



# Current Status of Alien Plants and Fire in the Mojave and Colorado Deserts

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# Recent Literature Reviews

Brooks, M.L. and T.C. Esque. 2002. Alien annual plants and wildfire in desert tortoise habitat: status, ecological effects, and management. *Chelonian Conservation and Biology* 4:330-340.

Brooks, M.L. and D. Pyke. 2001. Invasive plants and fire in the deserts of North America. Pp. 1-14 *In* K. Galley and T. Wilson (eds.), *Proceedings of the Invasive Species Workshop: The Role of Fire In the Control and Spread of Invasive Species*. Fire Conference 2000: The First National Congress on Fire, Ecology, Prevention and Management. Miscellaneous Publications No. 11, Tall Timbers Research Station, Tallahassee, Florida, USA.

# Alien Plants

116 species reported in or near critical desert tortoise habitat  
(a.k.a wildland areas)

## Widespread and Abundant

*Bromus rubens*, *Schismus* spp. and *Erodium cicutarium*

## Locally Abundant in Specific Habitats


*Brassica tournefortii*, *Bromus tectorum*, *Bromus trinii*,  
*Centaurea melitensis*, *Centaurea repens*, *Descurania*  
*sophia*, *Hirschfeldia incana*, *Pennisetum setaceum*,  
*Salsola* spp., *Sisymbrium alitissimum*, *Sisymbrium irio*

# Alien Plant Impacts

- Competition with native plants
  - *Bromus* and *Schismus*
  - Tamarisk
- Alteration of wildlife habitat
  - Tamarisk
  - others?
- Increase fire frequency
  - *Bromus*, *Schismus*, *Salsola*, Tamarisk
  - *Brassica*?



*Bromus rubens*  
fine fuel load ~600 lbs/acre



*Schismus barbatus*  
fine fuel load ~500 lbs/acre



*Salsola spp.*  
fine and woody fuel load ~2,000 lbs/acre



*Brassica tournefortii*  
fine fuel load ~2,500 lbs/acre



# Weed Control Research

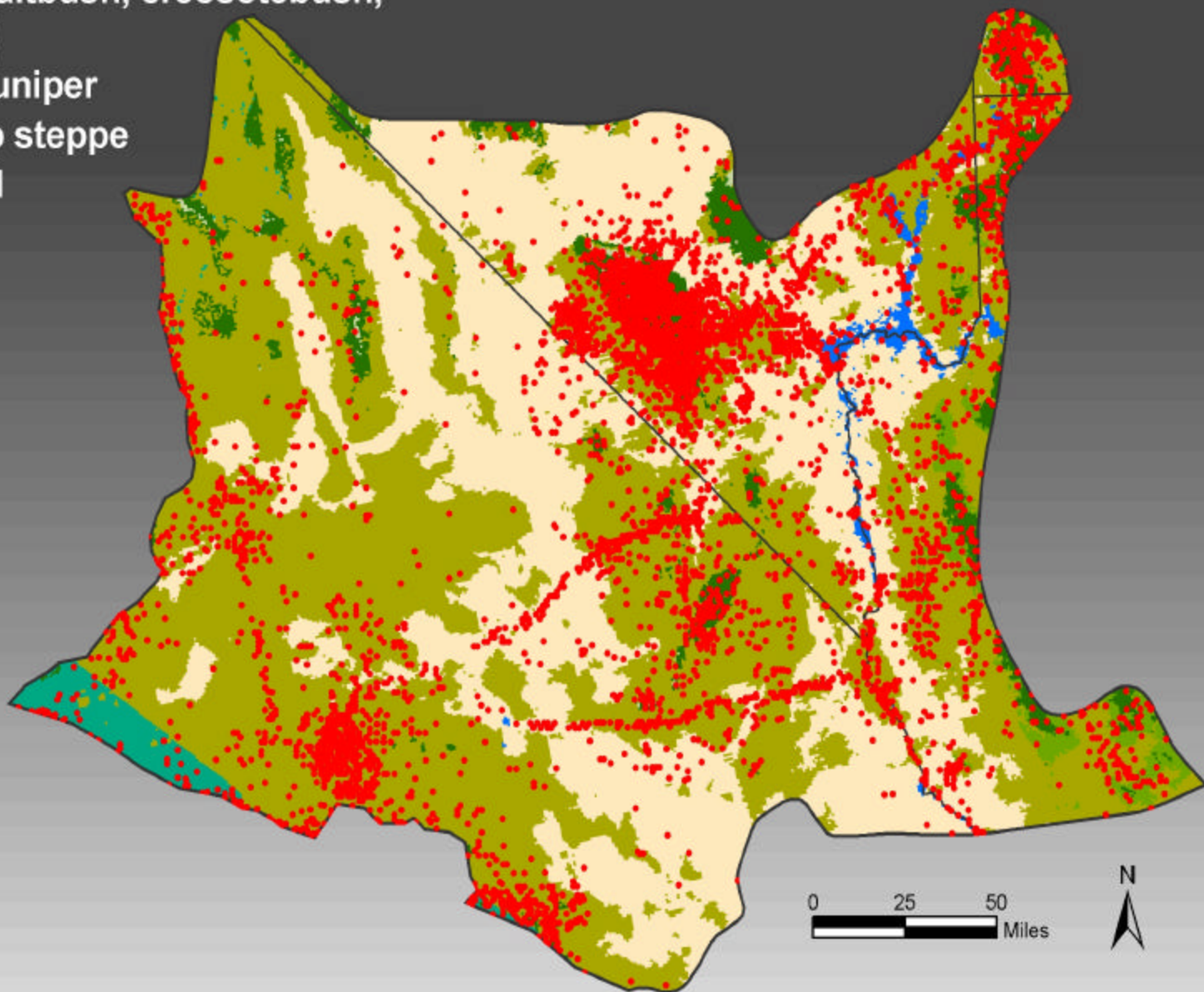
Effects of early season fire and herbicides on *Bromus rubens* and *Bromus tectorum* in blackbrush shrublands.

