

# **Bear Hazard Assessment Update for the Greater Bragg Creek Area of Southern Alberta 2016**



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## Executive Summary

The purpose of this report is to update the hazard assessment that was completed in 2010 for the Greater Bragg Creek study area (Aspen Wildlife and Environmental Services and Karelian Bear Shepherding Institute of Canada (KBSIC), 2010). That report incorporated data on bear conflicts from 1999 to 2008. This report analyzes an additional 7 years of data from 2009 to 2015 along with data from the 2010 report. The intent of this assessment is to establish an overview of human-bear conflicts (HBC) specific to the community while providing general recommendations for measures to reduce or eliminate these conflicts. Greater Bragg Creek is identified by the Province as a priority area for proactive bear management, where there is a pressing need to resolve human-bear conflicts. The study area falls within the Support Zone delineated by Alberta Environment and Parks (AEP) in the draft Grizzly Bear Recovery Plan. This Zone is intended to support grizzly bears whose home ranges extend east of the Recovery Zone into areas of private land. As such, a priority has been placed on reducing human-bear conflicts. The Greater Bragg Creek area has a history of conflicts with bears, many of which arise from the presence of unsecured attractants, such as garbage, compost, bird feeders, and livestock feed. The community is located at the approximate eastern portion of the range of both black bears and grizzly bears and has a relatively high density of black bears as well as a low but likely increasing number of grizzly bears. The area provides relatively abundant suitable habitat for both species, primarily in summer and early fall.

Approximately 30-kms southwest of Calgary, Greater Bragg Creek includes the Hamlet of Bragg Creek, Townsite of Redwood Meadows and numerous acreages ranging from 2 acre parcels to large land holdings used for agricultural purposes. Rocky View County anticipates the human population of Greater Bragg Creek to increase from approximately 3,000 to over 7,000 residents in the next 20 to 30 years. There has been no change in the waste management system since the first hazard assessment was completed. This system is not bear-proof and requires that the majority of residents have temporary storage areas for their household waste on their property and then transfer their collected waste to a central waste transfer site. At least one community within the study area has implemented their own curb side garbage and recycling pickup program. Businesses in the Hamlet of Bragg Creek process their own waste by contracting-out waste transfer and disposal but using non-bear-proof containers. Redwood Meadows uses a system of curb-side garbage pick-up where household waste containers are meant to be “animal-proof”, however the majority of these containers are not bear-proof.

Additional information on human-bear conflicts from 2009-2015 was obtained from Alberta Justice and Solicitor General (JSG) ENFOR District Occurrence Reports. These reports were used to generate information on the number of reported human-bear conflicts by year and season; the types of human-bear conflicts experienced; and where these conflicts took place. This information was added to that previously reported in 2010 (Aspen Wildlife and Environmental Services and KBSIC, 2010) to provide a longer term picture of human-bear conflicts in the study area and to see if any changes had occurred since the last report.

Data on reported human-bear conflicts was now available for Greater Bragg Creek for the period between 1999 and 2015. Within this time period, 298 public safety-related human-bear conflicts were compiled, 11 of which involved grizzly bears. A substantial number of these conflicts (72%) involved bears accessing unsecured attractants.

Garbage and bird seed continue to be involved in the highest proportion of attractant-related conflicts. There were no incidences of grizzly bears being involved in conflicts involving garbage or bird seed. Grizzly bears were primarily involved in livestock and livestock feed conflicts. Changes made to the Waste Transfer Site appear to have largely reduced bear related conflicts, however, the site would benefit from further evaluation to ensure it is “bear-proof”. No changes have been made to waste storage at commercial operations and bears accessing garbage in unsecured bins remains a problem. Bears caused property damage in 34% of reported incidents involving attractants.

