



Michigan
Technological
University

SCHOOL OF FOREST RESOURCES AND ENVIRONMENTAL SCIENCE

RE:GENERATIONS

SUMMER 2019

COMMITTED TO OUR FUTURE STUDENTS, CURRENT STUDENTS, AND OUR ALUMNI.



Andrew J. Storer

A MESSAGE FROM THE DEAN

DEAR ALUMNI AND FRIENDS,

As I approach the end of my first year as dean, I reflect on the wonderful times I have spent with alumni and friends at events on campus and on visits from Alaska to Florida. The enthusiasm for the School, its people, and its impacts, never cease to impress me—We are fortunate to be connected to this place! I am also impressed by the feedback and response to Re:Generations and welcome you to this latest edition.

In December of 2018 the School finalized its Strategic Plan. (Read the plan online at mtu.edu/forest/strategicplan2018.pdf). It articulates strategies to move the School forward and our values as a School—many of which you will see highlighted in this issue.

The plan focusses on people, programs, and places, and we use Re:Generations to help share and celebrate the achievements of the people in our community of scholars, students, staff and alumni. Four of the five University Teaching Award finalists are faculty from our School, alumni have been recognized for their leadership and achievements, and a faculty member serves on the newly formed State Board of Foresters. As we go to press, I am delighted to announce that Kathy Halvorsen

(joint appointment with Social Sciences) is now University Professor and John Vucetich is Distinguished Professor. These titles recognize outstanding faculty at Michigan Tech, and we are proud to have the opportunities to work with them. They are both outstanding scholars and colleagues!

The strategic plan also includes *research with global impacts*, and you will find examples of this here through profiles of faculty projects from around the world, including many that *optimize the integration of technologies for understanding the structure, function and trajectories of socio-ecological systems*. Additionally, we share the natural world; you will find thoughts on the natural world Gene Hesterberg shared with students for many years, and changes since 1940, when Gene wrote his name on a Peterson Field Guide.

We lead into the future by focusing on our students, their creativity, and the challenges and opportunities that they inherit. A major focus of our fundraising is on student scholarships. These make a difference to students. In many cases scholarships are what enable students to come to Michigan Tech. To further student professional development we

also prioritize helping them attend regional and national conferences, where they can build their networks through interactions with many of you as well as others in their field of interest.

This is an exciting time at Michigan Tech. President Koubek has established nine Tech Forward initiatives that arose through a series of campus conversations. The initiatives will guide Michigan Tech over the coming years and all have linkages to our School. Information on the initiatives is available online at mtu.edu/president/techforward. Expect to hear more about these in the future—we are looking forward to participating in partnerships across campus to move these areas of opportunity forward.

Thank you for your support for the School and for your continued interest in our success!

With best wishes,

Andrew J. Storer
Dean and Professor
storer@mtu.edu

TABLE OF CONTENTS

| | | | |
|--|----|---|----|
| A Message from the Dean | 2 | Hesterberg A Field Guide | 12 |
| A Future for Red Wolves | 4 | Making Tracks | 14 |
| Isolating Eucalyptus Genes for Oil | 6 | Checking in with Mary Snyder '13 | 16 |
| Deer Populations Stunt Forest Regrowth | 8 | In Memoriam and Alumni Scholarship Fund | 17 |
| Alumni Mentorship Program Piloted | 9 | Nara Legacy Land Gift | 18 |
| SFRES is Global | 10 | Hammer's Endowed Field Equipment Fund | 20 |



We welcome Jim Desrochers to our advancement team. He and Erin Froese will be working on a range of activities that include the areas of advancement, philanthropy, corporate relations, and foundation relations. The support of alumni and friends of the School are essential as we work to make education more affordable for current and future students, and provide exceptional educational experiences.

► Molly Cavaleri at Japanese Temple. Image credit: Hiroaki Ishii



► On the Cover: Molly Cavaleri climbing a camphor tree for research while on sabbatical in Japan. Image Credit: Hiroaki Ishii

A Future for Red Wolves May Be Found on Galveston Island

By Kelley Christensen

Red wolves, once nearly extinct, again teeter on the abyss. New research by Kristin Brzeski, assistant professor in SFRES, finds red wolf ancestry on Galveston Island in southeast Texas to provide opportunities for additional conservation action and difficult policy challenges.

The American red wolf is one of United States' greatest wildlife conservation stories. Red wolves were on the brink of extinction along the American Gulf Coast during the late 1970s when the U.S. Fish and Wildlife Service (USFWS) made a bold decision to purposely remove all remaining red wolves from the wild. The USFWS attempted to trap all wild wolves to initiate a captive breeding program and recover the species. After several years of successful captive breeding, red wolves were released back onto the landscape in North Carolina in 1988, well before the famous wolf reintroduction effort in Yellowstone National Park. The reintroduced population in North

Carolina grew for 25 years, even while experiencing complex management issues such as red wolves hybridizing with coyotes.

But the wild population is once again dwindling (from a peak of about 150 individuals in the wild in 2005 to a mere 30 or 40), amongst political controversy and pressure from a number of landowners to be able to shoot the wolves on their land. In addition to the wild population, there are approximately 200 red wolves in captivity. The entire red wolf population descends from 14 individual animals, of which only 12 are genetically represented.

During this ongoing debate of how to recover the red wolf, a team of researchers including Brzeski, discovered high amounts of red wolf ancestry in canids living on Galveston Island. "Our discovery that red wolf genes have persisted in Texas—after being declared extinct in the wild—was very surprising," Brzeski said. "It introduces both positive opportunities for additional conservation action and difficult

policy challenges." Brzeski and her coauthors published their findings, "Rediscovery of Red Wolf Ghost Alleles in a Canid Population Along the American Gulf Coast" Dec. 10, 2018 in the journal *Genes* (DOI: 10.3390/genes9120618).