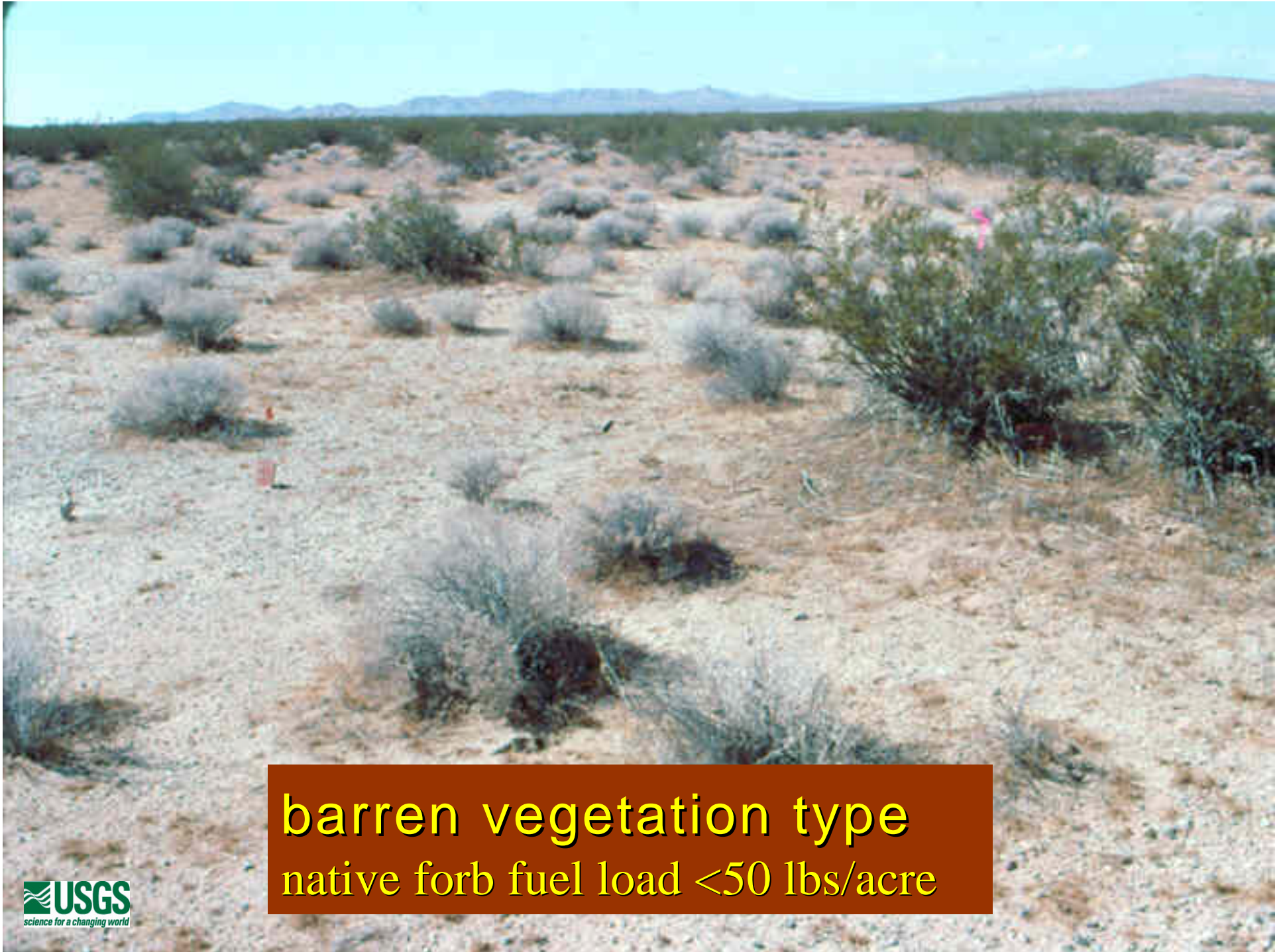
Effects of mechanical and herbicide treatments on Sahara mustard (*Brassica tournefortii*).

Effects of mechanical and herbicide treatments on bufflegass (*Pennisetum ciliare*).

