Demographic Change in the New West: Exurban Development Around Nature Reserves

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Human populations are growing rapidly in rural lands surrounding nature reserves. We currently lack a thorough understanding of the changes in society and technology that are driving this trend. Knowledge of the factors contributing to residential sprawl is needed for assessing regulatory implications, economic costs, and ecological consequences of future development.

Objectives of this study are:

1. Determine socioeconomic and ecological predictors of exurban development among and within communities of the Greater Yellowstone Ecosystem (GYE).
2. Construct the Exurban Development Simulator (EDS) and parameterize the model with the results from Objective 1.
3. Use EDS to simulate three alternative future scenarios of exurban development across the GYE.
4. Demonstrate a method of assessing ecosystem vulnerability to exurban development.

This paper focuses on Objective 1, and describes the amount of variation in growth in home density in rural areas of the Greater Yellowstone Ecosystem accounted for by spatially explicit biophysical and socioeconomic explanatory variables. In particular, the roles of natural resource constraints, the transportation infrastructure, and the location of towns and natural amenities are examined. Models of growth in residential sprawl were developed using Poisson regression and compared using Akaike's information criteria. Developed land in the GYE has increased faster than the rate of population growth, due to large-lot exurban subdivision. Exurban areas were found primarily within fifteen minutes drive of the nearest town and within canyons and valleys that provide entrance to Yellowstone National Park. Our findings indicate that spatial patterns of rural development were most strongly correlated with encroaching development, measures of accessibility to services, and environmental amenities. A goal of the study is to provide communities and planning agencies with an improved understanding of how and why development patterns occur in order to enable effective land management. Implications of the results are: (1) new home sites in previously natural areas are a primary factor encouraging further conversion of undeveloped land; thus, the location of new subdivisions is an important policy decision; and (2) enhancing environmental amenities through land use management can likely stimulate growth while limiting the ecological impacts of development. Continuing research focuses on developing the Rural Development Model based on these statistical relationships and using the model to simulate development under different land use planning and policy scenarios.

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