More Bad News about Garlic Mustard Mayhem

by Julie Feutz

Recent research shows that garlic mustard suppresses not only the herbal understory but also the quantity and diversity of forest trees. As a member of the mustard family, garlic mustard does not need to associate with mycorrhizal fungi to obtain nourishment from the soil; in fact it contains an antifungal agent that suppresses growth of mycorrhizae. Native mustards contain similar agents, but native mycorrhizae have developed defenses against them. Not so in the case of the alien garlic mustard.

According to Dr. Kristina A. Stinson, research associate at Harvard University’s ecology and conservation research center in Pteresham, Mass., garlic mustard may have detrimental and long-term effects on the forests it invades. She and colleagues discovered that trees are especially at risk. The following is excerpted from, “How an Aggressive Weedy Invader Displaces Native Trees,” by Liza Gross (PLos Biology vol. 4(5)), an article that elaborates on these studies.

Humans have never been known to tread lightly on the earth, but as our global reach has expanded so have our impacts on other species. Vanishing habitat caused by human activity is the number one threat to biodiversity, but the dispersal of alien invasive species—again, caused by humans—is not far behind. Over 4,500 non-native plant and animal species have established residence in the United States since European settlement, according to a 1993 report by the U.S. Office of Technology and Assessment. Many

Please see “Garlic Mustard Mayhem” on Page 4
Wow, I just took a look at the calendar and summer is almost over! Where did the time go? I spent a lot of the time moving hoses around and pulling huge weeds that seemed to leap out of the ground overnight. I am delighted to announce to you that we have a new newsletter editor. Her name is Julie Feutz, a graduate of Grand Valley State University with a degree in English. I have known Julie for several years and when she started working this summer with the company where I work, the idea surfaced that Julie would be interested in working on the newsletter. Marji has worked with Julie and you can see the results. Please let us know what you think. If you have any articles you think might be of interest to our membership please get them to Julie.

The conference committee has been putting together our 20th annual conference. The dates are March 4 & 5, 2007. The theme will be “Back to the Future, What have We Learned?” Some of our long time favorites will be speaking. Kim Herman, Steve Keto and Tom Smith, plus some new faces, Lorraine Johnson from the North American Native Plant Society (formerly the Canadian Wildflower Society) and Dr. David Karowe from Western Michigan University. We are looking forward to seeing all of you at this special anniversary conference.

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**Fall 2006**

**September 15 – 17**

**Michigan Nature Association Fall Social Event**

This is Paul with the Michigan Nature Association reminding you that our Fall Social Event in Alpena is coming up – it takes place from September 15th through 17th. This year’s trip is another great chance to meet other Michigan Nature Association members, staff, and board members while exploring four Michigan Nature Association sanctuaries and participating in other activities.

The cost for the weekend is $275 for Michigan Nature Association members and $300 for non-members. This includes an appetizer buffet on Friday evening, breakfast, lunch and dinner on Saturday, breakfast on Sunday, the bus trip to Alpena and the sanctuaries, a double occupancy room at the Alpena Holiday Inn, and transportation to Grass Island. Please e-mail me or Natalie at michigannature@michigannature.org or call the office at 517-655-5655 to reserve your spot. We look forward to seeing you on September 15th.

**October 7**

**Saginaw Valley Master Gardener Association Fall Seminar with Bill Cullina**

The Saginaw Valley Master Gardener Association is again hosting a fall seminar that may be of interest to you. Our keynote speaker, Bill Cullina, is the nursery manager and propagator at “Garden in the Woods” in Framingham, Mass., the showplace headquarters of the New England Wildflower Society. Cost of the seminar is $50 by Friday, September 15th or $55 after. Included are a box lunch, snacks, and seminar materials. Master Gardeners earn four education hours. You do not have to be a Master Gardener to attend.

For a conference brochure, visit www.webl.msue.msu.edu/mastergardener/saginaw. For more information, contact Judy Henning at 989-799-4136 or Aileen Cowan at 989-799-4136.
Yet Another Reason to Consider Native Plants

by Esther Durnwald

I had the opportunity to participate in the second annual Enhancing Beneficial Insects with Native Plants Field Day which took place on August 1st. Farmers, growers, MSU Extension educators, NRCS personnel, conservation district personnel, master gardeners and native plant enthusiasts attended the one day event. This project is an effort led by MSU and MSU Extension along with Farmer Cooperators, WildType Design & Native Plants, USDA Natural Resources Conservation Service, and Michigan Association of Conservation Districts.

We began the day with MSU graduate student, Anna Fiedler, explaining the project and results to date. The project concept is based on learning what native plants can attract beneficial insects, which will assist to suppress pests on a farm or in gardens. The results from observations in 2005 showed that Angelica (Angelica atropurpurea) attracted more natural enemies than any other species. Other species attracting beneficial insects included: sand tickseed (Coreopsis lanceolata), Canada anemone (Anemone canadensis), golden alexanders (Zizia aurea), Indian hemp (Apocynum cannabinum), shrubby cinquefoil (Potentilla fruticosa), meadowsweet (Spiraea alba), boneset (Eupatorium perfoliatum), cup plant (Silphium perfoliatum), Riddell’s goldenrod (Solidago riddellii) and horsemint (Monarda punctata). Native bee counts were recorded as well. It is hoped that by encouraging farmers and gardeners to utilize native species not only will biodiversity increase, but pollination and natural pest control will as well. After this presentation, attendees were taken by wagon out to the field where a variety of test plot stations were prepared.

