



Using Science and Data to Support the National Cohesive Wildland Fire Management Strategy

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Cohesive Strategy Focus Areas:

- Restore and maintain resilient landscapes
- Fire adapted communities
- Response to wildfire



Background on National Analysis

- Assignment (January 2013): Explore various potential national policy options for achieving the national goals of the Cohesive Strategy
- Purpose: provide a broad strategic overview of the challenges and opportunities that could inform subsequent discussion and decision-making processes.
- Follow-up Assignment (June 2013): Use the information from the national analysis to suggest spatially explicit national priorities to be included in a national strategy.

Analytical Challenge

- Wildland Fire is a complex issue that involves many interacting factors and processes.
- The United States is a dynamic and diverse landscape, where no single characterization (or solution) is universally appropriate—too diverse for a “one size fits all” approach.
- Yet without some generalization, simplification, or consolidation, it’s not possible to create a cohesive strategy. Cannot have an “everyone for themselves” strategy.”

Meeting the Analytical Challenge

- Draw from multiple data sets spanning the range of biophysical, social, and economic factors in addition to a comprehensive summary of wildland fire statistics.
- Explore relationships and patterns using a mix of statistical and geospatial techniques to create a nationally consistent classification system.
- Match patterns with policy or management options to identify opportunities for addressing major challenges.
- Blend options spatially and institutionally to create a national strategy (role of the larger CS governance).

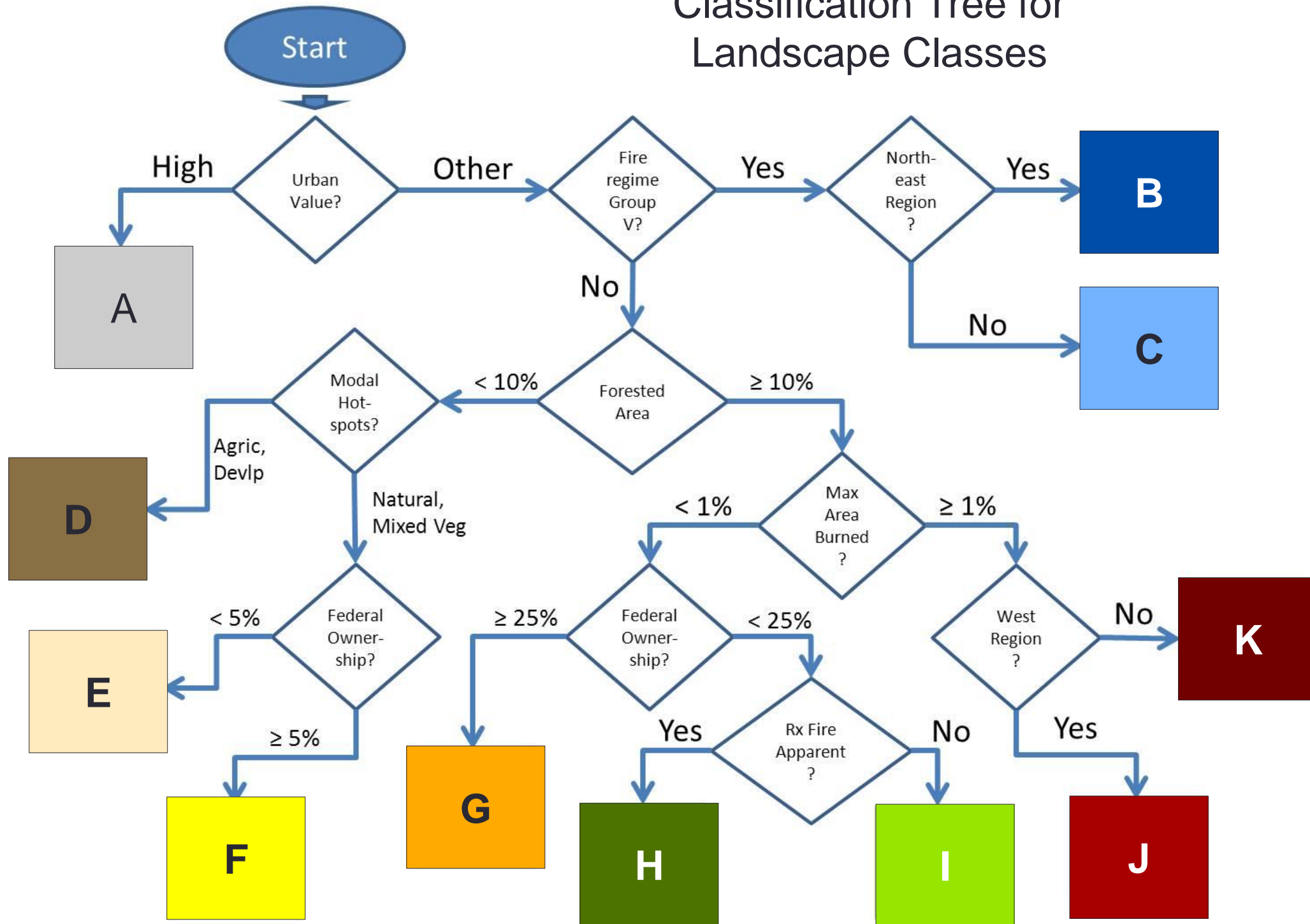
National Characterization

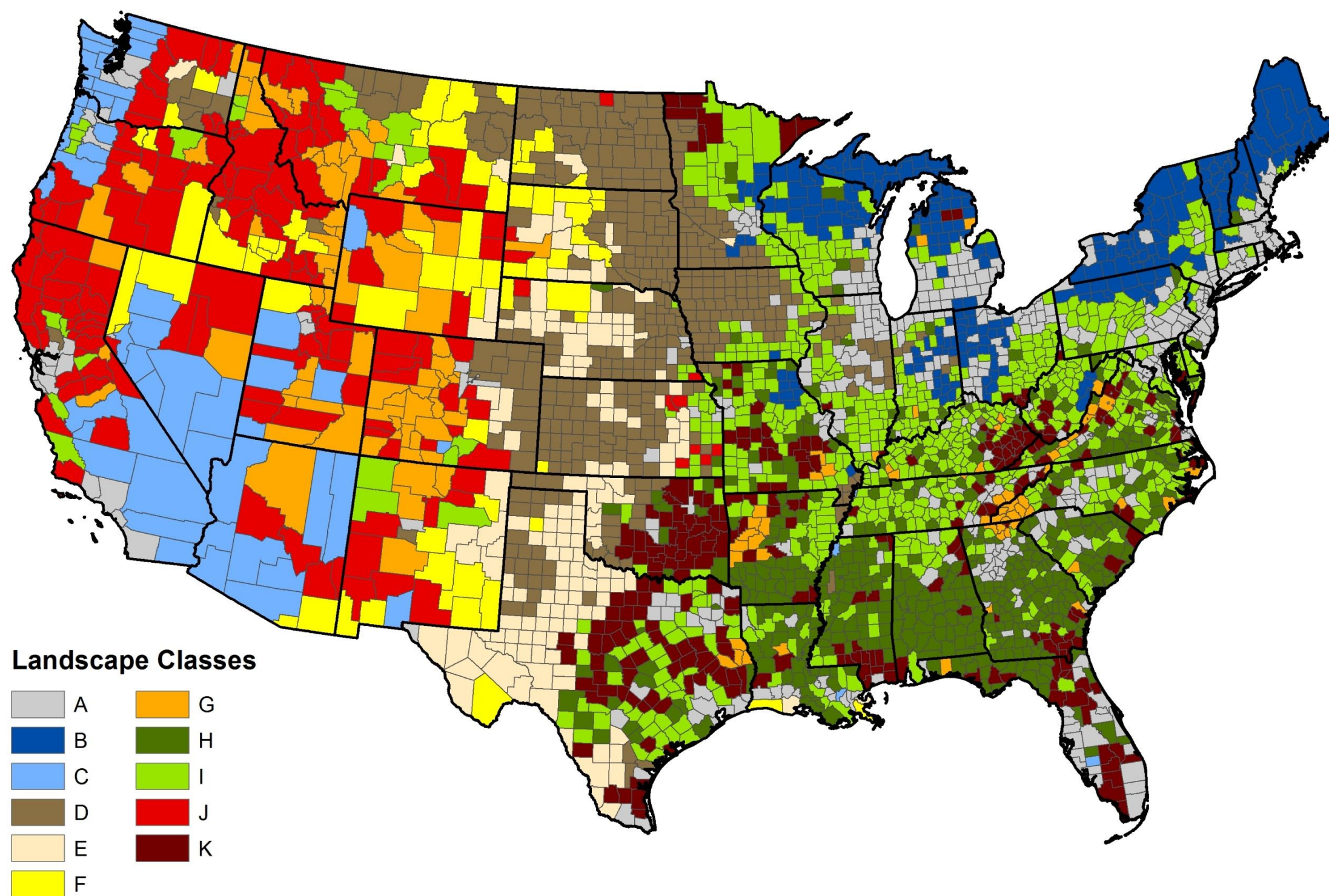
- Use county-level data and various models to identify commonalities and geographical differences among counties.
- Classify counties into subsets that share common characteristics relative to two principal goals:
 - Landscape resiliency
 - Community protection
- Use the characteristics of each group of counties to help tailor management options and priorities.

Landscape Resiliency Classes

- Resiliency is about sustainability and resistance to, or recovery from, disturbance.
- Landscapes themselves are complex intersections of natural, built, and human components—and the interacting processes involving those components.
- County-level summary data are insufficient to accurately measure resiliency, but they are indicative of the key issues and processes in play.
- The classification system is designed to divide counties into landscape classes where similar conversations about resiliency might occur.

