

# Botany & Conservation

A newsletter for alumni of Botany and Biological Aspects of Conservation • Spring/Summer 2015



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Bessie Splitt of Spalding Lab examines corn seeds. Photo: Bryce Richter / UW-Madison

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COLLEGE OF  
**Letters & Science**  
UNIVERSITY OF WISCONSIN-MADISON

Botany: [botany.wisc.edu](http://botany.wisc.edu) BAC: [bacmajor.ls.wisc.edu](http://bacmajor.ls.wisc.edu)

### BAC Student Receives Wisconsin Idea Fellowship

Adapted from Nelson institute story

Brenna O'Halloran, who is majoring in BAC, environmental studies, and geography, and Lauren Feierstein, studying environmental studies, zoology, and Latin American and Iberian studies, were awarded a 2015-2016 Wisconsin Idea Undergraduate Fellowship for their project, "Linking Ecuadorian Teachers to the Latino Earth Partnership Environmental Education Program."

Their project will train teachers from three Ecuadorian elementary schools in an environmental science curriculum that they can implement in their classrooms. The teachers will attend a workshop, receive help with teaching activities and receive lesson books in Spanish for future activities. The project also aims to lay a broad groundwork for the Madison, Wisconsin-based Latino Earth Partnership to expand their work to Ecuador and provide science education workshops there annually.



This newsletter is published by the Department of Botany at the University of Wisconsin-Madison for alumni, colleagues and friends. Editorial team: Anna Berberet, Ken Cameron, Carmela Diosana, Sarah Friedrich and Joan Weiss. Submissions are welcome. Please send comments, ideas and photos to: Alumni News Editor  
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### Chair's Letter: Investing in core values

Early dawns, a chorus of bird songs, and a sudden profusion of wildflowers assert the biological Spring. Classes and students spilling out of buildings to lie and linger on the slopes of Bascom Hill reflect the psychological Spring. An accelerating stream of papers and exams signal the end of Spring term. It is the time of year when those arranging appointments ask "Why not the Terrace?" Indeed.

represents a time of hope and aspiration, especially for deciduous plants that have waited all winter for this moment to fill miniature leaves with all the enzymes and metabolites they need to unfurl the green factories we call leaves. Investments made, the hemisphere takes a collective inhale of carbon dioxide and exhales oxygen. Local investments include welcoming Anne Pringle and Ken Keefover-Ring as new faculty and several new graduate students also due to start this Fall.

Disinvestment, however, seems to be the order of Spring at the state level. We hear increasingly detailed stories about just how much budgets will decline and just which classes, programs, and people will be cut. As students, staff, faculty, and deans become squeezed, immediate impacts are becoming obvious. It will take longer to judge just how current cuts, accelerating an historic trend, will affect the stature and effectiveness of our Department, College, and University.

### Welcome Joan Weiss

Joan Weiss joined the Botany Department in January of 2015 as the new Department Administrator. Prior to this, Joan worked for six years as the department administrator in the Department of Biomedical Engineering. She considers it a privilege to work in support of the faculty and students in the department. Always inspired by the beauty of nature, she attempts to live life with the three P's: purpose, presence, and unending possibility.

Two things impress me, providing some Spring-like hopes for renewal. First, I see leaders across campus at all levels reflecting on core values as they move forward to make necessary decisions. While damage is inevitable, it will be minimized and guided by a shared commitment to the goals and special opportunities that we have at UW. Second, I see an outpouring of concern by friends of the university and many citizens to do what they can to support their flagship university and the many students it serves. This is crucial as departments and the UW necessarily evolve to depend less on state support and more on the generosity and support of individuals and foundations.

Within Botany, we find ourselves setting priorities for allocating our teaching effort and ever more important gift funds. We remain proud of the quality and effectiveness of our teaching evident in awards to our TAs, wait lists for courses, and our innovative lab, field, and writing courses. We are pleased that eminent palynologist, paleoecologist, and Botany graduate Estella Leopold receives a UW honorary doctorate on May 15. The creativity and resilience that drive our teaching and research will also help us adapt and endure.

Don Waller, Chair

### Happy 90th, Dr. Iltis!

Students, staff, faculty, and friends celebrated Emeritus Professor Hugh H. Iltis' 90th birthday with a reception in Birge Hall on April 7. View photos of the event at [www.facebook.com/UniversityofWisconsinBotany](http://www.facebook.com/UniversityofWisconsinBotany).



Hugh Iltis



## Your chance to make a difference for future students

Botany was honored this year to receive an unprecedented \$800,000 gift from a generous and dear friend to establish the Wilhelm Hofmeister Botany Professorship. Hofmeister was an eminent and largely self-taught 19th century German botanist who discovered the alternation of generations in plants. Thanks to a 1:1 matching pledge from UW-Madison supporters John and Tashia Morgridge, this gift has grown to a \$1.6 million endowment, allowing us to establish a named professorship for the department – the first in our history. We now have a rare, but brief, opportunity to expand this endowment. All additional donations will also be matched by the Morgridges - but only through **June 8, 2015**. To take advantage of this unique



Wilhelm Hofmeister

opportunity, Botany is asking all our friends and supporters to help us as they can. Our goal is to reach a fundraising total of \$2 million, which would elevate this endowed professorship to a full chair. With the match, this amounts to an additional \$200,000. Current Botany faculty and staff have themselves already pledged \$7550 of this. Please consider making a contribution to the Hofmeister Fund to ensure the continued excellence in botanical research and commitment to teaching that distinguishes our department.

