

Bear Hazard Assessment for the Missoula Area

PREPARED FOR:
Missoula Board of County Commissioners,
Missoula City Council and Mayor of Missoula

June 2022

PREPARED BY:
The Missoula Bear Smart Working Group



Black bear in the Rattlesnake neighborhood on Missoula Avenue. Photo by Gwen Florio

Acknowledgments

The Origin of the Bear Smart Community Program

The Missoula Bear Smart Working Group is following the Bear Smart Community Program developed in British Columbia, Canada.¹ We are indebted to the visionaries in British Columbia for developing this approach to address the issues of human-bear conflicts in and around human communities.

The Bear Smart Community Program has been designed by the British Columbia Ministry of Environment and Climate Change Strategy in partnership with the British Columbia Conservation Foundation and the Union of British Columbia Municipalities. It is a voluntary, preventive conservation measure that encourages communities, businesses and individuals to work together.

The goal is to address the root causes of human-bear conflicts, reducing the risks to human safety and private property, as well as the number of bears that must be killed or relocated each year.

The Bear Smart Community Program includes the following steps:

1. Prepare a bear hazard assessment.

Review the history and pattern of bear conflicts in the community and identify high-use bear habitat, human-use areas and the location and seasonal availability of the human-related non-natural attractants that attract bears such as accessible garbage, fruit trees, bird feeders and compost.

2. Prepare a human-bear conflict management plan.

Develop strategies and actions to resolve the hazards identified in the Hazard Assessment and reduce the potential for human-bear conflicts.

3. Revise planning and decision-making documents.

Ensure the community's commitment to the Bear Smart Community Program by incorporating Bear Smart practices into official community documents such as solid waste management plans.

4. Implement a continuing education program.

Education is a key component of human-bear conflict reduction. The community must have an ongoing, consistent education program directed at all sectors of the community to reduce the availability of attractants to bears.

¹ <https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/wildlife/human-wildlife-conflict/staying-safe-around-wildlife/bears/bear-smart>

5. Develop and maintain a bear-resistant waste management system.

Ensure that all components of municipal waste, including garbage, recycling and composting, are managed appropriately and made inaccessible to bears. This should be done through involvement and cooperation by all community members, proactive efforts by the waste management companies, existence of widely understood and embraced regulations and the use of bear-resistant containers, structures, and/or electric fencing where necessary.

6. Implement Bear Smart policies and regulations.

Implement Bear Smart policies and regulations to limit the availability of human foods to bears because of intentional, neglectful or irresponsible management of attractants. Implement a compliance strategy to ensure full compliance with these regulations.

In summary, the Bear Smart Community Program is locally driven by citizens, local government entities and waste management companies working as partners to reduce the availability of human-related food attractants to bears in the community, reducing human-bear conflicts, increasing safety and reducing the number of bears that must be killed or relocated.



The Missoula Bear Smart Working Group

Mission Statement of the Missoula Bear Smart Working Group

To reduce human-bear conflicts through comprehensive analysis, problem solving, education and community engagement.

To apply the concepts of the Bear Smart Community Program to the Missoula area, a group of concerned citizens, several non-governmental organizations, bear biologists, agency bear managers, a Republic Services employee and employees of Missoula County and the City of Missoula formed the Missoula Bear Smart Working Group. The group has its roots in the working group that was instrumental in the drafting and passage of the City Wildlife Feeding Ordinance and establishment of the City of Missoula’s Bear Buffer Zone and its accompanying garbage management regulations during the past 15 years.

This group developed this Hazard Assessment and the assessment’s Supporting Materials. The Missoula Bear Smart Working Group will also develop the Human-Bear Conflict Management Plan and work to build public support and understanding in and around Missoula (Figure 1).

