Field Notes

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NREM welcomes a new Chair!

This fall we are proud to introduce Dr. Sue Blodgett as the new chair of the NREM and Entomology departments. Dr. Blodgett comes to us from South Dakota State University where she was head of the Plant Science department. She received her undergraduate degree from Syracuse University in biology, a Master’s degree from Cornell University in vegetable crops and a Master’s and PhD from Kansas State University in entomology. She has been involved in teaching, extension, and research on pest management of food crops and Integrated Pest Management. Dr. Blodgett brings with her a wealth of knowledge and innovative research, experience in leadership, and readiness to get to know her new colleagues in both departments.

On behalf of the Field Notes Editorial Committee, we offer a warm welcome to Iowa State, Dr. Blodgett!

Letter from the Chair

This second edition of Field Notes demonstrates what a talented and committed group of graduate students have been able to accomplish. Even though they are very busy with academic, research, and employment pursuits and family responsibilities, they have made the time and effort to build a new tradition in Field Notes. I am very impressed with the leadership the NREM Graduate Students have demonstrated in this publication to help inform alumni, friends, faculty, and each other about their many outstanding accomplishments.

I was very honored to have been selected as the Chair of NREM and the Department of Entomology at Iowa State. Although I have been on the job for just over a month, I am not the newest member of the Department. Dr. Peter Wolter arrived just weeks ago from University of Wisconsin and has gotten off to a very fast start with an NSF Rapid Response-funded project. In addition, Dr. Robert Klaver was selected as the new Unit Leader of the Cooperative Fish and Wildlife Research Unit, and we are looking forward to having him on board sometime after the first of the year.

One of my charges of Chair has been to develop a common business model for NREM and Entomology. What is the business model? Well, I hope that you will see it evolve over time. It is expected to have little or no impact on academic programs, but we hope to run office procedures and departmental resources more efficiently by combining strengths of both departments. For example, the Information Technology (IT) group is in the process of being merged into one co-located unit so that hardware, software updates, and installations can be managed more quickly and efficiently.

NREM continues to grow as enrollment has continued to increase. There are currently 35 graduate students enrolled, and another 14 have finished up since the last issue of Field Notes. New freshman enrolled this fall are 49 in animal ecology and 8 in forestry. In addition, there have been 35 and 9 transfer students in animal ecology and forestry, respectively, making our freshman class larger than we have seen in many years.

We know that many of our graduates go on to careers that keep them connected to Iowa State in one way or another. We welcome your news; let us know what you are doing and stop by when you are in Ames so that we can follow our alumni on their career path.

--Sue Blodgett

On the cover:
Tyler Harms (MS, 2011) measures length and width of Mountain Plover eggs to examine maternal investment in egg volume. Phillips County, MT. (Photo P. Skrade)
A Healthy Portfolio

Landscape diversity for a sustainable future

by Bill Headlee

A few miles southeast of the town of Luther lies a field unlike any other in Iowa. Several years ago, it resembled much of the surrounding countryside – farmland managed on a corn-soybean rotation. However, over the past three years, an elaborate patchwork has risen from the hillside. Seventy-five experimental plots span the landscape, and each one is an integral piece of an ambitious project to evaluate the productivity, environmental impact, and economic feasibility of an array of biomass crops. In this field, the corn and soybeans have company: switchgrass, sorghum, triticale (a wheat-rye hybrid), and hybrid aspen trees, each offering unique possibilities for producing renewable energy. From the summit to the floodplain, the patches adorn the hillside, and from a distance it appears as though an intricate quilt has been draped upon the shoulders of Mother Nature herself.

What makes this experiment unique, besides the diversity of the crops, is how they are combined to provide more than just yields. Multiple benefits, such as improved

soil and water quality, are achieved by combining early-harvested crops with late-planted ones (double-cropping) to maximize nutrient capture and minimize soil exposure. For example, winter triticale is double-cropped with sorghum, and with soybeans in a corn-soybean rotation, to capture nutrients and hold the soil in place. Other benefits, such as reduced inputs and timely economic returns, are also pursued by combining annual crops with perennials. Between the rows of hybrid aspen trees, winter triticale is grown to provide weed control and short-term financial returns while the trees mature. Within the switchgrass plots, corn is interplanted during the first year to provide an initial return and to protect the switchgrass as it establishes. These are more than just crops; they are multifunctional cropping systems, all of which have been designed to be not only productive, but also protect the soil and water.

Having a Field Day

Today is the annual field day – farmers, businesspeople, curious citizens, and a local television news crew listen to researchers describe their work. There is

continued...
much for the audience to absorb. Altogether, twenty-two faculty, staff, graduate students, and university affiliates are involved in what has been dubbed the “Landscape Biomass Project”. The research project has been spearheaded by Dr. Lisa Schulte Moore, but she is the first to point out that it has been a group effort.