There are just two recognized species of wolf in the U.S.: the gray and the red. Red wolves are smaller and more slender than their northern cousins and are native to the southeastern U.S. The small red wolf population has also been under threat from hybridization with coyotes. "Red wolf research is exciting, frustrating, sad, and uplifting all at the same time," Brzeski said. "They have neared total extinction, were saved through captive breeding and have been demonized by opponents—all the while continuing to be a successful, reproductively viable species that keeps on ticking, with the help of incredibly dedicated biologists, managers, captive facilities, and of course, dedicated volunteers."

The red wolf alleles—variant forms of a given gene—appear

to have persisted in a population of canids on Galveston Island, likely because of their isolation from coyotes and therefore low probability of interbreeding and hybridization. Researchers obtained tissue samples from two roadkill canids on Galveston Island and conducted analyses with genome-wide single nucleotide polymorphism and mitochondrial DNA from 60 animals that represented all potential sources of ancestry for the Galveston Island canids: coyotes, red wolves, and gray wolves. Brzeski and others found that the Galveston Island canids have both red wolf and coyote alleles, likely related to species interbreeding during the 1970s as coyote populations expanded across North America.

The Galveston Island animals—known as admixed canids—do not share all alleles with contemporary red wolves, but they are genetically closer to red wolves than they are to coyotes. This is significant because it means that red wolf genetics persist in the American south nearly 40 years after the species was thought to have become

entirely extinct from that region. The population of canids on Galveston Island could represent a reservoir of red wolf genes that could be used to bolster other red wolves. "This research shows hybrids can have conservation value through harboring extinct genes from endangered parent species," Brzeski said.

The research reveals the need for further genetic sampling of coyote populations in Louisiana and Texas to survey for red wolf ghost alleles. Additionally, the researchers note a need for assessments of morphological differences in canids with red wolf ancestry. The discovery of the Galveston Island canids could also

create an opportunity for future reintroduction efforts outside of North Carolina. "Our discovery opens up a new chapter in their story: red wolf ancestry has persisted independently without focused management action. How will this impact recovery efforts? Can we recover extinct genes through selective breeding with newly identified admixed canids? Are these individuals legally listable under the Endangered Species Act?" Brzeski said. "These are all difficult but exciting questions that are broadly important beyond red wolves that will influence wildlife conservation in an era of major climate and landscape change."



The Secrets of Secretion: Isolating Eucalyptus Genes for Oils, Biofuel



By Kelley Christensen

What is the genetic basis for eucalyptus trees to produce that fragrant oil many of us associate with trips to the spa? SFRES Associate Professor Carsten Külheim, has spent the last decade of his career studying eucalyptus—a diverse, fast-growing species that include scrubby bushes and 300-foot-tall flowering trees—mostly indigenous to Australia, but also New Guinea and Indonesia.

Specifically, Külheim studies terpenes, organic compounds found in the plant's leaves. Terpenes enable certain species that produce them (mostly plants, but also some insects), to emit strong odors that deter pests or attract pollinators. For example, hops, a primary ingredient in beer, contain terpenes, which gives the hops their piney smell. Certain varieties of eucalyptus and tea tree produce great quantities of just the right terpenes, which can be used for essential oils or biofuel distillation.

It is said that Australia's Blue Mountains take their name from the smog-like mist eucalyptus trees emit, particularly on hot days; this mist is composed of terpenes vaporizing in the heat. Külheim and his fellow researchers want to know what, at the genetic level, causes production of about 50 different terpenes so they can crank it up to use the oil as a renewable fuel.

In the article "High marker density GWAS provides novel insights into the genomic architecture of terpene oil yield in Eucalyptus" in the journal *New Phytologist*, Külheim and his coauthors investigate the genetic basis of variation in oil yield in blue mallee, a eucalyptus native to Australia. This will allow for faster and more efficient domestication, making the production of renewable fuels from eucalypt plantations more feasible.

One reason for the interest in eucalyptus oil is because bioethanol (typically made from corn), and biodiesel (typically made with vegetable and

soybean oils), do not have sufficient energy density to be useful for the aviation industry. Eucalyptus oil, however, can be converted into high-energy biofuel that can be used for jet fuel and even tactical missile fuel.

However, many eucalypts have yet to be domesticated and vary greatly in their oil yield. Using genome-wide association studies, Külheim has identified the genes that produce the components of eucalyptus oil that may be used for jet fuel and the aspects that may be used for the production of biodiesel. "This enables us to select for trees that mostly produce useful oil components for our purposes; we can use biotechnology to remove the genes for unwanted components or enhance the desired ones," Külheim says.

"We hope to provide eucalyptus farmers with genetic marker information to select trees at an earlier stage in their growth for higher terpene production. By choosing to cultivate new trees from power terpene producers, farmers can create new generations of the plants that naturally produce more oils."

Beyond the promise of eucalyptus oil for biofuels and beauty and wellness industries, the species could also prove an excellent cash crop for farmers in arid regions. The trees grow well in hot, dry regions, don't need to be irrigated, and therefore, do not compete with food production on arable land.

DEER POPULATIONS STUNT FOREST REGENERATION IN THE WESTERN UPPER PENINSULA

By Nathaniel Prangley

It is no secret that forests throughout the UP are beginning to see an abundance of white-tailed deer. Approximately 25,713 deer were harvested in the 2017 hunting season, a 57 percent increase over 2016, indicating there is a growing population in the western UP. With this increase in white-tailed deer abundance, forest regeneration is suffering greatly—both naturally and after logging. Once deer were considered a delicacy, with low populations throughout the UP; now forest managers consider deer to be pests, with their browsing habits on regenerating forests. Changes must be made in order to protect the future of northern hardwood forests.

