Litzsinger Road Ecology Center

COMMUNITY NEWSLETTER

www.litzsinger.org

March 2016

in this issue

Fifth graders expand their schoolyard prairie at Chesterfield Elementary School. Learn about creating a schoolyard habitat at your school at our Sustainable Schoolyards *workshop (see page 4). Photo by Eddie Jones.*

A Thought Before Testing

by Bob Coulter

I serve as a volunteer Equations coach at five schools each week, meeting with kids to explore interesting math and prepare for games they'll play against other schools. Recently, I met with a delightfully inquisitive 9-year-old and his father at Kaldi's to try out some advanced math beyond what he'd do at school. As the game evolved, the only way I could make an equation work was to subtract a negative number to achieve addition. Clearly this is past third grade math, but it was the only move possible, and I thought it would be interesting for him to see it. Fast forward to the next game, and he smoothly (and correctly!) slipped in his own instance of subtracting a negative. But, he mixed up a simpler math operation which kept him from a correct solution.

Which kid counts here? In school he'd never be challenged with advanced math like this, but he would be marked down for mixing up the simple arithmetic. I'll take kids being inconsistent in an adventure over being programmed to a script. Consistency comes with time and practice. Good experience won't happen if we wait until the "basics" are mastered.

Activity Spotlight: Vanquish the Invaders

by Leslie Memula

At this time of year I am eager to spring forward… to say goodbye to winter and hello, once again, to the familiar spring ephemerals that dot our woodlands. The much anticipated Ozark witch hazel (*Hamamelis vernalis*) is already blooming and beautifully fragrant. I smile when I think of walking the trails to look for the emergence of Virginia bluebells (*Mertensia virginica*) or searching for the huge bloodroot (*Sanguinaria canadensis*) leaves in an attempt to glimpse the white and yellow flower before it's gone.

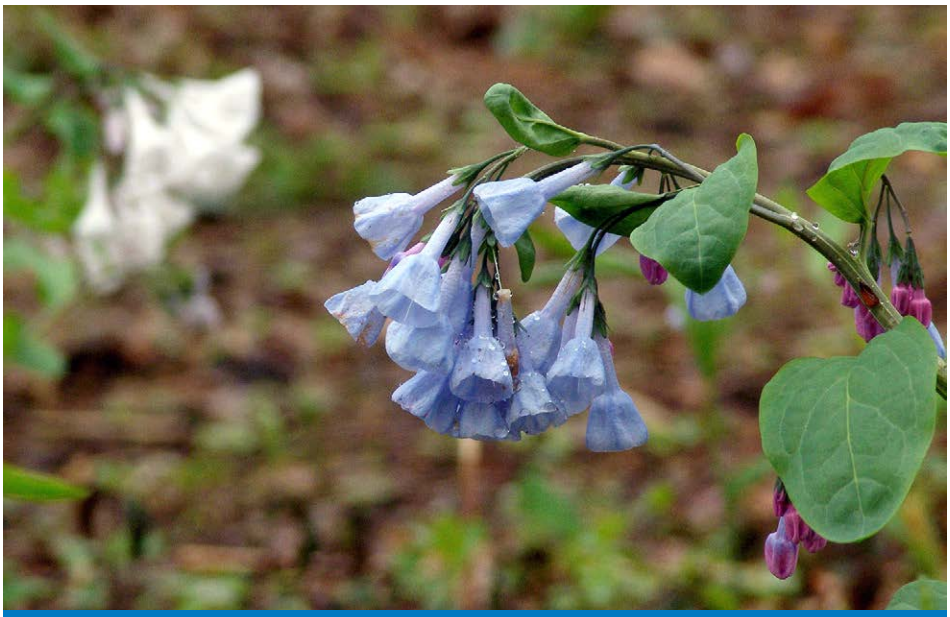
But along with the welcomed native plants, warmer weather causes some rather pesky non-native plants to spring from the ground. While wintercreeper (*Euonymus fortunei*) and bush honeysuckle (*Lonicera maackii*) are year-round contenders for the nastiest invasives in our area, we also have our fair share of others. These include lesser celandine (*Ranunculus ficaria*) and garlic mustard (*Alliaria petiolata*), which simply do not go unnoticed during the spring time.

While there is a lot of work here at LREC in terms of removing invasives and planting natives, you can do much of the same in your schoolyard spaces. *"Invasion of the Non-Natives"* will help you and your students identify and learn about common non-natives that could plague your outdoor spaces.

