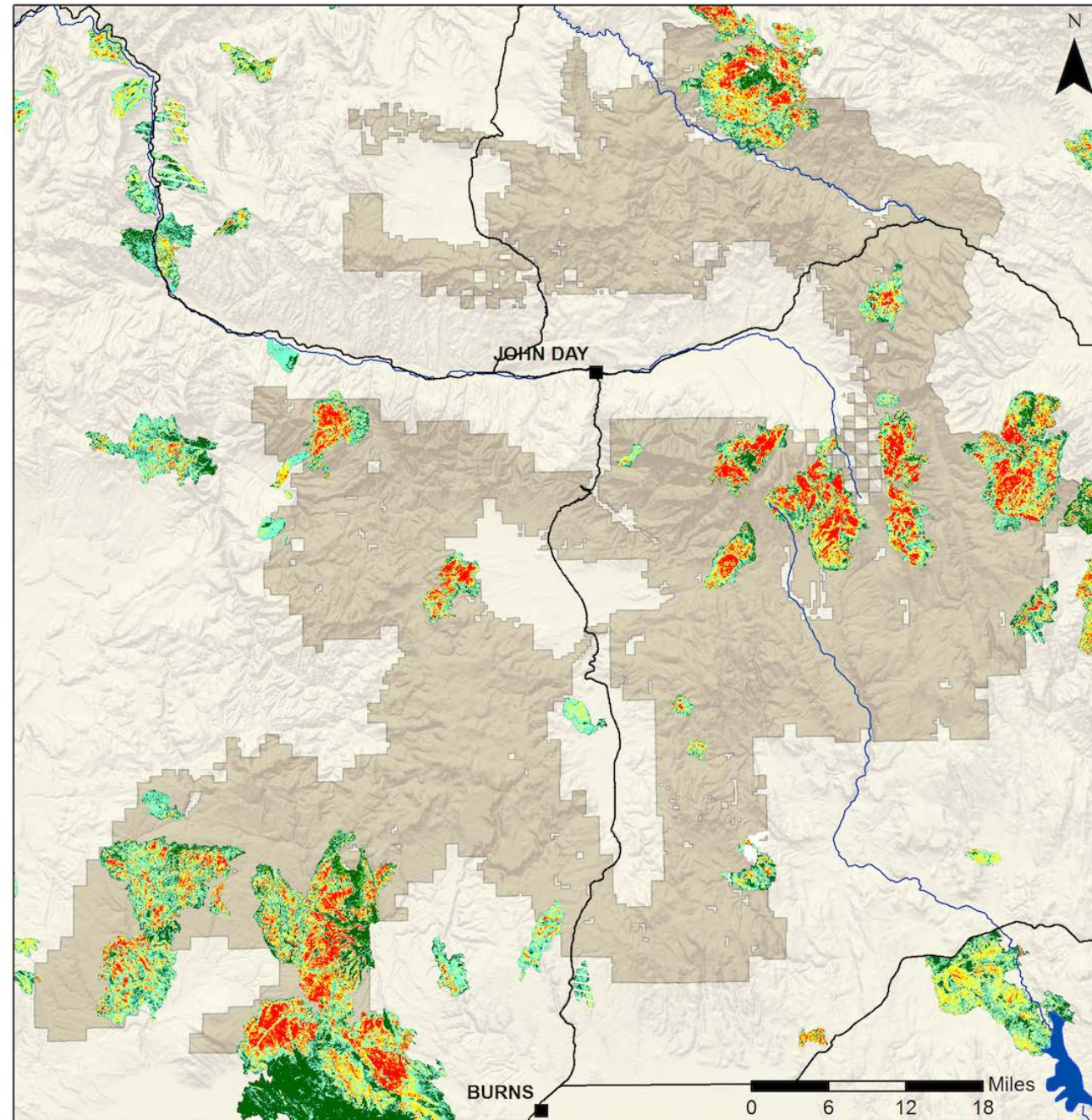
2011



- Unburned to low severity
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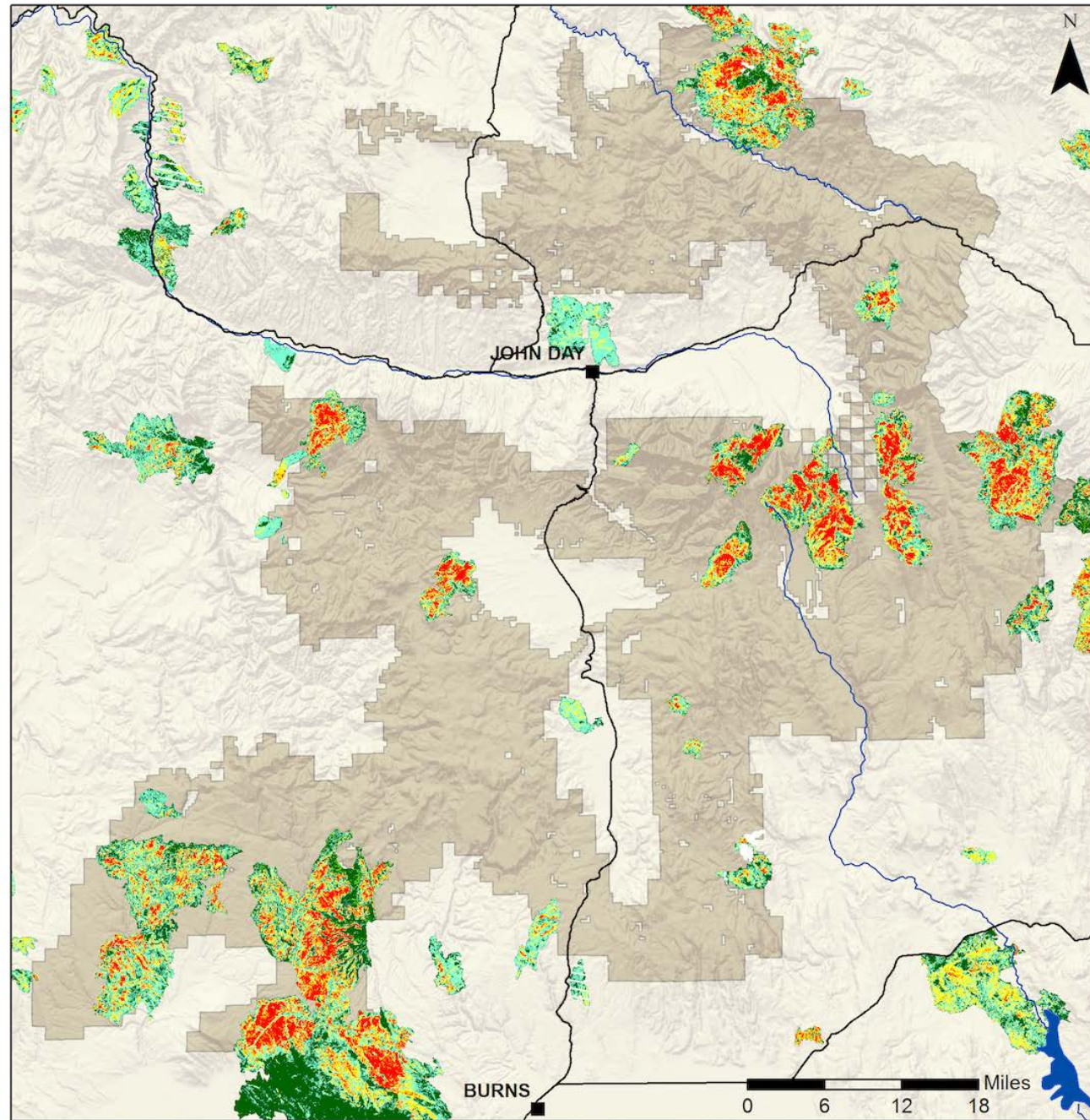
2012



- Unburned to low severity
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- High severity