Sustainable forest management aimed to promote natural and post-logging regeneration is by far the most profitable and ecologically friendly forest management method in the UP. These management methods bring about small sapling tree species, which many deer eat for nutrition throughout the year. The primary issue is that these regenerating saplings are the future of the western UP's forests. Forest managers have begun to see that natural or post-logging regeneration are not providing a healthy population of trees. This has been attributed to high

amounts of deer browse stunting the growth of regeneration. The population of white-tailed deer in the western UP is nearing the capacity to where their browsing activities have the ability to stunt healthy natural and post-logging regenerating forests.

Why have white-tailed deer populations reached high levels in the UP? Documented temperature rises have allowed deer to survive once uninhabitable UP winters. Temperature rises have allowed deer to move more easily and maintain critical food reserves in the winter. Another human dimension is the UP's doe hunting ban. The ban was created in order to protect the reproduction of the species. This continuous ban has effectively allowed deer to reproduce rapidly, and to occupy areas of forest that once were not affected by heavy browsing habits. The most ethical and feasible solution to this issue is to remove the ban. Protecting does has allowed deer populations to recover to a sufficient abundance, to the point where forest managers see an overabundance of white-tailed deer.

Opposing individuals argue that lifting the ban, forest managers will effectively be removing prey for species higher on the food

chain, disrupting the health of the ecosystem. However, both wolf and bear populations in the UP have reached sustainable populations and would not be impacted by this small reduction in deer abundance. As a result, the intraspecific competition of deer and its predators would benefit and would allow western UP forests to successfully regenerate with lower amounts of browse stunting growth. Regeneration both naturally and post-logging, are pivotal to the future of UP forests; white-tailed deer abundance must be controlled to allow for regeneration.



Nathaniel Prangley is an undergraduate student and research assistant at Michigan Tech, pursuing both a bachelor's degree in wildlife ecology and management, and a master's in forestry.

Alumni Mentorship Program Piloted

A way for young alumni to give back to Michigan Tech. An opportunity for students to get a glimpse of where their education might take them. And a platform for connections to be made. That's FutureU, an online social network of sorts, piloted in select academic units, including in SFRES.

"Career Services is always looking for new ways to support students both academically and professionally," says Melissa Michaelson, coordinator of career development programming. "Given our rural geographic location and our rich alumni network, we thought it would be helpful to look into utilizing a virtual platform to make it easier for students and recent alumni to connect and talk about college and career related topics."

The tool for making those connections is FutureU. Alumni sign up as mentors willing to share their experience and path to their current career. Then students sign in to FutureU and find mentors with careers that look interesting. Unlike LinkedIn or other platforms, students don't need to request a connection and then hope for a response. Plus, everyone on the platform shares the Michigan Tech experience, giving them something to talk about.

"Proactively initiating connections can be difficult for experienced professionals and especially so for younger students who are learning to promote themselves in the working world. From the feedback we have received, students using FutureU were grateful for the connections they made," said Michaelson.

STUDENT FEEDBACK

"Having been able to speak with a professional in my field of study has given me insights that I would not have otherwise considered. FutureU was a great platform for networking and coming to understand the career that I have been interested in and uncertain about for a long time."
—Allie May J.

"Each alumnus that I spoke with had a very different path to get where they want to be. I am glad that I got to speak with alumni from varying times in their careers as well—from five years post-graduation to retirement. I found Future U to be very helpful."
—Andi S.

"It allowed me to learn various sub-points about my main future profession which are not discussed in class. It also opened up a person in the field that I can now reach out to for advice and help with field-related questions when they arise."
—Joash P.

FutureU was piloted in five University academic units; 300 mentors and 260 students are currently using the platform.

With the success of the pilots, Career Services is looking to expand the program. "We want to make FutureU a normalized part of the Michigan Tech student experience," said Michaelson. "We'd love to

see all students use FutureU while they're here and then become mentors when they become alumni."

Alumni wishing to become mentors on FutureU and share their experiences can sign up at mtu.edu/career/alumni/futureu, or email Career Services at career@mtu.edu.

MICHIGAN TECH'S SFRES IS GLOBAL.

SFRES faculty collaborate with leading research institutes and alliances around the world. See where researchers are working to further basic knowledge and find solutions to global problems.



Robert Froese, Associate Professor
Project Timeline: Jan. 2018 to Dec. 2019

Location: Alberta, Canada

Successful reforestation remains a mystery, a mystery Froese hopes to solve by exploring the northern deciduous, mixed, and boreal forests of Alberta, Canada, which has a shorter history of intensive management than many other forest regions in North America. By exploring model structures and performances of the managed forests in the western Canadian province, he hopes to answer essential questions left unanswered by computer-aided sustainable forest management. While computer programs have been helpful, essential questions about successful reforestation remain: Are new forests growing similarly to the old forests they replace? Are forests developing the way our models told us they should? And how should the next generation of models be improved? By going beyond the computer and abroad, Froese's international research will help crack an important case in sustainable forestry.



