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Lost in the wilderness: Tech tools help but they don’t always find someone in time

By Christie Aschwanden

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Tice was just one of three men who have vanished in wintry conditions in the park since fall 2018, but people become lost in warm weather, too.

This past May, it took rescuers 17 days to find missing hiker Amanda Eller in Maui’s Makawao Forest Reserve. And when a helicopter crew finally found 73-year-old Eugene Jo on June 29, he had survived seven days lost in the San Gabriel Mountains of California after becoming separated from his hiking group.

Hiker Amanda Eller with her rescuers, from left, Javier Cantellops, Troy Helmer and Chris Berquist at Maui’s Makawao Forest Reserve on May 24. Eller, who was lost for 17 days, was finally discovered by helicopter outside of the official search area. (JAVIER CANTELLOPS/AFP/Getty Images)

GPS, cellphones, thermal imaging, infrared cameras and drones have improved many aspects of search and rescue, yet finding people lost in the wild remains a stubbornly difficult task. And finding missing persons is urgent, especially if they weren’t prepared to spend the night outdoors.

“The single biggest killer is hypothermia,” says Scott Berkenfield, a former park ranger at Grand Canyon and Grand Teton national parks, and it’s a year-round risk, because overnight temperatures can dip low enough even in summer for someone to become fatally chilled. Although there are always outliers — such the lost hiker found alive in Hawaii after more than two weeks — Berkenfield says that after three to five days, searchers generally start thinking that they’re looking for a body.

There’s no comprehensive database of people lost in the outdoors, but numbers reported to the National Park Service’s open survey have remained fairly consistent over time, with

3,453 cases reported in 2017, says Kathy Kupper, public affairs specialist at the Park Service.

The odds of finding a lost person can be reduced to a deceptively simple formula: the probability the individual is in the area you're searching multiplied by the probability that you'll be able to detect them in that area, says Robert Koester, past president of the Virginia Search and Rescue Council and author of "Lost Person Behavior." (The chances of detecting a person are reduced in areas of dense vegetation, rocky terrain or bad weather, and odds also go down as searchers become fatigued.) Koester's book provides statistics about the movement patterns of different people — hikers, hunters, children and mushroom hunters, for instance — that rescuers can incorporate into their search strategies.

A search-and-rescue effort always begins with an investigation phase.

"You need to figure out who you're looking for," says Tod Schimelpfenig, wilderness medicine curriculum director at NOLS, a nonprofit global wilderness school in Lander, Wyo. What's their health and fitness status? What were they intending to do? Did they have an established plan? Where were they last seen? What's their state of mind? What kind of supplies do they have with them?

Searchers also assess weather, terrain and other factors that might influence where a lost person could be, says Christopher Boyer, chief operations officer for the National Association for Search and Rescue. If rain moved in, they probably hunkered

down and sought shelter. But if temperatures fell, the person might keep moving to stay warm, and that can take them farther away from the last known spot, Boyer says.

Ideally, the lost person had a designated route and timeline that they shared with someone who would report them missing if they didn't turn up at a designated time. Focusing the search becomes more difficult when the missing person's plans are unknown.

When 70-year-old James Pruitt went missing in Rocky Mountain National Park in March, his car parked at a trailhead provided about the only clue to his possible whereabouts. A snowstorm made matters worse, and the search was eventually suspended after nearly a week when approximately 15 square miles were searched with rescue teams, aircraft and dogs. Pruitt remains missing.

"Rocky Mountain National Park has some of the most rugged high alpine terrain in the contiguous United States," says Kyle Patterson, the park's public affairs officer. Its terrain is "challenging to search, even from the air, and especially in winterlike conditions that can persist in some higher altitude areas of the park into the summer," she says, adding that high winds often limit aerial searches. Extreme winter weather and poor visibility complicated the search for Pruitt, Tice and for another man, New Jersey resident Ryan Albert, who went missing in the park in October 2018. Albert's body was found deep in the snow on May 30 after park rangers spotted his glove nearby.

