

# Litzsinger Road Ecology Center

## Volunteer Newsletter

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### Seasons Going 'Round

By Bob Coulter

**W**hen I was teaching at a school in suburban Boston back in the 90's we used to end each year with an assembly for the whole school, which always included a ritual of singing Joni Mitchell's "Circle Game" to mark the cyclical nature of what we did. Each year as the kids grew from toddlers to pre-teens, we would celebrate their growth and look forward to another year soon to come.

In a similar way, we are moving along in both our natural and program cycles, welcoming the new growth of spring, wrapping up school-year programs, and looking forward to an engaging summer. Restoration projects removing the honeysuckle from the front of the property and stabilizing the stream banks are proceeding well, and we have several research projects underway investigating—quite literally—the birds and the bees, along with the ants, moths, and other critters that make their homes here. In the next couple of weeks we'll be hiring interns, each of whom will be conducting their own mini-research project, adding to our understanding of the site.

We also have a busy summer lined up with teachers, students, and 4-H leaders. A re-developed Ecological Restoration Corps program debuts this summer, along with several weeks of field studies for our partner school districts and the Garden's "CampMBC" programs. Workshops will help teachers from our partner schools and elsewhere engage their students in meaningful investigations, and as we did last year, we will be hosting 4-H leaders and youth participants as they develop plans to investigate and enhance their local communities. New outreach programs will take us to north St Louis, enhancing environmental programs that are being offered by Lincoln University and the Youth and Family Center.

Looking toward the fall, we are beginning to receive applications for field studies to be done in the coming school year. In keeping with our goal of helping teachers and their students develop a strong attachment to their local places, priority will be given to schools with specific plans to extend what they learn at LREC back in their schoolyard or community.

As noted several times during the Garden's volunteer appreciation evening, we couldn't do it without you. Your work in maintaining and enhancing the grounds and in working with teachers and students makes each cycle meaningful.

#### Inside this issue:

A Gallery of Galls.....	2
New Programs Take Flight.....	3
Herbarium Happenings.....	5
Foray Finds Fungi.....	6

#### Upcoming LREC Events:

##### LREC Volunteer Appreciation Party

June 8, 11 a.m.–2p.m. At Faye Roth's Home. For more information or to RSVP call Martha at (314) 442-6717.

##### Summer Volunteer Opportunities:

Be sure to check the calendar if you'd like to volunteer this summer.

#### Upcoming Opportunities:

##### Whitaker Music Festival

Wednesday evenings at 7:30p.m. At the Garden. Free outdoor concert series featuring jazz pianist Peter Martin (June 7), St Louis Stompers ragtime and Dixieland band (June 14), Tom Byrne quartet (June 21), and Mardra and Reggie Thomas (June 28). Concerts continue into July and August.

##### Earthways Home Open House:

June 17 and 18. Public tours 11 a.m., noon, 1p.m. and 2p.m. \$2. 3617 Grandel Square. Call (314) 577-0220.

## Now Showing at LREC: A Gallery of Galls

By Eddie Jones

Whether you're at the ecology center every day (like me!) or a 3<sup>rd</sup> grader on a return visit to LREC, the ball-shaped swellings on some prairie plant stems capture the attention all LREC explorers. You have probably not only noticed, but also examined both the smooth ball galls and the leafy bunch galls that appear on the stems of goldenrod (genus *Solidago*).

Galls are a plant reaction to the attack of a parasite. The parasite's presence stimulates cell division and/or cell size of plant tissue that results in an abnormal growth on the plant's roots, stems, leaves or other structures. In addition to providing the parasite with a food source, the plant gall forms a protective environment for the parasite. You may recall that a parasite is any organism that lives on or in another organism at the expense of its host. It is to the parasite's advantage that its host remains alive and relatively healthy. Gall causing organisms tend to be picky; each attacking one, or a limited number of plant species as well as having preference for a particular part of the plant (stem, root, growing tip). The size, shape and location of a gall can give clues as to the identity of the parasite.