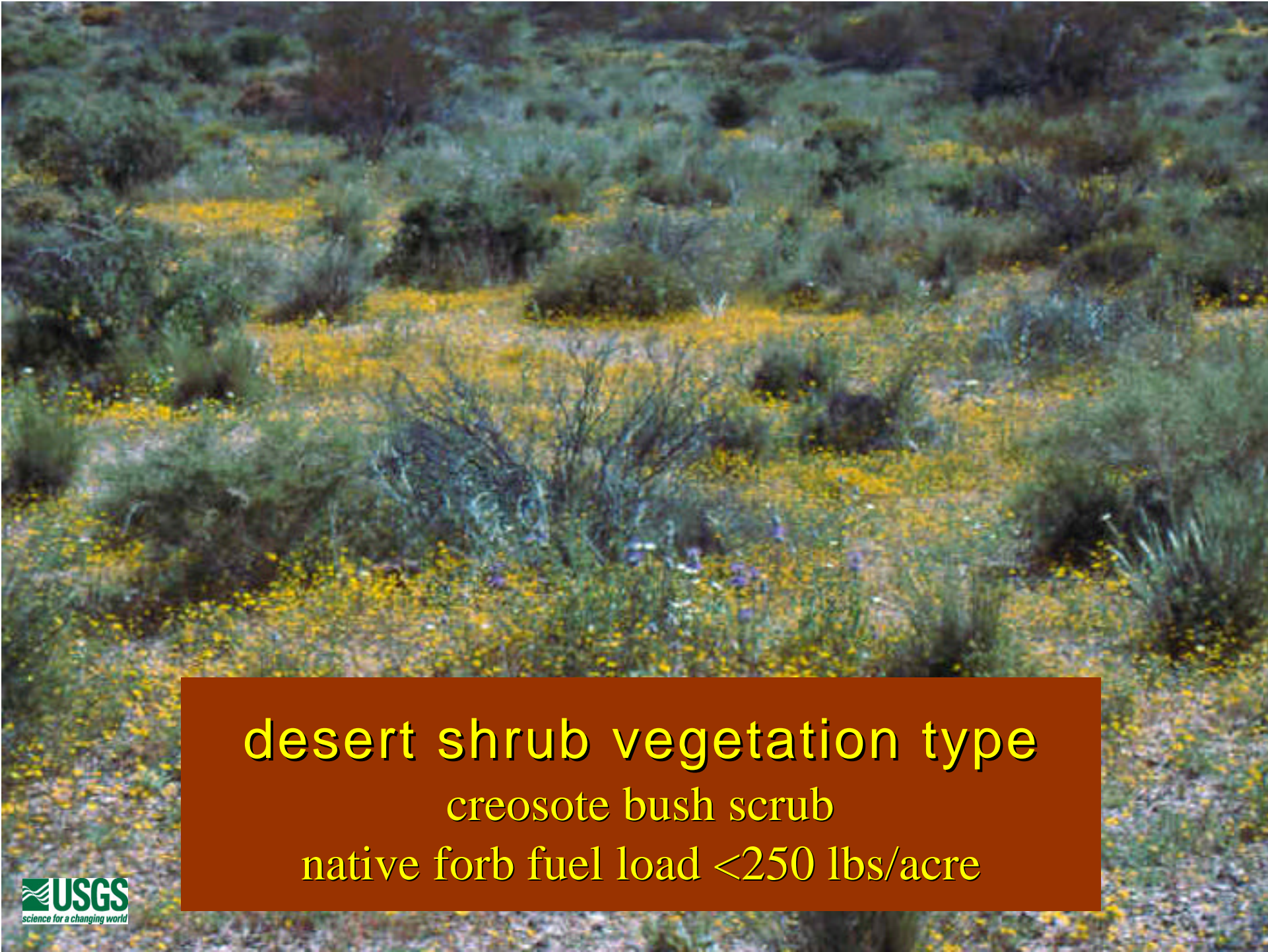
# Fire Occurrences 1980-2001

- Desert shrub (creosotebush, mixed-woody scrub, blackbrush)
- Barren (saltbush, creosotebush, playas)
- Pinyon-Juniper
- SW shrub steppe
- Chaparral
- Water
- Fires






**barren vegetation type**  
native forb fuel load <50 lbs/acre



desert shrub vegetation type  
creosote bush scrub  
native forb fuel load <250 lbs/acre



desert shrub vegetation type  
blackbrush  
native forb fuel load <150 lbs/acre



desert shrub vegetation type  
burned creosote bush with *Bromus rubens*  
fine fuel load ~1,000 lbs/acre



# desert shrub vegetation type

burned blackbrush

with *Bromus rubens* and *Bromus tectorum*

fine fuel load ~750 lbs/acre



## Juniper – Piñon vegetation type





# Recent Fire Statistics

## DOI/USDA-FS data 1980-2001\*

Küchler Vegetation Types**	Area (%)	Elevation/Latitude	Number of Fires	Human : Lightning	Acres per Fire	Acres Burned	% Burned
Barren	37	low	1,211	5.2	13	15,982	0.2
Desert shrub	54	medium	4,350	2.4	68	296,687	1.9
Juniper - Piñon	5	high	1,437	0.50	73	105,362	6.9

