Kemp's Point

A newsletter of the Kemp Natural Resources Station
Volume 3, Number 1 - Spring 2002

Salvage for Science

In August 2000, the Station was hit by a violent windstorm. Damage ranged from the occasional tipped-over tree to a 5-acre tract that was completely flattened. Such a storm is part of the natural development of old-growth forests, according to Dr. Craig Lorimer, Professor of Forest Ecology & Management at UW-Madison. From one-half to two percent of Wisconsin's forested landscape is affected by windstorms each year.

The 2000 storm presented a real dilemma for Kemp Station. Historically, our policy had been "hands-off," allowing the forest to develop naturally, without human intervention. Indeed, Kemp Station's signature feature was its virgin, old-growth forest. The forest provided a snapshot of what large portions of northern Wisconsin looked like prior to European settlement. It was these characteristics that made Kemp Station an exceptional outdoor laboratory.

But the large areas of windthrown trees now posed a potential wildfire risk and they had considerable timber value. Most importantly, the blowdown

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Kemp Research Report:
The Buzz About Cranberry Bogs

Last summer we grew sunflowers in our garden. In fact, the prettiest ones were those that came up on their own, probably from birdseed that had made it's way to the compost pile and then the garden. Not only were these flowers attractive to birds and squirrels, they were also extremely popular with the bumblebees in our yard.

During the evening hours, I enjoyed watching the bumblebees as they went about their work on the faces of the large flowers. The bees were so intent on what they were doing that they didn't seem to notice me at all. What made this experience especially fun was that I was able to share my bee stories with visiting Master's student, Colleen Ortwine-Boes. Colleen is studying how bumblebees forage in and around northern Wisconsin's cultivated cranberry bogs.

A bird's eye view of a foraging bumblebee.

Research shows that bumblebee populations are in decline in numerous areas of the world. I know that I do not see as many bumblebees around as when I was a child. A number of factors are cited as possible reasons for the decline, including habitat loss, fragmentation and pesticide poisoning. It has also been theorized that the increasing use of non-native pollinators, such as the honeybee (*Apis spp.*), may increase competition and adversely affect bumblebee populations.

So, why look at bumblebees in relationship to cranberry bogs? Well, it just so happens that the bumblebee (*Bombus spp. Latreille*) is the most effective pollinator of the American cranberry (*Vaccinium macrocarpon*). It has been shown that cranberry plants pollinated by bumblebees produce more fruit, larger fruit, and more seeds per berry than those pollinated only by smaller insects. This makes our black and yellow buzzing friend an asset to cranberry growers. But what can cranberry growers do to

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attract more bumblebees to their bogs? This is one question Colleen hopes to answer.

Since last spring, Colleen has been visiting cultivated cranberry bogs in Oneida and Iron Counties. At each study site, she collects information about landscape structure and composition, identifying specific plant communities. Each site is divided into smaller study sections based on plant community type. It's within these sections that Colleen regularly does her "bee walks."

Researcher Colleen Ortwine-Boes traverses a fallow looking for bumblebees.

Data collected during bee walks will help determine on exactly what plants bumblebees are foraging. Colleen records the observed bumblebee species (there are 13 *Bombus* species of bumblebees in Wisconsin), the plant it is foraging on, and whether it is gathering pollen or nectar. This information will aid in determining what plant species and/or community types bumblebees prefer.

In addition, pollen removed from bumblebees foraging on cranberries is analyzed to determine the presence of pollen grains from plants other than cranberries. Likewise, pollen from bumblebees foraging in uncultivated areas is analyzed to determine whether those bumblebees were also foraging on cranberries. This analysis will help estimate foraging distances and provide information about foraging resources found beyond the study sites.

Colleen's field research will wrap up at the end of this year's growing season, at which time she'll have ample information about the foraging preferences of the bumblebee. From this she can determine what specific plants, along with the American cranberry, provide the critical season-long forage for bumblebees.

A bumblebee forages on laborador tea.