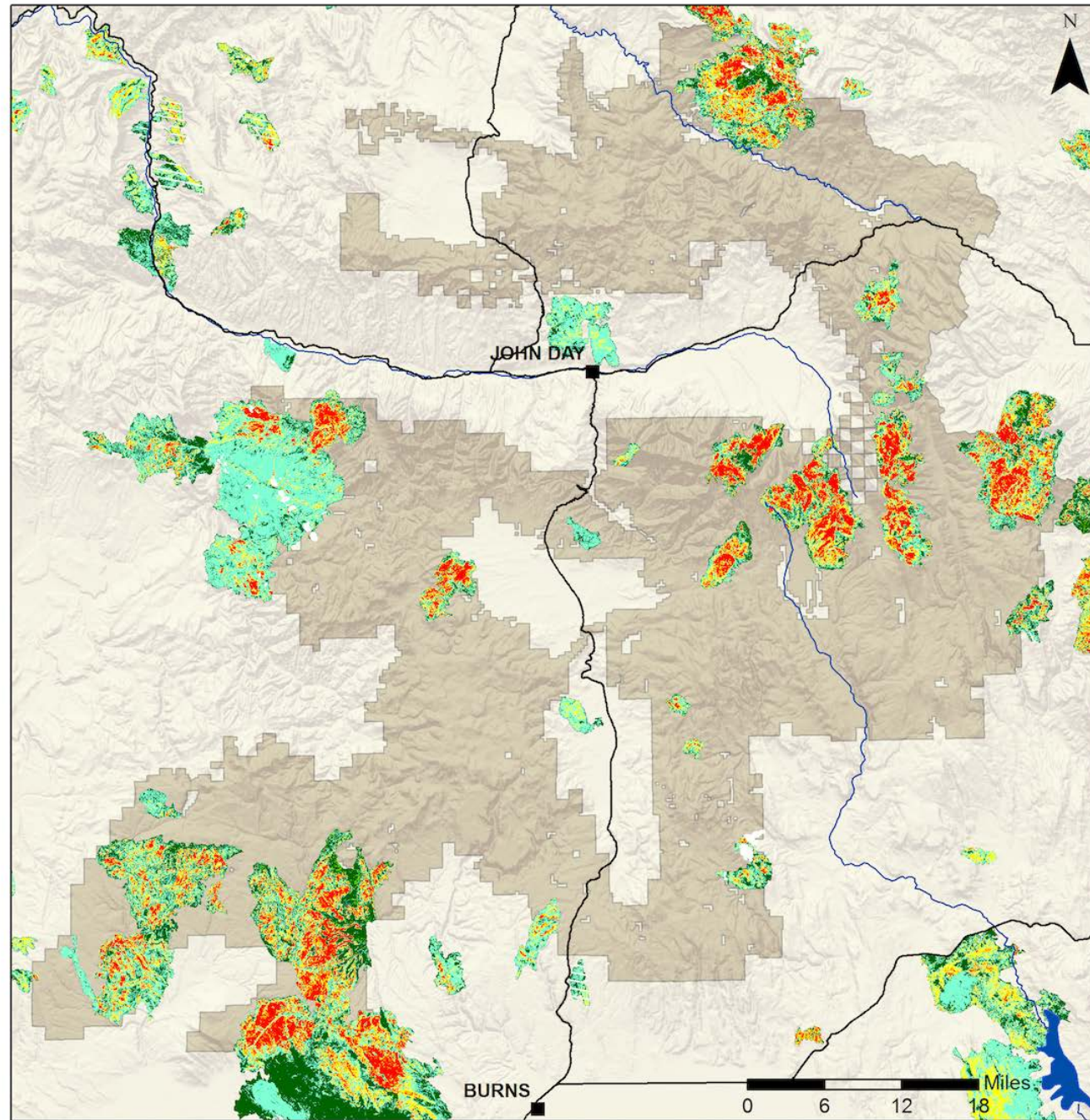
**2013**



- Unburned to low severity
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- High severity