Since 1999, the number of human-bear conflicts has varied on a yearly and monthly basis. We suggest these fluctuations are associated with seasonal and yearly changes in the availability of preferred natural foods. Periods of heightened bear problems were predicted to be associated with local shortages in natural foods, in particular the berry crop. The majority of reported human-bear conflicts were clustered within the residential communities of Greater Bragg Creek, primarily in the more populated Hamlet of Bragg Creek, Elk Valley, and in Redwood Meadows. Grizzly bear human-bear conflicts took place primarily in the western-most portion of the study area although incidences were recorded as far east as Fawn Hills (on Range Road 52) and Wild Rose Estates, in the central portion of the study area. No grizzly bear human-bear conflicts have been reported in the more populated Hamlet of Bragg Creek or in Redwood Meadows although there were two sightings of grizzly bears reported from Redwood Meadows in (year?).

An assessment was made of the conflict level of each reported occurrence in order to identify the seriousness of the various conflicts in terms of public safety and property damage. The majority of reported conflicts were categorized as Moderate; primarily the result of bears accessing non-natural attractants in people’s property. Low level conflicts made up the next highest proportion of the conflicts. High and Very High categories were relatively low in frequency and involved bear breaking into structures or killing livestock. There were no Extreme conflict category (Human Injury) conflicts.

No changes to habitat conditions were expected since the last assessment from 2010. The study area continues to include areas of good habitat quality for bears that constitute good potential for movement and feeding options. Gaps identified in available habitat data from the earlier assessment remain. There was little or no information available on recreational activities, especially those that may take place in natural areas surrounding residential developments.

Overall, this bear hazard assessment identified a number of factors contributing to human-bear conflicts in Greater Bragg Creek. Factors contributing to conflicts are similar to those identified in the earlier assessment. First, human developments and activities were found to be interspersed with an abundance of habitat considered suitable for both black bears and grizzly bears. Most human developments of the area are essentially islands within a matrix of bear habitat, with people’s homes commonly backing onto natural areas. Second, bears are predicted to move relatively freely within and across this landscape in response to the seasonal availability of preferred natural foods. A network of travel routes and extensive cover support bear movement across this landscape, including through developed areas.

This overlap of bears and people has led to changes in bear behaviour. Bears moving through developed areas have become human-habituated, losing their instinctive fear response as a result of repeat exposure to people with no negative consequences. In this way, these bears have developed a tolerance that allows them to use habitat in close proximity to humans and human facilities. Such behaviour brings bears into more frequent contact and conflict with people. Bears traveling through Greater Bragg Creek have also been provided frequent and repeated access to unnatural food sources resulting in bears becoming human food-conditioned. These bears have been persistent in their pursuit of these unsecured attractants, in many cases causing property damage, as well as causing residents to be concerned for their safety.

Between 1999 and 2015, there have been a substantial number of reported conflicts between bears and people living in Greater Bragg Creek. Subsequently, a lot of time and effort has been spent managing these conflicts. Such conflicts are only expected to increase as the human population of Greater Bragg Creek grows at the rate Rocky View County anticipates. A key objective of this bear hazard assessment is to recommend options for reducing or eliminating the sources of human-bear conflicts in Greater Bragg Creek. The intent in recommending these options was to benefit both people and bears by reducing the number of bears relocated and/or destroyed, the amount of money spent in property damage and “problem” bear management; and the risk of human injury as a result of human-bear conflicts. The recommendations focus on the key factors affecting people and bears in Greater Bragg Creek: bear attractants and public awareness of the consequences of attracting bears to area businesses, homes and acreages. Below is a summary of the Greater Bragg Creek Bear Hazard Assessment Recommendations.

