2015 was a year in which BRIT grew both inward and outward. BRIT deepened its roots by digging into its own resources. An eleven-month survey of the herbarium unlocked the secrets of our plant collection, uncovering the true size and scope of the herbarium while pointing to research opportunities under our own roof. At the same time, a Knowledge Management Survey documented other BRIT resources, giving the organization a clear picture of the research information BRIT generates.

In 2015, BRIT also stretched outward, widening our reach into the community by expanding our research and educational programs. In education, 2015 saw BRIT piloting a preschool curriculum—based on the beloved Bella the Begonia puppet—in childcare centers in some of Fort Worth’s neediest neighborhoods. We were also able to draw on several grants to expand the Green Revolution program into new schools in Fort Worth I.S.D. and other districts. Green Revolution has reached a bittersweet milestone as the Agents of Change who joined the program in its first year as sophomores will soon graduate from high school. We couldn’t be more proud of the men and women they’ve become, and we’re thrilled that several have chosen majors in science, technology, engineering, and math.

In research, BRIT scientists explored biodiversity both in Texas and across North America. A survey of the plants of Enchanted Rock State Natural Area in Central Texas discovered several species not previously known to live in Texas, while a multi-national, multi-disciplinary team documented the diversity of plant, animal, and insect life at a site threatened by a mining project in the Baja California mountains. In Tennessee, one of BRIT’s researchers is forming a coalition of scientists, landowners, and state and local officials to preserve the last vestiges of an endangered prairie habitat.

As the year drew to a close, BRIT began a new era of growth with changes in leadership. BRIT’s Board of Directors elected Mr. Greg Bird as chairman and thanked Mr. Harry Bartel for his dedicated service over the past three years. Dr. Sy Sohmer’s work in building the organization was recognized with BRIT’s prestigious Award of Excellence in Conservation. And the organization conducted a nationwide search for a new director this year, welcoming Dr. Ed Schneider in December. We’re excited to grow under Dr. Schneider’s direction and eager to work with him to develop a vision for BRIT’s future. The details of that vision are still developing, but we’re confident the strong roots and wide branches we grew this year have prepared us for the challenges to come.

Finally, we remember with gratitude Dr. George Sumner, the first Director of BRIT. We are grateful not only for his leadership during BRIT’s formative years but also for his active role on the Board of Directors through 2015. He remembered the organization in his will, leaving a legacy gift to BRIT for a research endowment he began some years ago.

We thank you for your support of BRIT and invite you to continue to grow with us.
DEEPER ROOTS.
WIDER BRANCHES.
We talked with Schneider about the experience he brings to BRIT and asked about his vision for the future of the organization.

Q: TELL US ABOUT YOUR BACKGROUND, DR. SCHNEIDER. THIS ISN'T THE FIRST TIME YOUR CAREER HAS BROUGHT YOU TO TEXAS.

ED SCHNEIDER: After I completed my doctorate in plant science at UC Santa Barbara, I took a position at Texas State University in San Marcos, where I held various positions including Dean of the College of Sciences. Then I received a call from UC Santa Barbara asking me if I'd like to come back and run the Santa Barbara Botanic Garden. My wife and I were in Santa Barbara for 18 years, and we really enjoyed our time there. Then I received an offer to serve as director of the University of Minnesota Landscape Arboretum, and we spent five and a half years in Minnesota. I had thought I would retire in Minnesota when I got a call from BRIT. I realized that I could close the loop on my career by coming back to Texas and returning to my research roots.

Q: WHAT ARE SOME OF YOUR GOALS FOR BRIT AS YOU START YOUR TIME HERE?

SCHNEIDER: I have a history of connecting institutions with their community, and I’ve felt there is room for improvement there. Many people in Fort Worth know of BRIT, but they don’t really understand what goes on in the building. I think we can start to form deeper connections by making better use of our landscape—the BRITscape—that surrounds our building. It’s a resource that allows us to attract people so they can learn what we do here.

Another goal centers on funding. One of the main reasons I was brought here was to increase the revenue streams. And really the landscape is part of that. If we can bring people here and get them interested in what we’re doing, they’ll become members, and members become givers.

Q: WHAT ABOUT THE RESEARCH SIDE OF BRIT?