Classification Tree for Landscape Classes





National

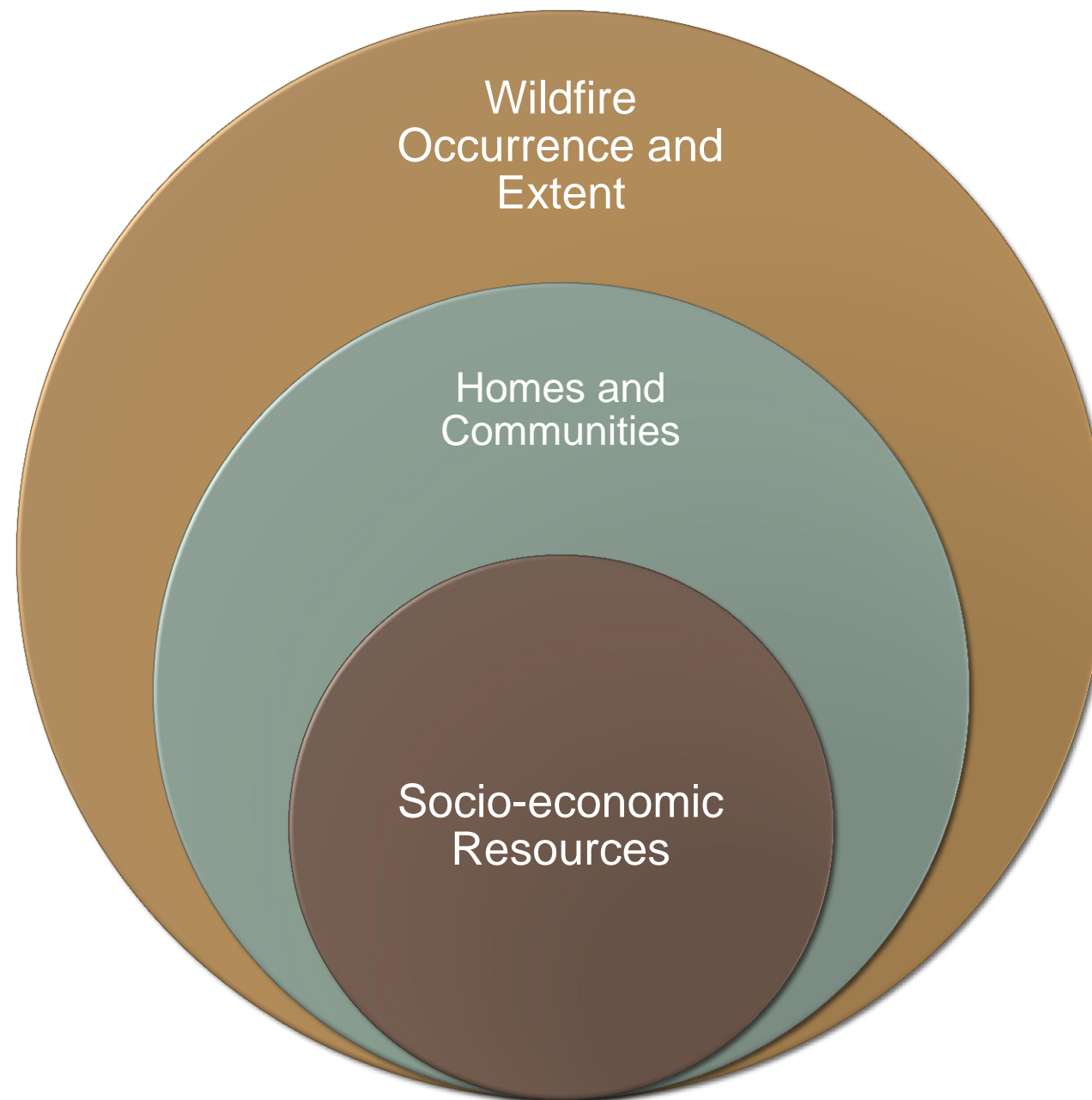
Landscape Class

		Percent Area Forested	Area Burned (2002-2011)	Historical Fire Frequency	Index of Prescribed Fire Activity	Federal Ownership	Average Urban Value	Natural Landscape (%)	Natural-Mixed Landscape (%)	Counties
A	Urban Developed Built									470
B	Cool, Wet Northern Forests									220
C	Historically Infrequent Fire (Western)									54
D	Agriculture and Grasslands									409
E	Private Rangelands and Prairies									159
F	Public Rangelands and Prairies									68
G	Public Forest Lands, High Fire Potential									131
H	Eastern Forests with Ongoing Prescribed Fire									459
I	Private Fragmented Forests with Less Prescribed Fire									715
J	Western Public Lands with Recent Large Fires									150
K	Eastern Mixed Forests with Recent Large Fires									274

Low
 Moderate
 High
 Very High

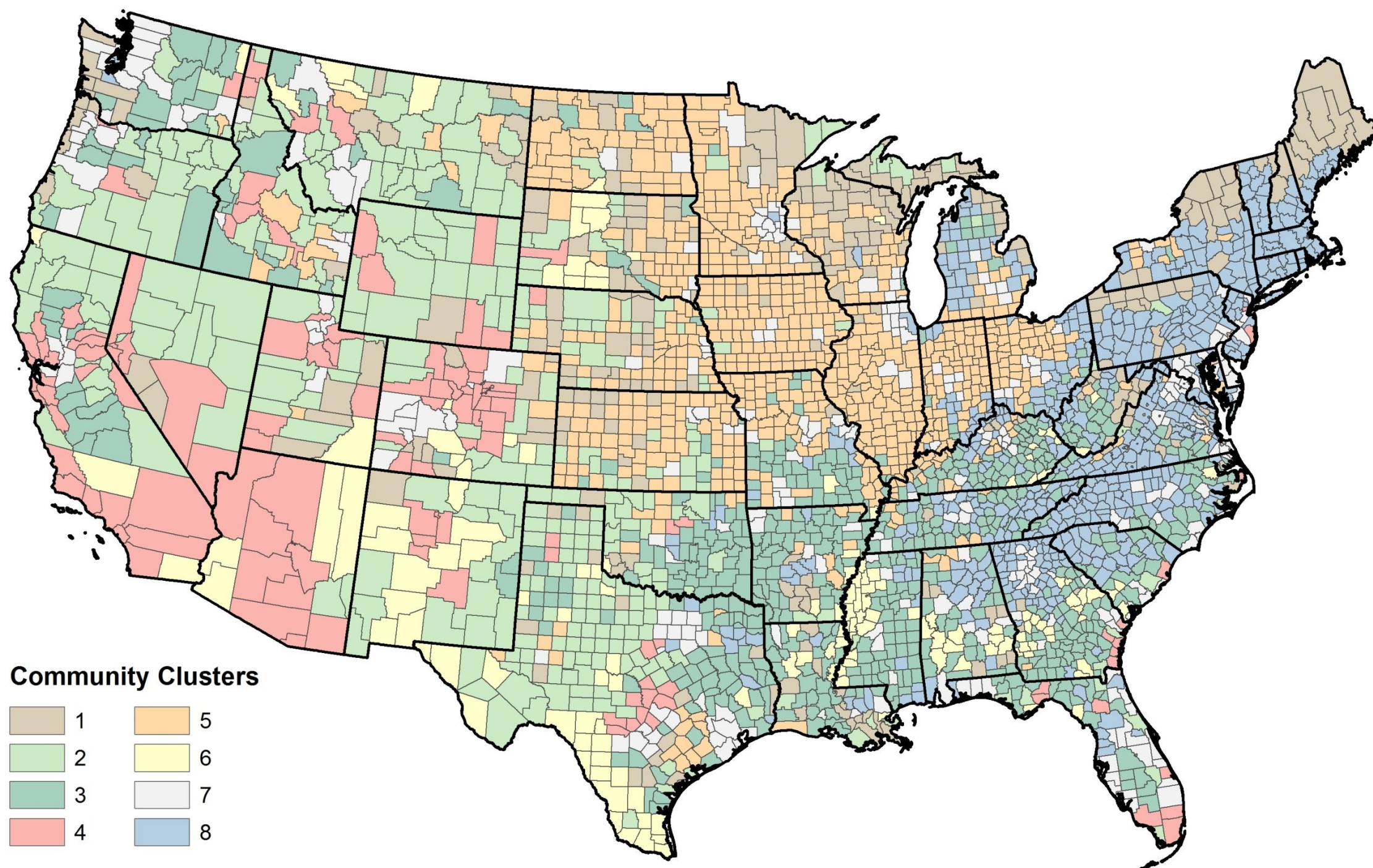
General attributes of each landscape class

Basic Conceptual Model: Risk results from the intersection of wildfires, homes and communities, and socioeconomic resources.



