

Litzsinger Road Ecology Center

Community Newsletter

9711 Litzsinger Road • Ladue, MO 63124 • Phone (314)442-6717 • www.litzsinger.org

Letter From the Future

By Bob Coulter

March 2010

Back in 2007, the Litzsinger staff and board developed goals for where they wanted the center to be by now. Fortunately, great progress has been made on each one, though there is always room for continued growth. Here's a quick summary of what has been done since then:

Continue to build synergy among education, research, restoration, and horticulture: Instead of just a few classes working on restoration projects, that is now the norm for older students. Younger students are building the skills they will be using as they mature, and are benefiting from the work their older peers have done as they observe native species throughout the site.

Expand our high school and college internships: Our college internships continue to provide much needed summer labor, but we now provide a much wider range of opportunities. Several high schools and colleges now have standing relationships to send students to us, and we are gaining the benefit of their faculty expertise.

Manage our partnership portfolio: Back in the 2006-2007 school year we hit the capacity for the center (as defined by the Ladue special use permit). Rather than recruiting all comers, we now focus on schools that apply what they learn at LREC back in the community. We also continue to increase the socioeconomic and racial diversity of our students, and build new programs for students with a variety of learning and behavior challenges. Throughout, we benefit from partnerships with local and national environmental education groups.

Model improved resource use: We're consuming less, recycling more, and using less energy. Tips on how to do this in the

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Upcoming LREC Events:

LREC Stream Team: *New Date!* **Water Chemistry**

March 8, 9–11 am. Please contact Jennifer Brown at (314)961-4410 if you plan to participate.

Ecology School (Volunteer Enrichment)

March 15, 1–3pm. Glass house.

Bush Honeysuckle Work Day

March 23, 9am–3pm. Meet at glass house. Coffee and snacks in the morning, Pizza for lunch. Call Malinda if you're interested at (314) 961-4410.

Garlic Mustard Pull

April 6, 9am–12pm. Meet at glass house. Coffee and snacks in the morning, Pizza for lunch. Call Malinda if you're interested at (314) 961-4410.

Upcoming Opportunities:

Native Plant School: Native Plant Propagation from Seed

March 8, 1–4pm. Whitmire Wildflower Garden at Shaw Nature Reserve. Session includes hands-on tours and demonstrations. \$12 (\$8 for Garden Members). Reserve your place by calling (636)451-3512.

Bush Honeysuckle Removal and Replacement Workshop

March 24, 9:30–11:00am. City of Olivette Community Center. Call Craig Mannion at (314)994-2406 to register.

School Spotlight: Maplewood-Richmond Heights Middle School

Expeditionary Learning: At School, Around Town, Around the Country

By Eddie Jones

A Recipe for Effective, Engaging Middle School Education:

Take two energetic science teachers. Blend thoroughly with 150 adolescents. Season liberally with clear expectations. Sprinkle the mixture over a variety of outdoor learning environments. Yield: Young people who can investigate and appreciate the natural world.

John Harbaugh and Christy Moore, the Maplewood-Richmond Heights Middle School science teachers, are committed to the Expeditionary Learning model as they each work with a community of students for two consecutive years. According to the Expeditionary Learning schools' web site:

In Expeditionary Learning schools, much of the academic work is done in learning expeditions: long-term investigations of important questions and subjects that include individual and group projects, field studies, and performances and presentations of student work. (<http://www.elschools.org>)

And from the MRH school district web site:

Expeditionary learning emphasizes learning by doing, with a particular focus on character growth, teamwork, and literacy. It connects academic learning to adventure, service, and character development. It helps teachers learn to teach reading, writing, science, math, and other subjects through a challenging set of inter-connected real-world projects called learning expeditions. Literacy instruction, embedded in learning expeditions, is a special focus of this design. (<http://www.mrhds.org/pages/curriculum/middleschool.shtml>)

MRH Middle School accomplishes this through a Shared Study, multi-disciplinary series of investigations ranging from historical analyses to environmental stewardship projects. Students convene symposia, create web pages, and venture outside to investigate a variety of ecosystems ranging from eastern Missouri streams to the Smoky Mountains of eastern Tennessee and a coastal region of the Gulf of Mexico.

School Facts:

Location: 7539 Manchester Rd, Maplewood, MO

Grade Levels: 7, 8

Number of Students: 150

Participating Grade Levels: 7, 8

Students Receiving Free/Reduced Lunch: 57%

Website: <http://www.mrhds.org> and
<http://www.mrhds.org/middleschool/MRH/MS%20Home.html>

MRH Middle School students bring their outdoor studies to Litzinger Road Ecology Center six times over a two-year period. During each of these visits, students investigate native and invasive plants and the ecology of the prairie, woods and stream. They do this

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Frozen Phenomena: Streamside Winter Report

By Jennifer Brown

In leading school groups around this winter, many of you may have witnessed a lot of student enthusiasm generated from frozen creek conditions. These frosty conditions have brought with them delicate ice crystal formations, translucent sheets with icy layers, and large blocks of aqua-marine to milky-white ice marvels! During periods of warming temperatures, melting ice caused creek water levels to rise and flow once again. It was on one of these sunny days of snow melt that I gazed down on parts of the frozen creek and could not help but think how some of the large wedges of ice that had started to break apart and shift around in the channel looked almost like mini geologic uplifts! How in the world did those form?, I asked myself.

