

# Kemp's Point

A newsletter of the Kemp Natural Resources Station  
Volume 8, Number 1 - Spring 2007

## Learning and Having Fun in the Process

For Maurizio Murru and his students, the process of teaching and learning about a science is fun and incorporates individual talents. Maurizio teaches biology, ecology and limnology courses at the Milwaukee Institute of Art and Design (MIAD). During the winter, he spent some time at Kemp Station, working on his Ph.D. dissertation and realized Kemp would be a great place to bring his students for an extended field trip. That idea became a reality in March when he and seven students from his limnology class ventured north.



I tagged along with the group as they went to a few area lakes to collect water samples. Maurizio was excited to have the students compare samples from Northwoods lakes to those they've examined from Milwaukee urban ponds. But Maurizio seemed to be excited about everything. His enthusiasm is infectious, as was evidenced by the students as the day went on.

Despite the recent cold weather, there was some open water at the lakes we visited. Requesting two volunteers to don hip waders, Maurizio announced with a playful grin that they would be rewarded with extra credit. By the time the last sample was collected, having waded into cold water and collected samples while the rest of the

class looked on, these volunteers had earned an "A" for the entire class! Not really, perhaps, but Maurizio and the students clearly enjoyed joking around.

As we traveled between lakes for samples, the students chatted with me about their class experiences and, more specifically, the projects they are required to complete for half of their course grade. These fascinated me and I often responded with a "Wow!" as these projects reflect a teaching style unlike what I experienced in college. And since I tend to be more of a "left-brain thinker," I was especially impressed with the talents of this group of students.

Jill is majoring in Communication Design. She is working with another student to design a piece about the limnology class to be included in a MIAD publication. You might think of it as a marketing piece, a tool to



communicate to other students what limnology is and what the class experience is all about.

Industrial Design major, Selim, is creating a new design for a piece of lab equipment known as a plankton wheel. A plankton wheel enables the biologist to view organisms microscopically as the organism moves freely through a water habitat. Selim will actually build the

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new wheel and it will be used in Maruizio's lab on campus.

Throughout the day, Aaron, a Painting major, was taking photos of the activities with what looked to be a rather "advanced" camera. Meanwhile Elliot, a Painting and Video major, was capturing the action with a video camera. Together they are documenting all the sampling the class does throughout the term. With photographs, video and samples, they will reconstruct the food web of a freshwater lake. They intend to produce either a brochure or film about the limnology class which they hope to present at a MIAD convention where students exhibit their work.



Finally, David and James (this James is female, by the way) are both Animation majors. David hopes to own a small independent studio one day, while James wants to work for Pixar in one role or another. Their project involves three microscopic animals that live in freshwater lakes – cycloids, rotifers and daphnia. Inspired by the movement of these creatures, they will create an animated wrestling match between cycloids and rotifers, with daphnia as the ring girls. Now who said science isn't fun?!

After lunch the group gathered in the lab to examine the water samples under microscopes, or as Maurizio put it, "let's see what we've got." Using Kemp's video-microscopy system, Maurizio led the discussion as microscopic bodies swam, darted and floated across the video monitor. Once when Maurizio was preparing the next sample to show on screen, he burst out with, "This is awesome! Check this out!" Like I said, his enthusiasm is infectious

and it was neat to see the level of interest among the students as they shot off questions to Maurizio about the various life forms.

What also struck me during the lab activity was that the students weren't madly scribbling notes, which is what I remember doing during such lab exercises. Instead they were involved in the action, discussing and capturing the



experience with various mediums for their projects. And there was laughing while learning.

When asked what they liked most about the class, the students were quick to cite the opportunity to apply their talents and skills. And it was obvious they liked their instructor. One student said that Maurizio has been so many places and has had so many experiences; just being in his class is a real treat. She compared Maurizio's class to a really good shoe sale – you don't want to tell too many people about it for fear you won't get in.