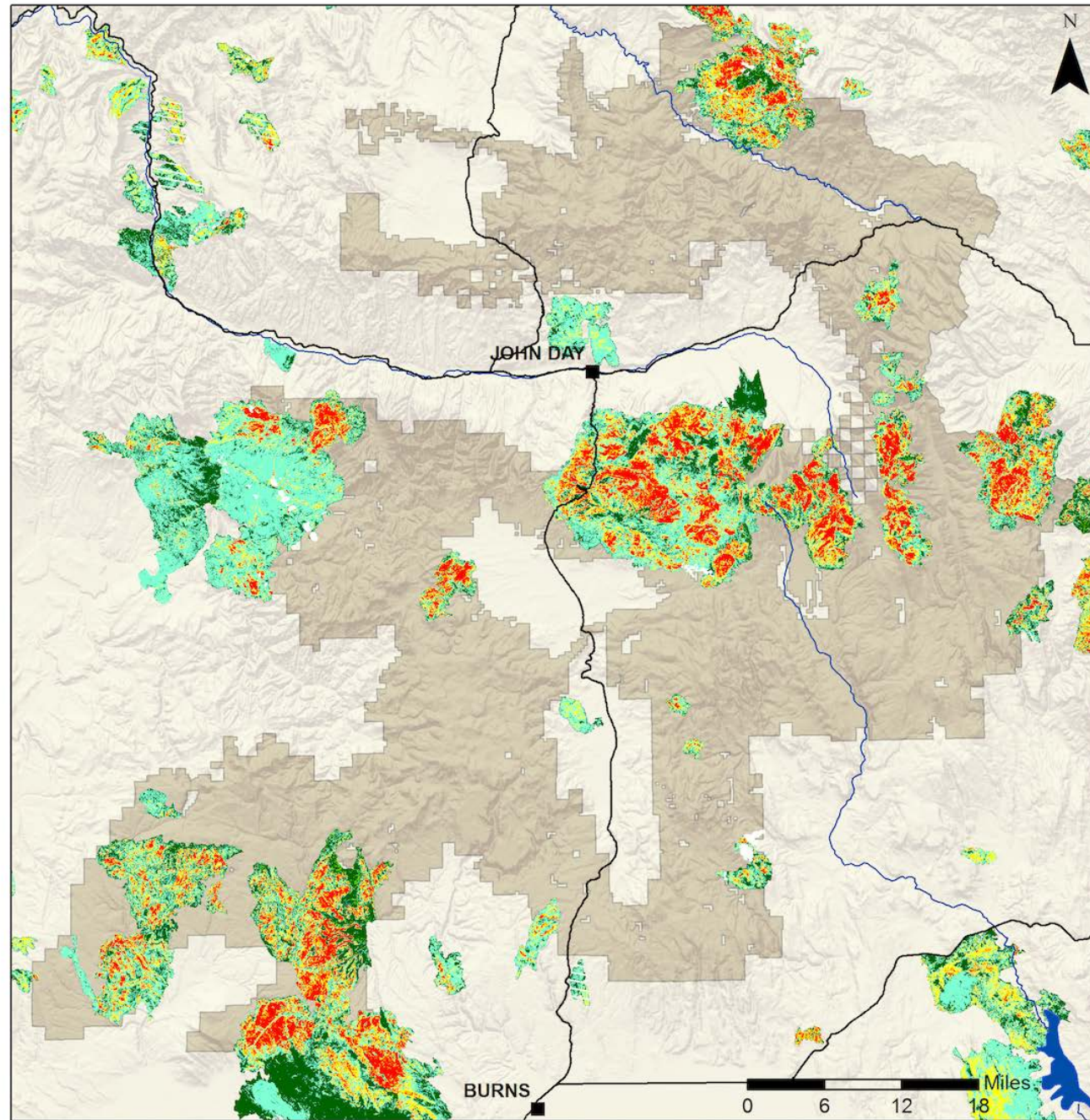
2014



- Unburned to low severity
- Low severity
- Moderate severity
- High severity



2015



- Unburned to low severity
- Low severity
