



Your key to discovering the *Natural Missouri*



From
Our
President

Ahhh! ... Summertime.

I hope you have been enjoying the slower pace of hot days and more rain than usual. As we look both forward to the increased pace of fall and back at the more relaxed pace of summer, I want to mention a few highlights for our chapter.

- The Missourians for Monarch lead team of Bob Lee, Larry Berglund and Lee Phillion were invited to attend a planning and coordination conference in Columbia to work toward a comprehensive statewide plan for helping stem the decline of the Monarch Butterfly. Quite an honor to be recognized as a player on a statewide basis. Congratulations team.
- Our artist member Leslie Limberg has some of her paintings displayed at St Charles Community College and I hope you have noticed them at Busch when you came for our chapter meetings.

A new class of trainees started a few weeks ago and we were delighted to see so many of

them visit us at our last two meetings. Hopefully they will join us when they finish in October. Thanks to all of you who give so generously of your time to attend their sessions to get acquainted and welcome them to our membership.

The series of Plant ID walks finished on August 3 with a walk at Shaw Nature Reserve led by James Trager. It has been a good set of walks. We covered Spring, late Spring, early Summer and late Summer. There is also an active Bird Watching group that is led by one of our members Gail Gagnon, and one of our hopefully new members, Susan Stevens. Get in touch with Gail if you are interested and are not on the distribution list.

Also, remember the Missourians for Monarchs and their need for milkweed seeds. Collect them if you can or let one of the team know where the pods are.

Please check our activities calendar frequently to see what is happening that might have interest for you. I am happy to say that we have things of interest to almost everyone and if there is something you want/need that we are not doing, please let me know.

Happy Fall,

Alberta

Alberta McGilligan
President, Confluence Chapter



Missouri Master Naturalist
2015 Annual Certification Pin

Prothonotary Warbler
Protonotaria citrea



We Are Celebrating
Our Tenth Year!





History of Native Landscape

In recent years, the beauty and function of the native grasses, flowers (forbs), sedges, shrubs, and trees that dominated our Missouri landscape for 10,000 years is being rediscovered.

Numerous accounts of the beauty of the pre-European settlement of the Missouri landscape are found in the writings of early explorers such as this one in *The Expeditions of Zebulon Montgomery Pike* during the years 1805–1807:

"The country round the Osage villages one of the most beautiful the eye ever beheld. The branches of the river viz the large east fork Sac river ... all winding round and the villages giving the advantages of wood and water at the same time the extensive prairies crowned with and luxuriant grass and flowers gently diversified by rising swells and sloping lawns present to the warm the future seats of husbandry the numerous herds domestic animals which are no doubt destined to with joy those happy plains ..."

This beautiful and diverse landscape evolved during these thousands of years with the interaction of climate, soils, native grazers, and the native peoples' use of fire to cover more than a third of the state—15 million acres. However, in the last 150 years or so that vast native prairie system has been reduced to fewer than 90,000 acres. This rapid transformation began when European settlers introduced change in land use with plants they transported to the New World to continue familiar agricultural practices, and converted the landscape to cropland, cities, roads, and highways Savannas, glades, wetlands, forests, and forested river corridors have also been greatly impacted with this change in land use.

FUNCTIONS OF NATIVE PLANTS. As so often happens, the value of something is not recognized until it is gone or nearly gone. This is the case with the plants of our native landscape. We now know many of the important and irreplaceable services native plants provide. Because of this knowledge, many efforts are being made to promote their use in land-

scapes, including individual landscaping, business landscaping, agricultural use for grazing, stream restoration, green spaces, and highway right-of-ways.

Some of the many functions of native plants that benefit water quality and water quantity include:

- Many native grasses and forbs have exceptionally long and complex root systems. This vast array of roots serves to facilitate the absorption of storm-water into the ground where it is available to replenish aquifers that are important in maintaining a base flow in streams. This root system also serves to filter pollutants and prevent them from washing into streams.
- Buffers, corridors, and greenways planted with a diversity of native plants—trees, shrubs, grasses, and forbs—keep sediments and pollutants out of streams by slowing storm-water runoff and trapping and filtering sediments. A diversity of native plants also contributes to water quality by providing food for native insects that are important for aquatic life.
- Strips of long-rooted native prairie plants interspersed among raw crops help to reduce nutrient and chemical runoff to streams and reduce soil erosion by slowing, trapping, and infiltrating runoff. They improve soil health and provide vital habitat for pollinators and many other creatures dependent on native habitat.
- Because native plants do not require inputs of fertilizer or pesticides, these pollutants to our waters are eliminated or greatly reduced from landscapes of native plantings.
- Native plants aid in the conservation of our water resources since they are adapted to survive in periods of drought and supplemental watering is not necessary.

