Horticultural News and Research Important to American Gardeners

HABITAT NETWORK ONLINE TOOLS

You won't be surprised to learn that American yards are primarily composed of lawns and impervious surfaces. If you're looking to create a more ecological landscape appropriate to your region but don't know where to start, the good folks at Habitat Network are here to help.

Formerly known as YardMap, the online mapping tool and social platform has recently been expanded as part of a collaboration between the Cornell Lab of Ornithology and the Nature Conservancy. With Habitat Network, users can both contribute to citizen science and receive advice from experts. "Science shows us that small changes in the way properties are managed can make a huge impact towards improving our environment," says Megan Whatton of the Nature Conservancy.

Through the Habitat Network website, shown above, people can map out an existing property such as the one pictured, top right. Based on the data you enter, the tool shows the environmental goals you already are meeting and provides a list of further actions you could take, such as monitoring and reporting bird activity like a goldfinch snacking on anise hyssop seeds, bottom right.

To get started, set up a free account to map aerial images of an outdoor space you are familiar with—whether that be your local park, school grounds, or your own garden—and mark what kinds of surfaces and vegetation are present. After completing your map, use the newly released planner tool to appraise the mapped area for ways to create wildlife areas, manage rainwater, and engage with nature.

From there, you can choose to prioritize which actions to take, whether they take the form of conserving water, empowering your community, or supporting any variety of wildlife—from birds and pollinators to dragonflies and turtles. Notably, useful regional information is also accessible without setting up an account; for example, you can use your zip code to search for resources on your local ecoregion, pollinators, and native plants.

This "game" of community habitat improvement continues as you update the map after each action implemented in the real world. You can also view other nearby sites that are part of the Habitat Network.

To explore the Habitat Network tools, visit *www.yardmap.org*.

PHOTOS COURTESY OF PLANT4WILDLIFE

PLANT BLINDNESS

It may be hard for passionate gardeners to understand, but some people don't notice whether leaves have serrated or smooth edges, or get excited about brilliant fall color on a maple tree. In the late 1990s, botanists came up with the term "plant blindness" to describe this tendency to ignore plants in one's surroundings. The problem, they noted, was that this meant the majority of people would perhaps never fully appreciate how important plants are in their everyday lives and in the global environment.

Researchers Mung Blading and Kathryn Williams of the University of Melbourne, Australia, decided to look into the reasons why interest in plant conservation lags behind that of animal conservation. In a 2016 article titled *"Plant blindness and the implications for plant conservation,"* they identified two major categories affecting this cognitive bias: biological and cultural. The biological component is that humans appear less able to accurately recall the visual image of a plant than they do of an animal. They tend to perceive plants as merely a backdrop for the large mammals often termed "charismatic megafauna."

Thanks to a phenomenon known as plant blindness, humans tend to notice a cute mammal like a giant panda, above, far more readily than a Franklinia tree, left.

In the second category, they discovered that in some cultures plants are perceived as so different from humans that people can't relate to them. This bias is also found in animal conservation, where humans tend to be more willing to protect animals they see as similar to themselves: focusing on cute and cuddly mammals rather than reptilian or fishlike creatures. All of this results, the researchers contend, in humans having a poor understanding about plants' complex and irreplaceable role in Earth's ecology.

So how can humans become more attuned to plants? The authors suggest horticulturists and conservationists must

LEFT: AHS STAFF; RIGHT: COURTESY OF THE SMITHSONIAN'S NATIONAL ZOO AND CONSERVATION BIOLOGY INSTITUTE

create more encounters and experiential learning experiences with plants. This includes collaborating with artists and writers to amplify positive emotions towards plants. In other words, gorgeous botanical illustrations to the rescue.

To read more about this phenomenon, visit *www.onlinelibrary.wiley.com* and find the December 2016 volume of *Conservation Biology*.

TOMATOES TWO WEEKS EARLY

A new breeding development may extend the growing season—and the geographic range—for many fruit and vegetable crops. Using a new technology known as CRISPR, scientists can now edit specific genes in a species' genome to create targeted mutations.

As one of the first steps in this venture, biologists at the Cold Spring Harbor Laboratory (CSHL)—a nonprofit research institution in Laurel Hollow, New York—used the technology to develop tomatoes that flower two weeks earlier than most other varieties. The newly created variety is not transgenic,

The genetically edited tomato seedling on the right is flowering two weeks prior to a normal seedling of the same age.

because no DNA from outside the tomato genome was added. Done as part of a gene isolation experiment, it is unlikely this variety will be released in the near future. However, this technology "opens the door to expanding the geographical range of where the tomato crop can be grown," says CSHL Associate Professor Zachary Lippman.

In effect, CRISPR bypasses the comparatively lengthy process of cross-breeding for desired genetic traits. The research team believes this holds promise for meeting future agricultural needs, not only for tomatoes but other crops as well. "It's really about creating a genetic toolkit that enables growers and breeders in a single generation to tweak the timing of flower production and thus yield, to help adapt our best varieties to grow in parts of the world where they don't currently thrive," says Lippman.

For more information about the tomato study, visit *www.cshl.edu*.

BOMB-SNIFFING PLANTS

Plants are known to be highly responsive to the conditions of their environments, such as drought or changes in the chemical properties of the soil. In an attempt to capitalize on this sensitivity, researchers at the Massachusetts Institute of Tech-

nology laced spinach plants with nanotechnology and then exposed the plants to a common bomb ingredient.

The plant leaves were first painted with a liquid solution containing nanosensors that were built to respond only to the desired molecules, "nitroaromatics" (nitrogen oxide). After the spinach absorbed the sensors through their leaf pores, their roots were exposed to nitroaromatics. Within 10 minutes the nanosensors responded, emitting fluorescent signals from within the plant. An infrared camera system detected these signals—since they aren't visible to humans—and a smartphone-sized computer connected to the camera notified the researchers by e-mail.

In the future, the researchers hope to expand the sensing range of the experimental setup beyond one meter, so that similar systems might have practical applications in other situations, such as monitoring groundwater for chemical contaminants. The original paper, "Nitroaromatic detection and infrared communication from wild-type plants using plant nanobionics," can be found in the October 31, 2016, issue of *Nature Materials*.

News written by Editorial Intern Lynn Brinkley.

LEFT: COURTESY OF COLD SPRING HARBOR LABORATORY; RIGHT: COURTESY OF CHRISTINE DANILOFF, MIT