Kristin Brzeski, Assistant Professor and Jared Wolfe, Research Assistant Professor,
Project Timeline: 2013 to Present
Location: Equatorial Guinea (EG), Central Africa

Observing the need for immediate conservation action, Brzeski and Wolfe cofounded the Biodiversity Initiative with colleagues, to curb species loss through education, science, and conservation. Wolfe and Brzeski have been doing research and educational capacity building in EG since 2013 and 2015, respectively. Wolfe leads a bird-monitoring project in the Oyala and a Protected Areas camera trap program, which has compiled data of each species' natural history and identify those species most sensitive to forest loss and habitat change. Brzeski runs the large Protect Areas camera trap project, now surveying all of the mainland's Protected Areas and getting EG "conservadores" into the forests to prevent illegal hunting. Additionally, Brzeski and Wolfe have developed, and regularly conducted, capacity-building workshops. Since 2013, Wolfe has conducted courses focused on wildlife conservation and field techniques in EG; in February 2019, Brzeski was lead instructor for a quantitative ecology workshop in Yaoundé, Cameroon, for Central African graduate students.



Victor Busov, Professor
Project Timeline: Jan. 2020 to June 2030
Location: Southeastern Europe (Balkan Peninsula and Bulgaria)

What can endemic plants—that is, plants left over from the last glaciation period—teach us about current challenges plants face? To answer this question, Busov travels to biodiversity hot spots known for its diverse terrain and homeplace for many endemic plants. These ancient plants have survived and thrived for thousands of years post glaciation and show no negative effects of low population numbers (e.g., inbreeding and genetic drifts). Busov is studying how endemics have thrived, despite inevitable consequences of having a small population size.



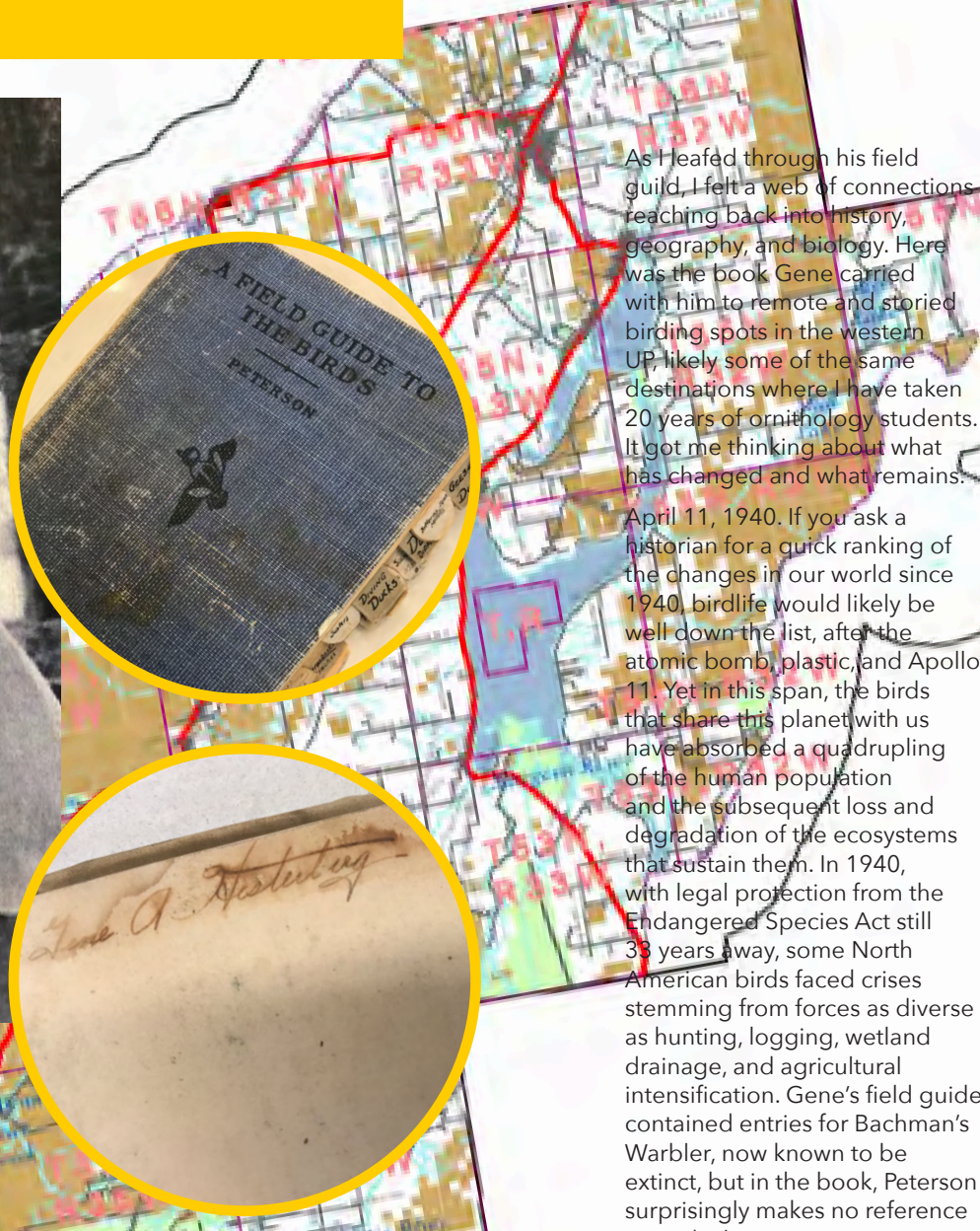
Molly Cavaleri, Associate Professor
Location: Kobe, Japan
Project Timeline: Jan. 1 to April 30, 2019

Studying how plants interact with their environment in forest canopies across Japan, Cavaleri hopes to better predict the extent of warming leaf photosynthesis can tolerate. Additional insight about plant's potential acclimation to warming will result from studying vertical gradients of functional traits within forest canopies. By analyzing how plasticity of the trees' traits correlate with regional climate variables, the team can determine the primary drivers of variation.



