



Erythronium

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A Quaky Step Back in Time Using 21st Century Tools: T-Lidar Scans of the Estherville “Big” Fen, by Dr. Rebecca Kauten,

University of Iowa Department of Geographical & Sustainability Sciences

In the early 20th century, B. O. Wolden characterized the flora in northern Emmet County as “bottom-land jungles within the floodplain of the Des Moines River. What was described as “one of the largest and finest” fens existing within Section 21 of Emmet Township. This site served as a resource for Iowa’s earliest natural historians and scientists. By 1956, the site was heavily drained (Wolden & Wolden, 1956). From that point on, few researchers ever visited the site again.

On November 25 of this year, a team from the University of Iowa returned to once again collect data. This time, the objective was to gather baseline elevation data prior to reconstruction of the property. The Neppel family of rural northwest Iowa recently secured a conservation easement with the Natural Resource Conservation Service (NRCS) to restore the wetland community. In 2020, the agency intends to begin hydrologic restoration of the site. Plans are to plug existing drainage tile lines, and re-engineer drainage ditches that were initially constructed to drain the parcel.

Because hydrology and fens are so inextricably (and sometimes unexplainably) connected, this baseline data serves as a key resource for this project. Heavy, intense drainage of the site has left much of the organic, naturally saturated soils relatively dry for decades. As hydrology changes *back* to levels more comparable to natural conditions, the site may not only rehydrate, but potentially re-elevate. Just as a desiccated peat pot from the garden center expands in water, these soils may very well change overall elevation of the site as saturation occurs. The research questions to then ask may be not only how much elevation changes, but where and after how much time?

A typical wetland restoration project begins by

collecting elevation shots by relatively conventional means. NRCS collected one dataset using standard surveying material, which will be used to design and implement the restoration effort. In addition, a terrestrial light detection and ranging unit, or T-Lidar system, scanned the entire parcel to generate high resolution, three-dimensional imagery.



Figure 1: University of Iowa students Drew Hutchinson (left) and Natalie Schoen (right) scan a large drainage ditch using the terrestrial lidar unit. A ground control point to the right establishes standard measurements for the device as it scans.

Terrestrial LiDAR, sometimes referred to as terrestrial laser scanning (TLS) generates precise, thorough physical surveys of environmental systems ranging from scales of centimeters to kilometers (Brodu & Lague, 2012). Three-dimensional data are acquired from a network of points to create a detailed Digital Elevation Model, or DEM, of greater coverage and accuracy than conventional surveying. In locations with rugged terrain, data collection can also occur more safely.

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Leaves of the President's Notebook



It is almost spring, and soon the plants will start growing and blooming! The birds will soon be returning for the summer. The next season of activities is also beginning, including Day of Insects on March 27 and 28. More details are provided in this newsletter. There are a lot of speakers giving short talks on various subjects related to invertebrates, so you can likely find something that interests you. Note that there is a fee for attending, and you will need to preregister.

Now that it is winter, do you ever wonder where some of the animals and insects spend their time? Spiders are snuggled down under leaves, or in a house or other warm place. They have enough antifreeze to survive the freezing weather. We have chorus frogs that overwinter in our lawn. They must have enough antifreeze to get by. We also have tree frogs, but I haven't figured out their strategy for survival. It probably also involves antifreeze. Thirteen-lined ground squirrels are in the ground below the frost line, but they are not safe from badgers, which do not hibernate. Last fall I saw some fresh digging in the road ditch that I am sure was a badger looking for a meal. A "new" movement advocates for not raking the leaves. Among other reasons, this would leave more habitat for the creatures that need to overwinter above the ground. I am all for that – I have never raked the leaves in my yard!

~ *Lloyd Crim*



25th Anniversary of INPS



The Iowa Native Plant Society was chartered in Fort Dodge in October 1995, so this year, we recognize the 25th anniversary of the Society. We celebrated our 20th anniversary with field

trips and gatherings in Northeast Iowa in 2015. While we may not celebrate the 25th anniversary with such an event this year, it is good to recall the many field trips and meetings – and members from whom we've learned so much across our 25-year history. So if you have a particularly memorable INPS moment to share, please send it to me for the spring or fall/winter newsletter – dlewis@iastate.edu. And don't forget to check out the photos and back-issues of the newsletter on the INPS website: <http://iowanativeplants.org/index.php>.

Calendar of Upcoming Events and Activities

The spring issue of *Erythronium* will have a more complete schedule of upcoming events and activities, including those for **Iowa Wildflower Month**, which is celebrated in May. See the article by Dianne Blankenship and Tom Scherer below for submitting your ideas or plans for a 2020 Field Trip, during and beyond **Iowa Wildflower Month**. And invite a friend to join you on an excursion into the beginning of the 2020 season.