SCHNEIDER: That’s really an unfulfilled area. We don’t have a VP of Research at BRIT now, so we’ll be looking at advertising for that position in the next few months. I also see BRIT focusing more on Texas plant conservation. Native plants in Texas are facing a lot of challenges—invasive species, climate change, dramatic urbanization. We can play a role in protecting the plant species and their ecosystem.

Another thing I’d like to see us work on is building collaborative relationships with higher education institutions. We have a very large herbarium, and it’s not just for the few scientists that work in the building—it’s also for students who could learn from it.

Q: SO ARE YOU ENJOYING BEING BACK IN TEXAS?

SCHNEIDER: It’s fun to reconnect to the state. Of course I haven’t been out of Minnesota for very long, and I’m not fully defrosted yet. Check with me in August—a few of those hundred-degree days ought to take care of it.
Cerastium Aquaticum; or, Marsh Mouse-car..
Scientists believe Sierra La Laguna was once an island. Only recently—in geologic time, at least—did it collide with Baja California and become part of the North American continent. Yet the mountain range retains many characteristics of an island despite being docked at the southern tip of the peninsula. Few places on earth are so isolated, and few can claim such diversity of flora and fauna.

This remarkable biodiversity prompted both the Mexican government and UNESCO to declare the range a Biosphere Reserve, but that hasn’t stopped resource exploration in the region. The mining company Desarrollos Zapal now seeks to develop an open-pit gold mine within the Biosphere Reserve, a project known as the Los Cardones mine. According to the Australia-based research group Center for Social Responsibility in Mining, the project would occupy 1235 acres and include two massive pits from which 173 million tons of material would be extracted. Critics charge that the mine threatens to contaminate water supplies with cyanide, arsenic, and heavy metals while producing mountains of waste rock.

Jesus Quiñonez Gomez wanted to assess the impacts of the mine on the biodiversity of the region but didn’t have the solid data he needed. Quiñonez, the director of Reserva de la Biosfera Sierra La Laguna at Mexico’s National Commission of Natural Protected Areas, sought the help of scientists from a range of disciplines to conduct a biodiversity survey to document the plants and animals found at the proposed mine site.

It took roughly a year to raise money, assemble the team, and plan the project, but in early December 2015, 29 scientists representing 19 institutions gathered in the Biosphere Reserve and set to work. The team gathered data around the clock, with different specialists heading out at different times of day—bird surveys, for example, began long before dawn, and bat surveys worked late into the night.

They documented 877 species, including 381 plants, 366 insects, 77 birds, 29 mammals, and 24 reptiles and amphibians. Among them were 29 species considered endangered under Mexican law and 107 endemic to the region, meaning they are found nowhere else in the world. At least three insects are new to science, a number likely to grow as other unfamiliar specimens are studied in depth.

BRIT Biodiversity Explorer Dr. Sula Vanderplank was one of the three lead organizers participating in the survey and was lead author on the report. Vanderplank notes the biodiversity of the region is likely much greater than that documented during the survey. "We were only in the reserve for a week in December. A more complete picture of the region would require intensive surveys over several seasons," says Vanderplank. "It’s likely the total potential diversity of the site is closer to double what we recorded."

The Los Cardones mine still threatens the biodiversity of Sierra La Laguna, but the data gathered by the 2015 survey gives advocates new information to make the case for preserving this unique island in the sky.
BRIT'S GREEN REVOLUTION PROGRAM

for middle and high school students began its fourth year in the fall of 2015, and the results are visible both on the ground and in the lives of Fort Worth students. In the southeast Fort Worth neighborhood where most Green Revolution students live, the community can see programs such as neighborhood clean-ups and a community garden. Individuals in the program, known as Agents of Change, are gaining not only the intangible benefits of increased confidence but also concrete results in higher test scores.

This success encouraged Green Revolution to grow beyond its roots at Morningside Middle School and O.D. Wyatt High School. During the 2015-2016 school year, the program expanded to two more campuses in Fort Worth I.S.D. with the addition of Forest Oak Middle School and Alvarado High School.

To learn how the program shapes the lives of its Agents, we talked to Petro Juma, a senior at O.D. Wyatt who will graduate in the spring of 2016 after four years in Green Revolution.

BRIT's Reginald Ballard, the program's Implementation Manager, has watched Juma grow and mature over the years. "Juma earned his rank of Command Agent in the program because of the leadership skills he developed. I've observed him mentoring younger students in the program—he's a great role model for them," said Ballard. "I'm excited about how amazing his future is. He has provided our Agents with a great example of true leadership, strength, and integrity."