Process is to group counties with similar characteristics using statistical cluster analysis

- Begin with six variables:
 - Ignition density (max annual fires per unit area)
 - Area burned (max annual area burned, normalized)
 - WUI Area Factor Score
 - WUI Home Density factor score
 - Demographic Advantage factor score
 - Demographic Stress factor score
- Cluster counties into eight “community clusters” using statistical methods



General attributes of each community cluster

National



Intersection of Community Clusters with Landscape Resiliency Classes

Resiliency Classes	Community Clusters								Grand Total
	1	2	3	4	5	6	7	8	
A	8	3	31	30	71	4	129	194	470
B	68	5	6		78	1	6	56	220
C	15	5	6	12		9	7		54
D	56	38	29	2	265	5	14		409
E	22	76	7	3	28	22	1		159
F	2	32	6	8	12	7	1		68
G	18	24	28	12	4	8	20	17	131
H	29	8	189	8	30	54	42	99	459
I	62	18	145	7	207	24	60	192	715
J		69	24	38	7	4	8		150
K		40	135	13	15	16	17	38	274
Grand Total	280	318	606	133	717	154	305	596	3109

Positive Associations between Classes and Clusters

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2G WDHF / IFF

Community Cluster.....2-WDHF-WUI Density, High Fire

Resiliency Class.....G-IFF- Interior Forest Federal

Description

These are primarily USDA Forest Service and Bureau of Land Management lands in the forested and mixed landscapes of the Western United States. These areas are located north of Santa Fe, NM; Richfield, UT; Ely, NV; BLM land west of Pueblo, CO; Northeast California and southern Oregon (Altamont); Northeast Oregon and Northern Idaho; and the tribal and Forest Service lands of Northwest Wyoming.

These counties are characterized by a large landscape with a small group of communities. Fire occurrence is likely, so if active fire management is to be applied, this area would be a logical candidate for both wildland fire use and prescribed fire. There are some localized conflicts with communities, but other areas should be easier to implement.

In order to avoid larger, destructive fires, non-fire treatments should be applied as a precursor to manage fire. Strategic fuel breaks for a buffer are important where communities are located, as well as instituting new building codes for new construction.

Options

1A) Use Prescribed Fire on a landscape scale where it is already being used.

1B) Use Prescribed Fire on a landscape scale where it is currently underutilized.

1C) Consider Prescribed Fire, but on a limited basis.

2A) Wildland fire use in forested landscapes.

3A) Non-fire fuel treatments supported by active timber industry.

4) Non-fire fuel treatments are economical as a precursor to managed fire.

6A) Home defensive actions

6B) Home defensive actions, active planning and installation of buffers to protect communities

7B) Building and construction codes, outside boundaries.

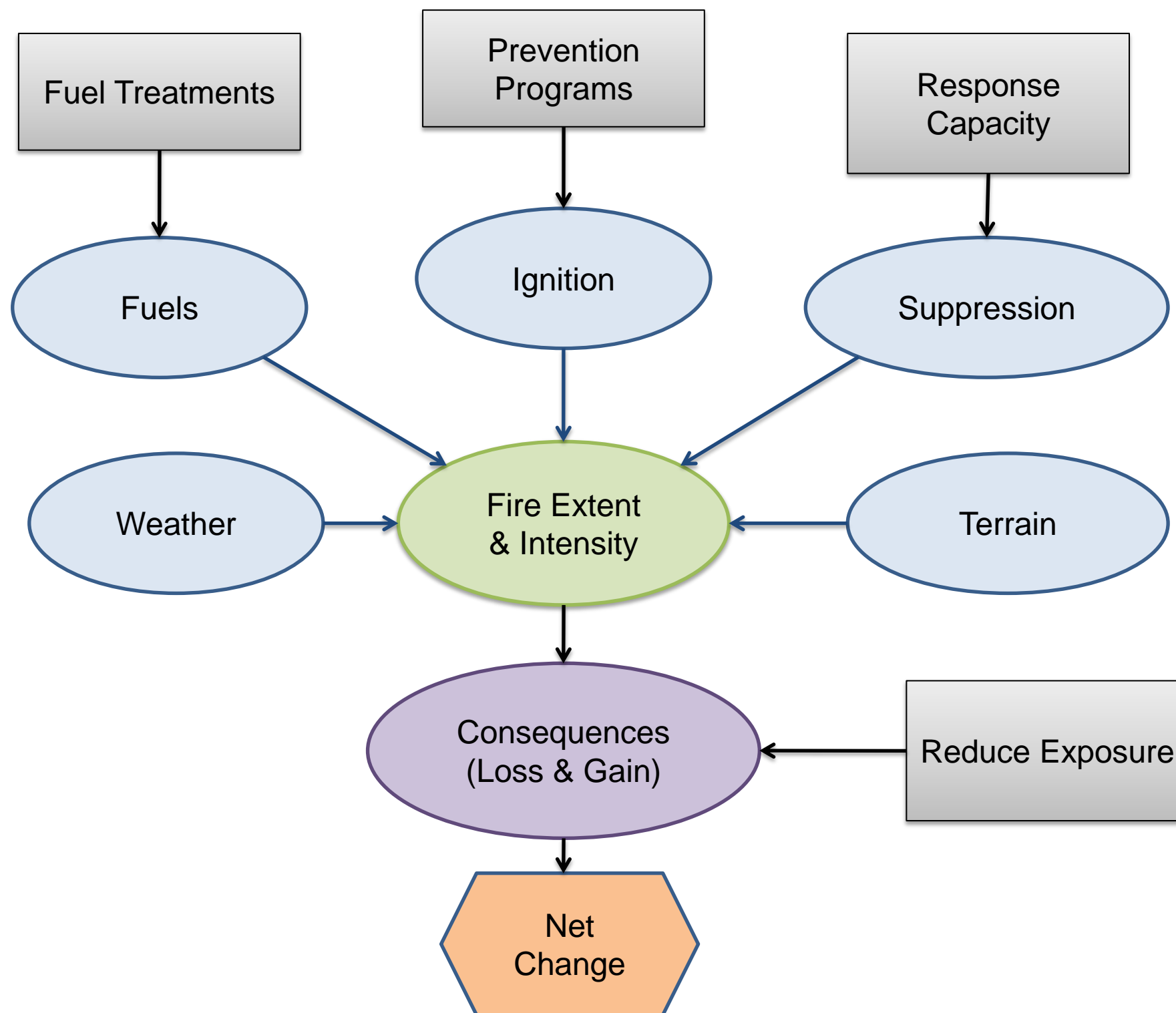
8) Preparedness for campaign fires (high costs)



Summary sheets have been prepared for each combination of community cluster and resiliency class

National Challenges and Opportunities

- Begin with a simple conceptual understanding of the wildland fire issue
- Identify key components or themes
- Identify policy or management options under each theme
- Use information and data previously assembled to match management options to landscape and community characteristics



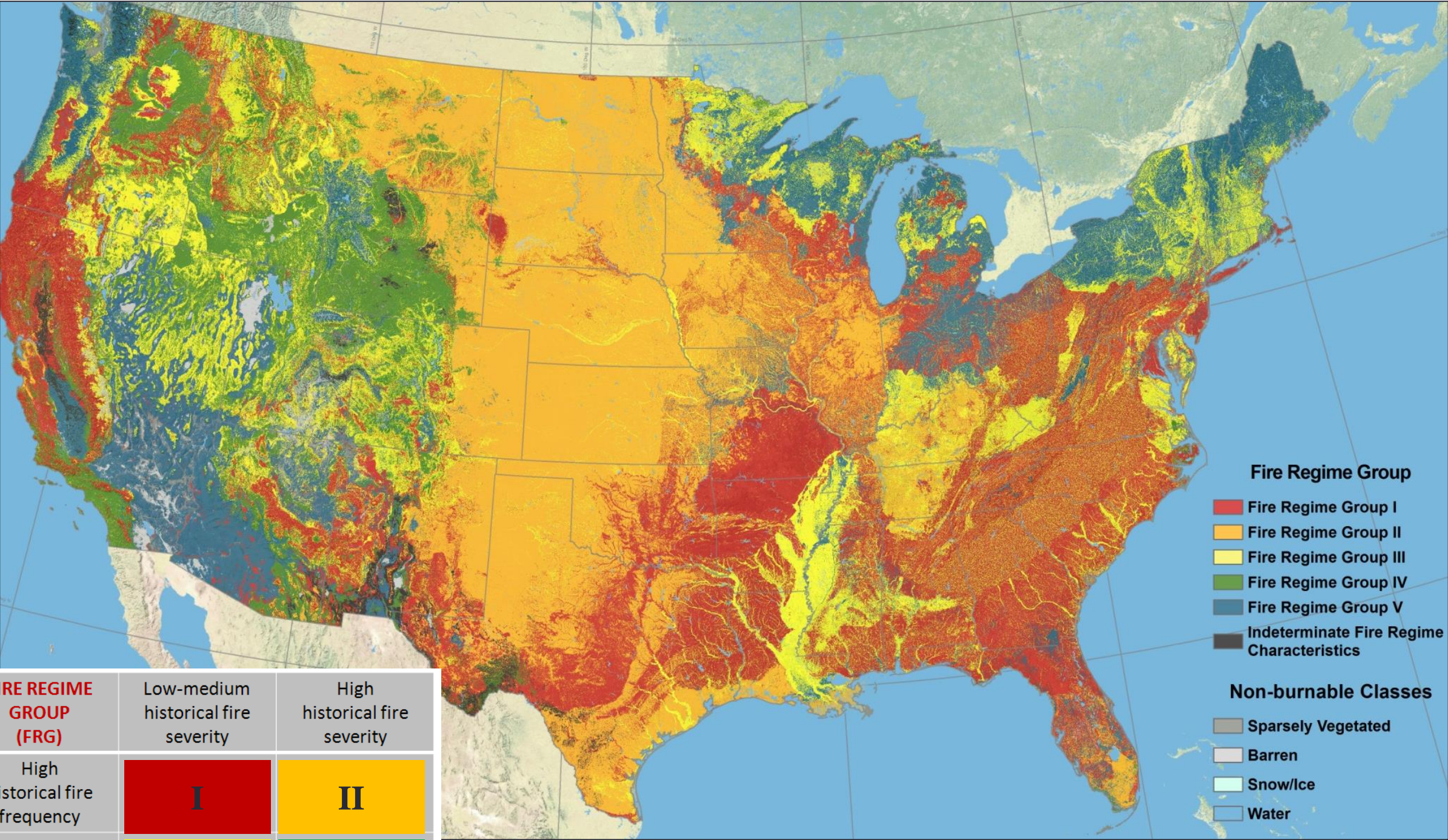
National Challenges

1. Vegetation and Fuels
2. Homes, Communities, and other Values at Risk
3. Human-caused Ignitions
4. Effective and Efficient Wildfire Response
5. Administrative Efficiency

