Kemp's Point

A newsletter of the Kemp Natural Resources Station
Volume 6, Number 2 - Fall 2005

Kemp Research Report: Getting the Low-down on Lowland Forests

When I tagged along to the field with Aaron Wunnicke and Ryan Wilson, two researchers staying at Kemp this summer, I never expected to learn they had a language of their own. See if you can follow along:

Strong 5 on cinnamon, trientalis, pinus strobus over and under, spinulosa, go 2 on succulent ginger— seeing a lot of, can go two on be-al, two on hispidula, mert—2, lycopus, I'm missing pimer under, I'm sure we can get a pimer under, I've been picking out these as be-als, the beppers are wider at the base, got a couple of pinus strobus, there's this picea mariana, I got that one and the one by me, hanging in from that last plot, the be-al sapper, go two on that, there's be-al coming in, a be-al sap, this is a medium picea, 3?, no acru, what's this? Medium be-al? A 5 for sure, 6?

Ryan and Aaron spent the summer surveying the vegetation of lowland forests. Their "secret language" is how they communicated to one another. Fortunately *we* don't have to know the language to understand and appreciate their work. Aaron and Ryan are early contributors to a habitat type classification system for northern Wisconsin's lowland forests.

European ecologists were the first to develop the habitat type concept. They observed that plants usually grew together in specific groups or associations, meaning plants A, B and C could be found in numerous locations, living together. Find plant A, and you'll likely find plant C, too. These associations were linked to forest disturbance patterns and to the differences that existed between sites.

Aaron (rear) records the understory plants Ryan finds at the survey site.

U.S. plant ecologist, Rexford Daubenmire, was the first to use plant associations to classify sites. In a forest free from disturbance – like windstorms, wildfire, or timber harvest — climax condition is the final stage of plant succession, where climax species reproduce in their own shade. Daubenmire showed that climax, or near-climax, plant associations are the most meaningful indicators of site condition. He went on to develop a habitat classification system for northern Idaho and eastern Washington, published in 1968, and this served as the model for classification systems elsewhere.

In 1988 the *Field Guide to Forest Habitat Types of Northern Wisconsin* was published by the UW-Madison Department of Forestry and the Wisconsin DNR. Since then two additional field guides have been published in the series, one for Central and Southern Wisconsin and one for Michigan. The common denominator with all the guides is John Kotar, UW-Madison Senior Scientist Emeritus who now, with his colleague Tim Burger, operates Terra Silva Consultants.

The Wisconsin forest habitat type classification guides are well-known and important tools used by natural resource professionals state-wide. Students in Wisconsin studying natural resources and

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ecology learn how to use the guides as part of their college training.

The field guides walk users through a flowchart to determine the specific habitat type of a particular site. Soil type is the foundation of this identification process, followed by the absence or presence of specific plant species. Once the habitat type is identified or keyed out, users verify their identification by reviewing details on distribution, identifying characteristics, common forest cover types and dominant understory vegetation. Once verified, the user can reference the successional trends section of the guide to determine the biological potential of the site. With this knowledge, land managers can determine what tree species will grow best on the site.

With the upland forest guides for Wisconsin completed, the Wisconsin DNR contracted with Terra Silva Consultants to produce a guide for lowland forests, with priority placed on the northern part of the state. Such forests are an important part of the fabric that makes up Wisconsin's forested landscape. It's estimated that the guide will be six years in the making. To the casual observer, what Aaron and Ryan accomplished this summer was an enormous task, but in the big picture, it is a small but critical start to a large project.

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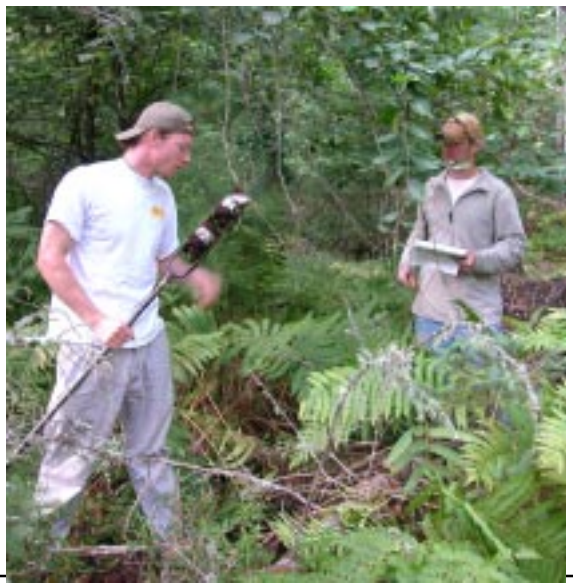
Each day Ryan and Aaron set out to survey as many lowland sites as possible. Each site survey took one to three hours to complete, depending on the vegetative complexity. Sites had to be lowland forests, where water was present in the soil profile. Once found, the exact location was determined using a GPS. This information will allow future field technicians to find the same plot for return visits and surveys.