Tuesday, March 3, 6:30-9:00 pm

Prairie Preview XXXVII – Bur Oak Land Trust, Bohemian Hotel, Iowa City (Johnson County)

Prairie Preview, Johnson County's annual premier environmental get-together and lecture, will be held on March 3 at The Bohemian Hotel (The Highlander) in Iowa City. This year's speaker will be Sarah Nizzi from the Xerces Society, speaking on "Integrating Nature into our Daily Lives and Why it Matters." The event is free, and all are welcome. <https://www.buroaklandtrust.org/events/prairie-preview-xxxvii/> (Co-sponsored by INPS)

Saturday, March 14

Tri-State Forest Stewardship Conference 2020, at Highland Community College in Freeport IL

The 2020 Tri-State Forest Stewardship Conference features 20 forestry, wildlife, and conservation-related presentations given by 20 expert speakers from across the Midwest. Registration is limited to the first 300 people who sign up.

Registration: <https://web.extension.illinois.edu/registration/?RegistrationID=21620> -- **Each adult attendee must register and pay separately;** for example, a husband and wife couple must register separately and pay separately since they will likely attend different presentations throughout the duration of the conference. Registration (online): \$40 [through March 10, 2020]

Directions: <https://highland.edu/directions/>

Friday to Saturday, March 27-28

Day of Insects, Reiman Gardens, Ames (Story County)

Registration (required, note fees) and the schedule for the 12th annual Day of Insects at Reiman Gardens is now online: <http://www.reimangardens.com/collections/insects/day-of-insects/>. Day of Insects is filled with presentations from professionals, academics, advocates, and enthusiasts covering a range of insect related topics. From beginners to seasoned veterans, DOI has something for anyone interested in or involved with insects.

Again this year for individuals that are in town early the night before we will have an opening reception. Come, be casual, enjoy dinner, get to know other insect enthusiasts, there's more of us than you think. Anyone

attending DOI can sign up to attend the reception and there will be some slots made available for individuals unable to attend DOI so they can participate as well. Registration for the reception can be completed on the link listed above. The reception will include a keynote by Doug Taron, The Chicago Academy of Science / Peggy Notebaert Nature Museum.

There will be three workshops on Friday afternoon on invertebrate related topics for those interested in attending. Be sure to check times, as there is overlap and you will not be able to attend all of them. Individuals can participate in the workshops regardless if they are attending any of the other DOI activities.

WORKSHOPS (Friday, March 27)

12:00 - 5:00 p.m. - "Mountain Midges to Muscoids: Diversity and identification of Diptera"

12:45- 2:45 p.m. - "Adventurous Eating: Spreading The Love of Eating Bugs"

3:00-5:00 p.m. - "Picture This: Insect Photography in a Whole New Light"

OPENING RECEPTION – (Friday, March 27)

6 p.m. – 8:30 p.m. Dinner, Keynote presentation and behind the scenes Reiman Gardens entomology tour.

Keynote: "Counting Butterflies: How Community Scientists Have Informed the Science of Monarch Migration, the Windshield Effect, and the Insect Apocalypse" presented by Doug Taron, The Chicago Academy of Science / Peggy Notebaert Nature Museum

PRESENTATIONS (Saturday, March 28)

9:10-9:30 a.m. - "Life in a Little Known Prairie (Thank you Howard Ensign Evans)"

9:30-9:50 a.m. - "Urban Habitat Development For Pollinators In Muscatine"

9:50-10:10 a.m. - "What Did I See and Where? Low-Cost GPS Data Capture of Field Observations"

10:10-10:30 a.m. - "Charismatic Flies"

11:00-11:20 a.m. - "Using Photography to Survey Pollinators on Natural Areas"

11:20-11:40 a.m. - "For the Bugs: a Basis for Surveying Glacier Creek's Insects"

11:40 a.m.-12:00 p.m. - "Tracking Migration of Red Admiral and Painted Lady Butterflies: Weekly Surveys, Flight Direction Monitoring, Citizen Science, and Stable Isotope Analysis"

12:00-12:20 p.m. - "Minnesota Wild Bee Survey – Lessons Learned After Six Years"

1:20-1:40 p.m. - "Communicating Knowledge and

Respect for Spiders and Their Functions in Ecosystems for Audiences Such as Elementary Students"

1:40-2:00 p.m. - "Ants and Bees of a Novel Nanoprairie (in Pella, Iowa)"

2:00-2:20 p.m. - "So What's in Your Back Yard"

2:20-2:40 p.m. - "Native Bees in the Conservation Reserve Program--Are We Planting the Right Prairie Plants?"

