

SESSION 3: HUNTERS AND BEAR SPRAY...

WHY AREN'T PEOPLE USING BEAR SPRAY?

MODERATOR

Mike Madel, Montana Fish Wildlife & Parks

CONTRIBUTORS

Steve Herrero, University of Calgary Professor Emeritus (by phone) - "Efficacy of bear deterrent spray from the technical and behavioral points of view"

Herrero delivered the following comments via telephone:

"We're having a panel on bear spray because it has evolved to be a fundamentally important tool regarding safety for people around bears, especially brown and polar bears. Bear spray also increases safety for bears around people. But as Stephen French said, "it isn't brains in a can." It should not be a substitute for avoiding aggressive encounters with bears.

Two research projects, and derived, refereed journal publications that I have been involved in, analyzed incidents of field use of bear spray. The raw data came from the files of wildlife and protected area management agencies. We don't think there were any misleading biases in either of these two datasets. The results showed that bear spray stopped aggression by brown, black and polar bears 80 – 90% of the time when properly deployed. Later Jim Wilder will talk about the most recent of these papers where Tom Smith is first author.

One of the unwritten details I want to stress is that bear spray can be challenging to deploy unless you have practiced using it and you have it readily accessible and have time to draw, take the safety off and direct it in front of an approaching bear. Adrenalin can complicate deployment. People relying on bear spray to deter aggressive bears should rehearse deployment until it is automatic and ingrained. Such training can help to carry users through adrenalin-charged moments. Even without this, bear spray can usually be effectively deployed; however, ineffective deployment or failure to deploy can lead to major injury.

A bear running at you at 30 mph is travelling 44 ft/sec. A bear that is 88 ft. away could be on a person in 2 seconds. The bear spray use training that I conduct has shown it takes people 2-5 sec to deploy bear spray. Bear spray is a great safety tool, but it is not a substitute for avoiding encounters.

On July 23 2011, a group of seven NOLS students were backpacking in a wildland area north of Anchorage, Alaska. NOLS had run similar excursions in Alaska for 40 years without a student being injured by a bear. Suddenly the single file group, that was neither tight nor strung out, faced a charging brown bear at close range. The details are complex. I stress that while three students carried bear spray, none of them even tried to deploy it. Four students were injured, 3 seriously.

If a person suddenly faces a charging brown bear that is closer than around 100 ft. then a decision must be made. Does one try to spray or instead play dead because you might only begin to get the spray deployed? Again, avoidance, understanding of bear behavior, and rehearsal are fundamental.

How effective is bear spray? It is very effective as I mentioned. The track record is broad and impressive. Early tests in the 1980s by people like Carrie Hunt, Gary Miller, Don Wooldridge and Lynn Rogers, and product development by Bill Pounds, were all positive, as were analyses of incidents of field use by people encountering bears.

Both datasets of field use of bear spray showed that while bear spray is most effective in stopping aggression when the bear is first sprayed, some bears required multiple sprayings for additional deterrence, and some people were injured despite what appeared to be effective delivery of spray. Not surprising, wind can be a complicating factor in spray use, but research suggests that spray users can take wind into account even if they have to spray into the wind.

A consistent finding has been that people who are sprayed don't have long term damage. Nor do bears. Tom Smith reported that bear spray residue is a powerful bear attractant. I too have observed this in field tests. Conclusion---bear spray is a deterrent, not a repellent.

There are unresolved issues for hunters who wish to carry and possibly deploy bear spray instead of trying to shoot and kill a bear running at them. Hunters, or others with firearms, have a special responsibility to not provoke unwanted aggressive interactions with brown bears. However, the nature of some hunting has one moving silently through brown bear habitat, or field dressing ungulates that may quickly become bear bait. As I see it a person hunting with a long rifle in brown bear habitat and facing a charging brown bear probably needs to have rehearsed in advance whether they will go for their spray or rifle. Bear spray is easier to use effectively. It is hard to shoot a bear lurching rapidly at you at high speed. Also some people may need two hands to effectively deploy bear spray. The two-handed rifle carry coupled with this would mean a person would need four arms and hands. I hope creatively thinking hunters are able to work out a means to use bear spray if desired and needed. The amount of information to guide people in their purchase of a certain brand or size of bear spray has improved. Still lacking are Independent lab tests of different brands of bear spray. This would help guide purchasers to products having the most desirable characteristics based on scientific testing. In my opinion bear spray is testimony to thoughtful design, science-based testing, and public involvement. The hackneyed reference to “better living through chemistry” comes true. Bear spray is good for people since it significantly reduces bear-inflicted injuries. It also may reduce bear deaths if it can be successfully deployed instead of using a firearm. I believe that bear spray offers people active on foot in bear habitat the opportunity to relax more and enjoy where they are and to know that if despite precautions they encounter an aggressive bear they will probably be able to deter it.”