For more information contact the Department of Botany, Ann Dingman at the UW Foundation, or visit [supportuw.org/giving](http://supportuw.org/giving) directly to make your gift.

## Estella Leopold Receives Honorary PhD Adapted from the article by Susannah Brooks

Every year, UW-Madison awards honorary degrees to recognize individuals with careers of extraordinary accomplishment. This year, Estella Leopold was one of four individuals selected. Estella has devoted the last seven decades to an academic career of extraordinary accomplishment alongside an active commitment to environmental conservation. A daughter of the legendary Aldo Leopold, she graduated from UW-Madison in 1948 and received her Ph.D. from Yale in 1955.

Trained in paleobotany, Leopold broadened her focus into the

relationships among prehistoric life-forms. She helped lay the foundations for the new field of paleoecology, which reconstructs the structure and function of ancient ecosystems.

In keeping with her family's rich tradition of service to the community, Leopold has worked to preserve the landscapes and habitats of the American West and Southwest, most notably blocking the construction of dams in the Grand Canyon and establishing the Florissant Fossil Beds National Monument.

Leopold is an emeritus professor at the University of Washington, studying

botany, forest resources and quaternary research. Throughout her career, she has also played a critical role in leading and expanding the Leopold Foundation.

"While election to the National Academy [of Sciences] is often the crowning achievement of a scientist's career, she took this in stride," writes Don Waller, John T. Curtis Professor and Chair of the Department of Botany, "continuing to make important contributions in the 40 years since then, both in her specialty and in her broader efforts to conserve the ecosystems and landscapes she understands, and loves, so well."

## Karow Fund Established for Native Habitat Research

Thanks to the generosity of UW-Madison alumni Russel S. and Marla A. Karow, a new endowment fund has been established to engage students in the Herbarium's important work focused on native Wisconsin habitat preservation, restoration, inventory and research. WIS routinely provides assistance to the state DNR, non-profits such as the Prairie Enthusiasts, and to private land owners who are in need of plant surveys

and inventories that serve as the fundamental basis for sustained conservation and restoration. The new Karow Family Endowment Fund will provide resources annually to support and engage students in these activities.

Please consider donating to the Fund by making a contribution online at <http://herbarium.wisc.edu> & clicking "Support WIS" from the Herbarium's homepage.



Botany major Marissa Barrett '16 assists with site inventories at a state natural area.

## Botany Congratulates NSF Research Fellows

In March four of our graduate students were named NSF Graduate Research Fellows. The fellowships are prestigious awards which provide financial support for three years, access to supercomputer facilities, and opportunities for international collaborations and professional career development. Fellowships reflect the exceptional promise that candidates hold for career-long innovation and achievement, and are based on their undergraduate (and 1st year graduate) records and research, letters of recommendation, and a detailed research proposal.

This year's winners are Stacey Anderson (Fernandez lab), Steve Hunter (Givnish Lab), Will Sparks (Givnish Lab) and Rachel Toczydlowski (Waller lab). Stacey is studying membrane differentiation in chloroplasts, the photosynthetic machinery of plants, and specifically, the targeting of the TatC component of the Tat translocase and its role in membrane biogenesis. Steve uses next-generation sequencing to analyze the history of geographic speciation and ecological specialization in the Hawaiian lobeliads, the largest plant lineage to have evolved on any single oceanic island or archipelago. Will is investigating why bladderworts invest more energy in traps in Wisconsin lakes with more fertile waters, as well as two other paradoxes involving the ecology and evolution of carnivorous plants. And Rachel is using tawny jewelweed to study how hydrologic shifts in temperate lowland forests caused by climate change will affect gene flow and evolution in understory plant populations. She is also assessing how well patterns of local adaptation are captured by neutral genetic markers and the fitness costs associated with inbreeding.

Stacey Anderson says she “was incredibly excited when I received the fellowship! The Botany Department is very supportive and I’m so glad I was encouraged to apply.” Botany received four out of the 37 awards received by UW-Madison this year.

## For the Love of Lichens

By Emily Rosenthal

*With the end of the semester comes another promising group of young science writers, fresh from a writing course offered by the Botany Department and made possible by an anonymous donor. In addition to formal scientific writing, students penned popular science articles aimed at a general audience. The following is an adaptation of the class favorite.*

Teamwork is a powerful tool, and not just for humans. All sorts of organisms form teams in nature, living closely together in symbiotic relationships. Many symbiotic relationships are mutually beneficial, as when bees pollinate flowers, and flowers reward bees with nectar. Small fish feast upon the parasites growing on larger fish, offering a cleaning service in the process. Even our own digestive tract provides a home to bacteria that help us break down our food. You scratch my back, and I scratch yours!

A particularly intriguing suite of symbiotic relationships exists between fungi and algae, known collectively as lichens. Though commonly mistaken as moss, neither the lichen nor its components are land plants. In fact, fungi are more closely related to animals than to plants, and while the algae component (a.k.a. photobiont) is able to photosynthesize, lichens bear no flowers, seeds, leaves, or even roots.