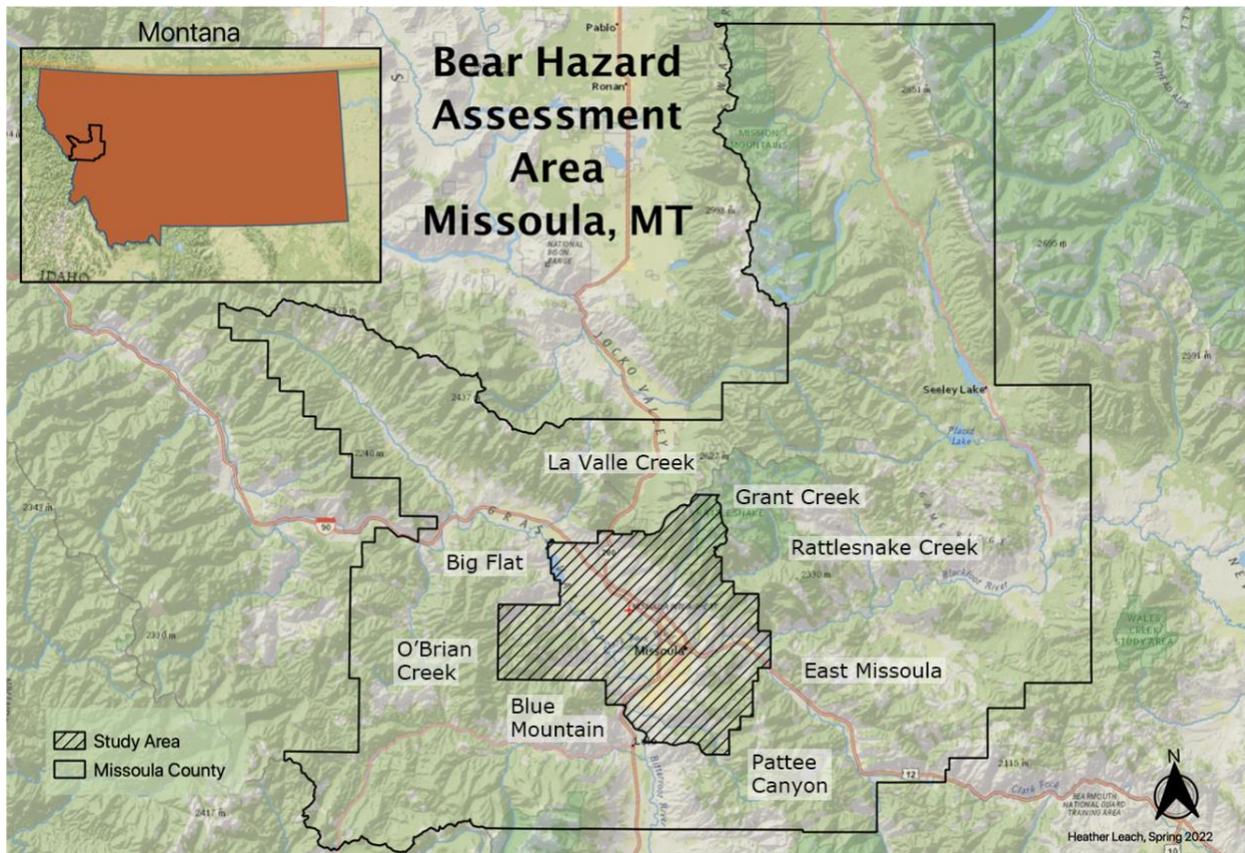


Figure 1. The Bear Smart Missoula Focus Area

The efforts of the Missoula Bear Smart Working Group have involved the support of the Missoula County Commissioners and the Mayor and City Council of Missoula. We gratefully acknowledge the involvement and assistance of the Missoula City-County Health Department; Missoula County Community and Planning Services; Montana Fish, Wildlife and Parks (Montana FWP); the Great Bear Foundation; Defenders of Wildlife, Missoula Conservation District and Republic Services.

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University of Montana Student Wildlife Society chapter that worked with the university and Montana FWP to prepare a bear hazard assessment and management plan for the university.

Missoula residents and community Bear Aware neighborhood networks such as Missoula Bears, the Rattlesnake Watershed Working Group, Friends of Grant Creek, Ninemile Wildlife Working Group, Friends of Two Rivers, Pattee Canyon Bear Aware, Bonner/Milltown Community Council and many others who helped petition for and launch the Missoula Bear Smart effort.