David Flaspohler, Professor
Project Timeline: Jan. 10 to July 25, 2019
Location: South Island, New Zealand

Flaspohler is studying habitat and landscape features that can support healthy native bird populations and their role as insect predators and pollinators of native plants. By using artificial caterpillars, he is measuring bird predation pressure on insects in forests, and using bird population data to measure the effectiveness of pest (e.g., rats and weasels) control efforts in New Zealand.



Hesterberg A Field Guide

By David Flashpohler

Excerpts taken with permission from MTU News Unscripted March 14, 2019

April 11, 1940. The date was neatly written in tiny sepia-colored ink in the top-right corner inside the cover of a worn blue book. Andrea Longhini found it during the building remodeling, and recognized it as something too special for the school's "give away" table. I picked up the four by eight-inch hardcover book bound in stained blue canvas, heavily

used, with old cloth tape holding together the last scraps of the book's paper jacket. It was an original Roger Tory Peterson Field Guide, customized with homemade tabs peeking out from the pages. In the same chestnut brown, old-fashioned cursive script, "Gene A. Hesterberg" was written inside the cover.

For alumni of a sufficient age, Hesterberg needs no introduction. His teaching and mentoring remain legendary. When I joined the faculty in 1998, I heard his name frequently and

saw him periodically. On a few lucky occasions, we chatted about the School, our students, and, of course, about birds and ornithology. He was trained as a forester at Purdue University and received his PhD from the University of Michigan in 1955. He won the Distinguished Teaching Award in 1980, and on Oct. 6, 2000, had his name forever attached to the new forestry building. Gene died September 2010. In addition to forestry classes, Gene taught ornithology, a class I began teaching in 1998.

As I leafed through his field guild, I felt a web of connections reaching back into history, geography, and biology. Here was the book Gene carried with him to remote and storied birding spots in the western UP, likely some of the same destinations where I have taken 20 years of ornithology students. It got me thinking about what has changed and what remains.

April 11, 1940. If you ask a historian for a quick ranking of the changes in our world since 1940, birdlife would likely be well down the list, after the atomic bomb, plastic, and Apollo 11. Yet in this span, the birds that share this planet with us have absorbed a quadrupling of the human population and the subsequent loss and degradation of the ecosystems that sustain them. In 1940, with legal protection from the Endangered Species Act still 33 years away, some North American birds faced crises stemming from forces as diverse as hunting, logging, wetland drainage, and agricultural intensification. Gene's field guide contained entries for Bachman's Warbler, now known to be extinct, but in the book, Peterson surprisingly makes no reference to its decline.

Peterson's entry for the Carolina Paroquet (now known as the Carolina parakeet) is particularly poignant: "Although it is years since the last paroquet was definitely reported in the South, there is still a bare chance that a stray individual or a flock might turn up. Adults would be about the size of a Mourning Dove, with a similar pointed tail, bright green with a yellow head deepening into orange about the base of the bill." Would be. The spark of hope in Peterson's choice of words seemed to me wildly optimistic; the last

confirmed wild paroquet sighting was in 1920, and the large flocks were gone by the 1890s.

April 11, 1940. As anyone who has spent a few springs in the Keweenaw can attest, mid-April can alternate between cold and snowy and snowy and cold. Eventually, however, what the season always brings by this date are new birds migrating northward. By the middle of April, White-throated and Fox Sparrows arrive singing their lovely songs, followed by ducks, grackles, and robins. It is a time of hope and renewal after our lovely but stubbornly long winters. Birds return each year like a fulfilled promise; I imagine that Gene experienced this reassuring rhythm and enjoyed sharing it with his students as much as I do each spring. Alongside these thoughts was the realization that the spring of 1940 was the beginning of one of the darkest periods in modern human history. Overseas, WWII was already underway. Yet here was this lovely book, in its sky-blue cover, owned by a gentle man who dedicated his life to enlightening and educating students.

Here, too, in his own hand, was a neatly written date that in many profound ways, marked a turning point in modern political and conservation history. The little blue book by Roger Tory Peterson had the modest ambition of making the beauty and grace of birds accessible to a wider public. And here was Gene Hesterberg in the spring of 1940, likely excited about his new field guide, crafting his custom canvas tabs in a world that had not yet encountered atomic bombs or even plastic, carefully penning notes alongside Peterson's. And just at the moment when a conflagration was about to engulf much of the world,

Gene was himself learning about and teaching our students, to identify, understand, and appreciate the songs, colors, and behavior of birds.

A field guide, like a favorite novel read over and over, becomes a deeply personal object imbued with memories, notes, coffee stains, and dog eared from fond thumbings. Gene's was a field guide from the earliest days of modern ornithology from a pioneer forester who thought that birds, as well as trees, were worth knowing. It was a time capsule preserving a snapshot of North American bird conservation history and a marker of a tipping point in time when human life and the planet itself was about to change forever.

Like me, Gene came to Houghton as an outsider, yet grew to love the geography and people to the point where, as he told me once, "wild horses couldn't have dragged him away." We can be confident that the dawn chorus that greeted Gene in 1940, is the same one we can enjoy on June mornings in 2019; for that matter, it was the essentially the same bird song chorus that rang out for ten thousand springs among the Great Lakes Anishinaabe and their ancestors. Such gifts should never be taken for granted. If we take the time to listen and watch and understand the life around us, these are the threads of connection that bind us with others through history and offer some peace and calm in a world so often full of discord. Roger Tory Peterson summed up a similar sentiment when he wrote: "The truth of the matter is, the birds could very well live without us, but many—perhaps all—of us would find life incomplete, indeed almost intolerable without the birds."