3:10-3:30 p.m. - "Lepidoptera of Wisconsin: Highlights of 50 years in the Field"

3:30-3:50 p.m. - "Beetle Banks"

3:50-4:10 p.m. - "Beetles in the Bush: A Bioblitz in Africa"

SILENT AUCTION – to support the North American Prairie Conference

During DOI, we will be holding a silent auction for participants at DOI to bid on. If you would like to participate in the auction you can bring an item/s for the auction. These items can be dropped off at registration in the morning of DOI. This year all proceeds from the auction will go to supporting the North American Prairie Conference.

Friday to Sunday, May 29-31

Loess Hills Prairie Seminar, Onawa and Sylvan Runkel State Preserve (Monona County)

The Loess Hills Prairie Seminar is a 3-day family event filled with kid-friendly activities, prairie excursions, and informational presentations. More information about this year's LHPS should be available soon at: <https://www.loesshillsprairieseminar.com/> (Co-sponsored by INPS)

Monday to Wednesday, July 20-22

North American Prairie Conference, Prairie Meadows Event Center, Altoona (Polk County)

The North American Prairie Conference (NAPC) is America's oldest and most celebrated native grassland conference. It has been held since 1968, roughly every two years. The 2020 conference is the 26th event and the fifth NAPC conference to be held in Iowa. Registration will open soon, with one-day options as well as full three-day registrations.

More field trips are being added, and symposia details will be shared soon.

The selection committee is currently accepting abstracts for 20-minute presentations and for posters. Sponsorship support is needed now, and your partnership is invited! For more information, visit: <http://www.northamericanprairie.org/> (Co-sponsored by INPS)

A Busy Field Trip Season in 2019 and Looking Forward to 2020

The Iowa Native Plant Society sponsored over twenty field trips in 2019. Most of these were with partners including ten conservation boards, the Iowa Prairie Network, Loess Hills Wild Ones, the Minnesota Native Plant Society, and Friends of Ames High Prairie. Tom Rosburg gets the honors for having led the most field trips, but every single leader was greatly appreciated.

INPS also sponsored or supported these: Iowa Prairie Conference, Loess Hills Prairie Seminar, Society for Ecological Restoration Midwest Conference, Plant.Grow.Fly, Estherville Fen Project, and several grants. See separate articles for details about some of these.

We actively exhibited at several events, including the Iowa Prairie Network Region 5 Winter Seminar in both 2019 and 2020. Many of our members pay their membership fees at that event. We also display at the annual Day of Insects, to be held this year on March 28. Both of those events are held in Ames.

The INPS annual meeting was held at Central College during the Iowa Prairie Conference and the 2020 meeting will most likely be held in conjunction with the North American Prairie Conference. It will be held at the Prairie Meadows Events and Conference Center in Altoona, Iowa, July 20-22.

Please let us know of your ideas of a natural area you would enjoy visiting with your INPS friends. Do you want to organize one or lead one? Do you know of groups with whom we could partner? We welcome your ideas.

Tom Scherer helps coordinate field trips and I continue to post them on the INPS website calendar. You can contact either of us. We look forward to hearing from you. Remember to check the calendar often to find events by INPS and others which might be of interest to our members. Send photos from field trips to Tom.

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2019 INPS Grants Final Reports

Restore Iowa! Grant: Chad Graeve (Hitchcock Nature Center, Pottawattamie County Conservation), "Hitchcock Nature Center Invasives Removal by Students" - \$1000 Funded in part by Linda Scarth memorial funds

It is with gratitude that I send this grant report to the INPS. Thank you very much for supporting our efforts to increase the number of young people we could engage in caring for our natural areas, and to reduce the threat from invasive species at Hitchcock Nature Center in Pottawattamie County and beyond.

As I reflect on the accomplishments of the summer, I am quite pleased with outcomes even though we had to deviate from our original plan. With the funds provided by the Iowa Native Plant Society and some funds from the Conservation Board, we purchased 4 new Stihl FS 131R weed eaters with grass knife attachments. We recruited 3 participants to the program, but were unable to get the necessary interest/commitment from local wrestling teams. We ended up hiring 3 athletes, only one of whom was in high school. Andrew West attends Missouri Valley High School and lives a couple miles from Hitchcock Nature Center. Two other hires are current students at Iowa State University and live in Council Bluffs. Brock Bortolotti and Zach Moore fit in with our efforts very well. Andrew, Brock, and Zach were up for the physical challenge. They were mentally engaged as well and were indoctrinated with our Guiding Principles and our work ethic. Because we had three instead of four hires, I could pay them to work past the five weeks originally scheduled. All three expressed satisfaction gained from the work and the learning that happened this summer. All three went back to school with a new outlook on careers and personal commitment to conservation.

