Chapter 32
TVAL-Farm:
A Qualitative Enhancement of the LESA Model

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ABSTRACT

The Total Value Assessment Tool for Farmland (TVAL-Farm) is a tool which incorporates scenic quality and cultural heritage elements to create an enhanced Land Evaluation and Site Assessment (LESA) model. The enhancement of the LESA model provides insight and a framework on how to collect and incorporate qualitative public values within the quantitative environment of a Geographic Information Systems (GIS). Inclusion of these public values is essential for holistically valuing land parcels and using LESA to make land protection decisions.

INTRODUCTION

This research presents the Farmland Values Project[1]'s TVAL-Farm tool which incorporates scenic quality and cultural heritage elements to create an enhanced Land Evaluation and Site Assessment (LESA) model. The LESA model, developed by the United States Department of Agriculture Natural Resource Conservation Service (NRCS), has been used across the country as a decision making resource particularly in the context of farmland preservation programs. This project develops a method for enhancing LESA's Site Assessment Factor 3 (SA-3), factors measuring "Other Public Values." The enhancement of the LESA model provides insight and a framework on how to collect and incorporate qualitative public values data within the quantitative environment of a Geographic Information System (GIS). This information is not typically included in farmland

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preservation benefit estimates and thus represents a significant bridge between the qualitative and quantitative studies of the importance of farmland to rural areas.

LESA is a numeric rating system created by the NRCS to evaluate a parcel's relative agricultural importance. The land evaluation (LE) component of a LESA system measures soil quality (Pease & Coughlin, 1996). It is usually based on land capability classes, important farmland classes, soil productivity ratings and/or soil potential ratings (Pease & Coughlin, 1996). The site assessment (SA) component evaluates other factors that contribute to the site's agricultural importance such as parcel size and on-farm investments. SA factors may also consider indicators of development pressure such as distance to sewer and water infrastructure and public amenities like wildlife habitat or scenic views (Pease & Coughlin, 1996). LESA systems assign points and a relative weight to each of the LE and SA factors. The sum of the weighted ratings is the LESA score; the higher the LESA score, the more significant the site for agriculture. States and localities often adapt the federal LESA system to meet their needs. Once a local system is approved by NRCS, it supersedes the federal system: NRCS is required to use the local version to review federal projects (Pease et al., 1994, p. 62).

Our enhancements focused on two benefits, scenic quality and cultural heritage significance, derived from survey information gathered in a community mapping activity conducted as part of the Farmland Values Project. Following the methodology of LESA, we assigned weights to each benefit category in order to derive the holistic benefit valuation score. Alternative weighting measures may also be calculated based on public input from various stakeholder groups. The primary product of this research is an enhanced geospatial database and assessment tool that includes qualitative layers for several types of farmland benefits; we call it the Total Value Assessment Tool for Farmland (TVAL-Farm).

While LESA has the potential for being a useful tool for farmland preservation, it has not been used in Western North Carolina. The need for linking LESA and GIS has been stressed (Soil and Water Conservation Society, 2003). Once site and benefit measures are tied to GIS data, future land use scenarios can be applied to identify which strategies maximize all the factors determined best for farmland preservation. The enhanced GIS-LESA model we have developed, TVAL-Farm, is a tool to help identify farmland most suitable for protection efforts.

THE STUDY AREA

The study area used to test our methodology consists of four contiguous counties in the North Carolina Department of Agriculture and Consumer Service's (NCDACS) Western Mountain District: Buncombe, Henderson, Madison, and Haywood (Figure 1). These counties provide an excellent test region for our methodologies because parts of the region are fairly urbanized while others have great potential for growth. Buncombe is the most populated county in our study area with 314 people per square mile and 6,454 non-farm establishments. Henderson is less populated but growing at a faster rate with 238 people per square mile and 2,302 non-farm establishments. Haywood's population density is 97.6 people per square mile; the county has 1,411 non-farm establishments. Madison is the least populated with 44 people per square mile and 309 non-farm establishments (U.S. Census Bureau, 2004). Madison County is perceived to be under an urgent threat of urbanization since the recent completion of Interstate 26 through the county now makes it more accessible to commuters and tourists, thus raising the likelihood that property values will increase and create additional stressors on farmland.

According to the NCDACS, Buncombe and Henderson counties have the highest cash receipts from farm goods in Western North Carolina (NC-