Grizzly Disposal now offers residential and commercial garbage pickup in Missoula County. The Missoula Bear Smart Working Group will offer Grizzly Disposal the opportunity to join the working group and has allowed Grizzly Disposal to review this Hazard Assessment.

Kim Ericsson, Shooting Star Design, for assistance with layout of documents.

DISCLAIMER

The Missoula Bear Smart Working Group produced this Hazard Assessment and will produce the comprehensive Human-Bear Conflict Management Plan for the Missoula area. The best available information was used to create this document. No liability is assumed with respect to the use and application of information in this document.

Bear Hazard Assessment for the Missoula Area

Background on the Relationship between Humans and Bears

The relationship between bears and humans is complex. In some places, bears are desired for their existence value and for various consumptive uses such as hunting for food and sport, as well as for non-consumptive uses like photography, bear viewing or simply as icons of wild nature. As human populations and settlements expanded into places where bears live and where bears found food and shelter, an extensive history of human-bear conflicts developed. These conflicts were caused by competition between bears and humans for food and space. In most cases, the bears were present in these places before humans arrived. The reasons that bears were in these places were the same reasons that humans desired to be there. These places were often in lush valley bottoms along streams and rivers where bear foods such as grasses and forbs and berry-producing shrubs grow and where bears could travel as part of their natural use of the landscape. These low-elevation valley bottoms were also the first places to melt out in the spring, resulting in early spring vegetation that is important to bears. Some bears are displaced from their favored habitats by humans and avoid humans, but some bears adapt to human presence and continue to use these areas despite the existence of humans around them.

Human-bear conflicts happen when humans and bears overlap in space and time combined with the presence of human-related attractants that bears can eat, such as garbage, tree fruits, gardens, beehives, bird feeders, compost piles, backyard chickens and pet food. Once bears find and eat these human-related foods in their overlap zone with humans, they will persist in their efforts to find and consume these foods. Bears remember the human-related foods they liked and where they found them and will seek them out every year, especially in years of poor natural food production, such as when berry crops fail.

The effects of human settlement on bears are threefold: bears can be displaced from their natural habitats by human community expansion and development; bears can remain as human development proceeds and can use human-related foods; or they can be drawn into communities from surrounding areas by the presence of human-related attractants. Because it is not feasible to relocate towns and communities, we can reduce the sources of this conflict by managing attractants and educating the residents of communities about how to avoid human-bear conflicts. Doing so is the objective of the Bear Smart Community Program.

There is clear scientific evidence from the well-designed work of Johnson et al. (2018) in Durango, CO, that the application of bear-proofing measures focused on residential garbage can dramatically reduce human-bear conflicts². The abstract of this publication summarizes this evidence:

² Johnson, H. E., D. L. Lewis, S. A. Lischka & S. W. Breck. 2018. Assessing ecological and social outcomes of a bear-proofing experiment. *Journal of Wildlife Management* 82(6):1102-1114. doi:10.1002/jwmg.21472.

“Human-black bear conflicts within urban environments have been increasing throughout North America, becoming a high priority management issue. The main factor influencing these conflicts is black bears foraging on anthropogenic foods within areas of human development, primarily on residential garbage. Wildlife professionals have advocated for increased bear-proofing measures to decrease the accessibility of garbage to bears, but little research has been conducted to empirically test the effectiveness of this approach for reducing conflicts. Between 2011 and 2016, we conducted a before-after-control-impact experiment in Durango, Colorado where we distributed 1,110 bear-resistant trash containers, enhanced education and increased enforcement to residents in 2 treatment areas and monitored 2 paired control areas. We examined the ecological and social outcomes of this experiment, assessing whether bear-resistant containers were effective at reducing conflicts; the level of public compliance (i.e., properly locking away garbage) needed to reduce conflicts; whether the effectiveness of bear-resistant containers increased over time; and if the distribution of bear-resistant containers changed residents’ attitudes about bear management, support for ordinances that require bear-proofing, or perceptions of their future risk of garbage-related conflicts. After the bear-resistant containers were deployed, trash-related conflicts (i.e., observations of strewn trash) were 60% lower in treatment areas than control areas, resident compliance with local wildlife ordinances (properly locking away trash) was 39% higher in treatment areas than control areas and the effectiveness of the new containers was immediate. Conflicts declined as resident compliance with wildlife ordinances increased to approximately 60% (by using a bear-resistant container or locking trash in a secure location), with minor additional declines in conflicts at higher levels of compliance. In addition to these ecological benefits, public mail surveys demonstrated that the deployment of bear-resistant containers was associated with increases in the perceived quality of bear management and support for ordinances that require bear-proofing and declines in the perceived risk of future trash-related conflicts. Our results validate efforts by wildlife professionals and municipalities to reduce black bear access to human foods and should encourage other entities of the merits of bear-proofing efforts for reducing human-bear conflicts and improving public attitudes about bears and their management.”