O: TELL US ABOUT YOURSELF AND HOW YOU GOT INVOLVED WITH GREEN REVOLUTION.

PETRO JUMA: I was born in Congo and raised in Zimbabwe, and my family came to America in 2009. My parents wanted us to come here to go to school. My freshman year at O.D. Wyatt I was working in class, and they pulled out some of us who had the potential to do well in the program to fill out an application for Green Revolution. I didn't know much about it—they said BRIT was interested in me even though I didn't know anything about them. After a few weeks, we got the results back, and they told me I had been accepted in the BRIT program. I was really happy.

O: WHAT ARE SOME OF THE THINGS YOU'VE LEARNED AS AN AGENT OF CHANGE?

JUMA: Green Revolution has brought science into my life. I had never known much about science. I knew scientists were important, but I didn't know what they did. It also taught me about living things and the science of living things. Now I know that I'm a nature person. It also really helped me in class. In science class, it was easy for me because I've already gone through these things in the BRIT program. My science teacher is involved in the BRIT program, too, so she would ask me questions that she knew I knew so I could explain things to the other students.

O: WHAT'S NEXT FOR YOU AFTER GRADUATION?

JUMA: I've been accepted at Sam Houston State University. My major will be engineering. I like to do things with my own hands. I like to see things and try them out, so I'm really interested in being an engineer.

O: THAT'S GREAT—CONGRATULATIONS! SO WOULD YOU RECOMMEND THE GREEN REVOLUTION PROGRAM TO OTHER STUDENTS AT YOUR SCHOOL?

JUMA: I would really encourage them to sign up for BRIT, especially if they're interested in science. It's a better way to learn because you do things with your hands. You get to move around, not just sit in class. You're out there sharing your experience with other people, and it's really interesting. It's a great program—I wish I could continue even now.

"I'M EXCITED ABOUT HOW AMAZING HIS FUTURE IS. HE HAS PROVIDED OUR AGENTS WITH A GREAT EXAMPLE OF TRUE LEADERSHIP, STRENGTH, AND INTEGRITY."

REGINALD BALLARD, GREEN REVOLUTION IMPLEMENTATION MANAGER
Aesculus Hippo-Castanum, or Common Horse-Chesnut.
GREEN REVOLUTION TEST RESULTS

Algebra 1
Students scoring proficient on end-of-course tests:
- 72% All Fort Worth I.S.D. students
- 54% All O.D. Wyatt students
- 100% Green Revolution students

Reading
Students scoring proficient in 8th grade reading:
- 69% All Fort Worth I.S.D. students
- 50% All Morningside Middle School students
- 87% Green Revolution students

8th Grade Science
Students scoring proficient in 8th grade science:
- 63% All Fort Worth I.S.D. students
- 43% Morningside Middle School students
- 67% Green Revolution students

High School Biology
Students scoring proficient in biology:
- 87% All Fort Worth I.S.D. students
- 78% O.D. Wyatt High School students
- 100% Green Revolution students

RESTORING THE LOST PRAIRIE OF THE MID-SOUTH

Americans know the prairies of the West and Midwest, but mostly forgotten are the prairies of the Mid-South—forgotten because these landscapes have all but disappeared.

Early Anglo explorers to the Pennyroyal region of central Kentucky and Tennessee, such as Daniel Boone, found more than 3.5 million acres of rolling prairies stretching as far as the eye could see—yet by the 1830s this landscape was disappearing. Settlers converted land to agricultural use and suppressed the once-annual fires, allowing trees to flourish. By the Civil War, the prairies had been replaced by fields and forests.

Brit Botanical Explorer Dwayne Estes wants to bring back the prairie. He’s scoured the region and only found a few prairie remnants, most smaller than one acre and confined to roadways and railroad rights-of-way. Fortunately, the largest remaining prairie is a 25,000-acre portion of Fort Campbell Army Base, but most of this land is an impact zone that contains unexploded ordinance and is off-limits to study. With the help of the US Army, Estes seeks to find and preserve other on-base, accessible prairie remnants and use these to recreate lost landscapes off-base. Restored grasslands would preserve at-risk grasses and wildflowers, improve water quality by filtering herbicides and fertilizers from runoff, and provide habitats for endangered birds and migrating monarch butterflies.

