

# Litzsinger Road Ecology Center

## Community Newsletter

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### Computer Games and the Environment

By Bob Coulter

In his recent book *Last Child in the Woods*, Richard Louv quotes a student as saying that he preferred to play inside since that is where the electrical outlets are. There's no doubt that computer games have a hold on the attention and imagination of many of our students, as well as some of their teachers. This certainly poses challenges for engaging students in making a difference in their community.

Rather than throw our hands up in despair, it might be useful to look for a middle ground. As a step in that direction, LREC began a partnership with the Massachusetts Institute of Technology (MIT) last month to explore how the power of games contained in handheld computers can motivate students' interest in the environment. Far from shoot 'em up games, these are environmental mysteries that guide students through the local community looking for clues and data they need to solve the mystery. We hope that students' engagement with the setting will foster their interest and commitment to the environment. We'll be pilot testing these projects in the schools participating in our LIONS (Local Investigations of Natural Science) after school program, but hope to expand their use in the coming school year.

In a broader sense, it's worth looking at what games give students that all too often, school does not, at least in any way that is meaningful to students. In *Digital Game-Based Learning*, Marc Prensky cites six features of games that overlap what we are trying to achieve with place-based education:

- Rules (*How does an ecosystem work? How does water quality affect organisms?*)
- Goals and Objectives (*What problem are we trying to solve?*)
- Outcomes and Feedback (*How are we doing? How can we do better?*)

See Computer Games, page 5

#### Inside this issue:

That's a Lot of ---- !.....	2
Calling All Volunteers .....	3
Summer '08 Teacher Training at LREC .....	3
What Do Insects Do in Winter? ....	4
New Virtual Tour on Web Site .....	5
Don't Forget to Feed the Birds .....	6
Goodbye Heather .....	8

#### Upcoming LREC Events:

Volunteer Enrichment:  
Rotting Log Ecosystems  
January 29, 12:30–2:30pm. RSVP to  
Martha at [martha@litzsinger.org](mailto:martha@litzsinger.org).

LREC Stream Team:  
Water Chemistry  
January 31, 9am–noon. See page 3.  
Please contact Jennifer Brown at  
(314)961-4410 if you plan to  
participate.

#### Upcoming Opportunities:

Nature's Niche: Reptiles of  
Missouri  
January 8, 10–11:30am at Powder  
Valley Conservation Nature Center.  
Ages 50+. For reservations please  
call (314)301-1500.

Winter Tree ID  
January 9, 10am–noon at Rockwoods  
Reservation. Learn how to use a  
dichotomous key, identify using  
bark, and utilize the tree's shape in  
identification. For reservations  
please call (636)458-2236.

Science Seminars  
January 24 (Pandemic Influenza)  
and January 30 (Greenhouse Effect).  
7:30–9pm at the Saint Louis Zoo's  
Living World. Call (314)768-5408 for  
more information.

# That's a Lot of - - - !

By Jennifer Brown

**T**he LREC Stream Team hopes to add a total of seven additional water quality monitoring point locations at LREC, situated both upstream and downstream of our current monitoring locations. These expansion efforts are being coordinated with the St. Louis County Health Department and Washington University. These institutions were recently awarded a grant from the Department of Natural Resources' Water Protection Division to write watershed management plans for three major watersheds in the St. Louis region. This valuable water monitoring data will be used in the development of watershed management plans that aim to decrease organic matter levels in our waterways.

Organic matter, such as animal wastes, large woody debris, leaves, mulch, grass clippings and other landscaping by-products are harmful to wildlife and humans when they occur in excess in our waterways. These "pollutants" are typically considered by many to be reasonably benign because they are organic and decompose over time. This false thinking, however, has led to the abuse of area watersheds, stream corridors, and streams themselves as people pile or dump horse manure and yard wastes near streams, on stream banks, or into gullies.

According to the St. Louis County Health Department, the horse population of St. Louis County and St. Louis City was estimated to be approximately 1300 horses in 2002. With each animal producing an average of 9.2 tons of manure annually, there is potentially 11,960 tons of manure to manage. This equates to an annual deposition of approximately 72.5 tons of nitrogen, 14.5 tons of ammonia, 72 tons of potassium, and 37.5 tons of phosphorus.

