



WILDERNESS

Rx

New science seeks to quantify how wild spaces can treat widespread mental health issues.

by ANNETTE MCGIVNEY

illustrations by JOEY GUIDONE

“MAYBE YOU SHOULD PACK A BAG?”

The advice from my friend Mary was practical but also terrifying. An hour ago, she had answered my frantic phone call for help and rushed to my house so she could drive me to an emergency psychiatric facility near my home in Flagstaff, Arizona. Now she was implying that I might not be coming back for a while.

It was July 2010 and for the previous 10 days I hadn't slept at all, not even for five minutes. Night after night I laid in bed with my heart racing and body trembling, filled with enough adrenaline to rob a bank, desperate for rest and some kind of explanation about what was happening to me. As Mary waited, I tossed my toothbrush in the bag and looked at my tear-streaked face in the bathroom mirror. Maybe I wouldn't come home, I thought. Maybe I would not survive whatever it was that was eating me alive.

Until this crisis, I had always thought of myself as a mental and physical rock. Nothing rattled me. Over the three previous years I had been investigating a story about a woman who was murdered in the Grand Canyon (BACKPACKER, “Freefall,” June 2007). In the beginning, my desire to learn more about the crime seemed like simple, journalistic curiosity. I wanted to know why the 18-year-old killer stabbed the victim 29 times just to rob her. I suspected there was some darker, more sinister force at work. But I couldn't have known that force was coming for me, too.



Tomomi Hanamure was murdered on May 8, 2006—her 34th birthday—as she hiked to Havasu Falls in the Havasupai Indian Reservation adjacent to Grand Canyon National Park. Tomomi lived in Yokohama, a crowded suburb of Tokyo, but she made a personal tradition of visiting spectacular wild places in the American West on her birthday. She chose a place of contrasts. Havasu Falls is home to both a series of iconic cascades—and the Havasupai, a people who have experienced extreme poverty and chronic substance abuse since they were forced onto the reservation 140 years ago.

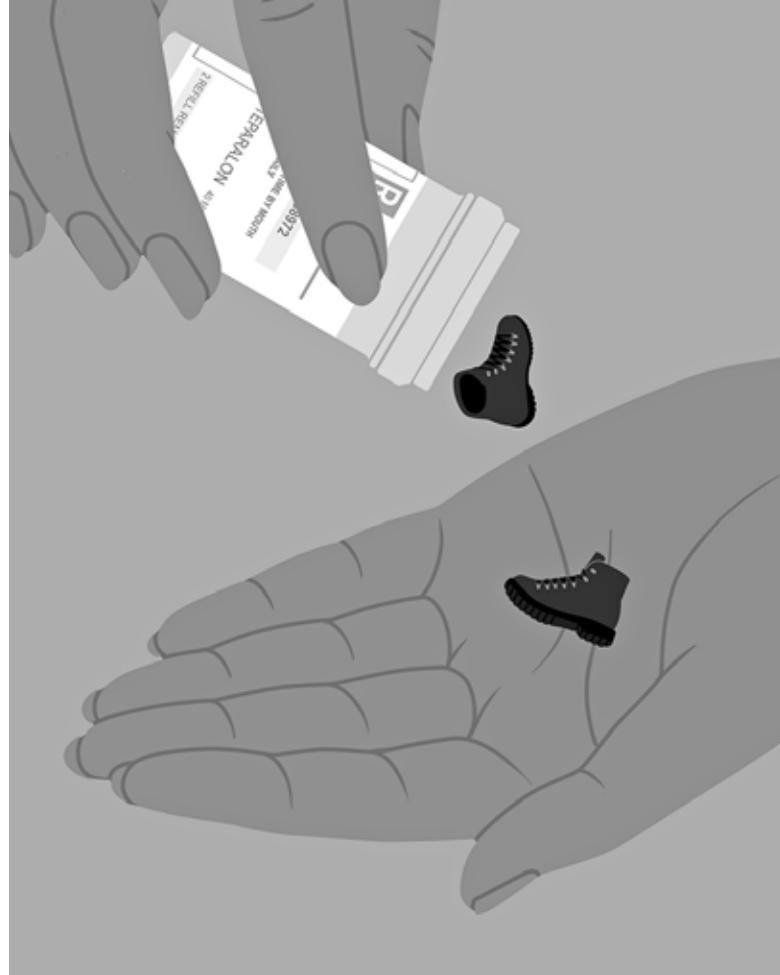
As Tomomi hiked alone, she encountered an 18-year-old Havasupai named Randy Wescogame. Randy was from one of the tribe's oldest families, and he had spent much of his teenage years in juvenile corrections for petty theft, alcohol consumption (illegal on the reservation) and minor assaults. In May 2006 he was addicted to methamphetamine. Other media and the public seemed to chalk up the most brutal murder in the history of the Grand Canyon to the desperate randomness of drug violence. I thought there was more to it, but not about what it might cost me to find out.

