



# Kemp's Point

Volume 12, Number 2, Fall 2011

News from the University of Wisconsin-Madison's Kemp Natural Resources Station

## Mammalogy at Kemp Station

Niche, a term used to describe the ecological and physiological parameters of a species, was first used in a 1917 scientific paper by Joseph Grinnell.

Grinnell trained our country's first mammalogy students at the Museum of Vertebrate Zoology at UC Berkeley, the first natural history museum associated with a public university in the United States. One of Grinnell's students, E. Raymond Hall, was among those who trained the next generation of mammalogists, including Charles Long, who came to the University of Wisconsin - Stevens Point, helped to establish its Museum of Natural History in 1966, and recently published *The Wild Mammals of Wisconsin* (2008). Now it is my responsibility to train a new generation of mammalogists in Wisconsin, and I recently discovered Kemp Natural Resources Station to be the best classroom in the state to do this.

There are two ways I teach mammalogy. Each fall I teach a traditional lecture/lab course for 75 biology and wildlife students at UW Stevens Point. While they learn a lot about mammals, it's hard to take 75 students out into the field to census mammals. Each summer I teach a field based course for 16 students, and it is in this course where students learn about being a mammalogist. A typical day starts with a trap check at 5:30 AM. After all the small mammals have been processed, a team of four students cooks breakfast and another team is assigned to clean up. During daylight hours, when most mammals are inactive, we have lectures and labs in the boathouse,

by Christopher J. Yahnke, Associate Professor of Biology

and plenty of recreational breaks to cool off in the lake. Before dark we set live traps and game cameras, and after dark we census bats using acoustic monitoring equipment. Teams of students spend the week working together not just cooking and cleaning, but they work together in the classroom, the lab, and the field. In the field they solve problems like deciding where to place traps, how to

partition the work to efficiently lay out trap lines and conduct trap checks, and discuss identifying mammals through signs like burrows, tracks, scat, rubs, or destroyed equipment (bears love crunching Sherman live traps – they smell like peanut butter but provide a disappointing payoff for the bear).

The data we're collecting will tell a story about the small mammal and bat communities at Kemp over time. Each summer we will set our trapping grids in the same two habitats; a relatively intact maple hemlock forest, and the blow down area that con-

tains a ribbon of gnarly but tasty raspberries and a picturesque fern gully (I thought that was just an animated movie). In Wisconsin, mammalogists are documenting some significant species replacements in the northern part of the state. Southern flying squirrels are replacing northern flying squirrels, eastern chipmunks are replacing least chipmunks, meadow jumping mice are replacing woodland jumping mice, and white-footed mice are replacing woodland deer mice. Kemp is revealing this species replacement in its small mammal communities.

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*UW Stevens Point mammalogy student, Mike Spaight, enthusiastically displays the result of his trap check.*

## Reflecting on the Season

By Tom Steele

It's a foggy, fall morning as I write this. There's a heavy dampness in the air and an early wave of color hangs from the trees. Most of our researchers and students are gone now. Although, there are still a few stragglers. Like late-migrating birds, they are busily wrapping up their fieldwork or squeezing in one more field trip. But overall it's quiet at Kemp and a marked change from the frenetic activity of just a few weeks ago.

The combination of fog, dampness and quietly falling leaves lends itself to reflection, and in my case, reflection about another field season that's in the books. And what a season it has been.

I am happy to report that research activity remains high at Kemp. Once again, we supported scientists literally from coast to coast. Our list of researchers included old friends from the University of Maryland whom we hadn't seen in years, and brand new scientists from Lawrence Livermore National Laboratory in California. Add to these dozens of researchers from throughout the Midwest and the result is a diverse group of scientists and science, all working to expand our knowledge about the world around us.

Our teaching program continues to thrive. This year Kemp hosted hundreds of students from around the state. And while their individual studies varied—from wildlife to forestry to ecometeorology—their experience didn't. Namely, critical, hands-on learning that is simply not possible in a campus classroom.

The Kemp Outreach Series flourished again this summer thanks to Karla's hard work. And it continues to attract new participants to the station. One program that particularly stands out was Scott Craven's wild game cooking class. It's safe to say that class was the tastiest outreach event we've held at Kemp in quite some time; we look forward to a second helping again next year.

