

Why Do We Care About Invasive Plants?

Every time I am asked to teach about this topic, I start with a clarification of what land stewards mean by “invasive plants,” and — more importantly — what they do *not* mean. People coming to this topic for the first time may confound “invasive” with “weeds” or with “non-natives,” and wonder if by invasive plant control I want to herbicide all the dandelions? (Spoiler alert: no.)



PHOTO: ERIC OLSON

American meadow goldenrods have invaded Europe, seriously harming biodiversity there.



PHOTO: ERIC OLSON

Japanese knotweed can strongly dominate the forest understorey.

Clarification is definitely in order, because more so than any other group of organisms, plant species have been crossing the seas for centuries, first as stow-away seeds in the ballast of sailing ships but often carried deliberately. Common plant names illustrate this exchange: Norway Maples shade our sidewalks, and Chinese Elm, Japanese Knotweed, and European Beech are all found locally. Users of a field guide will often see the term “alien” in a wildflower description or read that a tree was “introduced.”

Did you know apples originated in the mountains of Kazakhstan? Or that most species of rhododendron are from Asia? A few plants from the Americas have gone the other way; for example, goldenrod has become a problem weed in Europe, while corn is a vital crop around the world.

The coastal location and early settlement in Massachusetts by Europeans ensure that we have been at the receiving end of many plant introductions, both accidental and deliberate. In fact, a survey published by our State Botanist in 2011 found that of a grand total 2,712 species of plants growing wild in the Commonwealth, 898 species (that’s about a third!) were non-native. Fortunately, most of these relative newcomers have simply settled in alongside our native plants with no obvious negative effects. They include a few personal favorites, like Queen Anne’s Lace, also known as wild carrot (smell the roots sometime!) and the colorful blue roadside chicory.

Table II. Native vs. Introduced Taxa

	1999 number of taxa	1999 percent of total flora	2011 number of total taxa	2011 percent of total flora	2011 Number of established taxa	2011 percent of established flora
Native Taxa	1,770	57%	1,814	55%	1,814	67%
Introduced, established	1,349*	43%*	898	27%	898	33%
Introduced, Waifs			581	18%	-	-
Total	3,119		3,293		2,712	

*Waifs were not distinguished from established introductions in 1999 Checklist

One third of the plants currently found in the Commonwealth of Massachusetts did not occur here prior to European settlement. This graphic is from “The Vascular Plants of Massachusetts” by Melissa Dow Cullina, Bryan Connolly, Bruce Sorrie, and Paul Somers.

“ESTABLISHED”=REPRODUCING ON THEIR OWN.
“WAIFS”=SEEN ONCE OR OCCASIONALLY.



PHOTO: FIRST NATURE, WALES, UK

The non-native Queen Anne’s Lace flowers attract a variety of insects, and its leaves serve as food for native black swallowtail butterfly caterpillars.

Given this sheer number of plants moved hither and yon, inevitably a few species become wildly successful in their new land. Exactly why this happens is usually unknown in any particular case, but it’s likely these plants have left behind one or more highly specialized insect or fungus or other natural enemy that keeps them under strict control back in their native land. Liberated from natural checks, invasive plants have the ability to dominate the growing space in a favored habitat to such an extent that they exclude most other plant species, even other non-natives. The result is a monotonous single-species stand. Such total exclusion of all other plants is perhaps the most conspicuous way an invasive plant causes harm to our local environment.

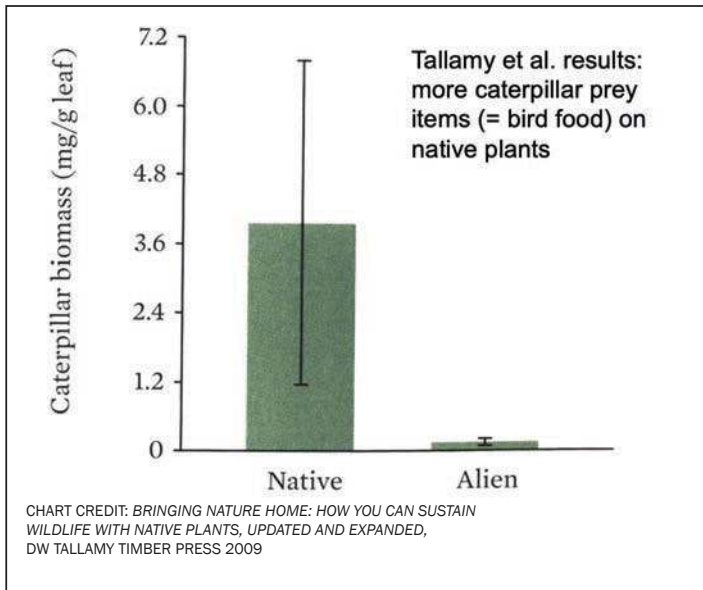
Is that sufficient reason to chop, dig up, and in some rare cases, use herbicide, to kill these plants? A town conservation agent once told me, “Eric, most walkers on the trails of suburban parks really don’t care what plants they’re looking at. They just want to see green.” This may indeed be true for most visitors, but it’s certainly not true for all. Through years of effort, in part by lovers of wild nature like Newton Conservators’ members and others, Newton has designated certain areas in town to be left in a natural state. By “natural” these conservationists meant a place where a good diversity of New England’s native flora could persist, and even thrive. Standing by while a few non-native plants come to dominate these places is clearly incompatible with a central