Smaller, but much more numerous, are domestic pets, principally dogs and cats, with an estimated combined population of 700,000 in the greater St. Louis region. Conservatively estimating waste productions at a quarter pound per animal adds another 87.5 tons of animal manure annually. That's a lot of - - - (scat of course)! Much of this pet waste either sits on lawns or park grounds awaiting the next storm event where it is picked up and washed into a nearby waterway or is dumped directly into storm sewer inlets.

In addition to volunteering for the LREC Stream Team to help to



The EnviroScape model demonstrates non-point source pollution.

provide valuable baseline data about the quality of the water in our streams (see article on page 3), individuals can help by picking up after their pets and properly disposing of yard wastes according to their local municipality's waste management and composting programs. As our volunteer educators have learned through working with the EnviroScape model, it is up to everyone in the watershed to reduce the non-point source pollution problems that affect our waterways. Thanks for helping make a difference in the quality of our streams through some of the personal choices you make daily. Perhaps more importantly, thanks for helping to pass this message on to the students with whom we work! ☺

# Calling All Volunteers Interested in LREC Stream Team Activities!

By Jennifer Brown

**S**tarting in 2008, our water monitoring efforts will begin to spread to additional parts of the Deer Creek Watershed. This will allow us to better understand the conditions present along our stretch of stream. I am in need of additional volunteers to help myself and three of our regular volunteers, Ron Nimer, Dale Albers, and Larry Berglund, who have been assisting in monitoring water chemistry once a month.

Ideally, new volunteers will be paired up with a trained staff member or volunteer and assigned two monitoring point locations to sample once a month with that trained person. The first water monitoring date is Thursday, January 31, 2008 from 9am to noon. Subsequent monitoring of water chemistry will take place during the same time on the last Thursday of every month. Contact Jennifer Brown at (314)961-4410 if you're interested in helping out. ☪

*For further information about the need for water monitoring, please see article on page 2.*

## Summer '08 Teacher Training at LREC

All four workshops run 9am–4pm and are held at Litzinger Road Ecology Center.

### **Sustainable Schoolyards**

For Teachers Grades K–12  
June 16–20, 2008

Turn a portion of your schoolyard into an outdoor classroom by engaging your students in the planning, development and management of a native plant habitat. This workshop is based on the Earth Partnership for Schools program developed at the University of Wisconsin—Madison Arboretum, where a number of teachers have successfully restored native plant habitats on their school grounds. The workshop is open to teams of at least two teachers from a school. Contact Eddie Jones at [eddie@litzinger.org](mailto:eddie@litzinger.org) for further information.

### **Introduction to St. Louis Ecology**

For Teachers Grades K–12  
July 21–25, 2008

Learn more about the ecology of the St. Louis region by investigating the prairie, woodland and stream habitats at Litzinger Road Ecology Center, located right in the middle of St. Louis. Participants will increase their understanding of local ecosystems, relate them to basic ecological concepts and gain experience in outdoor environmental investigation. Contact Eddie Jones at [eddie@litzinger.org](mailto:eddie@litzinger.org) for further information.

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The following two courses, part of the **Mapping the Environment** series, involve geographic information systems software. In each workshop, significant time is dedicated to developing your own curriculum project to implement in your classroom.

There is no registration fee for either workshop. Participants are responsible for their own travel and lodging costs. Optional graduate credit is available at an additional fee.

By application only. Download an application at [www.litzinger.org/mapap2008.pdf](http://www.litzinger.org/mapap2008.pdf).

For more information, contact Bob Coulter at [bob@litzinger.org](mailto:bob@litzinger.org).

### **Mapping Your Community**

For Teachers Grades 4–12  
June 23–27, 2008

Meet your curriculum goals while engaging your students in studies of their local community. Participants will develop a curriculum module to take back to school that uses a place-based approach to education and integrates use of geographic information system (GIS) software and other resources to support student inquiry. A school site license for the GIS software is provided to all participants.

### **Mapping Environmental Issues**

For Teachers Grades 4–12  
June 30–July 2, 2008

For teachers with some experience using a geographic information system (GIS), this advanced workshop covers how to identify local data sources and process the data for use in an environmental investigation. Participants will take home their data and an outline for a project. This workshop assumes comfort with basic computer skills, including navigating folders and downloading and unzipping files.