EVERY PIECE OF new information I found in my reporting led to a new disturbing question. I interviewed the killer's school teachers and read court records to learn that his father beat him with barbed wire hard enough to leave scars and his mother once shot him in the leg. I also felt the pain of the victim's family and friends when I interviewed them. I read Tomomi's journal about how she was abandoned by her mother at age four.

What started as simple curiosity soon grew into an obsession. The more I learned about the killer, the more my mind tracked into ruts from my own life. I would later discover I was acting out what Sigmund Freud called the repetition compulsion. "The patient cannot remember the whole of what is repressed in him, and what he cannot remember may be precisely the essential part of it," Freud wrote. "He is obliged to repeat the repressed material as a contemporary experience instead of remembering it as something in the past."

By May 2010, after nearly three years of reporting on the murder for a book, I started having nightmares and a sensation that my arms and head were vibrating, as if trembling in fear. In my report-

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ing notes from that time, even my handwriting was shaky. My body knew something my mind didn't. I kept digging.

In a taped, three-hour confession, Randy described how he stabbed Tomomi with his right hand using a rusty, 4-inch blade. As I listened, I felt something in me break loose. That one small detail—he used his right hand—was the key to the lockbox of my past. Out sprang a lost fact that I unnerved me with its force: My father had also used his right arm when he beat me.

More memories soon barraged me, presenting a version of my childhood that felt completely separate from everything I thought knew about myself. My mother suffered from chronic depression so severe it kept her mostly bedridden. I remembered my father's anger. By the time I was in grade school, he beat me almost daily with a belt. It was always after dinner or following his evening tennis workout. The violence would begin as measured spankings but then, as his rage gorged itself, he unleashed everything, stopping only when he was too tired to go on.

My life at age 49 became an endless horror show of my own childhood. I couldn't even switch it off with sleep. When another repressed memory flashed forth

my body reacted as if the abuse was happening all over again.

As much as I tried to manage my memories, there was no way to push them back down. My life began to spiral. My mental and physical rock crumbled. I needed help.

Four hours after I walked into the psychiatric facility that day in July, I walked out with a diagnosis of chronic post-traumatic stress disorder. This form of the condition has all the symptoms of regular PTSD most commonly associated with war veterans. But it also includes additional symptoms like cognitive impairments and dissociative disorders. These are born of prolonged trauma typically experienced by children who grew up in abusive homes.

When I first started research the story, I had no way of knowing how much I had in common with both Tomomi and Randy, or that hiking into Grand Canyon to investigate the crime would be both a curse and a blessing.

THE HEALING POWER OF nature has long been recognized. Henry David Thoreau, Ralph Waldo Emerson, and Frederick Law Olmsted all wrote in the mid-19th century about the benefits of a walk in the woods as they popu-

larized the idea of preserving wild places for the public good.

John Muir, who was tormented as a child by his tyrant of a father, famously discovered transcendence in the wilds of Yosemite. "Thousands of tired, nerve-shaken, over-civilized people are beginning to find out that going to the mountains is going home..." wrote Muir in 1901, "that wilderness is a necessity; and that mountain parks and reservations are useful not only as fountains of timber and irrigating rivers, but as fountains of life."

