University of Montana anthropology Professor Kelly Dixon has spent most of her career reminding people that archaeologists don’t traipse around the world like Indiana Jones, with bullwhips and a nose for treasure. Like many professionals, they spend a lot of time indoors.

“For every one day in the field,” she explains, “you need three to five in the lab cleaning, sorting and analyzing artifacts to get them prepped for long-term curation. The essential step of curation is all too often left out of Hollywood and documentary portrayals of archaeological discoveries.”

But now Dixon and her students find themselves in the unique role of curating the vast historical collection of the U.S. Navy. The collection includes a fastening bolt for the USS Constitution that was hand-forged by Paul Revere; the gold-hilt, sharkskin-handled sword of Spanish-American war hero Adm. George Dewey; and the commissioning documents for Revolutionary War sailor John Paul Jones.

While these and other objects are on exhibit at the National Museum of the U.S. Navy and the Cold War Museum in Washington, D.C., until recently, the bulk of the Navy’s collection was stored in a World War II-era warehouse in Cheatham, Virginia.

The Navy’s curation staff realized that warehouse was not a suitable home for the greatest repository of U.S. naval history. Starting in 2014, the Naval History and Heritage Command relocated the collection to a 300,000-square-foot building in Richmond, Virginia. Now that the artifacts are in an improved storage facility, the Navy wants a comprehensive catalog of the collection – something that has never been done. For that they turned to the U.S. Army Corps of Engineers, which recently awarded a $45 million five-year research cooperative agreement to UM. The University received the contract to assist with cataloging this collection through this agreement. Dixon learned about it while she was in Southern China with a delegation from Stanford University.

“It’s a pretty big deal,” Dixon says of the project. “The U.S. and the world have a curation crisis when it comes to artifacts.” Analyzing, cataloging and preparing artifacts for long-term conservation

Katie Stevens Goidich, a UM anthropology graduate and cultural heritage program coordinator for the department, served 14 years with the U.S. Navy and now works for a UM project to help the Navy curate its vast collection of historical artifacts.
Study: Oil and Gas Development Transforms Landscapes

What are the ecological consequences of accelerated oil drilling activity? Researchers at UM have conducted the first-ever broad-scale scientific assessment of how oil and gas development transforms landscapes across the U.S. and Canada. Their work was published April 24 in an article titled “Ecosystem services lost to oil and gas in North America” in Science, one of the world’s most prestigious journals. The article concludes that oil and gas development creates significant vegetation loss of rangelands and croplands across broad swaths of central North America.

Lead author Brady Allred says, “There are two important things here: First, we examine all of central North America, from the south coast of Texas to northern Alberta. When we look at this continental scale picture, we see impacts and degradation that are missed when focusing only at a local scale. Second, we see how present policies may potentially compromise future ecosystem integrity over vast areas.”

Allred and co-authors estimated that from 2000 to 2012 oil and gas development removed large amounts of rangeland vegetation, culminating at a rate per year of more than half of the annual grazing on U.S. public lands. Vegetation removed by this development on croplands is equivalent to 120.2 million bushels of wheat, approximately 13 percent of all wheat exported by the U.S. in 2013.

Fragmentation and loss of habitat also disrupts wildlife migration routes, alters wildlife behavior and assists new disruptive invasive plant species. Furthermore, nearly half of wells drilled are in extreme- or high-water-stress regions. High-volume hydraulic fracturing uses 2 million to 13 million gallons of water per well, intensifying competition among agriculture, aquatic ecosystems and municipalities for water resources.

Co-author Dave Naugle highlights the complexity of the issue: “We’ve known about the impacts of oil and gas development for years, but we now have scientific data from a broad regional scale that tells us we need to act now to balance these competing land uses.”

UM Upgrades Internet Speed with Internet2 Connector

The University is now home to a 100-gigabit-per-second fiber connection as an Internet2 Network connector site in Missoula. The ultra-high-speed capability advances UM’s research efforts and expands opportunities to support educational, research and health care institutions across the state.