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# Wild Wonders

## Tephritidae

Bird watching is a very popular hobby. Hikes, clubs, festivals and vacations are built around birding. You don't need to be a hard-core birder with a "life list" to enjoy your feathered neighbors. A feeder offering sunflower seeds is guaranteed to attract a variety of species for your viewing pleasure.

In a sense, bird watching is much like art appreciation, but the museum is the great outdoors. Unless you have holdings in a binocular company, your benefit is the simple pleasure of seeing and appreciating the wonders of wild birds. And isn't that true of so much in nature? Whether it's enjoying a great landscape view, taking in the scent of pine needles heated by the sun, or watching a chipmunk pack its cheek pouches with seeds before disappearing into its burrow, the reality is that the appreciation factor available in nature is immeasurable.

Take Tephritid flies. I didn't even know these little critters existed until I met Gary Steck. Gary is an entomologist and a curator at The Museum of Entomology in Gainesville, Florida. Gary was in the area visiting family and stopped by Kemp Station hoping to track down a specific fly. In order to do so, he needed to locate a specific plant. Each species of Tephritid fly is generally associated with a single plant species, known as a host plant. And some of these flies have a narrow range of host plants, all of which are related or chemically similar.



Gary was in search of *Paramyiolia nigricornis*, a Tephritid fly whose host plants are unknown in the northern U.S. but probably include the common winterberry, *Ilex verticillata*. This fly has not been recorded in Wisconsin and Gary thought perhaps Kemp could be the spot of first record. While Gary left Kemp without a discovery,

he did leave me with a bit of knowledge that piqued my interest and led to this story.

Tephritid flies, or the insect family Tephritidae, are often known as fruit flies. I know you're thinking about those annoying little flies that seem to magically appear in our kitchens when bananas or other fruits have aged past the ideal eating stage. Those guys belong to a different

family and are *Drosophila* species that, unlike Tephritidae, feed on yeasts and other by-products of rotting fruit and vegetable matter.

In contrast, Tephritidae live on healthy plants and their fruits, seeds and flowers. Buds, leaves and roots are also utilized by various species. Some of these flies make galls and others mine stems or leaves. This way of making a living is what makes Tephritidae the most agriculturally important family of flies. This importance is two-fold – some species are pests, and others are beneficial biological control agents of weeds.

Considered major pests, over 200 species of Tephritidae attack commercial fruit (citrus, mango, apples) and seed (sunflower, safflower) crops. In the larval stage, many species cause heavy losses on crops. When crops are lost to infestations, the economic impact can be huge. A loss in yield may lead to countries losing out on export opportunities. Other costs include the need for increased pest control on crops, and the cost of building and maintaining facilities where fruit is treated or insects are eradicated. Quarantine laws restrict the spread of fruit fly species, but also contribute to the economic impact of the pests. An established infestation of a specific fly in California was estimated to cost hundreds of millions of dollars annually.



On the other side of the coin are the fruit flies that are beneficial. About 15 species have been identified to help control weedy species belonging to the family Asteraceae, which includes such plants as dandelions and thistles. I was particularly interested to learn that there are species of Tephritidae that feed on the seed heads of spotted knapweed (see sidebar). In addition to biological control, other fruit fly species are key subjects in the study of genetics, molecular biology, evolutionary and ecological theories, and demographic research.

To me, what makes this family of flies really neat is how nature has dressed them. Much like the birds we watch and appreciate for their colorations and markings, Tephritidae have patterned wings and often brightly colored and/or patterned bodies. Gary was very kind to provide some photos that illustrate this. (Those of you reading the printed issue are encouraged to view Tephritidae images on the web sites listed at the end of this article or this newsletter at [www.kemp.wisc.edu](http://www.kemp.wisc.edu).)

