



Patterns of firewood and forest pests brought to California in 2011

Matthew Bokach
Forest Health Protection
USDA Forest Service
Pacific Southwest Region

Background

California Dept. of Food and Agriculture (CDFA) border stations record details on all firewood entering the state and all potential pests found on or in firewood.

CDFA data were summarized and reported for the first time in 2010.

Reporting today on patterns of firewood and forest pests brought to the state in the last year (Oct 2010 – Sept 2011). Complete dataset – all 16 stations recording in all months.

Data used to determine areas in the state most likely to be destinations for out-of-state firewood.



Key Findings – Firewood

Over 18 million pounds of wood in over 7,300 individual loads recorded between Oct 2010 and Sept 2011. Hornbrook, Alturas, Redwood Highway still top entry points.

Wood arrived from 47 states, Canada, Mexico. OR, CA, AZ, BC top origins – 87% of total.

CA destinations received 86% of the wood. Reno, NV was the main out-of-state destination.

On average wood in commercial vehicles expected to travel over twice as far (185 miles) than wood in private vehicles (87 miles).



Key Findings – Potential Forest Pests

317 potential forest pests were intercepted on firewood in the last twelve months.

Private vehicles accounted for over 90% of intercepted potential forest pests.

Almost half (44%) of the potential forest pests were intercepted at the Needles station on I-40. This is over 6 times more than expected relative to total traffic.

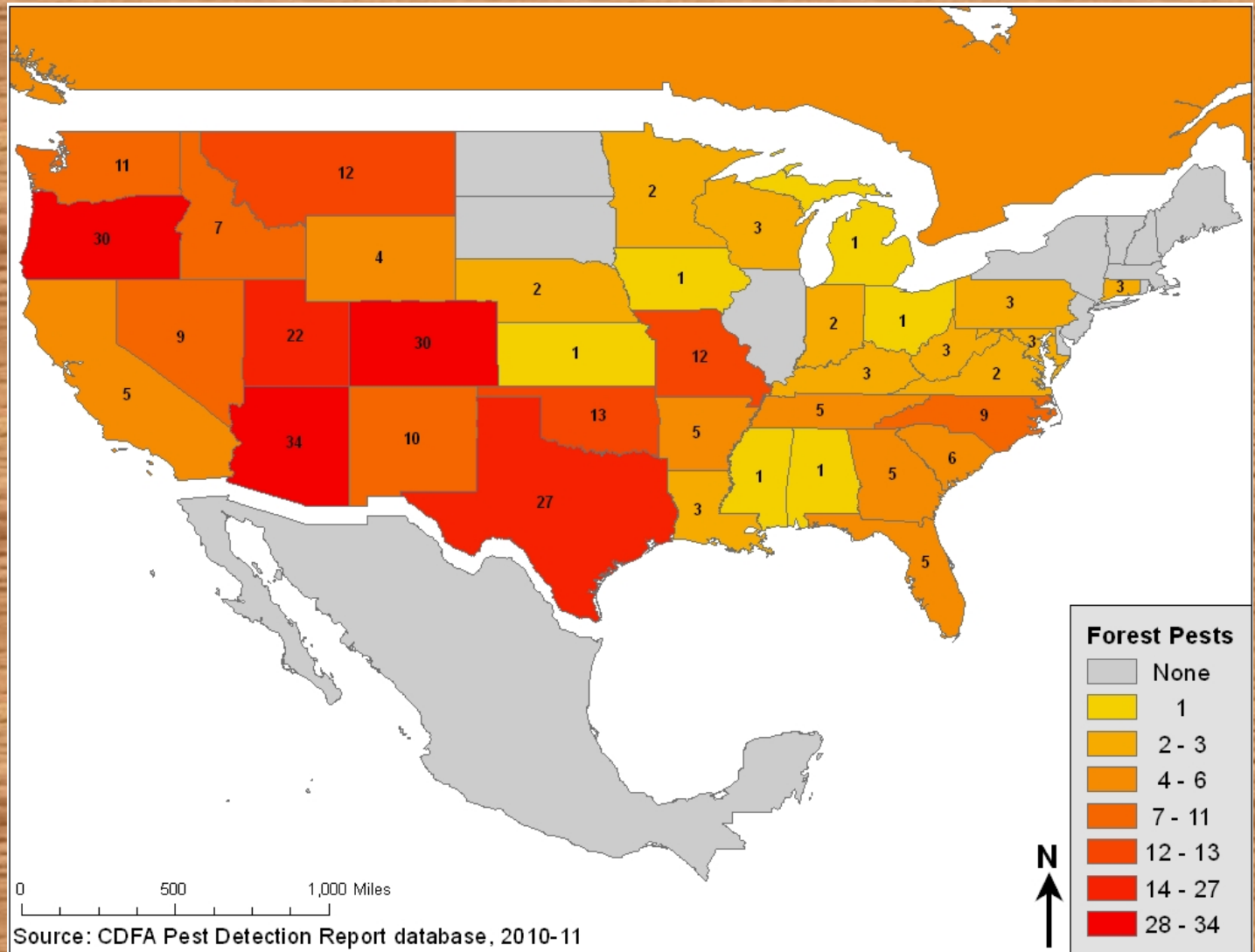
93% of the intercepted potential forest pests were beetles. First ever siricid wasp at a border station.

