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Vehicle transport of seed and soil under varying conditions and distances.

Nonindigenous plant (NIS) management on public lands is often limited to subjective discovery, selection and control of populations (patches). Rew et al. (2005) proposed a predicted occurrence modeling methodology to assist land managers with the process of NIS detection and prioritization for management. The modeling approach makes predictions of NIS presence based on transect and environmental datasets. This project extended the current approach by creating a web-based application for land managers to upload NIS presence or presence/absence data and receive predictive maps in return. It also creates a hypothetical model of NIS colonization and dispersal when sampling of transects or patches is repeated over time.

The application was scripted in the Python programming language, drawing on Python's built-in library, the RPy extension, ArcGIS geoprocessing and ArcGIS Server. As inputs, it accepts transect shapefiles, transect text files, or point and polygon shapefiles documenting weed occurrence and the area surveyed. Processing tasks were designed to optimally run on text files, accessing a database of Arc ASCII GRID files for the entire Western US. As an output, the application displays a raster (map) with probabilities ranging from 0 to 1. Given time-series data, the application runs a Multi-State Markov Model fitting package in R and projects NIS patch locations for 20 years into the future.