Cultivating discovery in pest management

North Central IPM Center

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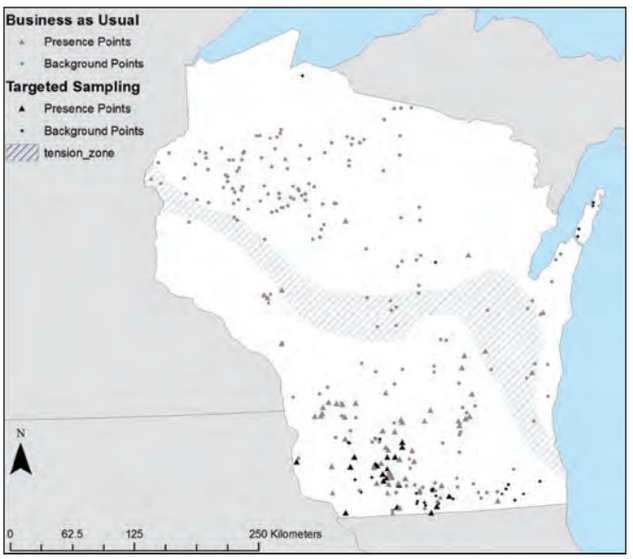
Evaluation, Refinement and Extension of Invasive Species Predictive Maps—A Success Story

A $71,681 grant from the United States Department of Agriculture National Institute of Food and Agriculture (NIFA) through the North Central Integrated Pest Management Center (NCIPMC) helped researchers determine if habitat suitability models could forecast the spread of an invasive species, especially if key data was added to the model. The team focused on spotted knapweed and wild parsnip in Wisconsin.

Results are especially useful for local, state and federal land managers who are tasked with managing large tracts of land with limited resources. Researchers found that using these models to select locations to survey results in a four-fold increase in their ability to find new populations compared to traditional random surveying methods. Prioritizing monitoring can lead to increased response times and control effectiveness.

Mark Renz, University of Wisconsin Extension Weed Specialist, the lead in the project, explained the models use a range of climatic, physical and environmental data for each known infestation in the state. Using this information they can create a predictive map that suggests areas where this plant has the ability to establish and learn about which of these combination of factors are important in determining a suitable habitat.



Wild parsnip observations used to create a habitat suitability map for Wisconsin. Triangles are locations of species observed either through a targeted search information from a predictive map (black) or from a non-targeted search (grey). Circles are the background points that were used in creating the predictive map used in this research effort.

The Connection
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Mark Renz

Wild parsnip is an invasive species in Wisconsin.

As this effort required knowledge of invasive species locations in the field, the team used iterative approach collaborating with many stakeholders throughout the state. "We provided stakeholders with initial results and asked them to add data to improve its performance. This approach works well as we engage our stakeholders and get them involved in the process. The final product is much improved and we get others involved so when we release the map they already know how to use it" Renz explains.

While these models are specific to a single invasive species, results have allowed for Renz to obtain additional funding for modeling 20 additional invasive species. And one of the new questions they are trying to answer is if combining models improves monitoring as land managers rarely search just for one invasive species.

Results from the project were incorporated into the Wisconsin Strategic Plan for Invasive Species, adopted by the Wisconsin Invasive Species Council. Now that the models exist, Renz said there are plans to incorporate climate change scenarios and test how it may affect the dynamics of invasive species spread.

Renz said the results could also help the Wisconsin Department of Natural Resources which regularly monitors the state for new invasive species. Invasive species can result from accidental spread, contaminated soil or seed, or purposely planted plants that then spread out of control.

The effectiveness of this modeling could reduce the time and cost of monitoring and lead to better collaboration of stakeholders in nonnative invasive species management efforts, including across regions and even internationally.

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www.ncipmc.org/action/success_stories/invasiveplants.php

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