

Conservation In Practice

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Your guide to the latest conservation research

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Prioritizing The Alien Plant Ranking System **WEEDS**

*The alien plant
ranking system is a
web-based resource
that helps managers
work through
tough decisions. . .*

Which invasive species cause the most serious ecological threats? And, which are most amenable to management? With more than 100 alien plants on many wildland sites and the daunting prospect of long-term expensive management strategies, these are not academic questions. Many managers may be inclined to just throw up their hands and give up.

The alien plant ranking system (APRS) is an automated web-based resource that can help managers work through tough decisions about prioritizing the management of alien plants. APRS helps identify those species that have the most serious impact—those on site of limited distribution or off site with a high potential to invade, as well as those that appear innocuous (usually the majority). APRS also helps manag-

ers assess the feasibility of controlling the most threatening species.

The system guides managers through 25 questions in three sections relating to individual species: (1) current level of impact, (2) potential of a species to become a problem, and (3) feasibility of control. The sections include questions about the distribution and abundance of species, the number of seeds they produce, and their dispersal capabilities. There are also questions about whether a species is known to seriously impact other sites. When all the alien species known to occur on or adjacent to a site have been scored, the system ranks

them according to current impact, potential impact, and feasibility of control.

Using the System

Step 1. List known and potential alien plants in the area. Good places to start include species lists and research reports, site-specific herbarium specimens, and a preliminary site survey. To determine which species are alien, each plant on the list should be checked against floras of the area.

Step 2. Survey the site. This more thorough site survey can be either a systematic walk through or a quantitative spatially-based sampling scheme such as a GIS-based survey. Though more expensive, GIS-based surveys show distribution and abundance information that can be correlated with disturbances, roads, and vegetation type, for example. GIS sampling schemes also can serve as the basis of invasive species monitoring programs.

By Ron Hiebert

Northern Arizona University

Tools & Techniques

Step 3. Search the literature. Managers will need to do a comprehensive literature search to answer the questions on the ecology, biology, and control methods for each alien species found. This is the most time-consuming step in the process. To help, the U.S. National Park Service has begun to front-end load data on alien species and prepare fact sheets for species already determined to be invasive.

Step 4. Fill out the data sheets. The system now has enough information to create graphs showing species scores and management status.

Step 5. Interpret the results. The final and most important step is to incorporate the outputs (listed below) in designing alien plant management strategies and action plans.

Considerations and Limitations

Although the APRS was initially designed to help make management decisions on individual sites, it has since been adapted for the State of Minnesota—and could be further adapted for use on a regional or even national scale. However, managers should bear in mind that results are good only for a limited space and time. Data should not be extrapolated from one site to another, nor should data be considered to reflect current conditions for a period of more than five years.

Another limitation of APRS is that many users have had difficulty responding with confidence to all questions. For some species, for example, seed longevity in the soil is not known; whether a species can be successfully controlled, what the side effects of control may be, or what the cost will be in time and

dollars are other examples. Other users have had difficulty dealing with scale and heterogeneity issues. Alien species may be prominent in one location or community within a site and scattered or absent in others. Yet APRS asks for just one response. Lessons from use of the APRS in the Channel Islands National Park provide a good example of how to deal with this particular problem. As the distribution and abundance of alien species varied highly between islands, managers decided to rank species by island rather than for the entire park.

As is the case with most tools, the quality of the product is dependent on the skill of the user. The person who actually applies the system should have skills in plant ecology and be knowledgeable of the area. While the system helps the manager decide which spe-