Fire Regime Groups

Group	Frequency	Severity	Severity description
I	0 to 35 years	Low / mixed	Generally low-severity fires replacing less than 25 percent of the dominant overstory vegetation; can include mixed-severity fires that replace up to 75 percent of the overstory
II	0 to 35 years	Replacement	High-severity fires replacing greater than 75 percent of the dominant overstory vegetation
III	35 to 200 years	Mixed / low	Generally mixed-severity; can also include low-severity fires
IV	35 to 200 years	Replacement	High-severity fires
V	200+ years	Replacement / any severity	Generally replacement severity; can include any severity type in this frequency range

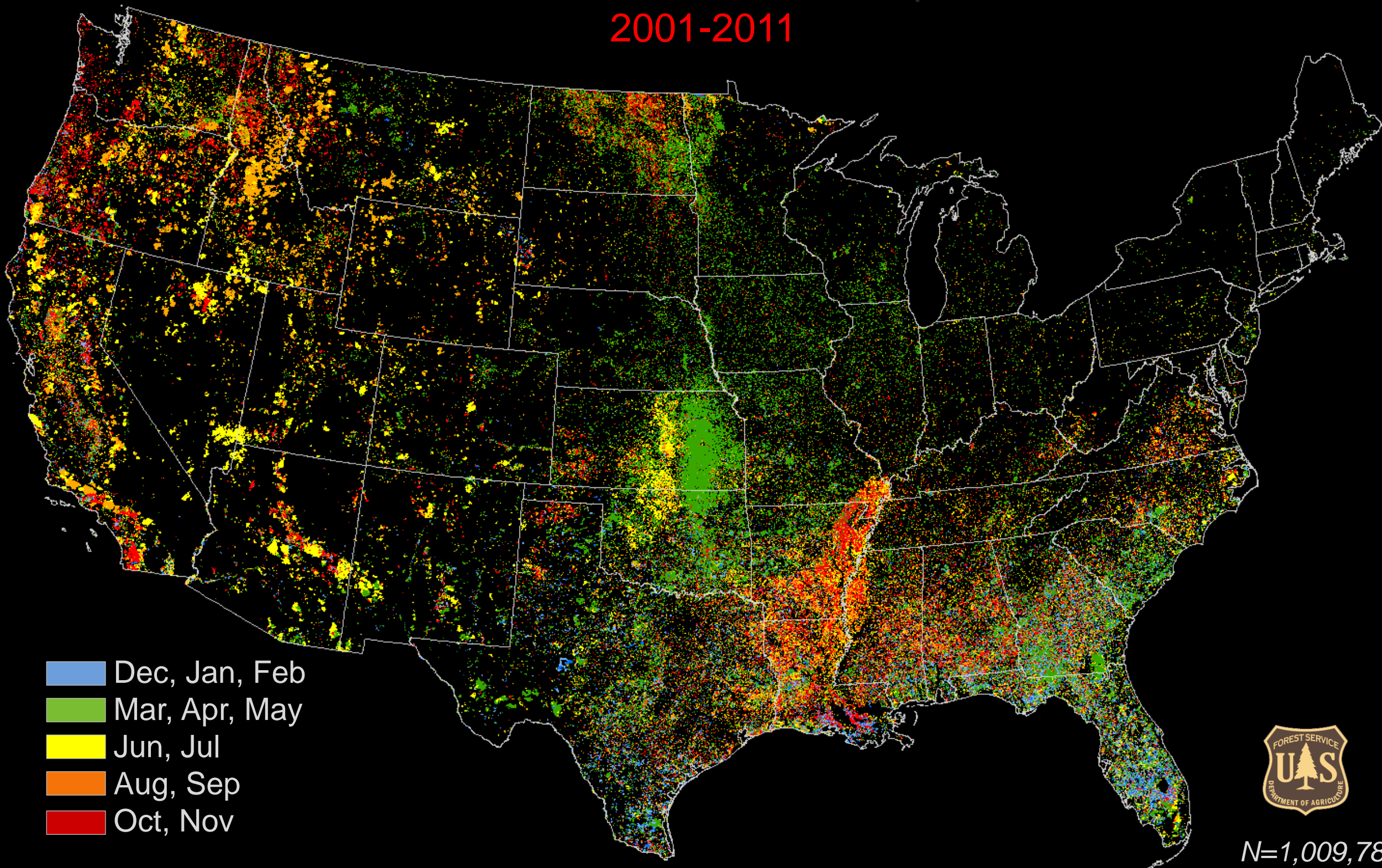
LANDFIRE Fire Regime Groups



FIRE REGIME GROUP (FRG)	Low-medium historical fire severity	High historical fire severity
High historical fire frequency	I	II
Moderate historical fire frequency	III	IV
Rare historical fire occurrence		V