Making Tracks

1 JIM SCHMIERER SCHOOL FORESTER AND SENIOR LECTURER (Forestry '98 MS Forestry '00)

represents Michigan Tech, as its university representative, on the Board of Foresters since 2003 (renewed through 2020). Schmierer is one of several key people involved in overseeing the newly restructured Registered Forester program, which has been moved to the DNR.

A bill introduced in 2014 in the state legislature, would have abolished the registered forester program, but then-Gov. Rick Snyder vetoed it after protest from foresters across the state. Shortly thereafter, a working group formed, tasked with a review and update of the registered forester program, including the forester occupational code, educational requirements, continuing education, oversight, and other details. The working group convened every few months, worked weekly over email for several years, and assisted in crafting legislation, getting it introduced and now passed (Public Act 116). The entire process took five years. In addition to Schmierer, Michigan Tech alumni compromised a significant portion of the working group, which include representatives from across the forest sector.

2 SFRES PROFESSOR'S BOOK RECOGNIZED AS ONE OF 2019'S BEST

In a groundbreaking effort, Jared Wolfe, a research assistant professor in the School of Forest Resources and Environmental Science, and Erik Johnson, conservation biologist with the Audubon Society, both have over a decade of experience studying Neotropical birds and used data from 70,000 bird captures in the Amazon Jungle to publish the book *Molt in Neotropical Birds: Life History and Aging Criteria*. Their book provides unparalleled insight into an understudied facet of avian natural history from one of the most biodiverse regions on the planet.

The Wildlife Society, a leading professional organization of wildlife managers and biologists, recently recognized Wolfe and Johnson's contributions by placing their work on a shortlist of best wildlife books in 2019. Specifically, out of 54 books considered, their work was ranked in the top five. The winner of The Wildlife Society's best book of 2019 will be announced in Reno, during their annual meeting this September.

3 BRITTANY VANDERWALL (BS FORESTRY '14)

was honored with the 2019 American Tree Farm System's® (ATFS) National Leadership Award. The award recognizes the efforts of extraordinary volunteers for their leadership in motivating other volunteers, educating landowners, and accomplishing their state committee's forest conservation goals.

VanderWall has been involved with Michigan ATFS since 2015 and has served as state Tree Farm Chair since 2016. As chair of the Michigan Tree Farm Program, VanderWall led an effort to change how the committee conducts business, moving it to a task and training-based structure and providing clearly defined roles for volunteers. This effort has inspired more foresters, who now feel their time is more valued, to get involved in the committee. This, along with renewing an incentives system and streamlining other protocols has ultimately allowed the Michigan Tree Farm Program to service landowners more effectively. In addition to her volunteer commitments to the Michigan Tree Farm Program, VanderWall is the District Forester for the Presque Isle Conservation District, working full time assisting family forest landowners in northeastern lower Michigan. Her role includes educating landowners about forest ecology, proper timber harvesting practices and programs to participate in that suit the landowner's needs, such as ATFS. In her four years at the Conservation District, she has participated in or hosted more than 60 workshops, educational field days, and seminars.

*Excerpts reprinted with permission from American Forest Foundation's March 26, 2019 story

4 FOUR FACULTY NOMINATED FOR DISTINGUISHED TEACHING AWARDS

Annually, Michigan Tech's William G. Jackson Center for Teaching and Learning (CTL) recognizes outstanding contributions to the instructional mission of the University with its Distinguished Teaching Awards. Based on more than 50,000 student ratings of faculty instruction, ten finalists were identified for the 2019 awards, formally announced in May, and awarded to an assistant professor and an associate professor. Four of the five finalists in the Associate Professor/Professor Category are SFRES faculty.

Andrew Burton (SFRES), Professor
Molly Cavaleri (SFRES), Associate Professor
Ann Maclean (SFRES), Professor
Christopher Webster (SFRES), Professor
Nominees were honored at the CTL banquet on April ninth. Banquette attendees heard the following student feedback for each professor:

Andrew Burton is a walking encyclopedia and is always there for students. He links classroom instruction to excellent teaching in the field. He is a critical link to the success of SFRES.

He goes above and beyond. Every single lab in the field was an adventure. He baked cookies for the whole class. He also took time out of his evening to lead review sessions for tests. He truly cares about his students.

Andrew was inducted into the CTL's Academy of Teaching Excellence in 2011.

Molly Cavaleri is AMAZING. I wanted to do a research project before I graduated and she was super willing to accommodate and assist. She immediately accepted me into her lab and put me to work figuring out how I wanted to design my research project. I won an award for my poster and was able to get my research published.

She uses a good combination of reading assignments, lecture, hands-on examples, individual projects, and discussion to make sure that her students truly comprehend the course material.

Molly was inducted into the CTL's Academy of Teaching Excellence in 2019.

Ann Maclean uses all resources to teach and to explain the topics in different ways. Her teaching is so outstanding. I NEVER feel dumb asking really basic questions. She draws out certain things to help you understand an issue much better than spoken words. She also encourages students to draw to better portray their ideas on exams and homework assignments.

Ann was inducted into the CTL's Academy of Teaching Excellence in 2016.

Christopher Webster brings a light to the classroom that is rare and wonderful. I learned so much and will not easily forget it.

He always takes the time to explain things to students and make each student feel included. He is one of the most knowledgeable individuals I have met, and very well versed in sharing his experiences.

Chris was inducted into the CTL's Academy of Teaching Excellence in 2009.