“One of the greatest rewards of this project has been the opportunity to work with such a fabulous team,” she says. “ISU has a great interdisciplinary environment, and we’re all learning a lot from each other.” In addition to NREM, members of the research team hail from: Ag & Biosystems Engineering; Agronomy; Ecology, Evolutionary, & Organismal Biology; Economics; and Biorenewable Resources & Technology. External collaborators include professionals from the U.S. Forest Service and USDA Agricultural Research Service. The interdisciplinary nature of the project means the research topics are as diverse as the cropping systems themselves – in addition to crop yields, the audience today hears about how the different cropping systems impact water quality, soil carbon, microbial communities, and greenhouse gases. Though seemingly far-reaching, these topics all draw from a central question: how do different biomass cropping systems, in different locations on the landscape, influence the productivity and health of the ecosystem?

The presentations are only summaries – countless hours have been spent over the past three years to establish plots and maintain them, and to collect the mountain of data that is being summarized over a few short hours at the field day. The researchers have been assisted by a small army of undergraduates and graduate students, both paid and volunteer. Funding for the establishment of the project has been provided by the ISU College of Agriculture and Life Sciences; Leopold Center for Sustainable Agriculture; USDA Agriculture and Food Research Initiative; and the U.S. Forest Service. In-kind support has also been provided by the researchers’ home departments, the BioCentury Research Farm, the U.S. Army, and the forestry company ArborGen. Last, but not least, the Committee for Agricultural Development has provided the land on which the study grows.

“How do different biomass cropping systems, in different locations on the landscape, influence the productivity and health of the ecosystem?”

Technology. External collaborators include professionals from the U.S. Forest Service and USDA Agricultural Research Service.

The interdisciplinary nature of the project means the research topics do different biomass cropping systems, in different locations on the landscape, influence the productivity and health of the ecosystem? As these answers emerge, the goal of the project is to provide a portfolio of cropping systems which growers and policymakers can use to manage both economic and environmental risks for a given landscape.

“One of the biggest challenges right now is finding the funding to continue the project out to our target of ten years,” says Dr. Schulte Moore. “Thanks to our
initial funding, we have made it through the establishment period. But in order to assess long-term ecosystem productivity and health, we need to be able to continue to actively manage and maintain the plots for at least a decade.”

“What we hope to do is lay the groundwork for an environmentally and economically sensible industry to continue to develop.” – Lisa Schulte Moore

The air is comfortably cool, pleasant for a mid-morning in August; a brief misting of rain dampens the ground but not the enthusiasm of the participants. Questions abound, many of them regarding the practical aspects of each crop: when can each crop be harvested, how much biomass per acre, how much fertilizer and herbicide, and how many passes through the field? The questions reflect the evolving reality of modern agriculture — the bottom line is paramount, as always, but in addition to sheer productivity there is also a growing concern over the cost of chemical and energy inputs.

Therein lies the promise of perennials like switchgrass and hybrid aspen — which require relatively low inputs beyond initial establishment — and annuals like winter triticale, which can be used in double-cropping systems to keep nutrients in the field and reduce weed pressure. Deploying these cropping systems at appropriate locations on the landscape — particularly those most important for preventing soil erosion and protecting water quality — offers the potential to grow highly-efficient, diverse feedstocks for sustainable energy production. And the benefits extend beyond the bottom line; less chemicals and fewer passes through the field are also gentler on the land. Soil is built up rather than lost to erosion, and the water leaving the field is cleaner. In this way, as Jerry Wilson suggests, we can “begin to repay” the land for its many years of service.

A Healthy Portfolio

The idea is seemingly simple: to evaluate how a diverse portfolio of biomass energy crops can be deployed in such a way to optimize long-term productivity while ensuring the health of the ecosystem, similar to how a diverse retirement portfolio can provide long-term financial stability and well being. In a way, our society is approaching a retirement of sorts — not your typical departure from a long-lived career, but instead the departure from a well-worn energy platform known as fossil fuels. Given that fossil fuels are in finite supply, few would argue against the inevitability of this retirement. As Thomas Friedman suggests in his book *Hot, Flat & Crowded*, it is now
largely a debate over the date of the retirement and, perhaps, the appropriate severance package.

But replacing fossil fuels is no simple task. Even just replacing petroleum is a tall order. Our modern society requires much fuel, so much that no single energy source is likely to replace petroleum on its own. Experts largely agree that our energy will need to come from a variety of sources. And biomass is poised to be an important part of the mix: biofuels from grain crops have become well-established, and progress is being made toward converting other forms of biomass into the fuels of the future. While progress by industry has not been as rapid as some have hoped, Dr. Schulte Moore is quick to point out the upside.

