

Backus, Vickie M., Lisa J. Rew, and Bruce D. Maxwell, Montana State Univ., Bozeman, Montana

GIS tools for successful implementation of adaptive sampling designs for nonindigenous plant species surveying and mapping.

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Alternatives to conventional sampling that capitalize on the spatial clustering nature of many biological populations, known as adaptive sampling, have been introduced. Based on results of our past surveying and mapping nonindigenous plant (NIS) research in the Greater Yellowstone Ecosystem, we designed two adaptive sampling methods – one adaptive cluster and one adaptive web. The adaptive cluster method exploits the known spatial proximity individual plants or patches of a particular NIS have to each other. The adaptive web formulates and utilizes a linked network of local NIS habitat suitability.

Applicability was explored both theoretically (simulation) and practically (pilot field study). In addition, a substantial amount of effort was devoted to developing user-friendly ArcPad GPS interfaces to facilitate field implementation of the designs. Unlike most GPS interfaces that focus on providing menus for easy and consistent collection of NIS-related data and background maps for navigation, the interfaces for these designs also provided decision support and controlled data collection workflow.

Simulation results showed, in some instances, adaptive methods have the potential of creating more realistic predictive spatial distribution maps of particular NIS, than more conventional sampling designs. The ArcPad GPS interfaces will be demonstrated and the simulations results presented.

vickie.backus@montana.edu

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