If you are curious about where these plants originally came from and how they got here, the activity *"Plant Immigrants"* can guide your research. Once you know little bit about these unwelcome plants, you can use quadrats or hula hoops as a sampling tool to look more closely at your schoolyard. *"Weed Lotto: How Brazen is the Invasion?"* will guide you through determining how much of your outdoor space is occupied by common non-native plants. Once you decide that you want to get rid of or remove these unwanted plants, it will be time to make plans to add native plants to your site. We recommend the activity *"Up Close and Personal"* to not only research appropriate native plants for your schoolyard but also to serve as a beginning field guide to the native plants on your school grounds.

All of the activities mentioned come from the *Earth Partnership for Schools curriculum* which is the backbone of the *Sustainable Schoolyards* training program at LREC (see next pages).

For information about invasive plants common to our area you can check out the *Invasive Species* section of our website!



Virginia bluebells (Mertensia virginica), *a beautiful native plant. Photo by Danelle Haake.*

2016–17 Teacher Partnership Program

by Eddie Jones

While it's been a delightful winter, we are already looking forward to spring, summer and beyond at LREC. In fact, we are now taking registrations for three year-long training programs that begin with summer workshops: one for teachers who have not previously partnered with us, and two for the teachers that are past or current partners. Teachers who register for one of these programs will have first choice of 2016–17 school year dates for class visits to LREC. Workshop descriptions and dates can be found on page 4. Register through our website: [http://www.litzsinger.org.](http://www.litzsinger.org)

Our vision is to see *every* teacher in the St. Louis region using their local community, beginning with their schoolyard and extending beyond, as an effective learning environment.

The mission of the LREC Teacher Partnership Program is to equip teachers to become effective outdoor place-based educators, using outdoor spaces to enhance learning, develop schoolyard native plant habitats, and engage with their community. Program participants will accomplish this as they:

Second graders prepare native plant seeds for a schoolyard habitat as part of their science curriculum at Rohan Woods School. Photo by Eddie Jones.

- develop outdoor teaching and learning skills
- integrate outdoor learning experiences into units of study
- make effective educational use of the schoolyard and surrounding community
- participate in a school/community place-based education team
- become an active participant in a dynamic community of outdoor place-based educators

The Teacher Partnership Program involves three years of training in specific outdoor teaching strategies that will be implemented at the school. Training consists of three one-year programs, each with a summer workshop and school-year components:

1. *Effective Outdoor Learning* (required of all new teacher partners)
2. *Sustainable Schoolyards* (schoolyard habitat development)
3. *Place-based Learning* (interdisciplinary projects that support the ecological integrity of the school and community)

See **Partnerships**, page 4

From **Partnerships**, page 3

Each training year will include the following components:

1. Summer workshop (3 or 5 days)
2. School-year components:
   - Relevant lessons
   - LREC visits
   - Professional development sessions
   - Share your knowledge
   - Build your school team
   - Teacher recognition

New teachers will be recruited annually to enter the partnership program. Teachers who complete the partnership program will remain in the LREC network with access to LREC resources.

Erik Taylor (City Academy) shares his experience with community partners at a recent teacher workshop.

SUMMER WORKSHOPS

Register for a workshop online at http://www.litzsinger.org/. Please keep in mind that the summer workshops are part of a **year-long training program**.

EFFECTIVE OUTDOOR LEARNING

July 6–8, 2016

Kindergarten–fifth grade teachers will be introduced to outdoor place-based education techniques for using the schoolyard and neighborhood outdoor spaces as learning environments that support the curriculum. Along with an introduction to LREC's on-site and school resources and support, participants will be provided with training and materials to use *Discover Nature Schools*, an outdoor curriculum published by Missouri Department of Conservation, and become eligible to receive funding for outdoor learning equipment. During the workshop teachers will develop a plan to integrate outdoor place-based education into their teaching through the next school year.

LREC will provide staff support and resources through the 2016–17 school year.

This training program is designed for teachers **beginning** an LREC partnership.

SUSTAINABLE SCHOOLYARDS

June 27–July 1, 2016

Teachers will use principles of outdoor place-based education to develop a unit of study around the theme "Schoolyard Habitats." Participants will be provided with training and materials to use the *Earth Partnership for Schools* guide to teaching across the curriculum as students plan, develop, and manage a schoolyard natural habitat. During the workshop teachers will create a plan to integrate the schoolyard habitats theme into their teaching.

LREC will provide staff support and resources through the 2016–17 school year.

This training program is designed for teachers who have had a **prior partnership** with LREC.