“A slow approach may be better in the long run,” she reasons, “because it can allow the industry to develop in a smarter and more equitable fashion. It means passion is the motivator, not just profit. We have a passionate group, and what we hope to do is lay the groundwork for an environmentally and economically sensible industry to continue to develop.” Like any good retirement, the retirement of fossil fuels will require early planning and diverse investments. Whether we have begun planning early enough is debatable; but now that we are planning, how are we to know which investments to make? Which crops are healthiest for the economy and the environment, and where on the landscape should we plant them? These are the questions being asked today, in a field a few miles southeast of Luther, Iowa.

Bill Headlee is a PhD student majoring in Forestry with a minor in Biorenewable Resources & Technology. His research revolves around quantifying the biomass productivity of selected poplar cropping systems, as well as the effects of nutrient management and site quality. His major professor is Dr. Richard Hall.

Like any good retirement, the retirement of fossil fuels will require early planning and diverse investments.
Urban fisheries - that is just a lake in town right? It sounded simple two years ago when I first became involved with the Iowa Department of Natural Resources’ (IDNR) Boone Fish Management crew. The IDNR needed an extra hand and I needed a job. The project started off well since the majority of the groundwork was already established. We began with 13 lakes/ponds within the city limits of the Capitol, typical bass/bluegill/catfish populations, and a willing city government partnership. The City of Des Moines was struggling to manage urban fisheries effectively. In two years the city had greater than 7000 children participate in their youth fishing programs where they would fish sub-par ponds or pools devoid of fish. The IDNR fish management crew from Boone was already swamped with projects in seven counties. I came in as a “field tech” but due to budget shortfalls I became the lead on the project.

We began like any IDNR fisheries lake restoration effort: collect and interpret data, pinpoint needed improvements, and implement those improvements. The majority of our focal lakes are actually small ponds that range from one to ten acres in area. These small ponds usually encounter the same problems as typical Iowa farm ponds or small lakes: high sediment and nutrients in the water, low predatory fish numbers, and small panfish sizes. If the DNR fisheries crews around the state manage these problems on an annual basis, then why are these urban fisheries so different?

It then became apparent that the social aspects posed a different challenge in urban fisheries. As with many discoveries, we had to fail before our findings became obvious. Our failure came when we tried to push for an extensive watershed restoration in one of our ponds. We quickly secured money, plans, and partnerships and we were nearly ready to turn everything over to a man with a backhoe when we got a big “hold on here!” from the local government. We had moved too fast and had not taken stock of the social ramifications of our work. We had overlooked the important question: “What do the people want?” Funding disappeared next and we were left scratching our heads despite two years’ worth of fisheries data that said we were doing the right thing. So what exactly just happened?

As fish biologists we tend to first investigate the fish and the water. The ecological aspects of fish and water are typically what we have studied the most and are undoubtedly the keystone of our profession. Tackle the fish and water problems and the people will be happy, and that is most often the path we take. In an urban setting however, managing fish and their habitats also involves understanding and managing people. Typical “rural” lake management strategies address social concerns secondarily to the science and...
often after changes are made. However, ponds in densely populated urban areas have additional social concerns that come with the relatively higher number and diversity of stakeholders. Each two acre urban pond and its surrounding park may be influenced by the city, county, and state governments; multiple neighborhood associations; a “friends of the park” group; and various other park users. This adds up to a lot of people to please per acre.

Our saving grace was getting a sociologist on board the urban fisheries project. Angie Carter, another MS student at Iowa State University, is providing us valuable insight into the human dimensions side of fisheries management. Her guidance aids our efforts far into the future and already she reminds us that our work and failures were not in vain. We have found high demand and willing partners in many cities of the Des Moines metropolitan area as well as promising locations and surprisingly good fish populations. The key is to slow down and find out where these things all intersect.

The project’s overall goal is easy to rally behind: provide better fishing opportunities for more people. Children and families have always been important to the natural resources professions because exposure at a young age tends to develop into a lifetime interest in the outdoors; an initiative not only in Iowa but also nationwide. Although Iowa was once a rural state, urban fisheries plans are vital with an increasing population and a growing family demographic. I feel privileged to return to Iowa State University and be on Iowa’s front lines aiding in fisheries management, while contributing to fisheries science.

Steve received a BS in 2008 from Iowa State in Animal Ecology with a focus on Interpretation. After spending three years working as a temporary employee with the Iowa Department of Natural Resources (IDNR), their Urban Fisheries Project led him back to Iowa State to pursue a MS in Fisheries Biology under Dr. Joe Morris. Funded by IDNR Aquatic Education, this project is helping to create a new method of evaluation and restoration for ponds in Iowa’s urban areas.