The seasonality of fire from space as inferred from MODIS hotspots

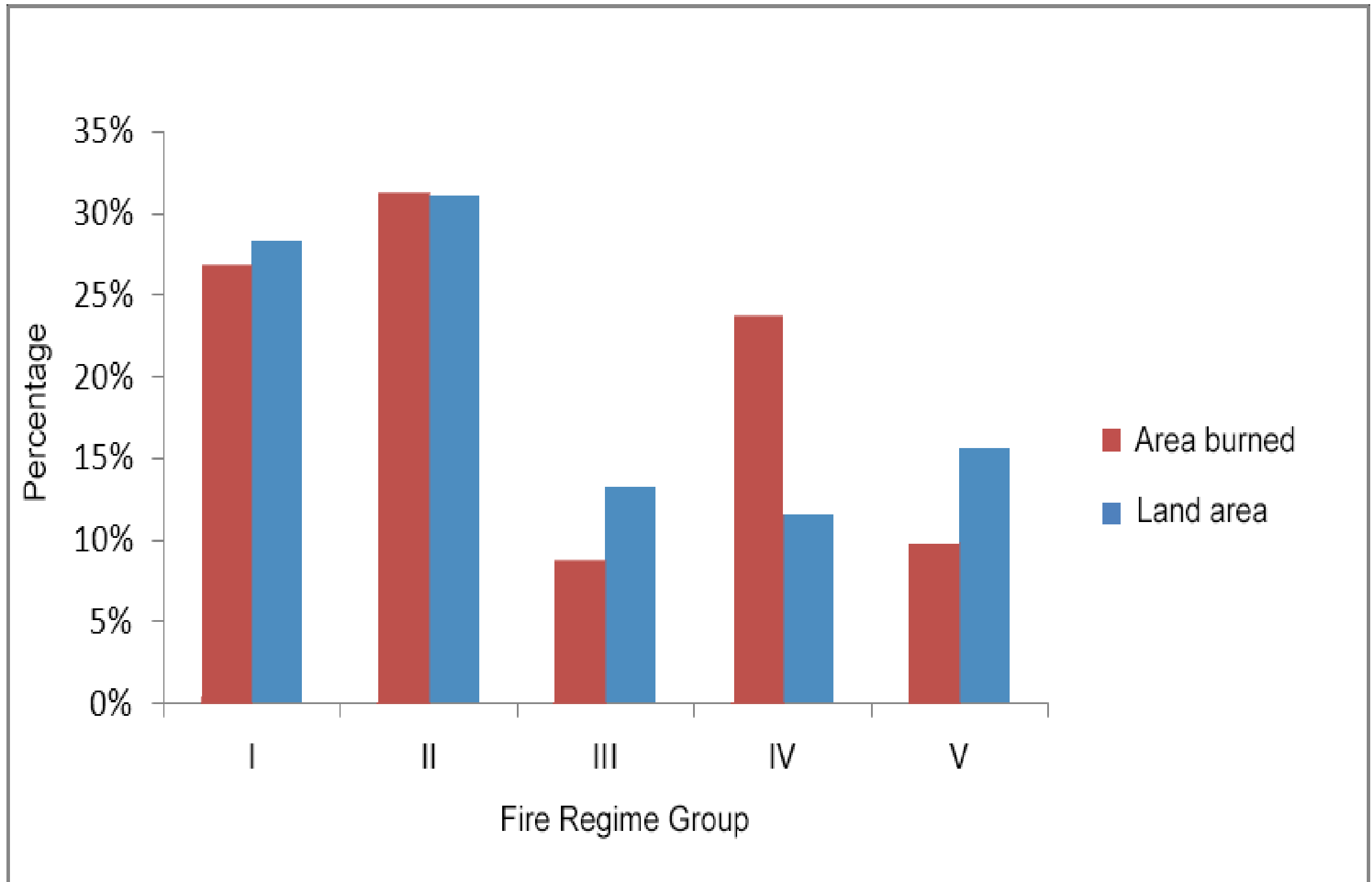
2001-2011



N=1,009,782

Steve Norman 5/2012

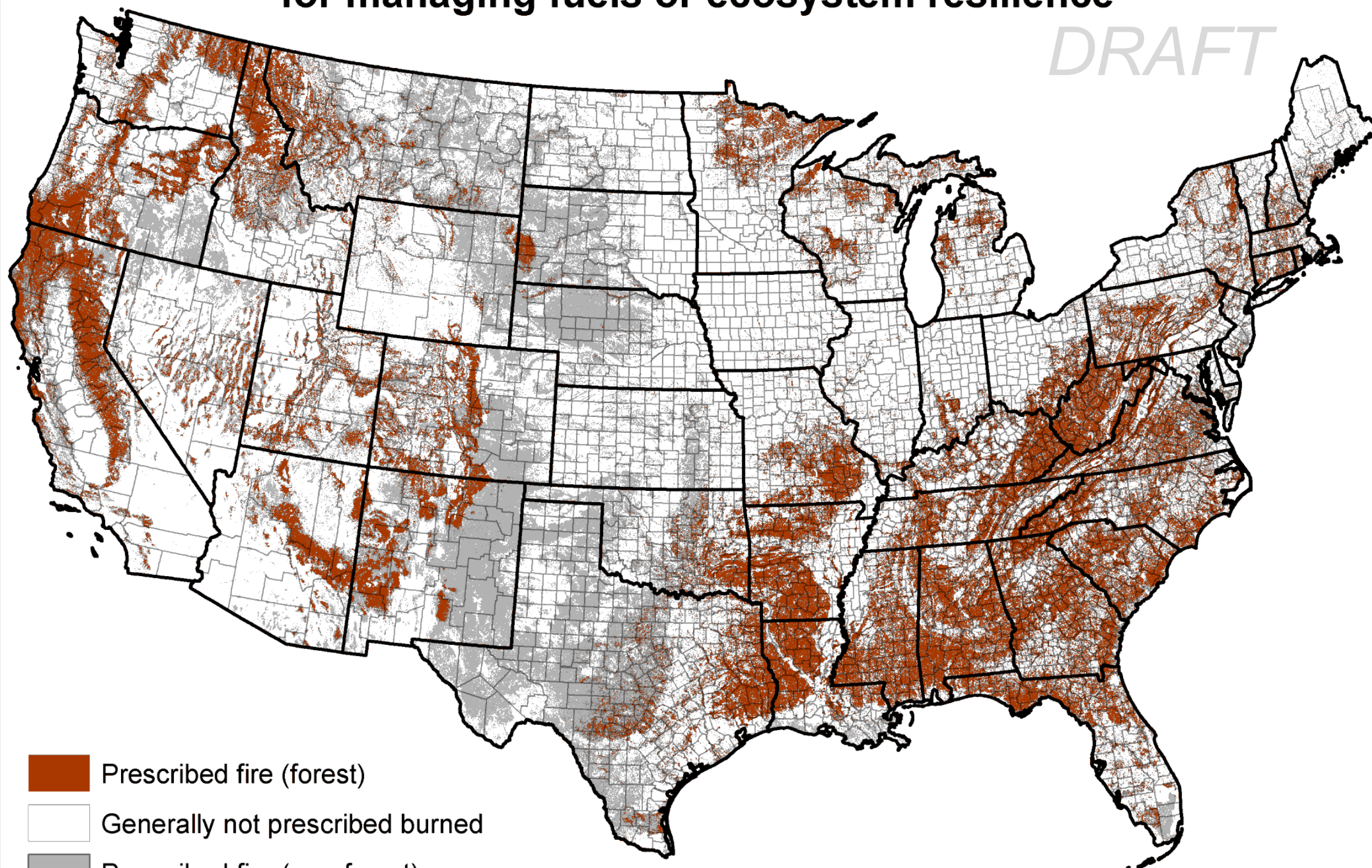
Relative Total Area and Area Burned within each Fire Regime Group



National Challenges	Management Options
Vegetation and Fuels	<p>Prescribed Fire: Expand or maintain in areas of current use Prescribed Fire: Expand into areas of limited current use Prescribed Fire: Utilize on a limited basis</p> <p>Manage wildfires for resource objectives: In forested systems Manage wildfires for resource objectives: In non-forested systems Manage wildfires for resource objectives: In areas where increased awareness of community risk is necessary.</p> <p>Non-fire Treatments: Supported by forest products industry Non-fire Fuels Treatments: In non-forest areas Non-fire Fuels Treatment: In areas with limited economic markets</p> <p>Fuels Treatments as a precursor to prescribed fire or managed wildfire.</p>

Areas generally available for prescribed fire use for managing fuels or ecosystem resilience

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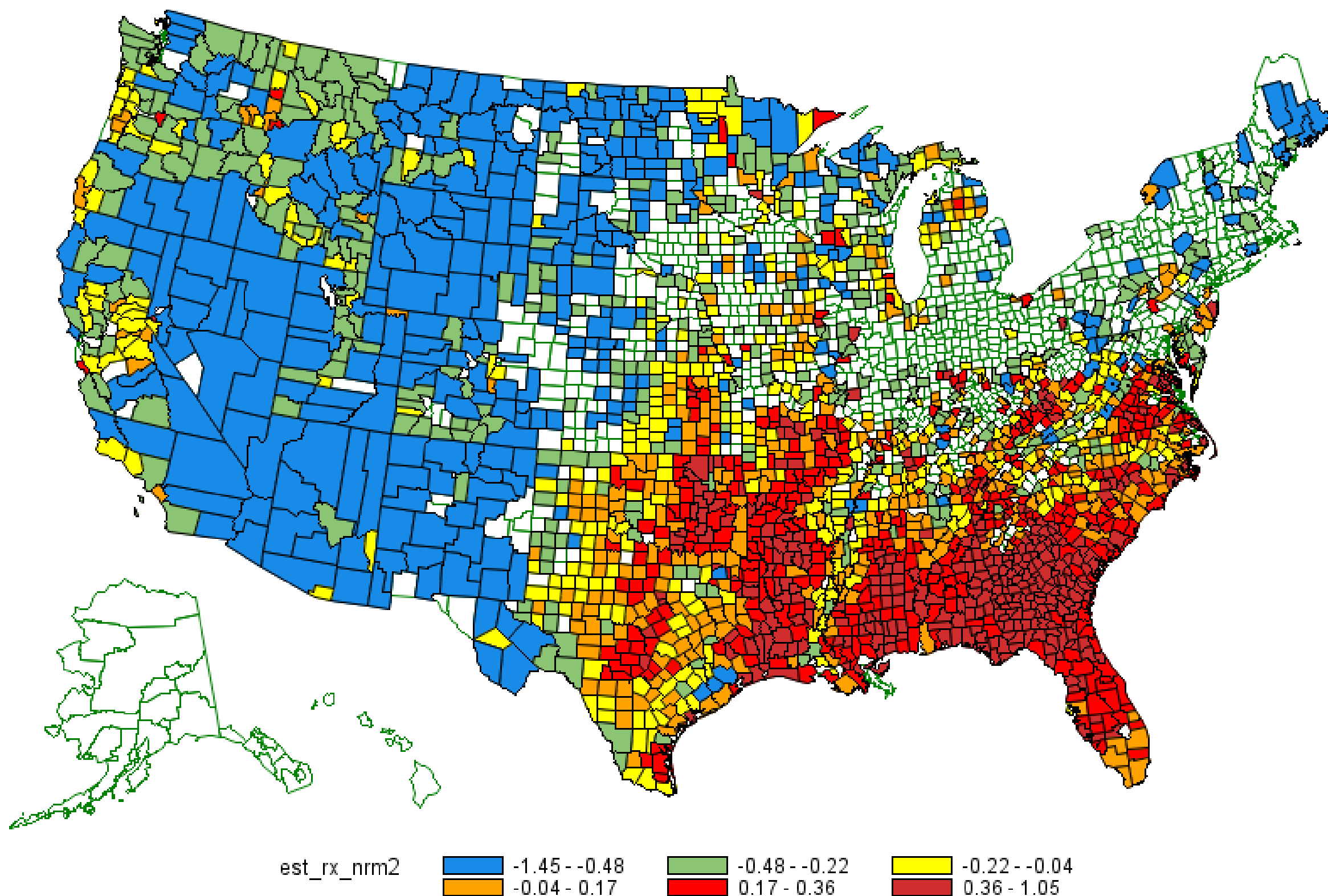