“The Internet2 Network connection provides great support to our researchers who collaborate with colleagues both nationally and internationally and, in particular, for those involved in big data initiatives and their entrepreneurial activities,” says Scott Whittenburg, UM vice president for research and creative scholarship.

The new capability, which is 10 times faster than UM’s previous connection, will further research efforts in the areas of ecosystems, climate change, environmental health, neuroscience, the search for Earth-like planets in nearby solar systems and more.

Matt Riley, UM’s chief information officer, says network connectivity is key to education and economic development in rural states where communities are separated by vast distances. UM connects a portion of Montana’s higher education institutions, as well as the U.S. Forest Service.

Regents Professor Emeritus Wins Major Ecology Prize

The journal Molecular Ecology chose UM Regents Professor Emeritus Fred Allendorf as the recipient of its 2015 Molecular Ecology Prize.

The distinguished honor officially will be awarded Aug. 10-14 during the meetings of the European Society for Evolutionary Biology in Lausanne, Switzerland. The prize includes an engraved silver platter.

The field of molecular ecology is a young and inherently interdisciplinary research area. The journal created the Molecular Ecology Prize several years ago to recognize significant contributions to this area of research.

Allendorf is one of a handful of people who founded the field of conservation genetics. He was one of the first to apply genetics to real-world conservation problems, and he has continued to advance the application of genetics, and now genomics, to pressing conservation issues.

His research focuses on the application of population and evolutionary genetics to problems in conservation biology. His book “Conservation and the Genetics of Populations,” co-written with UM Professor Gordon Luikart and Sally Aitken of the University of British Columbia, provides an understanding of how genetics can be used to conserve species threatened with extinction.

Allendorf, along with holding the position of Regents Professor Emeritus of Biology at UM, is a Professorial Research Fellow at Victoria University of Wellington in New Zealand.

Allendorf
Research UnCOVERs Why Songbirds Vary in Time Devoted to Warming Eggs

The amount of time songbirds spend warming their eggs directly correlates to their own survival probability and that of their eggs, according to a study by UM researchers that appeared recently in The American Naturalist.

The amount of care parents provide their young varies greatly across the animal kingdom, particularly among songbird species, who spend anywhere from 20 percent to nearly 100 percent of daylight hours warming eggs in their nests. A team led by Thomas Martin, senior scientist and professor at UM’s Montana Cooperative Wildlife Research Unit, set out to discover why.

“The reasons why species differ in how much care they provide their young has long been a mystery and of interest to scientists, given that it influences the quality and survival of offspring,” Martin says.

The researchers studied parental-care behaviors, egg temperatures and adult mortality rates in 63 species of songbirds. The study, which spanned two decades and four continents, found longer-living species with more future opportunities for breeding were less willing to expend energy and risk mortality associated with keeping their eggs warm.

Conversely, species with shorter lives put much more effort into caring for their young because they may not have another opportunity to reproduce. In both cases, the songbirds balance longevity against the risk of their eggs being preyed upon by predators. Species with a higher likelihood of their eggs being preyed upon invested more effort in keeping their eggs warmer, as warmer eggs take less time to hatch.
Jillian Campana always wanted to be a theater actor, immersed in the romance of bright stage lights, dramatic monologues, delirious opening nights and lively cast parties. But in her mid-20s, that dream took an unexpected turn. After graduating with a bachelor’s degree in theater from California Institute of the Arts, Campana took a job in Egypt teaching drama and English as a second language. Her classes at the American University of Cairo were made up of refugees from Eritrea and Ethiopia – people whose real-life narratives seemed open to theater’s transformative nature.

For Campana, the idea that the stage could alter someone’s life in a practical way suddenly added another layer to her passion. It offered a scope far beyond herself.

