

# Bow Valley Bear Hazard Assessment



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April 2007



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## Executive Summary

The Bow Valley, surrounded by federal and provincial protected areas, has been a magnet for developers and recreationists over the last decade. An influx of people and infrastructure has steadily crept into historical bear habitat and put pressure on local bear populations. As human use in the valley increases, so does the chance of bear-human conflicts. Much has been done to mitigate for conflict between bears and people in the valley. Programs such as bear-proof bins, birdfeeder bylaws, Bear Shepherding, attractant management, and the creation of wildlife corridors and highway underpasses have all required varying levels of compromise amongst stakeholders in the valley. Even with these advances, conflict continues to occur as a result of bears obtaining unnatural and natural foods in or near developments, bears becoming habituated and people not complying with local initiatives designed, in part, to reduce conflicts between wildlife and people. As this report outlines, formidable challenges exist. A long-range management plan for bears, that identifies adequate funding to implement, evaluate and sustain necessary programs, is required in order to meet the goals of reducing bear-human conflict and having a sustainable bear population in the Bow Valley.

## ACKNOWLEDGEMENTS

I would like to acknowledge the contributions of a number of people whose input made this document possible.

Jon Jorgenson, ASRD Bow Region Wildlife Biologist, assisted in many aspects of this report, including data sorting and analyzing. He provided valuable input into local bear management policy and procedure.

Angela Braun, ASRD GIS Technologist, assisted with the data analysis and creation of telemetry and bear-human interaction maps.

Nancy Ouimet assisted with the overall formatting of the document.

Joanna Kadi, who helped to edit the document.

Canmore District Fish and Wildlife Officer Ron Wiebe provided valuable information on bear-human conflict issues throughout the study area.

Bow District Conservation Officer Glenn Naylor provided valuable information regarding bear-human conflict information on Parks and Protected Area lands within the study area.

And lastly, to the numerous people within the Bow Valley who have provided their time and comments towards making the Bow Valley a better place for both bears and people.

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## Introduction

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This Bear Hazard Assessment will identify key areas and practices where bear-human conflict is occurring and why, and provide options for reducing that conflict. The report will also highlight the tremendous amount of work that has already gone into managing for wildlife, and more specifically, for bear-human conflict in the Bow Valley.

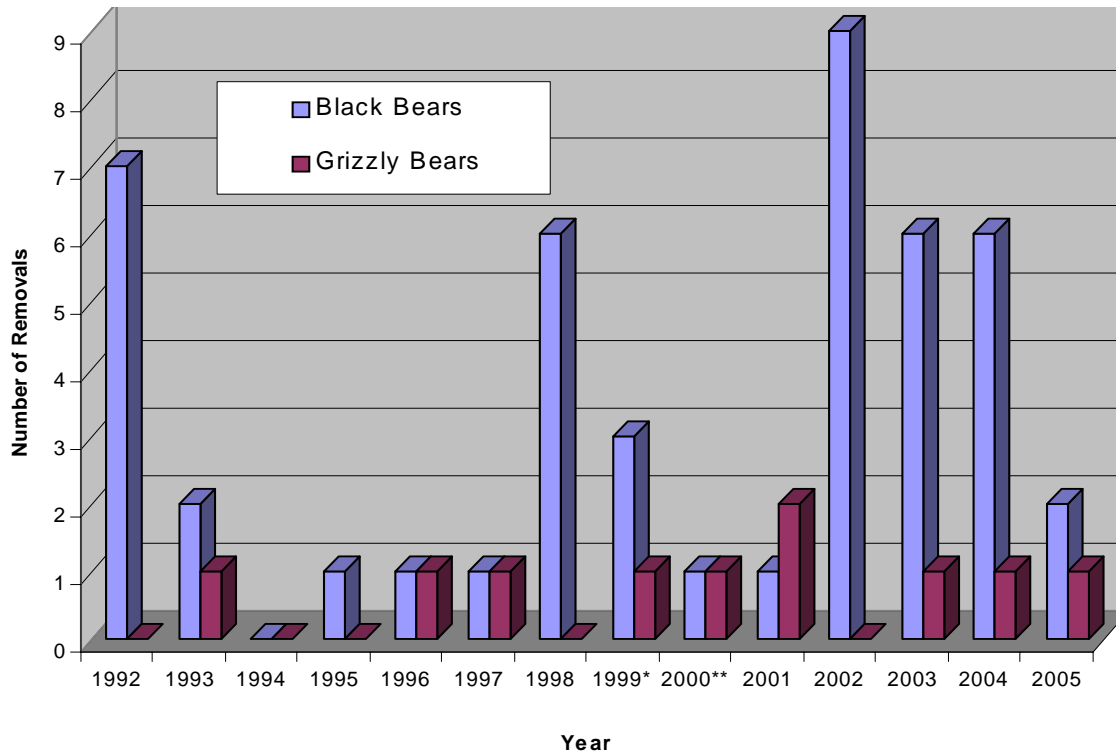
The Bow River around Canmore is an important linkage zone for large mammals, especially large carnivores travelling between the Kananaskis Valley, Banff National Park, and areas to the north (BCEAG, 1998). In addition, the Bow Valley provides important seasonal food resources for many species. However, use of the valley creates a number of challenges for wildlife, such as moving around residential and commercial developments, crossing the Trans Canada Highway and Highway 1A, and dealing with relatively high levels of recreational human use (Callaghan, C.J. and S. Everett, 2005).

The different jurisdictions within the Bow Valley have, in general, been proactive in their attempts to manage rapidly growing communities and a burgeoning tourism industry, which affects surrounding wild lands. There is only a finite amount of land in the valley and, not surprisingly, setting aside lands for wildlife while continuing to promote development and recreational use in the Bow Valley continues to be a challenge. Interactions between humans and wildlife are a fact of life here. They have occurred in the past and will continue to occur in the future.

The high level of human activity means that managing human-wildlife conflicts is increasingly complex. Large carnivores such as grizzly bears (*Ursus arctos*), black bears (*Ursus americana*), and cougars (*Felis concolor*) present an increasing concern from both a human safety and wildlife conservation perspective. The human fatality that occurred in 2005 as a result of a grizzly bear attack raised the issue of human-wildlife conflicts in a profound way. The success or failure of the various systems presently in place to manage wildlife in the Bow Valley hinges upon the community's ability to reduce negative wildlife-human interactions that can have serious consequences for both people and bears.

As development continues to expand in the Bow Valley, bears are forced to adjust their movement patterns to avoid developed sites and areas of high human use. In some cases, bears continue to utilize developed areas within municipal boundaries. Since 2000, five grizzly bears (three females and two males) have been relocated from the Bow Valley around Canmore, and one male grizzly bear has been destroyed (Figure 1). Twenty-five black bears have also been relocated or destroyed during this same period (J. Jorgenson, personal communication). The removal of these bears was a direct result of their coming into conflict with people.

Continued conflict between bears and people has resulted in the creation of policies and programs that affect developers, recreationists and residents alike. For example, long-term management closures of recreational trails in



**Figure 1.** Bear Management Actions Involving Removal (Relocation or Destruction) (1992 to 2005) (\* Canmore Bear-proof bins, \*\* Exshaw Bear-proof bins)

wildlife corridors and the rerouting of others have impacted recreational use in some areas. Also, developers often spend years working to obtain approval for future developments, and residents have been subject to municipal bylaws that, for example, now make it illegal to have bird feeders out during bear season. An effective waste-management program has reduced many of the unnatural food-related incidents between bears and people. For the most part, there is support and an understanding that these types of initiatives are part of living in the Bow Valley. It is apparent, though, that even with these credible and effective programs in place, more can and needs to be done.

There is a desire on the part of many stakeholder groups in the Bow Valley to move toward a long-term sustainable vision for wildlife management, with a special focus on bears. The Alberta government recognizes the importance of working collaboratively with local communities and businesses to ensure long-term sustainable populations of bears while reducing the risk of bear-human conflicts. This has resulted in the creation of the Bow Valley WildSmart Community group, which is comprised of a variety of stakeholders including local business, community members, non-governmental organizations (NGOs), biologists, and representatives from different levels of government.

The goal of WildSmart is to facilitate the development and implementation of living with wildlife initiatives east of the Banff Park gates to the Kananaskis River that reduce potential negative human/wildlife interactions and thereby support sustainable wildlife populations and human safety. (Bow Valley WildSmart, 2006)

An initial task of the Bow Valley WildSmart committee was to facilitate the creation of this Bear Hazard Assessment Report. The objectives of this report are to:

1. Identify the reasons why bear-human conflicts are occurring and what can be done to reduce those conflicts.
2. Identify where bear-human conflicts occur.
3. Provide a variety of options to mitigate these conflicts.

The next step will be to create and implement a sustainable bear management plan based on the issues identified and options put forth by this Bear Hazard Assessment. In addition, Bow Valley Wildsmart hopes that the information presented in this assessment will help to increase the public's awareness of bear-human conflict issues, reduce the number of bear-related human injuries, reduce the number of conflicts over the long term, and reduce the number of bears that must be relocated or destroyed.



Grizzly Bear by Trail Tracks  
Photo: © Derek Reich

## STUDY AREA

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The Bow Valley is situated in the Front Ranges of the Rocky Mountains one hour (100 kilometres) west of Calgary, Alberta. The study area includes lands within the Bow Valley from the eastern boundary of Banff National Park east to the Kananaskis River. The valley is bordered by a number of federal and provincial parks, and protected areas. These include Banff National Park, Bow Valley Wildland Provincial Park, Canmore Nordic Centre Provincial Park, Spray Lakes Provincial Park, and Bow Valley Provincial Park (Map 1). Other public lands include Alberta Forest Reserve. Municipalities within the study area include Canmore, Exshaw, Harvie Heights, Lac Des Arcs, Deadman's Flats and Little Kananaskis.

The natural vegetation of the valley is dominated by dense fire-origin coniferous forest cover. Topography ranges from flat areas along the Bow River valley bottom to steep mountainside terrain on each side of the valley (Walkinshaw, 2002).

The 2005 Canmore census placed Canmore's population at 11,442 people. Thirty three percent, or 3,790 people are considered part-time (S. Ketterer, 2005). The other municipalities add another 1,100 residents to the valley of which 2/3 are considered permanent (M.D. Bighorn, 2003).

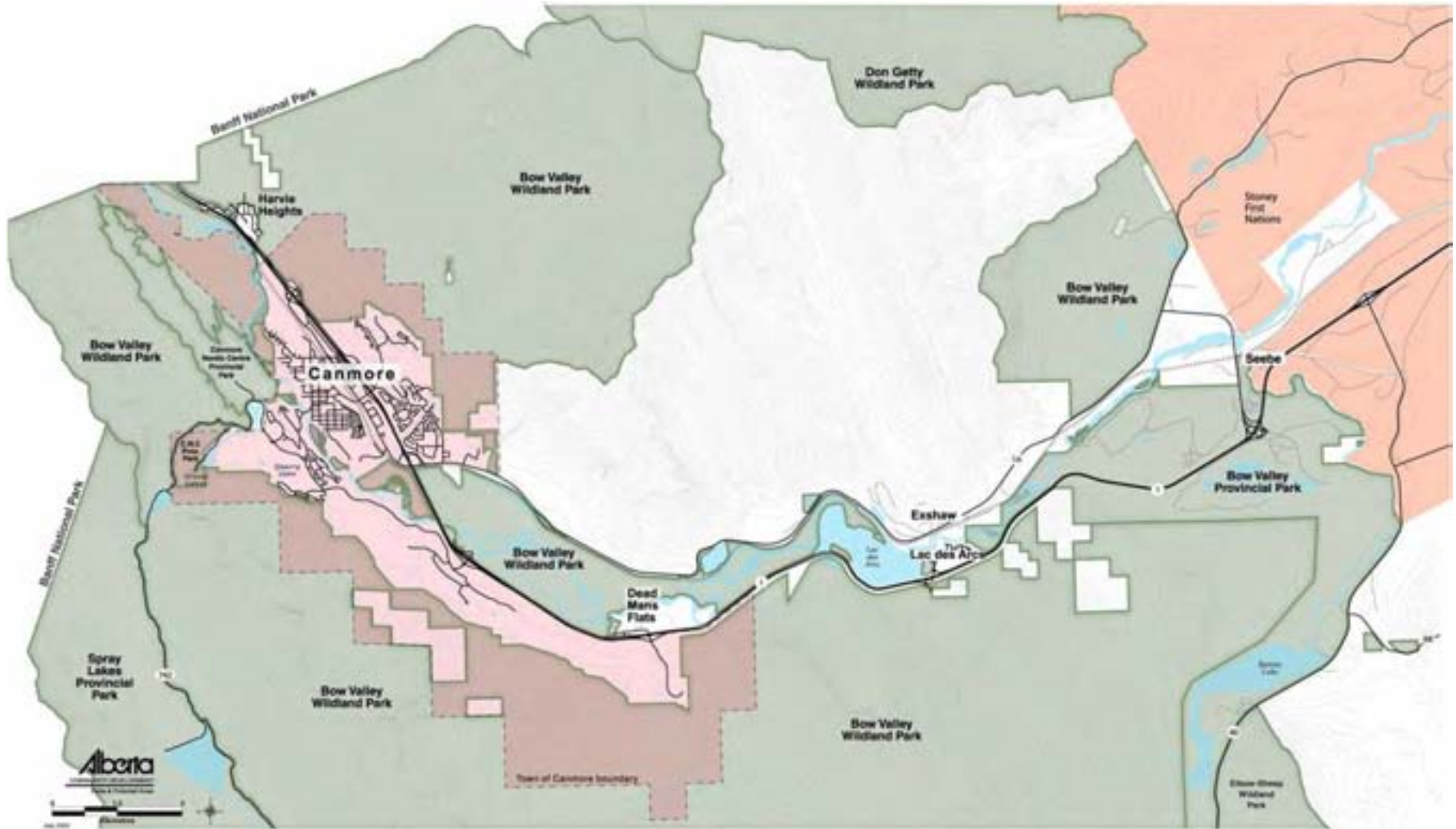
In addition, the City of Calgary has a population of more than 990,000 people (City of Calgary 2006). Should present growth rates continue, the City of Calgary's population is expected to reach 1.5 million by 2030 and the central east slopes 100,000 people (Stelfox et al. 2005).

The Bow Valley is considered an international tourist destination. The Town of Canmore attracts up to 1.3 million people annually, based on hotel occupancy rates. In addition, Tourism Canmore estimates 7,000 to 10,000 people per day visit Canmore during the summer months of June, July, and August (J. Samms. personal communication). Banff National Park visitation rates are forecast to grow from 3.1 million visitors in 2005 to 10 million visitors by 2030 (Stelfox et al. 2005).

The Trans Canada Highway, a four-lane divided highway, is situated along the valley floor and experiences traffic volumes of up to 21,000 vehicles per day in the summer. There is a double-lane highway, Highway 1A, which has a traffic volume of approximately 300 vehicles per day in the summer months (ESGBP 2005). A two-track transcontinental railway also runs the length of the valley adjacent to the Bow River. Researchers with the Eastern Slopes Grizzly Bear Project (ESGBP) "know of no other area within occupied grizzly bear habitat in North America that has such an extensive network of high speed, high volume highways" (Gibeau et al. 2005).

Other developments include a multitude of hotels, motels, bed and breakfasts, and mountain lodges. There are seven campgrounds, numerous picnic areas, four 18-hole golf courses, with an additional 18-hole course due to open in the next couple of years, and an extensive network of hiking, biking, and equestrian trails. The Bow Valley watershed has been described as "...one of the most intensively developed landscapes in the world where a grizzly bear population still

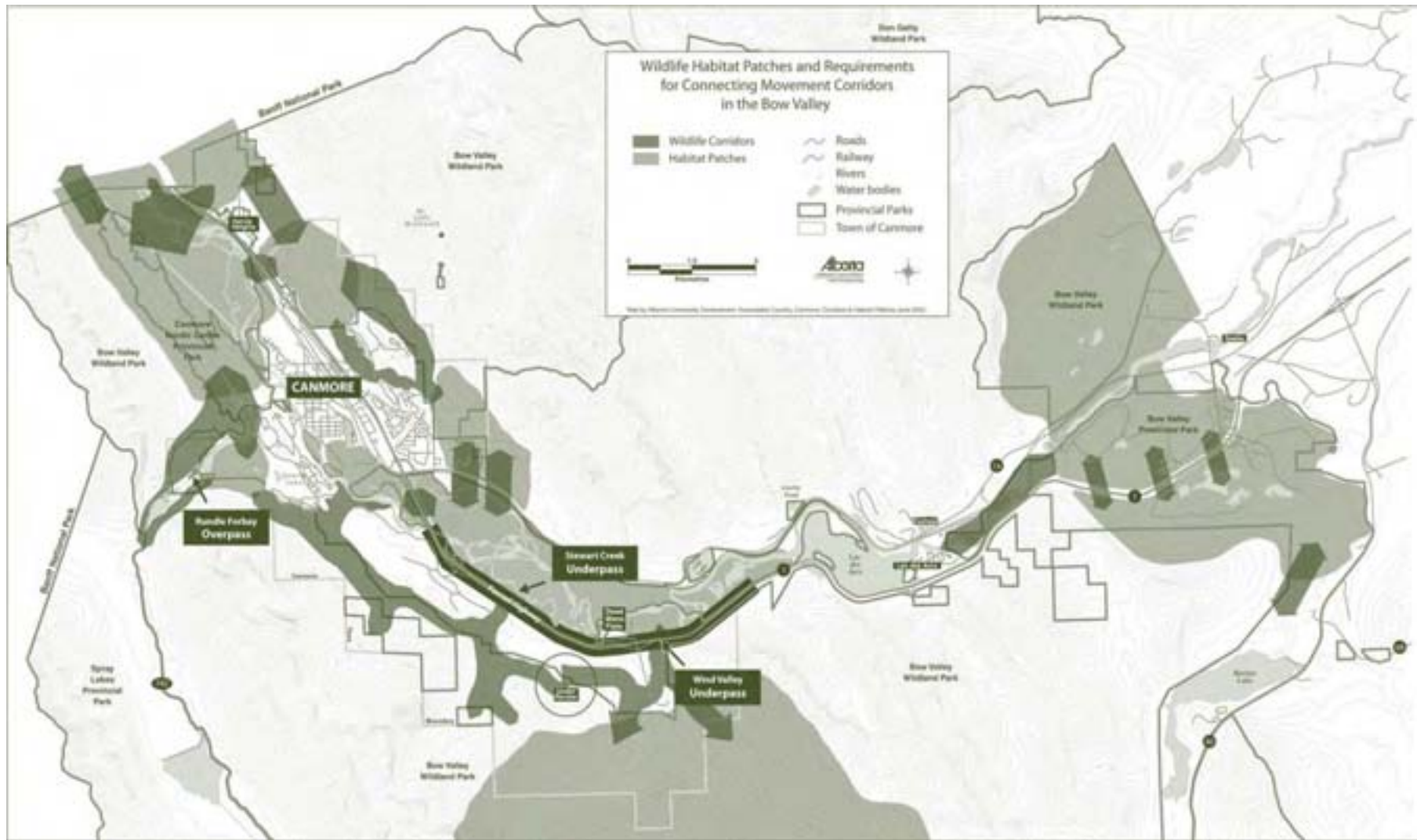
Map 1. Jurisdictional Boundaries within Bow Valley Study Area



survives” (Gibeau 2000, Herrero et al. 2000).

An extensive network of wildlife corridors and habitat patches has been identified and protected within the Bow Valley (Map 2). This network is intended to provide connectivity between larger regional habitat areas (for example Banff National Park and Wind Valley) and smaller local habitat patches within the valley. These areas are intended to be functional for large carnivores including grizzly and black bears. Current research data indicates that these areas are functioning in varying degrees for bears.

**Map 2.** Identifying Network of Wildlife Corridors and Habitat Patches in Bow Valley



## METHODOLOGY

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Historical information related to bear activity in the Bow Valley was obtained from District Occurrence Reports compiled by Alberta Sustainable Resource Development (ASRD) and Alberta Community Development (ACD). This includes occurrence records dating back to 1986, aversive conditioning records between 2000 and 2005, general bear observation data, and discussions with ASRD Fish and Wildlife Officers, biologists, and ACD Conservation Officers. These included records of conflicts pertaining to both unnatural and natural attractants. Discussions were also undertaken with stakeholders within the study area in order to gain a better understanding of their perceptions of bear-human conflict issues. These stakeholders included government agency wildlife managers, recreational groups, businesses, and not-for-profit organizations. Agency Wildlife Observation databases were also reviewed to further complement the District Occurrence data.

Radio telemetry data from a variety of sources including ASRD, ACD, Wind River Bear Institute (WRBI), Banff National Park, and the Eastern Slopes Grizzly Bear Project was used to identify bear distribution within the study area. The majority of telemetry records were obtained from GPS radio-collars placed on three grizzly bears. These collars provided unbiased data collected at hourly intervals 24 hours a day. Other data was obtained from bears fitted with standard VHF radio-collars. Data from these bears was obtained via ground telemetry from primarily roadways and only included locations obtained during daylight hours.

Information from a variety of sources was used to identify where bear activity and human use were occurring within the study area, as well as where and to what level bears were interacting with people. Bear interactions, a combination of bear sightings and bear-human conflicts, were tabulated. Sightings included actual sighting reports from the public and staff where no threat to people or bears was deemed to be present. Bear-human conflicts were defined as incidents where there was a perceived threat to individuals that may have resulted in personal injury such as a bluff charge, property damage, or incidents involving unnatural food attractants. An analysis of the specific types of bear-human conflicts, and when and where they occurred, was done. These included incidents where bears closed distance on people, obtained natural foods, including berries or carcasses, or when bears were located in or near people and developments. They also included bears that obtained unnatural foods such as garbage, birdfeed, human food, pet food, ornamental fruit trees, barbeques or compost. This information was divided into two primary bear seasons; pre-berry season (den emergence to July 15) and berry season (July 16 to when bears return to the den for winter). This was done to identify increased use of some areas of the Bow Valley during the spring, and to other areas once the berry season begins in midsummer. Data was separated by species into black bear and grizzly bear or in the case of the species not being known, unknown.

It was important for the purposes of this assessment to identify where certain types of conflicts occur and to spatially identify areas of historically high bear-human interaction at

certain times of the year. Other than telemetry points, most of the Occurrence record information could not be pinpointed to an exact location. Only a general description of the location was recorded. To spatially analyze the records, the study area was divided into a number of Location Zones to which individual occurrence records could be assigned (Map 3). Zones were identified within the study area, primarily based on municipal or geographical boundaries. The Town of Canmore was subdivided into a number of Zones of roughly equal areas. Campgrounds, golf courses, and other recreational nodes were identified as unique Zones.

The area (square kilometres) of each Location Zone was determined following removal of non-bear habitat such as rock, ice, and water bodies. The result was a comparative density value number, calculated in records per square kilometre for each Location Zone. Using a density value allowed for comparison between Location Zones of unequal size. A density value was used to compare Location Zones with the radio-telemetry data and bear-human interaction data. In total, over 15,000 records were compiled and attributed to Location Zones.

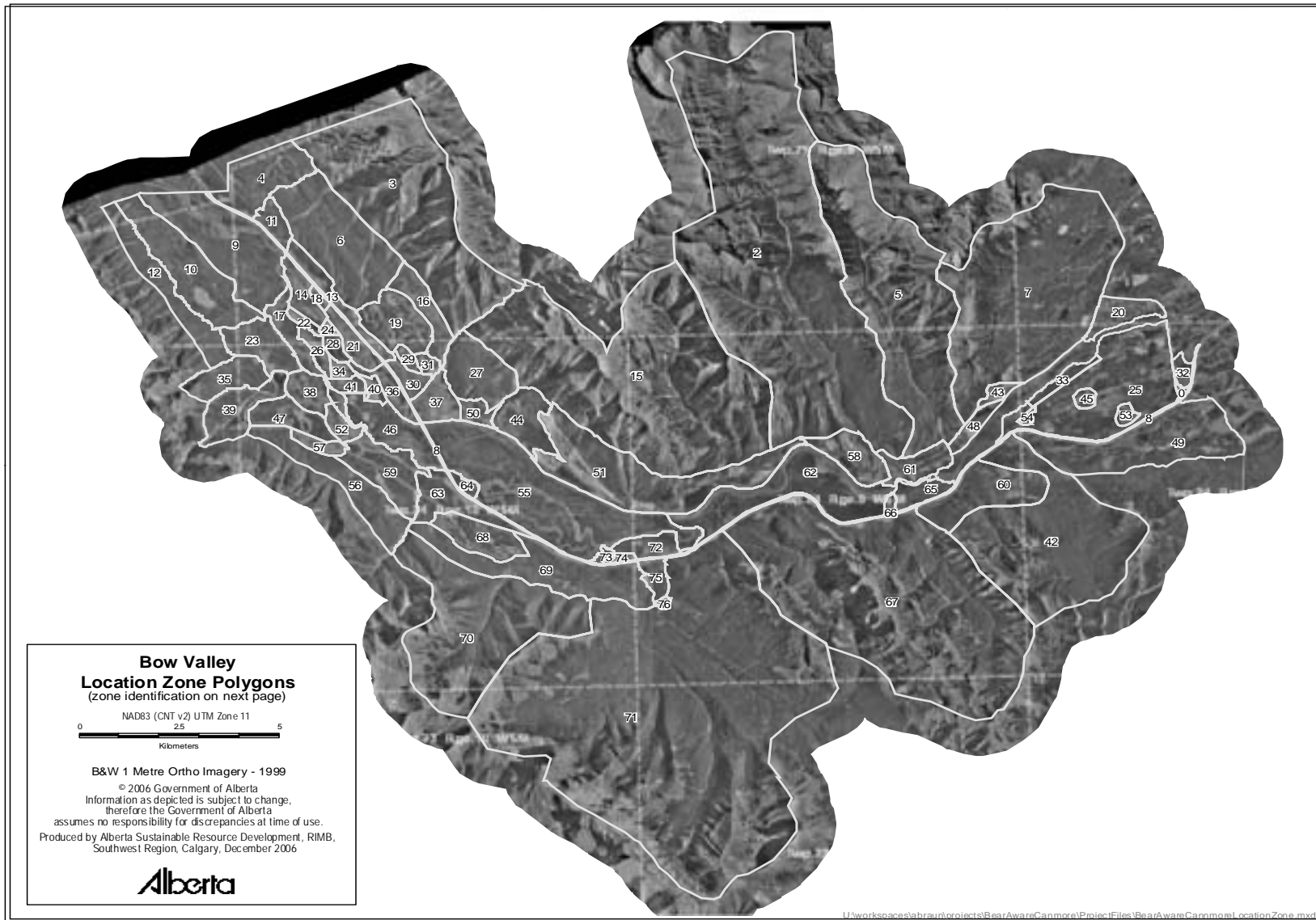
Records of occurrences were assigned to respective Location Zones. It was common for the telemetry data to have multiple locations for some individual collared bears in the same location zone during a single day. In these instances, only one record was used for that bear to avoid bias in the sample. In other words, if the same bear was seen five times in Rundview on the same day, it was counted as one incident for that particular zone. This was done to address the concern of varying numbers of reports of bears

received from the public in a particular zone. If it could be confirmed that the bear reports focused on different bears, then it was recorded as two incidents for that zone. For example, if Grizzly Bear #70 and Grizzly Bear #69 were at Quarry Lake on the same day, it was recorded as two different grizzly bear incidents for that zone. Additionally, if these bears travelled to different zones during the same day they would be recorded as being in each zone that day.