Potential Forest Pests	Total
COLEOPTERA (beetles)	
CERAMBYCIDAE (longhorn beetles)	173
SCOLYTINAE (bark beetles)	64
BUPRESTIDAE (wood borers)	59
HYMENOPTERA (social insects)	
SIRICIDAE (wood wasps)	1
ISOPTERA (all families) (termites)	12
LEPIDOPTERA (butterflies and moths)	
TORTRICIDAE (leafrollers/budworms)	4
LASIOCAMPIDAE (tent caterpillars)	3
LYMANTRIIDAE (gypsy/tussock moths)	1
Total	317



Key Findings – Potential Forest Pests

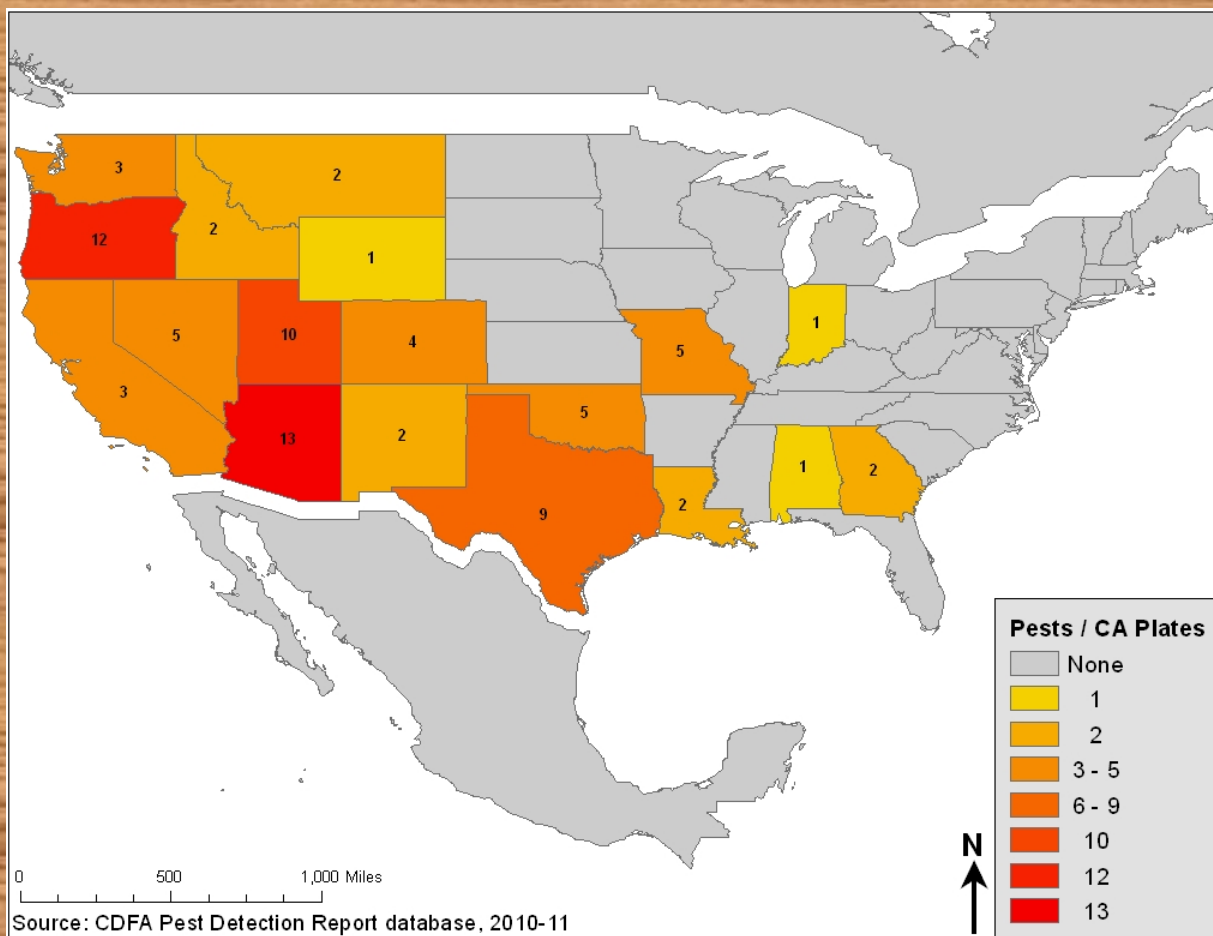
Potential forest pests were intercepted on or in firewood from 36 other states, CA, Canada. Top origins were AZ, OR, CO, TX.