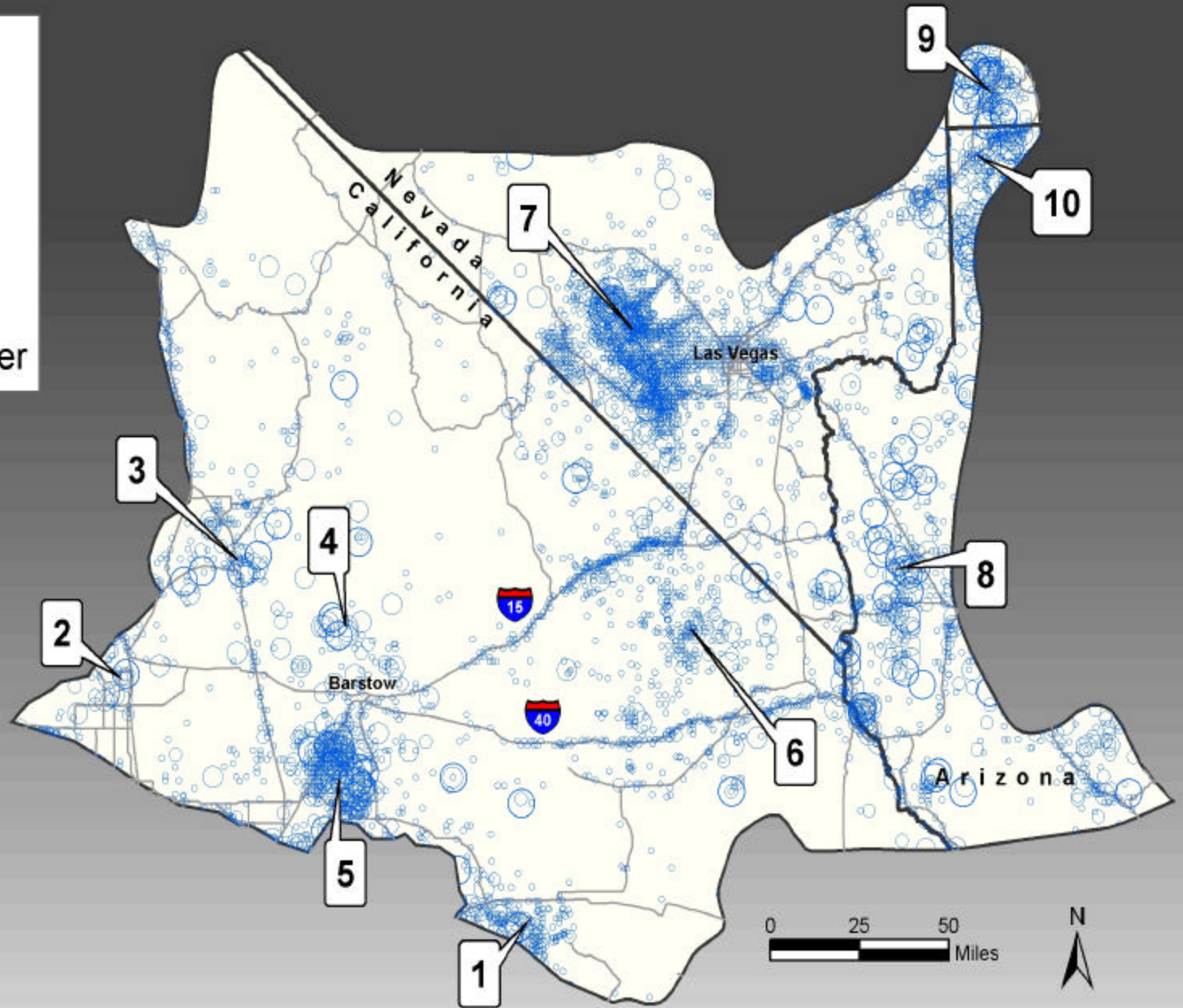
\* 7,900 fires

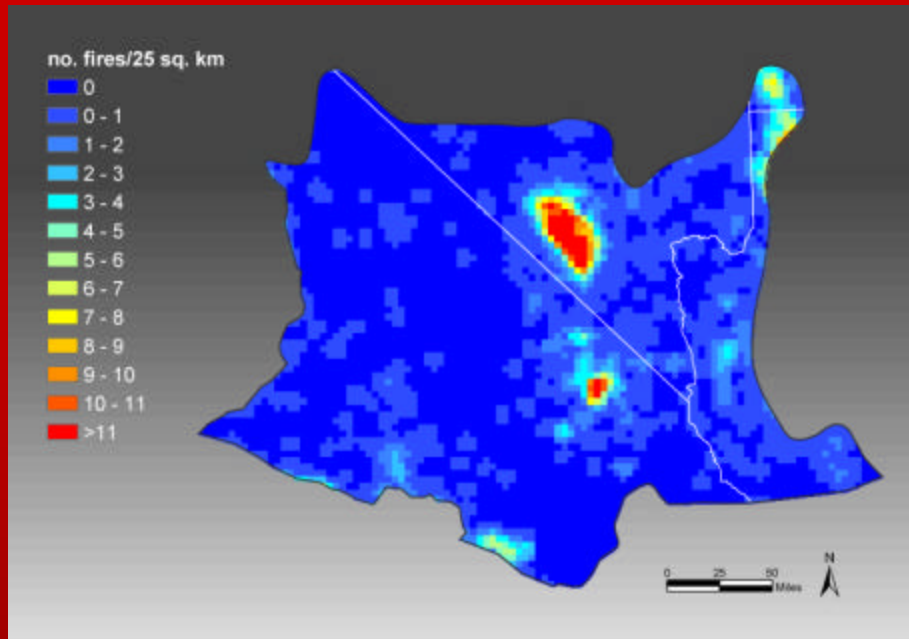
\*\* representing >96% of total Mojave Desert

Fire Size (ac.)