ACTIONS TO TAKE. First, it is important to understand what is meant by the term "native." All plants are native to some place, so before pursuing a native planting project, learn which plants are native to your



area. This information can be found at plants. <http://plants.usda.gov/java/>

To help acquaint you with native Missouri plants, the Grow Native! Website <http://grownative.org/#> is an excellent source of information and features a number of photos of native plantings.

Possibilities for native plantings in urban areas include rain gardens and landscaping with native trees, shrubs, flowers, and grasses to benefit water quality while providing vital habitat for birds, insects, and other creatures.

Parks and road right-of-ways are great places for native plants. Become an advocate in your community to promote plantings of natives in these areas.

Help educate the members of your community about the many benefits of native plants and promote their use in landscapes.

Support organizations whose mission is to protect our native landscapes. (MO Stream Team Fact Sheet #25)

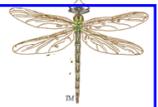
To learn more about native plants and prairies join our MN Quail Ridge Prairie Demo and Rain Garden Projects

E-mail Carmen at escarmeng2@charter.net for more information on our projects.



Milestones, Certifications, Annual Pins, and Other Recognitions

June–July 2015



June 2015

A silver pin was awarded to Tom Nagle, recognizing his 2,500 hours of service to the Master Naturalist Program.



Annual pins for 40 hours of volunteer hours and 8 hours of advanced training were awarded to Barbara Thomas Cliff Parmer, Carol Morgan, and Fay Roberts.



After the meeting MN climbed the "rock pile." to watch the sunset.



Carol displays a bracelet made with all her MN pins



July 2015

Member Awards were presented to Fay Roberts, Pat Burrell Standley, Malcolm Royse, Bob Coffing, Nancy Newcomer and Deborah Moulton.





Great Spangled Fritillary Butterflies Feed on Milkweed.



Pictures of butterflies
by MN Joe Veras.
Family: Nymphalidae
(brushfooted butterflies)

Life cycle: Adults fly from mid-May through early October. Males emerge two or three weeks before females. Female butterflies generally mate very soon after emerging. Great Spangled Fritillary females tend to mate only once, so early-emerging males have an advantage over later-emerging males. Eggs are laid in the fall, the caterpillars hatch, overwinter, then resume eating in the spring, when its food plant, violets, are at their peak.

<http://mdc.mo.gov/discover-nature/field-guide/great-spangled-fritillary>



Photo right: Nicky Davis / EOL

Don't pluck this off your violets! It's the Great Spangled caterpillar. They molt six times and grow large—2 inches long—but they're harmless, except for the munching they do on the plants. They hatch in the fall and —without ever eating—overwinter as caterpillars. This means they go seven or eight months before beginning to feed on violets in early spring. These butterflies produce only one generation a year and most of their larvae probably don't survive winter, so we can help them a lot by leaving them be.

http://www.welcomewildlife.com/?folder=pages/URBAN_WILDLIFE/insects/bios/butterflies

Indoor Picnic A First for Confluence Chapter

MN Leslie Limberg



So, what to do when it's 90+ degrees outside and mosquitoes are rampant?

Take your picnic INDOORS, which is what we did this Summer at the Weldon Springs Interpretive Center, (where Kevin now works). Alison Robbins deliciously catered our event with sandwiches, chips, homemade brownies, & lemonade. Thanks so much Alison!

Members also toured the newly dedicated native plant demo garden, now the Jeannie Moe Garden. The plants knew we were coming and wow, did they ever put on a show for us. And with their bug friends, we saw up close and personal a major pollinator workshop right before our very eyes. Cup Plant already 6 feet tall (it's only June), Compass Plant facing west, Foxglove and Spiderwort in full bloom and of course, the Master Naturalists' handy work weeding and pruning their dedicated garden beds. Awesome work, Guys.



After dinner, Kevin put on an interpretive show with slides of the historical nuclear clean up—locally known as "The Rock Pile", where it all started from World War II.

To top off the event, Kevin led a hike—for the brave & hardy—all the way up the rocky mountain to the tip top, at sunset! The tallest point in Missouri he said? Wow what a view! And the inspiration!