| <b>Topic</b>  | <b>Recommendation</b>   |
|---|---|
| <i>Residential Waste</i>                                | ➤ A bear-proof municipal waste management system should be implemented in Greater Bragg Creek.  |
| <i>Commercial Waste</i>                                 | ➤ Commercial waste should be stored in bear-proof containers and then transferred to the appropriate off-site facilities.   |
| <i>Construction Waste</i>                               | ➤ Construction crews should use bear-proof waste containers or separate construction waste materials from other waste attractive to bears (e.g. food waste).  |
| <i>Other Bear Attractants</i>                           | ➤ Area residents should be encouraged to take proactive measures to secure or eliminate all bear attractants at their homes and acreages including bird seed and garbage.   |
| <i>Public Education and Awareness</i>                   | <ul style="list-style-type: none"> <li>➤ A long-term bear education and awareness program should be implemented with the goal of making Greater Bragg Creek safer for people and bears.</li> <li>➤ Educational signage on bear presence and bear conflict management is recommended for throughout the study area in strategic communities.</li> </ul>  |
| <i>Municipal Bylaws</i>                                 | Municipal bylaws should be developed and implemented where they currently do not exist to ensure the highest level of resident compliance with recommended bear attractant management measures. These bylaws should focus on the various wildlife attractants and be enforced   |
| <i>Banded Peak School</i>                               | ➤ A review of school grounds and school bear safety protocol should be completed to identify safety measures that could be taken to reduce human bear conflict risk.  |
| <i>Area Kids' Camps</i>                                 | <ul style="list-style-type: none"> <li>➤ Kid's camps should implement bear-proof waste management systems similar to those applied in the community as a whole.</li> <li>➤ Area Kid's Camps should be a key target for annual education and awareness programs.</li> </ul>  |
| <i>Regional Pathways</i>                                | ➤ Existing and proposed pathways should be evaluated to identify any areas of high risk for bear encounters.  |
| <i>Area Golf Courses and the Wintergreen Ski Resort</i> | <ul style="list-style-type: none"> <li>➤ These areas, which may provide enhanced bear habitat conditions, should be evaluated for their bear habitat potential and levels of bear activity.</li> <li>➤ Appropriate bear safety protocols should be developed that address potential public safety issues including waste management.</li> </ul>   |
| <i>Future Development</i>                               | <ul style="list-style-type: none"> <li>➤ If possible, areas of high quality habitat for bears should be avoided when planning area developments.</li> <li>➤ A review of existing land use planning documents and tools should be completed to identify ways to be proactive in managing land use for the safety of people and bears.</li> <li>➤ Bear safety measures should be identified at the time of development application that include effective management of bear attractants.</li> <li>➤ Measures should be implemented to reduce human-bear conflict potential in designated areas of green space such as removing adjacent hiding cover and removing attractants (e.g. buffaloberry shrubs).</li> </ul> |

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***Human - Human-bear Conflicts  
Monitoring***

- Monitoring and reporting on human-bear conflicts should be completed to gauge the success of applied bear management initiatives.
  - A monitoring and reporting system to track effectiveness and outcomes of mitigation actions (e.g. bear proof loaner bins, electric fence loaner program, cargo container program) is recommended.
  - Measures should be implemented to improve the Enfor reporting system to resolve issues with missing information e.g. detailed locations, attractant types.
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## 1.0 INTRODUCTION

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In Alberta, the growth of human settlement has increasingly brought bears and people together. The potential for human-bear interactions in rural areas occupied by both bears and people is substantial. Such interactions can lead to human-bear conflicts that include extensive property damage, human injury, or even human fatality. Bears that come into conflict with people may be relocated or destroyed. Bear mortality resulting from the creation of “problem” bears is a significant source of bear population decline (ASRD 2008).

In 2006, the Alberta government initiated a province-wide bear awareness and education initiative in response to the on-going problem of human-bear conflicts in the province. The Alberta BearSmart Community Program is designed to encourage and assist rural communities in their efforts to coexist with bears: <http://aep.alberta.ca/recreation-public-use/alberta-bear-smart/default.aspx>

The program works towards three goals that benefit people and bears:

1. reduce the number of bears relocated and/or destroyed;
2. reduce the amount of money spent in property damage and “problem” bear management; and
3. reduce the risk of human injury as a result of human-bear conflicts.