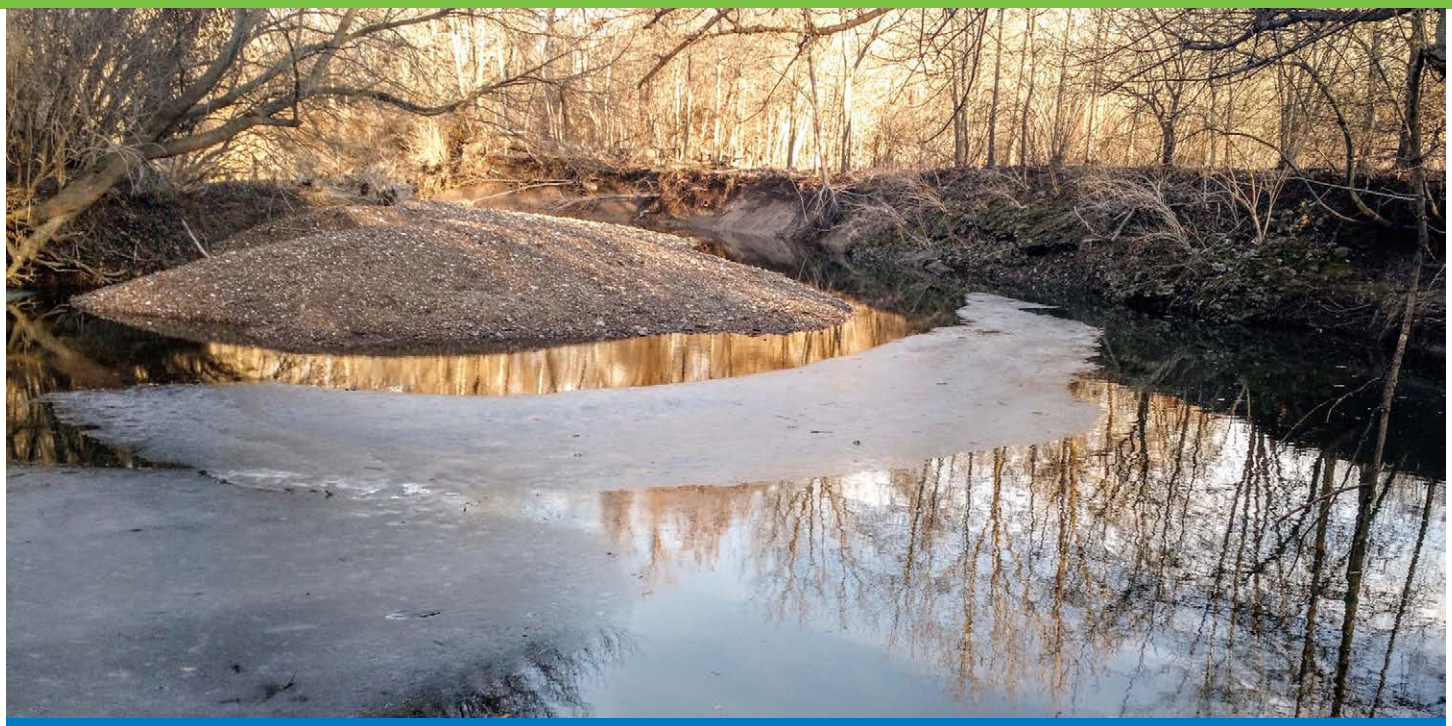
PLACE-BASED LEARNING

July 25–29, 2016

Teachers will use principles of outdoor place-based education to develop an interdisciplinary unit of study around the theme "Community Partnerships." Participants will be provided with training and materials that incorporate the use of local history, cultures, landscapes, and community organizations to support subjects across the curriculum. During the workshop teachers will develop a plan to integrate the community partnerships theme into their teaching.

LREC will provide staff support and resources through the 2016–17 school year.

This training program is designed for teachers who have had a **prior partnership** with LREC.



Meander in Deer Creek. Photo by Eddie Jones.

Stream Meander

by Jerry Lehman, LREC volunteer

"Did the creek flood last week?" We often get this question as folks visit LREC after a heavy rain. Occasionally, the answer is "yes." More often, it's "No, but the water shifted rocks and sand quite a bit." My own understanding of how those big piles of rock get moved around has changed as I read a study that Volunteer Educator Jerry Lehman shared with us recently. It's not what I thought! Thank you, Jerry, for sharing your research with all of us.