- Moderate severity
- High severity



## **Biophysical context of fires**

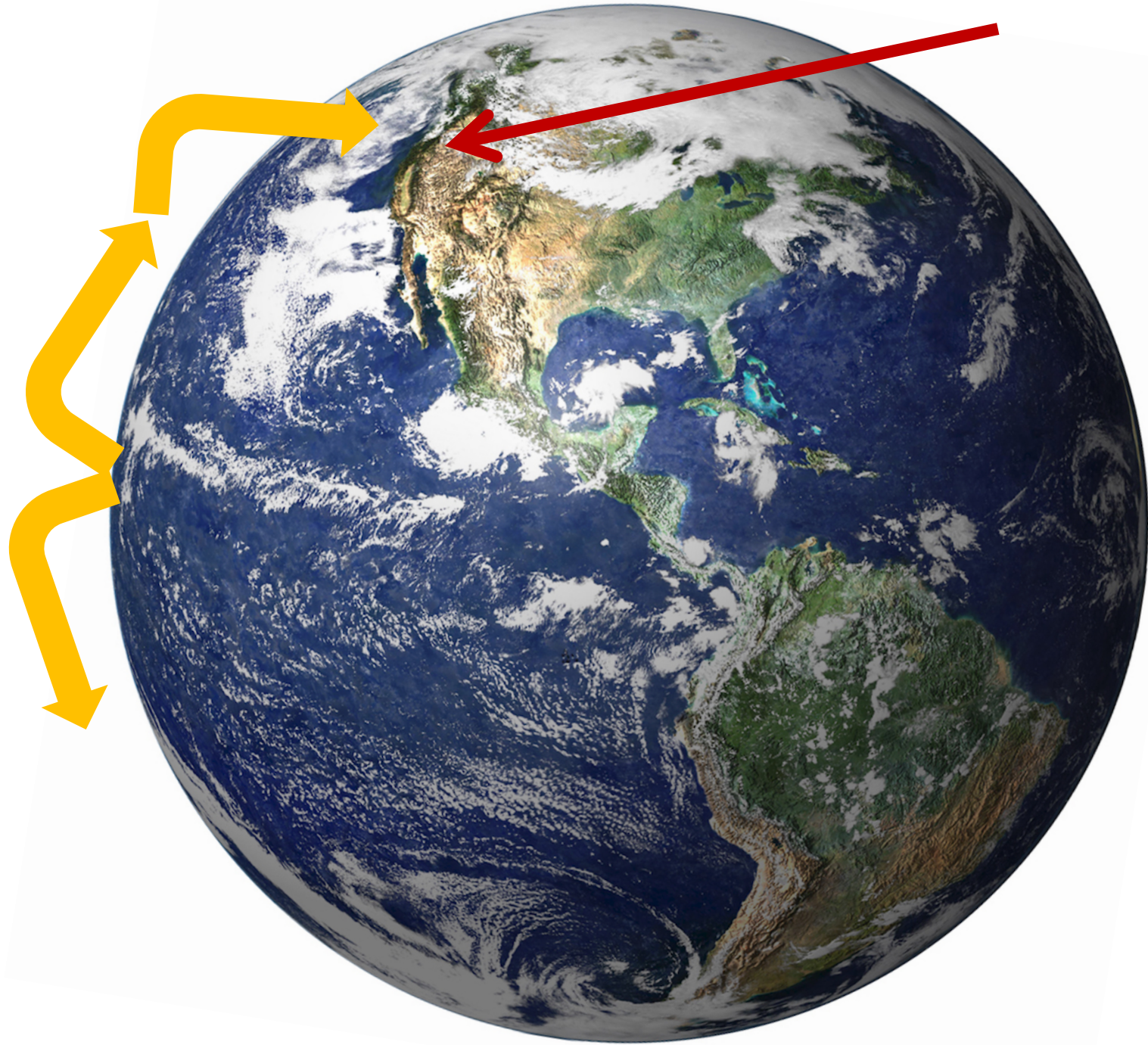






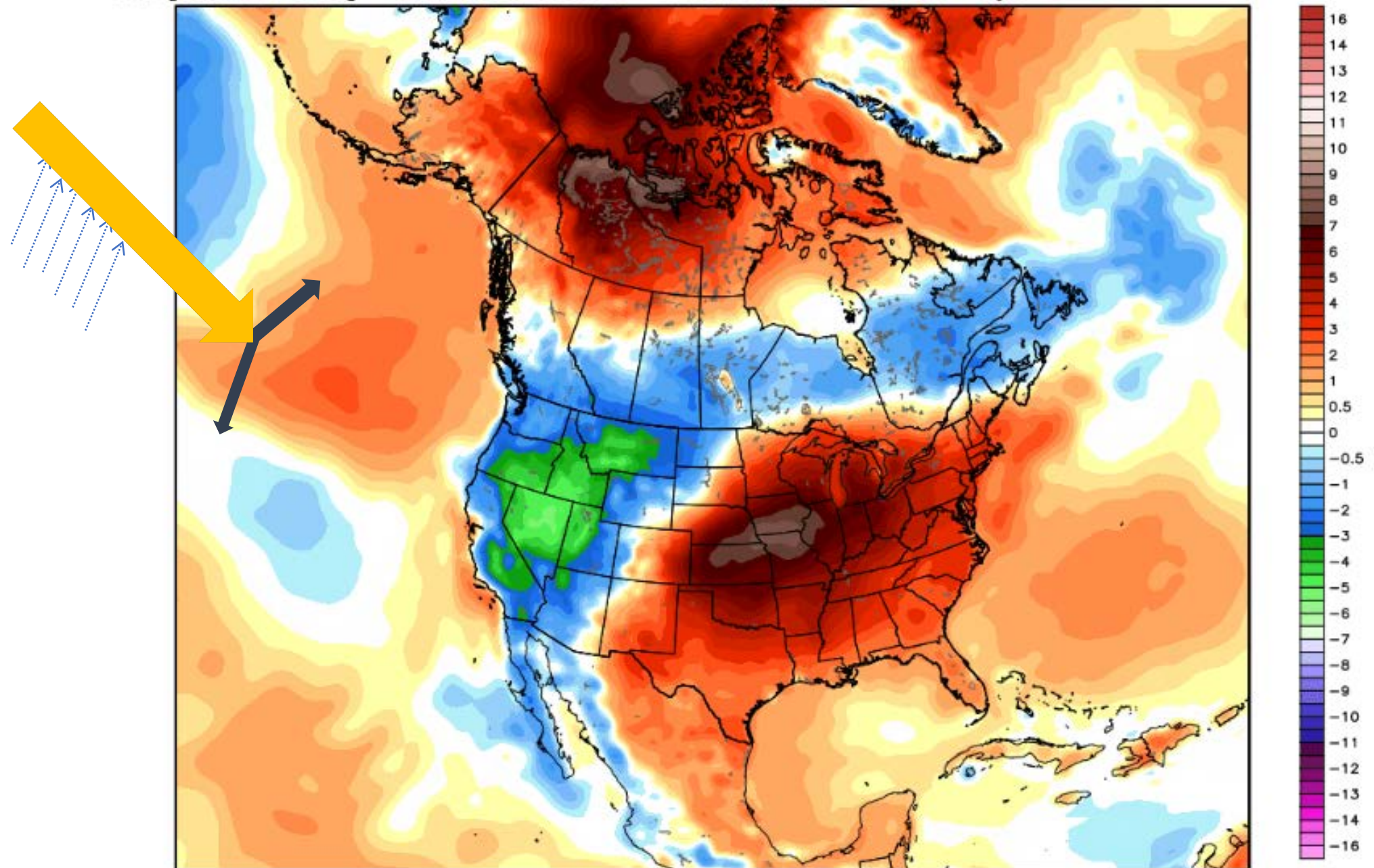