Working with Andrew, Brock, and Zach, combined with our two summer interns, and intermittent crews from Conservation Corps of Iowa and the Anna Beale crew from The Nature Conservancy, we were able to cut all of the sweet clover at Hitchcock Nature Center in record time (due to the additional help and the reduction in sweet clover from previous years). We were able to cut all of the Canada Thistle on our properties. We treated Tree of Heaven on our sites and on The Nature Conservancy's Folsom Point Preserve. The crew also helped cut brush on remnant prairies and in areas where we are reclaiming ground that had succumbed to woody plant invasion.

I plan to continue to market this opportunity to the local high school wrestling clubs. I am hopeful that active endeavors by teens can be channeled into conservation in adult life. It certainly worked for me. In addition, the equipment purchased by this grant will continue to serve in our efforts to control sweet clover, Canada Thistle and other invasive species in our natural systems in Pottawattamie County. Thanks again for your generous support.

Paul Readhead, Friends of Ames High Prairie (Pohl Prairie, Ames IA), \$1000, "Management Endowment for Ames High Prairie" (restoration/management grant)

On behalf of The Friends of Ames High Prairie, thank you to the Iowa Native Plant Society for its \$1000 grant for management of Ames High Prairie (aka Pohl Prairie), an Iowa State Preserve. Those funds along with others we have raised are currently being held in a dedicated account, pending the signing of a management contract. Iowa Natural Heritage Foundation has expressed a strong interest in assuming this remnant prairie's management and I believe that will be finalized within the next several months. When a management plan is written, we will release funds for use on projects such as tree removal, prescribed burns, and over seeding of existing prairie areas. The funds will help to continue the ongoing management efforts that have been underway for the last 6-8 years.

Jason Taylor, Bur Oak Land Trust (Iowa City IA), \$1250, "Land Management Equipment for Invasive Species Removal" (restoration / management grant)

Bur Oak Land Trust was awarded \$1250 for the purchase of land management equipment to reduce invasive species on lands the trust manages. These funds were used to purchase a Stihl 462 CM saw, which has already provided many hours of service.



In May, then Land Steward Jason Taylor used the saw when he attended a chainsaw training course to receive his US Forest Service Feller A certification. He used skills learned from that program to train the Bur Oak Land Trust AmeriCorps stewardship team members, who have cut down numerous invasive trees



and shrubs as part of a prairie restoration project at the Trust's Big Grove property.

The team has also used the saw as part of a habitat restoration and canopy reduction project at Muddy Creek Preserve. Removal of numerous invasive species at that property through the use of goats and mechanical methods has resulted in a return of native species, including a large population of threatened *Spiranthes ovalis* orchids, first seen in fall of 2019.



Partridge pea: its pollinators and variants, by Stephen Johnson

Partridge pea (*Chamaecrista fasciculata*) is a mid-to-late summer flowering plant belonging to one of the most abundant plant families in tallgrass prairie, the bean or legume family, known scientifically as the Fabaceae. Its well-known bean family relatives include round headed bush clover (*Lespedeza capitata*), Illinois bundle flower (*Desmanthus illinoensis*), and the prairie icon purple prairie clover (*Dalea purpurea*). All function as nitrogen fixers for the ecosystem, living with *Rhizobium* bacteria in intimate association with the plant's roots. This also allows the leguminous plant to endow its pollen with copious nitrogen, a key component of protein synthesis and consequently a serious attraction for many nesting bees.

There are a couple of fundamental differences

between Partridge pea and the majority of other prairie legumes. First, it is an annual in an ecosystem dominated by perennials. Next, it offers no floral nectar where most other prairie legumes such as leadplant (*Amorpha canescens*) offer plentiful nutritious nectar. Also, partridge pea makes its pollen hard to acquire, by having poricidal anthers that withhold pollen. Such anthers force bees to perform an energy intensive behavior called buzz pollination or simply called buzzing. In buzzing, a bee must detach its wing muscles from its wings and then vibrate them to an approximate key of C. At this point pollen pours from the anthers like a salt shaker and festoons the buzzing bee. These poricidal anthers also restrict access to the pollen for bees that cannot perform this act. Honeybees can't do it; male bees can't do it.