This information will allow cranberry growers to develop management plans that maintain non-cultivated plants while protecting the cranberry bogs from becoming weedy. In the end, Colleen hopes to foster a more symbiotic relationship between the cranberry grower and the bumblebee – one where cranberry bed landscape design enhances bumblebee habitat and the bumblebee works its pollination magic to improve cranberry yields. *-K.O.*

Colleen received her BA in English and Secondary Education from Hope College in Holland, MI, and completed an AAS in Forest Resources Technology at Central Community College in Bend, OR. While seeking funding for graduate work in forest ecology, Colleen learned of the bumblebee research available with Dr. Janet Silbernagel of the Department of Landscape Architecture. The project piqued Colleen's interest, and the rest is history. Colleen hopes to work in natural resource conservation or management in the future.

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Karla Ortman, Editor
Kemp Natural Resources Station
8031 Kemp Woods Road
Woodruff, WI 54568-9643
(715) 358-5667
kemp@calshp.cals.wisc.edu

Salvage for Science *(Continued from Page 1)*

presented a unique scientific opportunity to study the development of old-growth communities *with* and *without* human intervention. Although old-growth forests were once the dominant feature on the landscape, they account for less than 3 percent

Wayne Wagler converts downed trees into timber

of the landbase today. Consequently, there is considerable interest, both among the public and forest ecologists, in restoring these rare communities. The question is "how?"

During the spring of 2001, a team of campus researchers met to chart a course. After much discussion, the group decided upon a limited timber salvage. All trees that threatened buildings or human safety would be removed. Also, two small blowdown areas would be salvaged.

Logs near the blowdown are loaded for removal

Salvage areas were selected and boundaries marked in June and July. In November, Wayne Wagler, a Rhinelander logger, began work. Using a high-tech harvesting machine, Wayne deftly salvaged windthrown, broken, and damaged trees. His careful harvest set the stage for the next phase of forest development and it generated over $2,000 in timber revenue.

These funds will be re-invested in the forest and used to establish research plots that monitor long-term forest development. Kemp Station also received a grant from Dr. Kevin McSweeney, Director of UW-Madison's School of Natural Resources, to install several deer exclosures. The exclosures

Karla Ortman stands beside salvaged logs.

are 30-foot by 30-foot fenced pens designed to keep deer out. Kemp Station is home to a large deer population and there is some evidence that deer are impacting forest flora. The exclosures will provide a way to examine forest development under a range of deer densities.

Research plots will be set up in both the blowdown and salvaged areas this summer. The information they generate will enhance our understanding of old-growth processes and ultimately lead to prescriptions aimed at restoring these rare communities. Thus, while the 2000 windstorm was an unplanned and unwelcome event, it has provided Kemp Station with new ways of advancing its mission of natural resources research and education.

Kemp's Vanishing Spring Beauties

Kemp Superintendent Tom Steele has been at the Station since 1990. Over the years, he has observed many changes on the property, some big, some small. One change is the disappearance of many spring wildflowers.

Tom has told me that trilliums once covered the hillside between the Kitchen/ Dining Hall and the Office/Lab building. In May, this area would be white with their blossoms. Today, you will not find one trillium there.

In years past, Tom would visit specific locations on the property to find such plants as baneberry and sarsaparilla, goldthread and pipsissewa, even wood sorrel and Solomon seal. But now when he visits these spots, the plants are no longer there. Other species, such as wintergreen and twinflower, have considerably reduced in number as well.

If you're like me, you're thinking, "what gives?" Why aren't these wildflowers growing where they used to? Why are some that were once plentiful now sparse? And that's exactly what I asked Tom.

One species that has not decreased in number here at the Station is *Odocoileus virginianus,* better known as the white-tailed deer. In fact, the deer population seems to have increased. This conclusion is based on simple observations like sightings and increased browsing, not only of ground flora, but also of favored trees like maple and hemlock.

