

Building a better bear trap

Webcams, temperature sensors, and satellite technology allow FWP biologists to see and monitor what's in a culvert trap many miles away.

By Christine Paige

When Tim Manley receives a call from an apple grower who reports a grizzly raiding an orchard, the Kalispell-based bear biologist may have to drive an hour or more to the site to size up the situation. If he sets a culvert trap or snare to capture the nuisance bear, Manley then has to drive to the site at least once a day to check the device. Usually it's empty. Or he rolls up to find a skunk in the trap, or a bear cub caught with its frantic mother pacing nearby. Catching the wrong bear, known as a "nontargeted animal," is common, requiring him to release it and set up the trap all over again.

The same logistical problems challenge Montana Fish, Wildlife & Parks' four other bear biologists. Manley says it sometimes takes him or a colleague several weeks to trap a bear that has raided beehives, chicken coops, or garbage dumpsters and relocate the animal to where it won't get into trouble. "Trapping bears takes up a huge amount of our time," he says.

So in 2008, when Manley was asked to

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dream up the "ultimate" bear trap, he envisioned one that could be monitored live via a webcam and with a door he could control from the laptop computer at his office or home. Doing the asking was Ryan Alter, an entrepreneur based in Missoula. Alter is a natural tinkerer with a restless brain and a knack for problem solving. He's as comfortable machining metal and wielding a welder as he is fiddling with electronic gadgets and writing computer programs. Among other endeavors, Alter's company, Alter Enterprises, develops technological solutions for education, such as live-streaming presentations by experts in the field into science classrooms. It wasn't a stretch for Alter to start imagining the possibilities of a high-tech bear trap.

Alter took Manley's wish list and, using a generous grant from a private anonymous donor, went to work. Several months later he told Manley, "I've got your bear trap."

Built around a traditional culvert trap, the Automated Bear Trap (ABT) bristles with technology. It contains two webcams—regular light and infrared—that stream images of the trap's interior to a computer. When the trap door is tripped, the ABT sends an alert via a satellite link or cell

phone base station to a set of FWP e-mail addresses. A bear biologist simply calls up the webcam on a secure website and views the animal in the trap.

If it's the bear he's after, the biologist can immediately drive to the site, reducing stress on the captured animal. If it's the wrong bear that shows up on his computer or smartphone screen, a few keystrokes opens the door remotely, setting the animal free. If the bait is still intact, a few more taps is all it takes for the trap to be re-armed and ready to go again. "As long as we put the ABT in a place with cell phone coverage or we have the satellite dish up, we can control it from anywhere," Manley says.

The ABT is equipped with temperature sensors inside and out. Because a bear's body heat can raise the internal trap temperature as much as 10 degrees, biologists want to know if a trapped animal may be overheating on a warm day. If the temperature in the trap reaches levels dangerous to a bear's health, the ABT sends an e-mail alert and biologists can release the animal. Alter also installed an electromagnetic detector that reads a tiny microchip that biologists inject behind the ear of each bear they capture, like the microchip IDs used for pets.

The ABT's technological bells and whistles are powered by a bank of 12-volt batteries charged by thin-film solar panels set on the ground next to the culvert. The panels are durable enough to withstand bears strolling across them, though Manley occasionally erects barriers to deter curious cows.

Over the past three years, Manley and Jamie Jonkel, FWP bear biologist in Missoula, have tested the ABT on both grizzlies

and black bears with great success. The webcams help the biologists target individual bears, whether it's a sow with cubs getting too close to home sites, or a young male busted for breaking into chicken coops. The department has also used it to trap a few young female grizzlies in the robust Northern Continental Divide Ecosystem population that were then relocated to the tiny, struggling grizzly population in the Cabinets.

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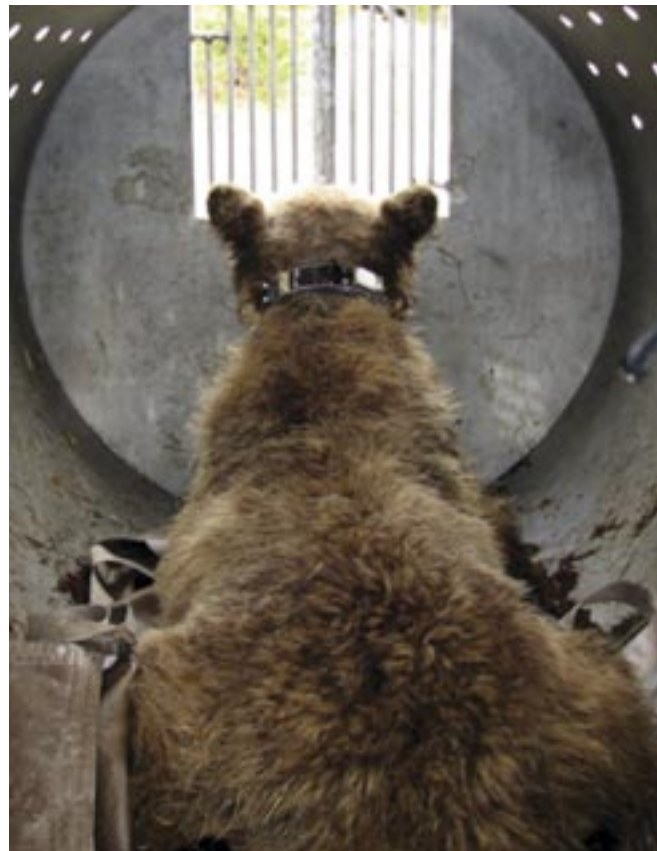
limit trips into closed areas of national forests," Manley adds. "And it's excellent for situations where you need to trap a specific bear but may have several others in the area you don't want to trap." The cameras and remote door release also make the trap safer for biologists.

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Though the ABT required a considerable

investment of capital and research, the one-of-a-kind trap was donated to FWP. The department pays only for maintenance and data transmission. Standard culvert traps and foot snares are the primary trapping tools of bear biologists and game wardens. That likely won't change. The devices are inexpensive, easy to set up, and do a good job of capturing bears. But in some cases, the ABT is a better tool. Not surprisingly, it has attracted the attention of bear management professionals elsewhere in Montana and other states. "There's been a lot of interest," says Manley. "The main concern is cost, but when they find out what I save in time and mileage, that becomes less of an issue."

Alter Enterprises recently received patent approval for the ABT, and Manley and Alter continue to work on improvements. The bear biologist says he'd like a weight scale mat installed on the culvert floor so he knows what a captured bear weighs and can more accurately estimate sedative dosage. He'd also like the trap to be modified and lightened so it can be hoisted into the backcountry by helicopter. "And maybe a mist cooling system..." Manley adds, his imagination clicking into gear.



TECH BELLS AND WHISTLES

Clockwise from far left: A camera in the new Automated Bear Trap (ABT) shows a captured grizzly; the ABT with thin-film solar panels to produce energy, and a satellite dish for transmitting images and other information; FWP bear biologist Tim Manley and Missoula entrepreneur Ryan Alter with a sedated grizzly; a computer screen showing Manley peering into the ABT.