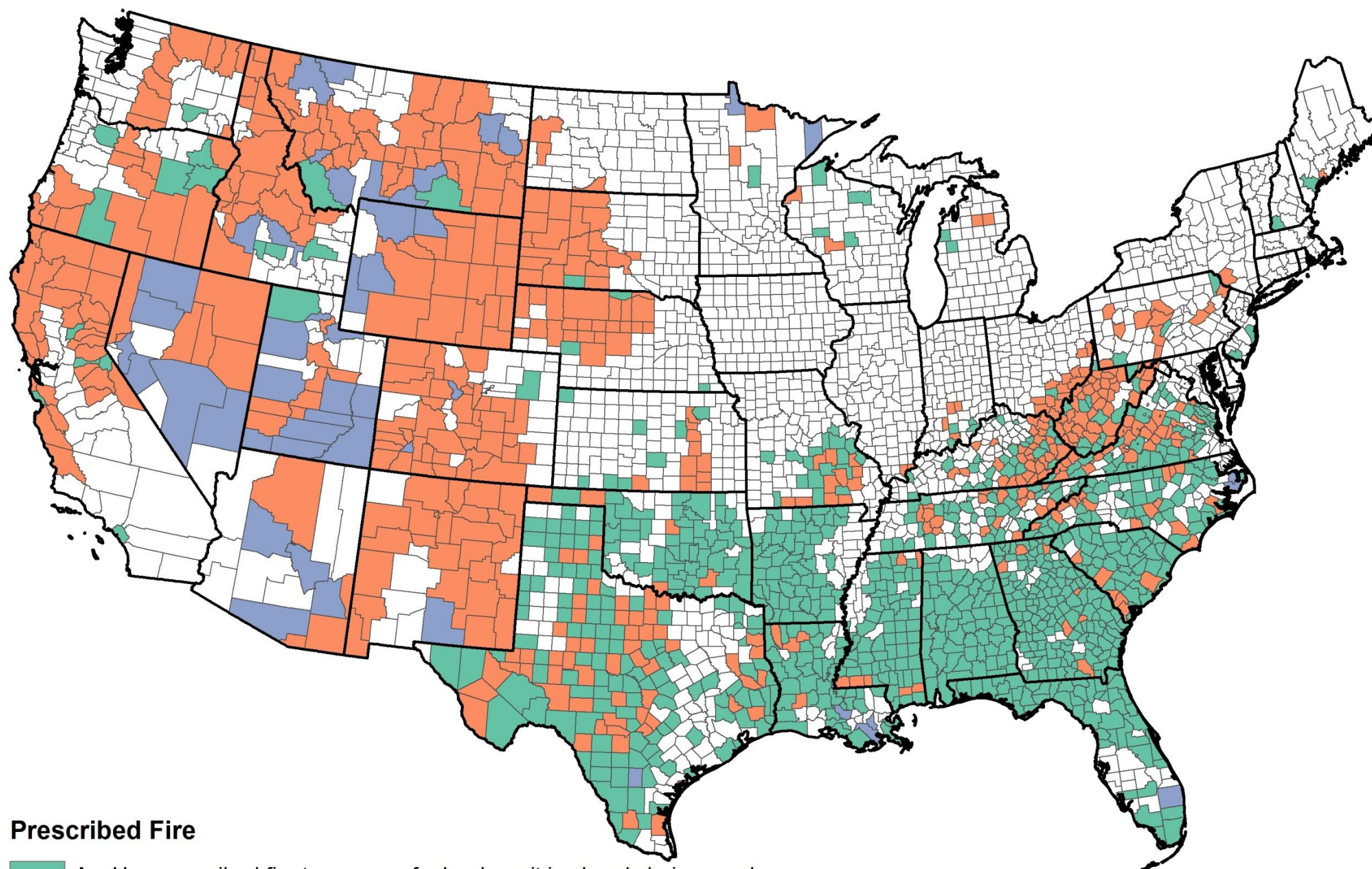
- Prescribed fire (forest)
- Generally not prescribed burned
- Prescribed fire (non-forest)

July 15, 2012
S. Norman, W. Christie,
USDA Forest Service EFETAC

Estimates of Rx Fire Occurrence: Area Normalized

Based on 2008-2011 fire data and hotspots, excluding LWF

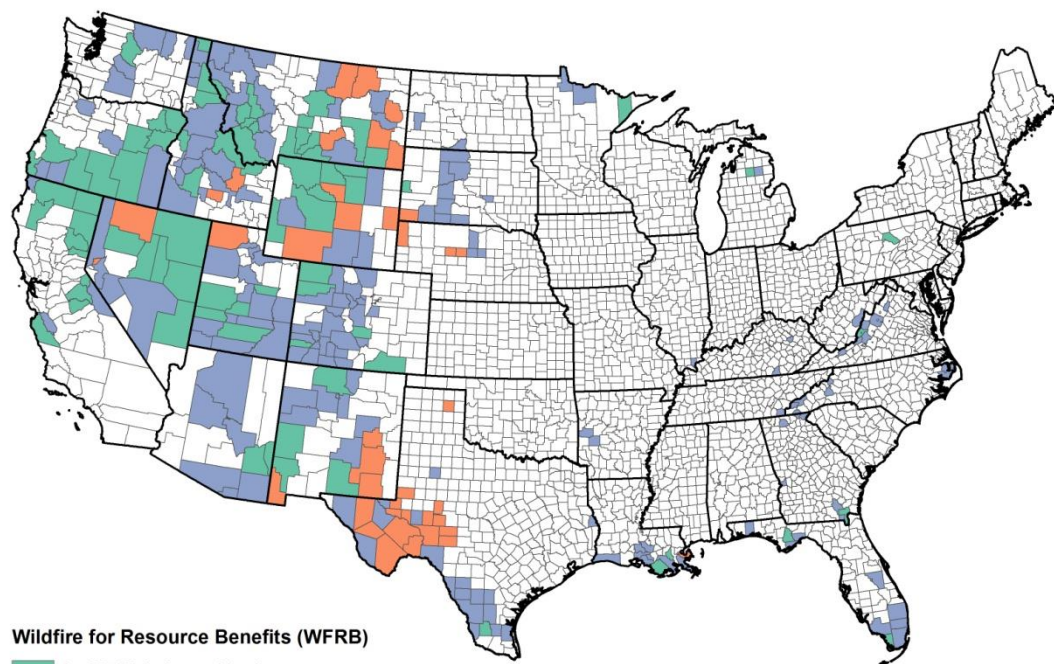




Prescribed Fire

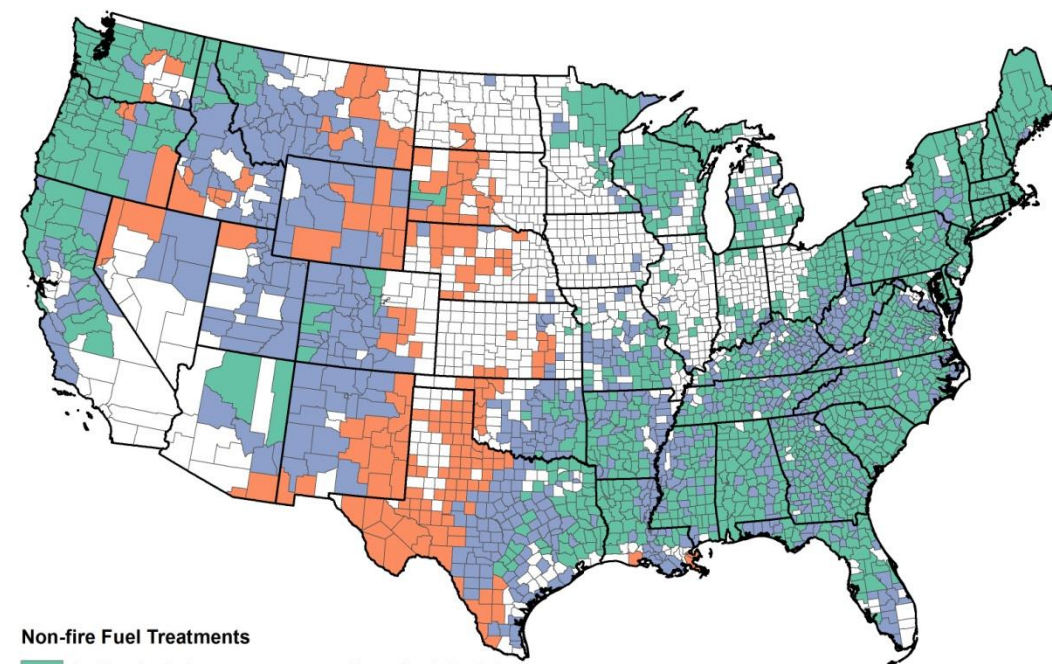
- A – Use prescribed fire to manage fuels where it is already being used
- B – Consider expanding use of prescribed fire
- C – Consider prescribed fire, but on a limited basis

National Challenges	Management Options
Homes, Communities, & Values At Risk	<p>Focus on home defensive actions</p> <p>Focus on combination of home and community actions</p> <p>Adjust building and construction codes, municipal areas</p> <p>Adjust building and construction codes, non-municipal areas</p>
Human-Caused Ignitions	<p>Reduce accidental human-caused ignitions</p> <p>Reduce human-caused incendiary ignitions (e.g., arson)</p>
Effective and Efficient Wildfire Response	<p>Prepare for large, long-duration wildfires</p> <p>Protect structures and target landscape fuels</p> <p>Protect structures and target prevention of ignitions</p>



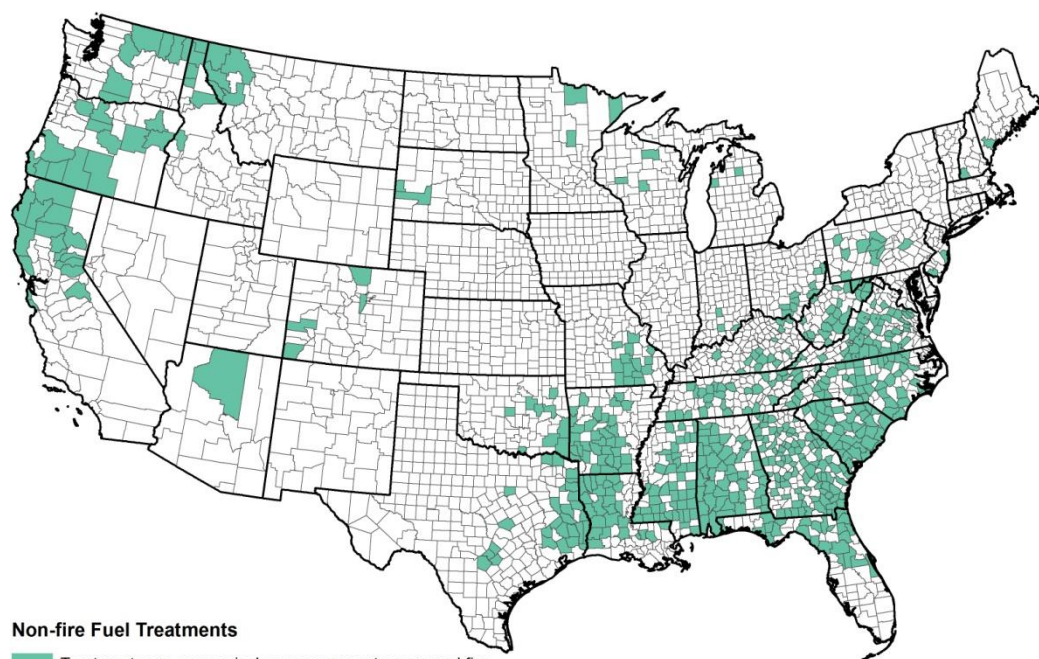
Wildfire for Resource Benefits (WFRB)