So it appears as though we could cite deer as the reason for the dramatic change in Kemp's forest floor. But what about growing conditions? Could growing conditions in the forest change so that plants that once thrived here can no longer? Forests are constantly changing, and although 12 years isn't a very long time in the life of a hemlock forest, this theory is not a complete impossibility. However, overall, there has been little change in the Kemp forest since 1990. That puts us back to the deer theory, but how can we know for certain?

Two words: deer exclosure. A deer exclosure is an area that has been fenced off so that deer and other animals cannot access the interior. The idea is to see what will grow if the resident browsers do not have an impact on the protected area.

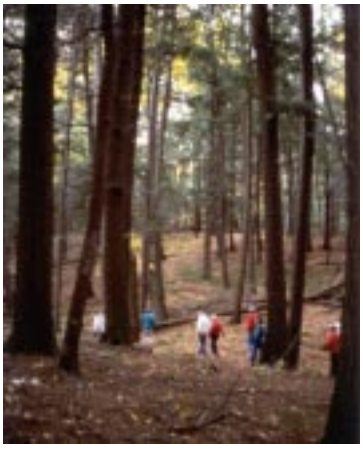
This summer about twenty 30x30-foot deer exclosures will be erected at Kemp Station. Some will be located in the blowdown area where zero post-storm clean up has occurred; some will be in areas where timber salvage took place following the windstorm; and still others will be located where the forest was not damaged at all. And some of these exclosures will include areas where ground flora was once known to thrive.

Will we see the return of the bunchberry or fringed polygala in these exclosures? Only time will tell. Seeds often remain dormant in the soil for years. If seeds are there and if they successfully germinate within one of the exclosures, then we may see the return of a missing plant.

But consider this scenario: the last remaining starflower in the Kemp forest is just about to bloom. Along comes a deer and "Munch!," there goes the starflower. Not to mention the last chance of seed production for that species, meaning no more starflowers at Kemp. True, animals and wind disperse seeds, but there are still many unknowns regarding all the mechanisms involved and the distance a seed may travel.

The Kemp deer exclosures are considered long-term research, the project lasting fifty years or more. It will be exciting to see what grows within these areas and to envision a Kemp forest of years past when ground flora was not so rare. A time when spring meant spring beauties blooming.
-K.O.

Edward Kemp (third from left) and friends along the shore of Tomahawk Lake. Notice the deep and extensive ground vegetation. Photo circa 1900.



The understory at Kemp Station, 1990. A new research project will investigate the impact of deer browsing on ground flora.

RAYMOND P. KENNEDY

1924 – 2001

Ray Kennedy, Caretaker of the Kemp Natural Resources Station from 1965-1993, passed away in June 2001. His connection to the property dates back to his early childhood in the 1920's when the Station was the summer estate of the Kemp and Spencer families.

Ray took great pride in caring for the Station's unique buildings and grounds and always looked for ways to improve the Station. He established the Station's first nature trail, a scenic hiking path through the woods and along the lakeshore that emphasized the Station's great natural beauty.

Ray was a towering man who had an equally large heart. He served as College "ambassador" to the many groups that came here. He was also a third-generation Northwoods fishing guide. He loved to hunt and fish and there was no place he would rather be than on the lake or in the woods. Throughout the years Ray provided rich memories for the many people who heard his stories or enjoyed one of his special shore dinners.

Ray passed away along the shore of nearby Spencer Lake – a fitting end to a lifetime spent on the waters and in the forests surrounding Kemp Station. He will be remembered for the extra care and attention he provided to thousands of researchers, students, and guests who visited the Station during his tenure.

Kemp Boathouse Gets a Facelift

The ice on Lake Tomahawk was a popular topic at Kemp Station this winter and rightly so. The Station's 77 year old wet boathouse was in need of a new roof. As we waited for the lake to freeze, we got all of the proper paperwork in order with the County and DNR. Weather conditions finally cooperated and work could begin. Scaffolding was set up around the building and tarps were carefully placed to catch roofing debris.

Gary Kellner repairs rotten roof boards before putting on the new roofing.

