

How Effective is Bear Spray, Really? Here's What Experts Want You to Know.

The discovery of a can of bear spray at the site of a fatal mauling in Glacier National Park has led some to question how effective the deterrent really is. Here's what scientists who have studied it say.

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Bear spray (Photo: Adam Roy)



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It's hard to believe that a can small enough to be used with just one hand has enough power to repel some of the planet's largest predators. This logic is probably why, even after 40 years of being on the market, bear spray still garners skepticism.

Every time [Backpacker](#) publishes a story involving a bear-related fatality, commenters chime in to suggest that the stricken hiker should have been carrying a gun, preferably a big one. The news that investigators had found bear spray at the site of [Glacier National Park's first fatal attack in decades](#) will likely only encourage that debate.

Developed in the 1980s by University of Montana graduate student Carrie Hunt and Vietnam veteran Bill Pounds, the invention of bear spray was a watershed moment for bear management and hiker safety. Previously, the only way for a backpacker or other wilderness user to fend off an upset ursine was to shoot it—a difficult and dangerous feat for the hiker, and a deadly one for the bear. Bear spray, essentially an extra-strength, long-distance version of the pepper spray designed for use on humans and dogs, gave recreationists a new method of defending themselves, one that would not only increase their chances of escaping unharmed, but also reduce the likelihood of future encounters by teaching the animal a lesson about approaching people.

There's no doubt that bear spray is an imperfect tool, a last resort when making noise, staying aware, and hiking in a group fail to ward off an encounter. But if some hikers still have mixed feelings about using a spritz bottle to defend themselves from a griz, the science is firmly on bear spray's side: A [2008 study led by Brigham Young University researcher Tom Smith](#) found that bear spray was effective at stopping aggressive behavior by brown bears in 85 percent of cases. And while [another 2012 study by Smith and Stephen Herrero](#) of the University of Calgary found that firearms could be

an effective defense in the case of an attack in the hands of a skilled shooter, the researchers noted that, thanks to bear spray's ease of use and the user's ability to deploy it sooner during a bear encounter without killing the animal, it tended to be more useful overall.

In [a Backpacker interview](#) published shortly after the second study came out, Smith put it more colorfully.

"If you shoot a grizzly in the Lower 48, you're moron of the year," he said.

"Most states require you to hike out the carcass, and in some cases, you'll have to pay fines [for shooting an endangered species]. Those problems go away with bear spray."

That attitude, not the data, may be the most compelling evidence in bear spray's favor: Scientists who make their living studying bear attacks—presumably the people who know the most about it—choose to rely on it.

"Not only are you stopping bears from attacking people...but you are not injuring that bear," Wes Larson, a podcaster and wildlife biologist specializing in human-bear conflict, told [Backpacker](#) in a video in 2025. "You're leaving that bear alive to continue living its life. It's much better than using a firearm. That's why we're constantly recommending it on my podcast, [Tooth and Claw](#), because it is very effective and it helps you save bears."

Want to learn more about bear spray and how to use it (and not use it)? We've collected [Backpacker](#)'s best writing on the science of it below.

[**The Fascinating, Life-Saving Science of Bear Spray**](#)

Yes, bear spray hurts. But that's not the only—or even the main—reason it works. Bears "see" the world through their sensitive noses. Deprived of those sniffers, they're essentially flying blind. In this video, Wes Larson explains.

Burning Eyes, Raw Skin, Lungs on Fire: This Is What Bear Spray Actually Feels Like.

What's it feel like to get an eyeful (or lungful) of bear spray? I asked three people who experienced an accidental discharge. The circumstances were different—one took a shot directly in the face during a safety demo in Yellowstone, while two others accidentally triggered their own canisters while unpacking their cars. One thing they all agreed on, though? It hurt like hell—and they walked away with a newfound appreciation for the deterrent's power.

Yes: Bear Spray Still Works in the Wind and the Cold. This Study Proved It.

One of the most common objections to bear spray: It's not up to the blustery, cold conditions that hikers and other outdoorspeople find themselves in. Smith put that common wisdom to the test, freezing canisters and testing them under simulated windy conditions. His conclusion? It's more reliable than you might think.

Bear Spray Is Not a Shield. It's a Last Resort.

Bear spray may be an effective deterrent, but it's not foolproof—and not a license to get closer to bears than you should. (After watching a tourist in Alberta walk within 10 yards of a feeding black bear with her phone in one hand and a canister of bear spray in the other, I think we need to put this on billboards.) In an essay for *Backpacker*, Larson runs through why a canister on the belt is not a substitute for common sense in bear country.