“It was kind of the first glimpse where I saw theater and drama as really powerful tools,” says Campana, who now runs the theater performance programs at UM’s School of Theatre & Dance. “For one, it was good for language acquisition, but also for community and identity building. And so that intrigued me.”

But it was a few years later, when she ended up teaching in Brazil, that Campana found full-blown inspiration in the idea of theater and drama as a means to social change. There she met Augusto Boal, a famous applied-theater practitioner who used theater to address citizen and cultural oppression. Boal’s work wasn’t just an abstract gesture: He had a long history with the intersection of theater and politics. His teachings were so controversial that, in 1971, he was kidnapped by the government, tortured and exiled to Argentina and then France. After that, he traveled the world using theater to empower the impoverished. He finally returned to Rio de Janeiro to start the Center for the Theater of the Oppressed, which is where Campana learned from him when she arrived in the mid-1990s.

“His work deals with those issues where people who are oppressed by either their government or by family or basic societal norms are unable to live the life they need to in order to be prosperous and happy,” she says. “Working with him opened my mind to all of the different ways that drama and theater can be used. I run the acting and directing program here at UM, and I direct, but my real interest is in working with people who find themselves in a difficult position for whatever reason.”

Above: People participate in one of UM Professor Jillian Campana’s rehabilitation programs at the Neurolinje center in Piteå, Sweden. (Images courtesy of Jillian Campana)
What Campana couldn’t have expected was that in 2000, just after she graduated from New York University’s Tisch School of the Arts and was hired at UM, she would find herself in her own difficult position. That year at age 30, she suffered a stroke, and she lost almost all of her movement. Over the next few years, she struggled to find her way back from it, and eventually through rehabilitation, she did. But it changed her forever.

“It was an incredible experience to have my body taken away,” she says. “I had to learn to walk again and do everything again. When I recovered I decided I was going to do something with this.”

Campana is a glowing, happy person who speaks exuberantly about her work like someone always on the cusp of a new adventure. Inside her McGill Hall office hangs an assortment of colorful theater masks and art that give away her worldly inspirations and love for the stage.

At UM, her job as a theater educator falls in line with her early love for the fine arts. But all the twists and turns of her life also have kept her with one foot on the path inspired by Boal. After recovering from the stroke, she earned her doctorate in theater for social justice at UM, and she spent time working with a traumatic brain injury support group, helping participants use theater and drama to embrace their new selves. It’s a different focus from Boal’s political work, but Campana uses the same approach for empowering people who need it.

With the help of Campana, the group created a play called “The Puzzle Club,” which demonstrated their individual struggles and triumphs. Shortly after PBS did a documentary on the making of the play, Campana started hearing from other people around the world looking for cutting-edge rehabilitation methods. One in particular was a rehabilitation center in Sweden that asked her to come work with their traumatic brain injury patients.

Each year for the past 10 years, she has traveled to Piteå, Sweden, to work in a rehabilitation center called Frammås Folkhögskola, a place that includes an educational facility, music conservatory, art space and neurological center for people who have been released from the hospital but are not yet ready to live on their own. The program is called Neurolinje, and it has ties with Luleå University of Technology, where Campana’s research partner Asa Gardelli works.

“It’s unlike anything we have here,” Campana says. “The whole program is about getting them ready to re-enter a world – not the world that existed before. It’s about a new life.”

Conventional rehabilitation focuses on survival – getting a person’s body back to functioning level. But the philosophy at Frammås Folkhögskola insists it’s equally important to address the emotional aspects of a person dealing with a major life change.

“I found drama was very profound for the individual,” she says. “Once they feel empowered enough to be able to know who they are and how they want to be perceived, oftentimes they are able to then embark upon a more aggressive physical or occupational rehabilitation campaign.”

In 2007, a few years after she started venturing to Sweden, Campana got another opportunity when she was invited to be a visiting professor at the University of Mumbai in India. During her four years there, she created Studio Three Theatre, which focuses on social and cross-cultural theater. She put her skills to work at St. Catherine’s Home for Girls in Mumbai, developing a drama therapy program for survivors of human trafficking and prostitution.