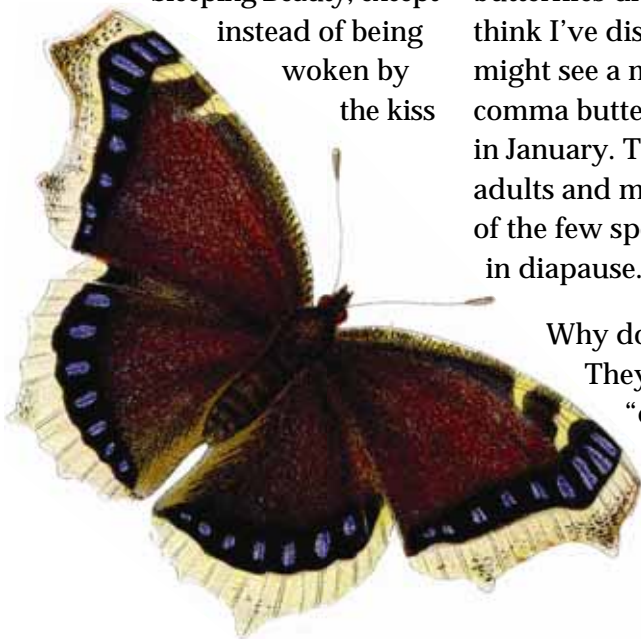
# What Do Insects Do in the Winter?

By Malinda W. Slagle

**A**s I was thumbing through an old Missouri Natural Events calendar (available now at SNR and Powder Valley gift shops, \$5) to try to decide what to write for my newsletter article this month, I noticed a few surprising events in January that caught my eye. January 15: "Snow fleas are visible on snow in sunny wooded areas." January 19: "Watch for mourning cloak and comma butterflies on warm days." January 21: "Adult winter stoneflies may be seen along streams."

These were surprising events because I thought that most insects would be in diapause this time of year, not out and about. What is diapause? It is basically a state of halted physical development, a

Sleeping Beauty, except instead of being woken by the kiss



*Nymphalis antiopa*, mourning cloak butterfly. Illustration by Jacob Hübner.

of Prince Charming, insects are woken by the longer day lengths of spring. While in diapause, the insect pupa does not become an adult, the egg doesn't hatch, the adult doesn't mate, the larva doesn't pupate. Mostly, insects that are in diapause are not active, but I learned that some might drink, eat, or even migrate (like monarchs do) in diapause.

All of the insects within a species diapause in the same life stage. For instance, walking-sticks, most bees, and most aphids diapause as eggs; dragonflies and cicadas diapause as nymphs (for seventeen years for some cicadas!); fritillary butterflies and some moths diapause as larvae; and squash bugs, mourning cloak, monarch, and comma butterflies diapause as adults. I think I've discovered why you might see a mourning cloak or a comma butterfly on a warm day in January. They diapause as adults and maybe they are some of the few species that are active in diapause.

Why do insects diapause?

They are ectothermic, or "cold blooded." Their body temperature is regulated by their environment and varies accordingly.

Invertebrates, reptiles, amphi-

bians, and fish are ectothermic. In contrast, mammals and birds are endothermic, or "warm blooded." Our body temperatures are regulated by generating heat via our metabolism, and are constant. Because insects are ectotherms, in cold temperatures, they are not able to function normally. Insects in diapause produce antifreeze so their bodies don't form ice crystals and their metabolic rate falls so they don't have to eat.

Some insects that produce this antifreeze have a special adaptation that allows them to be active in freezing temperatures without going into diapause. Snow fleas are often seen on the snow as tiny black spots. They are active in warm weather too, but can only be seen on the snow because they are so small. They are not actually fleas, but springtails, a group of wingless insects that have projections on their tails that allows them to spring in the air. Most springtail species are tiny, live underground, and are detritivores. Detritivores eat dead organic matter.

What about the stoneflies? Stoneflies are able to emerge on warm days from their nymph stage, which is aquatic. They overwinter in the unfrozen areas of the water and are able to continue eating

See Insects, page 5



Insects, from page 4

their favorite decaying leaves then emerge on warm days to mate and lay eggs.

How can you find insects in winter that are in diapause? Where should you look? Most insects diapause in leaf litter or underground. They may be hard to locate in a soil or litter sample because they won't move. Some insects are in galls, in hollow plant stems, in wood, furrows in bark, or in tree cavities. Think of the places you have seen woodpeckers, nuthatches, chickadees, and Brown Creepers hard at work. These are the places to look for diapausing insects. If you find any, try to figure out what they are, record your findings, and put them back where you found them. ☞



*Plecoptera*, stonefly.  
Photo by Trépas.

