Land Use Policy 26 (2009) 1149–1161

Contents lists available at ScienceDirect

Land Use Policy

journal homepage: www.elsevier.com/locate/landusepol

Strategic targeting of agricultural conservation easements as a growth management tool

David M. Stoms[a,*], Patrick A. Jantz[a], Frank W. Davis[a], Gregory DeAngelo[b]

[a] Donald Bren School of Environmental Science and Management, University of California Santa Barbara, Santa Barbara, CA 93106-5131, United States
[b] Department of Economics, University of California Santa Barbara, Santa Barbara, CA 93106-9210, United States

ARTICLE INFO

Article history:
Received 21 February 2008
Received in revised form 16 February 2009
Accepted 19 February 2009

Keywords:
Strategic conservation planning
Spatial targeting
GIS
Smart growth
Farmland preservation
Urban growth boundaries

ABSTRACT

Public and private programs have preserved an estimated 730,000 ha of agricultural land in the United States by acquiring agricultural conservation easements (ACEs) that retire a property's development rights. ACEs could be a potent tool for smart growth if strategically targeted. This paper attempts to quantify measures of strategic targeting of ACEs as guidance for planners. Evaluating the placement of 157 ACEs in the San Francisco Bay Area of California produced mixed results. Preservation and development of agricultural land were both consistent with general plans. In contrast, we found little evidence of ACEs being used on a regional scale either to reinforce urban growth boundaries or to coalesce with other open space to form large contiguous blocks of protected areas. We used the TOPSIS method (Technique for Order Preference by Similarity to Ideal Solution) to identify the most strategic agricultural lands, which are quite different from where easements have been established through 2002. We encourage planners to consider strategic targeting of ACEs as a politically acceptable mechanism to complement traditional planning tools to minimize low density sprawl.

Introduction

Farmland preservation has advocates on both sides of the rural–urban fringe in the United States. On the urban side, smart growth advocates endorse saving farmland to maintain access to rural amenities for city dwellers. By limiting low density urban expansion into rural areas, the smart growth movement hopes to reduce reliance on the private automobile, minimize costs of community services and infrastructure, preserve open space, promote the redevelopment and revitalization of urban centers, and increase the recognition of interdependence across the metropolitan area (Downs, 2001). The growing interest of urban consumers in locally grown food is one expression of interdependence that is relevant to farmland preservation. Loss of farmland on the rural–urban fringe serves to undermine the quality of urban life. On the rural side, farmland is preserved in many parts of the United States to defend farms, and particularly the most productive farmland, from relentless sprawl and to maintain the agrarian lifestyle. Urban and rural perspectives on farmland preservation have generally not been systematically conjoined either in practice or in research.

Regardless of the motivation for farmland preservation, there are many mechanisms available, spanning the regulatory, legal, taxation, and acquisition pathways. One of the most widely used mechanisms is to purchase the development rights on agricultural land from willing landowners. The landowner either sells or donates their development rights to the purchase of development rights (PDR) program. With this mechanism, an agricultural conservation easement (ACE) is placed on the deed to the property that permanently restricts the amount and type of development that can occur. PDR programs are popular in the United States because participation is voluntary and landowners are compensated by direct payment or tax relief for the reduction in the value of their property or both. Although PDR programs are often referred to as farmland preservation programs, in this paper we will speak of "PDR programs" as those that acquire ACEs and "farmland preservation" for the suite of mechanisms, including PDR programs. We will use "ACE" when speaking of the specific farms that have been preserved.

Geographical targeting of ACEs has recently been recognized as a potentially effective tool for augmenting urban growth policies that is politically acceptable to most American interest groups (Thompson, 1996; Daniels and Lapping, 2005; Sokolow, 2006a). Strategically located ACEs can potentially block growth from unsuitable areas, while maintaining rural amenities near urban residents (Thompson, 1996). In a recent study by Sokolow (2006b), structured interviews with planners, PDR program managers, agri-

* Corresponding author. Tel.: +1 805 893 7655; fax: +1 805 893 7612.
E-mail address: stoms@bren.ucsb.edu (D.M. Stoms).

0264-8377/$ – see front matter © 2009 Elsevier Ltd. All rights reserved.
doi:10.1016/j.landusepol.2009.02.004