Jim Wilder, USFWS Polar Bear Team- “Efficacy of bear deterrent spray – Alaska”

Wilder presented some of the results from his co-authored paper, “The efficacy of bear deterrent spray in Alaska, 1985-2006.” The authors collected 83 records from all available sources on the use of bear spray in AK from 1985-2006. Among these, they collected 11 incidents that involved the inappropriate use of bear spray (e.g., using bear spray as a repellent). Excluding those incidents, they analyzed 72 records involving black, brown, and polar bears. Their overall finding is that bear spray works and works very convincingly.

The authors defined a successful outcome as bear spray having stopped the bear’s undesirable behavior. Some examples of successful outcomes might be a bear that no longer pursues a person, breaks off an attack, abandons attempts to acquire food or garbage, or turns and leaves the area. Conversely, the authors deemed spray incidents to be failures when bears showed no change in undesirable behaviors, e.g., persisted in their attempts to acquire food or garbage.

In 96% of the bear spray incidents people reported their activity. The authors found that hiking was the most common activity. Second on the list was management actions, in which agency personnel were trying to push bears out of developed areas. These were followed by people in hard-sided structures, in their tents at camp, and working in bear country, sport fishing, etc.

The largest percentage of bear spray incidents were attributed to curious bears (62%). This was followed by surprise encounters (17%), and 3% due to persons having provoked bears in some way. Not surprisingly, the majority of bear spray incidents were reported as having had human food involved in some manner. Bear spray provides users with a valuable tool to de-escalate bear incidents that start out at a relatively slow and low level, e.g., when bears are seeking human food or “testing people”.

Single bears were the largest cohort involved in bear-spray incidents. Females with cubs of the year (COYs) were 16 times more frequently involved than were females with older dependent young, though these data may be questionable because not everyone can correctly determine the difference between COYs and older cubs.

Of all people carrying bear spray, 98% were uninjured by bears in close-range encounters. Only three out of the 175 people involved in 72 separate incidents suffered injury by bears that had been sprayed.

All three of these bear-inflicted injuries involved brown bears, and the injuries required no hospitalization.

No mechanical failures of spray canisters were reported in the 72 incidents, and in the majority of instances (83%), people did not report any adverse effects from using bear spray. However, in 14% of the bear spray incidents, users reported that the spray had negative side effects, ranging from minor irritation to near incapacitation. No one in any of these incidents reported that bears took advantage of the circumstances to gain food or garbage. Wind was reported to have interfered with spray accuracy in 7% of bear spray incidents although the spray reached the bear in each instance. Exit velocities for bear spray of ~70 mph probably compensates for cross-wind effects.

The authors looked at the effectiveness of bear spray on curious, non-aggressive bears and aggressive bears as two separate groups. They labeled bears curious if they were investigating people or their belongings in a nonaggressive manner. They labeled bears as aggressive when the incident included behaviors such as charging, agonistic vocalizations, or persistent following. In 68% of black bear incidents, and in 62% of brown bear incidents, bears were either acting curious or were searching for human food or garbage. In 85% of the nonaggressive black bear incidents, and in 100% of the nonaggressive brown bear incidents, use of bear spray stopped the undesirable behavior.

In 36% of brown bear incidents, the bears acted aggressively towards people before being sprayed. In 86% of these incidents for which they had distance information, the person was first aware of the bear at less than 15 meters. In the remaining two instances, bears were first noticed at 25 meters and 50 meters, respectively. In 64% of these close encounters, brown bears charged the person(s) before being sprayed. In 86% of aggressive encounters with brown bears, bear spray stopped the bear's aggressive behavior.