Thanks Kevin. And thanks to all fun-minded members who brought their cheerleading skills along. Good party.



Heritage Elementary— Leading Classes for Kids on Butterflies and Mammals

MN Leslie Limberg

This past May for the fourth year the Confluence Chapter participated in Conservation Day at Heritage Elementary in Wentzville. Eight master naturalists taught, rotating 25 minute classes, on subjects like Bird Beaks, Insect Hotels, Mammal Pelts, Attracting Birds to Your Yard, Trees & other fun stuff. Teachers at Heritage Elementary are very interested in schooling kids in the outdoors and are hip to the benefits of nature for a balanced mental/emotional life.

The day may have been strenuous, but all the naturalists came away with a profound sense of having made a difference with the time spent at Heritage Elementary. Thank you to Alison Robbins, Martha Hessler, Fay Roberts, Leslie Limberg, Jim Middleton, Tom Nagle, Jennifer Moore, and Connie Campbell for taking their time for this worthwhile effort.

Not alone were the kids funny, but the laughter was had by all of us on that smile-filled day. The students were not only cool, but very funny, as well...





Road Salt Changes Urban Ecosystems in Big Ways

In the urban parts of Minneapolis and St. Paul, Minnesota, around three hundred thousand tons of salt are dumped onto roads each winter. That's because sodium chloride lowers the freezing point of water, making the formation of ice on the surface of roadways less likely.

Dumping all that salt into the ecosystem doesn't just keep drivers safer. It also changes the chemical composition of the soil near roadways, and that added sodium chloride finds its way into plants, into bodies of water, and into animals. And all that added salt could shift the dynamics of natural selection and the animals' fitness, altering the course of evolution.

Sodium is critical for animal development; it's a necessary ingredient for proper neural and muscular function.

For example, some butterflies and bees have evolved to drink the tears of turtles and crocodiles as a means of collecting more sodium. In part, the need for sodium also explains why humans love snack foods so much. Suddenly, lots of animals find themselves in landscapes that now contain an overabundance of sodium, thanks to road salt. What does that mean for their health and their evolution?

Ecologist Emilie C. Snell-Rood and colleagues from the University of Minnesota wanted to understand the affects of high sodium intake on butterfly development. To start, they

needed to demonstrate that there was more sodium inside the leaves of plants near salt-covered roads. They measured sodium concentration in four plant species that butterflies eat. Some species soaked up more salt than others. For milkweed and oak, but not for mustard or grass, sodium levels were much higher in plants harvested adjacent to roadways than in plants collected one hundred meters away.

Next, Snell-Rood reared monarch caterpillars either on milkweed collected near a salted road or on



milkweed collected from farther away. The road-side-collected milkweed had sixteen times more sodium in its leaves than did the control plants. As a result, the male butterflies that were fed the sodium-rich plants had stronger flight muscles, while the females had

larger eyes. In other words, male butterflies had more thoracic protein if they were raised on high-sodium milkweed, while females had more neural tissue. It isn't clear just what that means for their fitness or their ability to survive long enough to reproduce, but it is certain that the extra sodium in their environment does make a difference for the development of their anatomy and physiology.

Finally, the researchers verified that there was such a thing as too much sodium. They reared a different species, cabbage white butterflies, on artificial diets containing low,

medium, or high levels of sodium. While there were no survival differences between the butterflies that ate the low or medium sodium diets, those who were fed the high-sodium food were much more likely to die young.

The problem is that these animals evolved to seek out sodium, but now find themselves in an environment rife with it. What are the implications? Ecologists and wildlife biologists have already documented altered foraging behavior in other species, thanks to road salt. Ants that live closer to salted roads spend less time seeking out sodium than those whose colonies are farther from roads. Moose also prefer to drink from roadside ponds, possibly because of salt runoff. The same could be true for butterflies and moths, which can detect sodium concentration through their chemoreceptors. Could the drive to acquire sodium lead butterflies and other wildlife to prefer roadside habitats? If so, that could come with additional problems, such as increased likelihood of death because of car collisions (which is already the case for moose), or for selection on flight behaviors to avoid cars (which has been observed for birds). Increased preference for the salty roadside would also increase the butterflies' exposure to the toxins in car exhaust.

"Our results highlight the need for more comprehensive descriptions of how nutrition is changing in the face of [human behavior] and the diverse responses to such changes," writes Snell-Rood. Combine the effects of atypical sodium intake on animals' anatomy and physiology with the side effects of living near roads, and its plain to see—yet again—that human behavior has the potential to dramatically affect the evolution and development of the wildlife with which we must coexist.