Now, researchers are finding evidence to explain the feeling. The last few years have brought forest bathing and nature deficiency disorder to the mainstream, as stressed-out city folks and kids turn to the wilds for renewed focus, healing, and relaxation.

In recent decades, the number of "nerve-shaken" adults diagnosed with PTSD has increased exponentially. According to the U.S. Department of Veterans Affairs, nearly 400,000 veterans from the wars in Iraq and Afghanistan have been diagnosed with PTSD. However, this number is just a small percentage of the total number of people in the United States with PTSD—approximately 8 million during any given year—who are struggling to recover from a traumatic event, whether it is a car accident, sexual assault, or an abusive childhood.

Ever since PTSD was first introduced as an official medical diagnosis, the two primary forms of treatment have been pharmaceuticals and talk therapy. For many PTSD sufferers, myself included, the pills and therapy help, but not enough. And the significant risk of pill dependency makes it unworkable as a long-term strategy for me. As PTSD's prevalence grows, a group of clinicians, veterans, and environmentalists is working to take the treatment for PTSD outside and use nature itself as a new form of medicine.

Such research is critical. The U.S. healthcare system runs on clinical trials, data-driven science, and quantifiable results about efficacy and dosing. Unlike, say, the benefits of exercise, it's hard to design a controlled experiment in which nature's impact on the psychological markers can be isolated and measured in a lab. And neurobiologists are yet to agree on what constitutes nature—is it city park, national park, or any chunk of untouched wilderness? That is to say, your doctor isn't about to write you a prescription for hiking boots

PROGRESS REPORT

Thanks to a bipartisan team of representatives, the Tennessee Wilderness Act, which poses to designate nearly 20,000 acres of Cherokee National Forest as wilderness, made it one step closer to completion by passing out of committee last fall. It moves on to a full vote within the Federal Land Management Act.

just yet.

In an effort to make this brand of wilderness medicine a reality, the Sierra Club has teamed up with scientists at the University of California, Berkeley, to create the Great Outdoors Lab, which complines research to quantify the effects nature has on mental health and other chronic conditions. "We hope to make public lands part of a common healthcare prescription," says Sierra Club Outdoors director Stacy Bare, who is also an Iraq War veteran diagnosed with PTSD.

Over the past three years, the GO Lab has conducted research on how the outdoors specifically impacts the human nervous system. The first article on its findings will be published in 2018 in *Emotion*, a peer-reviewed journal of the American Psychological Association. The research represents the most comprehensive science yet documenting how nature impacts individuals with PTSD on metabolic and psychological levels.

The GO Lab study group is comprised of 180 military veterans and youths from underserved communities who were experiencing PTSD symptoms and participated in one- or two-day rafting trips on California's American River. Before, during, and after more than 90 trips, researchers measured the participants' stress hormones, immune function, dopamine regulators, and proteins that control inflammation. All these markers for PTSD showed positive physiological changes. One week after the trip, participants also reported a 30 percent reduction in PTSD symptoms and a 10 percent increase in wellbeing measures, such as happiness and social connection.

Most notably, awe was the emotion that best predicted positive change in participants. The greater the level of awe the participant reported in connection with the dramatic natural landscape, the better he or she felt not only during the trip but for weeks afterward. Which is to say that protecting the most spectacular terrain isn't just good for pictures; it's the best thing we can do for our health.

"Time outdoors changes people's nervous systems," says UC Berkeley psychology professor Dacher Keltner, who co-authored the GO Lab study. "It is as effective as any PTSD intervention we have."

WHEN I WAS 8 YEARS OLD, my family moved from Houston to a rural town in East Texas that was surrounded by the dense pine forests of the Big Thicket National

Preserve. Our new home had a big backyard with a treehouse and was flanked by woods that seemed to go on forever. For the first time, I had a place to escape the yelling and violence at home. This wilderness became my private refuge.