Aaron examines a soil sample at the survey site.

After dividing the main plot into six subplots, the survey began. Taking turns as data recorder and surveyor, Aaron and Ryan spoke their "secret language," starting with the understory plants and moving up to assess the composition of the forest canopy. Each said the greatest challenge was identifying plants they didn't know. Field guides they used for reference often relied on the presence of a flower for positive identification and many plants were not in bloom. A sample of each species recorded throughout the summer was collected, labeled and pressed for future reference. Unidentified plants samples will later be labeled with their actual name.

In addition to identifying each plant, a size class and quantity were also recorded. Finally, before leaving the site, a soil sample was taken to determine where groundwater appeared in the soil profile. This summer was unusually dry and it was not uncommon to

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Wild Wonders

The Fairy Diddle

Squirrels are common mammals in Wisconsin. Gray squirrels are regular yard visitors, often raiding bird feeders for an easy meal. Red squirrels are well known for their feistiness and for making nests in attics and garages. The fox squirrel is a common sight in oak forests. But one Wisconsin squirrel is less familiar; perhaps only seen if they take up residence in a building or if you happen to check your bird feeders after dark. This would be the flying squirrel.

My first flying squirrel encounter occurred before I lived in "the woods." We had a second floor apartment in Middleton with a balcony where we had a bird feeder. One summer night after dark, our cats were alertly trotting back and forth between the bedroom window and the patio door, the two openings to the balcony. There they would sit, tails flicking, as they looked intently outside. Obviously, something interesting was out there! When I went to investigate, I was thrilled to find a flying squirrel munching away on sunflower seeds. Wanting to get a closer look, I quietly and slowly made my way toward the feeder. I was surprised at how close I got before the little critter retreated to the large tree next to the balcony.

The squirrel climbed high up into the tree and then glided down, over and across the parking lot and a tall fence, into a tree, and out of sight. Wow! How neat was that?!

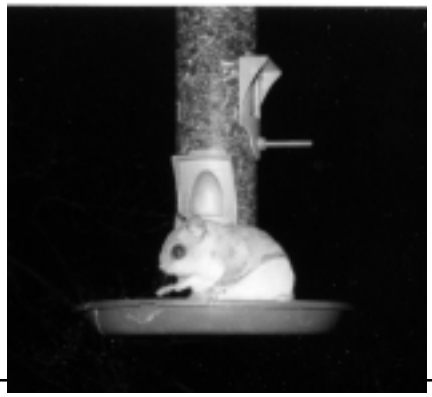
The flying squirrel continued to make regular visits to our feeder, entertaining the cats and myself. I came to recognize the soft, high-pitched peeping-type vocalization s/he made, and sometimes even knew the squirrel was there before the cats did!

After we moved to the Northwoods, I imagined seeing flying squirrels quite often and envisioned them visiting our yard. While I suspect they are around, after five-plus years of living in the Northwoods, I have yet to see a flying squirrel.

However, this past summer, I did see flying squirrels again; this time in Madison where my folks live in an older neighborhood, plentiful with large trees. My mom discovered the squirrels coming to her bird feeders in the evening, as many as nine at a time. But note that they are hard to count because these critters soar in and out of the feeding area at a quick pace and scurry about like chipmunks in the tree. Arrival time was fairly regular, just after dusk, which made it easy to put out peanuts and know that the blue jays and grey squirrels wouldn't gobble them up. It became known as "the critter show" in our family. What a treat to stand next to the tree, head tilted back, watching as flying squirrels came and went. The only down side was a sore neck!