Source:
<http://conservationmagazine.org/2014/06/road-salt-changes-urban-ecosystems-in-big-ways/>

Water Primrose

Submitted by MN Leslie Limberg



Take a look at this cute little water plant—from the family *Onagraceae* (evening primroses) and the genus *Ludwigia*—there are 11 species of *Ludwigia* in Missouri.

But WAIT! Cute is not all it is. When this species grows too rampantly in fishing ponds and waterways, it can become a nuisance and require control. People have introduced this plant all over the world, where it can become a noxious weed.

We know that colonies of aquatic plants are important nurseries for fish and other aquatic life, providing sustenance and shelter and for the small creatures at the base of aquatic food chains.

Water primrose is a common example of emergent plants that in some situations reach nuisance levels. As it was the case at Henry's pond, it was "ringing" the pond and preventing fishing from the shoreline—entangling fishing lures. Dense growth of primrose may provide too much protection for small bluegills and make it difficult for bass to obtain enough food for

good growth. Bluegills also grow slowly in this environment due to excessive populations created by overly successful reproduction.

Last month Confluence Chapter members working at the Quail Ridge Park (Joe Veras, Ann Finklang, Leslie Limberg, and Carmen Santos) noticed that a primrose was covering over half of Henry's Pond. Jumping to the call of duty, and after proper coordination, these mighty stewards requested County Park staff for a boat... and... well, let the games begin! (more fun than a barrel of monkeys is a boatload of smelly, fishy, roots, mud, and committed environmentalists).



After suiting up in boots and waders, with rakes, hoes and apple pickers, laughter was non-stop, with the pulling, tugging, hauling and loading the hundreds of weedy yards first into the boat, then OUT of the boat. Ooof... nothing short of back breaking work. And well worth the price of the volunteer camaraderie and inspirational team work that it is. In 3 hours, we had grabbed a third of it off the pond. We figure with another 6-10 hours, we can get rid of this monstrous invasion.

EEegads, any others free to help????

Another boat would cut the time in half. And another 2-3 volunteers would cut the time again. Heeeelp, please! Let us know if we can use your boat and/or if you can help with this short term project. Email Leslie Limberg, llimberg@aol.com

For more information on this plant visit: <http://mdc.mo.gov/discover-nature/field-guide/water-primrose>
http://mdc.mo.gov/sites/default/files/resources/2010/05/4883_2838.pdf
And the USDA:
<http://agresearchmag.ars.usda.gov/2006/may/water>





Lewis and Clark Boathouse Garden Floods Again

MN Leslie Limberg,
MN Martha Hessler, and MN Connie Campbell

History—In 1993, during the Great Flood, the Lewis and Clark Boathouse and Nature Center on the Missouri River saw flood stage of 40.04 feet, about 15 feet over flood stage. Since then, eleven times, the Missouri River has risen above flood stage at St. Charles. Good thing the Army Corps designed the boathouse on piers and that the Confluence Chapter used flood tolerant plants for their Capstone Project in 2005/6.

Hydrology 101—According to the National Weather Service hydrology levels at St. Charles, 25 feet is flood stage. What does flood stage mean? Flood stage is the level of rising water above which damage can occur. There is then measured Minor, Moderate, and Major damage measured in levels above that. At St. Charles moderate damage occurs at 30 feet and major damage occurs at the 40 foot stage.

Take a look at past hydrology in St Charles, showing Missouri River flood stage levels:
1993—40.04' (The Great Mississippi River Flood)
1994—35.40'
1995—36.50'
2006—(Confluence Garden Project completed)
2007—29.36'
2008—29.47 & 28.49
2009—28.60'
2010—30.22' & 29.38'
2011—28.00'
2013—33.81'
2015—This past June -31.77' & 31.2



That's a lot of flooding. And that's a lot of water... the longest river in North America!

Lewis and Clark Boathouse— This past June our two Boathouse gardens, the Never Die Garden and the River Walk again were inundated— approximately 12 inches under water for four days. This is pretty typical when river water rises.

Some think our garden plants will die. But the garden plants are native river edge plants. They relish the habitat, as do other river species.

Another ecological feature after flooding is the deposit of fishy water, silt, fertilizer & "unknown stuff." For the remainder of the summer plants grow like crrrazy!