Once the density of telemetry points for each Location Zone was calculated, each Zone was ranked Low (0.1 to 15 points per square kilometre), Moderate (15.1 to 31 points per square kilometre), High (31.1 to 47 points per square kilometre), and Very High (more than 47 points per square kilometre). Zones with no telemetry points were left as zero. Telemetry locations were biased towards grizzly bears, which have been formally studied more than black bears in the valley. The locations of the collared grizzly bears studied were all south of the Trans Canada Highway. Telemetry data may, therefore, be under-represented on the north side of the highway where grizzly bear activity is known to occur.

Bear-human interactions were analyzed to identify high-activity areas. Interactions included both bear sightings and bear-human conflicts. Values were calculated for each Location Zone based on the number of records of bear interactions per square kilometre. An analysis of Location Zones was carried out to compare each zone's interaction potential. These values or comparative rankings were Low (0.1 to 25 interactions per square kilometre), Moderate (25.1 to 47.0 interactions per square kilometre), High (47.1 to 75 interactions per square

Map 3. Location Zones



**Bow Valley  
Location Zone Polygon Identification**

(zone map on previous page)

Location Zone ID	Location Zone
2	Exshaw Creek
3	Mt. Lady MacDonald
4	Harvie Heights West
5	Jura Creek
6	Harvey Heights East
7	Yamnuska
8	TCH
8	TCH
9	Georgetown Flats
10	CNC Trails
11	Harvie Heights
12	Upper CNC
13	Johnny's Stables & Interchange
14	Canmore Golf Course
15	Upper Grotto
16	Cougar West
17	Bow River Channel
18	Service Strip
19	Silvertip
20	KC Guest Ranch
21	Tee Pee Town
22	Larch
23	CNC Facilities
24	Recreation Centre
25	BVPP
26	Fairholm
27	Cougar East
28	Policeman's Creek
29	Benchlands Terrace
30	Cougar Creek
31	Eagle Terrace
32	Willowrock Campground
33	BVPP Facility Strip
34	Central Business District
35	CNC Old Ski Hill
36	Bow Valley Strip
37	Elk Run
38	Rundleview
39	Grassi Lake
40	Restwell
41	South Canmore
42	Quaite Valley
43	Kananaskis Townsite
44	Graymont
45	Middle Lake
46	South Industrial
47	Quarry Lake
48	Continental Line
49	Camp Chief Hector
50	Alpine Club
51	Grotto
52	Homesteads
53	BVPP Housing
54	Many Springs
55	Bow Flats
56	Grassi Corridor
57	Grassi Subdivision
58	LaFarge
59	Resort Centre
60	Quaite Valley Trails / Campground
61	Exshaw
62	Bow Des Arcs
63	Three Sisters Creek
64	Bow River Campground
65	Lac Des Arcs
66	Lac Des Arcs Campground
67	Heart Wildlands
68	Stewart Creek Golf Course
69	Three Sisters South
70	Upper Stewart Creek
71	Wind Valley
72	Dead Mans Flats East
73	Three Sisters Campground
74	Dead Mans Flats

U:\workspaces\lab\raum\projects\BearAware\Canmore\ProjectFiles\BearAware\Canmore\LocationZone.mxd

kilometre), Very High (75.01+ interactions per square kilometre), or zero interactions per square kilometre. Data was analyzed on a Location Zone basis for the pre-berry and berry seasons. Data was also analyzed by species.

Types of bear conflicts were compared by Location Zone and jurisdiction. Jurisdictions included the Town of Canmore, M.D. of Bighorn, and provincial lands. These rankings were not calculated using the number of records per square kilometre for each zone, as sample sizes for actual conflicts in each zone were often too small. Rather, the values indicate the actual number of conflicts that occurred in that Zone.

An analysis of bear conflict incidents from 2001 and onwards was done. This is an attempt to more accurately reflect current issues of the day rather than, for example, including garbage-related conflict records prior to bear-proof garbage bins being installed throughout the Bow Valley. Garbage and birdfeeder conflicts were examined specifically for the five years prior to bear-proof bin installation and birdfeeder bylaw in order to better understand the impact these two decisions have had.



Black Bears Crossing Road  
Photo: © Unknown

## RESULTS AND DISCUSSION

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Conflicts between humans and grizzly bears are a significant concern to wildlife managers because such interactions threaten human safety and property and could result in the loss of wild bear populations through increased bear mortality (Gilbert, 1989). Conflicts have the potential to occur when bears and humans come in contact with one another. To a large degree, conflicts are a reflection of overlapping bear and human distribution. Certain human behaviours attract bears into areas they might not normally go, through the unintentional provision of food attractants. Within the Bow Valley, there are areas of high human use such as residential areas, campgrounds, community parks, and schoolyards where bears cannot be tolerated for human safety reasons. Areas outside of these locations are considered habitat for bears and other wildlife. They include wildlife corridors and habitat patches. These areas are affected by varying levels of human recreational activity and as such are areas of potential bear-human interactions.

Ideally, bear-human interactions within developed areas should be relatively low compared to non-developed areas where bears are expected to be. This, however, is not always the case.

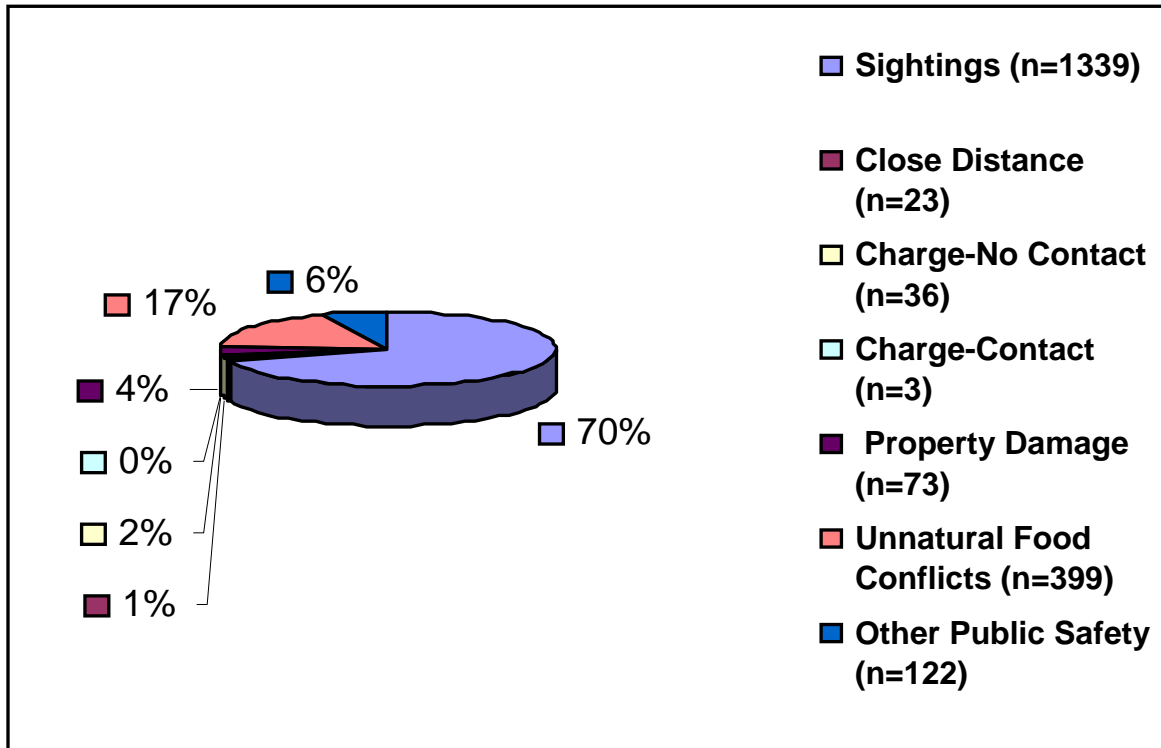
### A. HAZARD ANALYSIS

When bears and people overlap on the landscape in their respective activities, it can lead to interactions between the two. Bears are large carnivores with the potential to harm and/or kill humans. In the Bow Valley, space for both bears and people is finite and interactions are inevitable. Determining the causes, types, and

locations of these interactions is key to developing strategies designed to reduce such interactions and to lessen the potential for harm to humans and/or bears. Since 1985, the majority (70 percent) of interactions between bears and humans in the Bow Valley have been relatively benign and would more appropriately be considered as Sightings (Figure 2). However, 30 percent of recorded interactions are considered bear-human conflict or public-safety incidences. The majority of these interactions involve bears that found unnatural food sources (such as garbage, birdfeeders, human food, fruit trees, pet food) usually associated with human activity. The next highest category of interactions involves bears persistently hanging around human facilities and creating a safety concern; however the reasons for their persistence were not identified. The numbers of serious, aggressive, bear-human interactions were extremely low with only three records of bears injuring people. While low in number, these kinds of incidences are considered serious.

#### a) Bear Distribution

Unfortunately, a good predictive grizzly bear or black bear model with which to map bear distribution in the Bow Valley does not exist. The best information comes from a small sample of radio-collared grizzly bears and black bears from which unbiased telemetry location data is available. This data comes primarily from three grizzly bears (two females, one male) fitted with GPS collars.

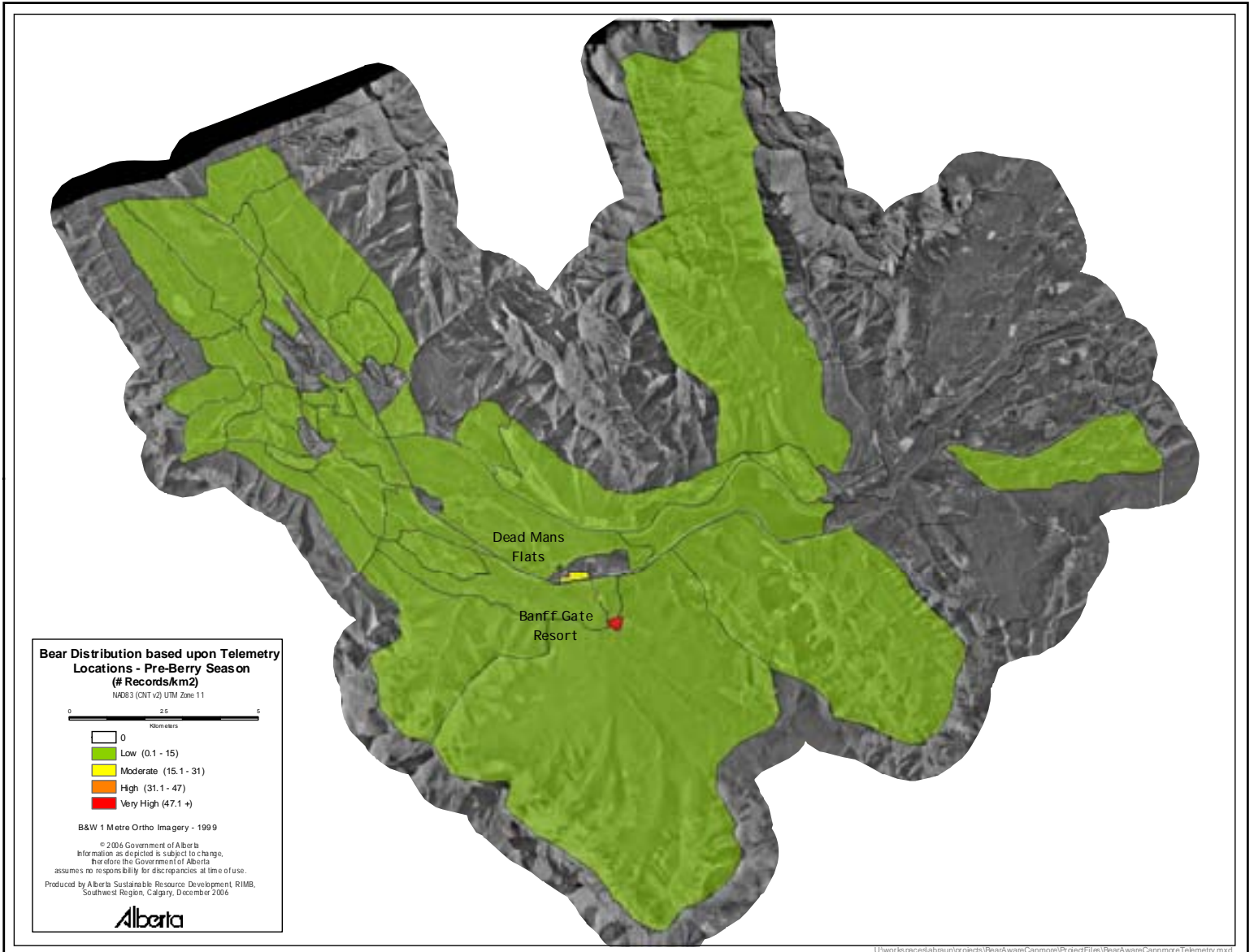


**Figure 2.** Categories of Bear-Human Interactions in the Bow Valley (1985 to 2005)

Bear distribution in the Bow Valley, based on telemetry data, differed between pre-berry and berry seasons (Map 4 and 5). For both seasons, relatively few Zones ranked in the High, Very High, or Moderate categories. Most Zones were ranked Low, and many had no locations recorded. Bears were not evenly distributed across the valley but were concentrated in only a few areas. Some Zones where bears, particularly

grizzly bears, have been appearing more frequently in recent years (for example some Zones on the north side of the valley) only appear in the Low category. This is a problem with the small sample size of collared bears and the fact that bears on the north side of the valley are under-represented in the collared bear sample. This needs to be considered when reviewing the bear distribution data.

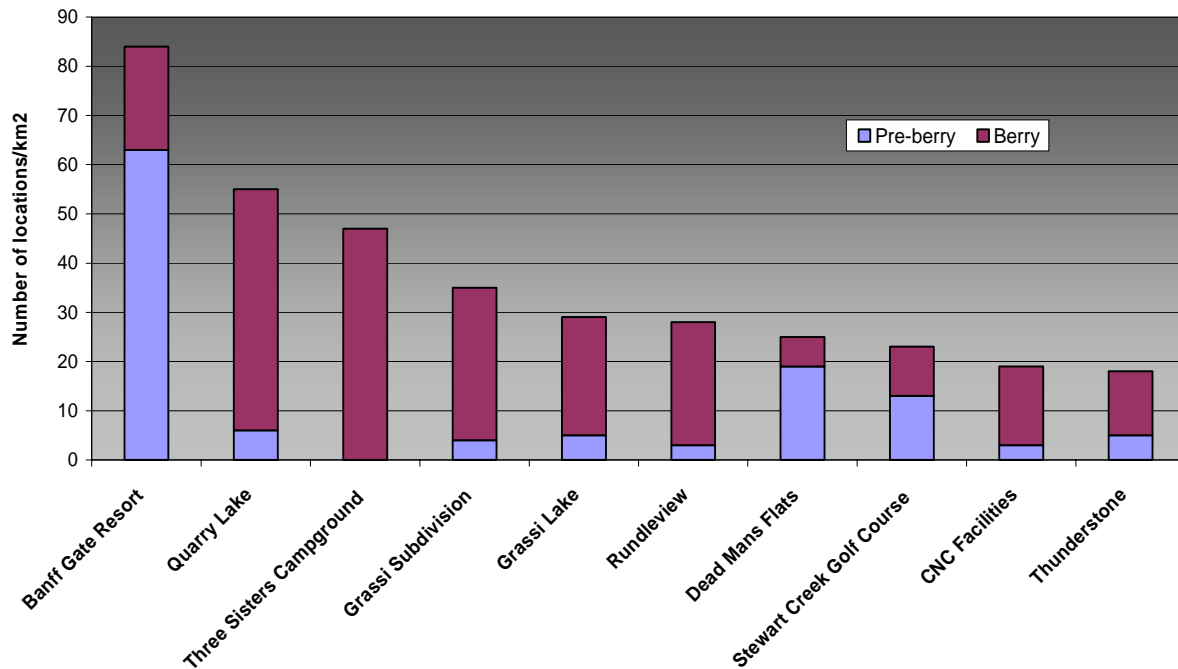
**Map 4. Bear Distribution Pre-berry Season**





The most frequently used Zones during the pre-berry season were Banff Gate Resort (Very High), Deadman’s Flats (Moderate). All other Zones were ranked far down in the Low category. The Very High rating given to Banff Gate Resort is partially a reflection of its small area. Standardizing sizes results in zones with small areas often showing a high density of locations even though the absolute number of records might be small. During the berry season, there were many more Zones with High to Moderate bear use. This reflects the influx of

bears into the valley during the berry season to take advantage of berry-producing shrubs. The highest used Zones during the berry season were Quarry Lake (Very High), Three Sisters Campground (Very High), Grassi Subdivision (High), Rundlevview (Moderate), Grassi Lakes (Moderate), Banff Gate Resort (Moderate), CNC Facilities (Moderate), and CNC Old Ski Hill (Moderate). Three Sisters Campground, which was highly used by bears during berry season, was not used at all during pre-berry season (Figure 3).



**Figure 3.** Density of Telemetry Locations by Season and Highest Location Zone 2000 to 2006

## **b) Analysis of Historical Occurrence Records**

A major component of any bear hazard assessment is the review of historical records related to past bear-human conflicts and interactions. Such information provides a helpful perspective on the number, types, causes, and locations of previous incidences. It allows for the focusing of management efforts designed to reduce potential conflicts and identify the highest priority causes and locations. For the Bow Valley, there is a significant database of past documentation from a variety of sources. Staff records, public sightings, and scientific telemetry records allow for a good analysis of the problem over a broad time frame.

### **i) Distribution of Bear-Human Interactions**

Bear-human conflicts and interactions occur when bears and human occupy the same landscape. Mapping the spatial distribution of conflicts and sightings can provide a relative representation of where humans are likely to encounter bears. As has been previously stated, most interactions in the Bow Valley are considered sightings. Interactions also include conflicts that may be described as any incident that has the potential to cause injury, property damage, or both. These are categorized as bears feeding on garbage, human food, pet food, carcasses, ornamental fruit trees, compost, barbeques, and golf course vegetation.

The spatial display of interactions is intended to highlight those areas that have the potential for conflict. Areas with high levels of bear-human interactions are considered to hold higher risk for encounters between humans and bears. Bear-

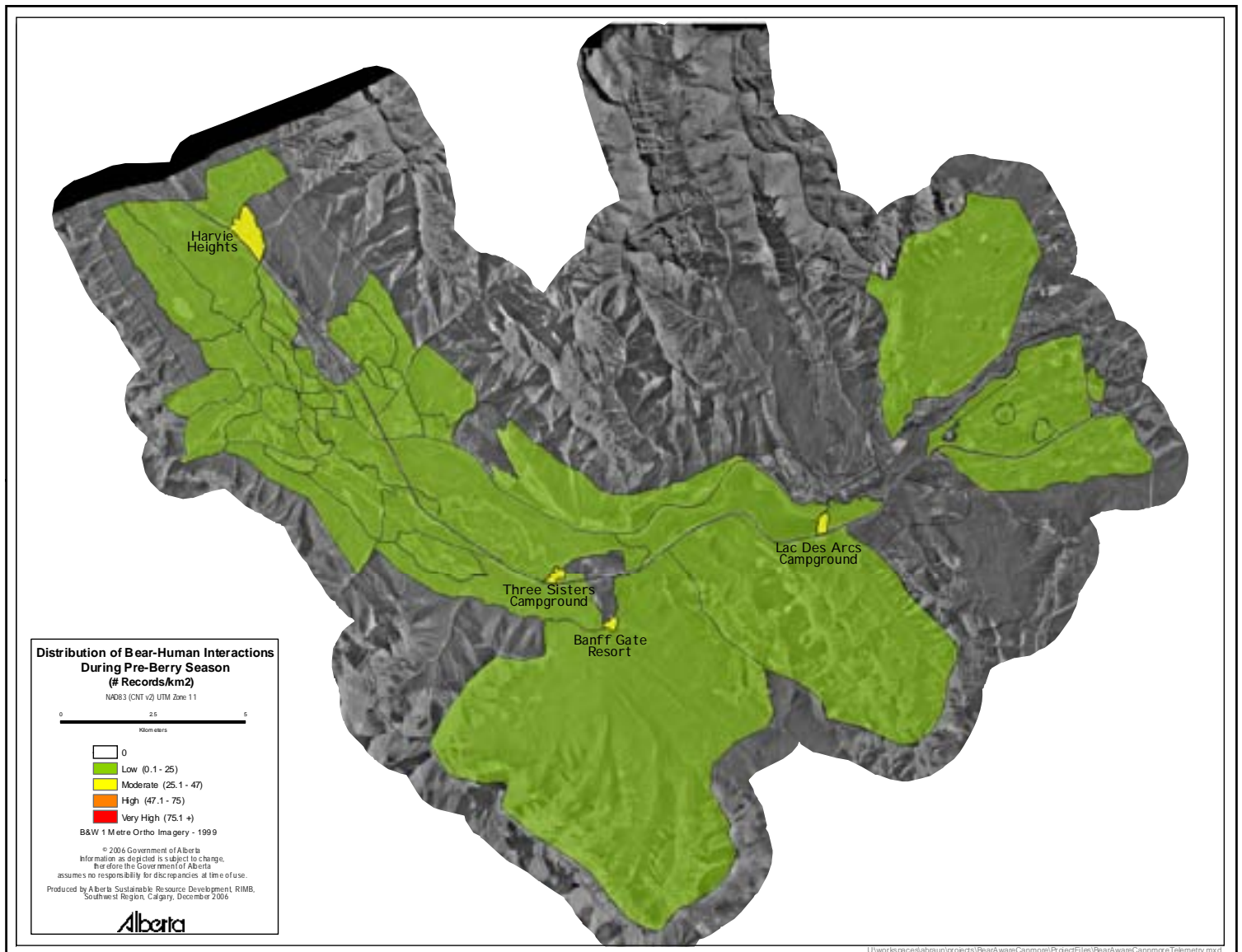
human interaction data (sightings and conflicts) was examined and ranked by Location Zone during pre-berry and berry seasons between 2001 and 2005 (Maps 6 and 7).

In addition to bear-human interactions, bear-human conflicts were also ranked. The numbers of conflicts were calculated by Location Zone, and based on the number of incidents that occurred in that Zone. While human-use levels were not available for each Zone, the majority of Zones where conflict occurred was in high human-use areas with relatively small land bases.

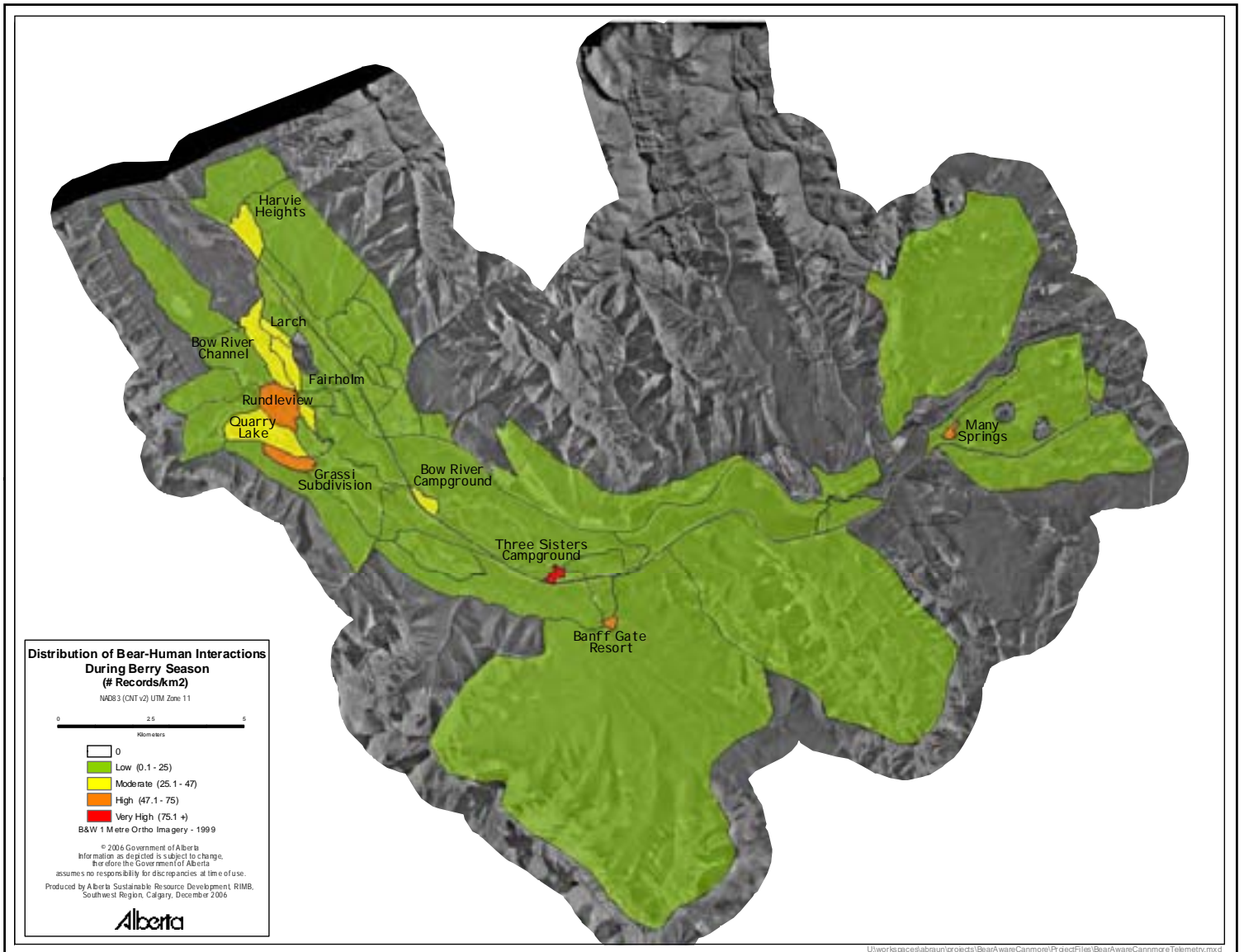
Areas of high human use with small land bases, such as subdivisions or campgrounds, have a much higher density of interactions (Figure 4). Sixty-five percent of the total interactions between 2001 and 2005 occurred during berry season. Berry season is also when human use is highest. During pre-berry season the relative density of interactions in each Zone was low throughout the valley. Only four Zones were rated Moderate: Banff Gate Resort, Three Sisters Campground, Lac des Arc Campground, and Harvie Heights. No Zones were rated higher than Moderate in the pre-berry season.