Both the southern (SFS) and northern flying squirrel (NFS) live in Wisconsin and their ranges overlap in part of the state, so knowing the differences between the two are needed for proper identification. The SFS is smaller, measuring 8-10 inches while the NFS measures 10-15 inches in length. The SFS also has shorter, sleeker-looking hair while the NFS's hair is longer and thicker, providing better insulation for colder temperatures. The key to distinguishing the two species is the midline chest hairs – when parted, one will find the SFS's hairs are white to the skin. The NFS's hairs are tipped with a sooty shade of gray or brown.

What makes this critter so incredibly unique is its mode of travel. While called a "flying" squirrel, it actually does not fly like a bird or bat, but glides with control over its speed and direction. Climbing high in a tree, the squirrel first identifies where it will land. While helpful in other ways, its large eyes are



The night visitor at the balcony feeder.

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limited when it comes to depth perception. Instead, the squirrel triangulates, viewing its glide path from two or more angles, each as far from the other as possible. Once a navigational fix is taken, the squirrel leaps from the tree, spreading its patagium, the fold of skin along the body between the front and rear foot. At the end of the glide, it swings sharply upward and lands head up. Sometimes a squirrel will plummet several meters with legs held close to the body before opening the patagium like a parachute to interrupt the fall.

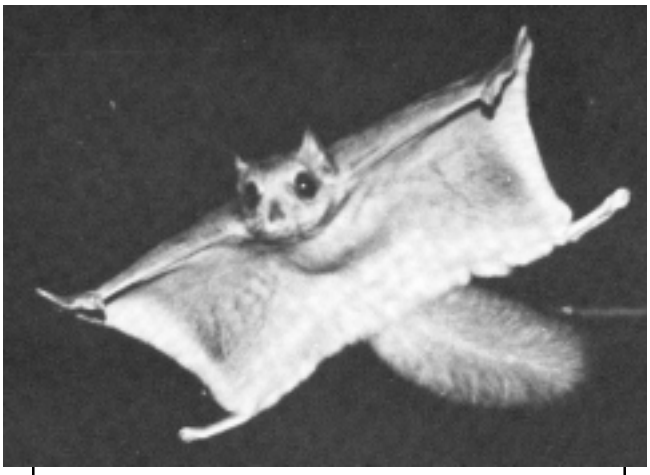
The glide and landing is silent, except for the slight sound of claws grasping bark. Most glides range from 20 to 60 feet in distance, but this depends on the abilities of individuals. Young flyers must find their "wings," so to speak, and learn the art of gliding. It is not uncommon for a flyer to miss their landing spot or run into something in error. Maximum distances of glides recorded by researchers include 150 feet from a tall oak tree and 300 feet down the side of a mountain.

While proficient in the air, both species vary in skill on the ground. The SFS is awkward and travels slowly by foot, likely less than five miles an hour. The NFS does better on land, perhaps due to its larger size, hopping in short leaps, traveling at most about eight miles an hour. By comparison, the gray squirrel's best speed is about 20 miles an hour when alarmed or pursued; and a red squirrel's maximum running speed is about 14 miles an hour.

Flying squirrels are the only nocturnal squirrels in North America. Aided by their large, conspicuous eyes they do their foraging when other squirrels are sleeping. Both species of flyers eat nuts, seeds, berries, fruit and tree buds. While nuts are the staple of the SFS diet, fungus is the staple food item for NFS who also have more of a tendency to eat meat. Insects such as beetles, grasshoppers, moths and larvae are consumed by both species. It is more common for NFS to eat young birds, eggs, or mice while the SFS tends to eat such items only when a craving strikes in winter or early spring, perhaps when fat and food stores have diminished.

There are some slight differences in the forest types preferred by the two species. SFS live in woodlands of deciduous trees and of mixed hardwoods and conifers, but more so where hardwoods predominate. These forests provide the SFS staple food of nuts. NFS prefer mature heavily wooded areas, again with a mixture of conifers and deciduous trees, but rarely in pure hardwood areas. Moist forests with many fallen, decaying and mossy logs are preferred as they support the NFS' beloved fungi.