Cup plants, normally reaching 7-8 feet will now grow to 9-10 feet. River Oats grass which usually grows to 24" will soon be 3 feet tall. For the remaining Summer months, everything has "steroid growth," bolting sky-high with the new found nutrients.

Driftwood—Quick! Drive down to the river's edge to see the Driftwood Sculpture Garden. This year it is bigger and more mesmerizing... 2 football fields wide along the entire length of the Boathouse river bank. During the flood, Martha Hessler and I stood knee high in water. We stared, bug-eyed, watching... As huge ancient 3 ton tree trunks careened down the river at 10 miles per hour, slamming into the bank of driftwood (and 300# buoys), pushing all further and further into shore... Red-wing Blackbirds flying helter-skelter scarfing up countless bugs gorging in the fishy mess... Mallard Duck families also taking advantage of added bugs along the shore. Eventually the City of St Charles will bulldoze the entire bank of driftwood—back into the water, sending it downstream.

Such an opportunity for learning River Ecology! This Fall long yellow school buses will unload the scores of screaming monsters that regularly deafen our gardening activities.



AND...

Boat House Volunteering—A few minutes into pruning the path, I realized I should take a before and after picture. Here they are. Great sense of accomplishment that I stole from all of you today! I would apologize, but it was a great sense of accomplishment.

Connie Campbell



Soil Biology Quick Facts

- The tips of small plant roots move through the soil with a twisting screw-like motion. Mature trees can have as many as 5 million active root tips.
- A single spade full of rich garden soil contains more species of organisms than can be found above ground in the entire Amazon rain forest.
- Although the soil surface appears solid, air moves freely in and out of it. The air in the upper 8 inches of a well-drained soil is completely renewed about every hour.
- The plants growing in a 2-acre wheat field can have more than 30,000 miles of roots, greater than the circumference of the Earth.
- The wonderful "earthy" smell of newly plowed ground is believed to result from chemicals produced by micro-organisms. One of these chemicals, called geosmin, is produced by actinomycetes, organisms that have some properties of both bacteria and fungi.
- Soil can act as either a sink or a source of greenhouse gases. An estimated 30 percent of the carbon dioxide, 70 percent of the methane, and 90 percent of the nitrous oxide released to the atmosphere each year

passes through the soil.

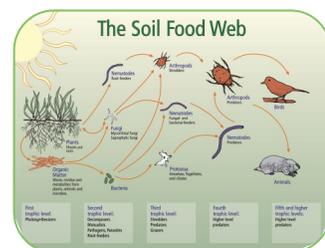
- It takes about 4,000 to 6,000 pounds of crop residue per year to maintain the content of organic matter in a soil.
- Modern farming practices that minimize soil disturbance (plowing) and return plant residues to the soil, such as no-till farming and crop rotations, are slowly rebuilding the Nation's stock of soil organic matter.
- Of the carbon returned to the soil as plant residue, about 5 to 15 percent become tied up in the bodies of organisms and 60 to 75 percent is respired as carbon dioxide back to the atmosphere. Only 10 to 25 percent is converted to humus in the soil.
- Every time you take a step in a mature Oregon forest, your foot is being supported on the backs of 16,000 invertebrates held up by an average total of 120,000 legs.—Dr. Andrew Moldenke, Oregon SU
- Even in agricultural soils, more than a thousand arthropod legs support your every step.
- One cup of soil may hold as many bacteria as there are people on Earth.
- Bacteria and actinomycetes are exceedingly tiny. Yet, because of their tremendous numbers, they make up half the living biomass in some soils.
- The weight of all the bacteria in one acre of soil can

equal the weight of a cow or two.

- Actinomycetes have cells like bacteria, but grow as long filaments like fungi. Like fungi, they help degrade tough materials, but unlike fungi, they prefer high pH (over 7.0).
- Nematodes are amazingly diverse. Twenty thousand species have been described, but it is thought that 500,000 species may exist.

<http://www.nrcs.usda.gov/>,

http://www.nrcs.usda.gov/Internet/FSE_MEDIA/nrcs142p2_049822.jpg (Click for a bigger picture.)





New Study:

Neonicotinoids Harm Monarchs

Submitted by MN Leslie Limberg

According to the latest United States Department of Agriculture research published this past Spring, a pesticide used in farming soy and corn is a likely contributor to Monarch butterfly die off in North America. Neonicotinoids, also referred to as neonics are the most widely used pesticides in the world. The study shows their water soluble molecules end up in nectar and pollen from soil or seed treatments and act as neurotoxins in caterpillars.