If you stay quiet and motionless in front of a stand of partridge pea you may witness an American bumblebee (*Bombus pensylvanicus*) enter a flower. Listen closely for the high pitched BBZZZZZZt! And then watch her gather with her middle legs the pollen that now bedecks her into her hindleg pollen-carrying baskets known as corbiculae.



Melissodes comptoides buzzing a *Chamaecrista* flower

I have been entertained for hours by watching how the various species engage with partridge pea flowers to perform the buzz. Species such as the brown-winged longhorn bee (*Melissodes comptoides*) does a very loud BBBZZZZZZZZZZZZZZt for five to eight seconds where another longhorn bee, not known to buzz and without a specific common name, *Florilegus condignus*

does it quickly with a fast and nearly silent BZzt in just about one to three seconds. It's an act difficult to witness, requiring the observer to be in the right place at exactly the right time.

Perhaps my favorite bee is the large and vividly striped Walsh's anthophora (*Anthophora walshii*). She is another long, loud buzzer but in the process, she acquires a perfect equilateral triangle of pollen clearly visible on the top of her abdomen. This phenomenon is so pronounced that, in my notebook before I had her identified, I referred to her as "Anthophora triangulifera", essentially meaning she is a flower holder bearing a triangle.



Anthophora walshii after buzzing a *Chamaecrista* flower

Yet another uncommon bee lacking a common name that visits partridge pea flowers is the silently flying and otherworldly black bee with emerald eyes, *Protandrena cockerelli*. Apparently at the time of this writing this species is not known to science as a buzzer of *Chamaecrista*, but as I can attest, buzz she does!

While partridge pea offers no floral nectar, it does produce nectar in extrafloral nectaries which appear as tiny orange disks on leaf petioles near their point of attachment to the stem. These nectaries can attract honeybees and sweat bees, species that are typically unable to provide pollination services. These nectaries more often attract ants that become symbionts, that in response to the provision of a sugary reward fend off herbivores intending to make lunch of the plant.

Botanically partridge pea has a few variations worth noting. At Kish-Ke-Kosh Prairie Preserve in Jasper County while negotiating pocket gopher holes and mounds underlying a slope covered in partridge pea in search of bees, I noticed plants with light cream-colored flowers. In the immediate area where I found the first light flowered plant, I found five more individuals and farther upslope I found six more making this form representing approximately 2% of the whole population. I later found in *Gray's Manual of Botany* that this "white" flower form had been first described in 1935 and given the designation of forma *Jenseni* after



Chamaecrista fasciculata forma *Jenseni*

its discoverer L. C. Jensen. So next year I'll check that area for more or fewer forma *Jenseni*.

While looking for cream colored partridge pea plants I literally stumbled into a perfect dwarf partridge pea! I can find no reference describing a plant with all of its dimensions miniaturized such that leaves are half to quarter sized, and flowers are reduced to about a quarter to a sixth of normal size. I took a small branch for a specimen, knowing I wouldn't readily see this dwarf again. Then a couple of weeks later, this time with camera in hand, I stumbled into another dwarf, but then couldn't locate it again. I think I found two of them but it's like looking for a straw-colored needle in a hay-



Comparison of typical and dwarf leaves

stack. It is likely that this form appears infrequently and then dies out. The flowers are not pollinated simply because they are much too small to be buzzed by the partridge pea cast of buzzers!

Spring of the Wild Petunia, *Prairie Flower*
Garden blog, October 30, 2019, by Diane Porter
<https://prairieflowergarden.com/blog/f/wild-petunia-spring>

For the last week I've been listening to slo-mo popcorn popping, sharply but at long intervals. The sound comes from the brown bag into which I stuffed some stems of Wild Petunia (*Ruellia humilis*) to let the seed pods finish drying out and drop their seeds. But those pods don't just *drop* the seeds! They catapult them with such force that, no matter where I am in my house, I can hear the seeds hit the inside of the paper sack. *Smack!*



Wild Petunia seed pod with seeds gone

It's not constant. Maybe two or three pods pop open per hour. Not often enough that I would have the patience to sit and watch a plate of Wild Petunia seedpods on the off chance of seeing one burst. Just often enough to startle me pleasantly and make me laugh a little every time one goes off. Admittedly a mild form of entertainment.



The seed pods are streamlined in shape but rather hairy. They grow close to the stem, and it's hard to pull one away. I find it better to pick the whole stem and let the seeds release on their own schedule.