Flyers commonly make their homes in old woodpecker holes or natural tree cavities. Bird houses or a loft or attic are choice nesting locations as well. Sometimes outside nests, or drays, are used; but for SFS this is extremely unusual in Wisconsin. NFS are more likely to use a dray as a breeding place during spring and summer, but not during the winter unless cavities are unavailable. Regardless, the animals are well-acquainted with the various shelters available in their territory as one may need to quickly escape from a predator, or relocate itself and possibly a litter if the nest becomes infested with parasites. Southern flyers typically have two litters per year, with mating taking place in February/March for the first and June/July for the second. Gestation is about 40 days and litter size is 2-6 young with three or four most common. The Northern flyers have just one litter, mating later with the young born in May or June. Two or three young is typical for NFS.



The flying squirrel during a glide. (Photo from Wells-Gosling book.)

Flyers have been found to share nests in the winter in a communal effort to stay warm, a behavior

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especially common among SFS. On record is a discovery of 22 adult flyers in a hollow tree. Flyers do not hibernate but SFS keep forays from the nest to a minimum and will enter a state of torpor where the animal drops its body metabolism to conserve energy. NFS are better adapted for winter with thick coats, furry feet and long hairs covering their ears, making them more likely to forage year round.

The large eyes of the little squirrel provide a wide field of vision, which helps them detect predators from many directions. And flying squirrels have many predators, with owls being the most common. Other predators include bobcats, lynxes, wolves, coyotes, foxes, skunks, weasels, pine marten, domestic cats, and in southern states, snakes. Even red-tailed hawks are on record as predators, most likely grabbing a flyer at dawn or dusk.

The flying squirrel is a protected species in Wisconsin, meaning they cannot be hunted, trapped or possessed without the appropriate authorization. Besides sometimes being a bit of a nuisance if they nest in a human dwelling, flying squirrels do little harm. In his book, *Mammals of Wisconsin*, Hartley H. T. Jackson wrote the following about the southern flying squirrel: "On the whole, its interesting and friendly habits and its beauty of form and action make it a desirable neighbor." Perhaps you already have this wild wonder as a neighbor.

- K.O.

Resources:

Jackson, H. H. T. 1961. *Mammals of Wisconsin.* University of Wisconsin Press, Madison.

Wells-Gosling, Nancy. 1985. *Flying Squirrels: Gliders in the Dark.* Smithsonian Institution Press.

Uninvited Guests

They're cute, but you don't want them in your house. What do you do if flying squirrels have moved into your dwelling? Staff at the Northwoods Wildlife Center, a non-profit education and rehabilitation facility in Minocqua, suggest live trapping and exclusion. State Extension Wildlife Specialist, Scott Craven, concurs: "Flying squirrels can be as destructive as any other squirrels in a building. If there is access to the space the squirrels have entered, they can be live trapped and relocated. Once removed, the access point(s) must be eliminated. If the access point is obvious, it can be treated with a squirrel excluder (a spring loaded one-way door available from Tomahawk Live Trap Company in Tomahawk, www.livetrap.com) which will keep the squirrels from reentering once they go out to feed. Sometimes a few mothball flakes in the attic space will also encourage them to exit allowing time to eliminate access." You can build your own squirrel excluder by mounting an 18-inch section of 4-inch diameter plastic pipe over the building opening used by squirrels. The pipe should point down at a 45-degree angle to allow squirrels to exit but prevent them from reentering.

Prevention is the best route. Routinely check your home or other buildings for openings where small animals might be able to enter, and seal them off.

Release live trapped flyers as soon as possible. If you've secured your buildings from re-entry, releasing them near your property to find a new nest spot shouldn't be a problem. Alternatively, find a site to release them where appropriate foods and nest cavities exist.

You may choose to offer nestboxes on your property for flyers. The recommended inside dimension is 5x5x12-inches, with a 1-1/4-inch entrance hole for SFS, 1-1/2-inch for NFS. Build with lumber 1-inch thick and position the entrance hole at the top of the box, next to the tree. A nestbox can also be constructed from a section of hollow log by adding a roof and floor. Keep in mind that adding nestboxes may attract more squirrels, so make sure your buildings are critter tight!

Construction Begins on Kemp Station's New Mead Residence Hall!

We had an exceptional field season at Kemp Station this summer with research and teaching activities reaching all-time highs. More students and scientists are using the Station for natural resources research and instruction than ever before.

However, our biggest news of the summer is that construction started on the new Mead Residence Hall. Hammers have been ringing and saws singing as construction crews have been hard at work. As you can see, great progress has been made. The walls are up, the roof is on, and the windows are in, all in advance of the impending cold weather. Currently, the builders are busy working on the interior installing plumbing, drywall, wiring, and ductwork.