The USDA experiments implicate clothianidin in changing Monarch caterpillar size, weight and survival at doses as low as one part per billion. Tests proved Clothianidin was lethal at 15 parts per billion. The tests with pesticide-treated food were conducted for periods of 36 hours. Researchers noted that in the field, caterpillar exposure would likely be greater and would include more pesticides as well as other neonics, producing a dangerous, if not lethal chemical concoction. Samples of milkweed plants in South Dakota corn fields contained on average over 1 part per billion clothianidin, as well as other pesticides.

How are neonics used? When sprayed, neonics are easily absorbed by bugs. In other applications, frequently seeds themselves are coated before sale (seed dressing), primarily to kill slugs that eat the young sprouted plants. Neonics can be used also as a 'soil drench,' granular application, soil spray and directly on foliage during the growing season to further inhibit insect damage. Manufacturers frequently combine neonics with other chemicals in products for broad application for home, municipal or agricultural use.

What do neonics do? Neonicotinoid pesticides are synthetic forms of nicotine and act as neurotoxins, immobilizing nerve receptors in insects, causing paralysis and eventually death. We have all heard of Colony Collapse Disorder. Neonic pesticides are implicated as part of this deadly syndrome affecting honeybees and bumblebees. Along with sudden weather changes, mites, fungus, habitat loss and poor nutrition, neonics then "nail the coffin," weakening bee immunity and accelerating disease and/or death.

Remember the thousands of honeybees and bumblebees found dead in Oregon in 2014? In four separate incidents, pesticides containing neonics, Imidacloprid and Dinotefuran had been either injected into Linden trees or sprayed on trees when in bloom. This resulted in hundreds of thousands of bees dying. Oregon's Department of Agriculture found contractors had violated label restrictions.

Neonic pesticides are highly soluble in rain water and end up washed into streams and rivers. Here they are toxic to aquatic invertebrates. In a 2014 USGS study on Midwest streams researchers found neonicotinoid pesticides were common in water samples from all 51 waterways tested. It was the first broad scale study done on nine Midwest rivers and streams, including the Mississippi and Missouri Rivers. The rivers studied drained most of Iowa, and parts of Minnesota, Montana, Nebraska, North and South Dakota and

Wisconsin, states that have the highest use of neonic insecticides in the country. Researchers say that at 10-100 Nano grams per liter, several neonics are aqua toxic when exposure is prolonged (during the growing season). Researchers also found herbicides (glyphosate) in stream water, as well as other agricultural chemicals.

Penn State and University of Florida labs found a "Toxic Slug Syndrome" showing that soil slugs did transmit the insecticide to ground beetles, seriously affecting more than 60% of them and this toxicity could likely rise up the food chain unbeknownst to farmers and manufacturers and retailers.

What can WE do? First, when purchasing plants for home and garden, buy from smaller nurseries that have "done their homework" and do not treat their plants with poisons or buy from wholesalers that do. Ask nursery managers and owners questions about sprays and talk to them. Have conversations about what you want as a customer, as well as about neonicotinoids and pollinators. Big Box stores and major hardware stores are not yet up to current standards. Phasing out wholesalers using neonic sprays takes longer for them, although they say it is happening. Well educated nurseries do not use neonic sprays, nor do they buy from wholesalers who 'neo-spray' their plants prior to sale.

Also, regular conversations with experienced nurserymen, Extension advisors and 'seasoned' organic gardeners will prove informative and useful. There are workable natural alternatives to most consumer bug problems all over internet websites.

Most importantly, buy native plants wherever possible and plant a diversity of them. Native plants are less susceptible to insect problems than hybrids, imports, exotics and specialty cultivated plants. The more diversification of natives, the more 'beneficial insects' they attract. Add compost seasoned with soil microbes to further protect soil, roots and foliage. Native plants combined with native bugs have a synergistic effect to balance bug populations and support the "Food Web" all the way up to top predators.

As a rule of thumb, avoid pesticides. They are poisons and are dangerous for children, pets, wildlife and families. First look for natural alternatives to standard pesticides. In other words, try a BB gun before using an atom bomb. With a little extra reading, other solutions are discovered. Much of the time, bug problems can iron themselves out naturally, as weather changes and insects normally come and go year to year. If you do need a pesticide, avoid buying neonic-based ones. Be sure to take your time (get your reading glasses!) reading the ENTIRE "fine print" on labels. Positively take precautions mixing and pouring chemicals to exact proportions. Follow precise directions, as you would a recipe. Do not guess or take short cuts.