Lichens absorb water and nutrients through the air, making them excellent indicators of atmospheric pollution levels. Often the first to colonize exposed surfaces, lichens are also important “pioneers” amongst vegetative organisms. The weak acids produced by lichens will even gradually erode rock. Over time, after enough accumulation of sediment and organic material, plants can become established in a once barren habitat, thanks in part to lichens.

Lichens are astonishingly diverse. Over 14,000 species of lichen are found worldwide, occupying an extreme range of conditions. Reindeer lichen feed their namesakes in the arctic, and lichen crusts maintain soil structure in desert environments. Lichens adhere to a variety

of surfaces, such as bare rock, rotting logs, even living insects! Lacewing larvae “wear” living lichens to camouflage themselves.

Lichens vary in size, color, and form. The three basic lichen growth forms are foliose, fruticose, and crustose. Foliose lichens are flat and leafy, similar to potato chips. Fruticose lichens branch up from the substrate and bulge into fruiting bodies. And crustose lichens are granular, just dusting the surface on which they live.

With all this diversity, how do we tell lichens apart? Dichotomous keys help us narrow down our options. Questions range from appearance – both macro and microscopic – to chemical tests. Often herbarium specimens will sport razor cuts on the thallus, or body, of the lichen. Certain species of lichen react to indicative chemicals, hence a bit of thallus is cut away to test for a color change. Even UV light can reveal secret traits of lichens, as some species glow when exposed.

Due to their wide range and diversity of species, lichens are a prime example of the evolutionary success of symbiotic relationships. A fungus protects its photobiont partner and benefits from the alga’s ability to photosynthesize. Lichens are important environmental indicators, pioneers of bare substrates, beautiful in their diverse colors and forms, and unique, compelling study systems. Fungi and algae’s teamwork creates an entirely different, entirely lichen organism.

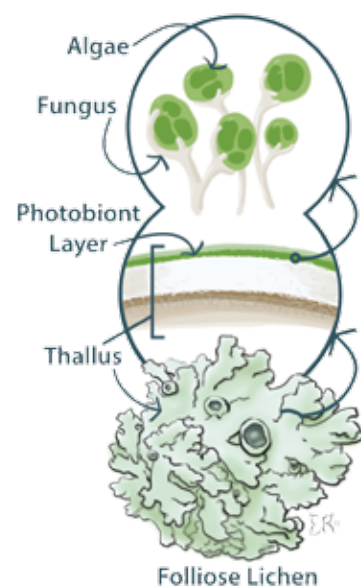


illustration: Emily Rosenthal



## Deer account for almost half of long-term forest change, study finds

Excerpted from the original news story by D. Tennenbaum, Jan 2, 2015.

A study published in the journal PLOS ONE has linked at least 40% of species changes in the forests of northern WI and MI over the past 60 years to the eating habits of white-tailed deer. Professor Don Waller and students used a pair of strategies to look at the ecological impact of deer. First, they resurveyed 62 sites across northern WI and MI in 2000-01 that were first studied by John Curtis and his students in the 1950s. “This showed us just how the forest has changed during a time when deer were becoming much more common, but it did not pinpoint the deer themselves as the cause of the changes,” Waller says. Waller’s group later examined plant communities inside and outside 17 fenced “exclosures” built to keep out deer but not smaller mammals. Together with Botany alumna Katie Frerker <sup>14</sup>, who is now working for the U.S. Forest Service in Duluth, MN, they discovered that many of the plants commonly seen in the early surveys now mostly occur inside the protective exclosures.

Where deer have been common, ferns and grasses — as well as several nonnative plants — have become more abundant. Deer greatly reduced regeneration of native trees, the growth of shrubs, the height of forest understory plants, and the abundance of flowering plants that are neither woody nor grassy. The two lines of evidence converge on the same general conclusion, Waller says: Deer account for at least 40% of the change seen in the forests over the past half-century or so. “The study links microcosm to macrocosm. We have exclosures in the same region where we have documented long-term changes in the plant community over the past 50 years. These are giving us the same message.”

The study may actually underestimate the impact of deer, Waller suggests, citing their attraction to the Canada yew, a shrubby evergreen that has been eliminated across most of the north woods. Thus, yew is no longer counted as a baseline species, even though its



Don Waller at his deer hunting stand in the driftless area of Wisconsin

disappearance likely reflects deer browsing. Furthermore, deer were already quite common when the exclosures were installed 15 or 20 years ago. “By that point, deer may have already eliminated some species that have not recolonized since. So this type of study would miss these losses,” says Waller. Some plants eliminated by deer need decades to recover, Waller says. “If a species is slow growing, or has seeds that are not dispersed readily by birds or as stick-tight burrs, it needs more time to reappear.” The exclosures, he says, “serve as controlled experiments once they are run for 15 or 20 years, as these were.” Waller says attributing at least 40% of the change in forest structure to white-tailed deer was surprising even to somebody like him who has studied deer for more than two decades. “It’s rare in ecology to find one

factor that accounts for so much change,” he says.