As increasing levels of human development occur in bear habitat, we see increasing numbers of bears in these developed areas, particularly in years of poor natural foods in the bears’ habitat. Many people think that the increasing numbers of bears and human-bear conflicts are the result of increasing bear populations. Johnson et al. (2020)³ demonstrated that bear use of residential developments was variable across years, with bears increasing their use of residential areas when natural foods were scarce. They also found that bears using human-related foods in residential areas had increased body fat and cub production but suffered reduced cub and adult survival. The reduced survival due to management removals and human-related mortalities such as vehicle collisions outweighed the benefits of increased fat and higher cub production so that most bear populations using residential areas declined. Thus, residential areas used by bears became population sinks. Such population sinks are a result of humans failing to secure garbage and attractants from these bears. Residential neighborhoods with unsecured human-related foods become death traps for bears and continuously drain the surrounding habitat of bears.

³ Johnson, H. E., D. L. Lewis, & S. W. Breck. 2020. Individual and population fitness consequences associated with large carnivore use of residential development. *Ecosphere* 11(5):e03098. 10.1002/ecs2.33098

Lamb et al. (2016)⁴ found the same result when they studied grizzly bears in an area of high-density human settlement in the Canadian Rocky Mountains centered along Canadian Highway 3. They documented that grizzly bears had 17% lower survival when using natural foods like berries and human-related foods like garbage in and around human settlements. They described this ongoing mortality of bears in these human settlement areas as an “ecological trap” that continued to draw bears into these high mortality risk residential areas with continuing negative impacts to the bear population of the surrounding mountain areas. This is exactly what Missoula is now for black bears—an ecological trap. As grizzly bears increasingly use the Missoula Valley, it will also be an ecological trap for grizzlies. This is why making Missoula a Bear Smart Community is so important.

In the past, human-bear conflict was widely perceived to be the result of “problem” bears and the solution to human-bear conflicts was to remove these “problem” bears. However, the problems were due to humans allowing attractants to be available for bears, which reinforced bear use of these human-related foods and encouraged bears to be around humans. The “problem” bears were not the actual problem, they were the symptom of the problem. Many people were not aware that their own behavior contributed greatly to the creation of these conflicts and thought the problem was “bad bears.”

The cost of having the bear managers at Montana FWP respond to human-bear conflicts in the Missoula area is estimated at \$50,000 dollars each year. Unfortunately, this reactive approach to human-bear conflicts is ineffective, as it focuses on managing the bears, not managing the real problem. In many cases a bear that is removed from the area near a human-related food source is soon replaced by a new bear that, if allowed access to the attractant, will also become a new “problem” bear and may be also removed from the system. This is a deadly cycle for bears, and it never solves the problem of bears getting into human-related foods.

The objective of a Bear Smart Community program is to help people understand that managing attractants in their community is the key to solving the problem. This understanding can empower the members of the community to do a better job of securing human-related foods from bears, which will result in greater human safety and fewer dead bears.

