

Incorporating Land Use Change and Development into Landscape Planning and Ecological Assessments in the Upper Deschutes Area, Oregon (USA) (10)

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Topic area(s): A. Land use and ecosystem interactions
B. Assessment tools for sustainable development
J. Managing public lands and protected areas
K. Land use policy making, effectiveness, alternatives,
consequences (impacts)

Approach or Method Used: 2. Multi-disciplinary/integrated

Policymakers and public lands managers need ways to evaluate and display the likely outcomes of policy and management alternatives while accurately accounting for the costs and many social, economic, and environmental benefits people expect from public and private lands. The most helpful tools are easy to understand, usable by a wide range of interested parties, and reasonably represent the implications of regional land use changes, natural and human-caused disturbances, vegetative succession, and other factors that might influence likely outcomes. In practice, however, landscape planning and assessment is fraught with challenges involving general lack of data, disagreement among analysts regarding the units and scales of analysis that are conceptually appropriate and computationally feasible, uncertainty about the socioeconomic, ecological, and other factors that must be represented, and the need to coordinate and fund a diverse team of scientists to deliver on project objectives in a timely and affordable manner. These challenges often can be too great for individual agencies and organizations to overcome. Ideally, agencies and organizations could produce landscape planning and assessment tools and information more cost-effectively by collaborating in the development of data, methods, and models to meet their individual needs.

In this presentation, we will briefly review some of the challenges in conducting landscape planning and assessment to evaluate current and potential policies and management practices jointly addressing wildfire, resource, and ecological objectives. We also will describe an ongoing collaborative multi-agency attempt to conduct landscape planning and assessment in Oregon. In the Pacific Northwest, landscape planning and assessment tools are needed by state and federal agencies to evaluate policy and management addressing wildfire, forest health,

wildlife habitat, water quality, timber harvesting, recreation, and other factors. Policymakers and managers also increasingly acknowledge the importance of accounting for forest, agricultural, and range land development resulting from significant socioeconomic changes taking place, including population and income growth, and the growing popularity of second homes in scenic forest and range land settings.

Our modeling approach uses a simple state and transition model that treats vegetation as a few combinations of cover type and structural stage within each vegetation environment. These states are linked through time by transition probabilities describing the likelihood of fire and other natural disturbances, management actions, vegetative growth, and forest and range land development. Results describing vegetation, ecological conditions, land use, and other factors are summarized at a hydrologic unit code-five (HUC5) watershed level, providing information about the spatial distribution of landscape characteristics likely to result from policy and management alternatives without implying pixel-level accuracy. We use point and polygon-scale data describing land use change to estimate forest and range land development rates in an area of the upper Deschutes subbasin where some of the most rapid population and economic growth in Oregon has been taking place. We model the effects of land development on several important ecological and resource value attributes in the area, focusing on the interplay among attributes and different land management scenarios within the wildland-urban interface and under differing assumptions about development rates and patterns.