And we continued to make improvements to the station's infrastructure. Two projects that come to

mind are the Pavilion project and the Kemp Cloud/Wireless project. The Pavilion project involves converting the station's 90-year-old carport into an attractive pavilion and outdoor classroom. To date, Gary has completely refurbished the pavilion interior with beautiful knotty pine paneling. The next step is to build a small addition (to store tables, chairs and audio-visual equipment) that matches the historical log construction. Tamarack trees at the Rhinelander Agricultural Research Station were harvested to serve as building materials. These logs were peeled and cut to match the half-log construction of the original structure. Check out the photo collage on Page 6 to see some of the steps in this process.

While the Pavilion project involves refurbishing the old, the Kemp Cloud/Wireless project involves adopting the new. Namely, extending wireless Internet connectivity across the entire station, including the station's old-growth forest, bogs, shoreline and surrounding Tomahawk Lake. A recent study by the Pew Research Center identified two dominant technological advances that are changing modern computer usage. They are cloud computing (where data, software and services are housed on remote computers accessed via the Internet) and the increased usage of portable computing devices such as laptops, tablets and smartphones. The Kemp Cloud/Wireless project embraces these trends to enhance the station's research and instructional infrastructure. When completed, scientists will be able to deploy environmental sensors throughout the station to monitor ecological processes in real-time. And instructors and students can harness all of the informational resources of the Internet whether they be chest deep in a soil pit, perusing a deer enclosure or exploring the station's nature trail.

So in review, it has been another full and productive field season at Kemp. And that brings my reflections to a close. Perfect timing too—the fog has burned off, the sun is shining and it's time to get outside.

Best wishes for a grand autumn! 🍂



# Through the Eyes of a Child

By Karla Ortman

I always thought I had a pretty good eye for noticing the little things in life, but after spending some time outdoors with Greyson, my soon-to-be 6-year-old nephew, I realized “my eye” isn’t as quick or as sharp as it could be.

In mid-August, we had a family gathering at the home of my dad’s cousin. They have a nice place near Brooklyn, Wisconsin, with horses and goats, surrounded by cornfields. It was a nice day so we spent time exploring and playing. Greyson was messing around on the swing set in the yard when he exclaimed, “Aunt Karla! What’s that?!” It took me a moment to find what he had spied with his keen eyes – it was the nymphal skin of a rather large insect. I immediately thought of

the dragonfly exoskeletons found on the Kemp boathouse each year and explained to Greyson what he had found. But what I wasn’t sure of is what particular insect had emerged from this now delicate, crusty shell.

Further exploration of the yard led to more discoveries of the same skins – and Greyson’s voice grew with excitement when he found multiples on the trunk and branches of a single tree! This hubbub drew spectators and soon someone discovered a living specimen of the animal that had emerged from one of the empty shells. It was a cicada.

This particular cicada had a greenish body with black markings, green/black eyes, was about two inches long, including the wings, and at least as big around as one of my fingers. I knew it was a treat to see this creature, as it is more common to only hear them. In July and August male cicadas

sing to attract mates – it is a powerfully loud sound and since the vocalization attracts competing males to the area, the chorus of cicadas can become deafening.

I now know that we were

looking at a dog-day cicada. They have a 2- to 5-year life cycle, which overlap among individuals, so these critters are present in our landscape every year. They should not be confused with the 17-year cicada, known as a periodical cicada, which truly does only emerge every 17 years. The last emergence in Wisconsin was in 2007, so look for these smaller creatures with their red eyes in 2024.

The cicada lifecycle is rather interesting. The adult female cuts a slit into a twig and deposits her eggs. When the eggs hatch, the nymphs fall to the ground and burrow into the soil. The nymphs feed by extracting juice from roots underground. Once fully developed, they burrow out of the ground and climb to a vertical surface, like a tree, and then emerge as adults, leaving their nymphal skin behind to be found by a little boy or girl exploring the natural world!