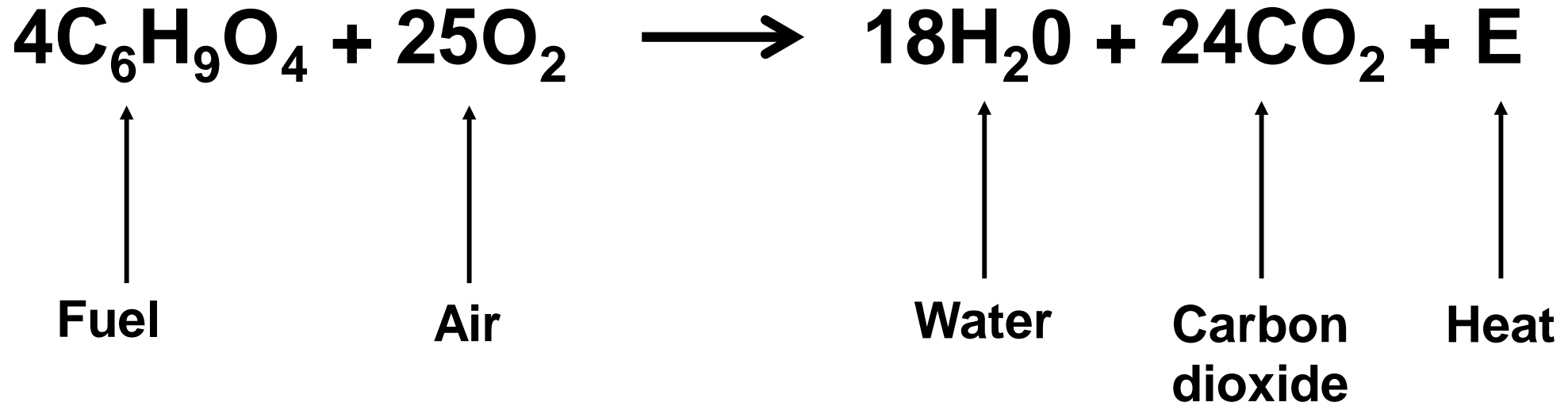




NCEP GEFS [T574] Ensemble Mean 1-day Avg 2-m Temperature ANOMALY [°C]  
Init: [06Z17SEP2016] -- fx: 06Z23SEP2016--06Z24SEP2016 6-7 days