Often courtship behaviors of Tephritidae utilize these patterns and colors. Males will move or hold their body,  
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leg and wings certain ways to attract a mate. But courtship behaviors are not limited to visual displays. Males of many species secrete pheromones (sexual chemicals), dispersing them with wing fanning, to attract females while others fight for territories. Entomologists have reported observations of mate-guarding and males defending food resources that are attractive to females. Sometimes there is a transfer of a “nuptial gift” in the form of trophallaxis, which is the regurgitation of food by one animal for another.



Some body colorations and wing patterns result in a fly that looks like, or mimics, another animal. Mimicry evolved as a means of protection from predators. Adult fruit flies are eaten by spiders, wasps, birds and toads so it is not surprising that some Tephritidae species have markings making them resemble wasps and jumping spiders. On the USDA website listed below, there is an image of a Tephritidae found in Kenya that

mimics a jumping spider. I was so struck by the resemblance...it's simply amazing!

Learning about Tephritidae reminded me that we often fail to extend our appreciation beyond the obvious things in nature. Just because a plant or animal isn't flashy, or of substantial size doesn't mean it isn't worthy of our notice and appreciation. There's a lot in our outdoor museum worthy of investigation, so take some time to find something new to wonder about. 🐞

PHOTOS BY:

Jeffrey Lotz, Florida Department of Agriculture

## Spotted Knapweed



Between late June and August, a rather pretty pink flower can be found blooming along roadsides throughout Wisconsin. If you travel on Hwy 51/39, you will find a blanket of pink between the north and south roadways in the central part of the state. Reaching a height of 3-4 feet, this plant is anything but friendly to farmer's fields and diverse plant communities. Spotted knapweed, *Centaurea maculosa*, was once thought to invade only heavily disturbed areas such as road ditches, agricultural field margins, railroad beds, pipelines, and recently installed utility lines. But the plant has now been found in dry prairie sites, oak and pine barrens, and on lake dunes and sandy ridges.

Spotted knapweed arrived in North America by way of British Columbia in the 1880's as a contaminant in alfalfa or in soil used as ship ballast. The plant reproduces solely by seed, but each plant produces about 1,000 seeds which disperse and remain viable for up to seven years. Once spotted knapweed is established, it takes over, killing other plants around it. It does this by releasing into the soil a chemical called (-)-catechin (pronounced minus-CAT-e-kin) that destroys the roots of other plants.

Researchers have compared the (-)-catechin content of North American and European soils where spotted knapweed grows. They found much higher levels in North American soils than in the European soils. This suggests that either the soil microbes in Europe somehow eliminate the toxic chemical or the North American plant produces more (-)-catechin. In Europe, native grasses and perennials grow alongside spotted knapweed, suggesting they are less sensitive to (-)-catechin.

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### LEARN MORE:

<http://www.sel.barc.usda.gov/Diptera/tephriti/tephriti.htm>

<http://www.fsca-dpi.org/Diptera/DipteraFrame.htm>  
(Click on “Tephritidae of GSMP” and then click on “A checklist...” and then each photo icon)



## Winter at the Mead Residence Hall

Animals have various ways of surviving winter. Some hibernate, which means they reduce their metabolic activity and “sleep” the season away. Some adjust by growing thicker coats, storing food beforehand, or changing what they eat for the season. And others just leave town, or migrate to warmer climes until spring.

It seems that humans tend to apply a combination of these techniques to deal with winter. And still others revel in the season, spending much time outdoors participating in various winter sports and activities.

At Kemp Station, winter has a history of being rather quiet compared to the busy summer field season. It has been a time for us to catch up on loose ends or work on projects we had no hope of getting to the rest of the year. Or maybe we even get a head start on preparing for the upcoming busy season. But because of the new Mead Residence Hall, Kemp’s winter did not hold true to history. This was especially true for craftsworker, Gary Kellner, who was busy all winter in the lower level of the building. There would be no hibernating for him!



Exterior stone work on the building’s chimney postponed Gary’s start on interior work last fall. Both the weather and the nature of the task contributed to the timetable. Since the cold weather held off, Gary pushed forward with the tedious stonework, ultimately completing the job in early December.