Deer hunting is a political subject in Wisconsin, and while Waller would like to see greater harvests, especially of does, he also favors gaining a better picture of deer’s impact. “I’d like to see more citizen science, with hunters and high school classes paying more attention to (the effects of) deer,” he says. “These groups could build exclosures or plant seedlings and then track what gets eaten. This would be very straightforward. It would not cost much, and would produce valuable data to inform hunters, professional managers and the public about whether deer density is too high or too low.”

A related interview with Dr. Waller concerning his interest in deer hunting was featured in the UW News at <http://www.news.wisc.edu/23307>.

## High throughput computing illuminates phenotyping

Adapted from an article by Brian Mattmiller

When Edgar Spalding crunches data on Wisconsin corn, the numbers boggle the mind. Four million acres are planted annually, with 30,000 seeds planted per acre, producing about 120 billion seedlings sprouting skyward each May.

With help from the Center for High Throughput Computing (CHTC), Spalding is applying this astronomical sense of scale

to quantify the incredibly complex process of corn growth from seed to vigorous seedling — not just one at a time, but over thousands of samples.

These analyses address a major gap in the understanding of corn phenotypes — the plant's expression of its genetic recipe, such as its growth rate, weather resistance, ear size or kernel density. Most of that work today is still done by hand or by observation: for instance, counting the number of seedlings per row, the number of days to flowering, or the number of kernels per ear.

HTC enables Spalding and his collaborators to remove the subjectivity, increase the precision, and ramp up the volume on phenotyping enough to one day add value to optimizing field crops, he says. The results will be a better connection between the genotype and the phenotype, and the ability to predict how different crop breeds will perform.

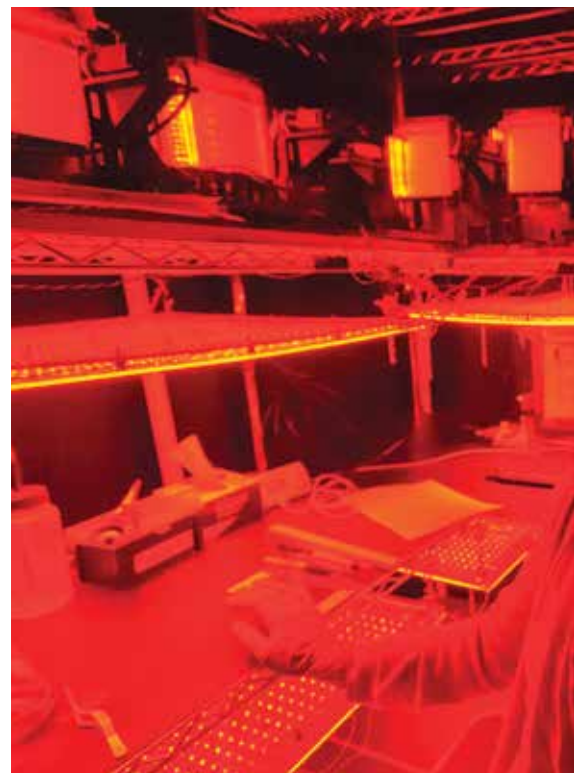
*“If we’re successful moving to the field, that will have dramatic growth potential for image-based phenotyping. Now we’re talking acres, not petri plates.”*

– Edgar Spalding

measurements and get big data sets from which to predict.”

In one room of Spalding's lab, a row of stationary cameras bathed in red light train in on petri dishes that contain seedlings growing in a gel. These cameras take pictures every two minutes, producing rich time-lapse composites of the plant's growth. A second room follows the same process, but with a robotic arm that

“That's what everyone wants to do, to get more predictive about this business,” says Spalding. “Our chances of getting predictive are improved when we make a lot of



Postdoc Satoe Toyota works with corn seeds in a darkroom.

moves a single camera across a gantry of more than 30 petri dishes.

Every night, these imaging data are shipped en masse to the CHTC for analysis. The data that come back measure the phenotype performances across thousands of specific genetic variations in the plants, something that would be impossible without the computing power the CHTC harnesses from computers across the campus and the nation. The project uses tens of thousands of computer CPU hours weekly during peak times.

And recently, Spalding has been making the leap from lab to field. Teaming with UW-Madison agronomists Shawn Kaepler and Natalia de Leon at the West Madison Agricultural Research Station, Spalding is using stationary cameras along rows of corn, teamed with GPS-directed drones that can capture growth across entire crop rows.

These types of measurements will be a game changer for Spalding's work. “If



Hybrid vigor: parent seeds on left and right, hybrid center





Bryce Richter / UW-Madison

m lit only by red light

we're successful moving to the field, that will have dramatic growth potential for image-based phenotyping," he says. "Now we're talking acres, not petri plates."

Some early applications already look promising. One might be a better way to measure hybrid vigor. Spalding has developed a time-lapse imaging approach that can show hybrid performance in the first 24 hours of growth, offering a faster, cheaper and more accurate way to identify the best hybrids.

A second application measures the ear traits of corn from scanned images of the ears. This workflow is then married with the HTC hardware at Morgridge, making it possible to analyze thousands of ears of corn in short time and match genetics with the best traits.

"Hopefully people will start to measure phenotypes this way rather than pulling out the ruler and hiring undergraduates to count how many plants come up." Says Spalding.

## Fundamental plant chemicals trace back to bacteria

Adapted from the article by David Tenenbaum

A fundamental chemical pathway that all plants use to create an essential amino acid needed by all animals to make proteins has now been traced to two groups of ancient bacteria. The pathway is also known for making hundreds of chemicals, including a compound that makes wood strong and the pigments that make red wine red.