Of course, most of the seeds are getting loose outdoors. I was surprised, after I'd been growing Wild Petunias in my prairie flower garden for a couple of years, to find little lavender blossoms looking up at me from the mowed grass that borders the garden. They appeared up to 12 feet away, where I'd never seen them growing before. They must have come from my planting.



I had to wonder... how did the seeds get so far from the parent plants? I mean, you'd think a pod would open, and the seeds would drop to the ground, or they might get carried away if they had some cottony stuff attached to them, or a bird might process one through its digestive tract and plant it far away. But none of those dispersal methods seemed to account for where I was finding new Wild Petunias.



Seeds

So I looked at a few seed pods under the microscope. After carefully cutting one along its seams, you can see that there are exactly four seeds inside. They're round and flat, like poker chips. However, I could not see much of anything about the internal structure of the unripe pods. Everything inside was rather thick and to my untutored eye looked pretty amorphous.

Pods that have naturally dried and opened, on the other hand, are easy to examine. They are split neatly in half, with two separate parts that look like little canoes. Each "canoe" has two white protrusions from the pod material. You can feel them with your finger, and they're stiffer than you would expect.



Pod with four retinacula

Each protrusion, called a **retinaculum**, flings a seed outward, as if by catapult, as the pod splits apart from the base at high speed. Slow motion photography of flower pods bursting among other members of the same family (Acanthaceae) show the seeds spinning away like vertical frisbees when the pod bursts open.

One retinaculum propels each of the four seeds. Some of the retinacula must break off in the explosion, because not every spent pod has all four. To get a look at all four retinacula intact, I taped a pod partially shut before it exploded, and that kept the retinacula from breaking off.



Seeds in their "boats"

Then I glued the seeds back into the positions where they were before the pod opened. They fit neatly, like four paddlers in a pair of little boats.

I do not understand the mechanism that causes the pod to open suddenly. If anyone knows how the pod manages to do this or would like to explain to me more about what is going on with these wonderful feats of engineering, please feel free to email me at dporter@lisco.com. I'd really like to know!

Wild Petunia is an attractive native wildflower that gardeners are discovering for their gardens, because it does fine in dry soil and doesn't need fertilizing or watering. I hope that, besides the lavender loveliness of the blossoms, gardeners are also enjoying the popcorn explosions of the seedpods.



Wild Petunia in bloom

Carl Nollen found and submitted this article from the Knoxville Express, May 26, 1920, p.1:1

Flora of Early Days

Cultivation Robbed Prairie of Its Early Beauty

Wildflowers Are Extinct

Marion County Once a Carpet of Rare Beauty—The Plowshare has Wrought Great Change

Iowa was particularly rich in the early days, not only in the numerous and beautiful flowers of many varieties, but it had as well a wealth of medicinal plants and herbs, the flowers, seed, bark and roots of some being used extensively for the prevailing complaints, especially those of a material origin, so common and widespread among its first settlers. No one was immune to these and to combat them, in the absence of doctors, botanical medicines were extensively used and every household had its standard remedies culled almost entirely from these sources. Black root, of

which there were two varieties, prairie and timber, and most abundant in back places, were widely used. Both varieties are now a rarity, and diligent search for an extended period by the writer has failed to locate a single specimen. May apple root was also in much demand being widely distributed. Mullein, boneset, Solomon's seal, calamus root, spikenard, bittersweet, sarsaparilla, yellow parilla, pliantain, ginseng, rattlesnake root, smart weed (two varieties), mouse ear, burdock root and numerous others being utilized. Berries, beans, flowers, roots and barks were all in demand. Red elm bark (slippery elm), walnut bark, oak bark and prickly ash berries contributed to the wide stock of remedies. This list does not by any means exhaust those to be had, but includes the principal ones then in use. Some of them, not a few, are now quite rarely found, spikenard especially is almost unknown. The aromatic plants were not wanting, horsemint, spearmint, wild catnip and wild tansy, peppermint and pennyroyal were some of those, though none of them were abundant.

Among the prominent vines were the grape (at last three varieties), green briar, bitter sweet, sarsaparilla (not less than three kinds), wild pea and wild morning glory, wild cucumber and numerous lesser species. Two varieties of vines call for special mention. First, the wild honeysuckle, once common in the woods and hazel thickets, now are very rare. Why it is so little known and appreciated by those who admire beauty in form, sweet-scented flowers, a unique leaf and almost matchless flowery cluster, brilliant with crimson that lasts long into the winter and only fades when the heavy freezing and the icy fingers of Iowa's winter storms despoil it of all these, seems an anomaly. Most varieties of berries do not persist into the cold. Not even the honeysuckle cluster of berries. One more characteristic of this plant is its numerous coats of bark. These may be termed multiple. Transferred from its wild habitat to the nursery or garden, it thrives luxuriously and well pays any care bestowed upon it. The second one is the common dodder, or angel's hair, etc., having other names as well. It is a parasite by nature, and almost the only plant of that kind indigenous in this region. Its bright slender threads in masses on its host are very attractive to the sight and do not appeal to any of the other human senses. It bears no leaves, and its long slender threads of hair-like makeup gives it the common name "angel's hair." It was in early days very common but has become exceeding scarce and at this date is scarcely to be reckoned with. No plant in the whole floral kingdom has so exercised the attention and curiosity of the writer as this golden wonder, as it has never become celebrated like its