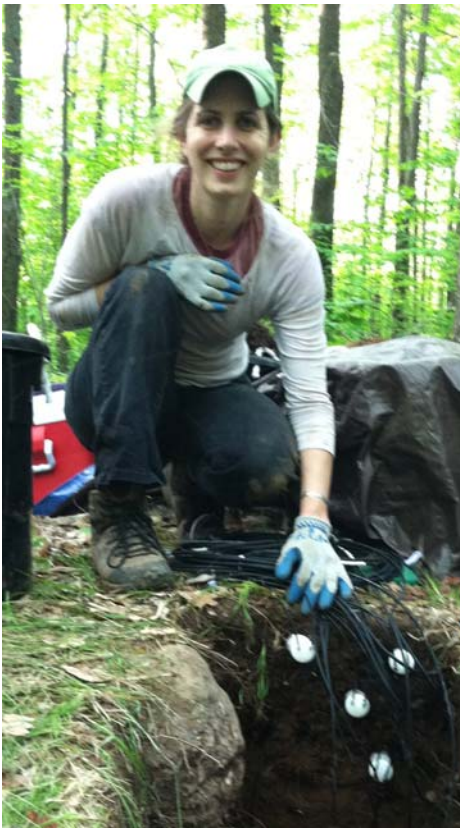
Our next outing was a hike at a county park near Greyson’s home. It was a warm, sunny day and we tromped along a boardwalk through a marshy area and on a trail through woods and fields. Little toads were the first item of interest, which were captured and relocated after a short trip in a pair of little hands. And then the eye-spying game turned to the woolly bear caterpillar—the familiar black and rust banded, fuzzy caterpillar. It turned out these too were fun to hold! They allowed their many feet to be viewed and displayed their defensive reaction of becoming a fuzzy ball.

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*After spending part of its life underground, the cicada larva comes above ground, and emerges as the adult form (right) leaving behind an exoskeleton (above) of its former self.*





# Kemp Profile: Claire Phillips

**Hometown:**  
Oakland,  
California

**Educational background and current area of study:**  
B.S., M.S.  
Stanford U,  
2001, PhD  
Oregon State U  
2009 (The OTHER OSU).  
Since May I've  
been a post-doc

at Lawrence Livermore National Lab in Livermore, California. Area of study: plant and soil “ecophysiology”

**Your 2011 field crew:** Myself plus occasional visitors, including colleagues Karis McFarlane (LLNL), Ankur Desai (UW-Madison), Dave Risk (St. Francis Xavier, Nova Scotia Canada), undergrad Ryan Harp (UW-Madison), and Shane Simenstead, a high school student who lives near Kemp Station.

**What question does your field research answer?**  
How *old* is the CO<sub>2</sub> that comes out of a forest soil and tree canopy? We are measuring the radiocarbon (14C) abundance in soil and whole-ecosystem CO<sub>2</sub> emissions, to make assessments of its age and determine its source. We want to know what portion of CO<sub>2</sub> emissions comes from pools of “old” carbon that got deposited in the soil as leaves or roots 10s to 100s of years ago. We are investigating how the age of CO<sub>2</sub> emissions varies across seasons, in response to changing environmental conditions, and before and after a selective harvest.

**How is your research/project funded?**  
We are working at the Willow Creek site, where our collaborator Ankur Desai has for the last several years been supported by USFS to measure CO<sub>2</sub>,

water, and energy fluxes. The portion of the project I am working on, isotopic and soil analyses, are funded by an award to Karis McFarlane from Lawrence Livermore National Lab, which is a Department of Energy/National Nuclear Security Administration facility.

**Describe a typical day of field work:**

Rouse myself between 7 and 8, usually the last one up in Mead Hall. Avoid getting in Tina’s way as she makes the common areas tidy and clean. Fill my economy sized rental car to the brim with shovels, soil augers, tool boxes, gas sampling equipment, dataloggers and environmental sensors. Drive 45 minutes to my field site. Spend the day in the forest digging trenches and installing soil sensors, or walking through the woods taking soil CO<sub>2</sub> flux measurements, or programming dataloggers, and occasionally chatting with bear hunters who pass by to check their baits. Get back to Kemp between 6 and 8pm. Go for an evening swim in the lake. Eat dinner. Process samples in the lab or catch up on e-mails until midnight. Call my hubbie and tell him I’m tired. Collapse into bed.

**What is the biggest challenge you’ve faced working on this project?**

Well, I have to knock on wood while I say this, but things have gone pretty according to plan! You always have to be pleased when things work out as well as you had hoped. I have much to be thankful for: It seems I’m comparatively distasteful to ticks and mosquitoes. And hot days were erased by jumping in the lake. And every time I really needed help digging a big soil pit, a wonderful helper seemed to appear at Kemp’s doorstep. And when I needed to build sampling equipment Gary had great ideas and helped tremendously. Everyone at Kemp gave me lots of support, from receiving packages from California (big and heavy ones), to lending me tools, to simply helping with housekeeping stuff so I could focus on working.