The only explanation I came up with in response to this interesting sight is that the warmer water flowing underneath caused the ice to fracture in certain places and the energy of the stream pushed these fractures up against one another, causing an “uplift” event. The thrill of seeing these icy features made me remember pictures and accounts I’ve read from the



Deer Creek Frozen
Photo by Jennifer Brown

mid 1800s to early 1900s of when the Mississippi River used to freeze solid. Upon thawing, huge blocks of ice caused tremendous damage to steamboats, at a time when commerce relied upon the river as one of the main means of transport. To my knowledge there have been no recent accounts of the Mississippi River freezing over in this region for some time. So what factors go into causing flowing water bodies to freeze? How are those huge blocks of ice able to float? And why does throwing salt on icy roads and walkways cause ice to melt? These ponderings caused me to dig into a few of the characteristic properties of water to help provide some answers to some of the frozen phenomena encountered this season.

First off, we all know the

formation of ice is caused by freezing temperatures, specifically 32° F (0° C). The density of water is greatly dependent upon its temperature. Lower water temperatures cause constantly moving water molecules to move less vigorously. This results in water molecules crowding closer together and thus, increases the density of the water. This explains why bodies of water are often warmer on the surface and cooler at deeper water levels—denser, cold water sinks. With this being said, wouldn’t this cause ice to sink, too? Bewilderingly, not so! Fresh water reaches a maximum density of exactly 1g/cm³ at about 39.2° F (4° C). At lower temperatures, water exhibits unusual behavior, decreasing

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slightly in density after cooling below 39.2° F and then dropping dramatically to 0.92 g/cm³ upon freezing. This explains why ice floats at the surface of the water instead of sinking.

Saltwater on the other hand has a lower freezing point of 28.5° F (-1.9° C). This lower freezing point is what people are taking advantage of when they put salt down as a de-icing agent. If you ever watch salt melting ice, you can see the dissolving process happen before your eyes—the salt dissolves into the frozen water molecules and the area immediately around the grain of salt begins to melt and spread out from that point. If the temperature of the road or walkway is however, lower than 15° F (about -9° C), then the salt will be ineffective because this is below the freezing point of saltwater, and the salt cannot diffuse into the solid water



Ice Chunks on Deer Creek
Photo by Jennifer Brown

molecule to start the dissolving process. In this situation, using an alternative to salt, such as sand, to provide traction on the ice is a wiser option.

With all this added salt being tossed around in the winter months and eventually running off into our waterways, one cannot help but wonder: What are the effects of increasing the salinity levels in our freshwater streams and rivers? How are freshwater aquatic organisms that evolved with far less saline conditions to survive under this influx of salt (sodium chloride)? The answers seem somewhat intuitive—most freshwater aquatic life is not adapted to handle these altered conditions. In fact, the practice of heavily salting roadways has been proven to be detrimental to many freshwater aquatic organisms. Can we think up alternative ways of dealing

with icy situations in the cold times of the year or at least use de-icing agents such as salt more sparingly?

The characteristic properties of

LREC Stream Team Update

Water monitoring conducted along Deer Creek the week after the Valentine's snowstorms showed a dramatic increase of five times the typical amount of suspended solids detected during other times of the year. Suspended solids could include things like chloride, which is one of the chemical compounds found in salt (NaCl = sodium chloride). Stay tuned for more detailed reports from our continued water chemistry sampling and find out how some of the critters are coping with these stresses when we do our macroinvertebrate sampling in early April.

water, combined with knowledge about some of our land use practices, helps to explain the riddle about the absence of ice on the Mississippi River in the last half a century. As in most ecological stories, the answer is most likely attributed to a number of factors, but increasing suspended solids, such as sodium chloride, and the resulting warming water temperatures certainly plays a role. Increasing ambient air temperatures, as well as dredging and channelization of the Mississippi River to deepen the channel for improved barge traffic, are also likely pieces of the puzzle. What do you think?

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classroom are now a standard part of our communications with schools.

Streamline operational

logistics: To support all of our schools and to enable teachers from different schools to collaborate on projects, an electronic classroom

environment was piloted in the fall of 2007. It is now a standard part of how teachers, LREC staff, and volunteers communicate, resulting in much richer experiences on site and at school. Behind the scenes, a database helps to manage schedules and activity

plans, allowing more time to be spent on building great learning experiences.