Even invasive species are different in an urban setting! Released pets, such as these, an eight pound goldfish and four pound oscar, are not uncommon in the project’s focus lakes (right). (Photo S. Konrady)
Bison-mediated seed dispersal in a tallgrass prairie

Pete Eyheralde

It’s late afternoon on a hot summer day. Dripping sweat and jotting down field notes, I’m hunkered down in the tall grass as squadrons of dragonflies drone overhead. In the air just above the prairie grasses and wildflowers these winged predators find good hunting, for a multitude of insects that seem to be hopping, buzzing, and flying in all directions. Dicksissels and sedge wrens belt out a continuous chorus from nearby, as they perch on the swaying grass stems. Hoping for cool breeze, I stand up from the vegetation quadrat I’ve been sampling and hear a loud roar from just over the hill. A deep, chest-rattling roar that can only mean one thing – the bison rut is in full swing on the Neal Smith National Wildlife Refuge.

That low frequency sound travels for miles across the open grasslands, telling all would be challengers that 2,000 pounds of adult bull bison is ready and willing to defend his cows. Hiking up over the hill I easily spot him in the midst of the cow-calf herd in the creek valley below. Flies buzz in a cloud around his mud-coated flanks as he shakes his massive head from side to side. He paws at the bare earth of the wallow beneath him before going down on one knee, stirring up a cloud of dust in the process. In a show of dominance with his tail held high, he turns broadside to his opponent, revealing the full bulk of his rippling muscles. Before he even lowers his head to charge, his smaller challenger has had enough. The young bull turns and gallops back to the satellite herd of three-year-olds and away from the cows in estrous.

The long shaggy hair on the front half of a male bison not only makes the mature bull look bigger, but serves to protect him as he plows through winter winds and the rough stems of summer grasses. Peering through binoculars I see what I’m looking for. Lodged in the thick mat of black hair between his horns are seeds – grass seeds, wildflower seeds, and scraps of vegetation picked up and carried for who knows how long, or how far. That’s what I’m trying to find out with my research. We know that grazing by bison has a huge impact on grassland plant growth and the resulting habitats used by other wildlife. What I’m trying to determine is the role that bison play as seed dispersal agents. How many tallgrass prairie plants depend on bison to move their seeds around? How many of those species get “planted” in bison wallows? Most importantly for managers of tallgrass ecosystems – if we try to reconstruct prairies without bison, will they be truly functional ecosystems? In other words, will
they “work”? Prairie restoration is kind of like trying to restore an old car or tractor. Putting tall grass and wildflowers on the landscape is the equivalent of fixing up the body and paint job without restoring the engine. It looks good, but it’d be even better if it could run. To get those prairies up and running we need to not only restore the plant species that were present historically, but the ecological processes that were functioning across the landscape as well. What I’m trying to find out is if bison are more like the cup holder in your car, nice to have but not essential, or more like the transmission, you can’t drive anywhere without.

Conservative estimates suggest that 30 million bison once roamed over North American grasslands, from eastern Oregon to northern Florida and Canada to Mexico. That’s a lot of seeds getting moved around! As far back as 1892 E. L. Berthoud documented evidence of seed dispersal by bison as "a peculiar case of plant dissemination" in the *Botanical Gazette*. He observed plant seeds in the "enormous pad of hair four to twelve inches long that clothes the whole front of the buffalo’s head" and the "dense long hair that clothes the legs and breast of the animal." In my research I’m attempting to quantify that process by recording the abundance and diversity of plant species found not only in bison hair (epizoochory) but also in bison dung (endozoochory). Unique among other grassland herbivores, bison shed their winter hair in large clumps throughout the spring and summer. This shed hair is full of seeds, both recently attached, and seeds carried from the previous fall. Some of these clumps of hair are picked up by birds and rodents for nesting material, some are carried off by ambitious ants and some shed hair is literally planted in the soft bare earth of bison wallows as the animals roll back and forth over the ground. The deposition of shed winter hair usually peaks in May and tapers off by the end of July, but bison are eating grass (and seeds!) and depositing dung samples the whole year round. I have fifty 164 ft. (50 meter) transects set up in the 750 acre (303 hectare) bison enclosure at the Neal Smith National Wildlife Refuge. Using a hand held GPS receiver, I locate and walk the transects once each month, collecting any shed hair or dung samples the bison have been kind enough to leave for me.

While extracting and identifying seeds from shed hair provides useful information, it doesn’t tell you the whole story. I need to know what seeds are being picked up and carried in bison hair in the early fall. I also want to know what seeds attach in early fall, but then fall out on their own, before the

...if we try to reconstruct prairies without bison, will they be truly functional ecosystems? In other words, will they “work”?

Three year old bull picking up seeds (photo P. Eyheralde)
winter hair is shed the following spring. To do that I need to clip hair samples directly from the animal's body. Sneaking up on a full grown bison with a pair of scissors is next to impossible (even the cows weigh 800 pounds) and using a dart gun to tranquilize the whole herd for a haircut is pretty impractical too. Luckily for me the bison herd at the wildlife refuge is rounded up every November to microchip the new calves, conduct genetics testing and check the health of the animals. That means that most of them end up going through a hydraulic squeeze chute, where I've got about three minutes to jump in with electric clippers and grab a hair sample, before they're turned loose. Having direct contact with the animals allows me to classify which types of seeds are more likely to be carried by bulls, cows or juveniles. Preliminary evidence from last year's data is showing quite a difference, most likely due to the different nutritional requirements and foraging behavior of nursing cows in large herds, compared to small groups of adult bulls that remain separate from the main cow-calf herd for most of the year.