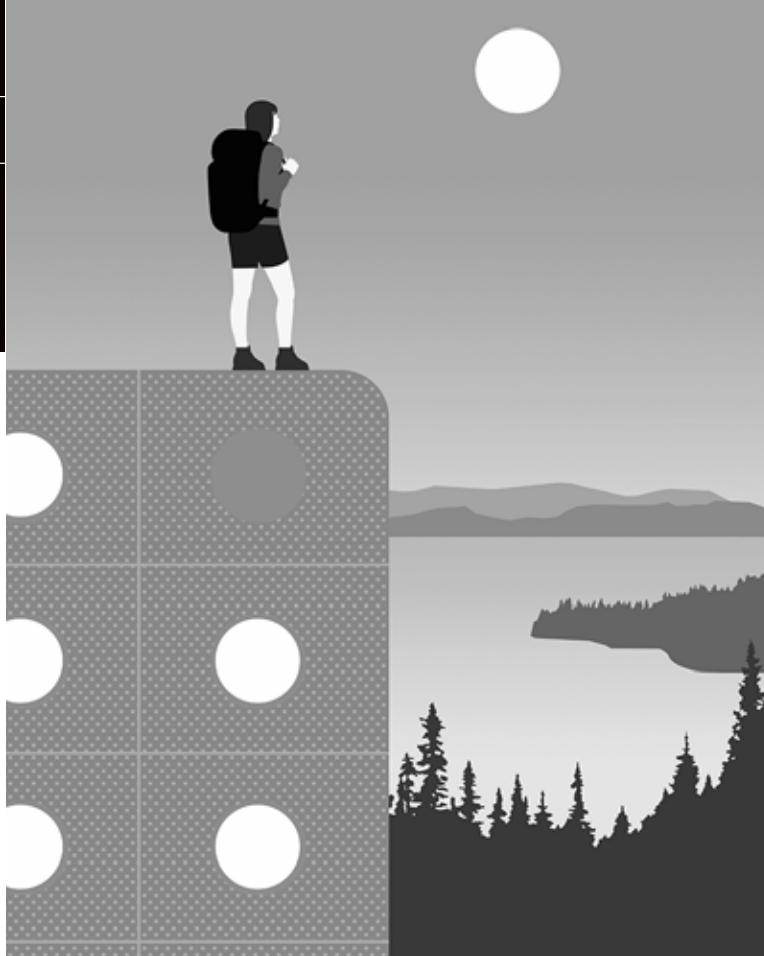
My fondest memories from childhood are of wandering in the woods with my dog Lucky. I felt safe and comforted there, like the trees were embracing me when no one else would. At night, inside my house, I kept the bedroom curtains open. It was easier to sleep in the company of the stars and the moonlit silhouettes of the trees.

Like me, Tomomi found a nurturing parent in the outdoors. After being abandoned by her mother, she was raised as an only child by her father, who worked 12-hour days in a factory. Tomomi took care of herself and, typical of children experiencing neglect, felt depressed and lonely. As an adult, she found the tonic she was looking for in the American West, where the wide open spaces of the Grand Canyon filled the void in her life. In contrast, Randy turned his abuse outward, fighting with his classmates and getting into trouble. Instead of Havasu's redrock sanctuary, he spent most of his youth behind the razor wire of juvenile correctional facilities.

While most research documenting the positive impacts of nature on mental health has been focused on vets, the largest group affected by traumatic stress is children. The number of kids experiencing family violence has been steadily climbing over the past 50 years. According to federal statistics from the U.S. Department of Health and Human Services, some 4 million children were reported to state agencies in 2015 (the most recent data available) for being at risk of abuse or neglect. But other groups of PTSD sufferers have not seen the same push into nature as vets have.

Nooshin Razani, a pediatrician and director of the Center for Nature and Health at Children's Hospital Oakland in California, is leading the charge to prove that wild places help traumatized kids. In 2015, she and her colleagues teamed up with the East Bay Regional Park System to take young patients on backcountry outings. There were 78 parent-child pairs enrolled in the study and they spent one full day in nature three times a week for three weeks. It was what Razani called the "park prescription." In addition to surveys on psychological wellbeing, saliva samples were obtained to measure parasympathetic nervous system markers (such as cortisol





and alpha amylase, which increase with stress), as well as heart rate and blood pressure before, during, and after the outings.