Almost no insect nibbling is ever found on knotweed foliage.

other herbivorous insects have been engaged in an exquisite “arms race” with our native trees, shrubs, and smaller plants. Plants cannot run away from animals eager to eat them, so they discourage herbivores with chemical defenses, like tannins in oak leaves and bitter alkaloids in tomato foliage. In response, insects have evolved detoxifying enzymes. The plants then add more odd compounds to their foliage, and on it goes.

As a result of these back-and-forth counter-adaptations, most insect species become highly selective, and will only lay eggs on those plants that their larvae can eat. These tight relationships of insects with their host plants are ancient, and not quick to change. What is the link to our invasive plant story? It’s this: many of the wildly successful non-native plants must have chemical mixtures in their leaves that our



Professor Doug Tallamy and students have documented strong differences between native vs non-native plants. Most non-native plants will be a food desert from the perspective of a songbird searching for insects to feed her nestlings.

reason our nature parks were created in the first place.

And there’s more: Over millions of years, our native butterflies, moths, and

native insects cannot detoxify, because we so rarely see much evidence of insect feeding on them. Keep a watch during your walks in nature. I think you’ll find that native insects are only rarely found feeding on invasive or really most any other non-native plants.

The consequences of these low insect numbers ripple upward through our forest food webs. For example, in one experiment, frogs placed for a couple days in marshes dominated by Japanese Knotweed lost weight, while others placed in nearby native plant marshes gained weight. Birds and butterflies are more abundant in suburban estates where the landowners plant native plants, versus estates dominated by non-native plants. Searching for caterpillars consistently turns up more species and greater numbers on native versus non-native plants. The data are overwhelming in support of the claim that our forests and other habitats — including the property around are homes — are richer with insects and bird life when they host a rich diversity of native plants.



Japanese honeysuckle

To be clear again though: overall, the movement of plants about the globe has produced incalculable value for humanity that far

outweighs the harm caused by a few invasives. Even the invasives have their good points! Surely, we all can appreciate the colorful displays of Asiatic Bittersweet fruits and the sweet scent of Japanese Honeysuckle. It’s no wonder 19th century nursery managers added these attractive species to the horticultural trade here in the US.



The Environmental Science Club after a knotweed cleanup.

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Unfortunately, these two plants along with a handful of others have a tendency to invade our natural areas, in some settings becoming oppressively dominant. Land stewards intervene whenever a non-native plant is so successful that it overwhelms our native flora because a) we like seeing our local flora and b) native wildlife depends on native flora. Pushing back against invasive non-native plants is not a sign of anti-immigrant bias; it's simply weeding those collectively owned, delightfully unruly gardens we call parks. Like

wild-area gardeners, groups like the Conservators' invasive plant task force serve to ensure our local forested parks stay diverse, from the plant community right up the food chain to butterflies and songbirds. ♦

✍ Eric Olson is recently retired from Brandeis University, where he taught Field Biology and other courses for many years.

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As explained in past newsletters, Amazon Smile is a program through which Amazon donates 0.5% of most purchases (yes, \$5 of every \$1000) to a nonprofit (501c3) organization of your choice (the Newton Conservators, we hope!).

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If you have any further questions about the program, check the FAQ page: <http://smile.amazon.com/about>.

MISSION Newton Conservators, Inc.

The Newton Conservators promotes the protection and preservation of natural areas, including parks, playgrounds, forests and streams, which are open or may be converted to open space for the enjoyment and benefit of the people of Newton. It further aims to disseminate information about these and other environmental matters.

A primary goal is to foster the acquisition of land, buildings and other facilities to be used for the encouragement of scientific, educational, recreational, literary and other public pursuits that will promote good citizenship and the general welfare of the people of our community.

The Newton Conservators was formed as a not-for-profit organization 60 years ago in June 1961.

The Newton Conservators' Newsletter® is published four times each year by the Newton Conservators, Inc., in June, September, December, and March. Deadlines for these issues are the second Friday of the month before the issue is published.

We welcome material related to our mission from any source. Send proposed articles or letters by email in MS Word or rich text format to articles@newtonconservators.org. Digitized photographs, maps and diagrams are also welcome.

Editor:	Ken Mallory	617-965-1908
Design/Layout:	Suzette Barbier	617-244-0266
Production:	Bonnie Carter	617-969-0686

Thanks to the following contributors to this edition of the Newsletter: Beth Wilkinson & Mark Feldhusen, Richard Primack, Eric Olson and Katherine Howard.