Gary quickly switched gears to the needed interior work of the building’s lower level and has made excellent progress as of press time. Tim Hoene and Craig Malnory, employees at the Arlington Ag Research Station, were at Kemp



several weeks to help Gary with insulation, dry-wall, and carpentry. Some additional help with carpentry came from Tom Wright, a Kemp donor and Superintendent at the West Madison ARS. We are extremely grateful



for the assistance provided by Tim, Craig and Tom! By the time you read this, we should be nearing completion of some of the rooms scheduled for use in May.

The Mead Residence Hall opened in May 2006, and Kemp saw a dramatic increase in research and instructional activity as a result. This immediate

impact suggests there was considerable latent demand for such facilities in northern Wisconsin. Moreover, it suggests the residence hall has incredible potential to make important contributions to environmental research and education over the long-term. It is not an exaggeration to foresee thousands of individuals using this facility over the building’s service life; and it is exciting to imagine the volume and diversity of scientific activity that such usage represents.

Kemp Station is dedicated to programs of research, instruction, and outreach concerning the management and conservation of northern Wisconsin’s natural resources. Thanks to our many generous donors, we have an additional facility to support our mission. The icing on the cake is that the Mead Residence Hall now exhibits some of the outstanding craftsmanship of our own Gary Kellner! And once the busy summer field season of 2007 is over, I suspect we all will look forward to a more typical Kemp winter! 🍷



## Knapweed (Cont'd from Page 4)

In Montana, spotted knapweed has infested over 4.5 million acres, much of which is grazing land. Because of the large economic impact, some \$40 million annually, researchers continue to seek a safe and cost effective way to eliminate the plant. The seed-head eating Tephritidae flies have already been tried out west, which led to another problem – a boom in the deer mouse population. It seems deer mice feed on the fly larvae that eat the plant's seed heads. Deer mice are carriers of hanta virus, which is deadly to humans. In order to stop the spread of hanta virus via exploding deer mice populations, other spotted knapweed control is being sought. So far the answer has been sheep, the one grazing animal that seems to fancy the weed and has been effective at controlling it.

My personal approach to controlling spotted knapweed in my little corners of the world, home and work, has been to prevent the plant from becoming established. For the past few years, a stray plant has shown up along Kemp Road which I will stop and pull, root and all. Along the road near my home I take the same approach, although the treatment is more intense as there are spots where the plants grow in small pockets along the road side. Perhaps I've fooled myself into thinking that I'll one day catch up on the viable seeds lying in wait in the soil. But I prefer to see plant diversity, so I'll keep trying!

### LEARN MORE:

<http://dnr.wi.gov/invasives/fact/knapweed.htm>

<http://www.smithsonianmagazine.com/issues/2004/december/phenomena.php>

## Learning... (Continued from Page 2)



All MIAD students complete Introductory Biology and one higher level science course as part of the Liberal Studies component of their degree. MIAD's website states, "The work you accomplish here will feed your art and design in ways you cannot yet imagine." The students I saw learning about limnology were doing just that. And while Maurizio helps them to accomplish this, there is much more to his motivation: "My hope is that through my teaching, and through my enthusiasm, students learn to appreciate nature, and become more aware of their environment and more informed as citizens." Maurizio plans to bring future class groups to Kemp and we're glad the Station can help support his goals. 🍄

*Maurizio obtained his degree in biology at the University of Cagliari, Sardinia, Italy, where he worked in aquaculture and marine biology. He is now pursuing a Ph.D. in biology and plankton ecology at UW-Milwaukee, where his research interests span from seaweed ecology in the Pacific Northwest, to plankton interactions in urban ponds. What little free time he has is spent participating in extracurricular activities like kayaking or learning archery with a handmade longbow.*

## 2007 Kemp Natural Resources Station Outreach Program

Learn about Wisconsin's natural resources at Kemp Natural Resources Station, a University of Wisconsin research and teaching facility in Woodruff. To register for a session, contact Karla at (715) 358-5667 or [kemp@calshp.cals.wisc.edu](mailto:kemp@calshp.cals.wisc.edu). All sessions are free of charge. The complete schedule, including added sessions, is available at [www.kemp.wisc.edu](http://www.kemp.wisc.edu).