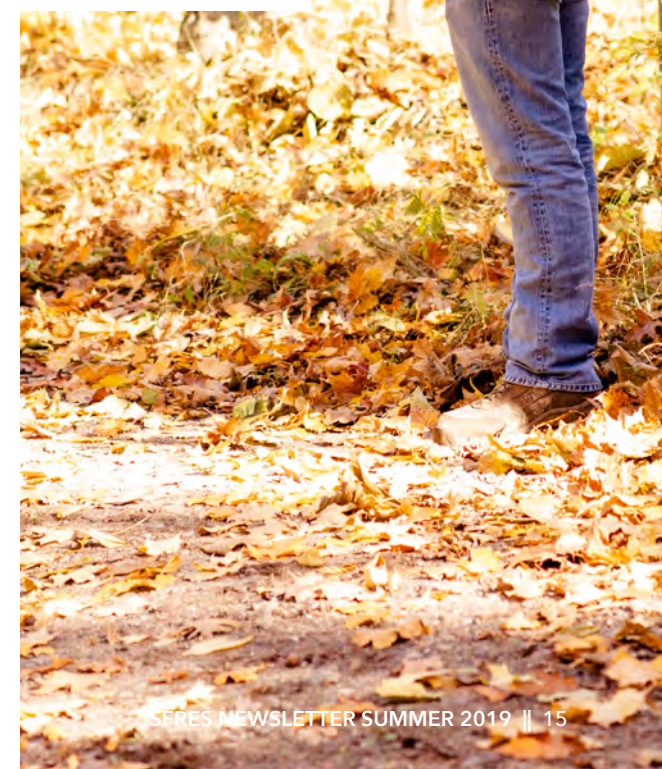
1
Jim Schmierer,
Board of Foresters



2
Jared Wolfe,
Best book nomination



3
Brittany Vanderwall 2019
AFTS award recipient





CHECKING IN WITH MARY SNYDER '13

Peace Corps Master's International, Forest Resources and Environmental Science

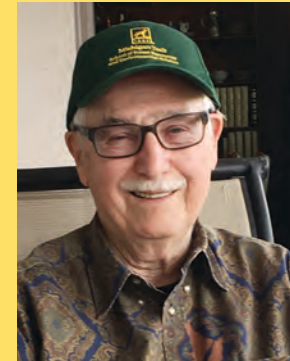
I got a Parks Service job as an interpretation park ranger at Lassen Volcanic National Park in Northern California, as my first job after graduating from Michigan Tech. That position was seasonal, so I did that until September. Next, I moved to Mariposa, just outside Yosemite for a yearlong AmeriCorps Program. I worked with a land trust called Sierra Foothill Conservancy as a Volunteer and Stewardship Coordinator. After that I got my current job with Davey Resource Group (DRG) in Santa Cruz, California.

Currently, I am a senior contract utility forester for DRG's Utility Vegetation Management division. I work within Pacific Gas & Electric's vegetation management program; I work to manage the vegetation along the transmission electric corridors throughout the Bay Area.

DRG periodically picks up smaller contracts with varied partners. In January 2019 they acquired a small contract with the EPA. As part of the phase one clean up, EPA crews were working to remove household hazards from the footprints of the

structures that were burned. The EPA needed certified arborists to assess hazard trees so the crews could work safely within the burn areas. The winter weather after the extreme fire in Paradise, California, created some hazardous conditions, and we needed to ensure the crews could work safely in burn zone. There was actually a tornado watch while I was on site, which was an extremely rare for the California Sierras.

My education at Michigan Tech taught me the foundations of forestry and environmental management that I use every day in my current position. It also taught me to work cooperatively in varied professional environments. It has certainly been different to work in the center of the extreme weather catastrophes happening on the west coast. It's been exciting and important work. I never thought I would work in this area as a forester, but there's definitely a need for folks with my degree out here. It's been an interesting and unexpected way to use the forestry principles I learned at Michigan Tech.



IN MEMORIAM: DENNIS TEEGUARDEN '53

Dennis Earl Teeguarden, respected scholar, teacher, and administrator, passed away on February 21, 2019 at his home in Richland, Washington.

Born in Gary, Indiana, Teeguarden's affinity for nature drew him to the

forests, sand dunes, and marshes along the Lake Michigan coastline. A chance meeting with a Michigan Tech alumnus, Jack Ojala '33 turned him on to the idea of studying forestry. Teeguarden came to Michigan Tech in 1948 and graduated in 1953 with a BS in forestry.

Teeguarden went on to earn a MS in Forestry and a PhD in Agricultural Economics from the University of California-Berkeley in 1964. He was immediately appointed to a faculty position in Berkeley's School of Forestry and Conservation, achieving full professor rank in 1968. Teeguarden served as chair of the UC Department of Forestry and Resource Management from 1978-86. He retired from the UC faculty in 1991, but continued as associate dean of the College of Natural Resources through 1993.

Dennis joined the Michigan Tech Fund Board of Trustees in 1994, and he and his wife, Sally, were members of the Founder's Society. Dennis was a member of both the Forestry Academy and the Forestry Club. In 1993, he was awarded Forestry's Outstanding Alumnus Award.

Teeguarden was the author of numerous journal articles, monographs, technical reports, and books on a wide range of topics related to forest economics. He served as a consultant to industry and government agencies on forest economics in California and is a past member of Committee of Scientists to advise the Secretary of Agriculture and US Forest Service on the National Forest Management Act.

When visiting Dennis recently, he recounted of his love of the UP. He said his dream was to have a little camp in the woods to visit and how he would only now ever get there in his mind, knowing he would never again be able to make the trip. Dennis wrote a memoir of the Teeguardens, which included an entire chapter on his time at Michigan Tech in the School of Forestry. Dennis was one of our programs' greatest advocates and most loyal alumni.