Estes’s passion for the lost prairies is infectious. He’s building a network of public agencies, nonprofits, private landowners, and businesses that share his commitment to prairie restoration. Many will come together for the Mid-South Prairie Symposium in May 2016 with the theme “If we rebuild it, will they come?”—that is, if prairies are restored, will the plants and animals that once called them home return? If Estes has his way, the answer to that question will become clear as prairies slowly reappear on the Pennyroyal Plain.
EARLY SCIENCE LITERACY AND THE JOY OF NATURE

BELLA THE BEGONIA has welcomed the youngest visitors to BRIT since 2011. The huggable hand puppet with a smiling face hosts events for preschoolers on the BRIT campus and beyond including Saturday Story Time, Bella’s Book and Nature Club, and Bella Goes to Camp.

Now Bella is making an impact on the wider community. In the fall of 2014, BRIT began a pilot program to develop an early childhood curriculum and model for professional development at multiple childcare centers. Now in its second year, the program is in use at five schools in Fort Worth with 13 participating teachers. Bella’s Seasons of Stories, Seasons of Science combines proven early-childhood teaching methods with an emphasis on literature, science, and nature. “Everything at BRIT is research-based, so our early childhood curriculum is founded on the latest research on the brain and learning,” says BRIT Education Specialist Pam Chamberlain.

The curriculum consists of 12 units tied to the seasons of the year. Each unit begins with an interactive reading of a children’s book and a close look at target vocabulary words. “Language development has proven to be critical for young children and is strongly linked to later academic success,” says BRIT Early Childhood Specialist Laura Kobetich. “We want children to respond to the story and verbally share their ideas.” The curriculum then suggests activities that will help deepen the children’s understanding of concepts introduced in the book. These activities are organized into three categories: exploration and discovery, purposeful play, and reflective conversation. These strategies have been identified by early childhood experts as fundamental for learning.

Along with the curriculum, BRIT provides professional development and in-class mentoring with the teachers implementing the program. “Bella is a great way to go in and model successful approaches to early childhood learning,” says Chamberlain. “We give them an opportunity to see best practices in action and to try out what they’re learning.” While the BRIT curriculum emphasizes early literacy and exploratory science, the principles underlying the curriculum could be integrated into any aspect of early childhood education. “I’ll know this program is successful when we see teachers taking the strategies and running with them,” says Chamberlain.

BRIT’s education experts are working to fine-tune the curriculum and professional development program to create a package that could be marketed to a wide array of early childhood programs. At the same time, BRIT will continue seeking grant funding to work with teachers at childcare centers in low-income areas. “Typically these teachers have fewer classroom resources and opportunities for professional development,” says Kobetich. “This is what makes working with them so rewarding.”

“BRIT’s mission is to change the world and make it a better place. The Bella program is a wonderful learning opportunity for young children, so it seems only right that we take this program into the communities where the need is the greatest,” Chamberlain says.

“EVERYTHING AT BRIT IS RESEARCH-BASED, SO OUR EARLY CHILDHOOD CURRICULUM IS FOUNDED ON THE LATEST RESEARCH ON THE BRAIN AND LEARNING.”

PAM CHAMBERLAIN, BRIT EDUCATION SPECIALIST

LEFT: Family learning side-by-side at Tandy Hills Natural Area.
CENTER: Meet Bella, the host of BRIT’s preschool programs.
RIGHT: Child from Like My Own childcare in Morningside collects fall leaves.
A Look at Bella’s Spring Curriculum

**STORY TIME:**
- Read the book *The Dandelion Seed*, written by Joseph Anthony and illustrated by Chris Arbo.
- Introduce the vocabulary words, including “frightening” and “silence.” Teach the word “silence” by asking children to be completely silent and make no sound at all. The silent moment won’t last long!
- Ask questions about the story, such as “I wonder why the dandelion seed feels lonely? What makes you feel lonely?”

**EXPLORATION AND DISCOVERY:**
- Look at dandelion plants through a hand lens. Ask the children to count the petals.
- Gather different kinds of seeds and have children sort them by size or color.

**PURPOSEFUL PLAY:**
- Hunt for dandelions outside. Talk about how dandelions can grow almost anywhere, even in a crack in the sidewalk.
- Blow bubbles with your children. Talk about how the bubbles float in the air like dandelion seeds.