Given the age of the structure, it was not surprising to find an occasional roof board that needed replacement. Thanks to the hard and conscientious work of Kemp maintenance guru Gary Kellner, with assistance from Dale Whittaker of the Rhinelander Agricultural Research Station, the necessary work was completed prior to the ice melt. It's nice to know that one of the Station's and Northwood's more historical buildings will be used by scientists and students for years to come.

Gary Kellner explains the syrup production process.

CONGRATULATIONS!

We are pleased to announce that Thomas Steele, Superintendent, has received two awards recognizing his work at Kemp Station.

In January, he was honored with the Agricultural Research Station's Staff Recognition Award. Only one such award is granted annually.

In April, the College of Agricultural and Life Sciences awarded Tom with the 2002 Academic Staff Award for Excellence in Service. This award recognizes outstanding performance and service to the College.

The nomination process was open to all academic staff in the College. Each nomination required documentation of the nominee's superior performance and letters of recommendation from three additional supporters. A selection committee then reviewed all nominations and selected this year's recipient.

Well done, Tom!

The Sweetness of Spring!

On Saturday, March 23, Kemp hosted an informative and tasty outreach program about maple syrup. We were glad to have Matt Thomas from UW-Madison here to speak about the history of sugaring in Wisconsin. Matt shared numerous slides from some of his archeological excursions into former sugar bushes, along with interesting facts and stories.

Participants then had a chance to see Kemp's "backyard sugar bush" in action, with it's tapped trees and boiling sap. Kemp's handyman, Gary Kellner, explained the sap to syrup process as folks looked on and enjoyed hot beverages and baked goods containing, what else?, maple syrup!

The final product was sampled before participants left the Station. We like to call this syrup "Kemp Gold."

KEMP DORMITORY UPDATE: A BUILDING DESIGNED BY STUDENTS FOR STUDENTS

Last summer, Kemp Station received a grant from the National Science Foundation to build a 20-person dormitory to house researchers and students working at the Station. The new living quarters will help alleviate a severe lodging shortage that has limited Station usage during the busy summer field season.

The traditional approach to state building projects is to hire a commercial architect to do the engineering and design. But true to its educational mission, Kemp Station is taking a different tack. The Station is working with Dr. David Bohnhoff and a team of senior Biological Systems Engineering students from UW-Madison to design the new residence. The students are enrolled in BSE 501 – Fundamentals of Biological and Agricultural Engineering Design. The year-long class integrates the knowledge students acquired throughout their undergraduate education into a comprehensive, capstone exercise.

"The Kemp dormitory presents an extraordinary learning opportunity," says David Bohnhoff. "This is a real-world project with real-world challenges. The students are gaining valuable experiences that will prepare them for their professional careers."

The students have responded enthusiastically to the challenge. They are particularly excited about working on a tangible project as opposed to a more theoretical exercise. Bohnhoff notes, "The students realize they are designing a facility that will be used by their peers for decades to come. This has really motivated them and got their creative juices flowing."

The course culminates at semester's end with the preparation of a comprehensive building plan and construction documents. This is a major accomplishment that specifies in detail all elements of design, literally from the ground up. The outcome will be a functional and aesthetically pleasing building that recognizes the unique history, setting, and mission of Kemp Station.

"We are designing a building that not only houses researchers and students, but that also teaches. We want this new building to be a model of green construction practices and energy conservation," says Bohnhoff. Given the amount of new home construction and remodeling taking place in the Northwoods, the Kemp dormitory should be a valuable demonstration of innovative and environmentally friendly building practices.

Construction of the dormitory represents an exciting new chapter in the Station's history. We will keep you posted via future articles as construction proceeds. Anyone interested in learning more about the project or wishing to contribute to the building's construction fund should contact Tom Steele at 715-356-9070.

Lower level of the dormitory containing kitchen and dining facilities, bath areas, utility room and suites

Upper level of the dormitory containing large living and meeting room, and suites

Kemp Natural Resources Station
8031 Kemp Woods Road
Woodruff, WI 54568-9643

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