- 0 - 10
- 10 - 100
- 100 - 1000
- >1000

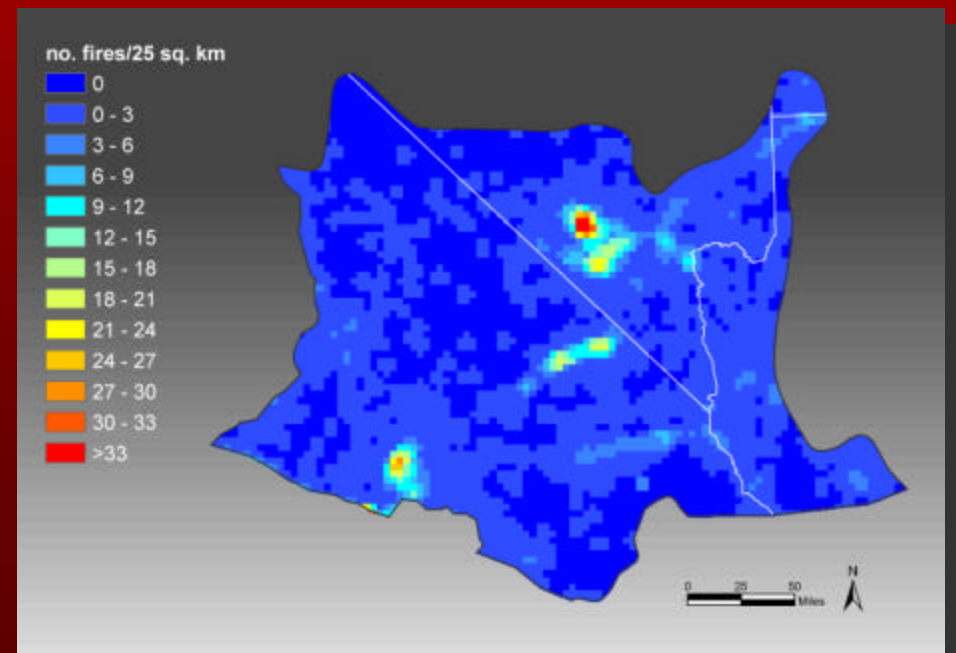
1 Regional Fire Cluster

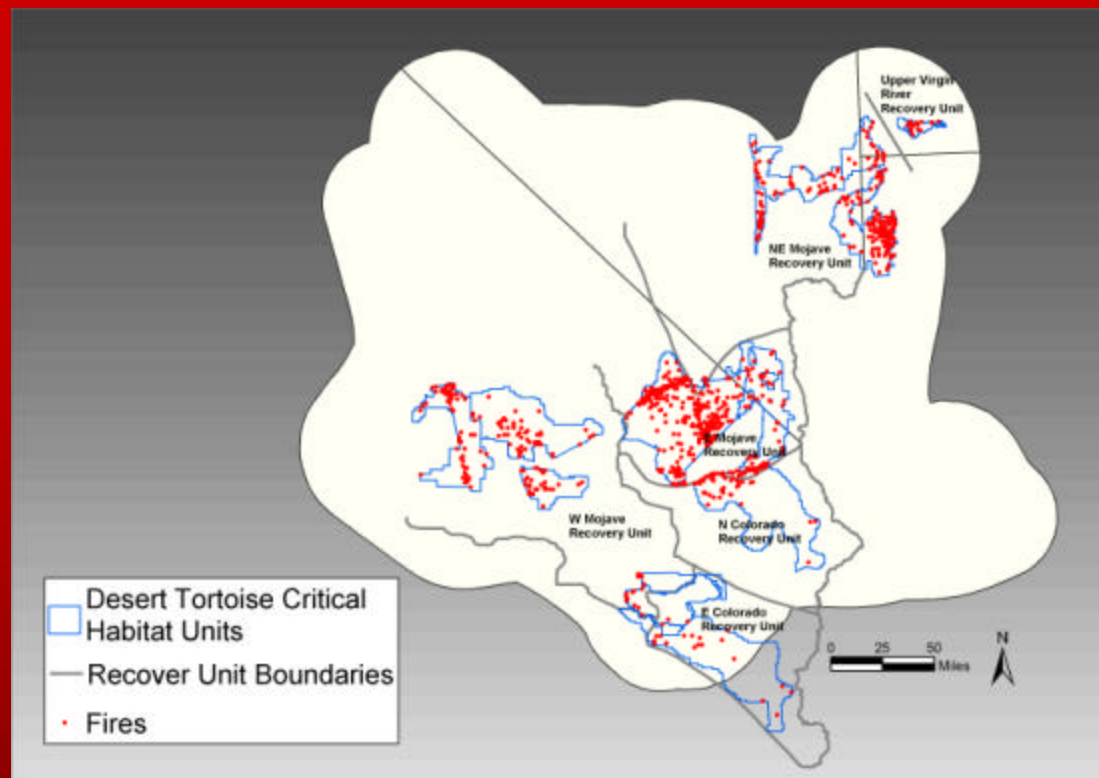




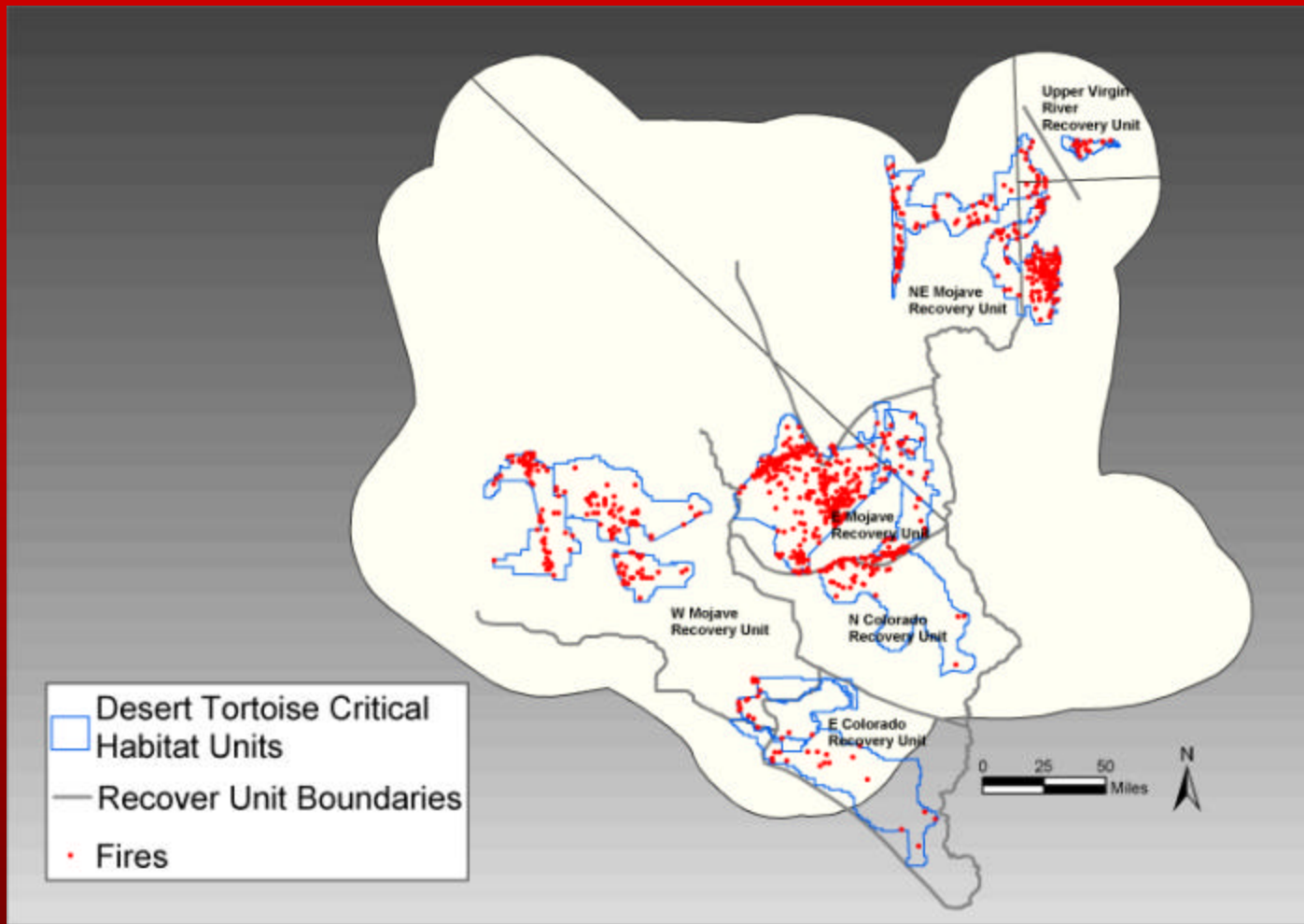
**Lightning-caused fires** were most dense in the Spring Mountains of Nevada, the New York and Providence Mountains of the Mojave National Preserve in California, in the Beaver Dam and Virgin Mountains in Utah and the Arizona Strip, and Joshua Tree National Park in California.