Source: CDFA Pest Detection Report database, 2010-11

Key Findings – Potential Forest Pests

Over 25% of intercepted pests were in vehicles with CA license plates. Californians brought pests back from at least 17 other states. All but one of these firewood loads were in private vehicles with an average load size of 43 pounds.

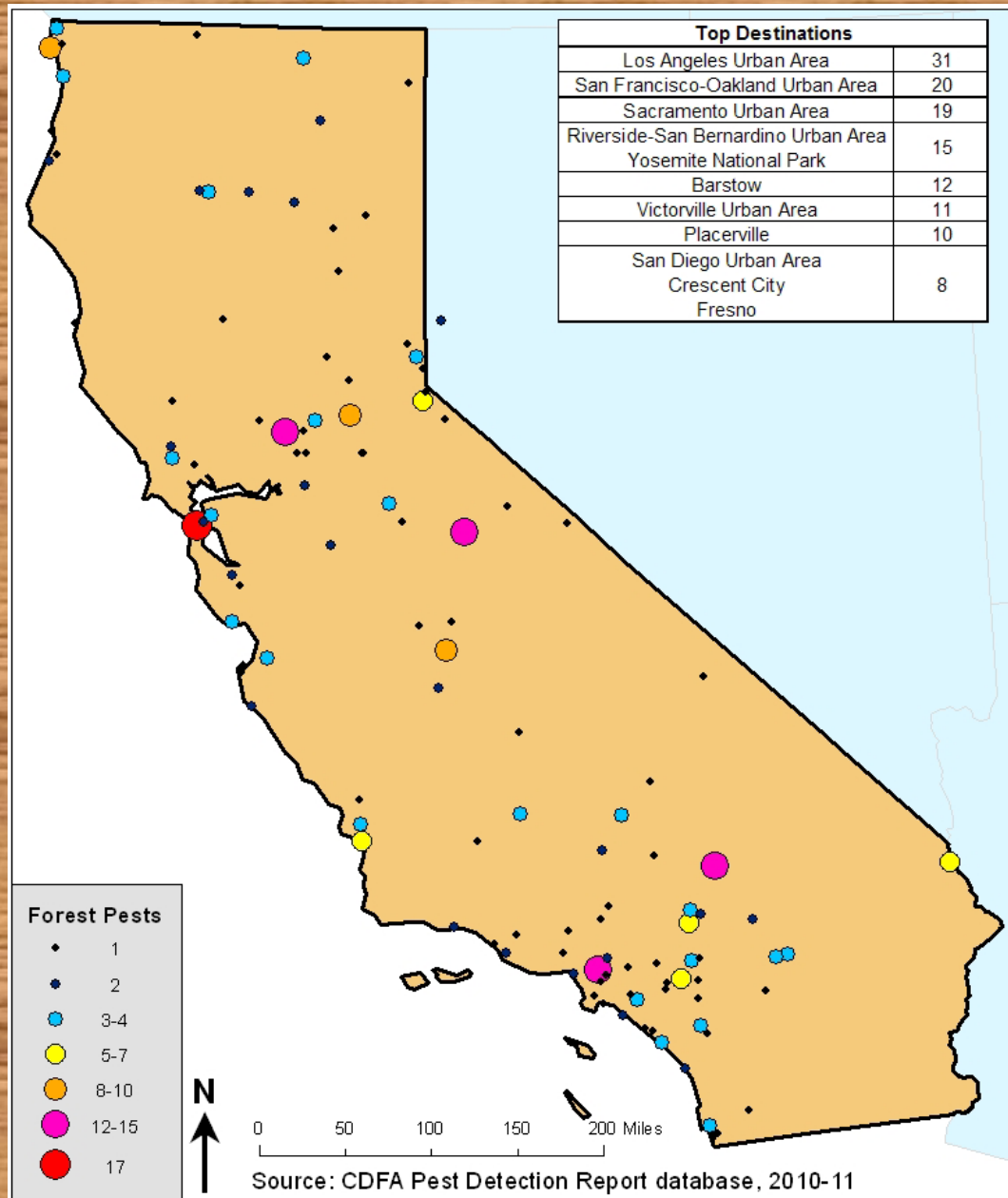


Colorado (9%) and Texas (5%) plates were next most frequent.

Key Findings – Potential Forest Pests

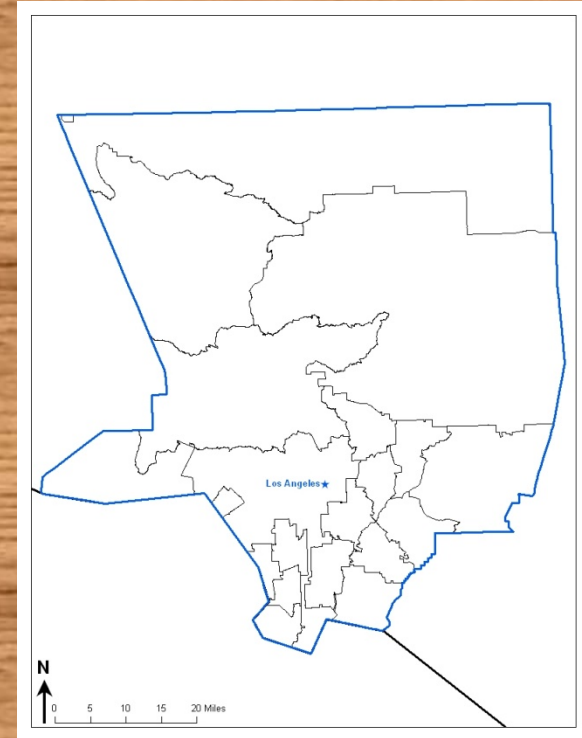