By studying the behavior and movement patterns of these bison I'll be able to build a better picture of what drives their movements from one area of the prairie reconstruction to the next, what types of vegetation they are likely to forage in or pass through most often, and how the herds may interact with non-native plant species that weren't found on the landscape 200 years ago. This fall I plan to place GPS collars on three of the bison, an adult cow and two adult bulls, to create a daily record of movement patterns within the reconstruction. This data can then be combined in a GIS layer with maps of vegetation types, topography, soil types, wallow locations, fence locations, water sources, controlled burn history, and probably a few other things I haven't thought of yet. I'll also be able to compare the movement patterns of the bison herd in this tallgrass prairie reconstruction with GPS data from bison herds in other states that are managed in larger enclosures, containing native prairie remnants, as well as from herds of free roaming bison in wilderness areas.

The long-term goal of this field research is to produce models that predict native and non-native seed dispersal by bison in tallgrass prairies. These models will help create a better understanding of how bison influenced plant dispersal throughout the eastern Great Plains historically, as well as how grassland managers today can restore the engines of the tallgrass prairies we are attempting to rebuild.

Pete is a PhD student in NREM, advised by Dr. Sue Fairbanks. Originally from northern California, he completed undergraduate degrees at the University of Northern Iowa and bought a farm in southern Iowa where he raised bison for 12 years. He's worked for the Iowa DNR in State Parks and Fisheries, the Iowa Office of the State Archaeologist, taught science courses as an adjunct instructor at Indian Hills Community College and William Penn University, and was the Naturalist for Mahaska County Conservation. His primary interests are large mammal ecology and restoration ecology, but he is occasionally distracted by herpetology and paleontology.
Stream pollution from runoff is a chronic problem in Iowa and the entire Midwest. Remnant forest ecosystems in this largely agricultural landscape could have the potential to protect water quality by capturing nutrients and sediment before they reach streams. Native systems are dynamic, with organisms adapted to the nuances of season, soil, and resources of a particular habitat. In a properly functioning natural system, these organisms tightly cycle nutrients so that little is lost. Many human land uses can affect forests and limit their ability to function. We have been looking for connections between land use, vegetation characteristics, and water quality. Some of our earlier work revealed that certain forest understory plants play a critical role in nutrient uptake, especially in early spring when crop fields are bare and trees have not yet leafed out. These herbaceous (non-woody) plants can also be useful indicators of ecosystem condition since they are sensitive to disturbance.

In this project, we are interested in the differences between preserved and urban forests, and their effect on water quality. To measure that, we have been sampling plants and water associated with headwater streams at forested sites in Polk and Warren counties. We conducted field work from early spring through fall for two years to examine seasonal variation as well as to compare land use effects. We examined plant community composition and nutrient content in areas that drain to stream water sampling points.

What we’ve found so far

- While both preserved and urban sites have a similar number of species, preserved sites have more native and urban more non-native species.
- In urban sites, high-quality specialist species are replaced by weedier generalists, and critical early-flowering perennials are lost.
- Urban forests had less total biomass (the dry weight of shoots and roots) than preserved sites across all seasons, and less root biomass that stores captured nutrients.
- Urban sites have more water output and higher concentrations of nitrate-nitrogen.

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We compared plant communities for different land use based on their diversity as well as on the floristic quality of the species present. Perennial herbaceous plants that are adapted to moist, closed-canopy forests are considered forest “specialists” (see Table 1) while plants that can take advantage of a variety of different habitats including old fields and ditches are called “generalists”.

We tested water quality, including sediment and nutrient concentrations (nitrate, total nitrogen, phosphate, and total phosphorus), and we measured stream size and flow rate bi-weekly.
to calculate the total discharge. We collected samples of water in the stream to analyze nutrient concentration and multiply those concentrations by the discharge of the stream to determine nutrient and sediment delivery.

Alister Olson, another graduate student on the project, collected samples of aquatic organisms from these streambeds. Many of these macro-invertebrates (large-bodied insects) can be used to evaluate ecosystem health because they are very sensitive to streambed conditions and stream water chemistry.

Preliminary results from data collected in 2010 indicate that human land use can cause shifts in plant communities. As communities are degraded, water and nutrients are less tightly cycled.

Nitrate is one nutrient we’re measuring that can pollute water in high concentrations (>10mg/L). We detected higher nitrate concentrations in stream water from urban systems. We also measured the amount of water flowing out of the watershed (discharge) and the amount of total nitrate leaving the system (delivery). This indicates that not only is more water flowing out of urban systems, but more polluted water.