The young women, all rescued but still healing, had been living together in close quarters, but they rarely spoke of their ordeals. They were learning how to train for jobs and get their feet on the ground, but the pain and abuse they’d gone through was buried deep.

“Once they got to that point where they could share what happened to them, absolutely everything changed,” Campana says. “They became tighter. They trusted me, they trusted the experience and then we set about writing a play, and they performed it for people in that residential setting and for a lot of the aid workers helping them.”

In one part of the play, a girl sells clothing at a shop. She shows good posture, makes eye contact, practices engaging with customers. It allows her to rehearse her new self without consequences, so that later when she gets out into the world she can feel confident.

Campana has spent a lot of time using her applied theater tools in places far away from home. But recently, she turned her focus back to the Missoula Valley. She gathered a group of war veterans together, mostly from Iraq and Afghanistan, to work with her UM students. Together, the students and vets co-wrote dramatic monologues. In the lobby of the PAR/TV Center, audiences could put on headphones and listen to recorded versions of the monologues. The museum theater piece served as a prologue to UM’s spring production of “Welcome Home, Jenny Sutter,” which told the story of a war veteran returning home. The monologue project not only served to give the veterans a new outlet, but it provided education for nonmilitary audiences.

Campana hopes to continue using theater and drama for a wide range of populations. To her, trauma comes in all shapes and sizes, but the tool box for how to understand that trauma can look very much the same. And, in her experience, the outcome is well worth the work.

“In all the areas I’ve worked in, many people refer to it as a waking up or a rebirth or a coming back to life,” she says. “A lot of what I do is, first, coming to terms with what happened, whatever it is. Then, coming to terms with the present, naming the new self and looking toward the future – and through drama imagining the possibilities.”

— By Erika Fredrickson
UM employees Justin Easterday and Lauren Henry process a hand-carved figurine of a lieutenant in 18th-century dress as part of their work on the curation project at the Collection Management Facility at the Defense Supply Center, Richmond, in Virginia.

Navy’s Novelties – continued from front

doesn’t have the glory of fieldwork, she explains, so it’s been an underfunded area of archaeology for decades.

But Dixon sees this project with the Navy as a good omen. “The fact that the Navy has invested in their collection on this level makes a very important statement about the future of historical collections,” she says.

And it can’t be done alone. Early this year Dixon, who is associate director of the UM center administering the Army Corps of Engineers grant, hired a team of more than 20 people who now are sorting through artifacts in the Richmond facility and at the National Museum of the U.S. Navy.

“From my perspective, I am a professor first,” she says. “My role in all of this is helping to facilitate educational opportunities for UM students and alumni, as well as the general public.”

It’s a prime teaching opportunity, and it’s also opening up career paths for UM students and alumni. Kyle Burke, for example, is just wrapping up a double major in history and anthropology. His interest is military history, and he’d like to enroll in a graduate program for underwater archaeology.

Dixon worried that the lack of underwater archaeology courses at UM might make it difficult for Burke to get into these competitive programs. When this project began, Dixon’s team hired him and sent him to Washington to help curate the artifacts at the naval museum. Thanks, in part, to that firsthand experience, he’s already been accepted into several graduate archaeology programs.

Ayme Swartz, a UM graduate student from Philipsburg, also is working at the naval museum. The assignment is helping Swartz earn her master’s in anthropology. Her knowledge of gemstones, thanks to her previous job in Philipsburg, already has helped the team identify an artifact with rubies from Myanmar and sapphires from Sri Lanka.

Another UM anthropology alumna, Katie Stevens Goidich, is working in the project’s Montana offices. Goidich served 14 years with the U.S. Navy in Iraq and elsewhere, and Dixon says she helps the team “learn how to speak military.”