Most sessions are held in the second floor classroom, above the Kemp Boathouse. There is a short walk to the Boathouse from the parking area and the classroom is accessible by stairs only. Participants are reminded to dress appropriately for the weather and planned outdoor activities.



## **The Muskellunge Spawning Habitat Project**

Friday, May 4, 7:00 pm

*Session Leader: Project participant, to be determined*

The musky, Wisconsin's state fish, draws many anglers to the state. In order to maintain a sustainable musky population, spawning habitat must exist. The University of Michigan, Wisconsin DNR, Musky Clubs Alliance of Wisconsin and local volunteers have teamed up on a research project to predict where muskies spawn in lakes. Appropriate conservation decisions can be made once the musky's critical habitat is identified. Join us for a discussion of this research project and how the results will be applied.

## **Bass Tournaments and Fish Mortality**

Monday, May 7, 7:00 pm

*Session Leader: Craig Williamson, UW-Stevens Point*

Bass tournaments are important for both economic and social reasons. But natural resource professionals must balance that with the health of the fish populations in our lakes. With concerns about bass mortality, the Wisconsin Cooperative Fishery Research Unit at UW-Stevens Point was asked to explore bass mortality in tournaments. Join Craig Williamson as he reviews his research addressing this topic and presents his findings.

## **Global Warming, the Global Carbon Cycle, and Wisconsin Forests**

Tuesday, May 15, 7:00 pm

*Session Leader: Ken Davis, Pennsylvania State University*

Is global warming real? What causes it? Do forests clean the atmosphere? What about the forests of northern Wisconsin? For more than 10 years scientists from universities and government research laboratories across the nation have been studying the forests of northern Wisconsin. Their goal has been to learn whether these forests are contributing to or slowing down global warming, and whether or not this is likely to change in the future. Join us for a review of the science of global warming and learn how forests around the world impact global warming, what role Wisconsin forests have in this global story, and how scientists are studying these issues within the Chequamegon-Nicolet National Forest.

## **A Look at Deer Impacts & Management**

Monday, June 11, 7:00 pm

*Session Leader: Scott Craven, UW-Extension & UW-Madison*

Deer are a common sight in Wisconsin's northwoods and are popular among wildlife watchers and hunters alike. The deer population in Wisconsin is estimated at over 1.5 million. Join Scott Craven for a look at how researchers study the impact of deer population on forests and how deer damage is managed in forests and around homes. A short hike on Kemp property will be followed by a fire ring discussion which will touch on some contentious issues in deer management such as chronic wasting disease and deer feeding and baiting. Please dress appropriately for the weather and walking.

## **Turkeys in Wisconsin**

Monday, July 9, 7:00 pm

*Session Leader: Scott Craven, UW-Extension & UW-Madison*

The turkeys have arrived! To the Northwoods, that is. In recent

years, the wild turkey has made its way north. Come learn more about this fascinating bird, its natural history and how the turkeys got here. Discover what this means as far as hunting opportunity and what landowners can do to enhance turkey habitat.

## **Moving Beyond the Rhetoric**

Tuesday, July 17, 7:00 pm

*Session Leader: Nick Balster, UW-Madison*

Can we trust science? Take a journey into the scientific mind and its role in ecological understanding. We'll explore topics ranging from global warming to tree harvests in the Northwoods, all within the context of how systems work and how we as the public can make sense of the rhetoric. Learn about the fundamental character of all biological systems and join in the discussion as we review the multitude of evidence that the harmony and balance of nature are merely a human constructs. Join Nick Balster for this fun and out of the ordinary presentation that will fundamentally challenge the way you think about nature and your place in it, as well as demystify the role scientists play in the management of your own backyard.