distant relation of the south—the mistletoe.

The reader does not imagine for an instant that because there has been a lessening and a total elimination in some cases of the plant life of this region, that a gap in the least degree has ensued. Nature is always prolific, and in all her kingdoms she makes a bountiful provision for the perpetuity for her creatures. The floral world knows no exception to the rule. So were one species from any cause to show a tendency towards a paucity in numbers or an inability to exist in a normal degree, others of its kind crowd to usurp the field. As the indigenous die out or disappear the exotics come in to take their places. This is so in this region of Iowa. They are here and have come to stay. They may be classed as noxious vegetation, and but few of them possess any economic use. Among these may be classed the thistles, two species, dog fennel or mayweed, Jamestown weed, butterprint cockle bur, Spanish needle, purslain (sic), sheep ticks, beggar (sic) lice, shepherd's pouch, smart weed, two kinds, dandelions, nettles and plantain. Of these, purslain and smart weed are used as medicine; whilst the Spanish needle in its blooming season has proved a source of sweets for the honey bee.

The noxious cockle-bur, is one of the most prolific wild weeds of Iowa. It is to be hoped the day may speedily arrive when it shall be fully utilized and this great weed thus held within bounds. No doubt all nature's products have a purpose, but so far, the cocklebur has not developed one!

W.H.H. Barker

(Carl notes: Mr. Barker would approve of the invention of Velcro, the cockle-bur's contribution to science, which came about in the 1940s.)

A Quaky Step Back in Time, continued from pg 1

Over the past decade device technology and data processing tools have improved significantly, with encouraging results (Dassot, Constant, and Fournier 2011). Techniques have measured forest viability, landslide potential and restoration efforts in estuaries and wetland communities (Klemas 2013; Dronova 2015; Athearn et al. 2010; Rapinel et al. 2015).

Terrestrial Lidar technology is based on the emission-reception of a laser beam, which is deflected by a mirror to automatically scan a scene by reflecting off first object encountered. (See Figure 22.) Based on angular position of the mirror, captured reflections measure the distance between the receiver and a three-dimensional point characterized by specific coordinates and a reflectance value for light emitted by the target point. The resulting object is a point cloud

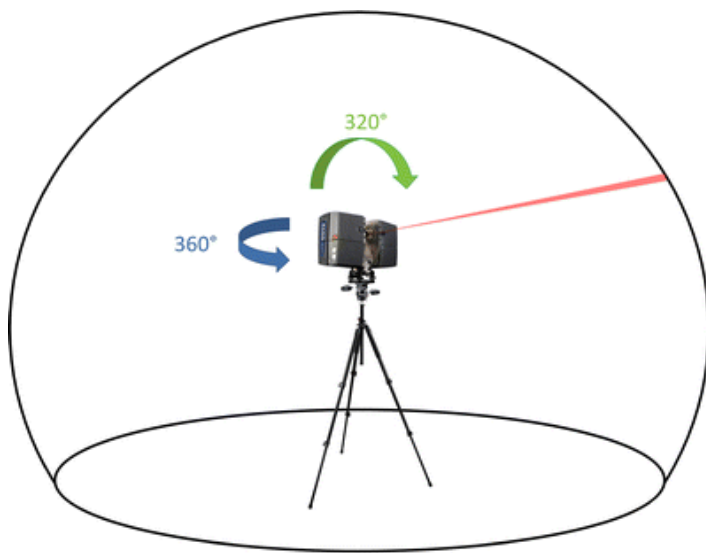


Figure 2: Operating principle of a terrestrial LiDAR (light detection and ranging) scanner (Dassot, Constant, and Fournier 2011).

representation of what was scanned composed of a collection of points based on a selected resolution.

A single beam return records the position of the object, while the last return indicates corresponding values to estimate canopy density of trees, soil or vegetation characteristics (Harding et al. 2001). Point clouds are then produced from the unstructured data using proprietary or open source software.