In recent years, several communities in British Columbia, Alberta and Montana have taken proactive steps towards reducing human-bear conflicts in their communities using the Canadian Bear Smart Community approach or some version of it. Montana communities that have applied or are applying the Bear Smart Community approach include Red Lodge, Whitefish, West Yellowstone, Big Sky, Virginia City and Polebridge. Other communities are considering doing so, and the Interagency Grizzly Bear Committee is in the process of standardizing a bear smart program designed specifically for use in the lower 48 states. The Bear Smart Community Program allows

⁴ Lamb, C. T., G. Mowat, B. N. McLellan, S. E. Nielson & S. Boutin. 2017. Forbidden fruit: human settlement and abundant fruit create an ecological trap for an apex omnivore. *Journal of Animal Ecology* 86:55-65. doi: 10.1111/1365-2656.12589

for a localized approach by providing communities with options for addressing their own unique situations to reach their objectives. By using proactive measures, including education and eliminating sources of human-related foods, many of these communities have increased safety and been able to decrease the number of bears destroyed each year. We want Missoula to apply the Bear Smart Community Program so that Missoula becomes a Bear Smart Community.

Key Points of the Hazard Assessment

Unsecured garbage is the primary cause of human-bear conflicts in the Missoula area, followed by birdfeeders, fruit trees in the fall, pet and livestock feed and unsecured human food such as frozen foods in freezers (Figure 2).

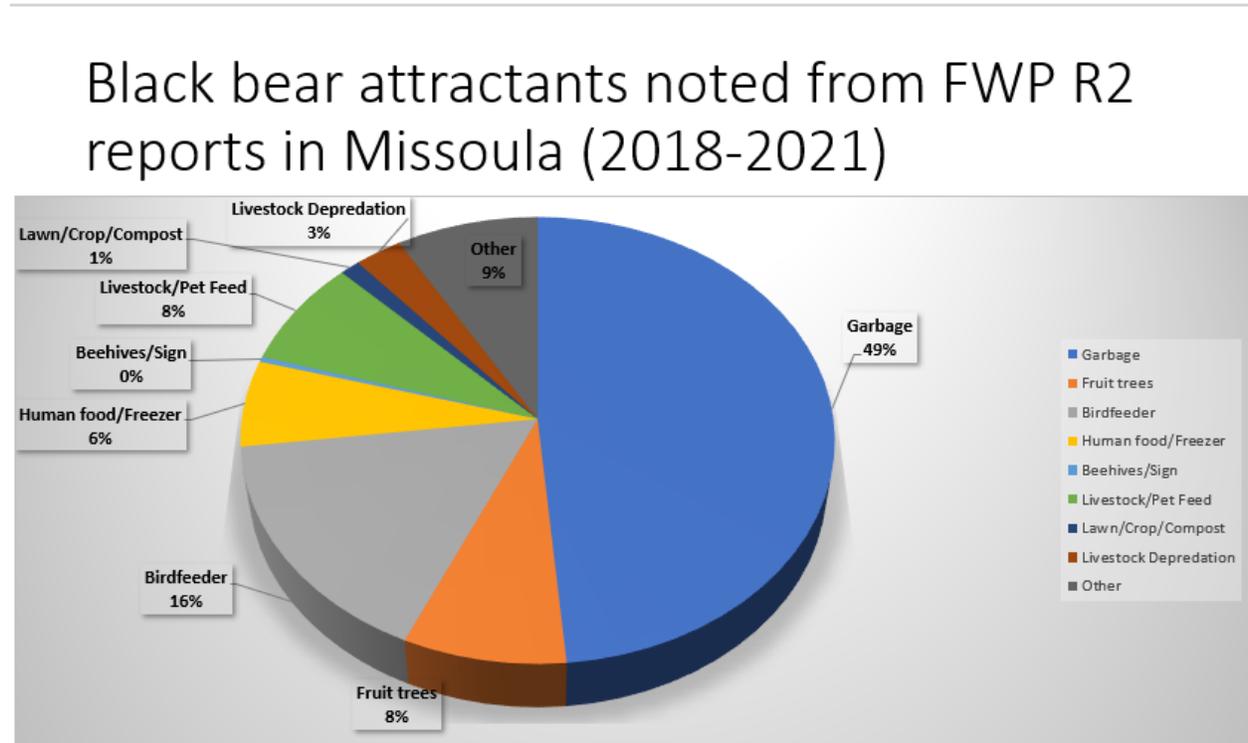


Figure 2. Sources of human-bear conflict reports to Montana FWP in the Missoula Valley area, 2018-2021

These conflicts are concentrated primarily in the drainages where residential areas overlap bear habitat, including the Rattlesnake, Grant Creek, La Valle Creek and Pattee Canyon (Figure 3).