**REFLECTIVE CONVERSATION:**
- Pick a dandelion and talk about how long it is. Encourage children to find other things that are longer than the dandelion, or shorter.
- Tell the children that some people make a wish when they blow seeds from a dandelion. Ask them what they would wish for. Have them draw pictures of their wishes and write the words for them.

**ESTRELLA SIMMS** is a teacher at the Rosie K. Mauk Child Development Center, a program of the Center for Transforming Lives in downtown Fort Worth. Simms has worked in early childhood education for more than 30 years. She uses the *Seasons of Stories, Seasons of Science* curriculum with her three-, four-, and five-year-old students.

**DIGGING DEEP**

Q: **HOW DO YOU USE THE BELLA CURRICULUM IN YOUR CLASSROOM?**

**ESTRELLA SIMMS:** I use the BRIT curriculum especially for vocabulary and science. It’s given me ideas about how to teach science, and the projects are hands-on. When the kids can feel and touch things, they like that better—and they learn more.

Q: **DO YOU THINK YOUR KIDS ARE LEARNING WITH THE BELLA PROGRAM?**

**SIMMS:** Oh, yes. They make connections between the stories and the activities—you can see them making connections, so I know they’re learning. We recently did the unit based on the book *The Dandelion Seed*, and then we found a dandelion on the playground. It gave us a chance to talk about the color and the shape. We let one of the kids pick the flower and blow the seeds, just like in the book.

Q: **DOES THE PROGRAM FIT IN WELL WITH THE OTHER CURRICA AND PROGRAMS YOU USE IN YOUR CLASSES?**

**SIMMS:** It fits in with our other curricula, and it fits with how we’re doing things now. When I first started, preschools wanted children to sit down and stay still like in elementary school. Now things are more hands-on and active. We’re engaging their senses more. There’s a big difference between looking at a bubble in a book and actually blowing a bubble. And the BRIT curriculum gets that.
DIGGING INTO THE BRIT HERBARIUM

IN EARLY 2015, BRIT kicked-off on an ambitious project: an inventory of the entire herbarium. We sat down with BRIT’s new Director of the Herbarium, Peter Fritsch, hired in October, to learn why the inventory matters—and what researchers can learn from the specimens stacked in the herbarium cabinets.

Q: FIRST OF ALL, WHAT IS A HERBARIUM?

PETER FRITSCH: A herbarium is a collection of preserved plant specimens along with associated data such as the plant’s genus and species and when and where it was collected. Scientists use these specimens to understand the characteristics of plants and to compare different species.

It is also a historical record, because it documents where plants grew at particular times. You can compare where a plant was found in the past with where it grows today. You can track how a plant’s distribution has decreased as its habitat has been destroyed, for example.

Q: HOW BIG IS THE BRIT HERBARIUM?

FRITSCH: We have more than 1 million specimens. Actually, it’s 1,027 million, a number we learned in the inventory. That puts us among the largest herbaria in the U.S.—we’re about 12th in the country in terms of size.

Q: THAT’S A LOT OF PLANT SPECIMENS! HOW DO RESEARCHERS KNOW WHAT’S IN THE COLLECTION?

FRITSCH: That’s the tough part. Traditionally, the specimen was the extent of the record. Specimens are stored by family, genus, and species, but to know how many plants we had in Apiaceae, for example—that’s the family that includes carrots and parsley—you had to go to that cabinet and look. There wasn’t a database you could search, or even a written ledger. This isn’t unique to BRIT, by the way. It’s the norm for most herbaria.

That’s inconvenient for scientists who would like to know if the plants they want to study are available. It also makes it hard to catch errors or update information. Plants can be misidentified when they are first collected, and sometimes plant names change. Some specimens in our collection were never identified in the first place. A scientist might collect a plant in the field but not know the genus or species. So they label it “indeterminate.” Every herbarium has these specimens—we call them “indes.”

Q: SO BRIT WANTED A DIGITAL RECORD OF THE HERBARIUM’S CONTENTS? SOUNDS LIKE A BIG JOB.

FRITSCH: It was, but we kept the scope of the inventory narrow so we’d have a manageable project that we could complete within a year. So we decided to record the number of specimens in each species and the region of the world where they were collected.