The team deployed a Leica P30 ScanStation™ high definition 3D terrestrial lidar unit, taking around 30 scans of the fen. The device rotates on a fixed tripod known as a “dual axis compensator.” This ensures the device is level with ground control points and reduces “data noise.” *On quaky ground such as a fen, this can be a very useful feature!* Within each scan, the laser recorded approximately 20 million points of data. The data was then joined together in the Leica Cyclone™ processing software to create a 3D point cloud of what was scanned. The point cloud can then be processed into different formats, such as a digital terrain model, or DTM, to allow three-dimensional elevation viewing.

The project began at approximately 9:00 a.m., with two University of Iowa students assisting technical staff and faculty with the project. Six hours later, the site was fully scanned. Weather cooperated impeccably, with an eight-inch snowfall hitting northwestern Iowa the evening *after* the team departed for Iowa City. Amazingly, we hit a window of good luck, good weather and good work.

Drew Hutchinson is a graduate student at the University of Iowa. He and Natalie Schoen, an undergraduate student from Dubuque, completed the lidar scan with the assistance of Adam Skibbe, GIS administrator for the University of Iowa Department of Geographical and Sustainability Sciences. Mike

Birmingham from the State Hygienic Laboratory at the University of Iowa also assisted with the project. The team overnighted at Iowa Lakeside Laboratory, which is also a key partner in the project. Matt Fairchild from Iowa Lakeside Laboratory was also on-hand to assist with moving some of the heavier scanning equipment as we navigated across the site.



Figure 3: Foreground: Mike Birmingham from the State Hygienic Laboratory (left) and Matt Fairchild from Iowa Lakeside Laboratory (right) assisting the University of Iowa Students Natalie Schoen (background left) and Drew Hutchinson (background right) with setup of the lidar equipment at the Estherville fen.

“It was a lot of fun to be a part of this effort,” said Hutchinson. “The hosts at Lakeside Laboratory were incredible and the project went smoothly. I’ve been using lidar to help with a series of different projects such as buildings and small objects, but this was the first time I have gotten the chance to use it on a large field. It’ll be excited to see what we can learn from the results.”

Once initially processed by the University of Iowa team, the data cloud goes to the GeoInformatics Training Research Education and Extension (GeoTREE) Center at the University of Northern Iowa. Here, analysts will work to resize the enormous data set for storage and online public data access. To date, support for this project has been provided by the Friends of Iowa Lakeside Laboratory and the Iowa Native Plant Society.

The team at the University of Iowa is considering additional scans of other fens in Iowa as a way to not only collect 3-D renderings of such unique landforms, but the data also serve as a critical resource for understanding how soils and hydrology respond to changes over time and space.

For more information: Rebecca-Kauten@uiowa.edu
To view the full album of project photos visit:
<https://photos.app.goo.gl/QRj2fn7BUqRJZq2M9>

Additional project photos



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Have You Paid Your 2020 Dues?

If not, it's that time again! INPS Treasurer Bill Blankenship will be happy to receive them! The membership form is available on the back page of this newsletter or can be downloaded from the INPS website.

Thank You to Our 2019 Contributors!

We wish to thank all INPS members who joined or renewed their membership in 2019 and hope you will do so for 2020! We are especially grateful to those who chose to be contributing members. Those who made contributions of at least \$25 in 2019 are listed below.

\$200 - \$250: Bill & Dianne Blankenship, Ray Hamilton, Connie Mutel, Nick Stoyloff

\$100 - \$199: Sibylla Brown, Lloyd Crim, Ron & Barb Eckoff, Mary Jane Hatfield, Beth J. Henning, Laura Jackson, Johnson County Conservation Board, Christine & Roger Kirpes, Roger Q. Landers, Jr., Dan & Cyndia Mays, Steve Schomberg, Elisa Zappacosta

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Karen Laughlin, Richard Lutz, Marlene Michel, James and Rose Marie Monagan, Rosemary Partridge, Joan Peterson, Susan & David Siev, Carole Teator, Denise Vrchota, Bill Watson, Mark Widrlechner

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Loess Hills Prairie Seminar, May 29th–31st, 2020. A wonderful opportunity to visit the Sylvan T. Runkel State Preserve with Tom Rosburg and many others who appreciate this native Loess Hill prairie. The LHPS is co-sponsored by the INPS.



Photo by Suzanne Gucciardo



Photo by Larry Stone



Photo by Don Poggensee



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☐ If donor, prefer to remain anonymous.

Send with your dues to: **INPS Treasurer, 737 Buckwalter Dr., Sioux City, IA 51108**

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