**Human-caused fires** were most dense in the Spring Mountains, along the I-15 and I-40 corridors, and the Stoddard and Lucerne valleys.



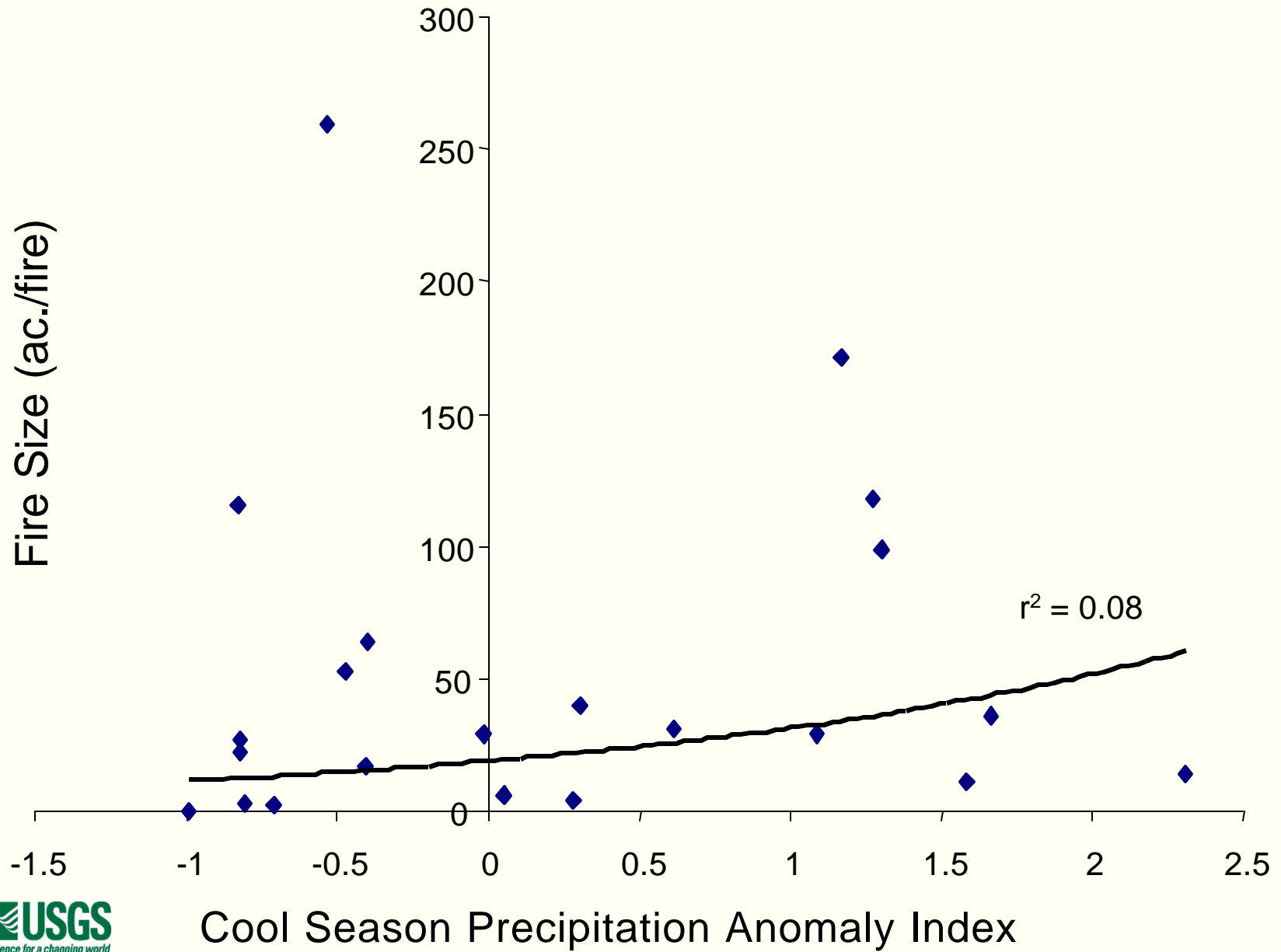


Unit	Number of Fires	Total Area Burned (ac.)	Average Fire Size (ac.)	Ratio Human to Lightning Caused Fires	% Area Burned Burned
Upper Virgin River Recovery Unit	17	3,061	180	0.6	5.0
NE Mojave Recovery Unit	315	143,093	454	0.4	12.6
E Mojave Recovery Unit	841	13,092	16	1.6	0.7
W Mojave Recovery Unit	208	25,663	123	2.7	1.4
N Colorado Recovery Unit	63	1,536	24	3.6	0.2
E Colorado Recovery Unit	44	14,384	327	3.8	1.1

