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Research Brief for Resource Managers

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Strategic Land Purchases Lower San Diego Fire Risk

Surprisingly, well-planned land acquisition by a private land trust can achieve two desirable land management goals at once: decreased fire risk to homes and local biodiversity conservation. Traditionally, the objective of local and national land trusts has been to acquire land for the preservation of biodiversity, scenic beauty and open space. This conservation strategy has resulted in over 20 million hectares of land protected by land trusts in the United States.

Protection of open space has been found to have other important benefits: increased adjacent property values, improved economic growth, the provisioning of regional ecosystem services, and decreased impacts of natural hazards like floods, hurricanes and wildfires. These authors show that by using strategic land purchasing power, the traditional goal of conservation and the less traditional goal of wildfire risk reduction could complement each other in San Diego County.

Three land development models for the South Coast Ecoregion of San Diego County were

Management Implications

- **Strategic land acquisition** may be an effective tool for reducing regional wildfire risk in southern California.

- Conservation purchases focused on lands with high fire hazard, low costs, and high probabilities of subdivision, can reduce fire risk at the county scale.

- "With limited land conservation and hazard reduction funding available, the potential exists for conservation organizations and government agencies to use land conservation as a tool to manage biodiversity, open space, and fire concurrently."

used to test the relative effectiveness of different acquisition strategies for conservation and fire risk reduction. The models – a land development model, a private land conservation selection model, and a fire risk to housing model – were linked through four land purchase selection algorithms (Table 1) with two different but fixed budget scenarios: $20k/year for the baseline budget X1 and $40K for an inflation budget X2 (Fig. 1). The number of housing units constructed per five years (37,500 units/five years) remained fixed under both budget scenarios. Simulations for land development,

conservation and fire risk were run for the next 20 years (Fig.4).

Table 1. Four selection algorithms for selecting which parcel to conserve.

Algorithm	Description
CostMin	Acquire as much property as possible at the least cost
SubMax	Acquire parcels that will develop in the absence of conservation
FireMin	Acquire inexpensive parcels that are at high fire risk
FireMinMax	Acquire parcels that are inexpensive, likely to subdivide, and at high risk of fire

Conservation land purchases that targeted parcels designated as high fire hazard resulted in lower fire risk to homes than purchases that targeted low costs or high likelihood to subdivide (Figure 1). Doubling the budget for any algorithm, did not substantially alter the trends (Figure 1).

Strategic land acquisition successfully lowers regional fire risk by displacing development and potential human ignitions away from high fire risk land and into higher density infill development. Higher density infill development reduces the low-medium density housing sprawl that has the highest fire risk in the wildland urban interface (WUI). When land acquisition is prioritized only by low cost and subdividing probability (CostMin & SubMax, Figure 1), the resulting new development may increase overall fire risk in the county.

Figure 1. Fire risk to homes in each time period, for each selection algorithm and for each budget.