"We have been trying to unravel the source of the phenylalanine amino acid for some time," says Hiroshi Maeda, an assistant professor of botany at the University of Wisconsin-Madison. "Plants use this pathway to make natural products that are vital to plants and also to our food, medicine, fiber and fuel. One of the most important is lignin, found in the plant cell wall, which allows trees to stand tall and transport water."

Other scientists have traced plant metabolic pathways to fungi, "But in this case, the source is bacteria, which are more distant relatives," says Maeda.

In a study published in the online journal *The Plant Cell*, Maeda and his colleagues described how they traced the phenylalanine pathway to two groups of bacteria.

During the study, Maeda and his colleagues, including John Jelesko of the Virginia Polytechnic Institute, compared the genetic sequence for the plant phenylalanine pathway enzymes to a genetic database covering numerous organisms.

"We asked the computer to fish out similar sequences, and we got thousands of sequences," Maeda says. "We took the closer sequences and did phylogenetic analysis. Essentially we were asking, 'Who is your closest sibling?'"

They found that the plant sequence was most similar to a class of bacteria called Chlorobi and Bacteroidetes. "This was surprising because when people do a similar analysis for other plant genes, they usually find the closest sequence in

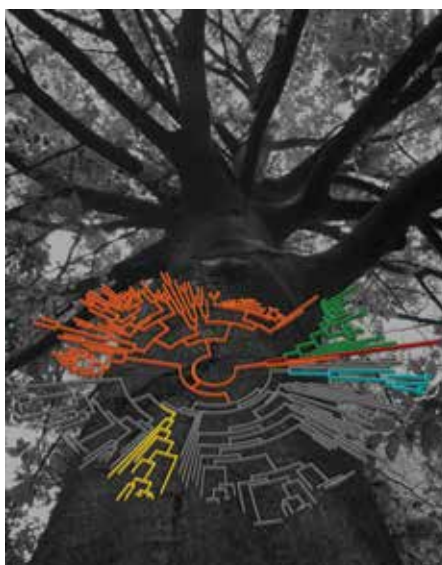
fungi, or in cyanobacteria whose ancestor came into plants and now make plants green and photosynthetic. Our results did not fit what people expected."

During follow-up experiments, the researchers arranged the protein sequences from other organisms according to how closely they resembled the plant sequence, and identified

two amino acid sites that are crucial for phenylalanine production.

"Plants use this pathway to make natural products that are vital to plants and also to our food, medicine, fiber and fuel."

Because the phenylalanine pathway is critical to the production of so many valuable plant products, Maeda says the study may eventually have practical benefits. "We hope this might help increase production of nutrients and medicinal compounds."



## STUDENT PROFILES

### Field Notes: Marie Faust

*Marie is a BAC major graduating in December 2015.*

I originally came to UW-Madison pursuing a degree in kinesiology; however, courses such as Forest Ecology and American Environmental History inspired me to think about how humans affect the earth and the organisms that



live on it. These courses and my natural love for the outdoors drove me towards pursuing a degree in conservation biology.

Last summer I had an internship with Institute of Environmental Science and Research in Christchurch, New Zealand, where I studied the ability of naturally occurring enzymes to kill viruses within wastewater in waste stabilization ponds. The research I performed may lead to a new mechanism for treating wastewater at deeper depths within waste stabilization ponds. This research could have huge implications for developing countries because waste stabilization ponds can be built and repaired with locally available materials, require no external energy for operation, are low in construction and operation costs, and they can treat high-strength wastewater into high quality effluent.

I also work for the Office of Sustainability at UW-Madison. Currently

I am working on the Academic Building Commitment to Reducing Waste, an initiative to improve waste infrastructure and knowledge of reducing, reusing and recycling material in academic buildings. I have engaged in trash audits and help facilities use the audit data to inform staff on how to properly put waste in its place.

This summer I plan on doing field research on the white lady slipper orchid to determine whether inadequate pollination is a factor in its dwindling numbers in Wisconsin prairies and fens.

I was always so set on studying one specific subject, but courses in BAC have taught me that jobs within the field of conservation biology can span across multiple disciplines. They also taught me that I really enjoy “getting my hands dirty” working in the field. After I graduate I plan on continuing fieldwork in prairie and/or wetland ecosystems. Eventually, I would like to go to graduate school for conservation planning.