Construction will continue through the winter months and wrap up early next spring, in time for the 2006 field season. When complete, the Mead Residence Hall will include kitchen, dining hall, meeting facilities, lounge, bathrooms, and sleeping space for 24 scientists and students. The building will have a high speed Internet connection with wireless computing access. Our goal is to provide the research and education community with one-stop shopping – namely, a place where they can live and learn about the amazing world around us.

One critical need this new facility will address is Kemp Station's lack of long-term lodging. Historically, demand for Kemp facilities was so great that we could not accommodate research teams that needed extended lodging for several weeks or more. Each year, we would receive lodging requests from within the state and across the country, seeking housing that spanned the entire field season. Unfortunately, we were so busy that we could not accommodate such requests with our existing facilities. I am happy to report that will no longer be the case. Beginning with the 2006 field season, Kemp Station will be in a position to provide long-term housing for individuals studying in the Northwoods.

A second critical need that the Mead Residence Hall will address is year-round lodging. Our existing buildings, built in 1918, are grand old structures rich in character. However, they were not designed for winter use. The new residence hall will fill this gap, providing comfortable and functional accommodations in a beautiful setting all 12 months of the year.

Construction of the Mead Residence Hall is the result of a public-private partnership. The National Science Foundation awarded Kemp Station a grant for a portion of the costs. We have been working hard to raise the balance of funds. And we have been very successful to date. We have received several generous donations, including a major gift from the Mead Family for whom the facility is named.

However, there are still funds to raise. If you are interested in supporting natural resources research and education, we ask that you consider a gift to this outstanding project. Your gift will ensure that scientists are able to conduct important environmental research and that students receive an exceptional educational experience in a one-of-a-kind setting. In addition, your gift will be matched dollar for dollar courtesy of a $75,000 challenge fund. So any gift you make will go twice as far. Thank you for your consideration.

- Tom Steele

PS: If you would like to monitor progress on the Mead Residence Hall, please visit our website at www.kemp.wisc.edu. We have set up a page where you can follow construction from start to finish.

Research Report *(Continued from Page 2)*

find water more than 4 feet underground. Aaron commented that at the site I visited, our feet likely would have been wet in a normal year. Because of this, many of the 2005 sites will be revisited when rainfall returns to near normal as it is likely that other plants may be growing at the sites.

For the purposes of the habitat type guides, the state was divided into 10 regions. Aaron and Ryan's surveys covered most of one region, leaving 4 of northern Wisconsin yet to complete. As data is gathered for each region, it will be John and Tim's job to complete the analysis. This will result in the definition of habitat types, as relationships among soil types and plant species become apparent. But before the habitat types are finalized, field tests are completed to ensure their reliability and applicability in the real world. Only after all the information tests out properly will the final guide be published.

Although the classification guides get their start as a "secret language" developed and shared by the field technicians, the final product is far from secret. The final product is a valuable tool used statewide to help foresters, wildlife managers, and woodland owners make ecologically based management decisions for their forests, a benefit that is enjoyed by all.

-K.O.

Ryan Wilson is from Dixon, Illinois. He completed his Bachelor's degree in Forestry at UW-Stevens Point in 2005. He is conducting a job search in the forestry field and hopes to land a job soon. Until then he will continue working at Menards in order to pay the bills!

Aaron Wunnicke is from Bear Valley, Wisconsin and graduated in 2005 from UW-Madison with a bachelor's degree in Forest Science. He plans to travel to South America in January where he hopes to work with a researcher on a forest ecology related topic.

Kemp Natural Resources Station -- Mead Residence Hall Project Pledge Form

Name: _____

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I/we wish to join other friends and alumni in enhancing the teaching, research and outreach programs at the Kemp Natural Resources Station by contributing as indicated below to the Mead Residence Hall project.

____ Enclosed is my/our contribution to the Mead Residence Hall project:
___ $5,000 Eagle ___ $1,000 Loon ___ $500 Chickadee ___ Other $ _____

____ I/we wish to pledge $ _____ each year for ____ years beginning in _____ (year).
Please remind me/us of the annual amount I/we have pledged in _____ (month).

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Please make your gifts payable to the **UW Foundation-Mead Residence Hall Project**
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Gaultheria hispidula