—Eddie Jones

Background

Deer Creek, at LREC, has several excellent examples of stream meanders. We see obvious erosion at the outside of bends and large gravel bars (point bars) on the inside. When I started volunteering at LREC someone speculated that the gravel bars are formed when the stream slows down on the inside of the bend causing gravel suspended in the water to settle out. This didn't make much sense to me because of the large size of the rocks. Rocks fall directly to the bottom of the stream, they don't float.

I found an explanation of what probably happens in Reference 1. This is an attempt to explain the physics of what's going on.

See **Meander**, page 6

From **Meander**, page 5

Results

As water flows around a bend it actually flows faster around the inside of the curve and slower around the outside. Tests reported in Reference 2 confirm this. This is contrary to what you would expect. If you think of a solid object sweeping around a bend, where everything is fixed together, you would expect the inside to be slower, because it has less distance to cover in the same amount of time. But a stream is not a solid, it's a fluid. Different parts of a fluid don't have to move together.

As water speeds up on the inside of the bend, the pressure decreases. You can imagine the water molecules are further apart because they speed up, so the pressure is lower. The water slows down near the outer bank which causes slightly higher pressure. Another way to think of the pressure difference is to apply Bernoulli's Principle which states that when the speed of a fluid increases the pressure decreases and vice versa.

The difference in pressure causes a secondary flow from the outer bank toward the inner bank pushing material from the outer bank to the inner bank. Reference 2 reports that there is a outward flow across the surface layers and an inward flow along the stream bed. You can think of it as a clockwise spiral motion as you look down stream at a bend to the left. Therefore this scrubbing of the stream bed pushes the eroded material, rocks and all, large and small, toward the inner bank. I expect that most of the erosion and buildup of the gravel bar occurs during high water when the stream is highly energized.

Discussion of results

Some of these thoughts are a little complex for our young students at LREC. But, perhaps some things can be mentioned during teachable moments. For example, when pointing out the erosion on the outer bank we could tell them that in addition to the water flowing down stream, it also circulates in a spiral pattern (use your hands to illustrate), which sweeps the eroded material from the outer bank to the gravel bar.

There may also be potential for some experimentation. How about painting three rocks (large, medium and small) with bright orange paint. Place the rocks at the bottom of the creek prior to a forecast heavy rain. Carefully record where the rocks are placed. After the high water, see where the rocks moved.

References

1. Clegg, B. Inflight Science, *A Guide to the World From Your Airplane Window.* London: Icon Books, 2011.

2. Rouse, H. *Engineering Hydraulics*. New York: John Wiley and Sons, Inc.,1949.

Aerial photo of Deer Creek at LREC. The barn and driveway are visible in the in the lower left.

MARCH
by Martha M. Schermann

Monitoring
Available
Resources
Creates
Habitat

Glass House Quiz: Invasives and Native Replacements

by Danelle Haake and Deanna English

During the winter months at LREC, you can find us removing invasive plant species, sowing native plant seeds in areas we are restoring, and planning what native shrubs and trees we would like to plant to replace the invasive species we remove. Now spring is on its way and many of us are thinking about plans for our own yards. Since you also might be thinking about landscaping this spring to support and attract birds and insects at your home or school, we thought this would be a good time to talk about native alternatives to some of the commonly found non-natives. Hopefully, along the way you will learn a little about what makes our work so special to us.

1. **Which are a few of the common non-native invasive plant species found in the St. Louis area?**
   a) bush honeysuckle and winter creeper
   b) vining honeysuckle and sweet autumn clematis
   c) burning bush and Bradford pear
   d) both a and b
   e) all of the above

2. **We need to supply nectar for pollinators like butterflies in our gardens, but we also need to supply plants that support the butterfly larvae. Approximately how many native butterfly larvae does the common butterfly bush (*Buddleja* spp.) host?**
   a) 0
   b) 10
   c) 100
   d) 1000

3. **What are some native alternatives to butterfly bush to attract butterflies and other pollinators?**
   a) spicebush (*Lindera benzoin*) and buttonbush (*Cephalanthus occidentalis*)
   b) milkweed (*Asclepias* spp.) and coneflowers (*Rudbeckia* spp.)
   c) Joe Pye weed (*Eupatorium purpureum*)
   d) all of the above

4. **If we want to supply the birds with winter berries, which of these sets of plants would be the best to consider?**

Bush honeysuckle. Photo by Danelle Haake.

   a) autumn olive (*Elaeagnus umbellate*), multiflora rose (*Rosa multiflora*), oriental bittersweet (*Celastrus orbicalatus*)
   b) arrowwood (*Viburnum dentatum*), Virginia creeper (*Parthenocissus quinquefolia*), flowering dogwood (*Cornus florida*)
   c) ninebark (*Physocarpus opulifolius*), witch hazel (*Hamamelis vernalis*), hazelnut (*Corylus americana*)
   d) all of the above