*References:*

Missouri Department of Conservation. 2005. *Natural Events Calendar*.

Waldbauer, G. 1996. *Insects Through the Seasons*. Harvard University Press, Cambridge, MA. pp. 216-236.

Computer Games, from page 1

- **Conflict, Competition, Challenge, and Opposition** (*What factors do we need to overcome, such as pollution or invasive species?*)
- **Interaction** (*How can others help with the project?*)
- **Representation or Story** (*How did things get this way? How will they be better after we're done with our project?*)

Which of these gaming attractions are in your curriculum? ☞

## New Virtual Tour on Web Site

By Jennifer Krause

Last summer Sean Fears carefully photographed twenty sites at Litzinger Road Ecology Center. Standing in each spot, he rotated 360°, taking photos at even intervals. Using computer software, he then "stitched" the photos together to create twenty 360° panoramas. These were saved as QuickTime VR movies and are now posted on our web site at [www.litzinger.org/tour.html](http://www.litzinger.org/tour.html).

You can navigate among the panoramas by clicking on "hotspots" located in each movie. Or click on links in the aerial view to take you quickly to a particular spot.



Winter panoramic photo by Sean Fears.

# Don't Forget to Feed the Birds

By Colleen Crank

**W**inter is a difficult time of the year for the birds. Not only do they have to deal with cold temperatures, but limited food and water supplies as well. Many of the fruits and berries are gone and bugs and insects are difficult to find. A lack of rainfall has diminished water resources and cold temperatures have frozen most existing water supplies.

Most bird species will switch from a diet of insects and fruits to seeds and grains during the winter months. Chickadees, titmice, Downy and Red-bellied Woodpeckers, and White-breasted Nuthatches will store insects and nuts for winter consumption and join flocks that contain several bird species to forage for food.

If you have never placed a bird feeder in your yard but are interested in doing so, now is the perfect time to do so. Your feeding station can be as simple or complex as you desire and good feeders are an essential component. The perfect bird feeder is strong enough to withstand the elements, holds a large amount of seed (to avoid constant refilling) and keep moisture away from the seed. Keep in mind

that you will need to periodically clean this feeder so easy assemblage and access is important as well.<sup>1</sup>

Location is another important factor. The ideal feeder will be at least ten feet from nearby branches and other ambush points for predators but yet in an area where the birds have access to cover from the elements and danger. A variety of trees and shrubs are good for the feeder birds and a nearby brush pile for the ground feeders is ideal. The feeder should also be out of direct sunlight, away from glass windows and doors to prevent fatal collisions, and be protected from the wind.

There is some seed that is better than others to feed during the winter. Black-oil sunflower seed is an excellent winter food because it is high in fat and protein and most birds can break the seed's thin outer shell. Cardinals, Blue Jays, chickadees, and woodpeckers are especially fond of black-oil sunflower seed.



Top to bottom: White-breasted Nuthatch, Eurasian Tree Sparrows, and Northern Flicker. Photos by Colleen Crank.

Suet is also an excellent source of fat for our feathered friends, especially since the birds need a high number of calories to keep their bodies warm. Commercial suet cakes are made from

See Birds, page 7

<sup>1</sup> Cornell Lab of Ornithology [www.birds.cornell.edu/pfw/AboutBirdsandFeeding/FeederTypes.htm](http://www.birds.cornell.edu/pfw/AboutBirdsandFeeding/FeederTypes.htm)

<sup>2</sup> Cornell Lab of Ornithology [www.birds.cornell.edu/AllAboutBirds/attracting/feeding/other\\_foods/document\\_view](http://www.birds.cornell.edu/AllAboutBirds/attracting/feeding/other_foods/document_view)

“rendered” suet, a process that involves melting, cooking, and straining out impurities so that the finished product is less prone to spoiling.<sup>2</sup> You will find suet in grocery, feed, and bird-feeding specialty stores. You can also make your own suet, and recipes are easily found on the Internet. The base ingredient for most homemade suet is peanut butter, but Crisco or lard is a great substitute for those with peanut allergies.

Woodpeckers are especially fond of suet, but you may also find Carolina Wrens, chickadees, titmice, and Blue Jays flocking to your suet feeder.

