

# MSU students take aim at bear spray canisters

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Visitors to national parks and forests are encouraged to use bear spray when they encounter grizzlies, but disposing of the bear spray canisters is a problem that three Montana State University engineering students addressed for their senior capstone project, sponsored by the Gallatin National Forest.

Ashley Olsen, a Butte native who graduated from MSU in December, returned to campus Wednesday to demonstrate a bear spray recycling machine she developed over the past year with Seth Mott of Helena and Kyle Hertenstein of Great Falls.

As private and government partners watched the outdoor demonstration behind the Engineering and Physical Sciences Building, the recycler machine removed the chemical that burns the eyes and mucus membranes of bears. It also removed the [refrigerant](#) that propels the chemical out of the canisters. Then the students' machine crushed the cans so they could be recycled normally with other metals. Processing three cans together took about 30 seconds.

"Good job," one bystander said as the others cheered.

The demonstration had its glitches. When Olsen tried to remove the top of one canister, it exploded and sent her running with it to a Dumpster that holds hazardous waste. The air compressor didn't have enough pressure at first, delaying the demonstration. Later, when the demonstration was under way, bear spray leaked out of the recycler,

setting off some coughing spells among spectators.

All-in-all, the partners said they were pleased with the prototype.

Jane Ruchman, the Gallatin National Forest Developed Recreation Program Manager and Forest Landscape Architect, commissioned the project and bought all the materials for the MSU students. About two years ago, she approached the MSU School of Engineering with the proposal for the project, which was funded by the Forest Service. She said she was very pleased with the results.

"The students did an excellent job," Ruchman said. "Now that they have completed the prototype, I hope that we can engage some local partners to take it to the next step so that we can recycle the canisters instead of disposing of them as hazardous waste."

The National Forest advocates the use of bear spray as a defense against bears, especially grizzlies, Ruchman explained.

Whatever the outcome with the recycling machine, the partners said bear spray recycling is much needed.

"This has been a dream of mine for many years," said Jim Evanoff, environmental protection specialist for Yellowstone National Park.

The park had 3.3 million visitors in 2009, with many of them carrying bear spray while in the park, Evanoff said. Some visitors turned the canisters in at visitor centers or the park gates when they left. Others threw the canisters into Dumpsters, which can create problems later. Every piece of garbage in the park ends up in a composting facility just outside of West Yellowstone. If a fork lift or backhoe accidentally runs over the canisters, the building has to be evacuated for several hours while the bear spray dissipates.

"It's just a huge issue in this ecosystem," Evanoff said.

Ruchman said some tourists throw bear spray canisters into garbage cans at area airports when they're ready to board airplanes. Some people store the canisters until they're too old to be effective. Bear spray is supposed to be disposed of as a hazardous waste, but some people just toss it, Ruchman added. If garbage collectors and landfill operators discover the canisters, they have to retrieve them and treat them as hazardous waste.

Chris Jenkins, head of MSU's Department of Mechanical and Industrial Engineering and back-up adviser for the bear spray project, said the recycler was one of many projects that students in his department completed during their senior year.

"I'm very proud of what our young engineers have been able to do on limited time and money," he commented.

Olsen said she enjoyed working on the recycler.

"It was definitely interesting," she said. "I didn't know anything about it when I started."

Provided by Montana State University

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