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Scale dependent spread predictions of leafy spurge using multi-elevation remote sensing and GIS collateral data

KARL BROWN[1], RALPH ROOT[2], RAY KOKALY[3], GERRY ANDERSON[4], STEVE HAGER[5], BOB NOWIERSKI[6], and ED HOLROYD[3]

Karl Brown, USGS Center for Biological Infomatics, Denver, CO. [2]Ralph Root, USGS Rocky Mountain Mapping Center, Denver, CO. [3]Ray Kokaly, USGS Spectroscopy Laboratory, Denver, CO, and Ed Holroyd, USGS Spectoscopy Laboratory, Denver, CO. [4]Gerry Anderson, USDA Agriculutral Research Service, Sidney, MT. [5]Steve Hager, National Park Service, Theodore Roosevelt National Park, Medora, ND. [6]Bob Nowierski, Department of Entomology, Montana State University, Bozeman, MT.

Abstract:

Spread predictions of leafy spurge are of vital importance to both rangeland users and land management agencies. Focused and timely control efforts need to address the most pressing population expansions or new infestations. Project scale and data resolution are key decisions in developing any model or tool to predict spread. Available data, cost of new data, and method of acquisition all influence cost, tactical project scale, and reliability. The prediction problem spans the synoptic (landscape) view, to the stream drainage and minimum mapping unit view of detail for site-specific control efforts. To enhance decision support, this predictive effort will compare and contrast the costs, methods, and traits of multi-scaled data, and the resultant confidence and reliability achieved by using those data. Distance from streams serves as a major known factor in patch expansion. That factor, combined with slope, aspect, and soil type can define favorable moisture micro sites on the landscape. Spatial relationships and data dependencies between environmental variables can be evaluated by autocorrelation and other spatial statistical methods. The desired tool allows the user to utilize existing common data types to predict spread at a given resolution. Employing finer detail data allows the user to define smaller and more specific predictions; however, the costs of all aspects of the analysis increase. Land managers and owners can employ this new tool to enhance the overall framework for leafy spurge control decisions.