# Fire as a rapid decomposer....





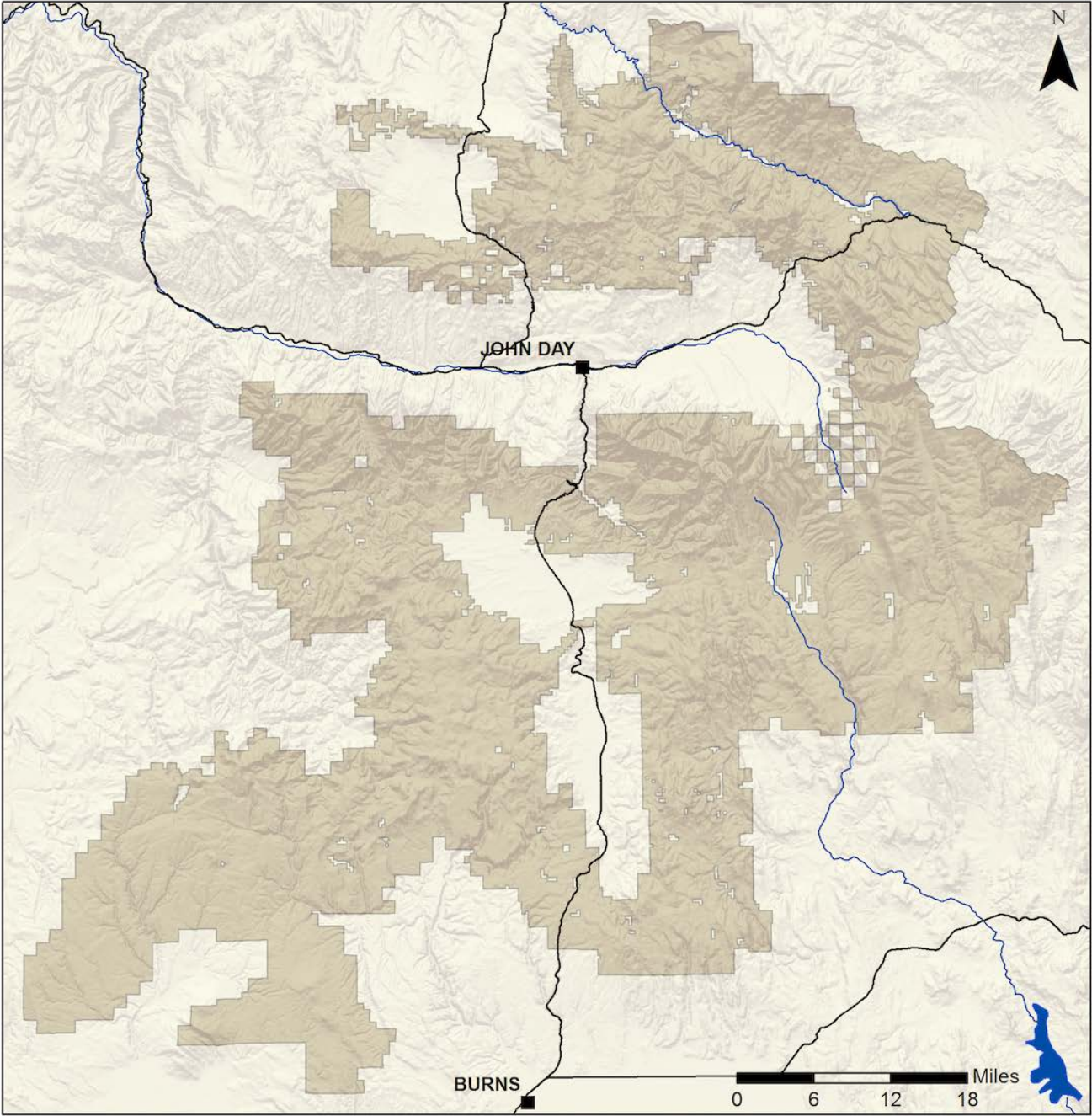






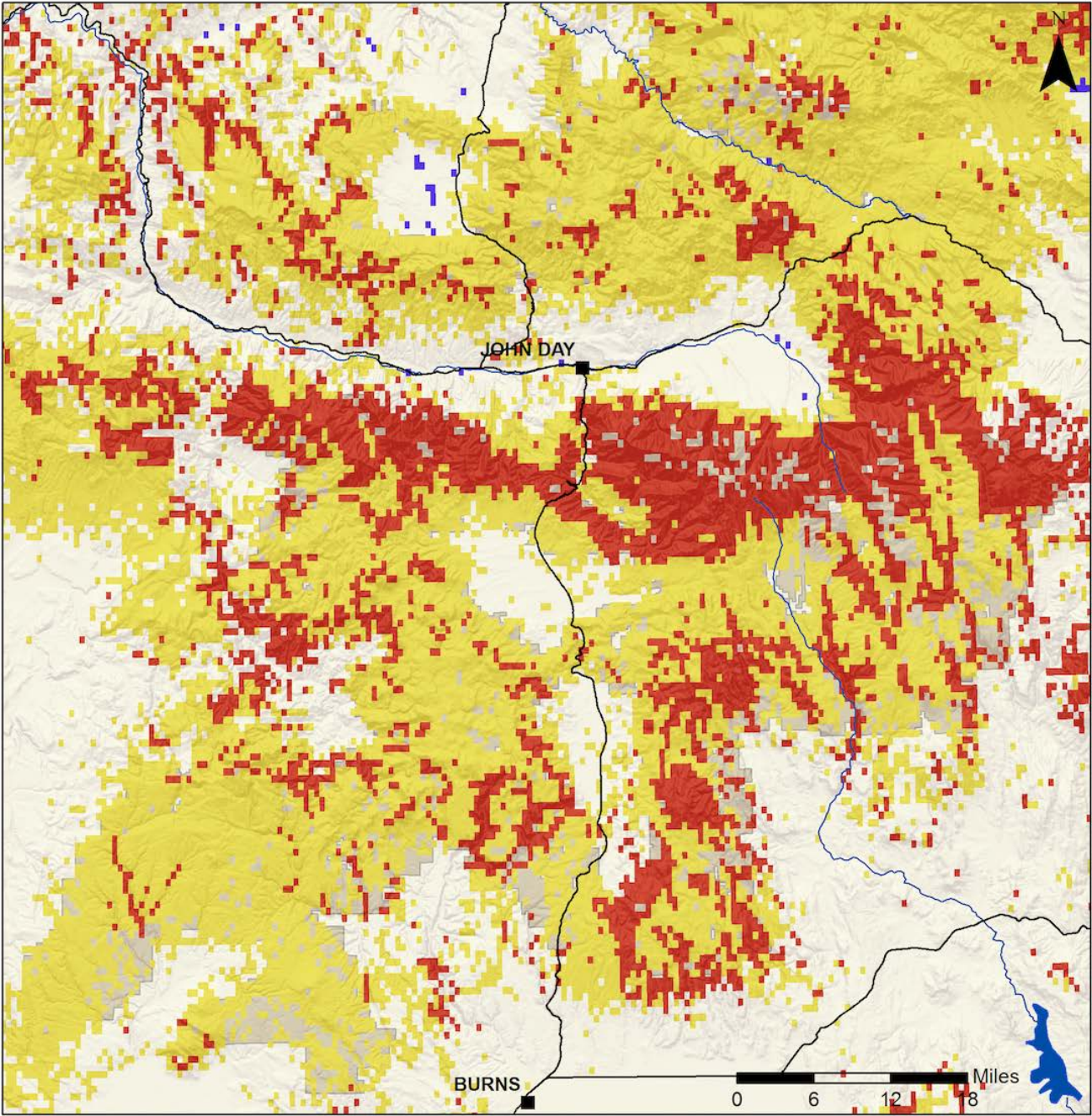


**Modeled  
future fire  
potential**





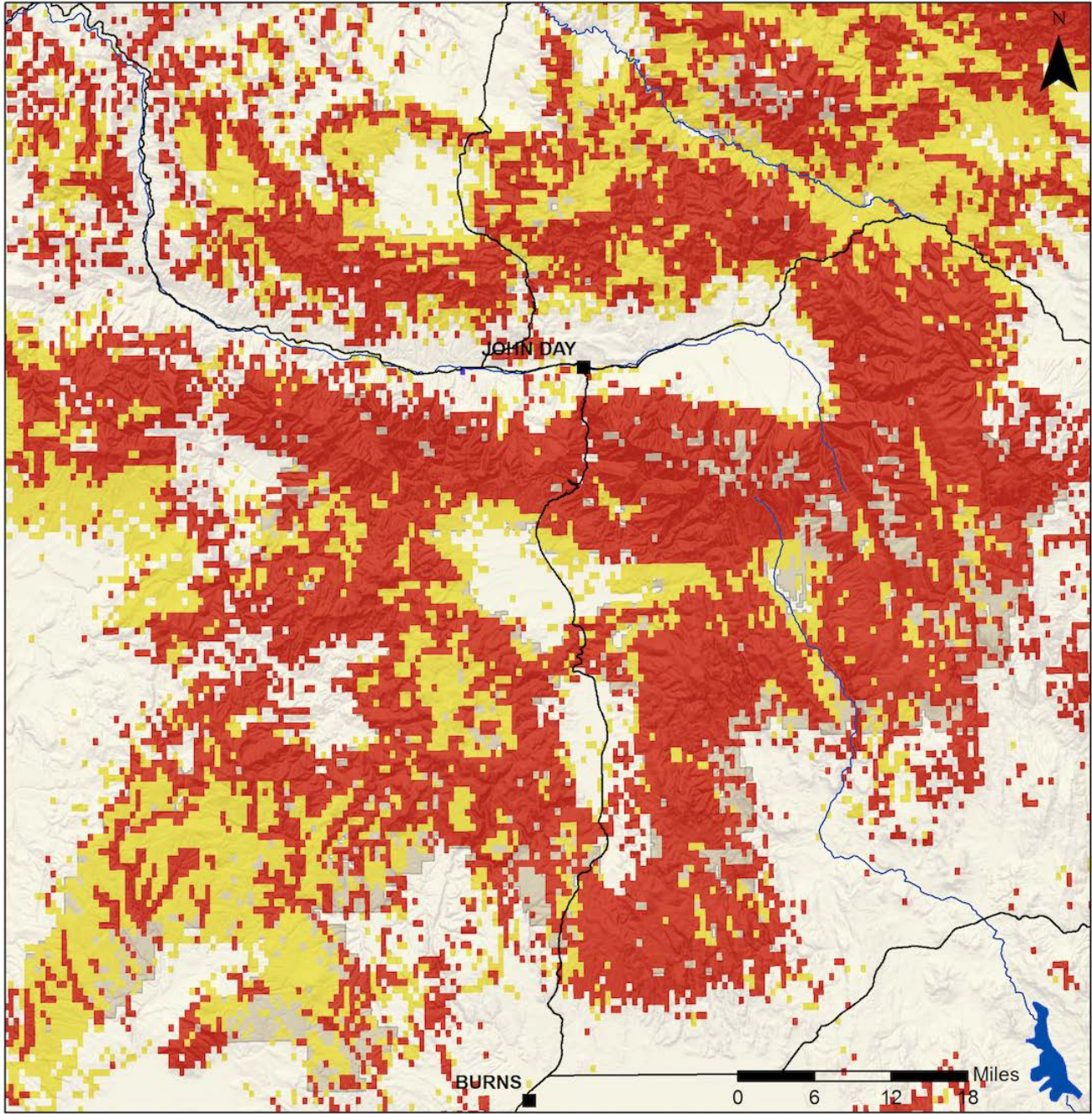
**1960-2000**  
**Fire potential**



Davis, R., Z. Yang, A. Yost, C. Belongie and W. Cohen. 2017. The normal fire environment—Modeling environmental suitability for large forest wildfires using past, present, and future climate normals. *Forest Ecology and Management* 390:173-186.