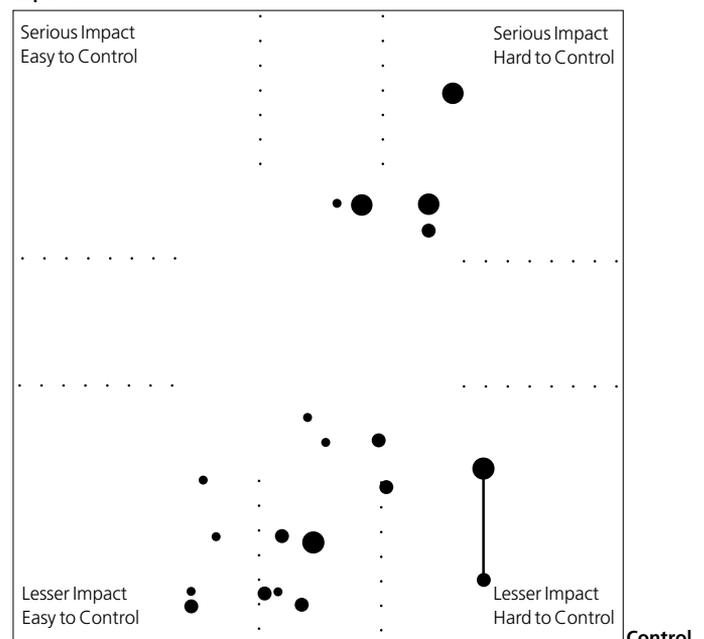
System Outputs

- A list of all the species, sorted alphabetically or by score of current impact, potential to be invasive, or feasibility of control.
- Fact sheets on the species that ranked high in impact and potential impact categories.
- Three-dimensional graphs showing the species scores and general management status (see sample to the right).

How to Interpret the Graph

- The three dimensions are current level of impact (y axis), feasibility of control (x axis), and potential to be invasive (size of dot). These axes can be rotated as desired.
- Clicking on a dot tells you what species it represents. Dots will be a different color depending on how many questions are answered.
- The line between the two dots represents the minimum-maximum function, i.e., how much the dot would move if it was given a maximum score for an answered question rather than leaving it unanswered. This shows the user how important it is to provide information to respond to a question.

Impact



Pipestone National Monument

An APRS case study on the tallgrass prairie

Pipestone National Monument is a small park (282 acres) in the southeast corner of Minnesota, in the tallgrass prairie. Most of the site is virgin prairie, although some tracts were formally cultivated. Corn and soybean fields surround the site. The APRS survey found 70 alien species within the site. Managers used the outputs to determine that 11 species were disruptive and required management. Five species were found to be causing serious impacts. Foremost among them were common buckthorn (*Rhamnus carthartica*) and smooth brome (*Bromus inermis*). The system ranked 11 other species on site as having moderate to low impacts—but the potential to cause more serious harm if they are allowed to spread. These included the rangeland pest, leafy spurge (*Euphorbia esula*), yellow sweet clover (*Melilotus officinalis*), and musk thistle (*Carduus nutans*). None of these species are easy to control. The only species that had a moderate control ranking were those that were limited in distribution and abundance in the site.

With the help of the APRS, managers were able to prioritize their management efforts. For example, they decided to halt the spread of buckthorn and control existing stands in wetlands along the stream that bisects the site. For aggressive species like leafy spurge, the management strategy was eradication of the few individuals present and monitoring for the early detection of new invasions.

cies need what management efforts, it does not tell the manager what that management effort should be.

Most site managers are looking for a decision tool that is quick and cheap to apply and will provide all the answers. Unfortunately, APRS is neither. While more efficient survey methods and species fact sheets are being developed, managers still need to conduct thorough site surveys and often intensive literature searches. However, the outputs of the APRS do help managers design and build an invasive plant management plan. Furthermore, the system is purposely designed to allow flexibility in applying the information to a specific site with its own unique ecological and political setting. 🐾

APRS is based on the system presented by R. Hiebert and J. Stubbendieck in the Handbook for Ranking Exotic Plants for Management and Control. Automation and revision of the system was a team effort involving Diane Larson and Jim Bennett of the USGS Biological Resources Division; Karl Beres from Ripon College; Diane Beres, David Lime, Anthony Starfield, and Jerrilyn Thompson from the University of Minnesota; and Ron Hiebert of the National Park Service.

Visit the APRS Web Site:

<http://www.npwrc.usgs.gov/resource/2000/aprs/APRS.HTM>

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