Of the aggressive brown bears interactions, the majority of the bears (56%) were females with dependent young, followed by single bears (38%). In 35% of the incidents involving black bears, bears acted aggressively towards people without an apparent food-related motive. In four of these seven aggressive incidents, the bear was apparently surprised at less than 15 meters. In only one case did the black bear charge before being sprayed. In 100% of bear spray incidents involving aggressive black bears, the undesirable behavior was stopped by spraying. In some cases, the mere sight and sound of deploying a blast of bear spray was enough to deter bears. The authors noted that on ten occasions, the sight and sound of the bear spray was enough to end the encounter.

In the majority of incidents, the bear left and did not return. However, in 18% of the cases Wilder analyzed, both brown and black bears resumed their threatening behavior after having been sprayed once. Yet, in these instances, repeated spraying eventually deterred bears such that the user could escape the situation. People had to spray bears multiple times to drive them off in 24% of incidents they studied. In six incidents, bears did not leave the area, although the spraying halted their undesirable behavior. Since this study was published, Wilder has collected nine polar bear/bear spray incidents from around the Arctic, and bear spray was 100% successful in all of them.

In summary, bears were not injured or killed in any of the analyzed bear spray incidents. The spray was 92% effective at stopping undesirable bear behavior, and 98% of the people using it were uninjured. The authors' research shows that bear spray is an effective tool to deter bears while leaving bears alive.

Frank Vitale, hunter and backcountry horseman - "A backcountry grizzly encounter with bear spray"
Vitale recounted a grizzly encounter he had along the north fork of the Flathead River in 1995. Vitale was leading a pack trip of 4 riders, with four horses, a young pack mule and a dog. While riding and leading the mule up a narrow trail on a steep slope, he saw the brown hump of a sleeping grizzly bear about 50 feet down the trail.

There was no place to turn the horses around without making a commotion or taking a lot of time. Knowing that scared horses in steep country were an issue, he quietly told his clients and partner to

dismount and tie their horses on a short line to the small, subalpine fir trees. When all of the horses were tied and the group was standing, Vitale yelled at the bear. Immediately, the bear stood up, revealing two COYs. The sow was growling and the cubs were bawling. The dog ran toward the bears, but then circled back behind the party. Vitale saw the sow begin to chase the dog, and he worried that the sow would follow the dog's trail resulting in horses and men between her and her cubs. However, the sow broke off the chase, and pinned her ears back, staring at the group. She started to charge.

Vitale's partner handed him the bear spray. Vitale aimed and pressed the handle when the bear was 30 or 40 feet away. He kept the handle depressed and created a big cloud of spray. The sow ran into the cloud and abruptly stopped, wheeled, returned to her cubs and kept running. Vitale turned to his clients and said, "I guess we had a real wilderness experience." The horses had gotten excited, but they were tied so short they were only slightly cut up on the rocks.

Vitale now carries bear spray every time he hunts, whether or not he's carrying a firearm. He wishes more big game hunters were present at the workshop to discuss the benefits of bear spray.

Mike Madel, Montana Fish, Wildlife and Parks - "Summary of results from Smith et al. 2012 Efficacy of firearms for bear deterrence in Alaska"

Madel reviewed the key results from a paper by Smith et al., 2012, "Efficacy of firearms for bear deterrence in Alaska." The results from this recent paper provide insight into the successes and failures of firearms to deter or stop bear attacks.

The authors compiled, summarized, and reviewed 269 incidents of bear-human conflict involving firearms that occurred in Alaska during 1883-2009. Of these incidents, 81% involved brown bears, 11% involved black bears, and 2% involved polar bears. A total of 444 people and at least 367 bears were involved in these incidents. All 444 persons (either alone or in groups) carried guns, however about 18% did not use them while in a close encounter with an aggressive bear. Surprisingly, there was no statistical difference in outcome (whether no injury, injury or fatality) for people using firearms in an aggressive encounter versus those with firearms that did not use them, or said differently, the injury rates for people in both groups were the same.....in short, guns really didn't make a difference overall. Overall, bear-inflicted injuries occurred in 56% of the incidents compared to 2% of those carrying bear spray in Smith et al. 2008. Bears were killed in 61% of the firearms incidents (total of 172 bears killed). Madel suggested that this rate should concern managers of threatened bear populations. In contrast, no bears were killed in the bear spray incidents analyzed by Smith et al. in 2008.