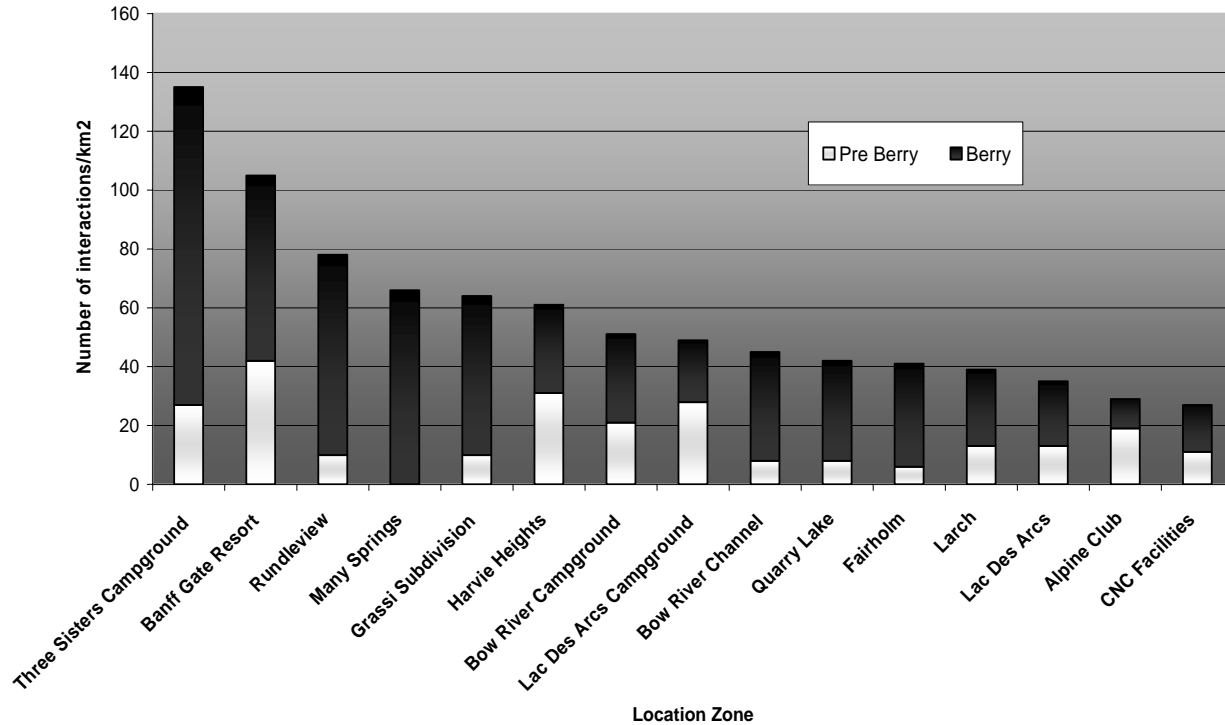
The likelihood of interaction was greater during berry season with nine Zones being rated Moderate to Very High. Three Sisters Campground was the only Zone rated Very High during this time, while Runderview, Many Springs, Banff Gate Resort, and Grassi Subdivision ranked High. Some Zones with relatively few actual interactions ranked Very High due to the small area the Zone represented. This was typical of locations such as Banff Gate Resort and Many Springs in Bow Valley Provincial Park.

**Map 6. Bear Interactions During Pre-berry Season**



**Map 7. Bear Interactions During Berry Season**





**Figure 4.** Highest Ranked Location Zones of Bear-Human Interaction Densities by Season (2001 to 2005)

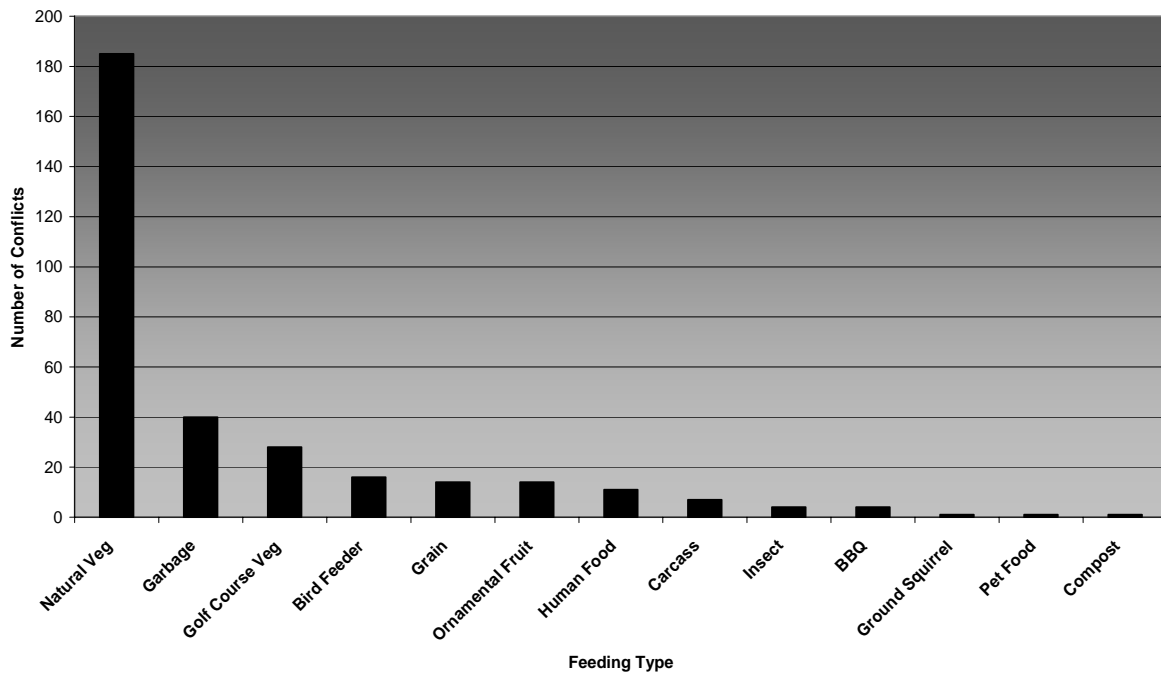
Many Springs recorded no interactions during pre-berry season but had a relatively high number of interactions per square kilometre during the berry season. It is felt that these areas still warrant the Very High ranking due to higher likelihood of bear-human interactions as opposed to a Location Zone with a higher number of actual interactions and a larger land base.

There were three times as many black bear interactions as grizzly bear; of those black bear

interactions, twice as many occurred during berry season. There was almost twice as much grizzly bear activity during berry season. The vast majority of berry-season, grizzly bear activity occurred on the south side of the valley in between Stewart Creek Golf Course and the Canmore Nordic Centre. Grizzly bear activity was more random during pre-berry season. Canmore had the greatest number of actual interactions, 443, followed by provincial lands, 355, and the M.D. of Bighorn, 116.

## ii) Attractants

Attractants are a major source of interactions between bears and humans in the Bow Valley. These attractants can be either natural bear foods such as buffaloberry (*Shepherdia canadensis*) or unnatural foods such as garbage, birdfeeders, and compost. Many current bear problems in the Bow Valley result from bears feeding on natural and unnatural foods in and around developments with high human use (Figure 5).



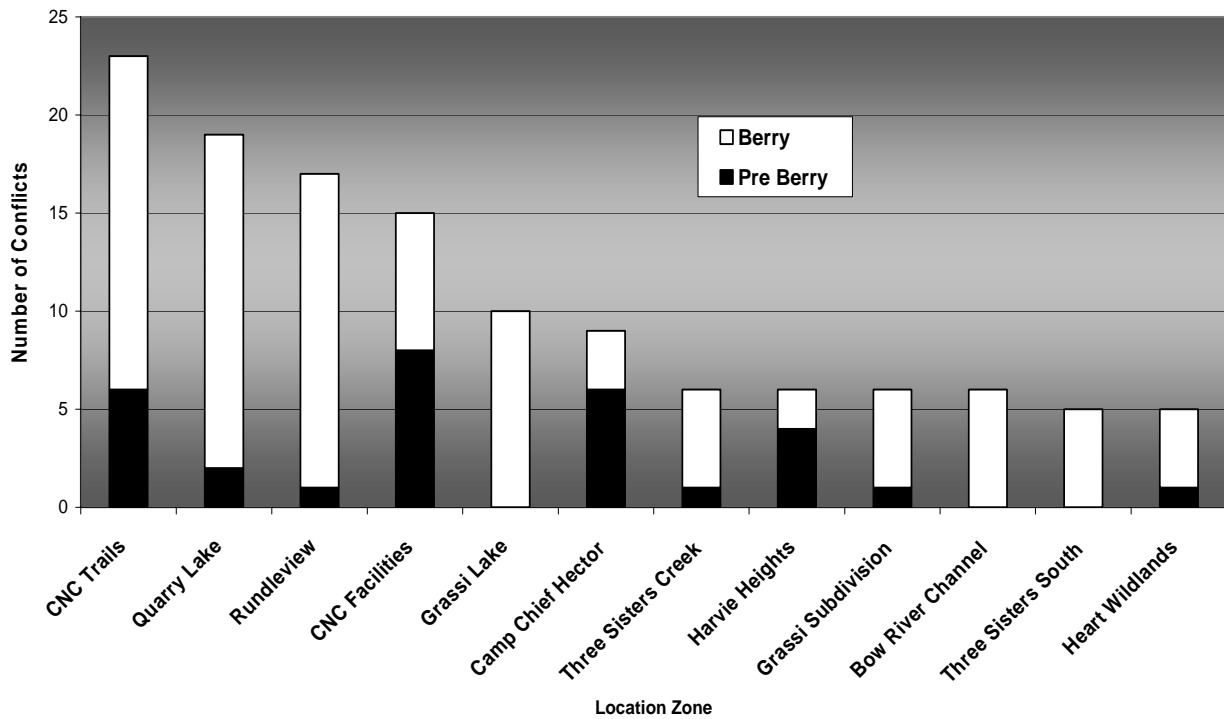
**Figure 5.** Type of Food Attractant Involved in Bear/Human Conflict (2001 to 2005)

Records of specific feeding incidents suggest that natural foods are the predominant attractant involved in bear-human conflicts (185 of 386, or 57 percent). This is followed by garbage incidents (40), golf-course vegetation (28), birdfeeders (16), grain (14), ornamental fruit (14) and human food (11). The presence or absence of a particular attractant was not always noted in the Occurrence report. Therefore, conflicts involving natural vegetation are possibly under represented in the database. Much of the interactions involving bears feeding on buffaloberry occurs on the south side of the Bow

Valley at the CNC Zones, Grassi Lake, Quarry Lake and Rundlevie (Figure 6).

### Natural Attractants

Natural attractants consist of natural vegetation such as spring grasses, buffaloberry, Dogwood (*Cornus sp.*), Wolfwillow (*Elaeagnus commutata*) and Chokecherry (*Prunus sp.*). Carcasses' or dead wildlife, also constitute a portion of a bear's diet. It is reasonable to expect bear activity to occur where these natural foods exist.



**Figure 6.** Number of Bear-Human Conflicts Involving Natural Vegetation Attractants by Location Zone and Season (2001 to 2006)

## Vegetation

Natural vegetation attractants take the form of early season green-up in the spring and berry bushes during the summer and fall months. Managing these attractants is a key factor in reducing the level of bear activity in and around developed areas.

Almost 70 percent of natural-attractant bear activity occurs during berry season. The main attractant species is buffaloberry, which grows well in open forest canopies that provide natural light to the forest floor. The majority of natural-food-related incidents involve black bears, with grizzly bears accounting for approximately one-third of all incidents. Disturbed sites such as trails, picnic areas, campgrounds, and residential areas may encourage buffaloberry growth due to the thinning of forest canopies. This may also be true with Firesmart thinning and Pine Beetle projects. The fact that these natural attractants grow in and adjacent to developed areas means that bears can be expected to frequent these areas. As a result, bear-human interactions are likely to occur.

Studies have shown that large carnivores, such as bears, use vegetative cover for security from human disturbance (BCEAG, 1998; McLellan and Shackelton, 1989). The vegetative cover that exists within developed areas where bears have been known to feed may act as secure zones for bears and therefore encourage them to use the area.

## Carcasses

Carcasses also constitute a part of a bear's diet. The majority of incidents involving carcasses occur during fall hunting season when the

remains of successfully hunted animals are more prevalent. Bears are also capable of killing animals. An example of this occurs in the spring when bears successfully hunt for moose calves shortly after they are born.

Road-kills are another potential source of conflict and may create a dangerous situation for the bear feeding near or alongside a highway. Obviously, it is dangerous for people to come upon bears feeding on a carcass. Historically, road-killed animals have been deposited at specific sites within the Bow Corridor deemed to be safe locations where carnivores such as wolves, bears, and cougars could feed. As development and human activity have increased in the Bow Valley over the last decade, there has been concern about the location of these sites. As a result, many of the traditional carcass dump sites, such as the old Burnco Pit site, are no longer being used. Volker Stevin, the contractor responsible for removing road-killed animals in the Bow Corridor, in consultation with ASRD, has agreed to build an incinerator east of the Kananaskis River in the Bow Valley, in order to more safely dispose of these carcasses (R. Wiebe, personal communication).

## Unnatural Attractants

Unnatural attractants include garbage, human food, birdfeeders, pet food, compost, barbecues, golf-course grasses and ornamental fruit trees such as Crabapple (*Malus sp.*), Mountain Ash (*Sorbus sp.*), and Chokecherry (*Prunus virginiana*) (Figure 5). Some bears are willing and able to acquire these foods if given the opportunity, particularly if access to them is easy. Once obtained, bears continue to pursue these foods persistently.

The majority of conflict incidents between 2001 and 2005 involving unnatural foods were black bear related. Only 7 percent (6 of 85) of unnatural food-related conflict incidents involved grizzly bears. Fifty-seven percent (45 of 79) of black bear incidents occur during berry season. Most of the unnatural attractant incidents in the Bow Valley occur within existing communities or facilities. These include Canmore (garbage, birdfeeders, ornamentals, barbecues), Lac Des Arcs (birdfeeders, human food, ornamentals, barbecues), Exshaw (ornamentals, garbage, compost), Harvie Heights (birdfeeders, garbage), and Provincial Park campgrounds (human food, garbage).

Studies have shown that grizzly bear mortalities occur in areas where food and garbage is not managed well (Benn 1988, Benn and Herrero 2002). It could be argued that the numbers of unnatural food related incidents in the Bow Valley are relatively low. However, even with few incidents occurring, bears are still being relocated or destroyed. This is reason enough to continue to work towards more consistent and proper management of food and garbage.

### **Garbage**

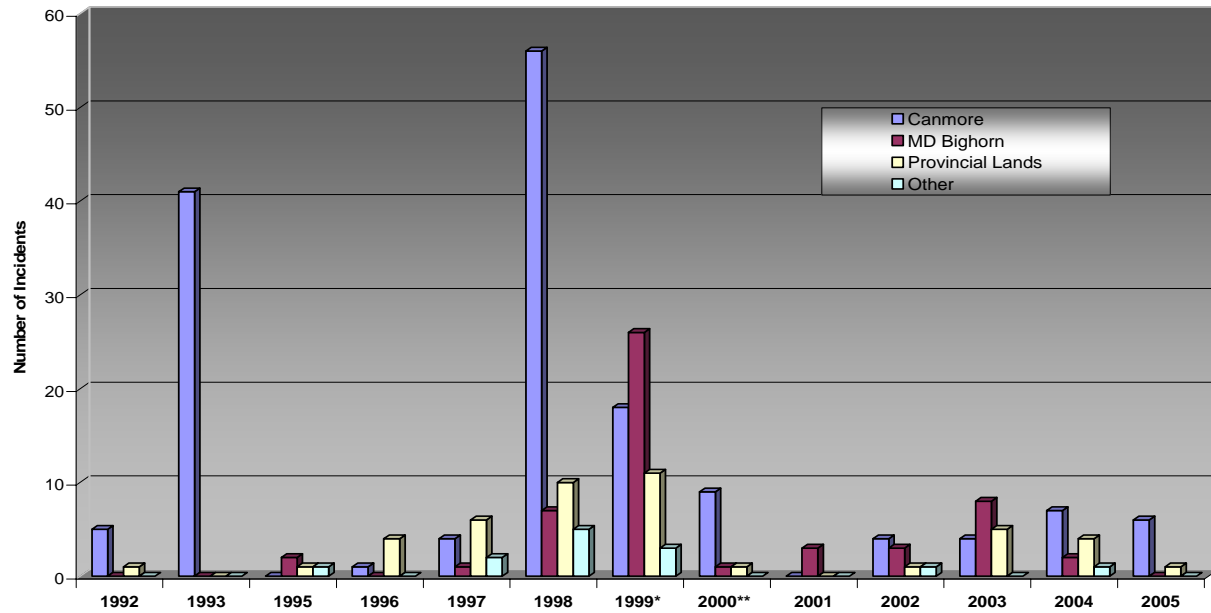
Many conflicts between bears and people arise from the availability of food and garbage. Banff National Park and Kananaskis Country are recognized as world leaders when it comes to bear-proof food and garbage storage (Herrero et al. 1986). The Town of Canmore and communities located within the Municipal District of Bighorn in the Bow Valley can be added to that list. The Bow Valley has made impressive inroads towards effectively reducing the availability of what many consider to be the

main unnatural attractant - garbage. In some ways, the Bow Valley has become an example of what other communities hope to achieve.

Through a public consultation process, the Town of Canmore approved a bear-proof waste-management system for implementation in the spring of 1997. Due to a poor berry crop in 1998, nine bears were reportedly relocated and four were destroyed due to garbage related incidents within the town. Canmore was fully bear-proofed in 1999 when curbside pick up was eliminated (Town of Canmore, 2000). The community of Exshaw saw its bear-related occurrences go up the following year in 2000. This may have been a result of garbage no longer being available in Canmore. In late 2000, the Municipal District of Bighorn installed bear-proof bins in the communities of Harvie Heights, Exshaw, Lac des Arcs, Deadman's Flats and Little Kananaskis with positive results.

Since the introduction of bear-proof garbage containers in Canmore and communities in the M.D. of Bighorn, there has been a decrease in the number of incidents of bears obtaining garbage (Figure 7). This is significant if you consider the local human population has grown between 2.7 percent and 10 percent annually between 1993 and 2003 (Ketterer, 2005) and a similar increase in garbage volume likely occurred.

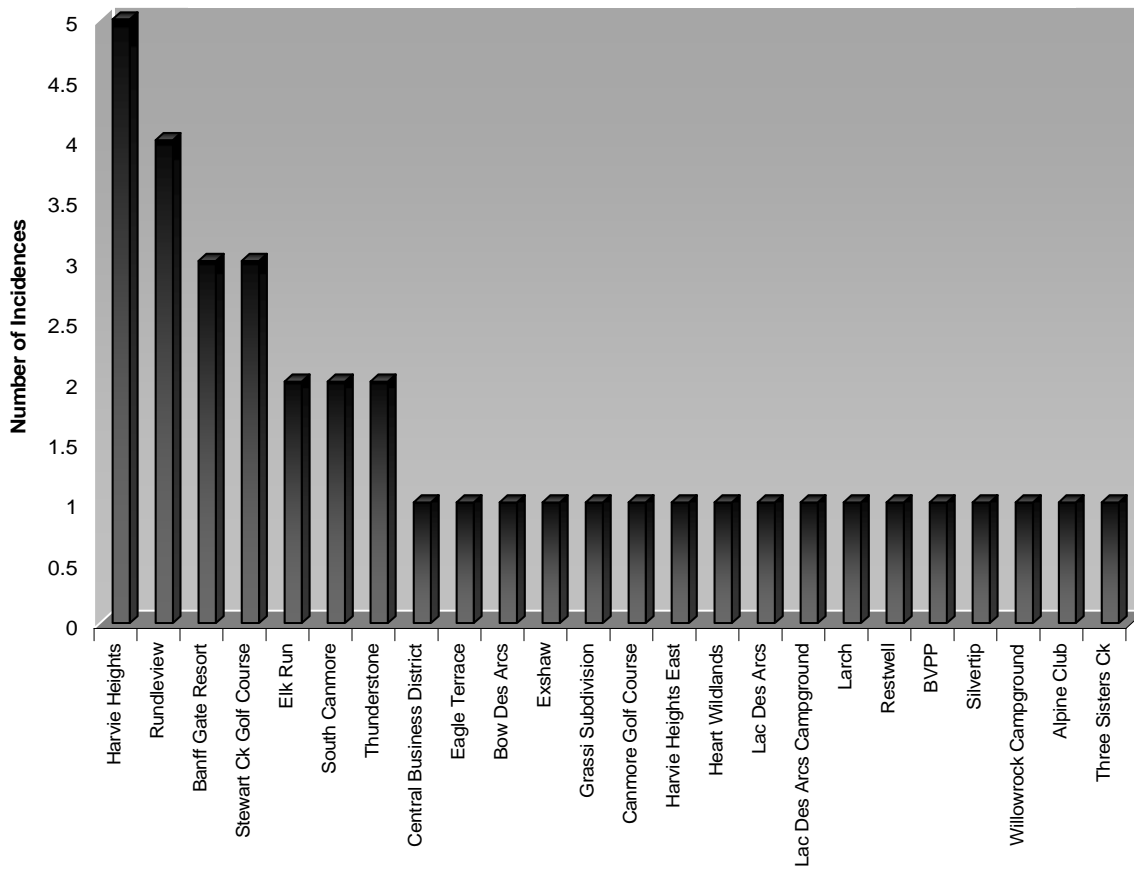
The Town of Canmore and the M.D. of Bighorn continue to experience occasional bear-garbage conflicts when people leave garbage out at their residences or commercial contractors leave garbage in non-bear-proof dry waste bins. An



**Figure 7. Bear-Human Conflicts Involving Garbage (1992 to 2005)**  
 (\* Canmore Bear-Proof Bins, \*\*Exshaw Bear-Proof Bins)

annual commercial bin survey in Canmore, undertaken by the Wind River Bear Institute, indicates that for the fourth year in a row approximately 80 percent of leased commercial bins surveyed do not conform to the guidelines set out in the Town of Canmore by-laws and are considered non-bear-proof. This is primarily due to faulty lids and non-functioning locks or latches and a lack of bylaw enforcement. While the number of garbage-related incidents is not as high as in previous non-bear-proof-bin years, bears continue to be relocated or destroyed, in part, due to improperly stored garbage (Figure 1). Those Location Zones in the valley that have had at least 1 incident since 2001 as a result of garbage are shown in Figure 8.

Bear-proof management systems require an effective system to be in place to ensure not only that people are using the bins but that bins are regularly emptied out so they do not overflow. Without regular emptying, garbage may be placed outside the bin or the bin becomes so full the doors cannot close. These situations render the bin non-bear-proof. According to Bow District Conservation Officer Glenn Naylor, there were occasions in 2006 when bins were overflowing and garbage was left outside the bins in Bow Valley Provincial Park (G. Naylor, personal communication). This situation has also occurred within the Town of Canmore and the M.D. of Bighorn.

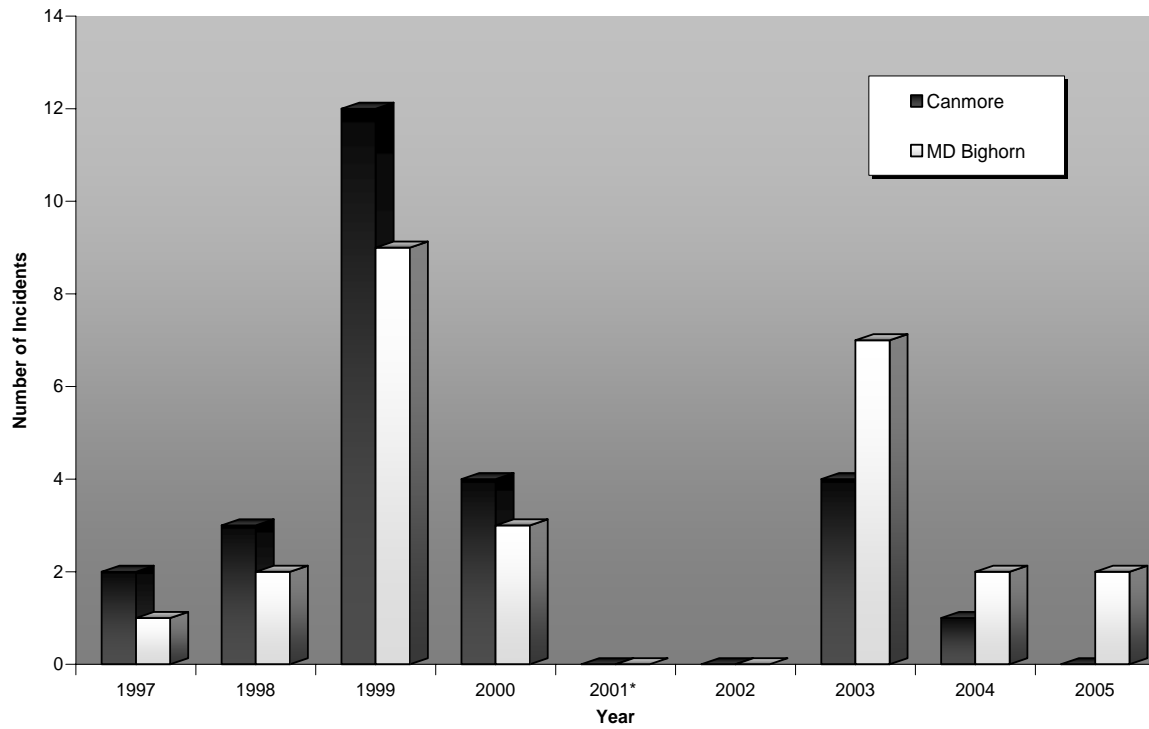


**Figure 8.** Distribution by Zone of Recent Garbage Related Incidents (2001 to 2005)

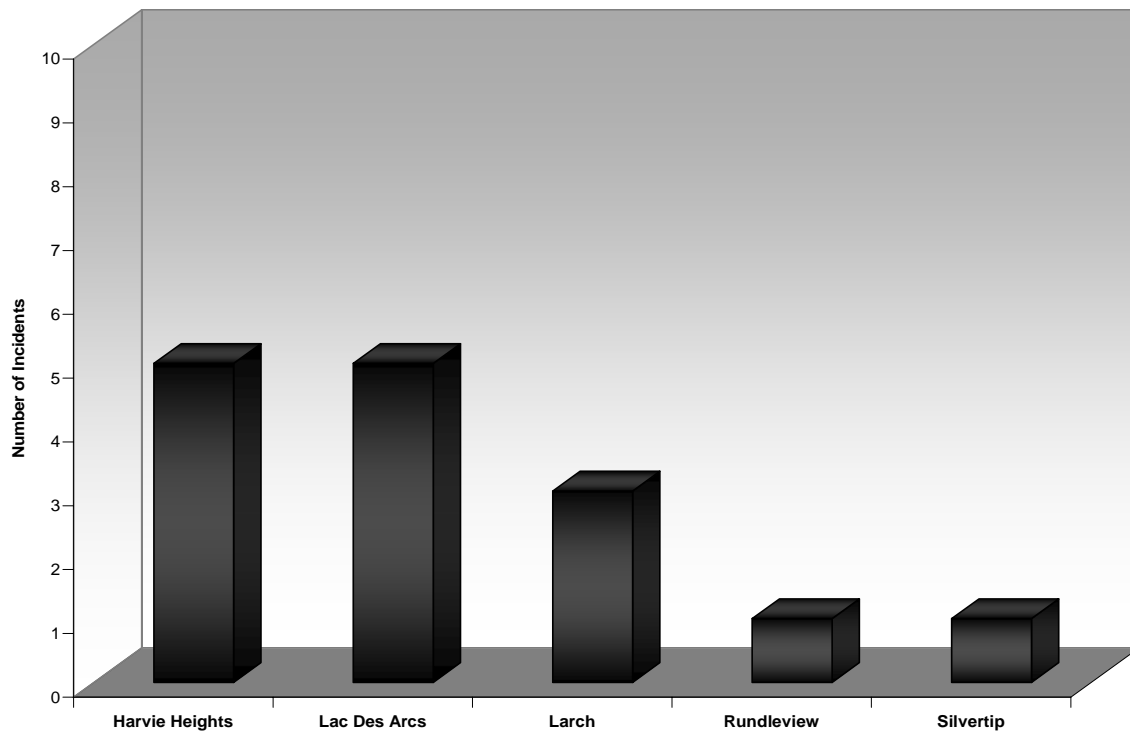
### Birdfeeders

Seeds, suet, and other material left out for birds is a strong attractant for bears and will bring bears into yards and up on decks, even in high density residential developments. Though not as frequently as garbage, birdfeeders are attracting bears into the community. The Town of Canmore instituted a birdfeeder bylaw, prohibiting birdfeeders from April 1 to October 31 annually (Town of Canmore, 2001). Fines were increased in 2004 in an effort to improve

compliance (Town of Canmore, 2004). These efforts have reduced the number of birdfeeder-related bear incidents in Canmore (Figure 9). The M.D. of Bighorn does not have a bylaw that restricts birdfeeder use. Seventy-five percent (12 of 16) of all birdfeeder incidents occurred in the pre-berry season and all involved black bears. Harvie Heights and Lac Des Arcs have had the greatest number of incidents since 2001 followed by Larch and Rundlevie (Figure 10).