In support of this province-wide initiative, the Bragg Creek BearSmart Community Program was initiated in the Greater Bragg Creek region of southern Alberta and more recently supplanted by a Redwood Meadows effort to establish a bearsmart program. This region is identified by the Province as a priority area for proactive bear management, where there is a pressing need to resolve human-bear conflicts. The Bragg Creek community has a history of conflicts with bears, many of which arise from the presence of unsecured attractants, such as garbage, compost, bird feeders, and livestock feed.

## 2.0 PURPOSE

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Based on provincial guidelines, a key first step in creating a “bearsmart” community is to conduct an assessment of existing and potential sources of human-bear conflicts in a particular region. The purpose of this report is to present updated results of a bear hazard assessment that was prepared in 2010 (Aspen Wildlife and Environmental Services and KBSIC, 2010) for the Greater Bragg Creek area through the inclusion of seven additional years of human-bear conflict information. The intent of these assessments are to establish an overview of human-bear conflicts specific to the Bragg Creek area while providing general recommendations for measures to reduce or eliminate these conflicts.

The overall objectives of the Greater Bragg Creek Bear Hazard Assessment are to:

1. describe existing conditions with respect to ear habitat;
2. describe existing human-bear conflicts;
3. identify potential sources of bear conflict;
4. identify limitations to our knowledge of bears and bear hazards; and
5. recommend options for reducing or eliminating existing and potential bear hazards and conflicts.

### 3.0 STUDY AREA

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The Greater Bragg Creek Study Area is situated at the foot of the Eastern Slopes of the Rocky Mountains, within the upper reaches of the Elbow River (Figure 1). The area is characterized by the rolling topography of the Rocky Mountain Foothills. Prominent ridgelines are separated by a complex drainage system that includes the Elbow River, Bragg Creek, Iron Creek, and a series of smaller tributaries and man-made ponds. The majority of Greater Bragg Creek is heavily forested, primarily with aspen (*Populus tremuloides*) and aspen mixed-woods. Lodgepole pine (*Pinus contorta*) and White spruce (*Picea glauca*) forests also exist. The complex drainage system of the area is associated with a series of wetland and riparian vegetation communities.

Approximately 30-kms southwest of Calgary, the area includes the Hamlet of Bragg Creek, located at the confluence of Bragg Creek and the Elbow River, and the Townsite of Redwood Meadows, situated on the Elbow River's southern bank (Figure 2). The majority of the study area falls within Rocky View County and is bounded by the Municipal District of Foothills to the south, Kananaskis Country to the south and west, and provincial lands leased for cattle-grazing to the north. The eastern portion of the study area comprises the Tsu T'ina First nation which falls under the federal jurisdiction of Indigenous and Northern Affairs Canada. Redwood Meadows, situated approximately 4-kms northeast of Bragg Creek, is located on federal lands leased from the Tsu T'ina nation. The Greater Bragg Creek Bear Hazard Assessment focuses only on lands falling within Rocky View County and the Townsite of Redwood Meadows. Further evaluation would be required to assess bear hazards on the Tsu T'ina First Nation reserve or on surrounding provincial lands.

Existing human activities and developments within Greater Bragg Creek are summarized below in Table 1.

#### 3.1 Anticipated Future Growth

An Area Structure Plan was developed in 2007 by Rocky View County for an area of Greater Bragg Creek similar to that delineated for this study. The County anticipates significant population growth over the next 20 to 30 years to as many as 7,002 residents (MD of Rocky View 2007). Growth is expected within Bragg Creek as well as the rural residential areas outside the Hamlet. Substantial portions of the area are designated for new or infill residential development. In comparison, the Townsite of Redwood Meadows does not anticipate any future growth or development of residential areas.

Recreational activities and human use of areas such as West Bragg Creek and the Provincial Park are expected to increase with population growth and development in Calgary and Greater Bragg Creek.