5. **Which group of native tree species support the most *Lepidoptera* (moths and butterflies)?**
   a) chestnut, beech, walnut
   b) basswood, ash, spruce
   c) oak, willow, cherry
   d) hawthorn, hickory, pine

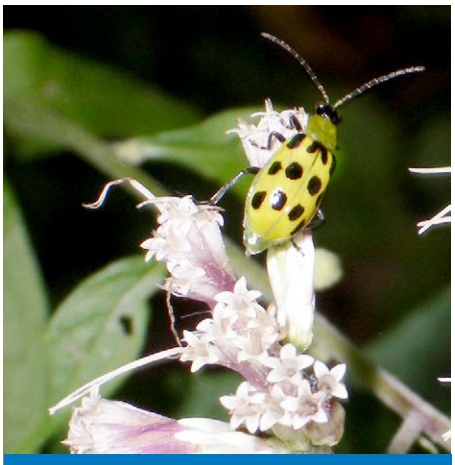
See **Quiz**, page 8

From **Quiz**, page 7

Answers:

1. **e) all of the above.** There are many invasive plant species in Missouri, but these are a few of the more common found in our urban and suburban yards.

2. **a) 0.** Most insects (up to 90%) are plant specialists, which means they are adapted to eat only a limited number of plant species. The non-native and invasive butterfly bush often found at nurseries does not support any native butterfly larvae.



Top: bee on buttonbush. Bottom: beetle on Joe Pye weed. Photos by Danelle Haake.

Ninebark. Photo by Danelle Haake.

3. **d) all of the above.** When planning your butterfly or pollinator garden make sure to consider both nectar plants and plants that supply food for butterfly larvae. Milkweed is a good choice for the monarch caterpillars, but milkweed also acts as a nectary for other butterflies and supports many native wasps, bees, and beetles. Buttonbush is great for wet places and provides nectar and is a host plant for the larvae of at least 18 butterfly species. Joe Pye weed is a real star; it will support over three dozen different butterfly species. Focusing on supporting butterflies will also support many other beneficial native insects.

4. **b) arrowwood (*Viburnum dentatum*), Virginia creeper (*Parthenocissus quinquefolia*), flowering dogwood (*Cornus florida*).** All three of these are Missouri natives and produce berries that support our native birds. On top of that, these natives support insects, which birds need when they raise their young. The plants listed as choice 'c'—ninebark, witch hazel, and hazelnut—are all native species that are great replacements for non-native species, but they do not produce berries.

5. **c) oak, willow, cherry.** Oak, willow, and cherry trees are hosts to over 1400 different *Lepidoptera* species. Caterpillars play a large role in maintaining biodiversity particularly by supporting birds as they raise their young. So, go plant an oak tree!

Source:

Tallamy, Douglas. *Bringing Nature Home: How You Can Sustain Wildlife with Native Plants.* Portland: Timber Press, 2007.

EPHEMERAL ART

On February 22, fifth-graders from Central Christian School decorated the deck with objects they found at LREC. Photos by Eddie Jones.

LREC Announcements

March 18
Volunteer Enrichment: Our Very Own Bob Coulter
1 to 3pm, meet in the barn. Bring your brown bag lunch at 12:30pm or meet us at 1pm for the program. Join in a "no holds barred" discussion of life in schools today, and how that impacts our work with teachers. RSVP to Martha at 314-540-4068 or *martha@lrec.net*.

Local Events

March 5–13
Honeysuckle Sweep Week
In various metro locations. Join other volunteers to remove invasive honeysuckle. More at *http://www.biodiversecitystl.org*.

Various dates in March and April
FrogWatch USA Volunteer Training
6:30 to 8:30pm, at Shaw Nature Reserve, the Saint Louis Zoo, and Broemmelsiek Park. Learn how to gather information for this citizen science monitoring program. Free. More at *http://www.stlzoo.org/education/frogwatchusa/*.

April 23–24
Birds & School Gardens Overnight
9:30am on Saturday to 3pm on Sunday, at Shaw Nature Reserve. Teachers, learn to identify local birds, discover ways to make your schoolyard more bird-friendly, receive resources (tied to Missouri State Standards) to help you teach effectively in an outdoor setting, and deepen your understanding of the importance of habitat on birds. Free. Learn more and register at *http://www.birdsleuth.org/event/birds-school-gardens-workshop-missouri/*.