In the case of goldenrod ball galls, the parasitic perpetrator is a little (5mm) fly that has trouble living up to its name. It spends much of its adult life not flying at all, but walking up and down goldenrod stems. The Goldenrod Gall Fly (genus *Eurosta*) mates and lays eggs into a goldenrod stem. The eggs hatch in about 10 days, with the larva subsequently chowing down on the inside of the stem, stimulating gall formation. As fall arrives and the stem and gall turn brown, the larva digs an escape tunnel to the surface of the gall but does not depart. Instead, it overwinters in the gall, with the aid of some self-produced anti-freeze. In the spring, the larva pupates and emerges from the gall as an adult. The adult fly lives for about two weeks during which time it does not eat.

Gall flies have predators. Chickadees and Carolina wrens break into the gall to eat the larva. Each bird does a distinctive type of damage to the gall, with the chickadees making the bigger mess. There is also a beetle that burrows into the gall to eat the larva. Two species of wasp in the genus *Eurystoma* inject their own eggs into the goldenrod galls where their larva hatch and feed on the fly larva. Both



▲Ball Gall

▼Bunch Gall



the wasp and the fly are dependant on goldenrod to complete their life cycles.

Goldenrod bunch galls (the leafy clumps) are caused by the larva of a midge-like fly, *Rhodopalomyia*. Females lay eggs at the growing tips of plants in late summer. As a result, leaves form at this tip but stem growth stops, producing the rosette or "bunch" of leaves. The larva of this fly pupates and emerges as an adult in the early fall. The bunch gall may contain more than one larval chamber.

See **Galls**, page 6

# New Programs Take Flight

By Heather Wells-Sweeney

We had a rare sighting at LREC recently—*high school students*. The Normandy High School BIO Club came to LREC for a Field Study on May 17. Typically the structure of high school schedules prevents high schools from taking advantage of our facilities during the school year. However, Normandy High School classes run from 7:20 a.m. to 2:12 p.m., opening the afternoons for their after-school groups to come to LREC.

The Normandy High School Field Study was a dream come true: students came to LREC to plug into site-based research. The BIO Club students joined our volunteer Colleen Crank in her study of bird nest boxes. Colleen is compiling data on nesting activity to learn about clutch sizes and rates, parasitism of nests, and competition for nesting sites.

The BIO Club students came to investigate two questions: *What is the state of the nest in a nest box?* and *What species of birds visit the feeding station?*

Students were able to look in nest boxes and were able to see a Eurasian Tree Sparrow egg that Colleen held out for them. The students met the goals of the teachers by recording data and making observations. Their great observations led to

great questions—a sample of those questions is shown in the sidebar and the complete list of questions, along with a sample student data sheet, can be seen on the blog at [www.litzsinger.org/weblog](http://www.litzsinger.org/weblog).

The success of this Field Study was due foremost to the partnerships that made it possible, including the better integration of site management with our research and education goals. Malinda recognized the need to get nest boxes ready for spring nesting and the Friday team of "Hort Volunteers" worked feverishly to make it happen. They repaired boxes that had weathered and they built and installed new boxes.

There is absolutely no way this Field Study would have happened without Colleen's establishment of a research program to monitor nest boxes. Colleen brings to LREC two seasons of experience checking nest boxes and four years of experience with mistnetting. Since March she's been dutifully checking nest boxes at LREC. Her data set and her familiarity with the LREC boxes guided the structure of BIO Club's Field Study.

The connection to Normandy High School came through

See **Flight**, page 4



Colleen shows students a tiny Eurasian Tree Sparrow egg

## Samples of questions asked by the students:

*What's the difference between a house sparrow and a Eurasian Tree Sparrow?*

*Does Colleen fill out a data sheet each time she checks the nest? Is this to see if there are changes?*

*Do sparrows use their own feathers as nesting material?*

*Do [birds] repair their nests?*

*How long does it take to raise their young?*

*Why do you want to remove the nest that stinks?*

*Does the mother teach the young to fly?*

**Flight**, from page 3

contact with the Missouri Science Teaching and Education Partnerships (MO-STEP) program. MO-STEP is part of the GK-12 initiative of the National Science Foundation, which pairs Fellows with teachers in underserved high schools. Two MO-STEP graduate Fellows, Danielle Lee and Patrick Sweeney, have been working with Normandy High School teachers Dr. Pamela Watson, Ms. Kathy Farrar, and Ms. Maria Khademian. Ms. Farrar, the Science Chair, sponsors the BIO Club.