### Field Notes: Roberta Donaldson

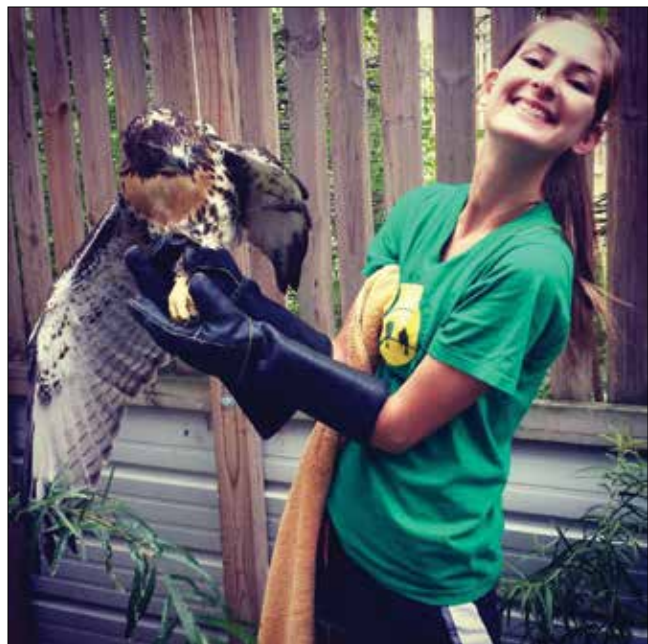
*Roberta is a BAC Major graduating in May 2016.*

I grew up in a suburb of Milwaukee and lived two blocks away from the Schlitz Audubon Nature Center which sparked my interest in the natural world. I am fortunate enough to have kind and supportive parents who taught me how to understand and value nature. I gained a strong connection with wildlife as I got older and visited Wisconsin’s amazing nature preserves and state parks. At UW-Madison, I worked in the Orrock Lab in Spring 2014 where I conducted real world ecological research and was exposed to possible future graduate school work. I also was an intern at the Dane County Humane Society’s Four Lakes Wildlife Rehabilitation Center where I assisted in the rehab, care, and release of all kinds of Wisconsin wildlife including songbirds, small mammals, waterfowl, raptors, and turtles. This fall I will be a teaching assistant for a Comparative

Anatomy class and I will be able to help my peers through a cat dissection. And in the summer I will be an intern with the Madison Audubon Society doing ecological restoration field work with various Madison nature preserves.

As a UW-Madison student, I have been exposed to how important, rewarding, and fun the BAC major is. My involvement with the Madison community has further sparked my passion for conservation. I have been able to take what I have learned in the classroom and apply it to my work in the community to create a better future for our community and environment. My experiences here have given me a broader perspective on conservation ethics, the scientific method, and community involvement. I am very grateful for all of the professors and TAs who have helped me through my undergraduate career. I have learned that there are so many possibilities for engagement in this field and

in the BAC major. My experiences as an undergrad have enhanced my possibilities for the future and given me the tools I need to continue further studies in conservation and hopefully make a difference in the future.

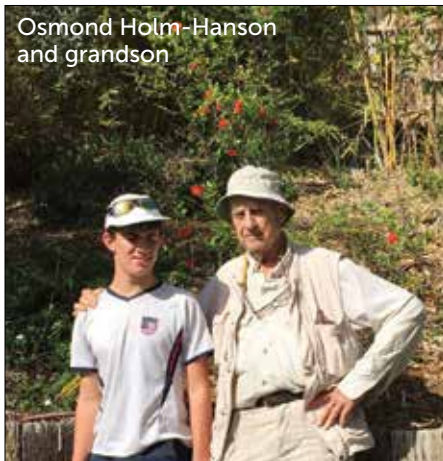




## ALUMNI NEWS

*Thank you to all the alumni who took the time to send us their updates. Please keep the news coming!*

**Osmond Holm-Hanson (Botany PhD 1953)** still enjoys his work each day in his lab and office at Scripps Institution of Oceanography, where he has been since 1963. As Head of the Polar Research Program at SIO, he is actively involved with the National Oceanic and Atmospheric Administration on oceanographic studies in Antarctic waters, where they are in their 26th year of studies with the Antarctic Marine Living Resources program, which has two cruises each year in the Southwest Atlantic and Northeast Bellingshausen Sea. This is the most complex and interesting region of the Southern Ocean, which is of much importance in global



Osmond Holm-Hanson and grandson

conditions. He is very appreciative of the educational opportunities and faculty at the University of Wisconsin, and thanks Hugh Iltis in particular for his role in teaching and stressing the importance of ecological studies.

**Jim Habeck (Botany PhD 1959)** approaches the age of 83, and his interests in field botany have not faded away. He remains active in attending seminars at the University of Montana, and at the Forest Service Fire Research Lab, both in Missoula MT. He also remains active in the Montana Native Plant Society, a group dedicated to the study, enjoyment and preservation of Montana's native flora and their habitats.

**Carol Steinhart (Botany PhD 1960)** recently moved to Oakwood a few months ago and celebrated a milestone 80th birthday with a surprise party and family reunion. She is an active volunteer at the UW arboretum, doing anything they ask her to do, but mostly serving as a receptionist and providing music on demand. She plays in a folk band and several chamber music ensembles. She uses her accumulated expertise on energy resources and general energy and environmental issues to work in a nonpartisan way for effective action to rein in the rate of climate change.

**Fred Swan (Botany MS 1961)** Fred and his wife Pat met in a required Physics class at UW-Madison in the fall of 1960 and were married in Nov. 1962. He earned an MS in Botany in June 1961 and Pat earned a BA in Medical Technology in 1962. Last year in April they enjoyed an Elderhostel trip to the Florida Everglades and gained new understanding of the invasive flora and fauna and critical water relationships there. Now that the snow has melted, their rooftop solar panels are producing over 13 KWH on clear days.