The amount of discharge and the concentration of various nutrients can vary seasonally and from year to year. Other water quality metrics fluctuated seasonally in 2010 and will be analyzed with 2011 data to uncover patterns.

Ongoing work

Nutrient content of harvested plants will be evaluated relative to vegetation community and water data. Aquatic organisms that were

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Table 1. Average of floristic quality metrics across 3 preserved and 3 urban sites.

<table>
<thead>
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<th>Floristic quality metrics</th>
<th>Preserved</th>
<th>Urban</th>
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<td>Total species</td>
<td>71</td>
<td>71</td>
</tr>
<tr>
<td>Native</td>
<td>69</td>
<td>63</td>
</tr>
<tr>
<td>Non-native</td>
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<td>8</td>
</tr>
<tr>
<td>Herbaceous plants only</td>
<td>53</td>
<td>47</td>
</tr>
<tr>
<td>Early-flowering species</td>
<td>22</td>
<td>18</td>
</tr>
<tr>
<td>Closed-canopy specialists</td>
<td>30</td>
<td>24</td>
</tr>
<tr>
<td>Moist habitat specialists</td>
<td>33</td>
<td>25</td>
</tr>
</tbody>
</table>

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Monitoring re-introduction of native perennials in an urban forest. *(Photo C. McMullen)*

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Some effects that people have on urban forests are obvious (litter and debris), and some effects are more subtle (invasive garlic mustard in the foreground). *(Photo Z. Keninger)*

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continued...
collected in June are being identified and assessed to compare aquatic communities across land uses. We are also studying the potential of restoring functionally important plants that capture large quantities of nutrients to find ways to reduce nutrient loss. This work is part of a larger study that integrates water quality modeling and in-field monitoring, forest vegetative community analysis, and examination of benthic macroinvertebrates across a land use gradient from agricultural to urban systems. With a deeper understanding of how these pieces work together, we can help enhance forest ecosystem function across the Iowa landscape.

Michaeleen is a PhD candidate in Forest Biology under the guidance of Dr. Jan Thompson. After studying English and Environmental Science at the University of Iowa, she completed a Master’s in Forestry at ISU.
The NREM Department and Iowa Department of Natural Resources (IDNR) hosted the first Outdoor Skills Weekend for Iowa State students at the 4-H Center near Luther, IA on October 14-16, 2011. Fourteen students participated in the event, which focused on the importance of the North American Model of Conservation for natural resource management in the U.S. Students also had opportunities to learn how to fish, canoe, behave safely around firearms, shoot rifles, shotguns, and bows, prepare for and equip themselves for camping and wilderness trips, and to experience nature alone at night.

The IDNR was instrumental in being able to offer this event to students; providing both equipment and the majority of the needed funding. Joli Vollers and Kim Bogenschutz helped with event planning and instructed at the event. Jim Pease, Professor Emeritus in NREM, taught students about the North American Model of Conservation and provided students the opportunity for a quiet, solitary experience in the woods at night. All of the student participants indicated that they had a wonderful experience and that they would recommend attendance at this event to friends and classmates. Planning has begun for the next NREM Outdoor Skills Weekend to be held in 2012!
I was raised without access to hunting; my parents did not hunt nor did any of my close friends, but I’ve held a lifelong interest in it. In high school I finally began searching for ways to take hunter safety, realizing that many Wisconsinites had done this at age 12. The embarrassment of being older than the typical hunter safety student stalled me from pursuing the hunter safety certification, but I was not overly concerned because I still lacked a hunting mentor and access to hunting grounds. Fast forward 5 years to Ames, IA. I’m 23 years old, a graduate student in the department of Natural Resource Ecology and Management, thinking about taking hunter safety only to realize that most Iowans complete the class by age 10. But then I found out about Conservation Leaders for Tomorrow (CLfT), a program designed for students and professionals in the natural resource sciences that have no experience hunting.

My purposes for participating in this workshop were to receive my hunter safety certification and participate in a hunt. It was perfect for me, because it was composed of my peers, some who had an interest in hunting all their lives but never the chance to experience it, like me, and others who were there to learn about the importance of hunting to conservation. CLfT provides classroom teaching and field experience through a four-day workshop with leaders in the fields of natural resources and conservation. Participants leave with an understanding of the cultural, ecological and ethical significance of hunting in today’s world. The real value of CLfT is that it is much more than a hunter safety certification course; it’s the interactions with the individuals with careers I admire and aspire to have, experiencing the sensation of the hunt, and understanding the role of hunting in conservation. 