- A – WFRB in forested landscapes
- B – WFRB in non-forested landscapes
- C – WFRB, but with more conflicts with communities



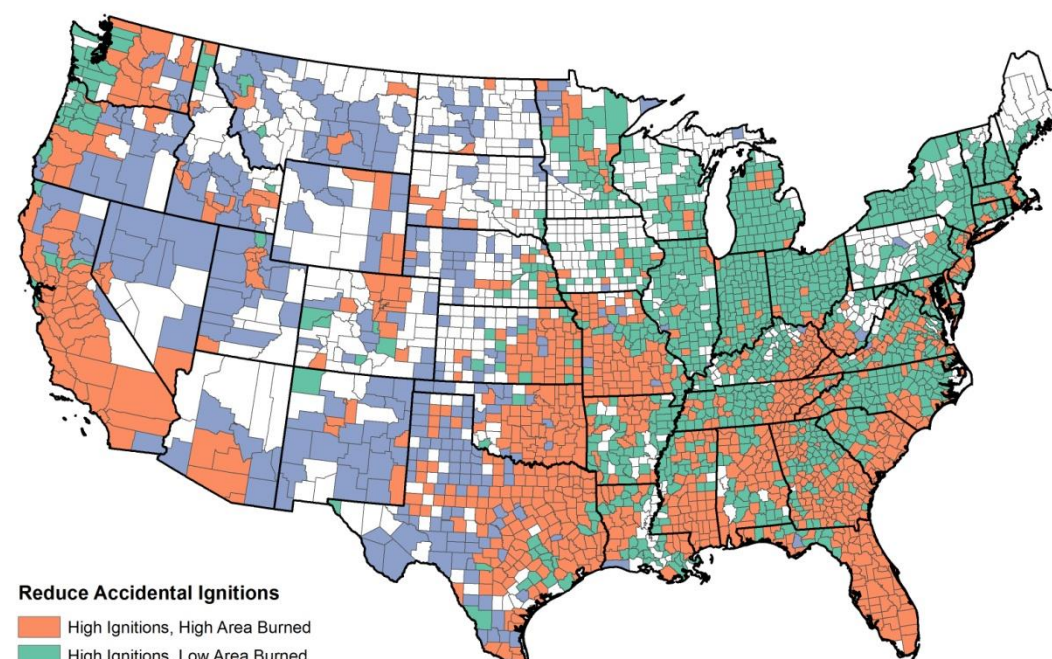
Non-fire Fuel Treatments

- A – Non-fire fuel treatments supported by active timber industry.
- B – Non-fire fuel treatments in non-forested areas supported by grazing or mowing.
- C – Non-fire fuel treatments are preferred option but supporting markets are weak.



Non-fire Fuel Treatments

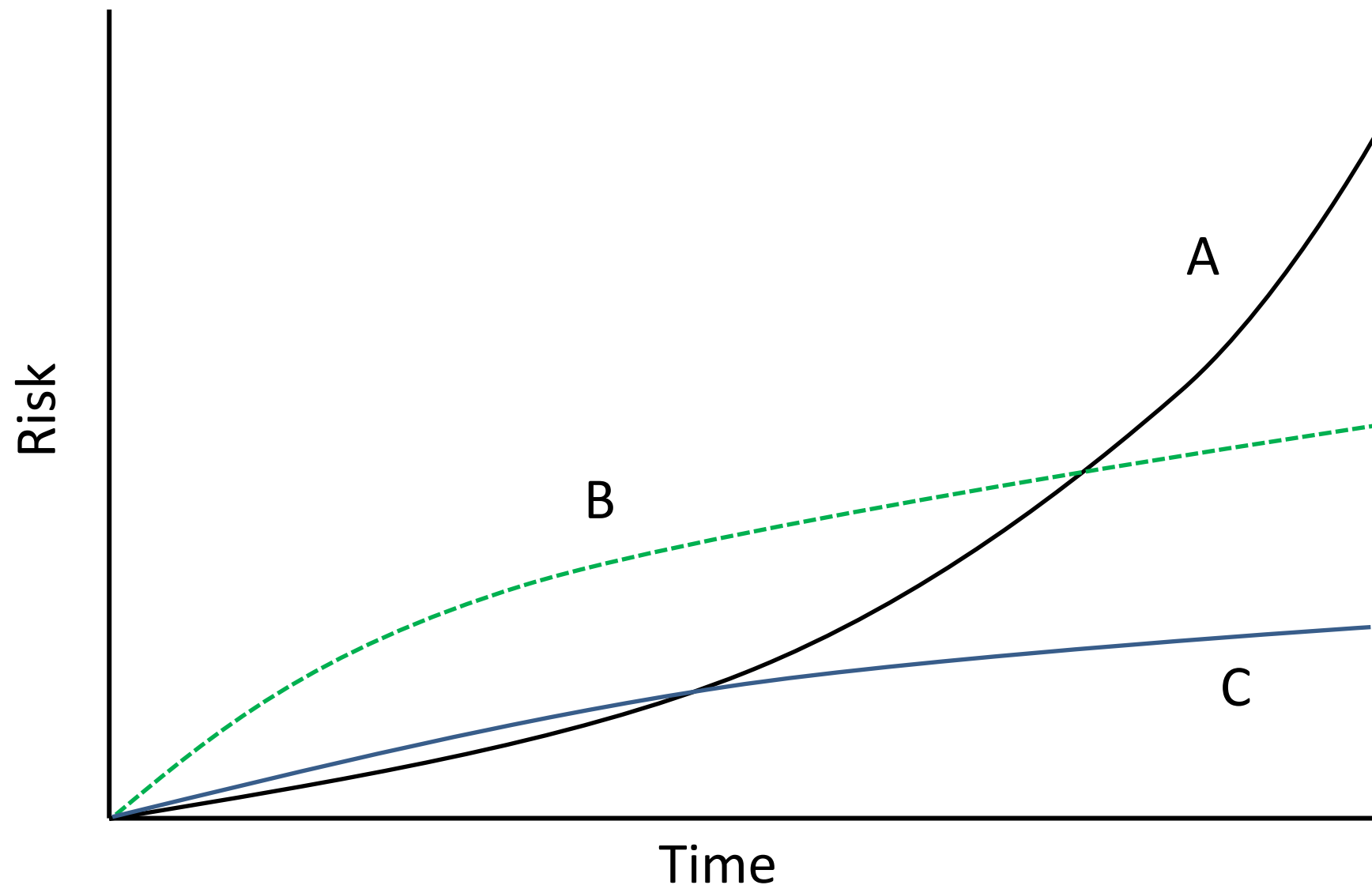
- Treatments are economical as a precursor to managed fire.



Reduce Accidental Ignitions

- High Ignitions, High Area Burned
- High Ignitions, Low Area Burned
- Low Ignitions, High Area Burned
- Low Ignitions, Low Area Burned

National Strategy: Temporal risk trajectories



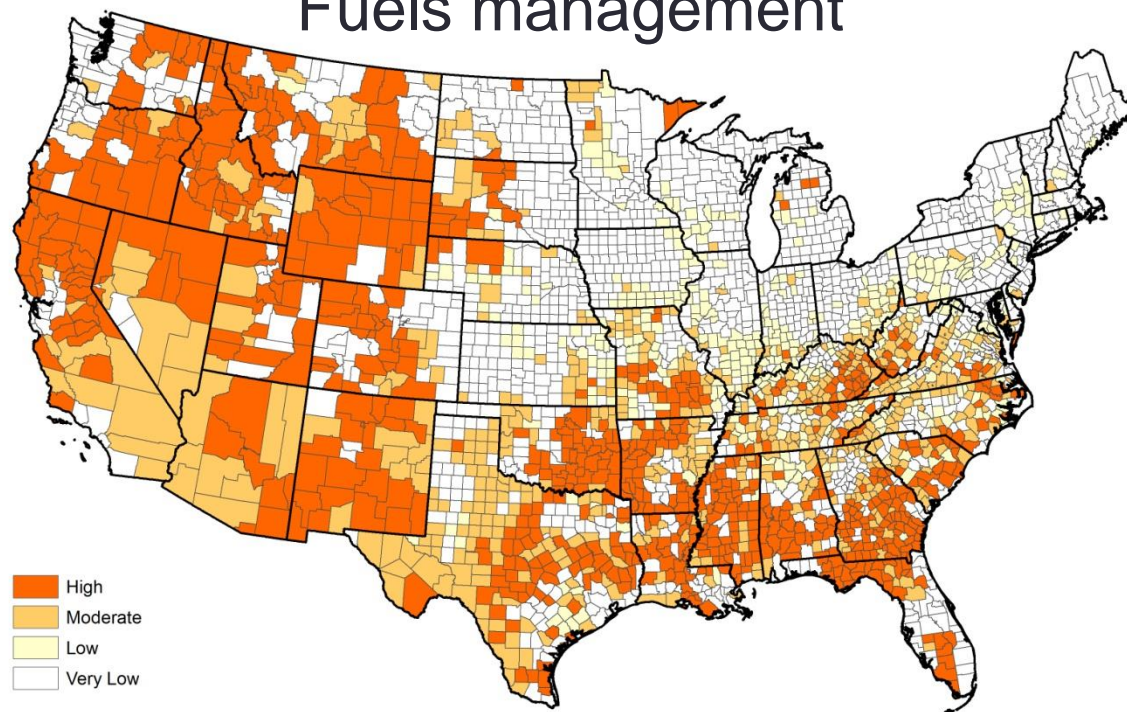
Three hypothetical scenarios for temporal trends in risk nationwide: continuation of current policies and actions (A), return to historical levels of wildland fire (B), and a mix of prudent policies and actions that effectively reduce long-term risk (C).