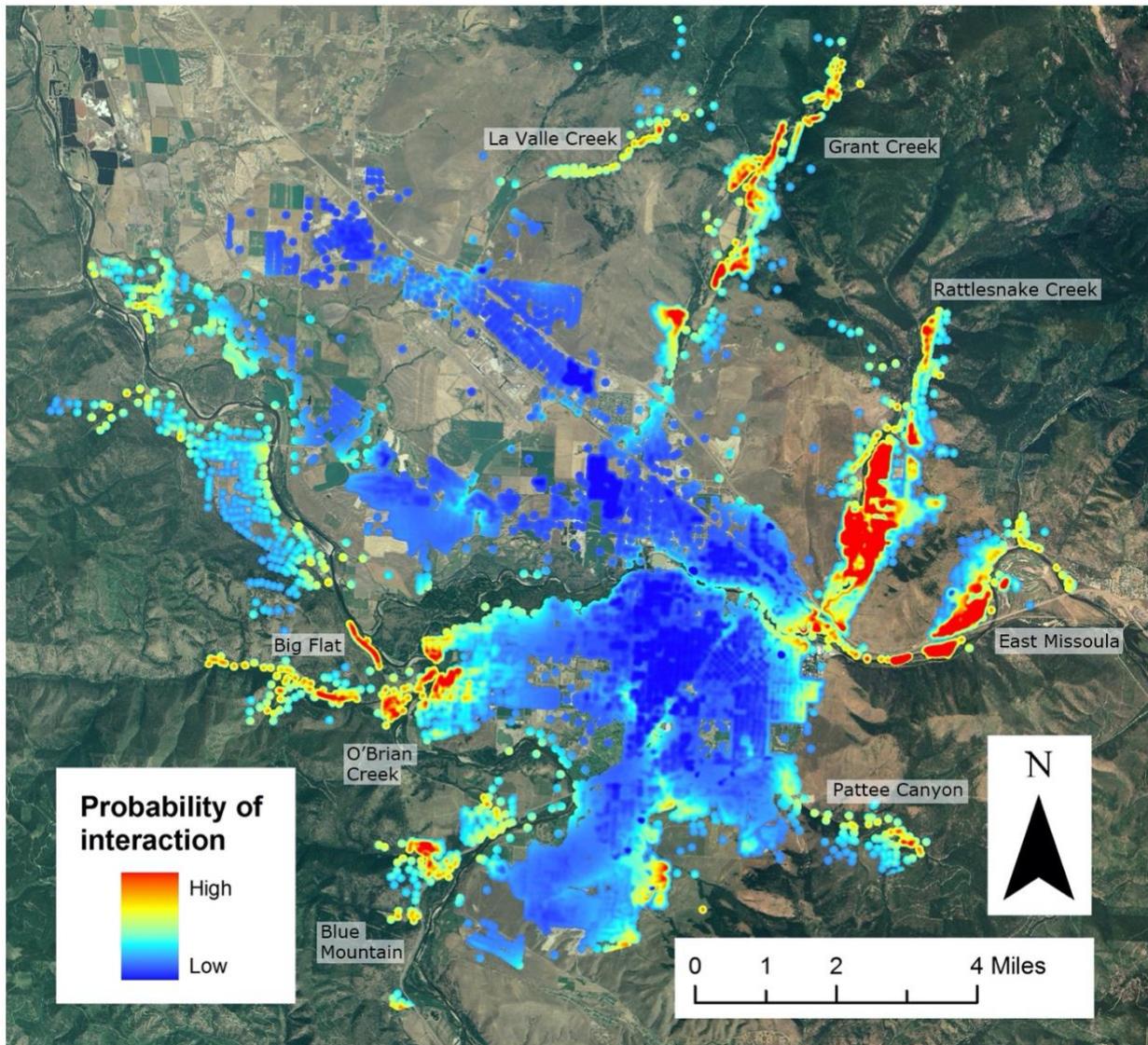


Figure 3. Probability of interactions with black bears in the Missoula area (From Merkle et al. 2011⁵)

⁵ Merkle, J. A., N. Decesare, P. R. Krausman, & J. J. Jonkel. 2011. Predicting spatial distribution of human-black bear interactions across an urban area. *Journal of Wildlife Management* 75(5):1121–1127.