For more information visit: www.clft.org
Allen Pattillo

Allen began work in the NREM Department on April 1st, 2011 as the Fisheries Extension Specialist for Iowa State University. He is responsible for answering questions from people throughout Iowa (and beyond) about fisheries, aquatic plants, aquatic invertebrates, and pond management as well as aquaculture. Allen, along with Dr. Rebecca Christoffel (wildlife) and Dr. Jesse Randall (forestry) comprise the extension group in NREM, who work closely with Iowa Department of Natural Resources to ameliorate current and emerging natural resources issues that affect Iowans.

Allen is also a researcher with the North Central Regional Aquaculture Center (NCRAC). The directorship of NCRAC is moving to ISU in January 2012 and is funded by the USDA for the purpose of promoting aquaculture research. Allen acts as the liaison to Dr. Joe Morris, long-time ISU professor and the new Director for NCRAC. Allen’s research with NCRAC includes exploration of new feed stuffs for the culture of juvenile bluegill and hybrid striped bass. In the near future, Allen plans to work with aquaponic culture of bluegill and seedling trees, and other high-value crops. Aquaponics is the combination of aquaculture and hydroponics to produce a stable, efficient, and economically/ecologically viable form of agriculture.

Allen Pattillo was born and raised in Dawsonville, GA, in the foothills of the Appalachian Mountains, an area famous for moonshine-running, stock-car racing, and the southern trailhead for the Appalachian Trail – Amicalola Falls. As an undergraduate, Allen majored in Fisheries and Aquaculture at the Warnell School of Forestry and Natural Resources at the University of Georgia. He has experience with reservoir dynamics management, trout stream ecology management, wetlands management, and aquarium culture of saltwater fish and invertebrates. Allen worked on the development of Australian Redclaw Crayfish aquaculture techniques for his Masters research at Auburn University in Alabama. Allen’s thesis dealt with potential invasive impacts of the redclaw on native crayfish species, crayfish anesthesia, and sex reversal of the redclaw crayfish.

Honorable Mention
Category: People
Future Scientists Fishing Lake LaVerne
Photo by Sarah Hart, submitted by Allen Patillo
Peter Wolter

Peter is an Assistant Professor in Natural Resources Ecology and Management. Currently, he is investigating the use of multi-temporal Landsat data, with Dr. Mike Madritch (Appalachian State University), to map aspen clones in MN, WI, MI, CO, and UT. This work will be linked with hyperspectral remote sensing data (airborne and in situ) to detect and map foliar chemistry differences between phenologically distinct aspen clones. The goal is to identify forest genetic diversity and resulting below ground microbial diversity. Peter is also interested in using airborne LiDar data to calibrate satellite-based forest structure estimation models that currently rely on ground-based measurement data. The aim is to be able to accurately and efficiently monitor forest biophysical parameters using readily available data sources, and provide a framework for semi-automated, periodic updates to track forest structural changes and associated impacts on ecosystem biodiversity.

Peter completed his PhD at the University of Wisconsin at Madison with Dr. Phil Townsend in May of 2009. His dissertation work focused on using synoptic polar orbiting sensors (Landsat, SPOT, Radarsat, and PALSAR) to model and map forest biophysical parameters (e.g., tree species abundance, tree size, basal area, crown closure, etc.) in northern Minnesota to support ongoing studies focused on understanding landscape-level insect outbreak dynamics which may lead to the design of more pest-resistant landscapes through adaptive forest management.

Prior to moving to Madison, Peter was a Research Fellow with the Natural Resources Research Institute at the University of Minnesota –Duluth (1991-2004). His work at NRRI focused on using multi-temporal satellite sensor data to map forest cover, monitoring forest change through time, and study the effects of harvesting patterns on landscape structure in the upper Midwest and Canada.

Peter received a MS in Forest Resources from the University of New Hampshire – Durham in 1990 where he also worked as a Research Scientist at UNH’s Complex Systems Research Center within the Institute for the Study of Earth, Oceans, and Space. His work at Complex Systems centered on using multi-resolution satellite sensor data to link fine-scale forest change dynamics in the Brazilian Amazon to broader scales for global change research and simulation models of biotic influence on atmospheric gas composition.
Where are they now?

Recent graduates find exciting careers

Devan McGranahan did both his MS (Sustainable Agriculture & Animal Ecology) and PhD (2011, Ecology & Evolutionary Biology) at ISU. His research involved monitoring the response of tallgrass prairie vegetation in the Grand River Grasslands to fire and grazing and studying the landscape ecology of tall fescue invasion with respect to fire. Devan left ISU for The University of the South in Sewanee, Tennessee, where he now works as a teaching/research post-doc. In addition to designing a course on the ecology of agriculture, he is involved in a new patch burn-grazing initiative on a recently cleared second-growth forest. He is also coordinating an investigation into the fire response of a newly-described native bamboo species that occurs on the 13,000 acre Domain of the University.