Lastly, share your landscaping plans with neighbors and others. The general public understands little about how 'mysteriously' our yards are connected. We forget about the inter-connectedness of greenery when we fertilize our lawns and treat our shrubs, which are all shared by birds, mammals, insects, reptiles, amphibians and.... soil microbes (indeed - precious and ignored). The chemicals we use actually cross easements, proper-

ty lines and fences, via animals, wind and rainwater, yard to yard. The habitat of all wildlife is all of our yards pooled together. Sometimes sharing a poem or book about this miracle of nature with friends, family and neighbors communicates. Or... an article on a neighborhood animal you have in common. Or... maybe just share a copy of USDA's current best management practices along with a pamphlet from Beyond Pesticides or The Xerces Society, reliable consumer education groups. What we know quickly becomes what they know, when we talk about what affects our community health.

www.independentsciencenews.org

www.Oregon.gov/ODA/PEST/Pages/Pollinator.aspx

www.sciencedirect.com/science/article/pii



Department of Conservation's Milkweeds for Monarchs Project Submitted by MN Martha Hessler

MDC has begun a milkweed project that involves collecting milkweed seed for propagation at the state nursery. Plants will then be distributed for planting. M4M anticipates that the MDC project may tie in nicely to ours. Training for how to harvest milkweed seed is being provided to master naturalists so that we can participate in this project. The first training session was held at Prairie Fork Conservation Area in Williamsburg on Thursday, July 9. It was well attended by a number of master naturalist chapters throughout the state. Attending this session from the Confluence Chapter was Alberta McGilligan, Martha Hessler, and Bob Siemer with his wife Ann Early (who is a member of the Great Rivers chapter). There was an overview about the project from Chris Newbold of the MDC. They have a great facility there for seed collection and storage. We then hiked into the prairie to identify the different milkweed species that were currently growing (Asclepias tuberosa seems to do quite well in that particular area). In addition to the milkweed, we identified numerous nectar plants - blazing star, blue indigo, coneflowers. We wrapped it up with a picnic lunch before heading home. All in all, it was very informative and we look forward to a collaboration that will benefit the future of the monarch butterfly.





Hemaris thysbe Visiting Carmen's Petunias

Commonly known as the hummingbird clearwing, is a moth of the Sphingidae (hawkmoth) family. Coloration varies between individuals, but typically the moth is olive green and burgundy on its back, and white or yellow and burgundy on the underside. Its wings are transparent with a reddish brown border. It has light colored legs, which combined with the lack of striping on the underside is diagnostic. Beating its wings rapidly, *H. thysbe* hovers to collect nectar from a variety of flowers. The combination of its appearance and its behavior commonly leads to it being confused with a hummingbird or bumblebee.

It is found in a large portion of the United States, with a range extending from Alaska to Oregon in the west and from Maine to Florida in the east. It is a migratory species and is most common in the eastern United States. *H. thysbe* has two broods a year in the southern portion of its range, but only one in the north. As a caterpillar, it feeds on honeysuckle and several types of fruit trees.

Due to the variable appearance of *H. thysbe*, it has often been mistakenly

described as multiple distinct species. The moth is not endangered and has minimal economic impact upon humans.



And then... *Hyla versicolor* (Hylidae) in Carmen's Mr. Lincoln Rose



Trees Communicate

Submitted by MN Cliff Parmer
By Jane Engelsiepen, October 8, 2012

"Mother Trees" Use Fungal Communication Systems to Preserve Forests

Suzanne Simard, forest ecologist at the University of British Columbia, and her colleagues have made the major discovery that trees and plants really do communicate and interact with each other. She discovered an underground web of fungi connecting the trees and plants of an ecosystem. This symbiosis enables the purposeful sharing of resources, consequently helping the whole system of trees and plants to flourish.

Simard was lead to the discovery by the observation of webs of bright white and yellow fungal threads in the forest floor. Many of these fungi were mycorrhizal, meaning they have a beneficial, symbiotic relationship with a host plant, in this case tree roots.

Microscopic experimentation revealed that the fungi actually moves carbon, water and nutrients between trees, depending upon their needs.

"The big trees were subsidizing the young ones through the fungal networks.