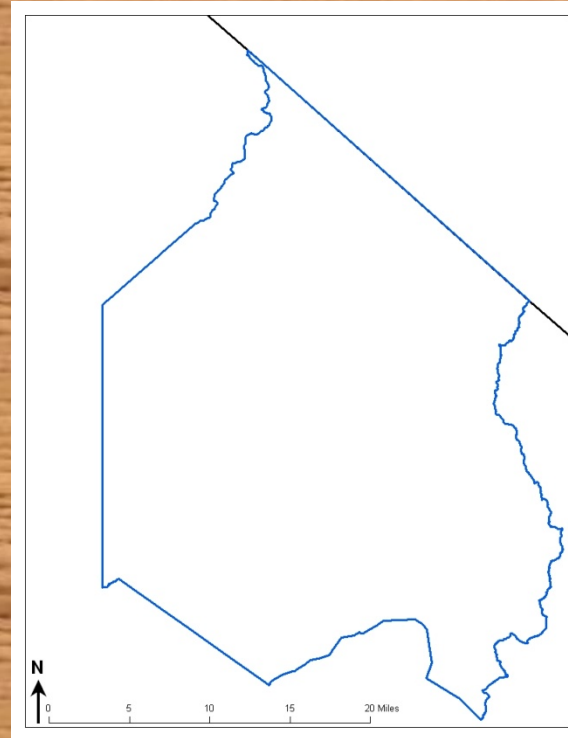


Wood with potential forest pests was traveling to 122 different destinations, 97% of them in CA. Major CA cities and Yosemite NP were among the most common.



Most Likely Destinations

Units of analysis were US Census Bureau county subdivisions (CCDs).



Used logistic regression and Akaike's Information Criterion to determine most likely destinations in CA for out-of-state firewood. Wood in private and commercial vehicles was analyzed separately.