**Figure 9.** Incidents of Bear-Human Conflicts Involving Birdfeeders (1997 to 2005)  
 (\* Canmore Birdfeeder Bylaw)



**Figure 10.** Location Zones with at least One Record of a Birdfeeder Incident Since 2001

### **Ornamental Fruit Trees**

Ornamental Fruit trees such as Crabapple, Chokecherry, and Mountain Ash trees are an unnatural food attractant for bears. Since 2001, bears have been recorded feeding on ornamentals in Canmore (Rundleview and South Canmore), Exshaw and Lac Des Arcs. Ornamental fruit trees were an attraction solely during berry season between 2001 and 2005. More than 90 percent (13 of 14) of these conflicts occurred in September and October, and all involved black bears. Ornamental trees exist in several other Bow Valley Zones but no incidents have been reported.

### **Golf Course Vegetation**

Historically, during spring, both black and grizzly bears have been attracted to early green-up vegetation in the Bow Valley. This includes areas along the Bow River and on the north side of the Bow Valley. Bear-human conflicts involving fertilized golf-course grasses accounted for approximately 30 bear-human conflict incidents between 2001 and 2005 (Figure 5). Silvertip and Stewart Creek Golf Courses have both experienced black bear and grizzly bear activity in May and June. Typically, bears are found out on fairways feeding on grass and are often indifferent to the presence of people. In addition to fairway grasses, golf courses may contain buffaloberry shrubs along fringe areas and between fairways where the forest canopy has been opened up. This provides another food attractant at golf courses and contributes to the popularity of golf courses for bears.

An example of bears being attracted to golf course grasses occurred at the Silvertip Golf

Course in May and June of 2006. A radio-collared female grizzly bear and her two cubs, two sub-adult uncollared grizzly bears, as well as at least three black bears, were observed feeding on the golf course. As a result the golf course was forced to close down operations for periods of up to four hours. As summer progresses, bears historically become attracted to other areas, thereby reducing bear activity at Silvertip. Stewart Creek Golf Course has experienced bears feeding on grasses in late July and early August. They are also attracted to buffaloberry on the course. There have been no reported incidents of bears feeding on golf-course grasses after early August.

Both Stewart Creek and Silvertip Golf Courses are adjacent to, or part of, wildlife corridors where carnivore use is encouraged by wildlife managers. The Canmore public golf course, located adjacent to the Bow River, does not receive the same level of bear activity as Silvertip and Stewart Creek.

### **Recycling and Composting**

Canmore has two recycling depots that accept recycled cans, bottles, plastic and paper products. They also accept refundable pop and liquor bottles. The latter are deposited into bear-proof garbage containers. A private recycling company in Canmore, Flying Pigs, offers residential curbside pickup service once a week and a daily pickup service for commercial operators. According to the owners of Flying Pigs, recyclables are picked up from residences and businesses, then deposited in the town recycle depots the same day. All recyclables must follow the guidelines set out in Schedule 'C' of the Town of Canmore Waste Control Bylaw

(Canmore, 2001), which states that all food containers must be rinsed and cleaned thoroughly to remove any possible animal attractants. Flying Pigs will not pick up recyclables that are not adequately cleaned, except for pop and liquor bottles, which are not typically washed out. An additional policy of requiring lids on all residential recyclables was instituted in October, 2006 in an effort to reduce the amount of odours from materials that may not have been adequately cleaned (M. Newhook, personal communication.). The Town of Canmore Waste Control Bylaw also prohibits the use of kitchen organic waste in outdoor composters. The M.D. of Bighorn does not have a bylaw restricting kitchen organic waste in outdoor composters.

### **Grain**

The Canadian Pacific Railway (CPR) operates regular eastbound and westbound train traffic that runs parallel with the Bow River, the Trans Canada Highway, and Highway 1A. There have been occasions when grain has spilled from trains. CPR has a vacuum grain truck that travels daily between the Bow Valley and Banff/Yoho National Parks to pick up grain that has spilled along the tracks. It also responds to grain spills reported by the public or wildlife managing agencies (G. Bridgewater, personal communication).

There have been periodic incidents of grain spills occurring along rail lines within the study area. During the summer of 2005, grain picked up from CPR's grain vacuum truck was deposited on the ground along the side of the tracks near Gap Siding east of Canmore. In 2006 grain was discovered just west of the Canmore town limits on the tracks. In both incidents there was a

significant delay in securing the spilled grain and bears were observed feeding along the tracks. In 2005, there were numerous black bears and one grizzly bear observed at the site according to Canmore District Fish and Wildlife Officer Ron Wiebe. Several of these bears were captured and either released on site or relocated (R. Wiebe, personal communication). In response to this activity, two bear-proof bear bins were installed in 2005 at Gap Siding. Grain from the vacuum truck is deposited into these bins prior to being picked up by trucks and deposited in a landfill east of the study area (G. Bridgewater, personal communication).

## **c) Other Contributing Factors**

There are other contributing factors related to bear-human conflict in the Bow Valley. This includes bears becoming habituated through repeated exposure to people. The frequency and type of human activity, whether or not people comply with existing regulations and policies and changing landscapes such as large scale development or wildlife corridors, can also affect how people and bears use an area. This may affect the degree to which conflict occurs.

### **i) Habituation**

Habituation of bears is a growing concern. Both black and grizzly bears are being seen in, or adjacent to, developed areas or areas of high human use. Typically, they are drawn to unnatural attractants such as garbage, human food, birdfeed, pet food, and ornamental fruit trees. In recent years, the category of unnatural food attractants has been expanded to vegetation such as golf-course grasses, dandelions, and clover. Natural attractants such as buffaloberry are also attracting bears to developed areas.

Many of the incidents that occur in the Bow Valley are a result of bears becoming comfortable feeding or travelling in close proximity to developments or people. Injuries of recreationists by grizzly bears in national parks have primarily involved campers confronted by bears, who had learned to associate people with available food (Herrero, 1976). However, it is also believed that frequent, innocuous contacts between bears and people can create 'problem' bears even without food reinforcement (McCullough, 1982). That is, frequent exposure to people can lead to habituation in bears. Habituation is defined by Thorpe (1996) as a decline in an animal's response following repeated exposure to an inconsequential stimulus.

Habituation can result in bears gaining access to human foods, which can lead to conflicts with people (Albert and Boyer, 1991). Studies have shown that habituated bears are subject to higher mortality rates (Mattson et al. 1992, Pease and Mattson 1999) and incidents with such bears may lead to a higher risk of injury to people (Herrero 1985, 1989). Mueller (2001) demonstrated that sub-adult males and female



Grizzly Bear in Developed Site  
Photo: © Derek Reich

grizzly bears are prone to interaction with humans. This is true in the Bow Valley where the majority of grizzly bears using developed areas are sub-adult males or females with young. This use of developed sites can lead to increased risk of human-caused mortality (Gibeau and Stevens, 2005). The current Bear Shepherding program is one method of attempting to discourage bears' use of developed sites.

## ii) Compliance and Public Behaviour

Wildlife agencies have the responsibility of managing areas for the purpose of both public safety and resource management. This includes closing areas permanently or seasonally to provide wildlife with secure areas in which to bear young or feed undisturbed. It also includes the closing of areas or posting warning signs for relatively short periods of time when bears frequent an area and create public safety concerns. Areas are also closed when attempts are made by wildlife officials to capture 'problem' bears. The protocols for these types of management actions are outlined in the ACD/ASRD Bear Conflict Prevention Plan for the Kananaskis Management area. In the case of area and/or trail closures, these decisions can be controversial and have resulted in people not complying with the management action but actually entering closed areas or removing closure signs and ribbons. Such situations obviously create public safety concerns. Compliance with closure restrictions has become an important issue.

Roadside bear viewing is another example of situations that put people and bears in jeopardy should either one's behaviour be inappropriate. The commercial viewing of bears in Alaska and

coastal British Columbia, where guides strictly manage people's activities and movements when bears are present, has proven to be a safe and effective way for people to see and learn about bears in their natural environment. Locally, where people are not managed as intensively as the formal bear viewing operations previously mentioned, wildlife managers believe that viewing of bears can lead to habituation and indifference behaviour on the bear's part. Many tourism operators in the Bow Valley widely promote wildlife viewing, taking advantage of the opportunity for their clients to see and photograph bears at close range (G. Stermann, 2006). These two views highlight the differences that exist regarding the appropriateness of activities such as bear viewing in the Bow Valley. From a management perspective, many aspects of bear viewing in the Bow Valley is in direct opposition to ASRD and ACD operating policy, where for the past five years bears have been conditioned to stay away from roadsides and developments and to move into cover when near people.

Dogs running off-leash in parks and protected areas, as well as in other areas of the valley where dogs are required to be on leash, is another example of non-compliance. The number of dogs in the Bow Valley has steadily increased over the years and regulations are now in place requiring dogs to be on leash in many areas of the Bow Corridor. Compliance is far from 100 percent and there have been reports of dogs chasing bears and vice versa. In 2006, Timberline, a female black bear who had lived in the Bow Valley for 23 years, was relocated to southern Alberta after she had begun chasing off-leash dogs who were reported to have been chasing her two newborn cubs at the Canmore

Nordic Centre. The problem escalated to the point where she was reportedly closing distance on dog owners whose dogs were on-leash. Prior to 2006, there had not been any reports of similar behaviour concerning dogs from Timberline.

Another concern has to do with people intentionally entering closed areas. One example of this occurred when the Upper Benchland trail on the north side of the valley was closed in 2002. Many valley residents opposed the closure. A local Canmore Town Councillor, in direct response to the Benchlands trail closure, stated he would "go wherever I want, when I choose..." (Canmore Leader, 2004). During a trapping effort for an uncollared grizzly bear in August 2006, three groups of people were observed by Wind River Bear Institute staff walking under closure tape and past signs indicating the trail was closed. Two of these groups had dogs off-leash.

People have also unintentionally entered closed areas. These incidents often result from the public accessing closed areas from random trails that did not have signs stating the trail was closed. It can be an impossible task to put up signs at each and every designated and non-designated access point into an area, particularly when large areas, such as the north side of the Bow Valley between Harvie Heights and Cougar Creek are closed. This ongoing problem is severely compounded by the intentional removal of Closure/Warning signs by the public. In 2005, more than 50 bear warning and bear closure signs were removed from points within the Town of Canmore. Bear-closure tape was also removed or cut from a number of places in 2005 (R Wiebe, personal communication).

Much of the opposition to trail closures comes from people who feel unfairly singled out by restrictions placed on their recreational pursuits or favourite recreation areas. People believe their activity is relatively minor when compared with the impact that large-scale development has had on the Bow Valley in the last 10 years. While there is no doubt that development activities have had an impact in the valley, management actions such as trail closures need to be respected for the safety of both bears and people.

Alberta Community Development and ASRD have a formal process for posting bear caution and closure signs in parks and protected areas. Consistency in process and implementation has not always been optimal which has created some concerns with the public. At times, signage is left up intentionally for extended periods, particularly in areas such as Quarry Lake (near Dog Pond), where bear activity is common and quite predictable during August. At other times, agency personnel have unintentionally left signage up. When this occurs people begin to question the authenticity of the signs in question.

All of this points to the need for better compliance on the part of the public, as well as a review of current policies regarding signs and public education. One way these concerns have been addressed is through the posting of relevant information on the ACD website, and from that site to other local websites.

### **iii) Human Activity in Bear Habitat**

Widespread human activity in natural areas used by bears will lead to interactions and possibly conflict. With the steady increase in the number of people living and recreating in the Bow

Valley over the last 20 years, more and more people are hiking, biking, camping, and living in bear country. These people include full-time and part-time residents, tourists who visit annually and international tourists who are in the area for a short time and will not return. There has been an increase in commercial activity occurring in bear country including guided outdoor activities, film productions, and multiple large-scale events such as endurance races and music festivals that take place through the summer months when bears are active. There is a wide range of knowledge amongst these diverse groups regarding bears. Some are highly educated and will take the necessary precautions to reduce the chance of a bear encounter and respect closures. Others know virtually nothing, and put themselves and bears at risk through their uninformed actions. These activities all result in varying levels of human use in bear habitat which puts pressure on land managers to identify ways to accommodate human use while not adversely affecting bear populations or creating public safety concerns. It also indicates the need for a more informed and educated public that will understand and support management actions such as trail closures.

### **Lack of Predictability re: Human Use from Bear's Perspective.**

The Banff Management National Park Plan indicates that predictability of human use is a key factor for managing sustainable populations of grizzly bears. It states that: "Predictability of human activity helps bears to avoid people. Fewer bear conflicts, human-caused mortalities and human injuries occur when human activity is more predictable in terms of location and time." (BNP 2004)

Predicting human activity patterns in the Bow Valley has become difficult for bears due to the rapid rate of development and human activity that has occurred here in the last 10 years. The ever-changing landscape requires bears to adjust their movement patterns on a regular basis when attempting to move through the Bow Valley. This issue is compounded by recreationists, attracted to the Bow Valley by its enormous opportunities, who continue to push their respective sports into areas that have not experienced much human use in the past. The creation of the Recreational Outdoor Working Group (ROWG) in 2002 was an attempt to deal with some of these concerns. Comprised of various recreation groups in the valley and government, they addressed the needs of recreation groups and worked with managers attempting to sustain wildlife populations.

### **Trails**

Trails have the potential to create bear-human conflicts from a number of perspectives. Certain trails in the valley experience greater numbers of bear-human interactions than others. Within parks and protected areas, this includes the eastern portion of the Montane Trail, trails in the vicinity of the Alpine Club, Heart Creek, the Heart Creek connector, Quait Valley trail, Many Springs, Grassi Lakes, and many of the single track trails at the Canmore Nordic Centre (G Naylor, personal communication). Trails within the Town of Canmore that experience regular bear activity include Larch Island, the engine bridge and paths between Peaks of Grassi Subdivision and the Rundle Canal. This is by no means an exhaustive list but it does give an idea of the scope of the problem. Further review is required to identify other trails that may be

considered higher risks for bear-human interactions.

Trail design and location can influence conflict potential. Narrow trails with many sharp bends and dips afford poor visibility for both bears and people. Additionally, trails with good buffaloberry growth adjacent make them ideal sites for bears to feed.

### **Special Events**

Large corporate events, involving hundreds and sometimes thousands of people, take place in bear habitat on a regular basis. Mozart on the Mountain, the 24 Hours of Adrenaline Mountain Bike Race, the Trans Rockies Challenge, and film productions are all examples of annual events attracting large crowds of spectators and participants. The potential for bear-human conflict during these events creates unique challenges for wildlife management agencies.

Large investments of staff time and resources to deal with potential wildlife-related problems are required. While cancelling these events can mean significant losses in revenue for local business owners and event organizers, agency budgets are hard pressed to maintain this level of service. It is becoming more commonplace for organizers to assist in covering the costs of proactive bear management in order to continue to hold their events in areas bears are known to frequent. In the event that there are bear-management concerns in areas where special events occur, ACD and ASRD can make it a condition of the special-event permit that organizers have an officer on site to manage any bear-human interaction that may occur. Permits also stipulate that event organizers manage attractants appropriately, including providing bear-proof

garbage containers when necessary (J. Dennis, personal communication).

Proactive management of bears at special events is not restricted to government wildlife staff. Non-agency personnel, supported by local wildlife officials also carry out this type of bear-prevention management. An example of this is the contract ASRD and WRBI have with Three Sisters Mountain Village (TSMV) during the Mozart on the Mountain music festival. ASRD and WRBI have helped prevent bear-human conflicts for the past three years during the September festival. This one-day event attracts more than 7,000 thousand people. WRBI provides an experienced bear-conflict specialist and a trained Karelian bear dog to monitor for radio collared and non-radio collared bears. An ASRD Officer is scheduled to attend during the day of the actual event. Bears in or near the site are moved prior to the event using WRBI bear shepherding techniques. WRBI provides advice and education to TSMV staff as needed to ensure proper storage and handling of possible bear attractants (WRBI Report 2003).

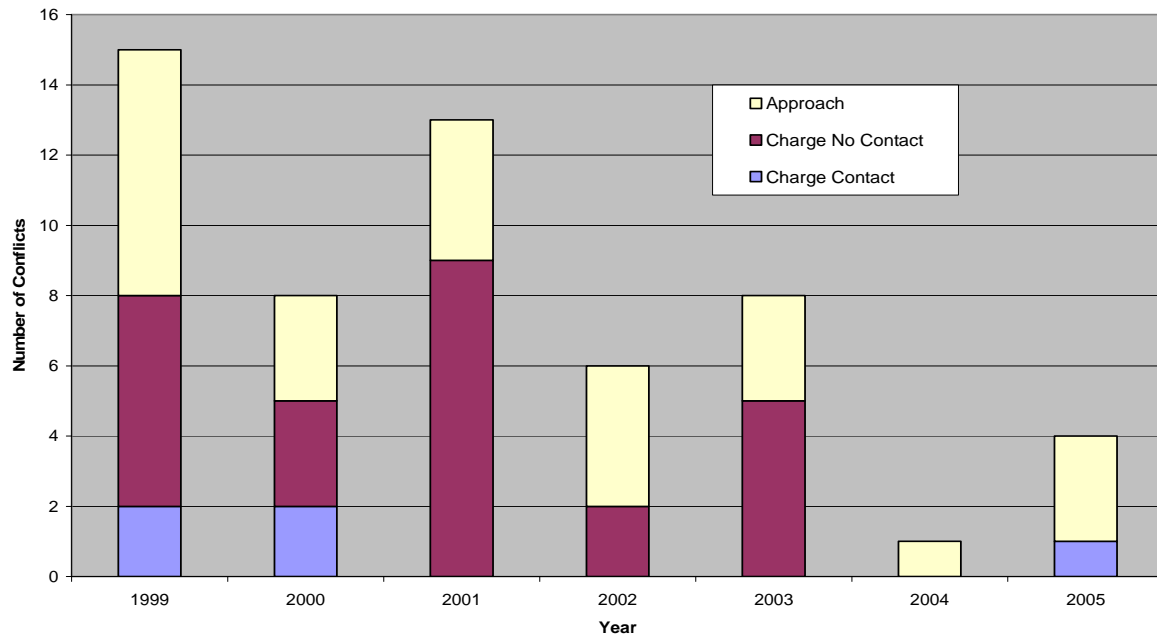
The Canmore Nordic Centre (CNC) has experienced an increase in both recreational and competitive mountain-bike use over the years, and is being utilized more and more as a special-event site for high profile competitive mountain bike races. Typically, race organizers are responsible for providing additional resources, as dictated by ACD permits, to manage for specific bear-related safety concerns. Organizers often cover the costs of providing additional bear-proof garbage bins and a Conservation Officer on site during the event (Lee Weiss, personal communication).

### **Types of Recreational Use**

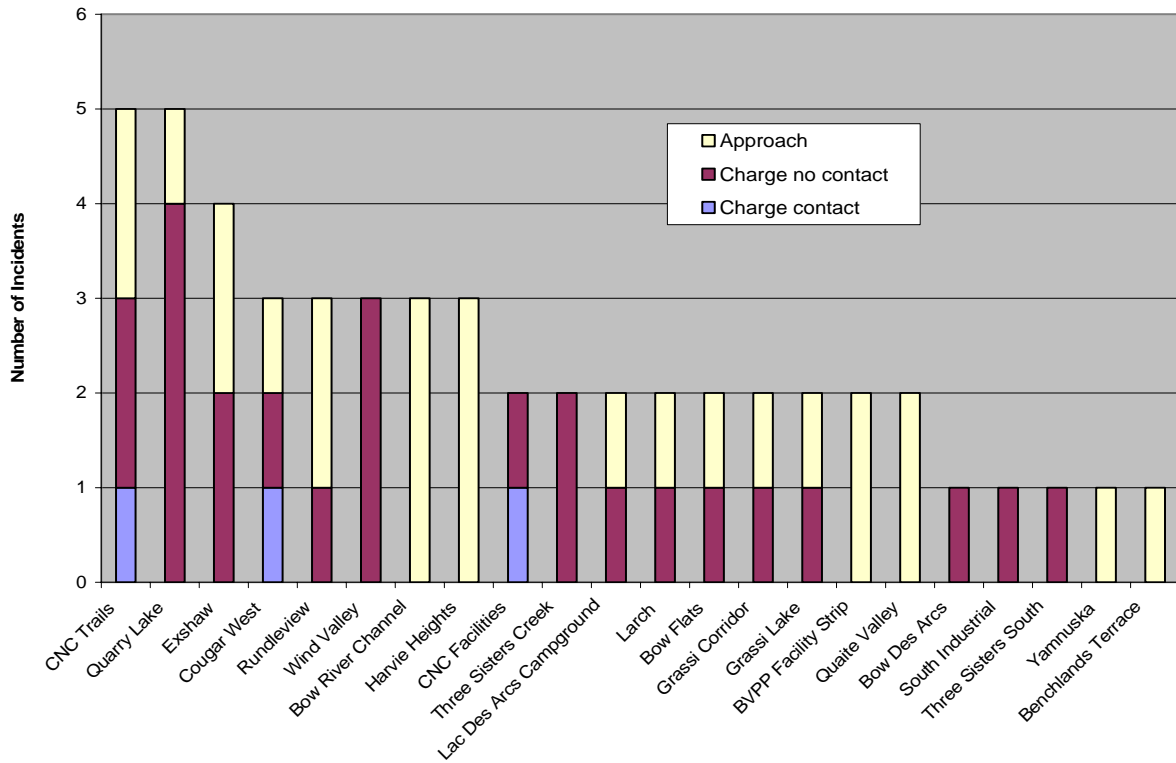
Between 1999 and 2005 there have been more than 50 recorded cases of bears approaching, bluff charging or making actual contact with people in the Bow Valley (Figure 11). Almost 90 percent of the charge-related incidents between 1999 and 2005 occurred during the berry season. The majority of these occur in zones located on the south side of the valley (Figure 12).



Mozart on the Mountain at Stewart Creek  
Photo: © Jay Honeyman



**Figure 11.** Bear-Human Conflicts Involving Closing Distance Incidents (1999 to 2005)



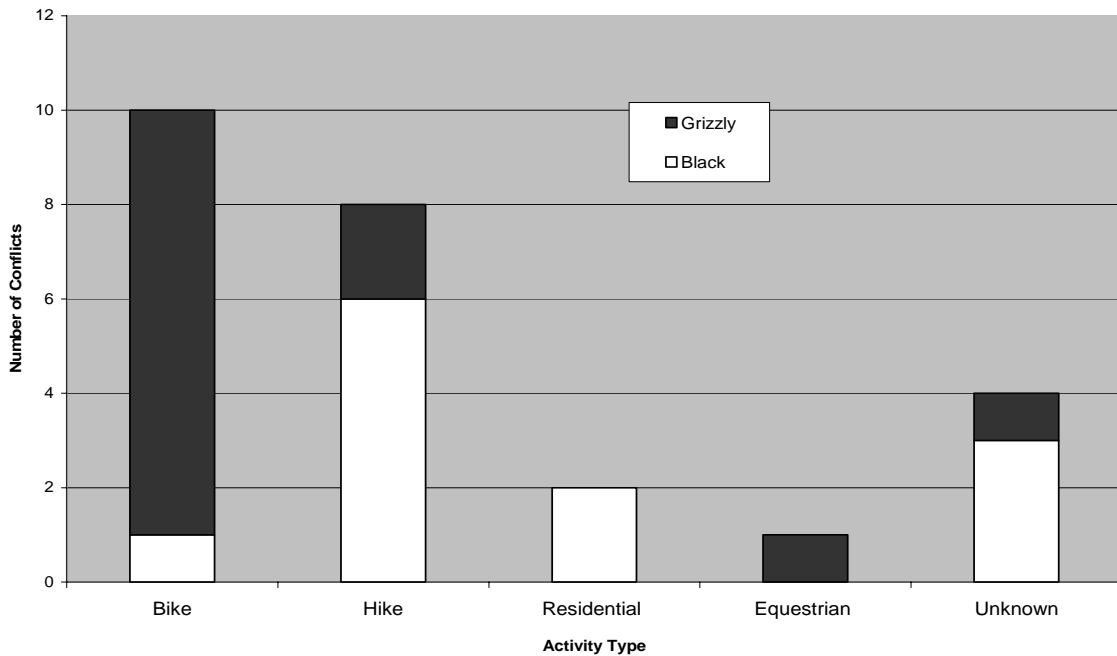
**Figure 12.** Bear-Human Conflicts Involving Closing Distance Incidents by Location Zone (1999 to 2005)

A review of the number of bluff-charge incidents in the Bow Valley suggests that the type of activity can influence the chance of an encounter (Figure 13). The numbers do not necessarily mean that people are more likely to encounter a bear while biking compared to hiking or horseback riding, as there is no data to indicate actual numbers of bikers compared to hikers or equestrian users. Grizzly bears were involved in all but one 'no contact' charge involving bikers. All but one of the biking incidents occurred on the south side of the valley. No-contact charge incidents involving hikers all occurred during berry season on the south side of the valley as

well except for one incident at Three Sisters Campground. There were five black bear and three grizzly bear bluff charges involving hikers.