We made the process as easy as possible, so volunteers could do the work with very little training. We created a web-based app that could be used on iPads borrowed from the education program. Each volunteer would physically remove a folder from one of the cabinets, log in to the app, record the region, family, genus, and species, and count up the number of specimens in the folder.

Led in large part by Collections Manager Tiana Rehman, we worked over the course of 11 months, and now we know what’s in our herbarium. We can say with confidence how many specimens we have, which families they fall into, and where they were collected.

Q: WHAT CAN YOU DO WITH THAT INFORMATION?

FRITSCH: It gives scientists a clear picture of what’s in our collection. Right now the inventory dataset is only available internally, but we’ll be publishing it online soon at www.brit.org/herbarium/inventory. By the time this report is in print, external researchers will be able to search our collection for plants that interest them.

The inventory also creates research opportunities. For example, I’ve studied the plant family that includes rhododendrons, and I’ve found we have a large number of indeterminate specimens from Southeast Asia in that family. It’s likely that there are one or two new species in there, maybe even more. It’s an area of interest, so it jumped out at me. I’m sure experts in other plant families will make discoveries in their research fields.

Q: WHAT’S NEXT FOR THE HERBARIUM?

FRITSCH: We’re working on digitizing the collection, which involves taking a high-resolution image of each specimen and recording all the associated data. Online digital herbaria are fantastic tools that allow scientists to study plant specimens without ever leaving their offices. Digitization is a slow process, but we’ve made real progress speeding it up. Previously each specimen took about six minutes to scan on a flatbed scanner, but we’ve set up a new system using lightboxes and digital SLR cameras that allows us to photograph three specimens a minute.

Entering all of the information associated with specimens is another big job. Since the specimen labels are often hand-written, a human being has to read the label and transcribe the data—computers can’t do it well. But recent crowdsourcing projects have had fantastic success using volunteers to capture this information. We’re working with an organization called Notes from Nature that hosts images from BRIT and other natural history collections. Anyone can log on to the site, have a specimen label pop up, and transcribe the information into the database.

Q: SO PEOPLE AROUND THE WORLD COULD BE TRANSCRIBING BRIT LABELS RIGHT NOW—IN THEIR SPARE TIME?

FRITSCH: Absolutely! Some people really love it and transcribe hundreds of labels. It’s a great way to learn about nature and contribute to science.

It will take a long time to digitize all of our specimens, but we’re moving forward. The inventory was a huge first step. We know how big the job will be and have a great foundation we can build on.

Dr. Peter Fritsch holds two titles at BRIT—Vice President of Research and Director of the Herbarium.
Anagallis Arvensis, or Old Man’s Weather-glass.
GET INVOLVED TRANSCRIBING SPECIMEN LABELS

Become a citizen scientist by transcribing specimen labels online.

Visit NotesFromNature.org and click “Start Transcribing.” The website will guide you through the process of viewing and transcribing handwritten specimen labels from herbaria and other natural history collections from across the globe. BRIT periodically uploads collections to the site, so you might get to help BRIT scientists digitize the BRIT herbarium. It’s a great way to learn about the natural world and help advance science.

Volunteers are actively transcribing specimen labels (some as many as 200 years old), converting handwritten and typed labels into digital records that are accessible for viewing online and for use in large-scale research projects.

1. Stickers on the ends of rows mark inventory progress.
2. Staff and volunteers counted every specimen in the herbarium cabinets.
3. Data were recorded on iPads using an application created for the purpose.
4. One person records while one counts.
5. Teamwork was essential.
6. Many staff enjoyed the change of pace and learning about new plants.
SMART USE OF TECHNOLOGY was a critical element of the herbarium inventory. BRIT’s Jason Best led the technology effort, ultimately developing a solution that has the potential to help organizations beyond BRIT manage their natural history collections.

Q: AS BRIT’S DIRECTOR OF BIODIVERSITY INFORMATICS, WHAT WAS YOUR ROLE IN THE HERBARIUM INVENTORY?  
JASON BEST: Once we determined the scope of the inventory, my job was to develop software that would allow us to record data. So we took stock of our resources and our requirements. We had access to iPads from the education department. We wanted to use volunteers and staff and get them up and running without a lot of training. We knew they’d be working in large numbers at times. The software had to be easy to use and pretty intuitive.