Whole peanuts are another excellent source of high fat and protein. There are peanuts packaged for the birds on the market today, but peanuts from the grocery store are just as good, provided they are of the unsalted variety. Woodpeckers and Blue Jays love the high-

energy treat and you may see chickadees, titmice, and nuthatches pecking away at the peanuts as well.

Water is just as important to these birds as food. Obviously water is prone to freezing this time of year, but hardware stores and bird-feeding specialty stores sell immersion heaters, and there are birdbaths that contain built-in heating units. The best birdbath is the one that imitates a puddle, shallow with a slight slope. A plastic birdbath is also ideal, as it will not crack in freezing temperatures and is easy to clean. There are a few things to keep in mind while maintaining a winter birdbath. Make sure the water is ½”–1” deep at the edges of the bath and no more than 2” deep in the middle. Change the water every few days and scrub out discarded seed and other muck from the basin.

Not only do the birds benefit from the food and water, but

you do as well. It’s fun to watch the birds as they hop and flit about the feeders on a cold winter day. And the feeding doesn’t need to stop when winter ends. Bird activity and behavior at your feeders will change along with the seasons. When spring rolls around you may be lucky enough to witness a male cardinal feeding his potential mate or watch a young fledgling chickadee chase a parent and beg for food during the summer and fall. So don’t delay, put those feeders up and let the fun begin! ☺

*Resources:*

Cornell Lab of Ornithology  
[www.birds.cornell.edu/](http://www.birds.cornell.edu/)

Wild Birds Unlimited  
[www.wbu.com/edu/](http://www.wbu.com/edu/)

*Colleen Crank is an LREC Education Volunteer, frequent contributor to the LREC blog ([www.litzsinger.org/weblog](http://www.litzsinger.org/weblog)), and an avid birder.*

## Volunteer Enrichment Program

### Rotting Log Ecosystems

January 29, 12:30–2:30pm

Where are the bugs in the winter? One answer is—inside rotting logs! LREC volunteers are invited to this guided investigation of rotting logs as ecosystems. Participants get to be the students!

Please RSVP to Martha ([martha@litzsinger.org](mailto:martha@litzsinger.org)).





# Goodbye Heather!

by Eddie Jones

**W**ith a mixture of sorrow and joy, the Litzsinger Road Ecology Center community is saying goodbye to Heather Wells-Sweeney. Heather's husband, Patrick, recently completed his PhD program and has accepted the position of Collections Manager of Botany

at the Peabody Museum of Yale University. Heather, Patrick, and their two sons, recently departed St. Louis for their new home in New Haven, Connecticut. During her four and a half years at LREC, Heather effectively coordinated many student field investigations. Heather also directed the Ecological Restoration Corps, a

summer program for high school students, and coordinated Volunteer Educator recruitment and training. We are all grateful for the time that we have benefited from Heather's cheerful and professional approach to her work. We wish her family the best as they begin a new chapter in their life. ☘

*On my first day of work at LREC, my new boss, Celeste Prussia, turned in her letter of resignation. The other instructor, Stacey, was six-months new to teaching at the Center. And I was curiously exhausted every evening from—unbeknownst to me at the time—being pregnant with Alex. Needless to say, I was off to a rocky start in my new job.*

*Thankfully I could turn to the staff—Mary, Martha, Joe, Jennifer Krause, Stacey, and Bob—to figure out my job. Luckily, great changes were on the horizon, thanks to Bob. Soon Stacey and I had help when Eddie was hired. I don't think I would have made it otherwise (then or since). A few months later, Bob agreed to step up as Director so we finally had direction and guidance. Not long after, we moved from the Lee Center to our current desk space—I like working where I work :-). An even better improvement was our transition to our current model of partnership with our teachers. Plus, we have all benefited greatly from the expansion of the staff to include another "instructor type" (thank you Sean!), a naturalist (thank you Jennifer!), and a restoration ecologist (thank you Malinda!).*

*I am glad that I stuck around to be a part of the great changes that have transpired here. I am sad that I will not realize some of my dreams for the Center, like holding Litzsinger-based field guides in my hands with kids; but, I am excited by the energy and commitment I see. I look forward to hearing of your future successes as I keep in touch. You are all very dear to me, and I will miss you.*

*Cheers,  
Heather*



Heather assists an Ecological Restoration Corps participant.