There have been three recorded charges by bears resulting in human contact. In 1999, when two hikers were approached by a black bear at the CNC, they decided to play dead. The bear, which had a cub nearby, approached one individual and bit him in the leg causing superficial injuries.

Two mountain bikers were attacked after a surprise encounter with a grizzly bear sow and two cubs at the Canmore Nordic Centre in 2000.



**Figure 13.** Bear-Human Conflicts Involving Charge Incidents by Activity Type (1999 to 2005) (does not consider total number of users per activity type)

One biker was hospitalized as a result of his injuries. Both of these incidents occurred during berry season. A human fatality occurred in 2005 when a sub-adult male grizzly bear climbed a tree after a woman. She died of her injuries after either being pulled or falling out of the tree. The bear was subsequently destroyed. This incident occurred during pre-berry season in the Cougar West Zone above Silvertip.

#### **iv) Development**

The Bow Valley corridor is one of the most developed areas in the world where grizzly bears survive (Gibeau 2000, Herrero et al. 2000). The landscape in the Bow Valley has experienced ongoing change in recent years as development and human use continues to increase. These changes come in the form of new residential and commercial developments, recreational facilities such as golf courses and trail systems and roads. One result of this development is increased exposure of people to bears and thus, an increase in potential bear-human conflict. This level of human activity has and likely will continue to, have an effect bears' ability to survive in the Bow Valley. In fact, landscape access and density have been directly correlated with human-caused grizzly bear mortality (McClellan 1989, USDA Forest Service 1990, Benn and Herrero 2002). This is significant since the Bow Valley has been identified as an important connectivity corridor for bears in the regional landscape scale.

Many significant, human made features in the valley can and do affect how grizzly bears utilize the area. These include highways, railways, highway fences, major urban development, campgrounds, golf courses and a myriad of trails from one end of the valley to the next.

The 1A, a 2-lane highway, runs east to west on the north side of the Bow Valley and the Bow River. The CPR transcontinental railway essentially parallels the 1A. Other major impediments to travel include the Hamlets of Harvie Heights, Lac des Arcs, Exshaw, Deadman's Flats, Little Kananaskis and the Town of Canmore. The municipal footprint of Canmore is expected to extend to just south of Deadman's Flats once development has finished (Map 8). Adjacent and within these populated areas lies a significant trail network utilized by hikers, bikers, equestrian users and dog walkers.

There are four 18-hole golf courses presently in the Bow Valley including Stewart Creek, Silvertip, Canmore Golf and Curling Club, and Rafter Six. An additional 18-hole course is due to open in 2008 within the municipal boundaries of Canmore on Three Sisters Mountain Village property. Bear activity varies with season and from course to course. These courses are used by bears for both travel and food requirements. In the case of Stewart Creek and Silvertip Golf Courses, a portion of a formal wildlife corridor lies within the boundaries of the courses themselves. As mentioned earlier, some golf courses have begun to experience bears actually being attracted to fertilized grasses, particularly during pre-berry season, and to natural vegetation such as buffaloberry during berry season. Golf-course staff, often in conjunction with local wildlife officials, have sometimes closed portions of the course due to bear activity.

Beginning in 1999, highway underpasses, highway fencing, jump-outs, cattle guards, and rock impediments at the end of the fence have been constructed between the Three Sisters interchange and west of Dead Man's Flats on the

Trans Canada Highway. In September 2004, as part of the G-8 Environmental Legacy Project, a large open-span wildlife underpass was built east of the Dead Man's Flats interchange. Wildlife fencing was installed where the Three Sisters mitigation ended and extends east approximately one kilometre from the wildlife underpass. The goal of these measures is to provide regional connectivity for wildlife in the Bow Valley and to reduce the current number of traffic-related mortalities of wildlife on the Trans Canada Highway (Clevenger, 2005).

The Bow River flows through the centre of the Bow Valley and is recognized as a travel corridor for bears as well as many other species. There is likely a correlation between bear activity and the communities and facilities located adjacent to the Bow River. These areas include parts of Canmore, Lac Des Arcs, Exshaw, Deadman's Flats, Bow River Campground, and Three Sisters Campgrounds. In addition to the Bow River, undisturbed green spaces along both sides of Policeman's Creek and Spring Creek provide cover and some limited foraging opportunities for bears. Black bears have interacted with people in both these areas and adjacent community zones.

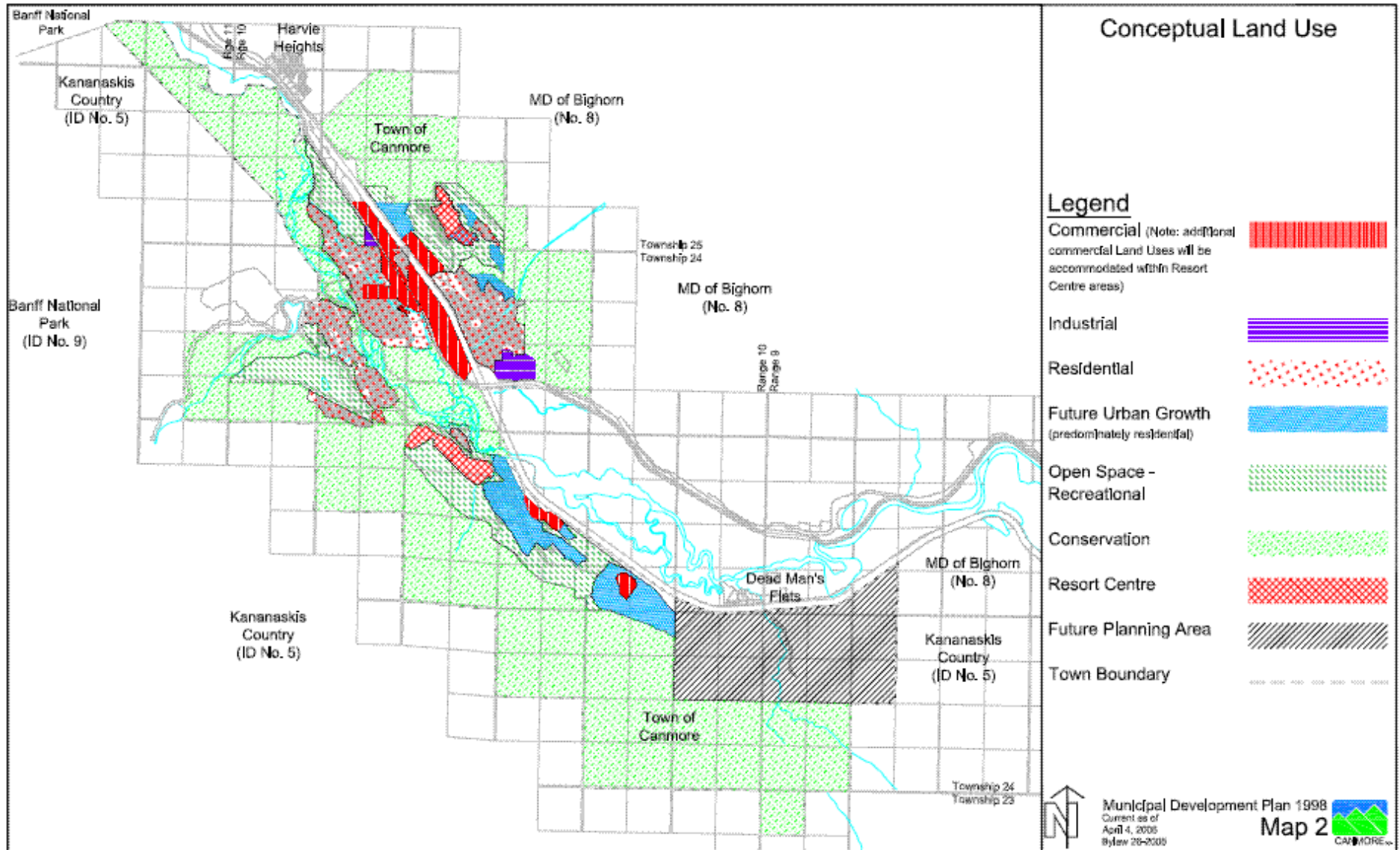
#### **v) Wildlife Corridors and Habitat Patches**

The role and function of wildlife corridors in maintaining connectivity in the lower Bow Valley are becoming increasingly important if healthy wildlife populations are to persist (Clevenger et al. 2002). Wildlife corridors (Figure 3) were created to help mitigate concerns over habitat fragmentation and loss of habitat connectivity. They also allowed individuals to

bypass human communities, thereby reducing the likelihood of wildlife human conflicts. The importance of corridors is stressed in a report by the Bow Corridor Ecosystem Advisory Group (BCEAG): "Habitat abandonment by wildlife due to high levels of human activity is a common occurrence" and "increased contact with humans is directly linked to increased human/wildlife interactions...and in the case of bears is directly linked to increased mortality" (BCEAG 1999).

From a bear-hazard perspective, some wildlife corridors in the Bow Valley actually have the potential to contribute to bear-human interactions. Most corridors in the valley are adjacent to human developments containing concentrated nodes of human activity. They become playgrounds for landowners as well as a place for locals to bike or walk their dogs. In some instances, bears utilizing the corridors come in close proximity to these developments. Bears do have the option to stay away from the fringe areas of corridors adjacent to developments and wary bears likely will do so. Other bears may not and, if attractants are available, may choose to ignore the presence of humans in exchange for access to food resources. One example where human use occurs inside a designated wildlife corridor is the Grassi Corridor/ Habitat Patch area, located adjacent to the Grassi Subdivision and used by local residents for recreational purposes. The Grassi Habitat Patch is situated within the Quarry Lake Location Zone and experiences relatively high numbers of bear-human interactions, particularly during berry season. The Grassi Habitat Patch is used by dog owners walking to the informal off-leash area known as Dog Pond. Bikers and hikers also use the powerline area just south of Dog Pond. This area has an abundance of

Map 8. Expanded Footprint



buffaloberry and experiences regular grizzly and black bear activity in July and August. The end result is that the area is presently being used by both bears and people with their dogs. It is likely more bear-human interactions will occur in this area.

An important consideration by BCEAG during the development of the Human Use Guidelines and review of existing trail use was to ensure that a variety of trail opportunities throughout the valley was maintained. Although some displacement occurred, the intent was to minimize displacement wherever possible. Many compromises, such as allowing trails to pass through selected portions of wildlife corridors, were integrated into the Human Use Guidelines to ensure that recreational opportunities were maintained. BCEAG also recommended that consolidation of trails, seasonal and temporary trail closures, human-use monitoring, enforcement of leash laws and appropriate signage explaining wildlife corridors be integrated into the management of human activities (BCEAG, 2002).

#### **vi) Habitat Alteration**

Large-scale vegetation manipulation programs have recently been implemented in the Bow Valley designed to address specific issues, including the Firesmart and Mountain Pine Beetle initiatives. These ongoing programs have the potential to influence bear-human interactions primarily through changes to the vegetation cover, which may lead to proliferation of buffaloberry shrub growth. Both programs involve thinning of the forest, which results in the opening of the forest canopy. Whenever, this occurs, buffaloberry has the potential to grow

provided site, soil, and moisture regimes are suitable.

The Firesmart program involves forest thinning that, in many cases, occurs adjacent to residential communities and other developments; the purpose is to protect these areas from wildfire. The new proliferation of buffaloberry in these areas will attract bears during berry season. In areas far removed from human habitation where Firesmart is applied, managers of the program must be cognizant of recreational activities and especially trail systems that may go through or be adjacent to these newly thinned areas. Much of the current Pine Beetle activity in the Bow Valley involves single-tree removal and burning. Depending on whether this strategy successfully stops the infestation, future work may involve removing much larger areas of forest, resulting in more open forest canopy. Such areas will be susceptible to increased buffaloberry growth as are areas affected by the forest thinning that occurs during natural blowdown events. This has occurred above Harvie Heights and in the Eagle Terrace subdivision.

#### **d) Area Assessment**

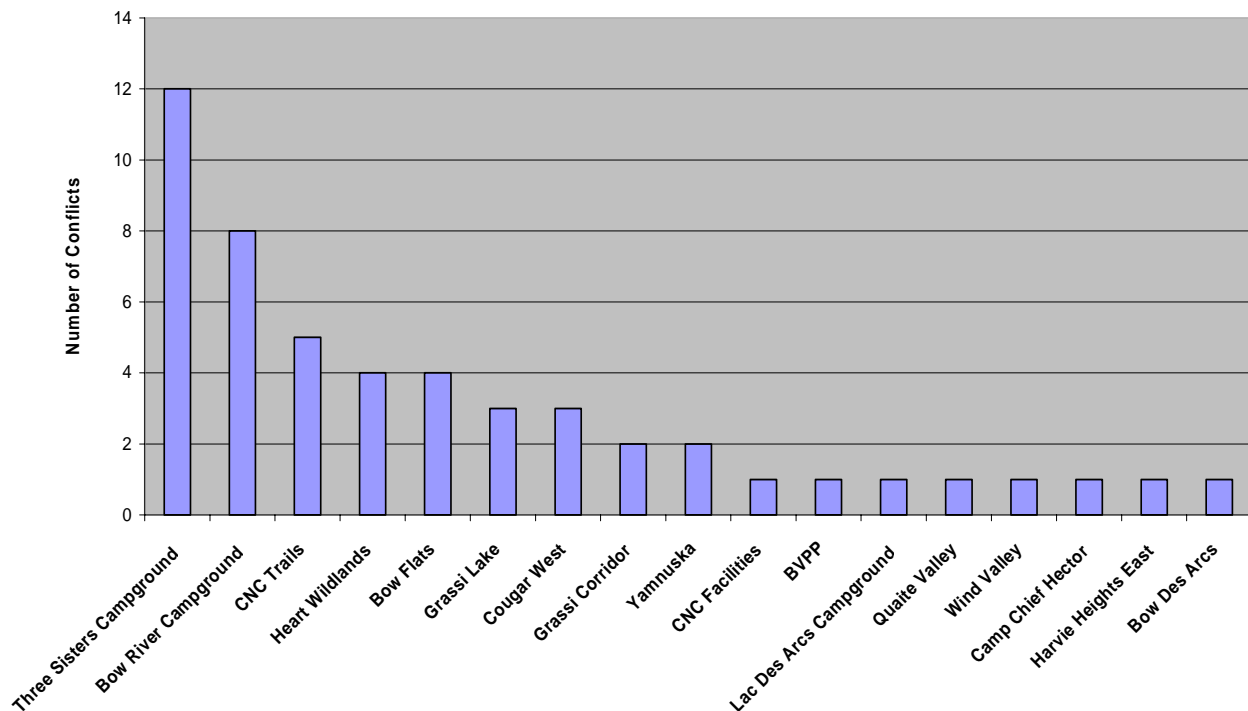
Some Location Zones have experienced relatively high numbers of bear-human interactions at certain times of the year. These are discussed below, as are some of the possible reasons for these high numbers. Of the 74 Location Zones identified for this hazard assessment, the majority experience relatively few interactions.

### i) Provincial Lands - General

Provincial Lands include provincial parks and the campgrounds within them, Wildland Parks and Natural Areas. These areas are administered by ACD and/or ASRD depending on the particular Location Zone. Provincial Park campgrounds are managed by a private contractor, Bow Valley Campgrounds. They are responsible for maintaining the campgrounds and collecting fees from campers. Bear-human interactions involve bears feeding on natural vegetation in many areas of provincial lands, the main location being at the Canmore Nordic Centre. The greatest density of interactions took

place in the campgrounds situated along the Bow River east of Canmore. This is likely due to a number of reasons, including proximity to the Three Sisters campground ranked Very High in interaction densities during berry season and Moderate during pre-berry season. Lac Des Arcs and Bow River campgrounds were amongst the five highest zones for interaction densities during pre-berry season for the Bow Valley, though they were ranked as Moderate and Low respectively.

Bear-human conflict records are concentrated in provincial park campgrounds and on some trail systems within protected areas (Figure 14).



**Figure 14.** Bear-Human Conflicts by Location Zone on Provincial Lands (2001 to 2005)

This is not totally unexpected, given the high numbers of people using these areas. Bears are being attracted to natural vegetation such as Dogwood (*Cornus stolonifera*), Chokecherry, buffaloberry and unnatural attractants such as garbage and human foods. Recorded incidents are almost exclusively black bear related, and two black bears have been destroyed from provincial park campgrounds in the last two years.

### **Three Sisters Campground**

Three Sisters Campground is located adjacent to Deadman's Flats along the Bow River east of Canmore. It has 36 campsites and is open from April 15 to October 31 each year. This campground received a Very High ranking during berry season for telemetry points per square kilometre. Telemetry locations came from radio-collared black bears during berry season. This campground was the only Location Zone to rank as Very High in interactions per square kilometre on provincial lands. This occurred during the berry season, as compared to a Moderate ranking during pre-berry season. Interactions here are almost exclusively black bear related, although there have been isolated incidents of grizzly bears in the campground. Most bear activity occurs during berry season.

Conflict is related to bears feeding on natural attractants as well as some human food. An additional factor contributing to bear interactions in this campground is its location in relation to the Bow River and the community of Dead Man's Flats. There is a natural movement corridor between the river and developed sites within the Hamlet of Dead Man's Flats. The campground is located in the middle of the

corridor to the west of the Hamlet. The corridor is bordered by the river on one side and the community on the other. Bears moving along this corridor eventually end up in the campground. The availability of natural vegetation attractants in and around the campground, combined with potential access to human food, is likely a major reason why this site is ranked as high as it is.

### **Bow River Campground**

Bow River Campground is located one kilometre east of Canmore along the Bow River. It has 32 sites and is open from May 1 to September 28 annually. This Zone was ranked Moderate during berry season and Low during pre-berry season. All interactions here involved black bears. Some happened when bears obtained food from coolers left out overnight. There have also been instances of bears damaging property, including sniffing and ripping tents.

### **Lac Des Arcs Campground**

Lac Des Arcs Campground is located adjacent to the community of Lac Des Arcs and the lake itself, 25 kilometres east of Canmore. It has 28 campsites and is open April 29 to September 17 each year. This Zone was ranked Moderate in bear interaction densities during pre-berry season and Low during berry season. Again, all interactions involved black bears.

Portions of Lac des Arcs Campground were closed in September 2005 and 2006 due to black bears feeding on Chokecherry in sites adjacent to the lake. The trails that bears use to access the campsites from Lac des Arcs have poor lines of sight and vegetation is dense, making it difficult

for people to see bears approaching or for bears and people to move off the trail.

### Canmore Nordic Centre - General

The Canmore Nordic Centre (CNC) is situated adjacent to the northwest corner of the Town of Canmore, and borders the eastern boundary of Banff National Park. It includes Location Zones CNC Trails, CNC Facilities and CNC Old Ski Hill. Black bears are frequent visitors in the spring and summer months. Grizzly bears are seen throughout the trail system during seasonal feeding on buffaloberry. Bear sightings are frequent enough that Alberta Community Development has erected permanent “Bear in Area” signs at the entrance to the facility. There is also a seasonal closure on the eastern edge of the CNC below Mount Rundle from December 1 to June 15. This closure, for both carnivores and ungulates, helps reduce bear-human interactions in spring but does not affect the number of interactions that occur during berry season.

The CNC has become a popular mountain-biking venue in summer. The trail systems include a variety of machine constructed ski-trails used by mountain bikers recreationally and competitively. There are also single-track trails that extend into steep terrain to the base of Mount Rundle. Some trails have poor visibility which, combined with good bear habitat, create the potential for surprise encounters between bears and people.

The Canmore Nordic Centre Zones were all ranked Low for bear-human interaction density. It is interesting to note that despite a low ranking, these zones have a relatively high rate of bluff charges. This may be related to the high amount of mountain-biking activity that is prevalent during berry season.



Canmore Nordic Centre Permanent Signage  
Photo: © Jay Honeyman

The main attractant here is natural vegetation, spring grasses during pre-berry season, and buffaloberry during berry season. There are no records of bears being attracted to unnatural foods. Activity levels are higher during berry season but do occur during pre-berry season.

Grizzly bear activity is somewhat higher during berry season but records show both species interacting with people during the different seasons. Six charges have occurred at the CNC, two resulting in actual contact with people. The majority of the encounters involved bikers. All of these charges occurred during berry season between 1997 and 2002.

CNC completed a major upgrade last year, including a paved roller-skiing trail system. It remains to be seen how this will affect future summer activities but it would be surprising if recreational use did not continue to increase. The paved roller-skiing trail system has the potential to increase early-season use at the CNC at a time when many other trails in the valley are still wet and snow-covered.

#### **Canmore Nordic Centre Facilities Zone**

CNC Facilities have a Low density of interactions during both pre-berry and berry seasons with interactions slightly higher during berry season. Most interactions in this Zone are in the form of sightings along trails or developed area of the main stadium. Bears, grizzly and black, typically travel along CNC trail systems or feed alongside those same trails. The trail systems and abundance of natural vegetation attract bears here, particularly during berry season. Pre-berry season interactions have occurred as early as April 30. The majority of

these interactions involve black bears though grizzly bear interactions do occur annually.

Two bluff charge encounters occurred in this area. In 1999, a black bear sow with cubs charged two hikers with their dog. In 2000, two bicyclists were chased by a female grizzly bear (Bear # 68) and two cubs (Bear #69 and #70) after having been surprised while descending a single-track trail. The sow made contact with one individual resulting in hospitalization. Both incidents occurred during berry season.

#### **Canmore Nordic Centre Trails**

The CNC Trail Zone consists of the extensive trail system beyond the main CNC facility area, and is comprised of both machine-built trails and single-track trails. The majority of interactions between people and bears come from bikers and hikers viewing bears on the trail. The CNC Trails are ranked as Low in both pre-berry and berry seasons. Seventy-seven percent of interactions here involve black bears. Black bear incidents occur evenly during pre-berry and berry seasons. Three quarters of reported grizzly bear activity occurs during berry season.

Grizzly bears carried out three bluff charges between 1997 and 2001. Two incidents involved bikers, while the other incident involved a black bear and cub charging two hikers. The bear made contact with the hikers when they played dead, and this resulted in minor injuries. These three encounters occurred during berry season.

#### **Grassi Lake**

Grassi Lakes is situated between the Canmore Nordic Centre and Quarry Lake on the south side

of the Bow Valley. It is a popular hiking and dog-walking area with a small hamlet, Trans Alta Village, located within it. This Zone was ranked Low during the berry and pre-berry seasons. More than 90 percent of interactions here occur during berry season and are evenly split between black and grizzly bears.

Prior to 1999 this area had experienced black bear-related garbage problems and one incident of a house break-in for human food. Since 1999, there have been no recorded incidents involving garbage or other unnatural attractant. Natural attractants are the issue here. Most interactions have been roadside or trail-related occurrences during berry season. Grassi Lakes trail is an extremely popular hiking trail in the valley. Regular bear observations and interactions are recorded every year by hikers on this trail.

### **Many Springs**

Many Springs is a wetland located within Bow Valley Provincial Park that has a popular hiking trail circling the lakes. This Zone was ranked High during berry season and there was no recorded activity during pre-berry season. All interactions occurred with black bears. The concern with Many Springs is the poor lines of sight along the trail itself, coupled with abundant natural vegetation available for bears. There are sections of the trail where it would be difficult for a bear to retreat from people due to the thick vegetative cover trailside.

### **Quaite Valley Trail and Backcountry Campground**

The Quaite Valley Trail and backcountry campground, prior to 2000, experienced a number of human-food-related bear conflicts;

bears approached groups of people and sniffed backpacks. These incidents involved both black and grizzly bears during pre-berry season. Since 2000, there has only been one record of conflict. There continue to be regular sightings of black bears during both pre-berry and berry seasons.

### **ii) M.D. of Bighorn**

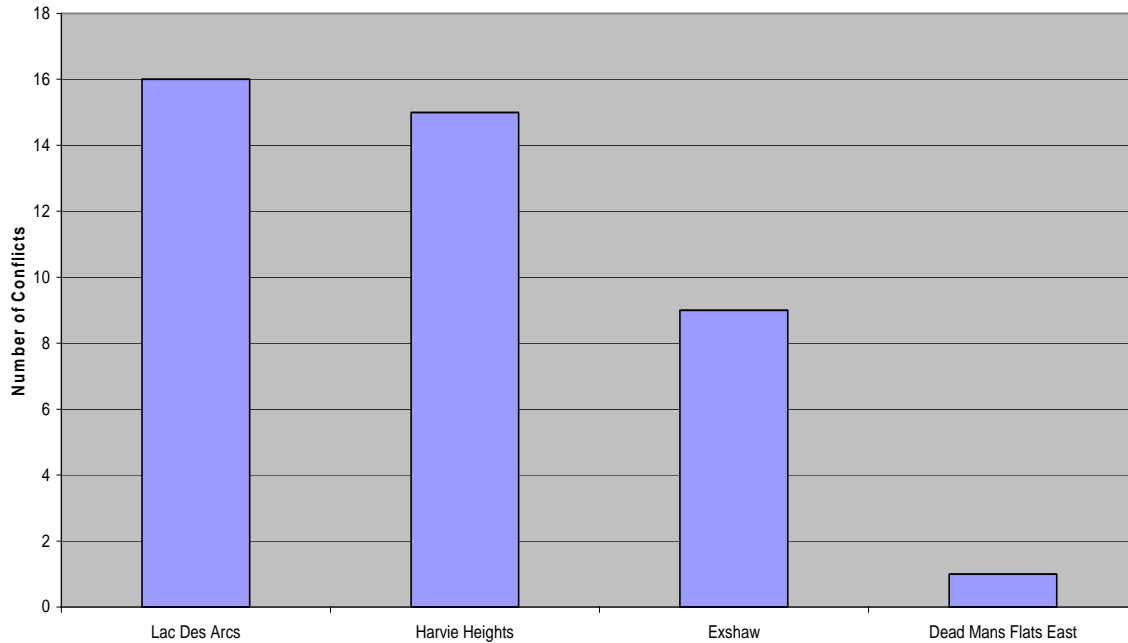
The M.D. of Bighorn includes the communities of Harvie Heights, Lac Des Arcs, Exshaw, Dead Man's Flats, Little Kananaskis, and other lands that do not fall under private, provincial or Canmore municipal jurisdiction.

Bear-human conflicts within the M.D. involve unnatural attractants such as garbage, birdfeeders, compost and ornamental fruit trees. A breakdown by Zone indicates that Lac Des Arcs, Harvie Heights, and Exshaw have the highest recorded incidents of conflict between 2001 and 2005 (Figure 15). Ninety percent of the recorded conflicts involve black bears, with more than half of them occurring during berry season.

### **Exshaw**

Exshaw is a small community east of Canmore adjacent to Highway 1A and the Bow River. Exshaw has a Low bear interaction density during berry season and has no recorded bear interactions during pre-berry season. Activity primarily involves black bears.