MICHIGAN TECH FORESTRY ALUMNI ENDOWED SCHOLARSHIP FUND

In 1994, Dennis Teeguarden '53 made a gift to Michigan Tech to establish an endowed scholarship, eventually named the Michigan Tech Forestry Alumni Endowed Scholarship. He said he made the gift, "in the hope that it would help a forestry student through the financial thicket of winning their degree at Michigan Tech."

Join other alumni honoring Dennis' legacy by supporting the scholarship. **Make a gift using the enclosed pledge envelope.**

"I purposely used the word 'alumni' in the name in the hope that fellow alumni would join me in the cause."
—Dennis Teeguarden '53



IN MEMORIAM: TOM DUVENDACK '72

Thomas Russell Duvendack, 78, passed away with his family by his side on April 21, 2019, from pancreatic cancer. He was born November 3, 1940. Tom married Marianne Britt in August 1983. Being daddy to three wonderful and interesting children was Tom's greatest joy. He earned a BS in Forestry from Michigan Tech, then went to work for the Ohio Metroparks system. Working with his hands on outdoor

projects was his life's calling. He was a founding member of the Northwestern Ohio Rails-to-Trails Association (NORTA). Unless he was out of town, he was working on the Trail every single week during his 17 years of retirement. The NORTA property in Pike Township (Fulton County) has been designated as the "Tom Duvendack Savanna."

Nara Legacy Land Gift

By Mark Wilcox



A PLAN 15 YEARS IN THE MAKING CAME TO FRUITION

when the largest donation ever to the School of Forest Resources and Environmental Science (SFRES) was made official by the Nara family. At a signing ceremony June 28, 2018 at the park that bears her family's name, Ruth Nara of Houghton and Bootjack, donated a forest in Houghton County's Torch Lake Township to Michigan Tech. The 640 acres of land and the timber on it are valued in excess of \$2 million.

In addition, a scholarship in the Nara family name will be established to benefit Michigan Tech students studying forest resources and environmental science.

Andrew Storer said, "The School of Forest Resources and Environmental Science is extremely pleased that Ruth has chosen to gift this property to Michigan Tech." The property will be known as the Nara Family Forest in honor of Ruth and her late husband, Robert Nara. At the presentation, Terry Sharik said, "This is the biggest gift [our school] has received." He said the size of the forest will allow students to study forest management and natural resources issues on a large scale. He pointed out that the property will be managed as a sustainable, working forest. Turning to Ruth Nara, Sharik said: "I can assure you, we will take care of it."

Glenn Mroz, Michigan Tech's ninth president, said he was touched by the trust the Nara Family has shown to Michigan

Tech. "When Gail and I first visited the property with Bob and Ruth about 15 years ago, one of the things that struck me was that several generations of the Nara family had managed that forest. Through good times and especially through many very trying economic times, the generations of the Nara family emphasized their continued stewardship of the land. They've managed it with a steady hand for more than 100 years, and now they're trusting us to do the right thing." Mroz added, "I think we all feel a deep sense of gratitude, but also a responsibility, that the Nara forest is being entrusted to Michigan Tech to benefit many generations to come." In making the presentation to the University, Ruth Nara said, "All I can say is thank you for putting this all together. This forest is a special place and it is special to all the people in the Bootjack area."

Eric Halonen, assistant vice president for advancement, has worked with the Nara family for about 14 years. He says this latest gift is part of a long-range plan Bob Nara had for the property. "It was important to Bob that it remain a managed forest. That's why he trusted it to the SFRES," Halonen says. Bob and Ruth Nara are well-known philanthropists in the Copper Country. Perhaps their best-known community project is the City of Houghton's 100-acre Nara Nature Park, which for the past 10 years has been linked to the Michigan Tech trails. In recognition of their contributions, the Michigan Tech Alumni Association presented the Naras with the Honorary Alumni Award in 2013.



Michigan Technological University
**SCHOOL OF FOREST RESOURCES
AND ENVIRONMENTAL SCIENCE**

1400 Townsend Drive
Houghton, MI 49931-1295



HAMMER'S ENDOWED FIELD EQUIPMENT FUND

To develop great field skills, you need great tools. Put those tools in the hands of our students!

The Hammer's Endowed Field Equipment Fund honors faculty member "Hammer" Steinhilb, who ensured Michigan Tech students left with the best field skills in the industry. The fund extends Hammer's work, by giving students access to modern field equipment.

EQUIPMENT PURCHASED SINCE 2017-18:

Geographic Position System (GPS) has become ubiquitous in natural resources, but has only recently been common for nearly every resource professional to carry a portable field computer: a cellphone. But cellphones have only low precision GPS. So we purchased high-precision wireless (bluetooth) GPS receivers that can be paired with any cellphone turning the field computer into a mapping-grade field computer for spatial data collection, at a fraction of the cost of a dedicated mapping grade unit. This allows us to keep teaching the newest technology to our students, who then carry that experience into the workforce when they're done.

Wildlife Cameras

Recognizing the need for additional trail cameras, for not only wildlife techniques, but also mammalogy and wildlife

senior projects, we purchased 12 new Bushnell Trophy Cams. Field cameras are one of the most fundamental tools for studying wildlife and provide engaging and exciting imagery for student projects.

Heavy Duty Digging Spades

Heavy duty digging shovels are a necessity for many types of field excursions.

In our modern era, students need to graduate having been trained with the best equipment in modern technologies. Alumni donations to the Hammer Endowed Field Equipment Fund helped us upgrade our teaching field equipment.

Make a gift using the enclosed pledge envelope.

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