People sometimes have unrealistic expectations about how easily someone can be found, Berkenfield says. "A lot of people think that as soon as we launch a helicopter we'll find them, but frankly, it's very difficult to spot someone from the air," he says.

Helicopters have been known to pass right over people who have been standing there waving. A lost person is usually much more visible if they create an SOS in the snow or sand or they place bright clothes in a X pattern or even just lie down and wave their arms and legs, Berkenfield says.

Koester has conducted formal experiments in which he has placed subjects in an area and then observed trained searchers as they try to find them. He has learned "never to underestimate the ability of a trained searcher to miss the obvious."

If the subject is visible for 10 seconds as the searcher walks by, then they're usually detected. "But if they're only visible for a few steps, the chance of detection falls off," Koester says.

High-tech tools have made certain aspects of search efforts a little easier. For instance, searchers can use GPS to track exactly where they've searched, "which is a big help," Berkenfield says. A cellphone may help searchers find someone, but only if the device is charged and can hit a tower — unfortunately often not the case in remote areas. Personal locator emergency beacons operate where cellphones don't and can send out an SOS in a real emergency. Satellite messengers, such as Spot, require a subscription plan but can also send out non-emergency messages and some allow users to receive messages, too, assuming the battery hasn't run out.

There's not much data to show whether technology is luring people into situations that they're not prepared for, but Schimelpfenig says that it's a common subject of campfire discussion when search-and-rescue workers get together.

"There's a lot of speculation that technology makes people feel protected, so maybe they're a little less prepared," he says. "People rely on calling for a rescue if things go wrong, but then technology fails them."

Overall, however, Koester says he's sure that "technology helps far more than it harms."

He estimates that personal emergency beacons have saved thousands of lives, as has cellphone forensics where a phone's call and text history and its communications with towers are used to map the region where it might be. But this kind of phone sleuthing requires good signals from both GPS and the lost person's phone, as well as people trained to interpret the data.

Searches in the Rocky Mountain park, for instance, have used helicopters, fixed-winged aircraft with thermal imaging to look for sources of heat (like a body), infrared cameras, which also sense heat, and drones to take aerial photographs of the search area, where appropriate, Patterson says.

But these tools cannot crack every case.

Tice's phone data provided only vague information about his whereabouts because of the limited cell signal in the area. Thermal imaging and infrared cameras can provide an added layer of detection, but rocks or vegetation may obscure their ability to sense body heat. Aerial photography by drone or

aircraft is of limited value when visibility is low.

And if the people aren't inside the expected search area, they won't be found. Eller, the hiker lost 17 days in Hawaii, was finally discovered by helicopter outside of the official search area.

Ultimately, the best way to solve lost person cases is to prevent them in the first place, experts agree. If you're headed on an outdoor adventure, make a plan and share it with someone who will notify authorities if you don't return on schedule. Know your limits and pay attention to the weather. And don't count on the GPS on your cellphone to tell you where you are at all times.

Study a map ahead of time and pay attention to your surroundings.

"Don't just get out of your car and start walking. Look around and orient yourself," Schimelpfenig says. He likes to develop what he calls a "hand rail" — an orientation to his surroundings that can help guide him. "Maybe my handrail is that I'm walking down a trail in a valley and the river is on my right and on the left is a big ridge and I'm oriented to that."

Travel with the essentials you'll need to protect yourself from the elements and survive if you get caught out longer than you anticipated.

"Don't rely on a battery to save your life," said Lt. Col. Gene Manner, incident commander at the Air Force Rescue Coordination Center at Tyndall Air Force Base in Florida. Bring navigation tools — such as a map and compass — that will work in any conditions, and consider taking along a personal

locator device

Plan to be self-reliant. Even if you have great cell service, a call for help won’t be answered with the speed of an Uber.

If you find yourself lost or disoriented, “Sit down, unpack your gear, figure out what you have and plan to spend the night,” says Laurence Gonzales, author of “Deep Survival: Who Lives, Who Dies, and Why.”

Rather than continue moving, eat something, set up shelter and clear your mind. Technology is helpful, but the worst thing you can do is act out of panic.