**Bob Ream (Botany PhD 1963; Agronomy BS 1959)** an emeritus professor, College of Forestry and Conservation at the University of Montana, keeps busy professionally and with skiing, hiking and backpacking in the mountains of Montana. In the last year he has given a number of presentations on "Climate Change and Wildlife in Montana" and "A 40 year Odyssey with Wolves in Montana", at a Wildlife Society conference, and with public groups. Bob participated in a plenary session on "Conservation Biology, Politics, and Policy" at the Society for Conservation Biology Congress last summer. He recently gave an invited lecture, "Wilderness Research Then and Now: The Wilderness Institute's Fortieth Year" at UM. Bob most recently served as Chair of the Montana Fish, Wildlife

## Consider helping our Department's people and programs

### Botany Department General Fund (fund # 1216106)

The generosity of our donors allows the Botany Department to help our students, faculty and staff reach their full potential via grants, awards, travel support, internships, guest lectures, and buying critical equipment. Please consider making a donation to via the UW Foundation. See: <http://www.supportuw.org/giving?seq=1254>  
Additional targeted funds are available at: <http://www.botany.wisc.edu/giftgiving/>

### Biological Aspects of Conservation Major Fund (fund # 12168143)

Please join us in our efforts to provide support for important BAC program priorities. Gifts to the Biological Aspects of Conservation Major are used to recognize outstanding BAC undergraduates, support various activities such as research and study abroad, and to sponsor special lectures and other professional development opportunities for students. See: <http://www.supportuw.org/giving?seq=19206>

Online donations at the links provided are easy and secure. Check donations can be made out to the University of Wisconsin Foundation. Please include the fund number on the check.

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Questions? Contact: Ann Dingman  
[ann.dingman@supportuw.org](mailto:ann.dingman@supportuw.org)  
608-265-9954

## ALUMNI NEWS

and Parks Commission (2009–2013) and was re-appointed by the current Governor but failed to get senate confirmation. He retired in 1997 from UM, and from 16 years in the Montana House of Representatives. He resides in Helena, MT and occasionally sees Jim Habeck (PhD, 1961) and Peter Stickney (MS, 1959) in Missoula.



Mary Ann Lila

**Wayne Rosing (Botany BS 1969)** received his BS at UW-Madison before going on to grad school at the University of Texas, Austin where he earned a Ph.D. in Botany in 1975. He retired from the biology department of Middle Tennessee State University in July 2013 after 33 years at that institution and nearly 40 years as a university professor. He still collaborates (from his home lab) with colleagues at the University of Arkansas and elsewhere on Myxomycete biodiversity, most recently “First Reports of Myxomycetes from Cambodia.

**Larry Kascht (Botany MS 1981)** taught high school science from 1978 until 1989. He became the Naturalist Supervisor at Waukesha County’s Retzer Nature Center in 1989 and has been

there ever since. He says, “I have had the good fortune during my career to be able to use my UW Botany education every day—teaching families, school kids, and adults about the mysteries of the ecosystem, in a discovery-based way...hoping to give them the opportunity to enjoy it and care about it, and to be part of saving it. UW Botany rocks!”

**Mary Ann Lila (Botany PhD 1984)** is the Director of the Plants for Human Health Institute with North Carolina State University working on health protective benefits of phytoactive compounds in plants, berries, allergies and interventions with natural plant phytoactives. See a PBS newsclip on her work with berries: <https://youtu.be/-6ow2da3uN4>.

**Brian Hudelson (Botany BS 1984)** is currently the director of the UW-Madison/Extension Plant Disease Diagnostics Clinic (PDDC), and will be celebrating his 17th anniversary with the organization this July. The PDCC provides assistance in identifying plant diseases and provides educational information on Plant diseases and their control. <http://pddc.wisc.edu>.

**William Kleindl (Botany BS 1987)** Bill went on to a MS in stream ecology from the University of Washington-Seattle and spent many years working in the public and private sectors on the science, policy, and management of aquatic environments. He found that management questions began to shift from ecosystem response to human perturbations to ones focused on combined human and climate-driven disturbances and that the tools necessary to answer these pressing management questions do not readily exist in a consulting framework. This led Bill to pursue a PhD from UM-Missoula where he currently conducts research to solve these tangible problems that intersect natural and human environments. The skills he learned at Birge Hall have taken him far!

**David T. Hanson (Botany PhD 1999)** achieved the rank of full Professor

in the Biology Department at the University of New Mexico this year. Over the past year he was also Chair of the Gordon Research Conference on “CO<sub>2</sub> Assimilation: Genome to Biome”, he published an edited volume “Photosynthesis in Bryophytes and Early Land Plants” in the Springer series “Advances in Photosynthesis and Respiration including Bioenergy and Related Processes”, and was selected as a Kavli Frontiers of Science Fellow. He also co-founded a new section of the American Society of Plant Biologists that focusses on Environmental and Ecological Plant Physiology. The inaugural meeting in 2014 was a great success and he strongly encourages anyone who is interested to attend the 2015 meeting just across the border in Minneapolis in late July (still joint with the national ASPB meeting this year). Contact Dave with any questions at [dthanson@unm.edu](mailto:dthanson@unm.edu). Lastly, and most fun, Dave just got to visit his former UW-Botany partner in crime (or more accurately partner in TAing Intro to Botany), J. Chris Pires, at the University of Missouri-Columbia.

