

When beauty becomes the beast: Research efforts successfully combat invasive species

April 22 2016, by Melanie Schefft



UC's Denis Conover stands in late winter among Amur honeysuckle that have choked out native species. Credit: Melanie Schefft, University of Cincinnati

A walk through most Midwestern state parks and nature preserves looks much different today than it did a century ago.

In contrast to a backdrop of diverse wildflowers, bees, butterflies and birds—commonly seen in 19th-century landscape paintings—modern wooded areas are now overrun by imported [invasive plants](#), choking out most [native species](#) and disrupting much of the natural biodiversity.

But recent research by University of Cincinnati Biologist Denis Conover, working alongside Tim Sisson, president of the Western Wildlife Corridor, reveal their approach for safely killing and removing invasive plants, thus leading to a natural resurgence of native species at Bender Mountain Preserve and other natural wooded areas in southwestern Ohio.

"The problem began in the 1800s when horticulturists and landscapers chose to use plants imported from Asia that are pretty and easy to propagate," says Conover, UC educator professor of biology. "But these introduced plants have dominated over [native plants](#) and have choked them out over time.

"Researchers are finding ways to successfully control this aggressive invasive spread and are now seeing a natural return of many native plant species in Ohio wooded areas."



Wintercreeper lines the edge of a pond where native plants used to thrive. Credit: Melanie Schefft, University of Cincinnati

Conover's latest back-to-back studies featured in the journal *Ecological Restoration* begins with his research with Sisson and Donald Geiger, published in March 2016 and titled "Dormant Season Foliar Spraying Slows the Spread of Wintercreeper, English Ivy, and Lesser Periwinkle in Wooded Natural Areas." This study focused on three of the imported species that have spread from residential and commercial landscape beds into Southern Ohio wooded areas.

Wintercreeper, English ivy and lesser periwinkle are evergreen ground covers that spread quickly in wooded natural areas. English ivy and wintercreeper can climb, flower and produce berries that are eaten by

birds, who later disperse the seeds elsewhere through their droppings.

The hardy and aggressive nature of the evergreen invasive species allows for easy domination over native plants that go dormant over the winter. But according to the researchers, this evergreen feature is also what makes them easy to kill and control during winter months while not harming nearby dormant native plants.

"SPRAYING" IT FORWARD

"We have found that the spread of all three of these species can be slowed by spraying their leaves with specific herbicides during late winter when native plants are dormant," says Conover. "By minimizing the herbicide exposure to native plants we are now seeing a positive regrowth of valuable native wildflowers, trees and shrubs."



UC's Denis Conover points to climbing wintercreeper covering a tree. Credit: Melanie Schefft

Using varying concentrations of herbicides mixed with added surfactants, the researchers sprayed the invasive ground covers and used a stump-cut method on more mature climbing vines in both Avon Woods Nature Preserve and Bender Mountain Nature Preserve in Southwestern Ohio.

A few weeks after applying the herbicide treatments in late winter, much of the wintercreeper, English ivy and lesser periwinkle had died. Remarkably in the spring, the researchers observed a surprising number of native plants growing once again in the sprayed areas, some of which included: Virginia creeper, Solomon's seal, cutleaf toothwort, wild black cherry, Ohio buckeye, sugar maple and mayapples, just to name a few.

Conover hopes that instead of using non-native invasive landscape plants like Chinese silvergrass, homeowners and horticulturists will use one of this area's beautiful native tall grasses such as prairie dropseed, little bluestem, big bluestem, switch grass or Indian grass because, "restoring the flora to its native species will enhance the biodiversity of native plants and the native animals, including butterflies that depend on them."

PUBLIC ENEMY NUMBER ONE

Conover and Sisson report some success against another Asian import seen all over the Midwest. Introduced to North America by Botanical Gardens in the 1890s, Amur honeysuckle—referred to by Conover as public enemy number one—has formed dense thickets in the local forest

sub-canopies, choking out native species everywhere it grows.

In their upcoming second Ecological Restoration publication titled "Resurgence of Native Plants After Removal of Amur honeysuckle from Bender Mountain Preserve," Conover and Sisson reveal the lengths to which honeysuckle alters habitats by decreasing light availability and depleting soil moisture and nutrients, as well as by possibly releasing toxic chemicals that prevent other plant species from growing in the vicinity.

While focusing this research on the removal of Amur honeysuckle growing in the Bender Mountain Nature Preserve, a successful multi-task method used to kill honeysuckle was based on research conducted in the 1990s by Conover and Geiger, at the Mt. St. John Nature Preserve in Greene County, published in Restoration and Management Notes (1993) and the Ohio Woodland Journal (1996), which involved:

- Fall foliar spraying with specific concentrations of herbicide
- Cutting of the plants and stump treatment with herbicide
- Physically removing the plants

Because Amur honeysuckle leafs out earlier and holds its leaves longer than native trees and shrubs, Conover and Geiger suggested foliar spraying on warm days in the fall after the native shrubs and trees have lost their leaves.

Not surprisingly, Amur honeysuckle successfully absorbed the herbicide through its leaves and died leaving the surrounding dormant native plants to grow in the spring.

In the wake of this study, Conover also includes a vascular plant survey conducted in the past couple of years that has identified over 387 vascular plant species now growing in Bender Mountain Nature

Preserve. Over 90 percent are native to Hamilton County, Ohio, and the list of species includes two horsetails, four ferns, 70 woody plants (shrubs, trees and vines), four rushes, 15 sedges, 35 grasses and 257 wildflowers. The list will be published by the Ohio Biological Survey in an upcoming article by Conover and Sisson.

While there has been great success in restoring native species into the Ohio River Valley Western Wildlife Corridor, the researchers hope their efforts inspire a national conversation about the benefits of incorporating more native plants into residential and commercial landscape beds, especially those near natural wooded areas.

"Our ultimate goal from this research is to encourage people to plant more native species instead of non-native invasive species; and to encourage land managers and park officials not to give up on the nature preserves," says Conover. "Invasive plants can be successfully removed from the nature preserves giving native plants an excellent chance to come back."

Ecological Restoration Journal is published four times a year by the University of Wisconsin Press. The journal provides a forum for people interested in all areas of [ecological restoration](#) including the technical, biological and social aspects of restoring landscapes. The journal also focuses on emerging professional issues, the role of education, evolving theories of post-modern humans and their environment, land use policy, the science of collaboration and more. The quarterly publication also offers peer-reviewed feature articles, short notes, and book reviews as well as abstracts of pertinent work published elsewhere.

Provided by University of Cincinnati

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