

Classification and evaluation of forest sites using a GIS

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Poster Abstract: Forest Management

Forest sites of the northern Cumberland plateau in the central hardwood forest can be classified into landtypes based on topography and dominant geologic and soil layers. The objective of this study is to apply GIS technology to identify the forest sites of Powell County, KY and inventory their distribution, extent, and location based on these site characteristics. Landtype classification and associated attribute data may then be utilized towards forest management and ecological applications.

The study location was selected due to its inclusion in the Daniel Boone National Forest and its broad physiographic diversity to apply to the model. Dominant geologic layer, dominant soil layer, slope, and aspect themes for the ten 7.5 minute quadrangles encompassing Powell County were incorporated into ArcView for landtype analysis. An info file that classifies 33 landtypes based on these characteristics was then used to identify the landtype distributions.

The model serves a suite of forest professionals as it realizes intrinsic site differences and soil related processes and may incorporate them into research and management objectives. An immediate application is in multi-scale identification of timber management strategies, schedules, and site-related limitations. Current knowledge that can be integrated within each landtype classification includes site productivity, desirable species management, and soil and landscape hazards. The model also provides a synthesis of variables for ecological applications, including wildlife habitat analysis, landscape carbon and nutrient budgeting, and a potential for rare and endangered flora habitat mapping.

Our study and others provide a starting point for land managers and scientists to develop regional scale models of managerial and ecological processes within a geographic and temporal scope. The strength of this GIS is that it allows rapid adjustment with new information and knowledge to increase the validity of desired applications. Ground checking and the inclusion of more detailed physical features and attribute data will then help to reinforce the utility of the model over time.

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