## **Phenology**

Monday, July 23, 7:00 pm

*Session Leader: Mark Schwartz, UW-Milwaukee*

Spring's arrival each year is eagerly anticipated, and lately it's been showing up earlier. Phenology, the study of plant and animal life cycle events as influenced by the environment, offers many ways to record and examine these changes. Prof. Mark D. Schwartz, from the University of Wisconsin-Milwaukee will give an overview of changes in the onset of spring across the Northern Hemisphere and describe a research project that is exploring spatial variations in tree phenology near Park Falls, WI. Schwartz will also detail on-going efforts to build a USA-National Phenology Network, which welcomes members of the public who wish to volunteer as observers.

## **An Evening at the Bog**

Tuesday, August 7, 6:30 pm

*Session Leader: Lee Wilcox, UW-Madison*

Learn about the unusual and beautiful life forms that live in a northern peat bog. We'll begin with a brief indoor presentation on how bogs are formed and the important ecological roles they play, not only locally, but globally. We'll then make a foray into a black spruce bog on the Kemp Station grounds and get our feet wet as we walk on a floating mat of peat moss to examine carnivorous plants, cranberries, and other organisms adapted to life in this quintessential northern habitat. We'll also collect a water sample and return to the lab to take a quick look at the intriguing microscopic creatures that live in bogs. Please dress appropriately for weather and bogwalking where feet could get wet.

## **The Common Loon**

Wednesday, August 13, 7:00 pm

*Session Leader: Dan Haskell, U of Michigan Tech*

The Common Loon is one of the most famous and popular birds in Wisconsin's Northwoods. Oneida and Vilas counties, with their many lakes, are home to many loons each summer. Join Dan Haskell for an evening of loon discovery. Dan has been involved with loon research for many years and has great experiences to share.



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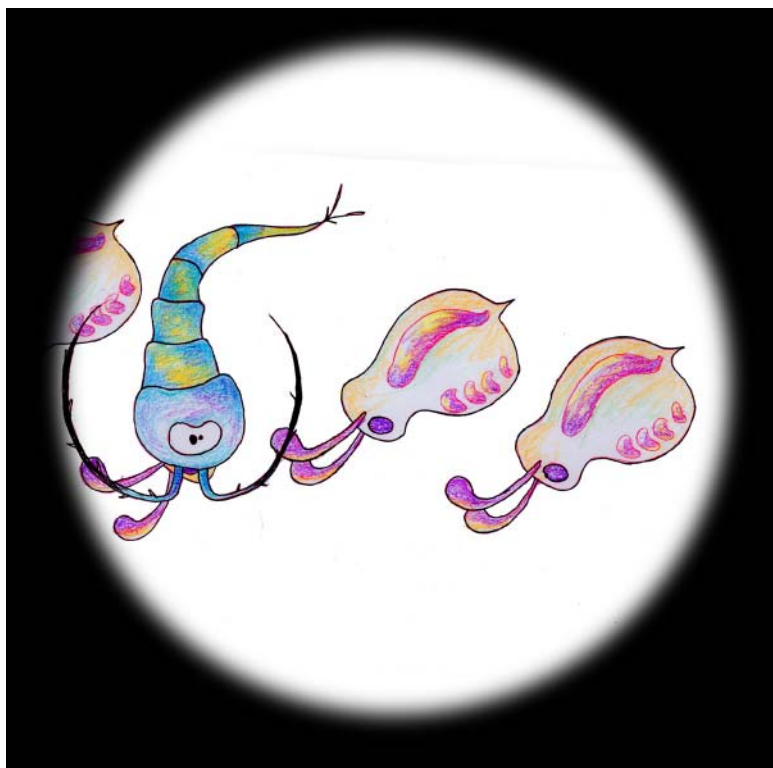
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*Animation screen shot, by James Doppelt and David Borman*