Connie (Dettman) Rose completed her MS in 2006 under the direction of Drs. Cathy Mabry McMullen and Heidi Asbjornsen. Her work was on the historical and current vegetation communities of lowland savannas in the Midwest, linking research, restoration, and management. She is currently a Fish and Wildlife Biologist with the US Fish and Wildlife Service. Connie is a planning biologist in the Midwest Regional Office in MN. She writes Comprehensive Conservation Plans (management plans) for existing Refuges across 8 states in the Midwest and also plans new Refuges.

Annabel Lee Major completed a MS in 2006 working with Dr. Jim Pease. Her research focused on conservation education and volunteer training programs. She is currently the Program Coordinator for the Nebraska Master Naturalist Program at University of Nebraska-Lincoln. She develops and coordinates the Master Naturalist Program alongside a number of partners, including UNL, Nebraska Game and Parks Commission, and the Nebraska Environmental Trust. The program consists of training for adult natural resource volunteers in interpretation, ecology, conservation biology, native ecosystems, native flora and fauna, geology and hydrology, and human dimensions of natural resource management with the purpose of developing an engaged and informed corps of conservation volunteers.

Tony Sindt received his MS in Fisheries biology in 2011 under the direction of Drs. Mike Quist and Clay Pierce. For his thesis, Tony studied fish species of greatest conservation need in wadeable Iowa streams. In addition to testing existing species distribution models, Tony identified relationships between habitat characteristics and species occurrences. After graduating from ISU, Tony obtained a position as a fisheries biologist with the Ohio Department of Natural Resources. As a fisheries biologist Tony conducts and coordinates research projects related to fisheries around the state of Ohio, including the Ohio River.
Field Notes Photo Contest Winners!

First place
Category: Animal
*The Bears Are Back*
Rick Hall

Overall winner
*Half Dome Silhouettes*
Peter Wolter

2nd place
Category: Animal
*Dragonfly, Broken Kettle Grasslands Preserve*
Andrew Stephenson

continued...
First place
Category: Plant
*Things Are Looking Up For This Aspiring Aspen*
Rick Hall

2nd place
Category: Plant
*Fall Prairie: Sawtooth Sunflowers at Neal Smith NWR*
Anna MacDonald

First place
Category: People
*Night Fire, Ringold County*
Photo by Danielle Techentin, submitted by Anna MacDonald

2nd place
Category: People
*Iowa-Nebraska State Line, 2011*
Tyler Grant
Category: Landscape

First place
*Hot Spring Pebbles*
Peter Wolter

2nd place
*Sunrise Over Little Millers Bay, Iowa Lakeside Laboratory*
Andrew Stephenson

Honorable Mention
Category: People
*Mt. Democrat, Colorado, 2011*
Bryce Gonzalez

continued...
Lakeside Lab Offers Opportunities for Graduate Students

Iowa Lakeside Lab is pleased to host graduate student research and independent study. The surrounding Okoboji region offers many opportunities for study, with its varied habitats and ample amount of publicly owned land. Financial aid is available through the Lab and its Friends group, including the G. Dennis Cooke Scholarship for grad students in aquatic ecology.

Lakeside Lab offers overnight lodging at reasonable cost, and during the summer sessions, meals are also available. Researchers who are staying at Lakeside Lab can reserve temporary office, lab, or storage space at no additional charge.

For more information, see Lakeside’s web site at http://www.lakesidelab.org or contact Executive Director Peter van der Linden at peter-vanderlinden@uiowa.edu, 712-337-3669 ext. 5.
FIELD NOTES: Tell YOUR story!

Field Notes is a chance for graduate students in Natural Resource Ecology & Management to have their efforts recognized; to provide a venue for sharing their work with other students, professors, professional partners, and to gain experience in outreach communications.

Summary: Manuscripts are currently being considering for the fall issue. Field Notes is produced by the NREM Graduate Student Organization. Drafts due by September 6, 2012.

Guidelines: Manuscripts should describe the author’s research or other activities (such as outreach, study abroad, or internship) related to their field of study. Authors are responsible for the accuracy of all aspects of the information contained in their manuscripts, and are encouraged to have their major professor review it prior to submission. Manuscripts should adhere to the following:

1.) Topics and verbiage should be accessible to non-technical audiences, and the total length should be 800 to 1,200 words.
2.) Include a descriptive title, the author’s name and brief biography, and acknowledgement of funding entities at the end of the article as appropriate.
3.) Use 12-point Times New Roman font, with one-inch margins.
4.) Include relevant pictures and/or graphs with descriptive captions.
5.) Results should be reported in English units, and Latin names of species should be used only after the first mention of the common name.
6.) Use a first-person narrative or third-person descriptive style, in Associated Press (AP) format.

Submission Process: Manuscripts should be submitted as Word documents via email to fnotes@iastate.edu AND copied to your major professor. Please submit photos as separate jpeg files. Submissions will be critically reviewed and selected for publication based upon content, style, and the availability of space in the upcoming issue.

Please direct questions to Michaeleen Gerken (mgerken@iastate.edu).