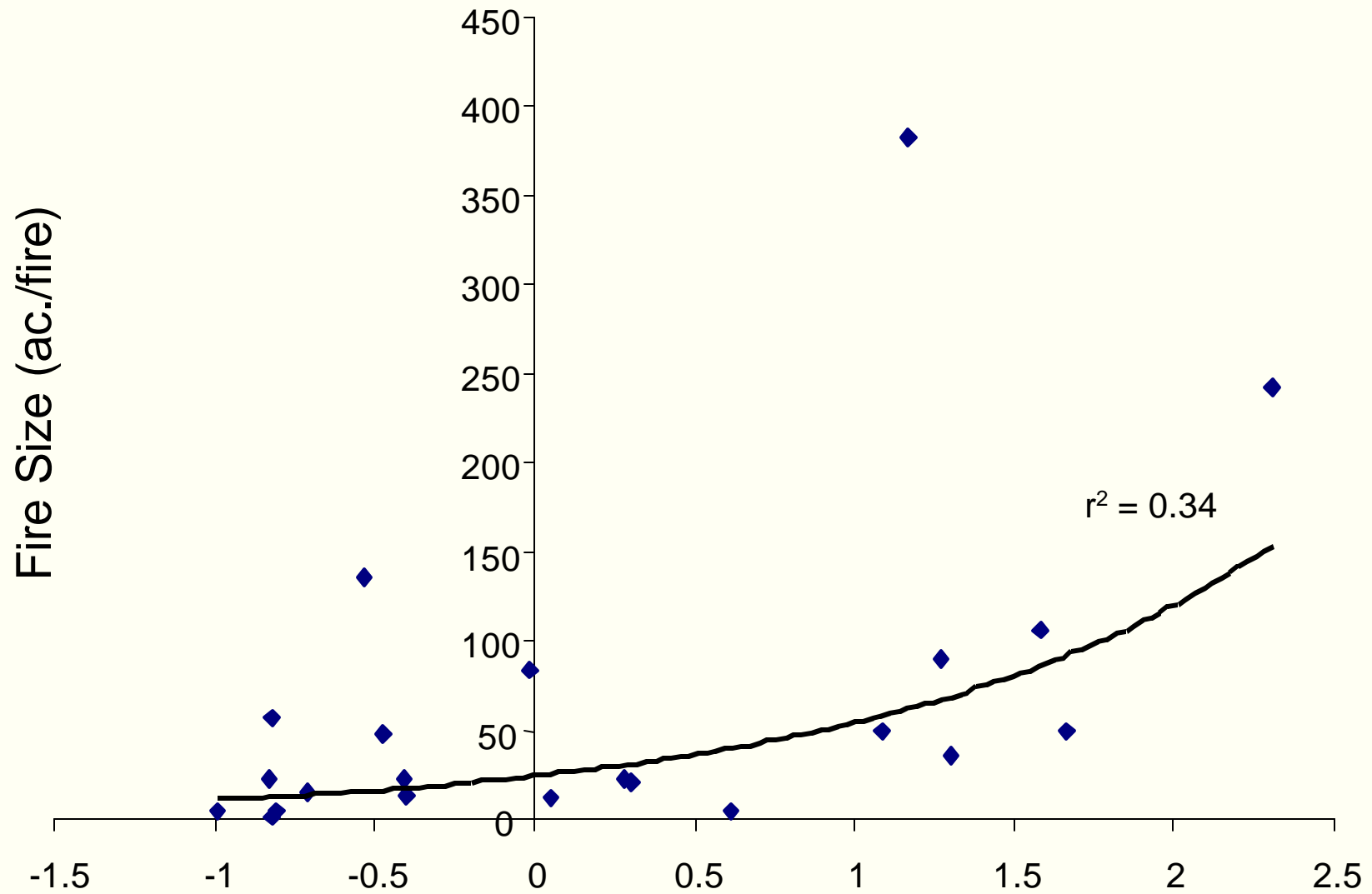


Unit	Number of Fires	Total Area Burned (ac.)	Average Fire Size (ac.)	Ratio Human to Lightning Caused Fires	% Area Burned
All Critical Habitat Units	1,488	200,829	135	1.3	2.9
Low Elevations (<4,200 ft)	1,149	177,063	154	2.1	--
High Elevations (>4,200 ft)	334	23,748	71	0.2	--

# High Elevation Fires $\geq 4,200$ ft. (above desert tortoise habitat)



# Low Elevation Fires < 4,200 ft.(preferred desert tortoise habitat)





# Summary and Recommendations

- New alien species continue to invade desert tortoise habitat, and some have the potential to further alter fire regimes.
- Coordination of regional WMAs is needed to effectively manage these invasive plants.
- A Mojave Desert wildland weed list would help this process.

# Summary and Recommendations

- Fires now occur in the “barren” regions of the Mojave Desert previously thought to be fire-proof.
- Human-caused fires are most prevalent in low elevation areas preferred by the desert tortoise.
- Low elevation areas (<4,200 ft) preferred by the desert tortoise are most sensitive to increased fire frequency and size after years of high rainfall.
- Proportionately more area burned in the NE Mojave and Virgin River recovery units.
- Fires are clustered in regional hotspots, which should be considered when pre-positioning fire suppression resources.