**Jeff Morawetz (Botany BS 2000)** After much thought and consideration, Jeff has switched careers from research to research administration. He has been working at Keck School of Medicine at USC since September 2014 as the Contracts & Grants Coordinator for the Department of Preventive Medicine.



**Mike Skuja (BAC BA 2001)** Mike is working to restore and protect the Tualatin River in Oregon, serving as the Tualatin RiverKeepers’ Executive Director.

In his spare time he keeps working internationally, managing the nonprofit Center for Rural Empowerment and the Environment ([www.conservationforpeople.org](http://www.conservationforpeople.org)), a non profit founded by Mike whose goal is to support talented young





Julie Christian

scientists from the developing world to institute sustainable development.

**Maria Spletter, Ph.D. (Botany BS 2003)**

is a postdoc at the Max Planck Institute for Biochemistry in Munich, Germany, where she studies muscle development in *Drosophila*.

**Julie Christian (Botany MS 2009)**

received a temporary promotion to Program Manager of the Chihuahuan Desert Network. As part of the Inventory and Monitoring division of the National Park Service, she is helping establish long term studies of natural resources in seven NPS units in west Texas and southern New Mexico: Amistad NRA, Big Bend NP, Carlsbad Caverns NP, Fort Davis NHS, Guadalupe Mountains NP, Rio Grande WSR, and White Sands NM. For her normal duties as Ecologist - Field Coordinator, she manages the field efforts for three monitoring protocols: Desert Springs, Early Detection of Exotic Plants, and Upland Vegetation and Soils. This spring has been spectacular given the diversity and sheer volume of annuals blooming.

**Amanda Olafsson (BAC BA 2011)**

Amanda moved to Boston, MA after graduation in 2011. She is currently working as a Project Manager at Next

Step Living, which provides Residential Energy Efficiency services to homeowners and renters in New England. It's an exciting, young company trying to make a serious impact in our country's residential energy use (~20% of all sectors). When not working at Next Step Living, Amanda enjoys scuba diving, dog-sitting, cooking, and getting together with other Boston-area Badger-alums to play Sheepshead and Euchre after work. If you ever find yourself in Boston, look her up and join them!

**John Stuhler (BAC BS 2011)** John will be graduating from UW-Madison in spring 2015 with an M.S. in Zoology. He will then be moving to Texas to pursue a PhD with Dr. Richard Stevens in the Department of Natural Resources Management at Texas Tech.

**Sam Grossberg (BAC BS 2012)** Sam is a dual degree student at Virginia-Maryland College of Veterinary Medicine getting his DVM and MPH. He is currently wrapping up his third year in vet school and his fourth and final year of clinical rotations begins this May.

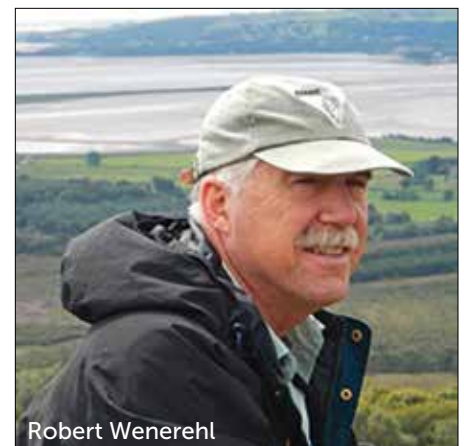
**Deidre Jaeger (nee' -Conocchioli) (Botany, BAC BS 2012)** Deidre has shifted from doing field-based conservation work to genetic conservation. Since

November 2014, she has been working for the Rocky Mountain Research Station in Provo, Utah, which is a branch of the US Forest Service. In the Shrub Science Lab, she has been helping to develop a method to use sagebrush seed weight and ploidy as a diagnostic for deciphering subspecies and checking the identity of sagebrush seed lots purchased by the BLM. While she misses field-based conservation work, she has been learning much about plant DNA and genetic tools as means to support conservation efforts.

**Jacob Zeldin (Botany BA 2013)** For the past year and a half Jacob has been managing computer labs and learning spaces for the school of education. In the Fall of 2015 he will start the Plant Biology and Conservation Masters program at Northwestern University and the Chicago Botanic Garden. His research plans will focus on plant community ecology with an emphasis on the relationships between plant functional traits, biodiversity, exotic species invasions, and community composition. He looks forward to a fantastic summer of volunteering on restoration crews, visiting natural areas, and botanizing before he starts graduate school.

**Robert Wernerehl (Botany PhD 2014)**

began his new position as the State Botanist of Massachusetts, Natural Heritage & Endangered Species Program in February and is loving it. <http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/>



Robert Wernerehl





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## Goodbye, President's Oak

This winter campus said farewell to its oldest resident: a Bur Oak. The President's Oak, as it had become known for its vicinity to a historic presidents' residence, was estimated to be over 300 years old. Time had taken its toll on the tree; much of the trunk was hollow and branches were dying back. This compelled arborists to remove the tree before it became a danger to passers-by. Some of the tree's wood was salvaged and will live on as custom furniture in Bascom Hall.

Read the full story at:  
<http://www.news.wisc.edu/23441>

Adam Alves, arborist in the UW Grounds Department, looks for signs of decay in the President's Burr Oak  
photo: Bryce Richter/UW-Madison

