

Ranking System Aids Land Managers in Control of Invasive Species

by Sara J. Drake

Approximately 5000 non-native invasive plant species inhabit the U.S. and they make their presence felt—\$35 billion annually for losses, damages, and control measures (Pimentel et al. 1999). Since the impact of invasive species on our ecosystems and economy is immense, most land managers recognize the need for action. With limited funds, time, and personnel, though, they must prioritize their efforts. But where to begin such an arduous task?

The “Alien Plants Ranking System” developed by the United States Geological Survey provides a starting point (APRS Implementation Team 2000) for determining which species are most problematic. The system uses a query method to amass information about species characteristics as well as features of the invaded community. Twenty-three multiple-choice questions are assembled into three sections: I) Significance of Threat or Impact, II) Innate Ability to Become a Pest, and III) Difficulty of Control. Examples of some queries are, “areal extent of populations,” “mode of reproduction,” and “competitive ability.” These queries zero in on attributes commonly associated with invasive species and susceptible ecosystems.

Ranking System Implementation

In collaboration with Jake Weltzin, plant ecologist at the University of Tennessee, Knoxville, and Oak Ridge National Laboratory Area Manager, Pat Parr, I tested the usefulness of the system. The Department of Energy’s National Environmental Research Park (Research

Park) in Oak Ridge, Tennessee contains 167 non-native invasive plant species, 42 of which are classified as “aggressive” (Oak Ridge Reservation Exotic Pest Plants 2001). I selected 18 of the most prevalent species and ranked them using the “Alien Plants Ranking System.” During the summer of 2000, I surveyed 16 natural areas encompassing a total of 1,457 hectares and visually noted the density and distribution of the 18 species. These observations were supplemented with published data from the ecological literature and entered into the ranking system.

Japanese stiltgrass (*Microstegium vimineum*) ranked highest, or most problematic, mainly because of its impact on ecosystems and how difficult it is to control. *Microstegium* is present in most disturbed areas of the Research Park as well as in many natural areas. It can be found growing along roadsides and often penetrates forested areas, resulting in a dense, monotypic carpet. This weed is difficult to control because it has an extensive seed bank and spreads rapidly, out-competing native species.

Japanese honeysuckle (*Lonicera japonica*) ranked second-most problematic and was prevalent in early- to mid-successional forests in the Research Park. Also prevalent in these forests was Chinese privet (*Ligustrum sinense*), which tied with kudzu (*Pueraria lobata*) for third place. Chinese privet often forms thick, impenetrable stands with relatively shady understories. Birds disperse Chinese privet’s copious fruits, while asexual reproduction also helps it

spread. Kudzu reproduces both sexually and asexually, but unlike privet, it was found in only a few locations on the Research Park. The low density of kudzu across the Research Park may be due to its purported small number of viable seeds.

Ranking fifth was multiflora rose (*Rosa multiflora*), a shrubby weed found mostly along roadsides and fencerows. Multiflora rose also is spread by birds and has an extensive seed bank that can persist for 20 years. Chinese lespedeza (*Lespedeza cuneata*) came in sixth and occurred only in more recently disturbed areas, such as along roads and in power line rights-of-way. Additional Research Park ranking results can be found in Drake, Weltzin, and Parr (2003).

The “Alien Plants Ranking System” produced satisfactory results consistent with species ranking designations from other organizations, such as the Tennessee Exotic Pest Plant Council (2001). Results of this research can be used to prioritize management efforts for eradication of invasive species on the Research Park. Additionally, this work provides impetus for other land managers to utilize the “Alien Plants Ranking System” as a tool when controlling invasive species.

For more information or to use the Alien Plants Ranking System, go to www.npwrc.usgs.gov/resource/2000/aprs/aprs.htm

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