Most Likely Destinations

For private vehicles, best predictive factors were:

Total population

Number of homes heating with wood

Annual number of campground visits

Median income (inverse)

For commercial vehicles, best predictive factors were:

Total population

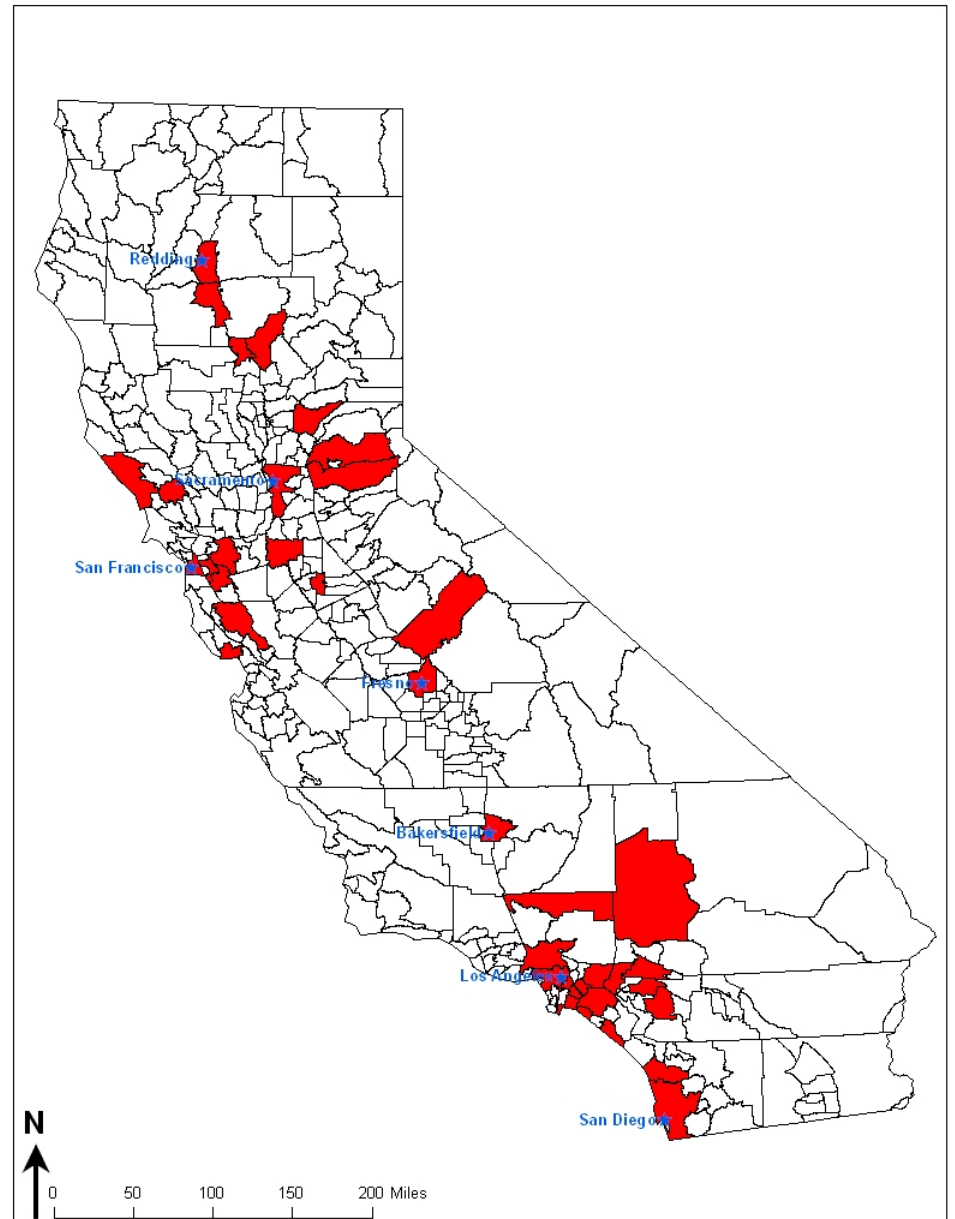
Number of homes heating with wood

Maximum average daily number of trucks



Most Likely Destinations

Based on summed model probabilities for private and commercial vehicles, this map shows the top 10% most likely CCDs to receive out-of-state firewood.



Firewood Management Implications

Firewood is a very likely vector for introduction and spread of new forest pests in California.

Campers and those heating with wood are two important audiences.

Outreach/educational materials should focus geographically on large urban areas and popular recreational areas (Yosemite, Tahoe).

A large number of Californians bring wood back to the state from elsewhere. Continuing to expose them to the firewood message before they leave is important.

Development of Best Management Practices is in progress and should be promoted across all agencies.