Reducing human-bear conflicts in the Missoula area will require specific community and local government efforts to secure each of these human-related foods from bears by:

- Using bear-resistant garbage containers, holding racks, enclosures and electrified structures
- Removing bird feeders when bears emerge from hibernation
- Securing or picking fruits
- Securing livestock and fowl, pet/livestock feed and human foods
- Public education
- City and county regulations
- Enforcement of regulations
- Public cooperation.

Conflicts between humans and bears across North America have occurred frequently in the past and are increasing as humans develop homes and properties in formerly undeveloped lands in bear habitat. As these human developments expand, human-bear conflicts almost always increase. Both black bears and grizzly bears have been involved in human-bear conflicts in the Missoula area. Black bear conflicts are more common because the Missoula area has many more black bears than grizzlies. As the number of grizzly bears begins to increase in the North Hills and the Rattlesnake Wilderness area, human-bear conflicts involving grizzly bears will increase primarily in the northern end of the Bear Smart Missoula Focus Area. The same things that get black bears into conflicts with humans (see figure 2) will also get grizzly bears into conflicts. Applying the Bear Smart Community Program in the Missoula area will help reduce both black bear and grizzly bear conflicts.

When applying the Bear Smart Community Program in the Missoula area, the Missoula Bear Smart Working Group is focusing on human-bear conflicts that are related to urban/suburban human-related foods (Figure 4). Conflict with humans at developed sites is the primary cause of death for bears in the Missoula area and surrounding valleys. Livestock depredations are not the primary cause of human-bear conflicts in the Missoula area, so they are not fully addressed in this assessment. We recognize that conflicts with livestock occur on smaller farms and with 4H activities, as do conflicts with chickens in urban/suburban settings. These conflicts are addressed in the supporting materials in our assessment.

Management of human-bear conflicts has traditionally been reactive—bears and human-bear conflicts are dealt with after they happen. Reactive approaches to human-bear conflicts usually result in the death or relocation of the bear with little effort to solve the causes of the problem. The bear’s removal or relocation usually is not “owned” by the public or the community, leaving the source of the conflict unaddressed. Reactive methods rarely reduce human-bear conflicts over the long term.



Figure 4. Non-bear-resistant garbage containers along Pattee Canyon Road on May 3, 2022, and trash a bear dragged uphill into the woods on April 30, 2022. Photo by C. Servheen

From 2003 to 2021, Montana FWP averaged about 500 human-bear conflict complaint calls each year in the Missoula Valley. During that 19-year period, 73 black bears were killed for management reasons or killed by homeowners during conflicts, 150 black bears were trapped and relocated and 72 died in vehicle-related incidents. This yields a yearly average of nine black bears trapped and relocated, four black bears killed by managers and four black bears killed in vehicle collisions.

There is a better way to manage human-bear conflicts: the Bear Smart Community Program developed in British Columbia in the early 2000s.

We are hoping that the County Commissioners, Missoula Mayor and City Council, after reviewing the Missoula Bear Smart Working Group's Bear Hazard Assessment for the Missoula Area, will instruct the team to begin working on the Conflict Management Plan, focusing on the areas of greatest potential conflict identified in this assessment.

The Conflict Management Plan will include a timeline for implementing the criteria to become a Bear Smart Community, including identifying the agencies, groups and individuals involved, setting priorities and estimating the cost of the proposed management actions.

Missoula's Conflict Management Plan will involve:

- Monitoring the types and sources of human-bear conflicts
- Education and outreach
- Improving the management of garbage and waste
- Managing attractants like fruit trees and gardens
- Implementing and enforcing regulations
- Community planning
- Managing the bears that get into conflicts

The Bear Smart Community Program is designed to be adaptive. New management options or improvements can be incorporated during each phase. When Missoula becomes a Bear Smart Community, we will have fewer human-bear conflicts and greater public safety. In addition, the increased public awareness and involvement will reduce the actions and attractants that create human-bear conflicts.