Jerry Stewart of Native Connections, Kyle Ferris and I

Indian hemp (Apocynum cannabinum) attracts Empididae (dance flies), crab spiders, and ladybugs.

(Michigan Wildflower Farm) performed demonstrations of seeding techniques using hand broadcasting, broadcasting using a tractor, and drilling methods. There were also visits to test plots where information was shared regarding native plant attractiveness to natural enemies, native plant cultivation, natural enemy identification, and pollinator identification. After lunch, those in attendance carved into WildType for a tour of the nursery and fence row seeding and planting demonstrations. Despite being one of the hottest days of the summer, the event was attended by over 100 who appreciated learning about yet another beneficial reason to incorporate native flora back into our landscape. The effort by those performing this research to share their results with those who can utilize and benefit is greatly appreciated. This is a wonderful example of academic and practical application coming together.

For more information about this project visit:
<http://www.ipm.msu.edu/plants/home.htm>
Use Native Plants to Help our Migrating Birds

by Kay Charter

Many of our most beautiful migrating songbirds, such as orioles, warblers and tanagers, are in decline. Saving Birds Thru Habitat’s mandate is to teach people of all ages how they can help turn those numbers around. We often get questions on what kind of food we should offer to help these birds. The answer to making a difference for birds whose numbers are falling is not in offering a particular food. It is rather in providing the right kind of habitat for them. And habitat means native plants -- not just native flowers, but native trees, shrubs, grasses and ferns.

Most songbirds depend heavily on insects for their survival, and all of them need insects to feed their young. Native plants host far more of these insects than non-native plants do, therefore all of our efforts revolve around encouraging people to incorporate native plantings into their personal landscapes.

We have a number of programs to carry out our work on behalf of these flying jewels. We offer age-appropriate field trips for school children at our Habitat Discovery Center in Omena, we have adult programs focusing on various habitats and the bird species that nest within them, we provide an annual prairie program and plant sale with Vern Stephens and Sue Tangora, and we offer a habitat certification program for industries, agricultural entities and commercial interests that are interested in maintaining or improving habitat on their properties.

In order to demonstrate the habitat value of, as well as landscaping possibilities for native plants, our organization initiated a project several years ago to return all of the three acres of land on which our nature center rests to native plantings. About an acre of the property is wooded, and a portion is taken up by parking area, building and trails. The rest is largely open, and it is on that part of our land where we have been working to create an extended native prairie demonstration garden. The funds for planting that garden have largely come from grants from the Wildflower Association of Michigan. Saving Birds Thru Habitat is most grateful to WAM for helping us in our efforts by providing funds for the purchase of plants for our demonstration garden.

Our Habitat Discovery Center is open to the public and is located at 5020 North Putnam Road, about a mile and a half west of Omena. Our phone number is 231-271-3738.

American redstart (one of the warbler family).

Mustard Mayhem

Continued from Page 1

alien species cause little disturbance, while others radically transfigure their new habitat by displacing less competitive native species and disrupting fragile ecological relationships that evolved over millions of years.

Of a growing list of invasive plants in North America, garlic mustard (Alliaria petiolata) has been on the Nature Conservancy’s Red Alert list since 2000.... In a new study, Kristina A. Stinson, John N. Klirominos, and colleagues [investigated] garlic mustard's effects on native hardwood North American trees.

The weed gains a competitive advantage, they discovered, by releasing chemicals that harm a fungus the trees depend on for growth and survival.

Many forest trees and other vascular plants form mutually beneficial relationships with arbuscular mycorrhizal fungi (AMF). The fungus has long filaments that penetrate the roots of plants and... effectively extend the plant's root system.

AMF depend on the plant for energy, and the plant depends on the fungus for nutrients....Garlic mustard [does] not depend on native AMF and often takes root in landscapes altered by development or logging, where AMF networks are disturbed.

Biologists are especially concerned about what might happen if a non-mycorrhizal invasive plant turns up in a mature, intact forest with an established mycelial network—which is just what garlic mustard has started to do. In the North American forests it has recently invaded, the plant inhibits the growth of understory plants, including the seedlings of canopy trees. Stinson et al. suspected the invader might somehow be thwarting the symbiotic relationship between fungus and tree.

To test this possibility, they collected soil from five forests in...
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Mustard Mayhem
Continued from Page 14

Ontario dominated by four species of native hardwoods. Three species—sugar maple, red maple, and white ash—had significantly less AMF root colonization and slower growth when grown in infested soil. Seedlings grown in sterilized soil taken from invaded and pest-free locations showed similar reductions, suggesting that diminished microbial activity led to suppressed growth. A second set of experiments supported this conclusion...that garlic mustard uses phytochemical poisons to disrupt native plants’ mycorrhizal associations and stunt their growth. Stinson et al. go on to show that garlic mustard’s impacts vary with a native plant’s AMF dependency. Plants with fewer roots to take up nutrients—like the hardwood seedlings studied here—will be most affected by garlic mustard invasions. This suggests that garlic mustard is invading the understory of mature forests because it’s poisoning the lifeblood of its woody competitors.

If true, the appearance of this noxious weed in an intact forest promises to have devastating impacts. The plant will stifle the regeneration of the dominant canopy trees, and...will pave the way for weedy plants that don't like the beneficial fungi.

Which phytochemicals are to blame and how they interact with other beneficial soil microbes is a question for future study. Determining if and how plants in garlic mustard's native European habitat peacefully coexist may suggest ways to help North American natives fend off its fungicidal attacks. With evidence that the plant can displace native species within ten years of establishing a presence, prudence suggests taking steps to eradicate the weed before all the answers are in.

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