## Kemp Profile... (Cont'd from Page 4)

### What have you enjoyed most about working on this project?

When I arrived in May, I have to admit I didn't immediately fall in love with Northern Wisconsin. It is so flat and the woods look the same in every direction! (I STILL second guess myself sometimes about which way to turn driving to the field site.) I was used to Western forests with mountains and vistas and waterfalls, and NO BUGS! The Wisconsin woods were plagued with ticks, the lake was full of motor boats, I was worried about encountering this thing called swimmer's itch, and the town was teeming with aimless tourists. But the more times I went back to the lab in California, I looked forward to the peace I would enjoy returning to Wisconsin, spending days in the woods alone with my thoughts. As the summer went on I enjoyed getting intimate knowledge of our field site, learning the succession of flowers, berries, and animal activity. I really felt this place grow on me in early September, the week that summer ended (85 degrees one day to 48 degrees the next!). I got to see the leaves turn, and turkeys coming out onto roads, and all those precious changes that are a muse for my work. But the very best thing of all, my absolute favorite, was simply not being desk-ridden and spending days at a time outdoors like a proper human! 🍄



Claire and Karis McFarlane measure soil CO<sub>2</sub> emissions..

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## It's What They Lichen About Kemp!

Scientists from UW-Madison and the Chicago Field Museum spent a few days collecting lichen at Kemp Station. Susan Will-Wolf explains: "Our project is to decide what easily-observed physical characteristics are most reliable to distinguish species (as determined by their DNA) of a group of common 'old man's beard' lichens (genus *Usnea*) whose taxonomy is uncertain. We used Kemp Station as a base for collecting specimens from several nearby areas, both because Kemp's grounds are home to many of the lichens we want to study and because the excellent sleeping and laboratory facilities make the field part of our project affordable and easier to complete. This group of lichens is used to indicate clean air and healthy, intact forests from Great Lakes Forests through the Appalachians. Studies with these lichens will give more reliable answers if we have a better way to quickly and more accurately identify them to species or species group."

Photos by John Wolf, UW-Madison science editor, retired.



Above: Chicago Field Museum researcher Carrie Andrew maps multiple *Usnea* specimens on a single branch in the lab at Kemp. At left, UW-Madison researcher Susan Will-Wolf and Chicago Field Museum researcher Matthew Nelsen record physical characters of individual *Usnea* specimens.



## Through the Eyes... (Cont'd from Page 4)

I know these guys are most often seen in the fall and over the years heard my grandparents and parents comment on how the pattern of the black and brown bands had something to say about the upcoming winter. But I had no idea what this caterpillar grew up to be and knew nothing of its life cycle.

There are several caterpillars referred to as “wooly bears.” Ours is the banded wooly bear. This animal has the reputation for predicting the severity of the upcoming winter, based on the size of the black bands – longer black bands meant a more severe winter. This theory has been debunked by studies that have shown the band length may have more to do with age and/or the moisture level in the environment.

The reason we see them so often in the fall is because that is when the caterpillars, or larvae, emerge from eggs laid by the adult moth during the summer. On sunny days I have seen them crossing the highways and I read that they may like the warm surface provided by the road. Thankfully they are easy to

avoid with your car as they are small and don't move very fast! However, they do always look like they are on a mission, and that is probably to find shelter, perhaps in leaf litter or behind some bark. They spend the winter in the larval form and are able to do so because they produce their own antifreeze which protects their tissue from the cold. When the weather warms in the spring, the caterpillar spends some time eating whatever it comes across, as they are not choosy. Then it spins a fuzzy cocoon and in about two weeks, emerges as the adult Isabella tiger moth (*Pyrrharctia isabella*). The moth is dull yellowish-orange with black specks on the wings and not nearly as spectacular as other members of the tiger moth family. Regardless, the “bear” has transformed into a “tiger” and the cycle begins again.