“We found that nature decreases the trauma response, improves cognitive function, and promotes healing,” Razani says. “Our study showed that park visits increase resilience in children. It doesn’t take away the adversity in their lives but it buffers stress. Hormones, blood pressure, and heart rate normalize in nature.”

Why, exactly, is this so? Other researchers are investigating a variety of theories on the relationship between nature and human health. Possible explanations range from the calming effect of the color green to deep quiet to the absence of distractions. “Maybe it is simply because we evolved in nature,” Razani says. “For most of human history we lived outside.”

Though scientists and social workers haven’t uncapped why nature works the way it does, it seems the next major advance in mental health treatment is just as likely to come out of a public forest as a private lab.

DURING THE FIRST FEW months after my PTSD diagnosis, I thought my goal should be to get back to the way I was before the

crisis—a strong, single mom raising a teenage son. I tried to resume my normal routine of running but the side effects of the medications caused debilitating muscle cramps. I wanted to travel, but I was too afraid of having a panic attack on the airplane. The only place I felt comfortable and safe was in the backcountry. Just like the veterans in the GO Lab study, my sense of wellbeing was restored in the wild. And fortunately, I live in Arizona, which is more than 40 percent public land. The national forests and parks around my home became my hospital.

The medication I was prescribed in the aftermath of my breakdown played a critical role early on and I also had good luck with various body-based therapies for minimizing my symptoms. Regular visits with a psychiatrist and therapist were essential, too. But over a period of several years, I came to realize that it was my time in the nature, day in and day out, that helped me feel better than anything else. I would tell this to my therapist, who made notes of it in my chart but didn’t seem to understand what I was really saying. She had not read up on the GO Lab research. My time in the wild wasn’t just a fun hobby. It was helping me. It was healing me.

Just as I did when I was 10, I took up rambling through the woods

with my dog, always alone and off-trail. Being away from people allowed me to connect more completely with the Earth’s natural rhythms. There was no reason to hurry and no goal except to be there on a visceral, sensory level. I plugged into the equilibrium of the forest—the trees, the wind, the birds, the solitude. A few months after starting the routine, my heart rate went down; my breathing became deep; I didn’t startle as easily; I felt like I was going to be OK.

All that from being outside, taking regular doses of awe in the spaces we all own. It would sound mystical if it didn’t work as well as it does. That’s part of the problem. Public lands are at risk, torn between the value of their petrochemicals, minerals, and real estate and the value placed on them by people like me who have experienced something in the wilderness we can’t prove or quantify. But with research ongoing, we might be on the cusp of putting a number on public health value. And that could just be the beginning. What else don’t we know about how the wilds work on our brains? And will we be able to preserve them for long enough to find out?

I have now tapered off most of the medications that I was on seven years ago, replacing them with daily nature walks. And I regularly immerse myself in Grand Canyon or other Southwest national parks for infusions of awe. By definition, I will never be completely over chronic PTSD, but now I know it won’t ruin me, either.

Last year, when I felt my mind filling anew with dread, I loaded up my pack and hiked to the bottom of the Grand Canyon.

That first night, I laid my sleeping bag on the sand next to the Colorado River. I listened to the purring waters of rapids and stared up at the moonless night sky. The white band of the Milky Way stretched like a bridge of diamonds from the North Rim to the South. I looked at the familiar faces of the constellations, the planets, the shooting stars. It was as if the whole universe was embracing me, welcoming me home, telling me it was going to be all right. 🌲

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BACKPACKER Southwest Field Editor Annette McGivney is the author of *Pure Land*, which chronicles her experience reporting the most brutal murder in Grand Canyon history and grappling with chronic PTSD. She is also founder of The Healing Lands Project, a non-profit that funds wilderness trips for child victims of domestic violence.