Conflicts consist mainly of bears in residential areas obtaining unnatural foods. Ornamental fruit trees constitute the main attractant (five of seven), all of which involved black bears in September and October of various years. Other attractants include garbage and compost.



**Figure 15.** Bear-Human Conflicts by Location Zone on M.D. of Bighorn Lands

### Lac Des Arcs

Lac Des Arcs is a small community located 25 kilometres east of Canmore adjacent to Lac Des Arcs itself and Lac Des Arcs Campground. This Zone ranked Low for interactions during both pre-berry and berry seasons. The recorded interactions involve only black bears and are evenly split between pre-berry and berry seasons. They include a variety of unnatural food attractants including birdfeeders, ornamental fruit trees, garbage, human food and barbeques. Birdfeeders in Lac Des Arcs ranked the highest number of any other zone for that attractant type. Ornamental-fruit-tree incidents occurred only in the fall.

### Harvie Heights

Harvie Heights is a hamlet located between Canmore and the east boundary of Banff National Park on the north side of the valley. This Zone ranked Moderate during pre-berry and berry seasons. Most interactions occur within the residential area and involve black bears. Interestingly, four out of the five grizzly bear-related interactions in Harvie Heights occurred in 2005.

Twice as many conflicts occurred during pre-berry season, with garbage and birdfeeders the main causes of conflict. Along with Lac Des Arcs, this had the highest number of birdfeeder conflicts of all Location Zones, with four of the five incidents having occurred during pre-berry season.

### Deadman's Flats

Dead Man's Flats is located east of Canmore along the Trans Canada Highway adjacent to Three Sisters campground and the Bow River. It is comprised of a service strip with restaurants, motels, gas stations and a small residential housing area. It is significant from a bear-human conflict perspective due to its isolated nature (basically surrounded by the river and the highway) and because it is situated adjacent to a well-used habitat patch and wildlife movement corridor. While the number of incidents in Dead Man's Flats is relatively low, the potential for increased bear-human conflicts is high, due to plans for expansion of residential housing and commercial development. This expansion will greatly reduce the size of the current habitat patch and introduce many more people into the area.

### iii) Town of Canmore

Canmore is located along the Bow River and is surrounded by protected areas on three sides of the valley. Almost half - 48 percent – of all bear-human interactions that occurred within the study area took place in Canmore. Banff Gate Resort and Rundlevieview in berry season (Map 7) and Banff Gate Resort in pre-berry season (Map 6) had the highest interaction densities of Location Zones within the Town of Canmore. No zones, other than Banff Gate Resort, ranked above Low during pre-berry season. The majority of interactions occurred on the south side of the valley in Rundlevieview, Quarry Lake, Quarry Lake, Grassi Corridor and Fairholm during berry season.

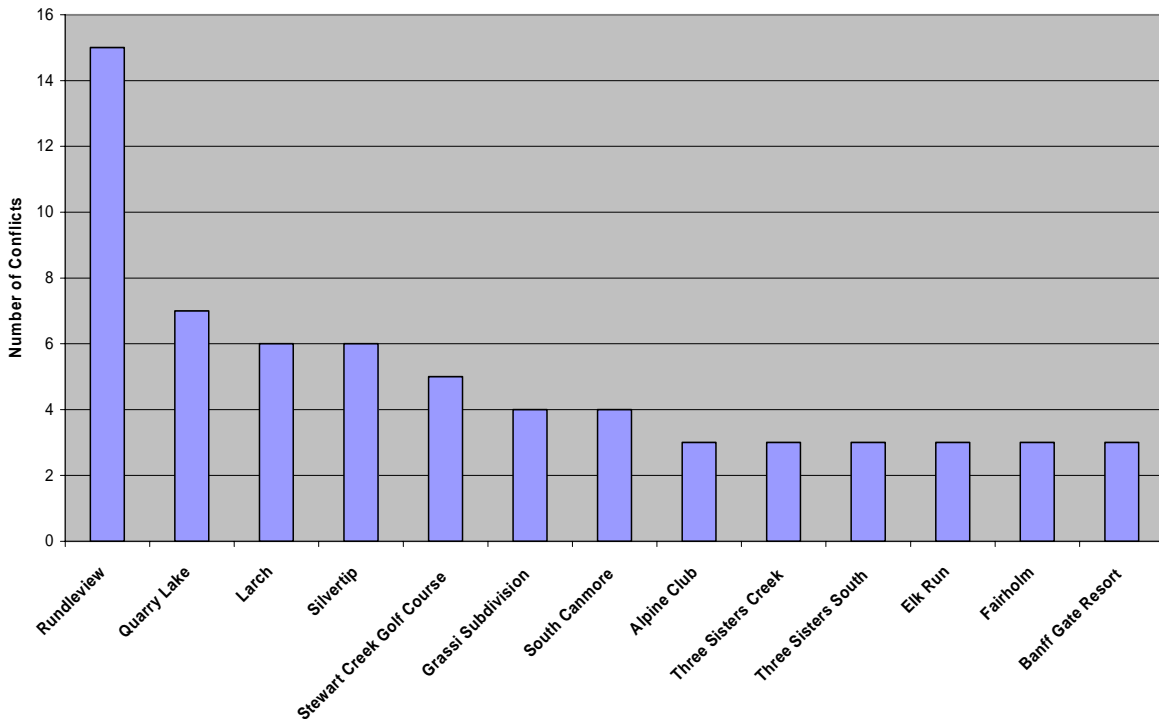


Figure 16. Bear-Human Conflicts by Location Zone on Town of Canmore Lands (2001 to 2005)

Conflicts between bears and people involve both natural and unnatural attractants. Unnatural attractants include garbage and birdfeeders, although the actual numbers of incidents have decreased since the town installed bear-proof bins and instituted a birdfeeder bylaw. In the five years preceding the installation of bear-proof bins, there were 104 recorded incidents involving garbage in Canmore. Since bear-proofing in 1998-99, there have been 50 recorded incidents. This happened even with Canmore's population growing from 6,621 people in 1993 to 11,442 in 2005 (Ketterer, 2005), which created a significant increase in garbage volume. Other unnatural attractants include pet food, barbecues, and ornamental fruit trees. Rundlevie had the highest number of interactions (15 of 77) between 2001 and 2005 (Figure 16). Other Zones with relatively high interactions include Quarry Lake (7), Larch (6), Silvertip (6), Stewart Creek Golf Course (5), Bow Flats (4), Grassi Subdivision (4), and South Canmore (4).

### **Banff Gate Resort**

Banff Gate Resort is a year-round facility located at the base of Pigeon Mountain, adjacent to Wind Valley Wildland Park. This Zone ranked High for interaction densities during berry season and Moderate during pre-berry season. Since 2001, pre-berry season interactions involved only black bears while both grizzly and black bear activity occurred during berry season. Garbage found during pre-berry season and natural vegetation found during both seasons have been the main attractants. Mountain Ash trees were destroyed here in 2004 by foraging black bears. Banff Gate Resort staff members have removed most of the Mountain Ash trees. They also purchased portable bear-resistant

containers for use at the firepit and entrance to the day lodge. The resort has had problems leasing functional bear-proof bins from suppliers in the past. They have been attempting to ensure the bear-proof bins they now lease are fully functional.

### **Rundlevie**

Rundlevie is located on the periphery of Canmore adjacent to Quarry Lake and Canmore Nordic Centres Zones on the south side of the valley. Both grizzly and black bears use the area. Rundlevie is ranked High during berry season, the second highest density of bear interactions of any other Location Zone in the Bow Valley and ranked Low during pre-berry season.

Since 2001, the actual conflicts have involved a variety of attractants including ornamental fruit trees, garbage, birdfeeders and buffaloberry. Crabapple trees have attracted black bears during the fall. Prior to 1999, before Canmore had fully implemented bear-proof waste handling, garbage was more of an issue. In 1998 alone, four different houses were broken into by black bears in one month to obtain human food; this was also reportedly a poor berry crop year. Of note, garbage-related incidents still occur annually. Since the introduction of the birdfeeder bylaw in 2001, there has only been one reported incident of a bear obtaining birdfeed in Rundlevie.

Rundlevie has been utilized by three radio-collared grizzly bears in the last four years. Bear Shepherding staff typically move these bears out of the area in the early morning and keep them out through the day. As there are no resources available to discourage bears from using the area

at night, it is quite common to find the bears back in Rundlevue the following morning when staff move the bears out again. Other non-collared bear activity observed during berry season suggests the Rundlevue Zone has enough natural attractants to interest them as well. All of this increases the risk of bear-human interactions when people walk their dogs, hike, and play in the woods behind their homes.

There was one bluff-charge incident involving a grizzly sow and two cubs who had been surprised by a cyclist in August, 1999.

### **Quarry Lake**

The Quarry Lake Zone includes the lake itself, the formal dog off-leash area and Dog Pond, which has become a popular spot for people to walk their dogs. This area also includes the Grassi Lakes Habitat Patch located adjacent to Dog Pond, an area where animals such as bears are expected to be. A wildlife corridor runs east-west along the south side of this Zone. The corridor itself is used by wildlife, including bears, moving east to Wind Valley and west to the Canmore Nordic Centre Provincial Park and Banff National Park. A popular trail system, used by bikers, hikers and dog walkers, runs the length of this wildlife corridor.

Quarry Lake ranked Very High for telemetry points per square kilometre during berry season. The vast majority of recorded activity involved grizzly bears, 85 percent occurring during berry season. In terms of interaction densities, Quarry Lake was ranked Low during pre-berry season and Moderate during berry season. Eighty-five percent of interactions occur during berry season, primarily during July and August but as late as

mid-October. Almost half of these incidents involve grizzly bears.

There have been four incidents of people being bluff-charged, all during 2001, three involved grizzly bears during berry season. These may have all been related to Grizzly Bears #68 and #69 who were relocated to southern Alberta shortly after the last bluff-charge took place. There have been numerous sightings of bears in the area since, but no records of bluff charges. There are no recorded incidents of unnatural attractants being a concern; the primary attractant for bears is buffaloberry.

Various types of human use occur including hiking, biking, jogging and dog walking. Many of the incidents happened in or adjacent to the Grassi Habitat Patch on the trails and the forested area around Dog Pond. Bears also feed on buffaloberry in the patches of forest between the dog-walking areas and Dog Pond/ Canmore Creek. These areas provide poor lines of sight for both bears and people, increasing the likelihood of surprise encounters with bears.

There have been incidents of off-leash dogs chasing bears at Dog Pond, which is technically outside the off-leash area although it is common for many dog owners to go there. Fines for having dogs off-leash were doubled to \$200 in 2004 in an effort to address concerns pertaining to dogs off-leash in non-designated areas within the Town limits (Town of Canmore, 2004a).

### **Grassi Subdivision**

Grassi subdivision is located east of Quarry Lake on the south side of the Bow Valley in Canmore. It is a relatively new residential area that borders

the Grassi wildlife corridor to the south. Grassi Subdivision ranked High for telemetry locations per square kilometre. The majority of these locations were grizzly bears during the berry season. This Zone was also ranked High during the berry season and Low in the pre-berry season for interaction densities. Eighty five percent of the interactions here occur during the berry season, two thirds of the activity involving black bears. All of the grizzly bear activity occurs during the berry season.

There are isolated incidents of bears obtaining unnatural foods here but the main issue appears to be natural attractants and the fact that this subdivision is located adjacent to a known travel corridor for bears.

### **Bow River Channel**

Bow River channel is located along the Bow River through the Town of Canmore. There are many popular walking paths in this Zone, including Larch Islands, the engine bridge and the main walking path that parallels the river through Town. Also, it is likely a main movement corridor for bears moving in and out of lands west of Canmore towards Banff National Park and south from the Canmore Nordic Centre.

This Zone is rated Moderate during berry season and Low during pre-berry season for interaction densities. Most interactions involve people viewing bears from trails along the Bow River, in particular the engine bridge area along the Bow River south of the Fairholm subdivision. Approximately 90 percent of these interactions involves black bears, who are drawn to available natural foods; more than 75 percent,

occurs during berry season.

### **Larch**

Larch is a residential subdivision of Canmore, located along the western edge of town adjacent to the Bow River and Canmore Public Golf Course. It ranked Moderate in berry season and Low in pre-berry season for interaction densities. To date, recorded activity only identifies black bear activity during both seasons, though grizzly bears are known to use forested areas adjacent to Larch bordering the Bow River during berry season. Conflicts have focused around birdfeeders and isolated incidents of garbage and natural food.

### **Fairholm**

Fairholm is a residential subdivision adjacent to the Bow River east of the Larch subdivision. One of Canmore's older areas, it is bordered by walking paths close to Larch Islands and the engine bridge. Fairholm ranked Moderate during berry season and Low in pre-berry season for interaction densities. Most activity occurs during berry season and includes both black and grizzly bears. Interaction records in pre-berry season indicate black bear activity only. The main attractant has been natural foods during berry season.

### **Stewart Creek Golf Course**

Stewart Creek Golf Course is located on Three Sisters property at the east end of Canmore on the south side of the Bow valley. This 18-hole golf course has a formal portion of the wildlife corridor within its boundaries at the eastern edge of the course. Both black and grizzly bears use this area to move to and from Wind Valley to the

east, The golf course ranked Low in both pre-berry and berry seasons for interaction densities; two thirds of those interactions occurring during pre-berry season. Seventy-five percent of use during pre-berry season is by both black and grizzly bears feeding on golf-course grasses or natural foods. The majority of use during the berry season is by grizzly bears. Black bears have obtained garbage here in the past.

Parts of the golf course have been closed at certain times, due to bear activity. Since 2004, bear activity has been less frequent and Stewart Creek has not had to close the course. (S. Sjkemus, personal communication.)

There has been recorded black and grizzly bear use of Stewart Creek over the past four years. An intensive aversive conditioning program has recorded regular, collared, grizzly bear activity within Stewart Creek each year in areas within and outside the wildlife corridor.

Grizzly Bear #70, received extensive conditioning by ASRD and WRBI between 2001 and 2004. This experience, as well as the movements of other bears through the golf course over the years prompted discussions between Stewart Creek staff and ASRD about removing attractants from key areas of the golf course in order to discourage bears from feeding in close proximity to golfers during the day. Stewart Creek Golf Course staff, in conjunction with ASRD, have removed patches of buffaloberry from the course in the last two years. The one section that has not had buffaloberry removed is the section of the golf course that includes the wildlife corridor. There is reluctance to remove natural vegetation that currently provides hiding and thermal cover

for bears and other wildlife. The availability of natural foods in the corridor that goes through the course does increase the possibility of interactions between bears, golf-course staff, and golfers.

### **Silvertip Golf Course**

The Silvertip Golf Course is located on the north side of the Bow Valley. This resort complex includes a residential area and 18-hole golf course bordered by a wildlife corridor to the north. Silvertip ranked Low during pre-berry and berry season for bear-human interactions. There is twice as much activity during pre-berry season involving both black and grizzly bears. In 2005 and 2006, there has been an increase in grizzly bear activity, mainly as a result of one family group, Grizzly Bear #71 and her two cubs and two sub-adult grizzly bears, feeding on golf-course grasses. The berry season activity has been predominantly black bear oriented.

Bear-human conflict records indicate that attractants include birdfeeders, barbeques and garbage. Up until 2005 these incidents only applied to black bears. In 2005 there were two recorded incidents of conflict with grizzly bears, one of them involving garbage. Early-season grasses growing in nearby forested areas as well as on the golf course seem to attract bears in early spring. In the last two years, grizzly bears and black bears have made regular forays to the Silvertip area, primarily in May and June.

According to Silvertip Golf Course Superintendent Robin Sadler (personal communication), bear activity at Silvertip has resulted in the closure of the course on half a dozen occasions over the last three years. These

closures typically last one to five hours, and include anywhere from a single hole to nine holes. They occurred in May and June, with 75 percent of closures occurring at the north end of the course.

## **B. CURRENT BOW VALLEY CONFLICT REDUCTION ACTIVITIES**

In an effort to reduce conflicts between both bears and people, wildlife managers have implemented a variety of measures, including a Bear Shepherding program, the installation of bear-proof bins, birdfeeder bylaws, the creation of wildlife corridors, and the implementation of permanent, seasonal, and short-term closures of areas.

### **a) Bear Shepherding**

Traditional methods of trapping and relocating ‘problem bears’ have been largely ineffective in meeting long-term population management goals (Herrero, 1976, Jorgensen et al. 1978, Miller and Ballard, 1982). In an attempt to manage for habituated bears and reduce the number of relocations, the Alberta government is involved in a formal Bear Shepherding program within the study area in an attempt to teach bears to avoid developments and people. The Wind River Bear Institute (WRBI) has been contracted since 2000 to assist in this effort. Many government agencies, including Banff National Park, US Forest Service, US National Parks, and Washington State, now include some form of aversive conditioning in their bear-management programs. The Montana Fish, Wildlife and Parks



Bear Shepherding using Karelian Bear Dogs  
Photo: © Derek Reich

Draft Grizzly Bear Management Plan for 2006-2016 identified aversive conditioning, specifically the WRBI methodology, as an important alternative to relocating and killing bears (Dood et al. 2005).

The Alberta program runs during active bear season from early June to October and includes active participation from local ACD Conservation Officers, and ASRD Fish and Wildlife Biologists and Officers, and WRBI staff. The program focuses on grizzly bears considered good candidates for Bear Shepherding. The selection of bears for the program is based on WRBI's Conditioning Indices and Protocols that have been developed to help identify the type of bear most likely to respond positively to Bear Shepherding techniques. These indices, based on 30 years of observed bear-human interactions, show a typical progression of bear conflict behaviour, beginning with habituation to humans, at times progressing to food-conditioned bears followed, in rare cases, by bears that actively destroy property in occupied human sites to obtain unnatural foods (WRBI, 2003). Bears considered habituated but not necessarily food-conditioned are radio-collared and monitored on a daily basis. Developed areas within the Bow, Kananaskis and Spray Valleys have been identified as No Go Zones (NGZ) which bears are discouraged from using. Bears are prevented from entering these NGZs or moved out of them using WRBI's bear-shepherding techniques.

Bear shepherding has provided proactive bear-conflict management on a day-to-day basis. An example of this involved Grizzly Bear #96, a radio-collared adult male who showed up in the Grassi Habitat Patch adjacent to Quarry Lake

and the local dog off-leash area in August 2005. His presence resulted in a number of short-term facility closures, implemented to minimize interactions between the bear and people. This included closing off the Dog Pond area and power line near Quarry Lake to public use and rerouting a large mountain-bike race away from the bear. Bear #96 was prevented from accessing NGZ in the Canmore area for the duration of his stay (WRBI Report 2005). Other radio-collared grizzly bears have been known to frequent certain subdivisions within Canmore. Whenever possible, they are now prevented from entering these areas through the Bear Shepherding program. If they should happen to enter these NGZs, they are moved out immediately. This has resulted in a reduction of daytime use by radio-collared bears. There is periodic bear activity at night when conditioning work is not carried out.

Generally speaking, the public is supportive of Bear Shepherding, particularly when compared with the alternatives of relocation or destruction (WRBI Report 2005). There is interest within the science community in bear shepherding as a tool for bear management; however a formal science based evaluation of the program still needs to be completed. The author is in the final stages of completing his MSc thesis, which will formally evaluate the Bear Shepherding program in Peter Lougheed Provincial Park (PLPP).

## **b) Attractant Removal**

Several agencies are experimenting with removing buffaloberry in order to discourage bears from utilizing developed areas. In a number of cases, attractants have been removed and bear activity has been reduced as a result. Buffaloberry removal has reduced the levels of

bear activity in a number of the facilities in the Kananaskis District, including Kananaskis Village, where it is estimated that bear activity has dropped by two-thirds since 2001 when buffaloberry was removed. Similar reductions in bear activity have also occurred at the William Watson Lodge Campground and Lower Lake Walk-in tenting sites in PLPP where buffaloberry was removed in 2001. This has reduced the number of warnings and closures posted for these facilities (D. Hanna, personal communication).



Buffaloberry Removal in Kananaskis Country  
Photo: © Jay Honeyman

According to ACD District Conservation staff in the Bow Valley, there has been a reduction in bear activity since removing Dogwood from Provincial Park Campgrounds at Bow River and Three Sisters. Since the initial removal, it is estimated that the Dogwood has grown back to four feet in height, suggesting that ACD will need to consider cutting it back again (G. Naylor, personal communication). Banff National Park (BNP) Warden Blair Fyten has noticed a similar

trend in Two Jack Campground where buffaloberry was removed in 2002 due to abnormally high grizzly bear activity within the campground in 2000 and 2001. Four years later, the cut bushes have regrown to approximately one foot high and are not yet producing berries. Johnston Canyon campground in BNP underwent buffaloberry removal in 2006 and Jasper National Park is considering removing attractants in Wapiti Campground in 2007 (B. Fyten, personal communication). Stewart Creek Golf Course has also been actively removing buffaloberry from key areas of their property under the direction of ASRD.

Buffaloberry has been removed from certain trails in BNP in order to improve sight lines and remove available food sources (B. Fyten, personal communication). Trails within the Bow Valley do not have a formal program to remove attractants from trails although ACD and ASRD have actively removed buffaloberry from specific areas experiencing regular bear activity; these include sections of the dog off-leash area at Quarry Lake and the ditches of the Trans Canada Highway in Canmore (S. Donelon personal communication). The Canmore Nordic Centre has been removing buffaloberry from some of the trails near the facility core as time permits (L. Weiss, personal communication).

All of these initiatives have involved the mechanical removal of berry-producing bushes. Some experimentation has been undertaken with Ethrel, a naturally occurring growth-regulating hormone in plants that can be applied to buffaloberry bushes to encourage early-season berry drop-off. It appears that the success of the spraying depends on many variables, not just time of spraying. Complete removal of berry-

producing buffaloberry bushes through mechanical means, and simultaneous habitat improvement in bear-friendly (i.e. non high-human use) areas, is preferable to annual spraying of plants with Ethrel (M. Percy. 2006).

Removing a natural food source will likely result in bears moving to other areas to feed. This may have been the case with Grizzly Bear #70, a female grizzly bear who frequented the Kananaskis Village hotel complex. The buffaloberry was removed from this site and WRBI staff report that Bear #70 stopped coming there after a few post-removal visits. Interestingly, she began feeding on buffaloberry in and around Mount Kidd RV campground shortly thereafter. It was her level of activity around Mount Kidd RV Park and lack of positive responses to bear-shepherding actions that contributed to her eventual relocation to northern Alberta in 2004 (D. Hanna, personal communication).

### **c) Ornamental Trees**

The Town of Canmore is attempting to educate community members about trees and shrubs that are considered potential wildlife attractants in an effort to discourage homeowners from planting them (Appendix II). A list of these trees and shrubs will be made available on the town website in the spring of 2007 (Riva, personal communication). Parks Canada has also created a list, "Recommended Species for Landscaping in Banff National Park" in order to do the same (BNP, 2004).

Three Sisters Mountain Village, a major developer in the Bow Valley, has also created a list of recommended plants and shrubs and their

palatability to ungulates and bears. This will be used by homeowners and developers building homes in the area (Three Sisters, 2004).

However, according to Richard Haworth, a landscape architect working with TSMV, there is no obligation for homeowners to follow these guidelines once they have purchased their homes.

### **d) Compliance**

A number of initiatives over the year has demonstrated the Bow Valley's willingness to adapt to new ways of living and recreating with bears in order to reduce conflict. For instance, Canmore effectively reduced garbage-related bear-conflict incidents. The creation of this bear-proof waste-management system in 1998-99 was a result of public consultations (Town of Canmore, 2000).

The Recreational Opportunities Working Group (ROWG) is another example of Bow Valley stakeholders working together to resolve issues between people and wildlife. The Bow Corridor Ecosystem Advisory Group (BCEAG), a senior-level advisory group representing various levels of government, was initially formed to address development issues in the Bow Valley. The group recognized the need for greater public education and community participation to implement guidelines BCEAG had formulated. As a result, ROWG was formed to consider a wide range of user interests within recreational planning processes. One of the benefits of this type of multi-stakeholder group efforts is to maximize compliance and reach agreement on what can be done to resolve issues of concern.

## **e) Trails and Human Use**

In an attempt to provide more predictability and manage for both humans and wildlife, much of the wildlife corridor network contained within Bow Valley Wildland Park and Canmore Nordic Centre Provincial Park was designated a Wildlife Protection Zone (WPZ). ACD has since instituted seasonal and permanent closures to the public within certain areas of these WPZ (ACD, 2005).

These closures are targeted at a variety of wildlife species, including bears, and are designed to provide habitat security. In some cases, they do allow for limited human use, provided people restrict their use to designated trails. These areas include the Benchland Trail system located within the wildlife corridor on the north side of the Bow Valley above Silvertip within Bow Valley Wildland Provincial Park, and a portion of land extending from Wind Ridge to Grassi Lakes on the south side of the valley. There are also other trails outside of these protection zones that are only open for part of the year. These include Grotto Mountain, open May 16 to November 30, and the Centennial Ridge Trail, open from June 22 to November 30. Signage has been installed at key entry points to these WPZs, informing the public that these areas are being managed for bears and other carnivores (S. Donelon, personal communication).

The level of human use within closed areas of the wildlife corridor above the Silvertip development has dropped by 85 percent (S. Donelon, personal communication.). Donelon attributes the high level of compliance to the constant presence of Conservation Officers in

these areas for the last two summers; he believes that the creation of the Montane Traverse Trail was critical to providing an alternative to the popular Benchlands Trail that was decommissioned due to its location within the corridor. Also, the human fatality of 2005 confirmed that, even with these steps in place, interactions between bears and people are likely to continue. By utilizing trails within wildlife corridors, people are accepting a higher level of risk.

The Town of Canmore is currently gathering input based on input from local stakeholder groups to help establish a plan for the towns trail system (Canmore, 2005). Bow Valley Wildsmart has provided input into this plan through the creation of the document “Bow Valley WildSmart Guiding Principles of Trail Design.” This document, currently being drafted will highlight what can be done regarding trail development and maintenance to reduce the potential for conflict between wildlife and people.

## **f) Education and Outreach**

Education is recognized as a key component of managing bear-human conflicts. The Bow Valley has achieved much in the last 10 years in regards to educating the public on how to better co-exist with wildlife. Education is the primary only means to address issues related to attractants on private lands, because provincial legislation does not provide ASRD Officers the authority to enforce clean-up orders in residential areas, unless it can be shown that attractants are actually bringing bears in. As a result, someone who has made attractants available can only be persuaded through educational means to clean up

or remove them. There are no municipal bylaws in place within the M.D. of Bighorn pertaining to birdfeeders or composters. There is also no legislative means to prevent residents from planting ornamental fruit trees or shrubs that could potentially attract bears (R. Wiebe, personal communications).

A number of well-known researchers, educators, wildlife managers, and conservationists live in the Bow Valley. Many of them take time out of their busy schedules to talk with school groups and the community regarding the conservation work they are doing, both locally and further afield. Much of this is considered on the leading edge of conservation work. One could argue that children in the Bow Valley are knowledgeable about environmental issues concerning grizzly bears and wildlife corridors.