When statistical models were applied to the data (i.e., the best suite of variables that successfully predicted outcomes), the authors found that the four best models did not include firearms at all in them. This means that if you go into bear country and do all of the wrong things but still encounter an aggressive bear, then the next wrong thing to do is hope to shoot your way out of that situation with a gun.

The authors recommend that all people walking in bear country, with or without a firearm, consider carrying a non-lethal deterrent such as bear spray. Bear spray's success rate under a variety of situations has been greater (i.e., 90% successful for all three North American species of bear; Smith et al. 2008) than firearms.

DISCUSSION

Jay Honeyman, Alberta Sustainable Resource Development, commented that video clips of successful bear spray encounters such as the one that Wilder presented are very helpful for educational settings such as bear safety trainings.

Bill Stiver, Great Smokey Mountains National Park, said that NPS now regulates bear spray as a

repellent and not a weapon. This new categorization may mislead visitors to deploy it on objects, thereby creating an attractant. Stiver asked the panelists if we should be concerned about bear spray residue after encounter incidents. Should managers worry that the residue will attract bears? Herrero commented that he has seen bear spray attract bears several hours after deployment, but would like to see some specific testing residue attractiveness.

Wilder was part of project to test smells and attractants at Kulik River in Alaska. Those brown bears seem very attracted to the residue.

Tim Manley asked Vitale to comment on better methods to get hunters to carry bear spray. Vitale responded that intensive education should be the first step, and if that doesn't work and as a last resort, develop regulations. Vitale is concerned that many big game hunters are inexperienced with hunting in grizzly country, and they rely on the information gleaned from TV hunting "reality" shows. As an alternative, Vitale cited Grizzly Country by Andy Russell as a source for understanding grizzly behavior. Russell and his colleagues, even after years of hunting grizzlies, went into the woods to photograph bears without firearms and never had a dangerous incident. Herrero added that Andy Russell recommended one key behavior essential to safer grizzly encounters: stand your ground. He said that the recent firearm research showed that didn't matter if a person discharged a firearm or not; the outcomes were roughly similar.

Larry Lewis, Alaska Department of Fish and Game, asked the panelists if there was any research on the long-term physiological effects on bears post-spraying. Chuck Bartlebaugh, Center for Wildlife Information, said that all bear spray manufacturers are required to submit independent research data about long-term and short-term effects.

Lewis also asked the panelists where the authors gleaned the records for the firearms and bear spray studies. Wilder responded that they used all the sources that were available, such as newspapers and agency records.

Gregg Losinski, Idaho Department of Fish and Game, commented that he uses a Nerf gun in his bear spray demonstrations. He challenges participants to shoot the Nerf gun at a "charging bear" (person in a bear mask). Subsequently, he asks participant to deploy inert bear spray. The superior effectiveness of bears spray becomes clear to the participants.

Jason Herreman, North Slope Borough, Alaska, asked if there's any information about the effective temperature range for bear spray. Wilder responded that he knew of no incidents in temperatures below 40°F. However, since the 2008 paper was published, he has gathered nine polar bear spray incidents to analyze and he may find more information about effective temperatures.

Joy Erlenbach, Washington State University, suggested that managers should require bear safety classes (like hunter safety) for hunters that are new to grizzly country. Vitale agreed, but added that it is hard to convince a hunter that his chances of surviving an encounter are greater with bear spray. In reality, Vitale believes that a large percentage of charges are bluff, so standing your ground may be enough.

Danny Gammons, National Park Service, asked the panelists if is feasible to mount bear spray on a rifle or shot gun. Dave Parker, Counterassault, said that there is someone working on this; however, he thinks that hunters will not want to attach bear spray to their \$3,000 well-balanced rifles or shotguns. The bottom line is that hunters can carry bear spray and a firearm and still be able to deploy the bear spray. It helps to practice, but it can be accomplished.

Ryan Leahy, Yosemite National Park, asked the panelists if they examined the impact of yelling as a deterrent to bear attacks.

Wilder said they did not analyze the impact of yelling in their bear spray study.

Herrero responded that he is a co-author of a paper in preparation that analyzes the reactions of brown bears to various sights and sounds.

Chuck Bartlebaugh, Center for Wildlife Information, cautioned the audience that practicing bear spray deployment is essential. The bear spray can might pivot upward in one's hand if it is not held correctly.