Perhaps it is impossible for us to see the world the way we did when we were kids. But I think that with a bit of effort, we can see and appreciate things around us the way we did when we were 6 years old. If we slow down and pay attention or make time for some discovery. As fall rolls into winter, see what you can see, through your childlike eyes....and if you can do it *with* a child, all the better! 🐻

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## From Trees to Timber: Gary Kellner procures material for the Kemp Pavilion



## Mammalogy....(Cont'd from page 1)

What's driving these replacements is still not well understood, but some scientists suggest global climate change is creating niche conditions that allow species to extend their ranges northward.

We have only two seasons of data, and the small mammal community picture is beginning to emerge. The dominant residents on our study grids at Kemp are the white-footed mouse, eastern chipmunk, and red-backed vole. Also present in high numbers this summer was the cinereus shrew. We are still waiting to find the less common pygmy shrew, one of the smallest mammals in the world. My students are able to distinguish it from the cinereus shrew based on a single tooth character, since the two shrews look nearly identical when you remove them from a pitfall trap. We were able to identify a southern flying squirrel based on ventral pelage that is white from tip to base, unlike the northern flying squirrel with ventral hairs that are white at the tip and dark at the base. This year we trapped our first woodland deer mouse. They appear almost identical to the white-footed mouse, but have one important distinguishing character in this part of their range. Woodland deer mice have slightly larger ears; between 17-20 mm compared with 14-16 mm in white-footed mice. While this seems like a trivial difference, we have found that it correctly identifies the species 98% of the time when we've followed up with genetic tests. The presence of this single individual suggests a community in transition.

There are two small mammals I have yet to trap anywhere in Wisconsin. The least chipmunk was common in Vilas and Oneida Counties a century ago. Hartley H. T. Jackson wrote in the Mammals of Wisconsin that it was common as far south as Waushara County in 1850, and John Muir describes a least chipmunk accurately in his book about growing up in southern Marquette County. In 1920, Ned Hollister wrote a personal note to Jackson stating that he predicted the eastern chipmunk would entirely replace the least chipmunk in the region before many years. I'm interested in looking at the historical collections from Kemp to see when the last least chipmunk was collected. Finally, woodland jumping mice have not been collected in Wisconsin in almost 20 years. Our last record is from 1992 in



*Students learn the technique of preparing study skins. These specimens are one way to create a permanent record of a species in place and time.*

Douglas County. Where woodland jumping mice were found in Bayfield County in the 1970s, those same habitats are yielding meadow jumping mice today. There is a long way to go towards characterizing the small mammal community at Kemp, and field stations like this are priceless as they allow for long term studies with lower risk of human development of the land. I'm already looking forward to next summer! 🐿️

## In Memoriam

Kemp Station lost a dear friend this summer. Dr. James Fralish passed away on August 30, 2011, after a short but courageous battle with a brain tumor. Jim had a long and profound history with Kemp Station. He first came to Kemp in the 1960s as a doctoral student in the Department of Botany at UW-Madison. Following graduation, he accepted a faculty position with the Department of Forestry at Southern Illinois University in Carbondale, IL. For more than 40 years, he continued to visit Kemp, conducting research and bringing students from SIU to learn about Wisconsin's Northwoods. These annual trips continued even after his formal "retirement" in 1996. Jim was a keen ecologist, a passionate teacher, a fine mentor and a wonderful friend. His beaming smile and enthusiasm for our natural world will be sorely missed.



## Great Horned Owl (*Bubo virginianus*)

On one of those warm nights in early October, I lay in bed and listened to a pair of great horned owls calling to one another. One of the owls was rather close, but the other was quite a distance away as his or her response was very soft. Their “hoo-hoo hooooo hoo-hoo” calls reminded me that I grew up knowing this bird as a hoot owl, a term used by my grandparents and mom. I read that they are also known by the names cat owl and winged tiger, likely referencing their ear tufts, which look like a cat’s ears. Great horned owls are our earliest nesters, and the pair formation process begins in the fall, with eggs laid in January or February. Incubation time is about a month, during which the female stays on the nest while the male brings her food. About 6 weeks after they hatch, the young test their wings, but don’t fly until they are about 12 weeks old. Mom and dad continue feeding them into July and then come fall, the kids either leave on their own or are driven off as it’s time for a short break before breeding starts over again. Come this January or February when you’re feeling chilly on a bitter cold day, think of the hoot owl on her nest, keeping her eggs or owlets warm, and that just might warm you up a bit.



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