When the MO-STEP team at Normandy learned that Eurasian Tree Sparrows are nesting at LREC, they immediately saw the connection to their program (see [http://icte.umsl.edu/MO-STEP/sparrow/sp\\_index.html](http://icte.umsl.edu/MO-STEP/sparrow/sp_index.html)) and they starting hatching a plan to bring BIO Club students to LREC. Danielle and Patrick, along with MO-STEP undergraduate Fellows Lyndell Bade and Jessica Kossuth, met with LREC staff to jointly develop the lesson plan.

From the planning process arose two new partnership opportunities. First, in discussing Colleen's procedure for checking nest boxes, we realized the opportunity to expand the research program. Originally, Colleen had

planned to discard the nest material, as she had been trained; but, by planning the lesson along with the MO-STEP team, we learned of an opportunity to study bird parasites. So, the BIO Club students assisted in collecting the nests from two nest boxes. The nests are being delivered to Dr. Patricia Parker, an ornithologist at the University of Missouri-St. Louis and a Principal Investigator with the MO-STEP project. Lyndell and Jessie are returning to LREC to join Colleen in retrieving the remaining nests.

Lyndell also realized the connections between LREC and a new MO-STEP program. Looking to our summer service-learning program for ideas, Lyndell is developing a summer internship for the MO-STEP high school students. Plans are underway to bring

the interns to LREC for continued bird studies, possibly including mistnetting.

Additionally, the Field Study itself created new connections. One student asked what programs they could sign up for, which led to all 7 students requesting applications for the Ecological Restoration Corps (ERC). On the way back to school, a lively conversation about birds continued, and by the time they got back to school, they had formed a Bird Club with Ms. Farrar—with hopes of returning to LREC in the fall.

We are looking forward to these new partnerships and connections being realized and we will keep you informed about how the programs develop. If you are interested in being involved in further developing our bird research curriculum, please contact me.



# Herbarium Happenings

By Malinda Slagle

Every other Tuesday since March 7<sup>th</sup>, 7 volunteers and 3 staff have been meeting to collect and catalog plant specimens for a growing herbarium collection. So what is an herbarium? An herbarium is a collection of dried plant specimens mounted on paper that has the plant's species name, collection date, location, associated plant species, and size of the population. Herbaria are useful for researchers that are trying to identify a plant, research its habitat and distribution, document its occurrence in a particular time and place, and study the variability of physical characteristics of a plant species to describe it more accurately.

At the LREC herbarium, we plan to have at least 2 flowering and 2 fruiting specimens of each of the 421 plant species that we have documented on site. We plan to collect two specimens of each so that we have a specimen available for research purposes, and one that can be used for teaching purposes. The specimens for teaching purposes can be used when plants are dormant to give students a better idea of what the plants look like in a certain habitat or what plants look like whose seed they are cleaning or propagating. LREC has nowhere near as large a collection as the Missouri Botanical Garden (5.2

million specimens) or Kew Gardens (7 million specimens), but our collection is growing. So far, LREC staff and volunteers have cataloged hundreds of specimens and have collected 66 different plant species since March, ranging from silver maple to tall fescue to blue bells.