So we created a web-based software interface to our database called BRISC—BRIT Rapid Inventory of Specimen Collections.

Q: HOW DID IT WORK?  
BEST: We made it as simple as possible. The first step was as easy as recording the color of the folder the individual was holding. Specimen folders are color-coded by region.

Then they chose the family, genus, and species of the specimen from drop-down lists that we had pre-populated with names. No one had to worry about spelling Latin plant names unless they ran across something that we didn’t expect. Then they entered the number of specimens they counted and moved on to the next folder.

Many features of BRISC were things end-users didn’t even see. We wanted to be able to track our progress. We needed to manage large quantities of data. And we needed easy ways to make corrections because people are human—they’re going to make mistakes. We had to do a lot of trials and testing, but we ended up with simple but powerful software that more than one hundred volunteers and staff used over the year.

Then they chose the family, genus, and species of the specimen from drop-down lists that we had pre-populated with names. No one had to worry about spelling Latin plant names unless they ran across something that we didn’t expect.

Q: NOW THAT THE INVENTORY IS COMPLETE, IS THE SOFTWARE STILL USEFUL?  
BEST: Absolutely, yes. Periodically BRIT acquires collections from other institutions, and probably the first step in receiving a new collection would be to conduct an inventory. We’ll be putting the inventory dataset online to allow researchers from other institutions to access the information, and we’re going to add features that will allow users to run queries and generate reports about the collection. These improvements will make the inventory useful both within BRIT and to external researchers.

We’re also interested in making the software available to other organizations. I’m a big fan of the open-source movement, where the source code for software is freely exchanged among users. I used open-source components in developing the software, and I want to allow others to use the finished product. Natural history organizations, museums, colleges and universities, and research institutions could adapt this software to inventory their own collections. We’re working on polishing the code so others could find it useful. We believe sharing the code fits right in with BRIT’s emphasis on sharing knowledge.

The Biodiversity Informatics Program provides technical solutions to BRIT’s research questions.
1. Lobelia fulgens  2. Lobelia speciosa  3. Lobelia colorata  4. Lobelia pulaeata
THE ORIGINS OF BOB O’KENNON’S WORK
at Enchanted Rock go back a long time—and by a long
time, think one billion years.

That’s when a blob of molten magma began to rise
toward the earth’s surface like wax inside a lava lamp. The
rock cooled as it rose, but before it could reach
the surface, it solidified below the crust into a massive
granite formation known as a batholith. Millions of
years passed, and a shallow sea eventually deposited
thick layers of limestone above the granite. When the
sea receded, the limestone eroded away, exposing the
batholith. Eventually humans arrived in Central Texas
and marveled at the dome that rises 425 feet above the
surrounding elevation and covers some 640 acres.

Among those humans was BRIT Resident Research
Associate Bob O’Kennon, who began studying the plant
life at Enchanted Rock about 30 years ago—a blip in
the life of the rock, a long time in the life of a scientist.
BRIT Research Botanist Kim Taylor came to share in
O’Kennon’s enthusiasm for the area and joined O’Kennon
in an extensive survey of the plant life of Enchanted
Rock State Natural Area, completed in 2015.

THE BEWITCHING PLANTS
OF ENCHANTED ROCK

The region’s unusual geology begets unusual habitats.
Shallow depressions in the granite fill with water after
spring rains and provide homes for rare plants found
only in a handful of other sites, all of them hundreds
of miles away (or thousands, in the case of one
particularly rare fern). Other rare plants grow in the
park’s woodlands, gullies, and caves. Several of
Enchanted Rock’s plants have evolved into unique
species found nowhere else and are unknown to science.
O’Kennon and Taylor are working to understand their
lifecycles so the plants can be named and described.
In total, the team found almost 950 plant species
in the park. This is an astounding level of diversity
for a 1643-acre site and almost double the number
of plants documented in previous surveys of the flora
of the park.

In the next year, O’Kennon and Taylor plan to write
a guide to the plants of the area, focusing on the rare
species hikers and picnickers might overlook. It will
be a time-consuming project, but time seems to move
differently at Enchanted Rock. What’s one year among
so many millions?
BRIT books have been published since 1987 under the series title Sida, Botanical Miscellany. They are devoted to a comprehensive study of one topic, ranging from floras to systematic monographs to botanical histories, and provide a greater depth of coverage for larger, key topics.
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