Every team member is vital, because the scale of the cataloging is massive. The Navy collection includes more than 300,000 accessioned artifacts. Some of those pieces, such as dental kits, contain many different parts.

“The number of individual objects is astronomical,” Dixon says.

The teams in Richmond and D.C. spend their days carefully unpacking crates that may not have been opened for decades. They analyze the contents item by item. They photograph the artifacts, inspect them for signs of damage, research the history and provenance, and type this information into a massive database.

“If you were to print it off,” Dixon says, “it might take up an entire wall. Each object has its own story. The crews have to tease out information about them and make it searchable.”

But Dixon sees a bigger picture in the works, too.

“What we’ve done with the Navy’s NHHC team is follow the Navy’s Curator Branch guidelines on the care of the collection,” she says. “We could only hope to extend this for the next couple of years so that we could get as far along on the project as possible.”

Ideally, after the catalog is complete – and that may be after UM’s involvement with the collection ends – the Navy will have a searchable database of its artifacts. Museums around the country will be able to request loans of these items. After all, the ultimate goal of the collection is to share U.S. naval heritage with the public. And the catalog is an important first step.

“These things can’t go on the road and be loaned out unless you have all of this information and all these ducks in a row first,” Dixon says.

In the meantime, Dixon’s team is immersed in some fascinating objects of U.S. history. They’ll document the furniture of famous admirals and the furniture of the USS Sequoia presidential yacht. They’ll inventory and catalog the contents of the hut U.S. Navy Officer Richard Byrd used during his exploration of Antarctica. They’ll catalog an atomic bomb shell – nonexplosive, of course.

They’ll also spend time with a gun from the famous USS Maine, the sinking of which, in a Cuban harbor in 1898, invoked an era of sensationalistic “yellow journalism” and triggered the Spanish-American War. The gun soon will make a journey to Clemson University’s Warren Lasch Conservation Center in Charleston, South Carolina. It will be scanned with an electron microscope to determine its earliest paint color. The lead will be removed, and it will be stabilized and conserved as close as possible to its original condition.

“The University of Montana is helping facilitate this,” Dixon says. “Who would’ve thought that we would be involved in such an important component of U.S. history? I’m really honored and proud that UM has a leading role in the long-term stewardship of objects that are entirely relevant to our American heritage.”

Dixon says UM students and graduates are proving themselves as professionals on the job. “People from small towns in Montana are getting experiences we never could’ve predicted a few years ago,” she says. “And the Navy benefits because they are among our brightest and best. We hope that this project can become a model for dealing with such massive collections.”

— By Jacob Baynham
When it comes to government contracts, it’s easy to assume that if you want to work with Uncle Sam, you’d better make planes, ammunition or some other product with military implications. Just don’t tell that to the dozens of Missoula-area businesses that accounted for a shade over $7 million in government contracts in just the second quarter of 2015. Is there a Lockheed-Martin facility tucked away somewhere? Hardy.

“It’s janitorial services for a ranger station and selling hay to the Forest Service,” says Patty Cox, a certified procurement professional and the head of the Montana Procurement Technical Assistance Center at the University of Montana. “In rural communities, it’s things like fire-camp catering or selling a couple of horses to an agency in addition to things like big construction contracts.”

The Montana PTAC office at UM – online at http://www.montanaptac.org/ – is one of 600 around the country and nine in Montana. The program exists thanks to joint funding from the Department of Defense and local entities such as universities and economic-development agencies. It provides consultation services to companies ranging from those that are longtime government contractors looking to expand or change their emphasis to those that have never even considered working for an agency – and the invaluable advice comes free of charge for its clients.

“In Anaconda recently, the ranger station needed janitorial services and so they posted ads with my information on them so I could help someone through the process,” Cox says. “Part of that is helping a local company understand what’s needed and then, if they are a good fit, helping them navigate the bid process.”

And completing that bid process and the registration required for federal contracting is no small task. Even experienced contractors who have used the vendor portal – called the System for Award Management, or SAM – can be stymied by the complexities and requirements.