Back to 2007: These are in fact goals we are working toward. Teachers and volunteers, please chime in with other areas to focus on, or with ideas of how we can best meet these goals.

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by designing and implementing field investigations as well as participating in the ecological restoration activities of native plant propagation, invasive plant removal, and water quality monitoring. The seventh graders are currently investigating environmental conditions that best promote native plant seed germination, including such factors as soil moisture and temperature, air temperature, and light intensity.

MRH Middle School students thrive in a community-oriented school district that benefits from an ethnically and economically diverse population. The Litzinger Road Ecology Center staff and volunteers are proud to be small ingredients in the “recipe” as we work with students from the early childhood center and the elementary school as well as the middle school of Maplewood-Richmond Heights.

Birds, from page 6



Eastern Bluebird
Photo by Patrick Coin

were introduced from Europe, but only live in the St. Louis area. We think that we put up the houses too late last year for bluebirds, so this year we left them up through the winter and have not disturbed them. Male bluebirds

have bright blue backs and brown breasts. Females have a gray-blue back and brown breast. Bluebirds mainly eat insects such as crickets, grasshoppers, and beetles. Watch for them foraging in family groups, diving down from a low perch to capture an insect. They may have two to three broods of chicks in just one breeding season, depending on the weather and food availability. LREC has great bluebird habitat with open grassy areas adjacent to woods with plenty of dead trees with open nest cavities and bluebird nest boxes. Bluebirds are the official state bird of Missouri, so aside from their beauty, they are interesting for that reason as well. Bluebirds are scarce in St. Louis, likely due to lack of nesting habitat. Learn how to build a bluebird house at <http://mdc.mo.gov/nathis/woodwork/ww2/>.

Birds in the Springtime

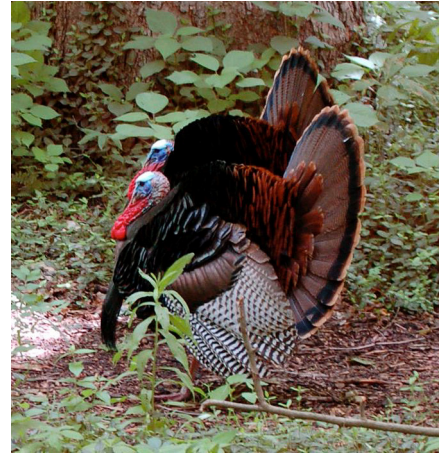
By Malinda Slagle

It's been a long winter, but spring is arriving! The trees are going to start budding soon, and the spring peepers will start calling from the ponds. Watch for spring beauties, dutchman's breeches, and false rue anemone to bloom in the woods. Aromatic sumac will start blooming on the berm, and rose verbenas will be blooming in the savannah.

And one of my favorite signs of spring is always the birds singing. Winter is a good time to observe birds because there are no leaves on the trees and they are highly attracted to bird feeders due to snow cover (especially this year!) and food availability. However, spring is even better! The birds are all trying to find mates and so they sing and show off. Their plumage is the most colorful this time of year to show their mates that they can still escape predators even though they're easy to see. Their feathers also show the quality of the food that they can find. The yellow in some cedar waxwings' tails has changed to orange because of all the bush honeysuckle berries they eat. This change has also been observed in white-throated sparrows, Kentucky warblers, and yellow-breasted chats. No one knows yet how this will affect the

mating behaviors of these birds.

Here at LREC, we expect to see our wild turkeys returning for their spring strutting. Turkeys don't migrate, but they are elusive at LREC in the winter. In the spring, the males or "toms" will fan their showy feathers and display for females, inflating their bright red wattles that contrast with the blue on their heads, and sometimes gobbling at them or at us as we watch the show. Females are a duller brown or gray and usually make little noise. Males are territorial and may mate with as many as five females in one season. If you see two males together, watch for the one that scratches and drums on the ground. That's the dominant male and he's the one that will father the eggs. He fathers an average of six more eggs by being part of a courting pair than if he were alone. A recent study in the journal *Nature* showed that males courting together are close relatives, with half of their genetic material being identical. So, not only do these pairs benefit by the dominant one fathering more eggs, they also benefit because the less dominant male has a greater chance of passing along his genetic material than if he were courting by himself.



Wild turkeys displaying at LREC
Photo by Patrick Sweeney

Turkeys are omnivores. In the fall and winter they mainly eat acorns and nuts. In the spring, they eat roots, seeds, and insects. In the summer, they eat seeds, berries, and insects. At LREC they are often spotted waiting by the bird feeders early in the morning, attacking rival images reflected in the shiny paint of parked cars, or displaying in the paths or rain garden.

Another favorite bird at LREC, the bluebird, will start nesting near the beginning of this month. Volunteer Colleen Crank carefully monitored bluebird nest boxes posted by horticulture volunteers last year. Unfortunately, last year the only residents she found were Eurasian tree sparrows, no bluebirds. Eurasian tree sparrows (or ETSs for short)

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