**2020-2050**  
**Fire potential**



Davis, R., Z. Yang, A. Yost, C. Belongie and W. Cohen. 2017. The normal fire environment—Modeling environmental suitability for large forest wildfires using past, present, and future climate normals. *Forest Ecology and Management* 390:173-186.

**Management implications for the future**







# Invasive species invasion following wildfire

2016





# Invasive species invasion following wildfire

2017





# Monitoring surface fuels following treatment

531 permanent plots (measured 2014-2017)  
2,987 surface fuel loading transects





# Changes in surface fuel following treatment

2014





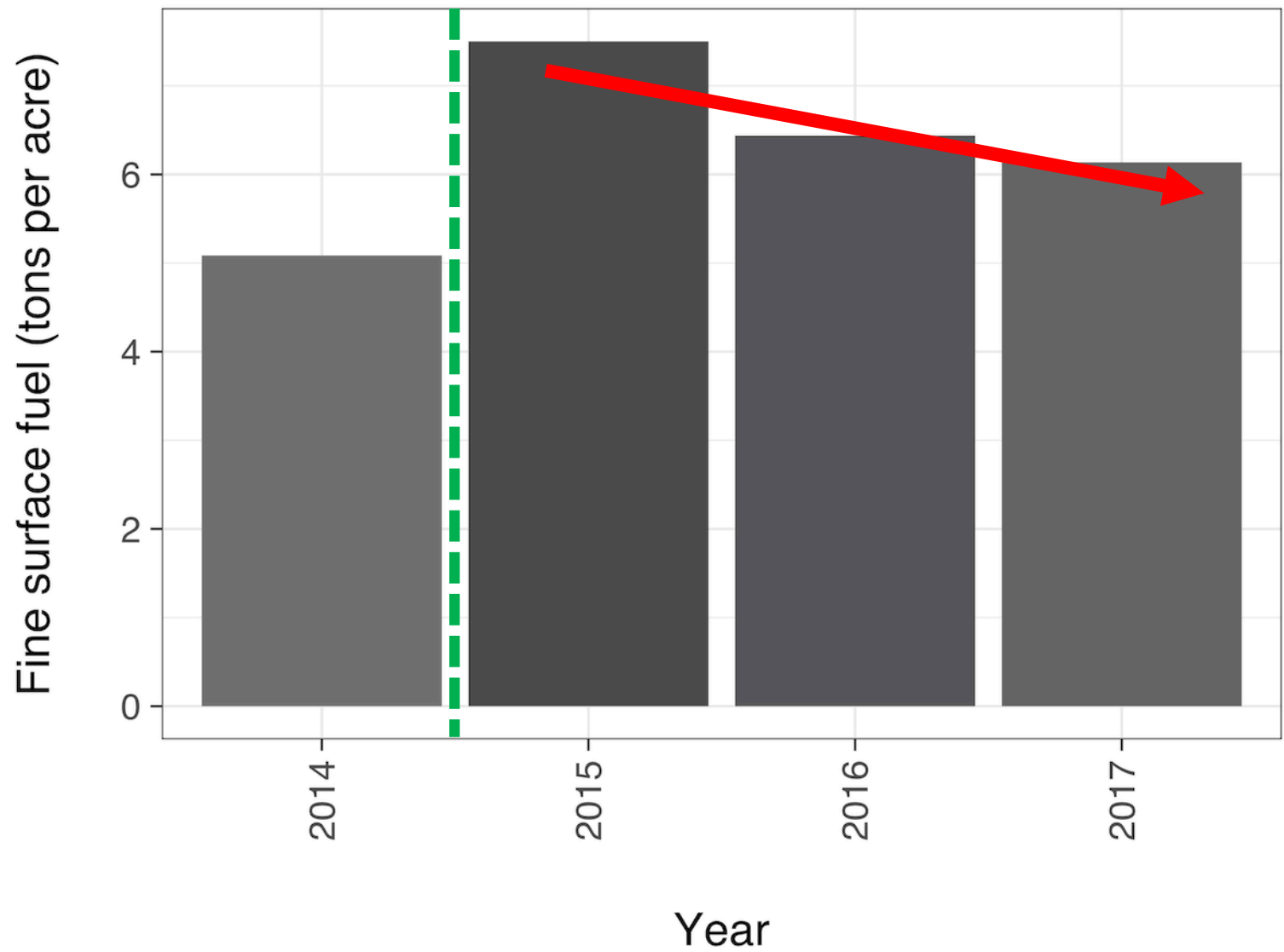
# Changes in surface fuel following treatment

2015





# Changes in surface fuel following treatment







Questions? Contact:  
[james.johnston@oregonstate.edu](mailto:james.johnston@oregonstate.edu)



**Oregon State University**  
College of Forestry