How do we collect and press all these specimens? We take a walk on the grounds, armed with trowels, clippers, plastic bags, data sheets, and clipboards. We look for flowering or fruiting plants, any size from 40-foot tall walnut trees to 3-inch tall chickweed. We take either a small piece of the plant (if large) or the whole plant if it's small, being sure to collect all of the characteristic parts of the plant. We then document the collection in our data sheet, recording the date collected, collectors, habitat, associated plants, plant population size, location on site, and tentative identity of the plant. We assign a number to each specimen and mark the number on the bag we collect it in. We try not to duplicate collections from previous weeks or our existing collection. After we have made several collections, we take them back inside and lay them out individually on newspaper so that the flowers can be seen clearly and the leaves are as separated as possible with at least one leaf facing up and one

facing down. Between the newspaper, we stack absorbent blotter paper to soak up moisture and cardboard to provide circulation. The specimens are then tightly bound between two boards with adjustable straps. Finally, one of the staff takes the plant press to MBG where they have plant drying ovens. These ovens dry our specimens quickly and kill any insects and insect eggs to protect our collection from being eaten.

What's the next step? We will continue meeting on first and third Tuesdays of each month at 9 am at the Glass House to collect and press plant specimens. Additionally, Nancy and I will be going to MBG to learn how to mount the dried pressed plants onto paper. We will train other staff and volunteers (date TBA). We also still need to enter the information from our current collection into a database on the computer so that we can more easily know what specimens we have available and the information about them. Following training, computer data entry could be done on your own schedule anytime during our hours. We very much appreciate the work of volunteers on this project so far. We could not have gotten this far without you! Please let us know if you are interested in working on any aspect of the herbarium, we welcome all who are interested to be involved.

## Foray Finds Fungi

by Heather Wells-Sweeney

**T**here's a fungus among us.

There are many kinds of fungi here, as we learned from a survey that happened earlier this month. Thanks to Chuck Yates, the Missouri



Mycological Society (MOMS) conducted a Mushroom Foray here on May 4<sup>th</sup>. The MOMS survey team was composed of Charlie Raiser, Joe Walsh, and Chuck.

Their species list includes wolf's milk, stinky squid, and coral crown. The most impressive specimen they found was a 20-cm diameter fruiting body (mushroom) of Dryad's saddle; Chuck was a bit surprised because he'd never seen that species here before, let alone one that size. For a complete species list, visit our website at [www.litzsinger.org/inventories.html](http://www.litzsinger.org/inventories.html).

The formal Ecological Survey of the site that was conducted in 1992 by Dr. Clifford Ochs (see the website again) did not include a mycological inventory, and I have not found any record of such a survey being conducted otherwise. Knowing what organisms make their home here is key to knowing how populations change over time; and, knowing how populations change over time helps us in evaluating our management practices. We are grateful to MOMS for helping us establish baseline information of what mycological mysteries dwell amongst the humus and woody debris of LREC.

The mushrooms species that MOMS found on the Foray may or may not be seen again until next spring, but Chuck assures us that any season is a good time look for mushrooms—especially a few days after a rain. So, next time you're here be on the look-out for these fungi and others.

Also, consider joining MOMS on one of their Forays. MOMS leads Forays throughout the area, with their largest event being the fall Foray to Mingo Swamp. For more information, visit [www.missourimycologicalsociety.org](http://www.missourimycologicalsociety.org).

Galls, from page 2

Not all galls are caused by insects. Some are the result of mites, worms, viruses, fungi or bacteria. Crown gall disease results in the growth of roughly textured galls on the roots and stems of many plants. The bacterium, *Agrobacterium tumefaciens*, is the gall-causing parasite. Unlike arthropod-induced galls, crown galls do not have an interior chamber where the insect larva develops. Crown gall disease is of economic as well as ecological importance as it attacks fruit crops and landscape plants. The recent development of herbicide-resistant crop plants was made possible with the help of *Agrobacterium*, which has the natural ability to inject its own DNA into plant tissue. This normally results in gall formation, but was exploited by the genetic engineering industry to transport herbicide-resistant genes into plant reproductive cells. While the extent of crown gall disease at LREC is unknown, there are a variety of woody plants that exhibit gall formation at the ecology center. While it may be a few weeks before the new goldenrod galls appear at Litzsinger Road Ecology Center, please explore the gallery of galls that is currently showing along the woodland trails.