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FACT SHEET

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Forest Density Preferences of Homeowners in the Wildland-Urban Interface

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Introduction

Wildfire management costs in the Western U.S. have skyrocketed over the past two decades, from $1 billion to more than $3 billion annually, due to an increase in the number and size of wildfires combined with rapid residential development of wildland urban interfaces (WUIs) surrounding western communities. The expansion of western WUIs is driven by increasing demand for homes in dry western forests. Millions of potential WUI acres remain available for future development. Arid western forests offer amenities, in terms of shade, cooling effects, and aesthetics, but also come with disamenities such as high wildfire risk. With little empirical evidence of how forest density and associated wildfire risk are incorporated into WUI house prices, we investigated the level of surrounding tree density as a possible explanatory influence on sales prices in four fire-prone western WUIs.

Methods

- We estimated a spatial hedonic pricing model for 418 home sales in four WUI areas surrounding Flagstaff, AZ; S. Lake Tahoe, CA; Missoula, MT; and Bend, OR.
- Potential explanatory variables included attributes of each house including structural, neighborhood, environmental, and wildfire risk characteristics.
- Forest density levels surrounding WUI homes at both 100-meter (109-yard) radius and 500-meter (547-yard) radius levels were broken down into low, medium, and high levels for each WUI and analyzed as aggregate dummy variables to determine any relative influence of forest density.
- Implicit prices were calculated for marginal willingness to pay for all significant attributes.

Arid western forests offer amenities, but also come with disamenities such as high wildfire risk. *Photo by Kari Greer, courtesy of the U.S. Forest Service*

Results

In addition to traditional house measures such as size, number of bathrooms, and lot area, forest density categories were found to significantly influence WUI house prices. Results include:

- In the more immediate forest surrounding WUI houses (100-meter (109-yard) radius level), WUI homebuyers have a preference for lower forest density.
- In the larger surrounding vicinity of WUI houses (500-meter (547-yard) radius level), higher forest density was preferred.
- Newer, or more recently built, WUI houses were associated with higher surrounding forest density levels.

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Policy Application

- **WUI homebuyer's preference for lower forest density immediately surrounding homes** is a positive sign that house prices are beginning to reflect the added value of reduced fire risk, whether that be from naturally less dense forests or from the creation of defensible space with fuels treatments and forest restoration. In close proximity to homes, forest density in fire-prone, dry-mixed conifer western forests is expressed as a net disamenity.
- **The preference for higher forest density at the broader surrounding scale** is likely an indication of the attractiveness of dense western forests in terms of cooling effects, aesthetics, and recreation where forest density is valued as a net amenity. But this preference is also likely due to subsidized federal fire management and underestimated fire risk. Without full information and without full accountability, markets are skewed toward dangerous and socially expensive WUI development.

The 2012 Waldo Canyon Fire destroyed approximately 346 homes, including several homes in this neighborhood near Colorado Springs, Colorado. The Waldo Canyon Fire forced the evacuation of 32,000 residents and burned 18,247 acres. *Photo by Kari Greer, courtesy of the U.S. Forest Service*

- **Current incentives to locate in high wildfire risk areas** are contributing to rapid, and often times, unstrategic expansion of the WUI. One way to address rising WUI fire management costs is to explicitly include local fire management costs in any new WUI development. Our research indicates that new WUI development is being relegated to the most at-risk areas and that ***there are market premiums for high fire risk areas that can be captured by county and municipal governments in*** order to provide for greater local fire management efforts in terms of both fire suppression and prevention (i.e., fuels treatments and forest restoration) in new WUI developments and adjacent public lands.
- **Including fire management costs at the onset of WUI development will be a critical means to address this new growth**. All new WUI development can be accompanied with wildfire risk assessments and developers and new WUI homebuyers can contribute a percentage of assessed home and property value, according to their assigned fire risk level, to a fire management fund above and beyond current county and overlapping municipal fire and emergency response fees. ***Implementing cost-share agreements between regional governments and federal management agencies*** can help coordinate and leverage collected private wildfire funds with federal fire management funds. ***Collecting fire management funds from new WUI developments in the beginning, based on fire risk levels***, would ensure greater private contributions to fire management and would provide incentives for not locating in the highest fire risk areas and for reducing current forest density and fuel levels. With escalating wildfire risk and WUI expansion guaranteed in the future, new policy applications that can limit and evenly distribute the cost of fire management are paramount.

This fact sheet summarizes information from the following publication:

Hjerpe, E.E., Y.S. Kim, and L. Dunn. 2016. Forest density preferences of homebuyers in the wildland-urban interface. *Forest Policy and Economics,* 70: 56–66.

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