“It can be challenging to find the right opportunities even for very experienced people who have bid on projects over the years,” Cox says. “I just met with an experienced engineering firm, and they followed up to say that they’d submitted a bid for a job they would have never found if it hadn’t been for PTAC’s help – even though they’ve been doing this for a long time.”

That’s in part because the PTAC office has a sophisticated matching system that’s more powerful than the search functions available to the general user and in part because Cox is really good at what she does. In fact, her status as a certified procurement professional puts her in select company when it comes to assisting businesses with government contracts.

“Patty is one of a handful in the country with this certification,” says Joe Fanguy, director of UM’s Office of Technology Transfer. “That’s helped PTAC become the latest arrow in the University’s economic-development quiver, which now exceeds 500 regional businesses when combining PTAC clients with the existing portfolios of our MonTEC business incubator, the Blackstone LaunchPad to help student and alumni businesses, and the Montana World Trade Center.”

Though Montana’s location and population might not make it an obvious choice for government work, businesses here have an odd advantage when it comes to contracts: The vast majority of them are small by government standards. And that’s helpful because the feds want 23 percent of their contracts to go to small businesses.

“Even what we consider here to be a big company is often classified as small, so they have the skills and experience for a job and remain attractive to procurement officers looking for a small-business partner,” Cox says.

But sometimes even small businesses with the right combination of experience, skills and a solid bid find themselves lost in the labyrinthine regulations that must be met before shovels start turning dirt. That’s where Cox comes in to help.

“Because a local contractor also has an Idaho location, there was a hiccup in their application, there was a hiccup in their application, and we had to work together to figure out how to solve it,” Cox says. “Every time it’s an amazing feat because you have to know these regulations and stay up to date to be able to find the needle in the haystack.”

— By Alex Strickland
PTAC Success Stories – continued from page 7

**Momentum Prosthetic Clinic LLC**: When the national prosthetic clinic Clifford Creekmore worked for unexpectedly announced it was closing its Missoula location, Creekmore decided he would open his own clinic in the Garden City. Creekmore’s old clinic had been a regular referral location for the Fort Harrison Montana Veterans Affairs Health Care System, and for his newly created Momentum Prosthetic Clinic to continue serving veteran clients, Creekmore had to move quickly. Montana PTAC worked to get Creekmore’s new clinic the proper documentation and registration to be eligible for the VA as the business was starting out. That speedy reaction meant the new clinic could continue serving Creekmore’s clients and retain its contract with the Montana VA — plus keep three jobs from leaving Missoula.

**PinnaCal**: Specialized tools like torque wrenches and pressure gauges are required to get technical maintenance tasks just right, but who makes sure the tools themselves are calibrated properly? A local Missoula company called PinnaCal does just that, and the young company was looking to pursue government contracting when owner Jessie Ellis sought out Montana PTAC. Because of the highly technical nature of the business, Cox helped PinnaCal get through the required registration and then walked through market research and strategies with Ellis so she could calibrate her approach. The process led Ellis to pursue smaller contracts that best suited her business’ size, and Cox was able to connect her with the appropriate buyers for the very specific but necessary service.

**Parke Logging**: The U.S. Forest Service Region 1 office in western Montana decided to pilot a new program and assemble a new Heavy Equipment Task Force – a request that’s never gone out before. Alan “Luckie” Bryant from Parke Logging came to Montana PTAC for advice on how to submit a bid for the new request and immediately got help reviewing the solicitation, which changed a few times during the process, requiring Cox to keep Bryant up to date. They came up with unique pricing to match the never-before-seen request and prepared a final proposal. Near the end of the process, Bryant ran into a snag with the Forest Service’s procurement system, and Cox was able to work with the contracting officer and Bryant to get it sorted and get the bid submitted on time. “You went above and beyond to watch out for us,” Bryant said afterward.