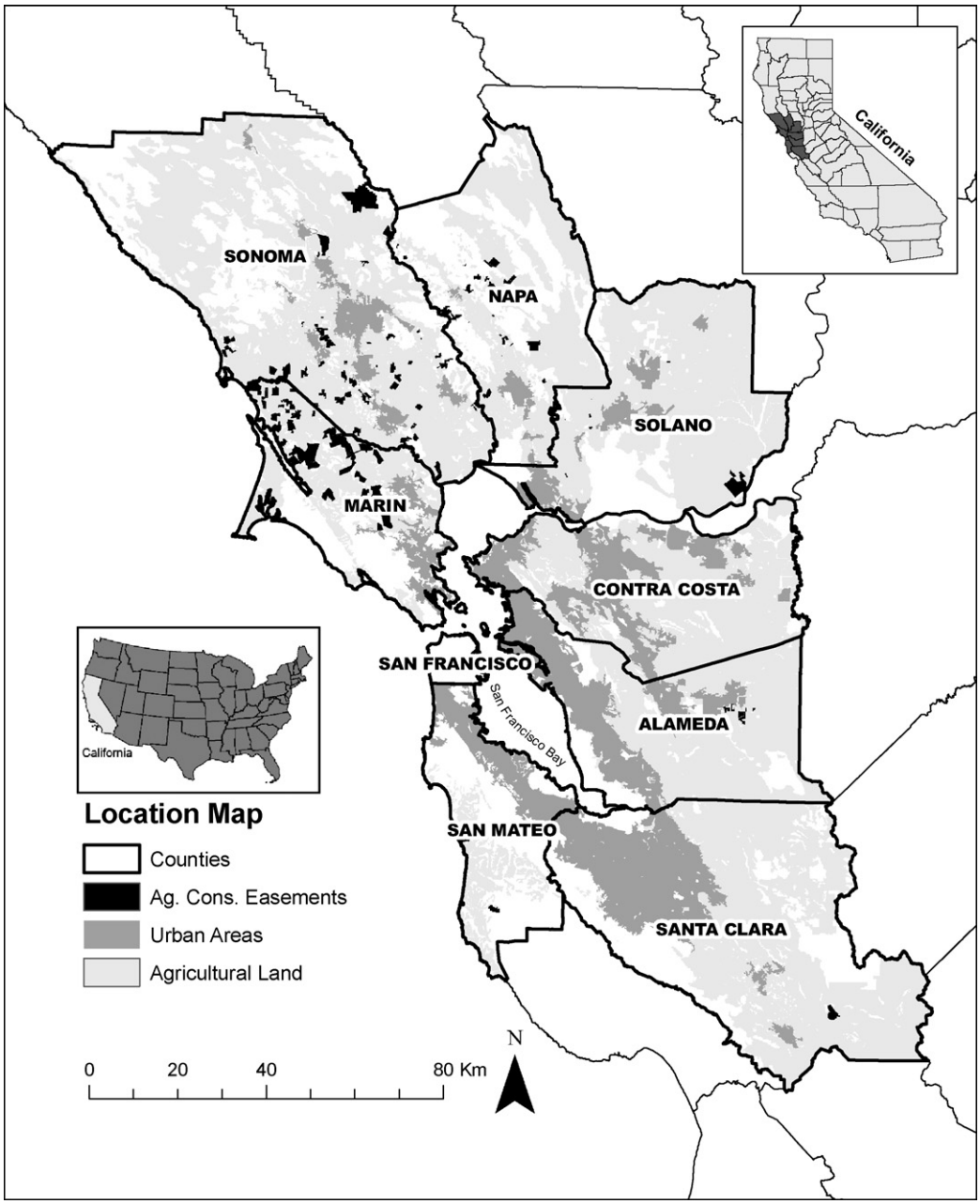

Fig. 1. Location map of the San Francisco Bay Area study region and the locations of agricultural conservation easements (as of 2002) in the context of urban and agricultural land use.

cultural leaders, and real estate experts revealed their qualitative perceptions that some programs have influenced patterns of urban growth by complementing growth management mechanisms such as zoning, infrastructure, and urban growth boundaries (UGBs). On the other hand, some programs that have preserved large easement portfolios have not had any apparent influence on urban growth (Sokolow, 2006b). To be able to monitor the strategic value of ACEs or to strategically target areas for ACEs will require new methods of spatial analysis (Sokolow, 2006b), such as those used for targeting forest management (Carver et al., 2006) or retiring agricultural land (Marshall and Homans, 2004). Many writers have noted the lack of evaluations of the strategic effectiveness of farmland preservation programs (Mundie, 1982; Heimlich, 2001; Hollis and Fulton, 2002; Bengston et al., 2004; Daniels and Lapping, 2005). Some spatial evaluations of PDR programs analyzed the tradeoffs between farmland preservation objectives (Lynch and Musser, 2001). Similar studies have examined the effect of urban growth boundaries on new development (Carlson and Dierwechter, 2007). Spatial planning models have been used to project future urban development under alternative growth policies and then to assess the loss of farmland (Bradshaw and Muller, 1998; Frenkel, 2004).

Prioritizing farmland for ACEs is typically performed in a spatial multicriteria analysis in which various social objectives can be integrated (Tulloch et al., 2003; Zurbrugg and Sokolow, 2006). Machado et al. (2006) offer a conceptual framework for quantifying the social value of preserving farmland for agricultural productivity, maintaining rural amenities and ecosystem services, and augmenting urban growth policies. They demonstrated the latter objective by a criterion related to reinforcing urban growth boundaries as an example of the potential contribution of farms to an