This is a direct result of living in a place that still has populations of black and grizzly bears within

its boundaries, yet is under tremendous pressure to provide, in an environmentally sustainable fashion, continued recreational opportunities and economic growth. It is this reality that frustrates long-time residents who long for the good old days and newcomers who have trouble understanding the logic of how walking or biking down a trail could possibly impact wildlife in the valley. This is the challenge the Bow Valley faces, and much of it centres on having the public better understand and accept decisions that may affect their personal use and enjoyment of the Bow Valley. The public needs to be able to support decisions made by wildlife managers that affect their trail use and be confident that these decisions are justified and based on sound science. Wildlife managers need to continue educating the public to understand the reasons why certain trails are closed or why a bear had to be removed from the valley.



WRBI discussing securing attractants with landowner  
Photo: © WRBI

The Bow Valley comprises long-term residents, part-time residents and visitors. These people all require some form of education in regards to coexisting with wildlife, including bears. Currently, there are a variety of programs that presently exist that target these different groups. They include local-not-for-profit groups delivering educational talks to school and community groups, government agencies creating brochures that explain limitations on human use in certain areas, park interpreters giving talks focused on living with wildlife and local officers and biologists talking to organizations, businesses, and the public during their day-to-day activities as wildlife managers.

Bow Valley WildSmart Chair, Pat Kamenka, a long-time resident of the Bow Valley, says that the goal of WildSmart is to support activities that aim to reduce wildlife human conflict and that the best avenue for WildSmart to do that is through education (P. Kamenka, personal communication). In the summer of 2006, WildSmart staff carried out point duties where they would go to specific public areas and talk to people about how to minimize conflict. They watched WRBI staff deliver bear shepherding techniques so that they would be able to explain the basic concepts to the public.

The Bow Valley experiences a busy tourist season. Many foreign tourists are short-term visitors who stay in an area for a couple of days and don't know how to react if they see a bear. Attempts have been made by various organizations to educate this group of people by way of brochures in hotel rooms, campgrounds, buses, taxis and restaurants. Sessions focused on educating seasonal service industry staff on bear-awareness issues are also in place. Some

businesses rent out bear spray to international visitors, recognizing the fact that these people may not purchase bear spray because the airlines will not allow them to carry it onboard aircraft on their flight home. Other businesses provide bear spray free of charge to their guests.

Efforts have been made to engage local schools in bear management issues. Examples include students having guest lecturers speak about issues pertaining to bear-human conflict in the Bow Valley and other parts of the world.

In an effort to educate new homeowners on the environmental challenges of living in the Bow Valley, the Chinook Institute has created *A Home Owners Guide to Environmental Stewardship*. This document is distributed by Realtors in the Bow Valley to new homeowners and is also available electronically (Chinook Institute, 2006).

Local newspapers and radio stations regularly offer information about bears and related topics. Also, some projects that have taken place in the Bow Valley have generated much public interest. The Bow Valley was included in the 11-year Eastern Slopes Grizzly Bear Project that examined, in part, human influence on grizzly bears in the Central Rockies Ecosystem. BCEAG received the Premier's Award of Excellence in 1999 for developing formal wildlife corridor standards in the Bow Valley. The Bear Shepherding Program currently in place in the Bow Valley has drawn the attention of national and international media including CBC Radio and Television, National Geographic, and the Discovery Channel. This media interest has provided an excellent opportunity to discuss the complexities of

managing for both people and wildlife in the Bow Valley and has the potential to be a positive educational tool.

Lastly, a number of organizations have taken advantage of the internet to get their message out to as many people as possible. Specifically, Ontario Bear Wise (2005) and the Bear Smart Society in Whistler (2006) have done exemplary jobs of creating informative and interactive websites related to bear-human conflict.

### **g) Habitat Alteration**

Enhancement sites, designed to increase buffaloberry in areas with limited human use, are being created to ensure there is no net loss to overall food abundance. The creation of these enhancement sites for buffaloberry growth will likely attract bears to those areas during berry season. However, there is no guarantee that bears presently utilizing areas in and around developments will move into these enhanced areas. It is possible that more dominant bears will occupy enhanced sites and less dominant bears will continue to prefer areas in and around developments.

A firebreak has been constructed adjacent to Banff National Park on the south side of the Bow Valley at the west end of the Canmore Nordic Centre. This firebreak will likely result in increased buffaloberry growth and enhanced habitat for grizzly bears (S. Donelon, personal communication). Other areas may indirectly be enhanced for buffaloberry growth due to natural events such as the blowdown that occurred in Silvertip, Eagle Terrace, and Harvie Heights. Similar results could happen with programs that result in the opening up of forest canopies. These

include the Mountain Pine Beetle program and Firesmart, where forest thinning takes place around developments to reduce the chance of fire. If the amounts of buffaloberry along the trail systems at the Canmore Nordic Centre and in Peter Lougheed Provincial Park are any indication, new trails constructed within the Bow Corridor, may experience increased buffaloberry growth and with that, increased bear activity.

### **h) Data Collection**

There are a number of different databases currently collecting bear-management information. They include bear-sighting report information as well as information collected from officers and contractors such as WRBI. Biologists often use information from these databases for the purposes of wildlife management, an example of which is this Hazard Assessment. The data collected, however, is not always the type of information needed in order to accurately assess or measure the effectiveness of ongoing programs in the valley. Much of the data utilized for this assessment was obtained through the narrative of occurrence reports. These reports are primarily for enforcement purposes and data that might be used for biological purposes is not always included. Human use data is also being collected from trail counters, which measure levels of human use on trails. This data is specific to individual trails and is extrapolated to other areas where trail-counter readings are not used. It does not identify activity types such as biking versus hiking. At present, little detailed recreational and social data is being collected that could be used in conjunction with wildlife movement data.

### **C. OPTIONS FOR FURTHER REDUCING CONFLICT**

Grizzly bears and black bears frequent the Bow Valley and there is always the possibility of a person encountering a bear. Not all people are comfortable with this concept. People need to figure out what level of risk is acceptable to them. People who have no interest in seeing bears need to be able to go about their business with the understanding that, in some areas, such as downtown Canmore, the risk of interacting with a bear will be low. Conversely, people who mountain bike at the Canmore Nordic Centre in August need to understand and accept the higher level of risk associated with that activity in that area at that time. With this in mind, we need to continue to work towards educating the public on how to live in the Bow Valley alongside bears. This means providing people with as much information as possible, so that they can make informed decisions on how to utilize the valley at acceptable levels of risk and in a manner that minimizes bear-human interactions.

Bear-human interactions occur in all three jurisdictions within the Bow Valley. While there may be more interactions in Canmore than on provincial lands and in the M.D. of Bighorn, a coordinated approach to managing human use and dealing with natural and unnatural attractants needs to occur across jurisdictions. For example, removing buffaloberry on provincial lands adjacent to Canmore and not in Canmore itself has the potential of increasing interactions in Canmore.

Attractants need to be managed in such a way as to keep bears away from certain areas. The removal of food sources needs to be balanced

with the creation of enhancement sites so there is no net loss of food to bears. It also means finding ways to change human behaviour that is detrimental to bears. People need to know it is in their best interests and the best interests of bears to have their dogs on leash in protected areas, stay out of closed areas, obey signage, and report sightings immediately.

Increased development and recreational activities in the Bow Valley have the potential to increase bear-human conflicts. Bears and people are using many of the same areas at certain times of the year. To minimize conflict between bears and people, these areas need to be managed accordingly. This does not necessarily mean outright exclusion. It does require a collaborative approach between groups with a vested interest in the future of the valley. Examples of this collaborative approach, include the Bow Corridor Ecosystem Advisory Group, formed in 1995 "to facilitate the coordination of responses to environmental and resource issues in the Bow Valley" (BCEAG 1999). Similarly, the Recreational Outdoor Working Group, was established to provide a mechanism to coordinate and make recommendations on managing recreational opportunities in the Bow Valley (BCEAG ROWG, 2001).

While these initiatives are positive steps towards finding common ground for managing bears and people, the challenges continue. The Bow Valley, particularly Canmore, will continue to undergo significant changes to the landscape that will affect how both bears and people utilize specific areas. Based on what we presently know about why conflicts occur between bears and people, and the fact that development will continue for years to come, bear-management

plans for the Bow Valley will need to be adaptable to future development and to new science and other information. Regular reviews of existing work practices and, if necessary, changes in the delivery of practices will be necessary in order to remain effective.

### **a) Habituation**

The rate of encounters between humans and grizzly bears has been positively correlated with human-caused grizzly bear mortality (Mattson et al., 1996). Habituation of grizzly bears in the Central Rockies Ecosystem has also been found to increase mortality risk (Herrero et al. 2005). The Bear Shepherding program is intended to reduce levels of habituation by discouraging bears from utilizing developed areas and to encourage them to move into cover when near people. The Eastern Slopes Grizzly Bear Project Final Report identifies aversive conditioning as a key factor in achieving high adult-female survival rates, and recommends continued funding for implementing and evaluating such programs (Herrero 2005). The Golder Report also identifies the need to maintain an adequate budget to cover an annual aversive conditioning program, and cited this program as a key factor in the success of corridor design and wildlife mitigation as part of the Three Sister development.

This suggests that the current Bear Shepherding Program in the Bow Valley and surrounding area is an important element in the management of grizzly bears, particularly if it targets adult females. If bears, particularly grizzlies, are to remain in the Bow Valley, they will have to be managed more intensively than in the past (WRBI 2003). Bear shepherding is one example

of how this might happen. Mechanisms need to be in place to evaluate this program. This means a long-range plan with formal goals and objectives needs to be articulated to justify the program and its costs. Data collection needs to be improved and the program needs to be in place at the start of the bear season.

In areas such as Silvertip, this means having a program in place shortly after bears emerge from their dens in order to monitor and condition radio-collared bears as they move into the valley bottoms to feed on early spring vegetation. Early program implementation can also identify any new uncollared bears deemed to be suitable candidates for conditioning work. Some radio-collared bears have reverted back to old habits early in the season before the formal conditioning program was in place, which results in reduced effectiveness of the overall program. As the summer progresses into berry season, staffing needs to reflect the increase in bear activity. This staffing can come from additional agency personnel, private contractors such as WRBI, or both.

Several communities in British Columbia have recognized the need to increase staffing levels for bear-conflict work. Whistler and North Vancouver, in collaboration with the British Columbia Conservation Officer Service, have created one nine-month position in each location to assist local conservation officers with bear management. The position is cost-shared by the municipality and the Conservation Officer Service. The program received a positive first-year review and is in its second year of operation (M. Badry, personal communication).

While conditioning is considered an important element for managing bears in the Bow Valley, it is not the only tool available. Public education, attractant management, and management of human use, including alternative concepts such as community-based social marketing, need to be considered as well. These programs will be more effective if done together.

## **b) Natural Vegetation Attractants**

Bear conflicts continue to occur where natural and unnatural attractants are available. A key ingredient to managing bears in developed areas is to deal with the food source that is attracting bears. By removing natural attractants, the incidents of bears obtaining unnatural foods opportunistically may also be reduced. The management of attractants, particularly the removal of natural vegetation, is becoming more commonplace in and around the Bow Valley. Positive results from thinning projects in Banff National Park and Kananaskis Country suggest that further research into attractant management should be encouraged. Removing natural attractants as well as unnatural ones may also make conditioning work more effective (WRBI Report, 2003). So far, the work that has been done to remove buffaloberry in the Bow Valley has been carried out on a relatively small scale; there are many other areas that could benefit from removing natural attractants.

The predominant natural attractant, buffaloberry, needs to be managed on a larger scale. Volunteer groups can be effectively engaged to removing berry bushes from campgrounds. This is an effective, educational tool for small, site specific areas. However, this type of removal effort in larger areas within Canmore, for instance, will

not be effective or practical. Dedicated crews that can remove natural attractants from large developed areas in one season will lessen the likelihood of bears discovering new feeding areas within areas of high human use.

Lac Des Arcs campground continues to attract bears during the month of September, the key attractant being Chokecherry and Dogwood. Consideration should be given to removing these attractants, as the possibility of an encounter is very high due to the poor sightlines and abundance of berries directly adjacent to the campsites bordering Lac Des Arcs. An alternative would be to close the campground as soon as berries ripen in the fall. This option could be a concern to campground contractors should berries ripen before the financially lucrative September long weekend.

In the post-bear-proof garbage era, Canmore and other communities in the Bow Valley will need to focus on managing natural attractants and on more intensive monitoring of bears using areas in or near developed sites. Grizzly bear activity has increased in the Harvie Heights area and it will be important to monitor buffaloberry growth in the blowdown above the community.

As natural vegetation is removed, it will be important to anticipate bears moving to other areas to feed. If these areas are developed sites, then wildlife management staff need to be prepared to manage the new attractant, monitor and condition those bears, and manage human use (WRBI report 2005). An example of this would be the potential removal of buffaloberry from the Rundlevue subdivision. A consequence of this could be bears becoming attracted to crabapple trees as an alternative food

source. This could result in bears being inside subdivisions rather than on the periphery of the neighbourhood as is now the case.

Projects such as Firesmart and Mountain Pine Beetle may encourage buffaloberry growth. The redevelopment of trail systems at the Canmore Nordic Centre may also result in an increase in buffaloberry in the next five to ten years. In all of these cases, there will need to be an active program to reduce the attractant in these areas or at least from areas adjacent to the trail system.

Lastly, attractant removal will require a flexible, adequately funded, long-term plan that identifies when and where to remove the attractant as well as the need to revisit areas as vegetation grows back and becomes a possible attractant for bears in future years. This plan requires measurable objectives to be identified to allow for a formal evaluation of the program's effectiveness.

### **c) Unnatural Attractants**

The number of conflicts involving unnatural attractants in any given location zone is not alarmingly high. However, cumulatively, they have the potential to affect bear populations in the valley. This becomes particularly true when such importance is given to reducing female grizzly bear mortality. The goal of preventing bears from being removed from the Bow Valley should be considered the starting point for measuring success. There may be occasions when bears have to be removed but these should be rare, isolated incidents. These removals should not happen because bears obtain garbage or human food, especially given the major inroads we have achieved in the last 10 years.

### **Garbage**

The installation of bear-proof bins in the Bow Valley has dramatically reduced the amount of unnatural food-related bear incidents. The positive impact began in Banff, with similar results in Canmore and Exshaw once bear-proof bins were introduced into these communities. There does, however, continue to be occasional, isolated, garbage-related incidents in the Bow Valley. According to District Fish and Wildlife Officer Wiebe, residential garbage can often be found in bags placed outside bins within Canmore town limits. Some of these incidents have resulted in bears finding this food, becoming a nuisance, and being destroyed.

The lack of compliance with commercial garbage bins in the Bow Valley is an ongoing issue that needs to be addressed. These leased bins are generally not bear-proof and it is more luck than good management that there have not been more incidents concerning commercial bins. Businesses need to obtain functional bear-proof bins from suppliers. An alternative is for the Town of Canmore to take on the responsibility of providing businesses with functional, bear-proof bins.

Provincial Park campgrounds, particularly those situated adjacent to the Bow River, experience bear activity on a regular basis. There have been issues of bears obtaining human food and garbage periodically from some of these campgrounds, notably Three Sisters Campground during berry season and the Bow River Campground in the spring/early summer and late summer/fall. Increased walkthroughs by campground contractors and park staff would help to ensure attractants are being properly

secured. A volunteer stewardship program aimed at educating visitors in these campgrounds will be delivered by Wildsmart in 2007 in conjunction with ACD.

Garbage pick-up in provincial park lands is at times inadequate, resulting in garbage being left outside of bear-proof bins (G. Naylor, personal communication). Park managers are attempting to ensure that bins are emptied in a timely fashion and not overloaded.

There continue to be unnatural attractants available to bears in several communities within the M.D. of Bighorn, including birdfeeders, garbage, compost and ornamental fruit trees. While none of these incidents on their own are major problems, the cumulative effect may be an issue. Certainly a birdfeeder bylaw would help reduce the number of birdfeeder-related incidents. Education programs that specifically target M.D. communities such as Harvie Heights, Lac Des Arcs and Exshaw would be beneficial.

### **Recycling and Composters**

The formal recycling program in Canmore has not been a bear attractant. Both depository sites are kept clean and have bear-proof dumpsters on site for recyclables and garbage. Items must be cleaned and rinsed prior to being deposited at the recycle sites. The local commercial recycling company, Flying Pigs, also follows these guidelines. The one exception to these rules is pop and liquor bottles, which are not generally washed out. They are put out on the street in non-bear-proof containers. Flying Pigs has not had an incident with unwashed bottles but it is worth noting that in Kananaskis Country, bears

have been attracted to non-bear-proof recycling containers. As a result, Kananaskis Country, in cooperation with facility managers, has bear-proofed all recycling facilities (D. Hanna, personal communication).

Several options for dealing with recyclables exist, including providing bear-proof carts similar to those used by Flying Pigs for recycling. These types of carts are presently being used in some campgrounds in Kananaskis Country for the sole purpose of collecting recyclables. These carts could be made available for individual homes, or municipalities could provide one bear-proof cart per block of homes. Another alternative would be to have pop cans and liquor bottles rinsed and cleaned prior to pick-up. An additional option is to not provide curbside recycling services during periods of high bear activity in specific residential communities, such as Rundview during berry season.



Recycle bins at Stewart Creek golf course  
Photo: © Jay Honeyman

## **Birdfeeders**

It appears that the creation of a bylaw reduced the number of birdfeeder incidents in Canmore. Communities within the M.D. of Bighorn would likely experience a similar reduction in birdfeeder-related bear activity with such a bylaw. Until that time, education and voluntary compliance will be an important factor in reducing birdfeeder incidents within communities such as Harvie Heights and Lac des Arcs.

## **Non-Native Grasses**

Non-native grasses, including golf-course grasses, have attracted bears to developed areas in the last few years. It is not practical to remove residential or golf-course grasses nor is a substitute presently known that would be considered non-palatable for bears. Actions need to focus on discouraging bears from using golf courses, especially during times when courses are open. Closing courses to allow bears to feed may encourage bears to stay longer. Fencing, such as that along portions of the Trans Canada Highway, may contribute to less roadside feeding, although there are no statistics to support this. Options for keeping bears from feeding on grasses inside developments include fencing, intercept feeding, aversive conditioning, or a combination of all three. These options have advantages and disadvantages, and should be considered on a site-by-site basis. As a preventative measure for future developments, consideration should be given to planting non-palatable native species of plants as opposed to mixes that may contain bear attractants such as clover. Controlling species such as dandelions should also be encouraged.

## **Ornamentals**

There have been, and continues to be, bear incidents involving ornamental fruit trees in the valley. While it has not been as great a problem as garbage, it has the potential to become more of a problem. Already, ornamental fruit trees are a particular concern in Exshaw. Reducing the availability of fruit from trees by picking fruit, or by replacing the tree with a non-fruit-producing variety, would help reduce bear activity during berry season in Exshaw.

Bears could potentially shift their attention from natural attractants to ornamentals, as species such as buffaloberry are removed from developed areas. Contingency plans need to be in place for this possibility prior to any major removal of buffaloberry. These plans could include bear shepherding in anticipation of increased bear activity during the period immediately after removal. Planting non-palatable species will also reduce the temptation for bears to enter developments. Local information from developers, commercial landscapers, non-profit organizations, and the Town of Canmore about non-palatable species of trees, shrubs, and flowers in residential communities is available. None of these programs are mandatory and their success is dependent on effective educational programs. A key to encouraging local homeowners to plant specific types of ornamentals on their properties is providing them with acceptable alternatives that meet their needs. Local landscaping companies can provide expertise in suggesting appropriate species that will not be considered attractants for bears and other wildlife.

Residents with berry-producing trees and shrubs already on their properties could be encouraged to replace these attractants with a suitable, non-palatable species through some type of cost-sharing program organized through the provincial government or local municipality. According to local landscaping companies, certain species of trees flower in spring and fall without producing fruit.

### **CPR Railway**

The bear-proof dumpsters installed at Gap Corner near Exshaw will help to reduce the amount of attractants available on CPR rail lines. The grain vacuum truck is also available for any grain spills that might occur on provincial lands outside of the national parks (G. Bridgewater, personal communication).

### **d) Compliance**

Many direct actions undertaken to manage bears and people require a certain level of cooperation from the public. This includes respecting area closures, reporting bear sightings, and staying on designated trails. It is difficult to measure overall compliance of these management actions in the Bow Valley. What is clear is that some people, likely for a variety of reasons, do not comply. They may disagree with the management action being taken, they may be unsure of what is expected of them, or they may be unaware of the management action. A closer look at non-compliance may provide ideas on how to improve the current situation.

### **Area Closures**

In the past few years, large areas of land have been temporarily closed due to bear activity. Some people have disregarded the closures. The

lack of compliance could be improved through increased education, identifying innovative ways of successfully changing peoples' behaviour, and increased enforcement through fines.

Closing large areas is a logistical challenge. It has traditionally meant posting closure signs and closure tape at every main access point to the closed area, as well as posting signs at the multitude of trails that access the area. It takes a tremendous amount of time and labour and, even then, it is practically impossible to sign or ribbon every feeder trail into an area. Inevitably, signs are occasionally left up when the closure ends. ASRD suggests erecting permanent signs in some areas such as Quarry Lake and Montane Trail. These signs could be locked closed and flipped open when necessary. Over time, people would automatically check these certain key locations for management information pertaining to a particular trail. Feeder trails would not need to be posted to the degree they are now if the public assumed more responsibility of finding out the current status of an area.

Additional methods of informing the public in addition to the present system of signs, radio broadcasts, newspapers and government websites may enhance compliance of closures. An example of this is direct emails sent to subscribers, as is currently done on the Trailex website. Subscribers check their email to determine where bears have been sighted, and then make decisions on where to recreate based on this information. This is similar to Canadian Avalanche Association website used by skiers and climbers seeking avalanche information prior to visiting backcountry areas. Information available on key websites and a Trailex-type email system could alert users to areas posted

with bear warnings or closures.

The way ASRD and ACD post signs vary. An example of this is posted closure signs. Some areas are posted with standard “Bear in Area-Closed” sign, while other areas include a detailed map of the closure area along with a physical description of the closed area, and the date of implementation. Signs without dates mean people don’t know if a particular closure sign is current, or if it is an old sign that was never removed. Ensuring all signs have a date on them will help resolve this issue. Also, signage posted throughout the Bow Valley should be standardized, regardless of the jurisdiction in which it occurred.

A concerted effort to better educate the public regarding how bears are managed locally and what the public can do to assist that effort is required. A common request voiced by people talking to Bow Valley WildSmart staff is that they want to know the reasons behind area closures or warning signs (K. Titchner, personal communication). Consideration could be given to providing more information than just a “Bear in Area – Closed” sign. An increase in understanding of why areas are closed may result in a more engaged public and increased compliance.

There have been instances where local recreational groups have worked effectively with government to implement changes to areas that both satisfy user groups and reduce bear-human conflicts. The Bow Valley Mountain Bike Alliance (BVMBA) has worked closely with Parks Canada to ensure mountain biking remains a viable recreational pursuit within certain areas of Banff National Park. The Moraine Lake

Highline trail, as an example, is open to bikers and hikers prior to and after berry season. As berries ripen, part of the trail is closed to public use. BVMBA director Eric Harvie says this decision satisfied everyone. He believes that having both parties discuss concerns and options is the reason for the positive outcome and the current high compliance rate. By comparison, he points out that unilateral land-management decisions without the involvement of recreationists are not positively accepted and accordingly do not have a satisfactory compliance rate (E. Harvie, personal communication.).

### **Bear Sighting Reports**

Accurate and timely reporting of bear sightings are an important and valuable tool for management agencies to efficiently deal with bear-human conflicts. In the case of ‘problem’ bears, if the public can be convinced of the need to report sightings early, there is a good chance that problems will not escalate (WRBI, 2003). Steps need to be taken to encourage everyone to report bear sightings on a more regular basis.

At the moment there are two different types of reporting information. One is bear-sighting information collected by government staff, contractors, and the public that is used by wildlife managers for day-to-day bear management. The other is the Trailex website (<http://trailex.org/>) being used by recreationists to obtain current bear-sighting information. The public is encouraged to report bear sightings in the Bow Valley and other areas of Kananaskis Country by phoning a central number (403- 591-7755) located at the Ribbon Creek Kananaskis Emergency Services Centre. This phone number is advertised on multiple local websites,

brochures, trailhead kiosks and at Visitor Information Centres.

Many people, however, are reluctant to report bear sightings. Some people believe that this will lead to the bear being trapped and destroyed, or removed. Also, recent trail closures in the valley have created divisions between some local user groups and wildlife managers; as a result of this tension, local user groups may not report sightings out of concern that trails will be shut down by wildlife managers if they learn that bears are using the area (WRBI, 2003).

Agency staff and WRBI staff record and report bear-sighting information, but this is not made available to the public. Radio-collared bear-location information is provided daily to specific groups in the Bow Valley that have a particular interest in bear activity. These include golf courses, developers, and Bow Valley WildSmart staff involved in bear education.

There are a few different ways the public can obtain information pertaining to bear activity in the Bow Valley. Alberta Community Development posts bear cautions and closures that occur in the Bow Valley on their website: [http://www.cd.gov.ab.ca/enjoying\\_alberta/parks/featured/kananaskis/trailreport.aspx](http://www.cd.gov.ab.ca/enjoying_alberta/parks/featured/kananaskis/trailreport.aspx). Information centres in the Bow Valley also receive this information and make it available to the public via the web. It is also included in public service announcements on the local radio station and available in local newspapers. This information does not include individual sightings of bears.

Some Bow Valley residents want access to more up-to-date, specific information regarding bear

activity. The Trailex website was developed in the spring of 2006 by a concerned group of residents in order to provide recreational users with information regarding wildlife sightings in an attempt to reduce wildlife-human conflicts. This initiative was a direct result of the fatal bear mauling that occurred in 2005. Many people at the time felt that accurate and current information was lacking.

The Trailex site is supported by many people and businesses in the area, and receives regular posts by members of the public who see bears while out on the trails. The website provides individual users with this up-to-date bear activity information via email. The Trailex site, as of November 2006, has had 21,000 hits since its inception in June 2006. Some users are making decisions on where to recreate based on information that comes directly from the Trailex site (H. McCroy, personal communication). Management agencies, however, have expressed reservations with the system. They are concerned that the public may interpret the locations identified on the site as the only locations harbouring bears and that they do not have to be concerned if they go elsewhere. They are also concerned that posting wildlife sightings with specific locations and times might encourage some individuals to seek out those locations to view and/or photograph bears. Proponents of the Trailex site believe that by posting up-to-date sightings of bears, recreationists will be able to make better decisions on where to recreate in order to avoid negative wildlife encounters, and will actually reduce human-use levels in areas where bear activity is occurring.

In reality, the Trailex reports constitute only a small portion of the bear activity actually

occurring in the area. This is based on comparisons with Trailex postings and bear-monitoring reports obtained by ACD and ASRD in conjunction with the WRBI Bear Shepherding contract during the last year. It is also true that agency-monitoring reports do not always include information from the Trailex site. In essence, there are a number of systems in place to record bear activity – none of which provide a complete picture of what is actually occurring. Most of the information being gathered is for management purposes and not available to the general public.

