

THE SOD FACTS OF LIFE: PROPERTY VALUE LOSSES FROM SUDDEN OAK DEATH IN MARIN COUNTY

Kent Kovacs¹, Jeffrey Englin¹, Thomas Holmes², and Janice Alexander³

¹University of Nevada, Department of Resource Economics, Reno, NV 89557

²USDA Forest Service, Forestry Sciences Laboratory, Research Triangle Park, NC 27709

³Sudden Oak Death Outreach Coordinator, University of California Cooperative Extension, Marin County, CA 94947

ABSTRACT

A difference-in-difference (DID) hedonic property price model examines the property value damage from the pathogen *P. ramorum* in Marin County, California. The mortality of tanoaks and coast live oaks in Marin County was first observed in late 1998, and the mortality continues throughout the central and north coast of California to this day. The pathogen's growth on the foliage and branches of a variety of tree and shrub species, the ability to spread aurally, and the broad geographic range of the host species makes this disease a serious threat to many forest ecosystems. We determine the property value damage in the geographically diverse and affluent Marin County from coast live oak mortality with a spatial DID model of parcel transactions from 1983-2008, combining knowledge of the year of invasion and several indicators of sudden oak death damage. This study is the first to make use of the DID model to look at the damages of an invasion that spans a decade, with findings for each year of the invasion, with the hedonic property price model.

There are several indicators of sudden oak death damages that include: 1) proximity to coast live oak woodlands; 2) confirmed infections of coast live oaks; 3) aerial observed oak mortality; and 4) arborist reported neighborhoods of oak mortality. Properties close to confirmed infections, aerial observed, or arborist reported neighborhoods of oak mortality have property value losses between 5 and 8 percent before the infected trees are removed. After the removal of the infected trees, property values return to the level typical for that area of the county. There is evidence of sustained property values losses between 2 and 5 percent for properties beside coast live oak woodlands. We believe the sustained property value losses are

where there is a high likelihood of oak mortality around the properties (even if mortality is currently not in the area.)

The results of an initial cross section analysis do not account for the potential feedback of the location of the invasion and the probability that the location is invaded. For instance, some locations may have unobservable characteristics, for instance more recreation activity, that transmits the pathogen to the location more frequently. To overcome this potential problem, we use a fixed-effects difference-in-difference model. This is possible because there are parcel transactions available from 1983 to 1998, before the invasion, in addition to parcel transactions from 1999-2008 during the invasion. The fixed-effects estimator is useful because we identify 53 distinct communities in Marin County for grouping parcel transactions. This way, any time-invariant unobservable variables, in the community, potentially correlated with the regressors will not influence the coefficients.

The County of Marin publicly provides a rich set of geographic information system (GIS) data to fully specify the hedonic property price function. A variety of location, environmental, transportation, topographic, geographic, and neighborhood characteristics for every property are calculated from this GIS data. GIS county wide data of the tree species affected by SOD, the locations of *P. ramorum* confirmations, and arborist reported neighborhoods of oak mortality were obtained from the Marin County Cooperative Extension and the UC Berkeley, Kelly research and outreach lab. GIS county data of oak mortality for the years of 2001-2002 and 2005-2007 were obtained from Pacific Southwest Region, U.S. Forest Service.