National Strategy: Key assumptions

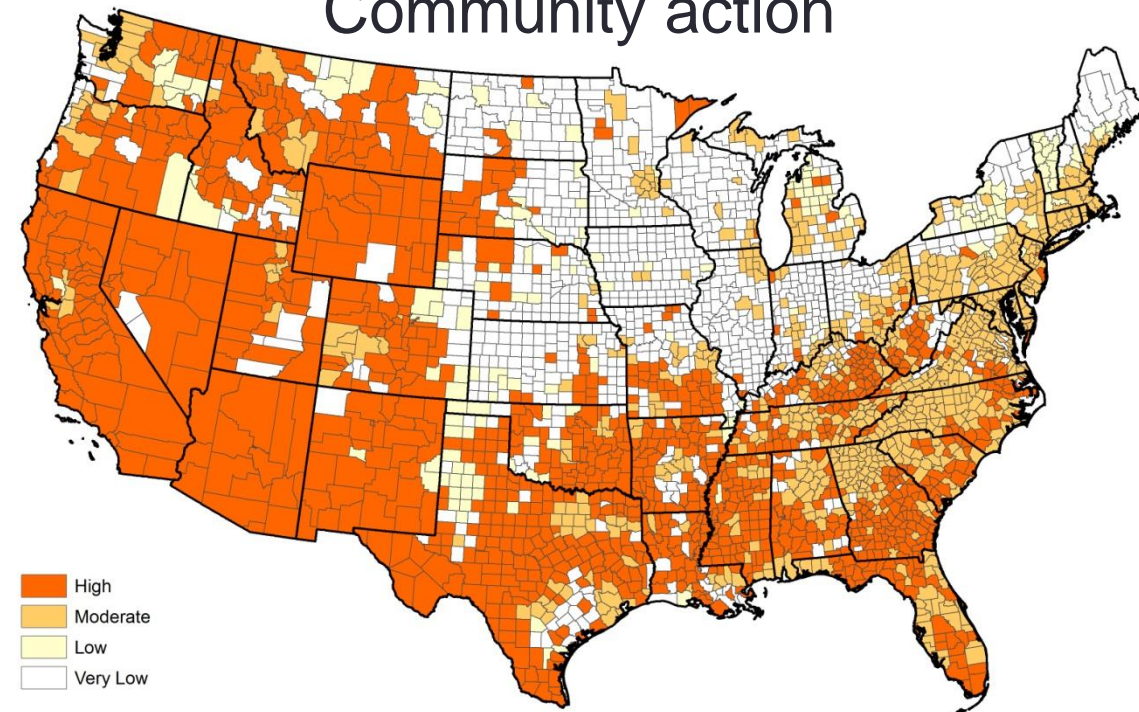
- **Prioritization of investment and use of resources.** Reducing risk significantly will require that existing resources are used more efficiently. From a national perspective, this may require reallocation of resources across agencies, geographical areas, or program areas.
- **Acceptance of increased short-term risk.** Significantly reducing fuels across broad landscapes will require expanded use of wildland fire to achieve management objectives. Using fire as a tool carries inherent risks that must be accepted in the short-term in order to achieve the longer-term benefits.
- **Greater collective investment.** Even with greater efficiency and acceptance of short-term risk, current levels of investment may be inadequate to achieve the levels of risk reduction desired. All who have a stake in the outcome must share the financial burden.

Spatial Prioritization

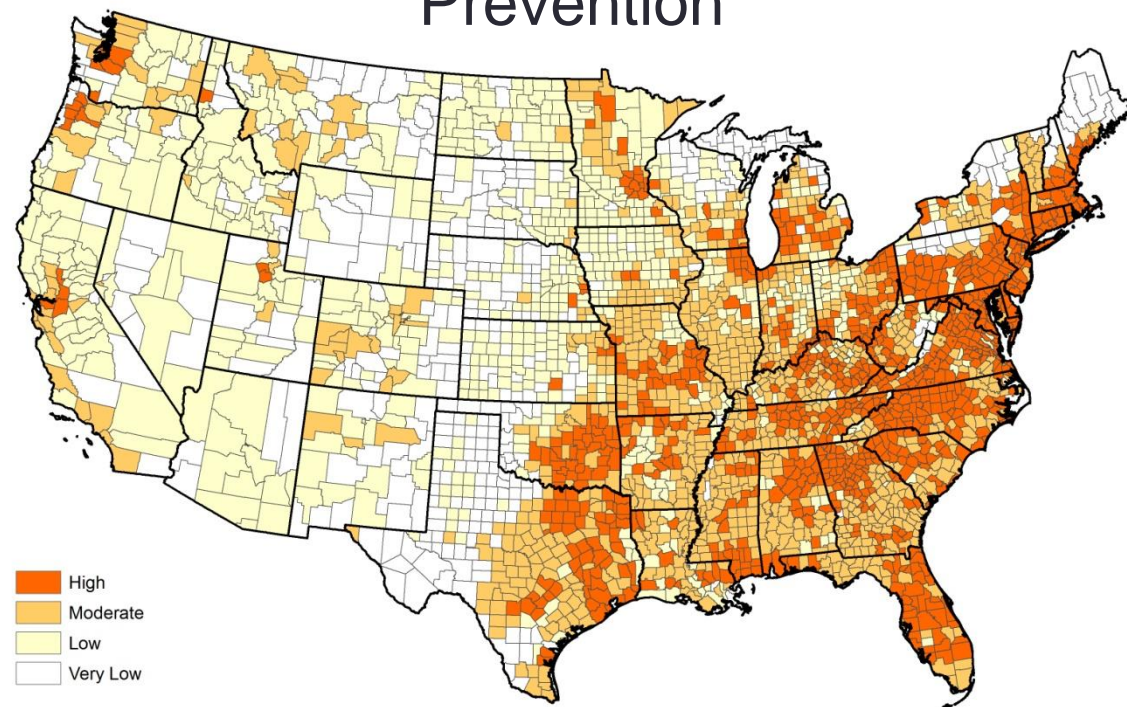
Fuels management



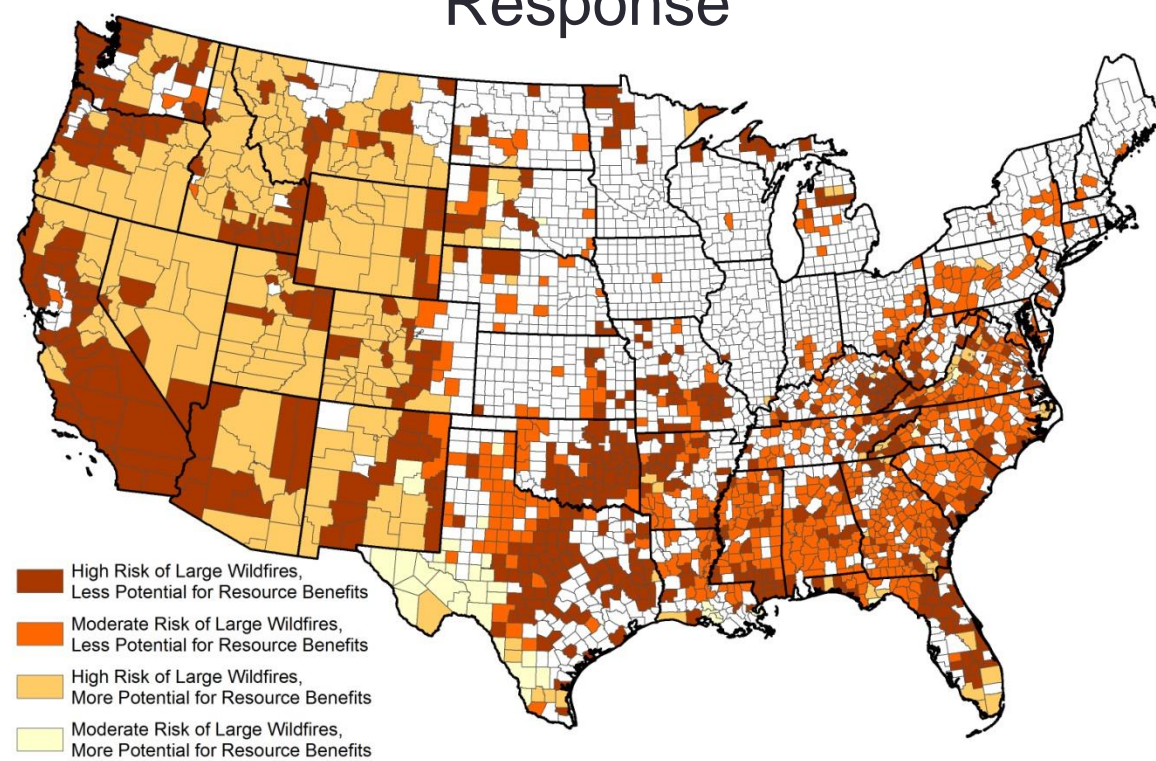
Community action



Prevention



Response



Questions?

For further information, visit <http://www.forestsandrangelands.gov>