Ideally, all available information would be collected and disseminated in a way that is acceptable to both wildlife managers and recreational users. Such a system has the potential to reduce human activity levels in areas when people voluntarily go elsewhere.

Kananaskis Public Safety Specialists indicate that there appears to be less backcountry ski activity during periods of extreme avalanche activity than during periods of low to moderate activity. This is believed to be a reflection of peoples' heightened awareness about the higher risk involved when skiing during extreme avalanche hazards (B. Duncan, personal communication). This is likely due, in part, to the Canadian Avalanche Centres (CAC) public education programs. The creation of a public bear-hazard rating, similar to CAC's Avalanche Danger Rating Scale, should be considered. The danger is that some people would use the information to find bears for photography, hunting, or tourism opportunities. To address this, the information should be non-site-specific, yet still provide bear-activity trends for areas of the Bow Valley.

Bear-activity information that is too specific can provide users with a false sense of security. For example, a single bear-sighting recorded on Grassi Lakes trail at 1600 hours on July 5<sup>th</sup> should not necessarily be a reason to avoid that place on July 6<sup>th</sup>. It is quite conceivable that the bear left an hour after the report. To deal with these concerns, information should indicate trends, or it could discuss general bear activity in the Grassi Lakes area for the past three days. This starts to paint a picture of activity that allows users to make decisions on where they want to go based on their risk tolerance.

This information is the most effective when many people use it. Again, the CAC is a good example of an information program, based on a wide range of data being compiled, utilized by many people. If this model is followed, there should be one main site where people go to obtain information regarding bear activity, posted warnings and closures. Obviously, there is a cost associated with this type of a program and it requires someone to deliver it. A group like WildSmart is a logical choice to manage this type of a site, providing funding can be secured. Alternatively, it could be built into the existing WRBI contract.

### **Enforcement**

Increased enforcement is always an option to increase compliance, pending the resources available from local provincial and municipal officers. Laying charges for entering closed areas and actively enforcing the dog off-leash regulation in Canmore and on provincial protected areas would likely improve compliance. There have been suggestions of doubling fines when people are discovered with

off-leash dogs in areas when bear warnings and closures are in place.

### **e) Human Activity in Bear Habitat**

Projections for Banff National Park indicate that visitation will increase by 2.25 times over the next 30 years (Stelfox et al. 2005). It would not be unreasonable to expect similar tourist-related growth rates in the Canmore area. It is difficult to imagine what the Bow Valley will look like in 10 years but we can expect to see continued challenges related to wildlife and people. The Bow Valley will need to be on the leading edge of grizzly bear management if we are serious about maintaining bears on this landscape in the future.

The Bow Valley presently experiences a wide variety of human use, from small groups hiking and biking on trails to large special events that attract thousands of people to the valley. This results in a lack of predictability, from a bear's perspective, on where and how people use the valley. As mentioned earlier, Banff National Parks Grizzly Bear Conservation Strategy (2004) indicates that fewer bear conflicts, human-caused mortalities, and human injuries occur when human activity is more predictable in terms of location and time. Examples of some strategies that have been used to improve predictability include the 'group access' strategy implemented at Moraine Lake; this allows access for people and reduces overall bear encounters due to larger, and as a result, fewer groups on the trail. Seasonal closures during periods of high bear activity is another example of how managing human use has worked for both bears and recreationists.

### **Trails**

Herrero (1985) indicates that sudden encounters are the most common situation associated with grizzly bear inflicted injury. A number of high-use trails in the Bow Valley experience a higher-than-average number of bear-human interactions or are considered a high risk for encounters due to poor sight lines and/or the availability of buffaloberry adjacent to the trail. These trails may increase the chance of sudden encounters between bears and people. Consideration should be given to creating an inventory of these types of trails in order to determine what might be done to reduce the chances of encounters between people and bears. An initial list of trails that have a higher than normal potential for conflict include Many Springs, Heart Connector, Grassi Lake, the Dog Pond powerline trail, Larch Islands, Canmore's engine bridge, and the CNC trails.

The prevalence of berries adjacent to the trails at the Nordic Centre makes it an attractive place for bears, particularly in July and August. There have been a number of bluff charges involving both black and grizzly bears at the CNC along with incidents of bears actually contacting and injuring people. Recreational users need to understand the high possibility of encountering bears in the summer months. Educational messages, specific to the Nordic Centre, in the form of brochures and videos, would help increase public awareness pertaining to bears. The paved roller-skiing loop is expected to hold snow well into the spring (L. Weiss, personal communication). If this is the case, it would have the benefit of reducing the level of human activity between the spring and summer seasons.

Consideration should also be given to the type of trail use being undertaken. A report conducted by Bios Environmental Research (2000) for Parks Canada provided various management options for the Moraine Lake Highline Trail in an attempt to reduce conflicts between grizzly bears and cyclists. Information collected by BIOS suggests that, based on the fact that cyclists can travel faster than hikers, sudden encounters with grizzly bears are more likely to occur with cyclists than with hikers. This seems to be supported by the number of bluff charges that have occurred between cyclists and grizzly bears in the study area (Fig 13).

Kevin Simpson of Rebound Cycle in Canmore suggests that one option to address this concern would be to identify a formal system of bike trails that a majority of riders could use (K. Simpson, personal communication). At present there is no formal trail guide to biking in the Bow Valley, other than guidebooks, which struggle with keeping editions up-to-date due to frequent changes in management policies related to the sport. A public brochure that identified bike trails that were recognized to be relatively low risk, for a variety of skill levels, could reduce use on those trails experiencing higher levels of conflict. Formally identified trails would be maintained to reduce conflict as much as possible. Bears could be discouraged from feeding beside these formal trails by removing attractants adjacent to trails 20 to 30 feet into cover. Sightlines would be improved so that bears would be aware of people approaching well in advance and be given the opportunity to move into cover. Informal trails, that are of higher risk due to trailside foods and poor sightlines, should be discouraged by aggressively advertising those other trails. Other tools for

reducing use on particular trails include seasonal closures, permanent closures or, as has been done at Moraine Lake, instituting a 'group access' program that requires people to travel in a tight group of six or more. Seasonal closures should be considered for the single-track trails above the machine-constructed trail system at the CNC during periods of increased bear activity during berry season (WRBI 2003).

### **Special Events**

Organizers of special events occurring in the Bow Valley have taken a proactive approach to wildlife management by having systems in place to deal with potential problems before they occur. The guidelines being used for events such as Mozart on the Mountain and 24 Hours of Adrenaline should be followed by other large groups planning such events.

### **f) Development**

A number of unnatural, large-scale features exist in the Bow Valley that influence how bears utilize the valley. They include residential and industrial developments such as golf courses, major highways, the railway, and wildlife corridors.

#### **Highways**

Numerous studies have identified the correlation between roads and increased mortality risk for grizzly bears (Mace et al. 1996, Gibeau 2000). According to Stelfox et al. (2005), road density is a recurring theme highly correlated with grizzly bear population decline along the Rocky Mountains of North America. Roads can also fragment habitat and populations, further stressing population viability (Proctor 2003).

From a human perspective, major highways may increase people's risk of hitting bears while travelling along roadways, or create accidents due to bear jams along high-speed, high-volume highways. This is more likely to occur in areas where the highway is not fenced, east of Deadman's Flats on the Trans Canada and 1A highways. Highway fencing and underpasses could be considered for other roadways to improve north-south movement and to reduce highway mortality.

### **CPR Railway**

The bear-proof storage containers at Gap Siding should prevent bears from accessing grain picked up and deposited by vacuum rail cars. There have been occasions when lids to the bins have

been left open, which allows bears access to the grain inside. The lids need to be kept closed in order for the bins to be considered bear-proof.

### **Golf Courses**

The two main concerns pertaining to golf courses are the level of spring bear activity that Silvertip has recently experienced, and the potential for interactions at Stewart Creek where the wildlife corridor bisects the golf course.

In the case of Silvertip, there has been increasing activity in the spring for the last two years, involving both black and grizzly bears feeding on golf-course grasses. Removal of the fertilized golf-course vegetation is not a viable option.



Gap Siding Bear-proof Bin  
Photo: © Jay Honeyman

Fencing is an option, although designing a fence that would be impenetrable for bears would likely involve electric fencing which would not be particularly people friendly. It would also prove difficult to keep bears on the right side of the fence, especially when golf-course grasses would be in full view of bears from the wildlife corridor adjacent to the course. It is possible to use Bear Shepherding to keep bears off the golf course during the three to four week window bears are present, providing adequate resources are available. This would be most effective on radio-collared bears. Conditioning work on non-radio-collared bears is possible but requires more resources than conditioning radio-collared bears. There has been a reluctance to radio collar black bears for the purposes of aversive conditioning, due to the limited amount of resources to effectively monitor and work them in addition to higher-priority grizzly bears. It is likely that any black bear-related conditioning would therefore be on uncollared animals.

Another option to reduce spring grizzly activity in the Silvertip area is an intercept feeding program. Animal carcasses (usually roadkill) are deposited at higher elevations, hopefully near den sites, and used by bears after den emergence in an attempt to keep bears away from lower elevations for longer periods of time. This type of program has been implemented in southwestern Alberta in an attempt to reduce livestock predation by grizzly bears in the spring. The intercept program has proven to significantly reduce grizzly mortality associated with spring livestock conflicts (Bergman, 2003). There are notable differences between the southern Alberta program and one that might be introduced in the Bow Valley. The program in southern Alberta is a protein (carcasses) for

protein (calf after birth and calves themselves) trade-off that would not be the case in the Bow Valley (M. Gibeau, personal communication). Gibeau says that there is a chance females with cubs would prefer the green grass of early spring to carcasses. Family groups may also realize that, by coming down to the valley bottoms, there is less chance of an encounter with more dominant male bears that might be attracted to the carcasses. He also notes that distances between the carcass drops and ranch lands are much greater in southern Alberta, up to 10 kilometres in places. In the Bow Valley, those distances may be less than a kilometre, making it easier for bears to justify descending to the valley bottoms for green grass. Intercept feeding has not been attempted here and it is unknown as to whether this option would be effective.

The likelihood of bears continuing to use portions of Stewart Creek Golf Course as a movement corridor remains high. Stewart Creek staff has been removing buffaloberry within golf-course boundaries for two years now. The exception is the section of wildlife corridor that cuts through the golf course. This area has not had buffaloberry removed, as ASRD is reluctant to alter the existing corridor. Bears actively feeding in the corridor section increases the chance of bear-human interactions during the day when golfers are on the course. An option to reduce the chance of encounters would be to remove natural attractants from the golf-course section of the corridor, thereby encouraging bears to travel through the corridor quickly. This option needs to be weighed against the importance of that area as cover and as a food source to bears. The present system of monitoring and Bear Shepherding when necessary should continue.

Attractant management should be part of any golf-course wildlife-management plan in the future, including the new 18-hole golf course currently being developed by Three Sisters Resorts.

### **g) Wildlife Corridors and Habitat Patches**

Human use will undoubtedly need to be managed intensively, particularly in areas designated as a priority for wildlife, such as wildlife corridors and habitat patches. As mentioned in the Golder report (2002), monitoring of the corridors is important and should include data regarding use of the corridors by wildlife, including crossings of the parkway, and human-wildlife interactions. Animal use of the long valley corridor on either side of the study area, and the corridor between south Canmore and Bow Valley habitat patches, should be monitored as well.

Human use in the corridor above Silvertip is presently restricted to designated trails only. Consideration should be given to further increasing public awareness of the fact that large carnivores are encouraged to be in this area. It is possible that with this knowledge and more effective public information regarding real-time bear activity, levels of human use in such areas would be reduced voluntarily.

Extensive buffaloberry is present in the Grassi Habitat Patch. This particular patch, identified to provide secure areas for carnivores to feed, extends from the Peaks of Grassi subdivision to the Rundle Forebay, and it experiences relatively high levels of human use. Bears feeding in an area that is visited regularly by recreational

mountain bikers, dog walkers and hikers equates to bear-human interactions occurring. In order to reduce the chances of negative interactions, either bear activity or human use needs to be reduced. There have been four bluff charges in this area since 2001, three of them involving grizzly bears. Several options are available to reduce bear-human encounters. Removing buffaloberry from the habitat patch would encourage bears to move through the area quicker and potentially reduce bear activity. Opening up lines-of-sight along key trails such as the powerline would increase visibility, allowing both bears and people to see one another and react accordingly without surprise encounters. This would result in the area acting more as a corridor than a habitat patch. Human activity could be reduced at key times by implementing permanent seasonal closures or short-term closures, as are presently done. It would also help reduce the level of off-leash dog activity at Dog Pond. This is discussed in more detail in the Education Outreach Section below.

It would be difficult and arguably ineffective to attempt to 'condition' bears away from an area with such an important area of buffaloberry. Conditioning bears to not use this area runs contrary to the initial purpose of designating this place as one which carnivores should be encouraged to use (WRBI report 2005). Another alternative is to control levels of human use, particularly during berry season when bear activity is high. This could include short-term seasonal closures, as well as increased educational programs informing users of the increased possibility of bear encounters. These options need to be considered against the importance of this area as a food source to bears, particularly grizzly bears.

Residential areas adjacent to wildlife corridors may experience higher levels of bear activity than other areas. Historical bear activity in communities within the M.D. of Bighorn and Canmore communities such as Rundlevue, Peaks of Grassi and Silvertip supports this notion. Residents of these areas need to be aware that they live adjacent to a wildlife corridor intended for use by bears and other large carnivores, and that there may be human-use restrictions pertaining to the corridor. People should know when and where bear-activity levels tend to increase and plan accordingly. A proactive, community-focused program to educate residents about attractant removal, reporting bear sightings and what to do if they see a bear should be considered.

## **h) Education and Outreach**

Education is an important element in increasing awareness and reducing bear-human conflict. Groups, such as Bow Valley WildSmart, are in a good position to expand existing programs in a coordinated manner with input from a variety of stakeholders. Recognition needs to be given to the variety of user groups in the valley, including long-term residents, single-day tourists and recreationists, and businesses. Long-term residents need to understand why they cannot do many of the things they did 25 years ago in the Bow Valley, and newly arrived residents from urban centres need to learn how to live with large carnivores as neighbours. Programs that target specific user groups need to be considered.

Consistent and basic bear prevention messages need to be regularly communicated to residents and visitors to the valley. For example, people

need to make noise when using the trails. All bicycles should have some kind of noise device. It would be prudent, given the number of bluff charges that have been recorded in places like the CNC, for people to carry bear spray in those areas, and to know how to use it. This includes bicyclists as well as hikers, joggers, and roller-skiers.

Where compliance issues are a concern, such as dogs off-leash in the wildlife corridors at Dog Pond, educational messages could be installed that explain the function of the corridors and habitat patches. Messages would state the need for minimal disturbance by people. This type of signage does exist in some of the Wildland Park areas, and should be extended to other areas experiencing problems with compliance.

Signage in key areas that identify seasonal trends of bear activity, based on historical data, could be considered to shift use to other areas of the valley, thereby reducing the chance of bear-human interactions. For example, according to data, grizzly bear activity seems greater in the spring on the north side of the valley and then increases to the south side of the valley during buffaloberry season. If people were more aware of this fact, it might be possible to reduce interactions in the spring by users voluntarily shifting to other areas where bear activity is less common. Of course, it needs to be made clear that there is always a chance of an encounter anywhere in the Bow Valley at any time of the year, but chances are less in some areas. The idea of posting bear-activity ‘trends’ would also enable the public to make decisions on where to recreate at any given time of year and enable them to gain a better understanding of seasonal and regional bear activity. Taking advantage of

the internet to make this information more widely available is one option, and such postings can be continually improved upon.

Dogs off-leash, and people entering closed areas, are two examples of education not working as effectively as one would like. Education can be an effective way to raise awareness about a particular issue but numerous studies show that behaviour rarely changes by simply providing people information (D. McKenzie-Mohr, 2005). McKenzie-Mohr suggests that "...behaviour change is most effectively achieved through initiatives delivered at the community level which focus on removing barriers to an activity while simultaneously enhancing the activities' benefits."

Community Based Social Marketing (CBSM) is an alternative program that has achieved some success in actually changing behaviour. This type of programming may help solve some long-term issues related to bear-human conflict, such as dogs off-leash and the availability of unnatural attractants. It needs to be further reviewed in the context of Bow Valley Bear Management. For example, a CBSM program would examine the issue of off-leash dogs at Dog Pond; it would note that a key attraction about the pond is that dogs can drink and swim. The formal dog off-leash area has no water available. If this barrier, water, was provided in an acceptable context, it might help resolve the current conflict. Options could include:

1. Create a new watering hole within the boundaries of the formal dog off-leash area and strictly enforce dog on-leash bylaws for the Dog Pond area.

2. Remove attractants and other understory from the forested area that presently separates the dog off-leash area from the dog on-leash area on either side of the path that leads directly to Dog Pond. This would reduce the attractant for bears, improve sightlines for people and bears, and provide one-way access to Dog Pond for dogs and their owners.

3. Continue searching for additional dog off-leash areas, particularly on the north side of the valley, in order to reduce use at Quarry Lake, particularly during berry season.

## **i) Data Collection**

The Bow Valley is experiencing situations that can be described as new ground from the perspective of bear management. While few communities in North America, outside of National Parks, have effective waste-management systems already in place, the Bow Valley is already dealing with the 'next phase' of bear-human conflict. This provides many challenges but also new research opportunities in the area of bear-human conflict management. Programs such as Bear Shepherding and attractant removal may provide insight for other wildlife managers and communities into how effectively they can (or cannot) reduce levels of conflict.

Collection of accurate data that allows for a science-based analysis of management programs is necessary. Proper analysis requires that data be collected in such a way that will allow researchers and wildlife managers to measure the effectiveness of various programs. Without this, it becomes difficult to justify continuing with programs that cannot be demonstrated to be

effective and worthwhile. In a time of budget constraints, it is paramount that systems be in place to allow for proper monitoring and evaluating of programs.

Ideally, a process for collecting biological and conflict data pertaining to bear management, as opposed to getting that information from enforcement-focused occurrence reports, would enhance data. Existing databases such as the Aversion database and Wildlife Observation database are a good beginning point, and should

be improved upon. There does not seem to be a clear objective in regards to why much of the data is being collected.

Currently little data is collected on trail-user statistics and user profiles. Data on user types (for example, biker, hiker, dog walker, jogger) and social data (for example, adult, family, single use, groups, resident, Albertan, international) would be useful and could be co-analyzed in association with wildlife use and movement data.



Data Collection  
Photo: © WRBI

## SUMMARY RECOMMENDATIONS

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The following summation of this report highlights recommendations that will reduce bear-human conflicts. They are not listed in any particular order; all are considered important.

### Natural Attractants

- \* Create and implement a long-term plan to remove attractants from developments.
- \* Use volunteer groups to remove attractants from small developments such as campgrounds. Educating and engaging these groups is a valuable side benefit.
- \* Establish a dedicated, funded crew to remove natural attractants from larger areas.
- \* Monitor and recut vegetation in areas that have already been cut such as Bow River and Three Sisters campgrounds.
- \* Remove natural attractants from these areas:
  - the Dog Pond area at Quarry lake,
  - Rundlevue,
  - Larch Islands trail,
  - the Engine Bridge trail,
  - the section of wildlife corridor at Stewart Creek Golf Course if deemed acceptable by ASRD,
  - the periphery of Banff Gate Resort,
  - Lac des Arcs campground,
  - Grassi Lake trail,
  - Many Springs trail,
  - Heart Connector trail and,
  - high-use trails at the CNC.

### Unnatural Attractants

- \* Continue and strengthen existing education programs in order to reduce available attractants.
- \* Establish education programs, and possibly bylaws, concerning birdfeeders and fruit trees.
- \* Improve the compliance rate for functional bear-proof bins at local businesses.
- \* Carry out curbside recycling in such a manner as to not attract bears.
- \* Establish contingency plans to deal with the event that bears begin to move to food sources such as fruit trees and non-native berry bushes once natural attractants are removed from developed sites.

### Habituation

- \* Commence the Bear Shepherding program in May when bears descend into the Bow Valley and finish in October as bear activity decreases.
- \* Implement a formal evaluation of Bear Shepherding activities to determine its effectiveness.

### Human Activity

- \* Continue to develop programs informing the public on the do's and don'ts of living and recreating in the valley.

\* Consider establishing formally identified hiking and mountain biking trails that are maintained in order to reduce bear-human conflict.

#### Compliance

\* Continue educational programs and use increased enforcement when necessary to improve compliance and change public behaviour.

#### Development

\* Remove - and do not plant - bear-attractant type foods, natural or unnatural, within developed areas.

\* Encourage local landscaping companies to stock non-palatable species of plants and shrubs for homeowners.

#### Education and Outreach

\* Develop and implement programs that send accurate messages to different user groups in the Bow Valley.

\* Research and possibly implement a Community Based Social Marketing plan for situations where education does not work.

\* Develop an effective public reporting system of bear-activity trends.

\* Focus education in site-specific areas that have a history of bear-human conflict, including:

- Dog Pond

Message: keep dogs on-leash while in the Dog Pond area and while in the Grassi Habitat Patch, particularly during berry season.

- Grassi Habitat Patch

Message: reduce human activity in this area, particularly during berry season.

- Residential areas adjacent to wildlife corridors

Message: inform residents who live adjacent to wildlife corridors of the potential for increased bear interactions, and tell them what they can do to reduce the chances of an encounter.

- Canmore Nordic Centre

Message: inform users at the CNC of the potential for increased bear encounters during berry season and strongly advocate the use of bear spray and noisemakers.

#### Data Collection

\* Identify measurables at the onset of specific programs to ensure they have the capacity to collect, input and analyze information regularly; programs can then be measured for their effectiveness.

## CONCLUSION

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With continued human growth and development, maintaining the current levels of grizzly bear mortality within the Bow River watershed will become increasingly difficult – yet is considered essential to prevent decline (Garshelis et al. 2004).

Few, if any, communities outside of National Parks in North America and beyond are dealing with the type of problem that exists in the Bow Valley (M. Gibeau, personal communication). Most other communities are still struggling to bear-proof their waste-management operations, admittedly an important first step. The Bow Valley has an opportunity to lead the way in managing bear-human conflicts, with effective waste-management systems already in place.

The changing landscape and the different types of human use that comes with it require both people and wildlife to adapt. How well they adapt will dictate how bears use the valley and the impact they will have on people, and vice versa. The Bow Valley has been challenged by this reality and, depending on who is speaking, has done quite a bit or not nearly enough to address these concerns from an environmental-sustainability perspective.

A science-based systems approach that integrates programs such as human-use management, attractant management, bear shepherding, and education is required in order to effectively manage the Bow Valley bear population. Any of these programs carried out in isolation will likely be less effective than if they are delivered in coordination with one another. Adequate, long-term funding is necessary in order for this to happen. As well, a sense of ownership for these

programs will need to be adopted by Bow Valley residents and visitors alike. While volunteers can play a key role in many of these programs, a core group of experienced, dedicated, and paid staff is required to ensure overall effectiveness. This effort requires a flexible, long-term plan that has measurable objectives in place to allow for a formal evaluation of the effectiveness of each program.

The success of this initiative requires involvement and cooperation across jurisdictions. It will need to have representation of various stakeholders including private developers, recreationists, active community members, not-for-profit organizations, and various levels of governmental representation. Education is critical as is the realization that education alone may not be the answer to changing some types of behaviour. Provinces such as British Columbia and more recently Ontario have made significant advances toward making communities ‘Bear Smart’. Even so, many communities are struggling to make inroads into solving their bear-human conflict problems. Only one community in British Columbia has applied for Bear Smart status and they are still waiting for approval. The challenge for many of these communities, and for the Bow Valley, is to create an effective and sustainable network of programs with engaged and committed local stakeholders. If the Bow Valley meets this challenge, this community will be in the spotlight for doing something that very few communities outside of national parks have been able to achieve – live, work and recreate in an area that continues to have stable populations of grizzly and black bears, and that does so with minimal bear-human conflict.

## **APPENDIX I – Definitions**

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Approach – Bear closes distance non-aggressively and does not make contact with person.

Aversion – Bear shepherding actions that are used to discourage bears from using a particular area.

Bear Shepherding – The act of moving a bear out of an area using noise and pain deterrents.

Berry Season – The period from July 16 to den-up inclusive.

Charge – no contact – Bear closes distance aggressively but does not make contact with person.

Charge contact – Bear closes distance and makes contact with person.

Bear-human conflict – Any incident that has the potential to cause injury and/or property damage. This includes bears feeding on unnatural foods (garbage, human food, pet food, carcasses, ornamental fruit trees, compost, barbecues and golf-course vegetation). It also includes incidents where the reaction of a bear could result in personal injury, such as bluff-charges or maulings.

Interactions – The term used in this report to describe a combination of bear sightings and bear-human conflict incidents.

Location Zone – Land units identified within the Bow Valley used to analyze historical occurrence and telemetry locations for the purposes of this study.

Natural attractants – Any attractant that is considered native to the area and palatable to bears.

Ornamental Fruit – Any tree or shrub that is considered non-native and palatable to bears.

Pre-berry season – The period from den emergence to July 15 inclusive.

Sighting – Any observation of a bear that does not involve human conflict.

Telemetry – Specific bear locations acquired through radio telemetry on radio-collared bears.

Unnatural attractants – Any attractant that is not considered native to the area and palatable to bears.

## **APPENDIX II – Natural and Unnatural Attractants in the Bow Valley**

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### **Ornamentals – List**

#### **Evergreen Shrubs**

Kinnikinnick or Bearberry *Arctostaphylos uva-ursi*

#### **Deciduous Trees**

Amur Cherry *Prunus Maackii*

Mayday *Prunus padus commutata*

Pincherry *Prunus pensylvanica*

Western Chokecherry *Prunus virginiana* aka *P. melanocarpa*

Schubert Chokecherry *Prunus virginiana* “Schubert”

Western Mountain Ash *Sorbus scopulina*

American Mountain Ash *Sorbus americanus*

Showy Mountain Ash *Sorbus decora*

#### **Deciduous Shrubs**

Saskatoon *Amelanchier alnifolia*

Alpine Bearberry *Arctostaphylos rubra*

Red Osier Dogwood *Cornus stolonifera*

Wolf Willow/Silverberry *Elaeagnus commutata*

Wild Red Raspberry *Rubus idaeus*

Elderberry *Sambucus racemosa* var. *pubens* or *leucocarpa*

Canadian Buffaloberry/Soapberry/ Soopalallie *Shepherdia canadensis*

#### **Flowers**

Cow Parsnip *Heracleum lanatum*

Alpine Hedysarum/Alpine Sweet-vetch *Hedysarum alpinum*

Northern Hedysarum/Northern Sweet-vetch *Hedysarum boreale*

Yellow Hedysarum/Yellow Sweet-vetch *Hedysarum sulphurescens*

(Recommended Plant Species for Landscaping in Banff National Park. 2004. Parks Canada.)

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