Without this helping hand, most of the seedlings wouldn't make it."

At the hub of a forest's mycorrhizal

network stand the "Mother Trees". These are large, older trees that rise above the forest, a concept illustrated in the movie Avatar. These "Mother Trees" are connected to all the other trees in the forest by this network of fungal threads, and may manage the resources of the whole plant community. Simard's latest research reveals that when a Mother Tree is cut down, the survival rate of the younger members of the forest is substantially diminished.



"What we think we know, is that there's some kind of electrochemical communication between the roots of the trees. Like the synapses between neurons." Dr. Grace Augustine, fictional character in "Avatar"

The concept of symbiotic plant communication has far reaching implications in both the forestry and agricultural industries. This revelation may change the way we approach harvesting forests, by leaving the Mother

er Trees in tact to foster regrowth.

In agriculture, undisturbed mycorrhizal systems enhance plant's ability to resist pathogens, and absorb water and nutrients from the soil, bringing into question common practices that disturb these underground networks, such as plowing.

For More Information:

[Mycorrhizal Associations: The Web Resource
Fungal Threads are the Internet of the Plant World
http://www.ecology.com/2012/10/08/trees-communicate/](http://www.ecology.com/2012/10/08/trees-communicate/)

In the Colony

Most bumble bee colonies are well advanced and have a complete worker caste, so they have switched to producing the colony's reproductive members. Because creating queens takes more resources from the colony than producing workers or males, the colony can only accomplish this once it has a worker caste large enough to provision the nest appropriately. Since the number of new queens (and not the total number of bees in a nest) is the measure of reproductive success, this is a critical time of year for all bumble bees. Ensuring they have enough food to eat between now and the end of the season will determine the strength of next year's population.



Rich Hatfield, The Xerces Society, on behalf of Bumble Bee Watch, Eastern bumble bee queen on flower by D. Gordon E. Robertson, Wikimedia Commons.





Thank You!



- ☞ Joe Veras, Jeannie Harmon, Ann Finklang, and Leslie Limberg for their dedication to the Quail Ridge and O'Fallon Projects —Go Team!!!
- ☞ Pam Walsh for taking over the coordination of our meetings' snacks.
- ☞ Martha Hessler, Deborah Moulton, and Lee Walters—Missourians for Monarchs and Boat House Projects
- ☞ Alison Robbins for her contributions in the Food Committee
- ☞ Pam Walsh for her contributions to the Babler and the Rabbit Habitat Projects.
- ☞ Fay Roberts, Malcolm Royse, and Donna Bourisaw for their contribution to several projects.
- ☞ To "the 2014 trainees" who have without question been the best, most contributory year of trainees yet. We have more new participants in any given training than we all can remember. We soooo appreciate their stewardship which makes all of us succeed, our community viable and our habitats beautifully sustainable for wildlife.
- ☞ MNs Leslie Limberg, Cliff Parmer, Connie Campbell, Martha Hessler, Lee Phillion, and Joe Veras for their contribution to our newsletter.



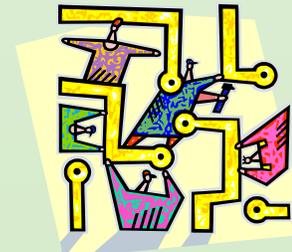
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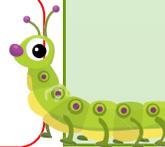
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When nature made the blue-bird she wished to propitiate both the sky and the earth, so she gave him the color of the one on his back and the hue of the other on his breast.

John Burroughs, 1837 - 1921 American naturalist and nature essayist, active in the U.S. conservation movement.

Sometimes gardeners kill the large, fat green Hornworm caterpillars on their tomato plants. Little do they realize that these are the larva of Sphinx Moths or Clearwing Hummingbird Moths!



The Confluence Chapter was founded in 2005 as the fifth Master Naturalist chapter in Missouri. The chapter was formed by 24 individuals from St. Charles County, St. Louis County, and St. Louis City after completing the Missouri Master Naturalist™ training program. We share a common interest in nature and in volunteering to help protect, preserve and restore Missouri's natural heritage. Most of our members live in the region West of the Missouri-Mississippi Confluence and from both north and south of the Missouri River.

We operate according to the bylaws and operating handbook of the Missouri Master Naturalist Program developed by the Missouri Department of Conservation and University of Missouri Extension.

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"There is nothing in a caterpillar that tells you it's going to be a butterfly." — R Buckminster Fuller