#### 3.2 Current Waste Management System

Waste management has changed little since the initial bear hazard assessment was completed in 2010. The majority of Greater Bragg Creek residents have temporary storage areas for their household waste on their properties. Household waste is then relocated to the Bragg Creek Waste Transfer Station. This waste and recycling station is located approximately 2 kms north of the Hamlet of Bragg Creek in a residential area called Elbow Rise. Residents pay a fee (currently \$3/bag) to dispose of residential garbage. Large bins for recycling are available for community residents. The Station consists of approximately 5

acres situated on a prominent ridgeline backing onto over 150 acres of undeveloped land. The site is surrounded by dense aspen and deciduous, mixed wood forests. Until approximately 2008, the site was enclosed with a 6-ft chain-

link fence that was in need of repair such that only three sides were still standing. Since then, the fence has been repaired and now encloses the site. Household residential waste was temporarily stored on site in three 40 yard steel bins with hinged steel wire mesh lids (Fox pers comm. 2007). The large

**Table 1. Existing Human activities and Developments**

| <b>Land Use</b>                    | <b>Description</b>   |
|------------------------------------|--|
| <i>Greater Bragg Creek</i>         | <ul style="list-style-type: none"> <li>➤ Low density rural residential development within a matrix of forested natural areas and agricultural lands.</li> <li>➤ ¼ of Greater Bragg Creek has been incrementally subdivided into country residential acreages (MD of Rocky View 2007).</li> <li>➤ Agricultural land uses include several large cattle ranches and a number of horse-boarding facilities with associated open pastures.</li> <li>➤ Livestock on smaller acreages includes chickens, sheep, goats, llamas, alpacas and bee hives</li> </ul>   |
| <i>Hamlet of Bragg Creek</i>       | <ul style="list-style-type: none"> <li>➤ Typical of a more urban setting, with smaller land parcels situated along residential streets.</li> <li>➤ Commercial businesses, including restaurants and grocery stores, are located within the centre of the Hamlet.</li> <li>➤ Several Bed and Breakfast facilities are located within the Hamlet.</li> <li>➤ The Hamlet as a whole is surrounded by large land parcels that remain relatively undeveloped, in particular to the south, where some Hamlet residents back onto Bragg Creek Provincial Park.</li> <li>➤ The Elbow River flows through the Hamlet</li> </ul> |
| <i>Banded Peak School</i>          | <ul style="list-style-type: none"> <li>➤ The school is located to the south of the Hamlet, along Highway 22, and is surrounded by relatively undeveloped lands, in particular, an area of approximately 40-plus forested acres used for outdoor recreational and educational activities.</li> </ul>  |
| <i>Townsite of Redwood Meadows</i> | <ul style="list-style-type: none"> <li>➤ More typical of an urban setting, with smaller (approx. 1/3 acre) land parcels situated along residential streets interspersed with the greens and fairways of the Redwood Meadows Golf and Country Club.</li> <li>➤ Includes an athletic park, smaller playground facilities, and formal and informal recreation pathways.</li> <li>➤ Community is an island of development situated in a matrix of relatively undisturbed land.</li> <li>➤ The Elbow River flows along the west side of the Townsite.</li> </ul>  |
| <i>Transportation</i>              | <ul style="list-style-type: none"> <li>➤ Area includes 4 major provincial highways and an extensive network of municipal roads providing access to communities throughout the study area.</li> </ul>   |
| <i>Recreation</i>                  | <ul style="list-style-type: none"> <li>➤ Recreational activities include cycling, hiking, dog-walking, horse-back riding, fishing, and hunting.</li> <li>➤ Recreation activities take place on privately-owned or leased land surrounding residential developments or in the West Bragg Creek Recreation Area, west of Greater Bragg Creek, and Bragg Creek Provincial Park, located south and west of the Hamlet.</li> </ul>  |

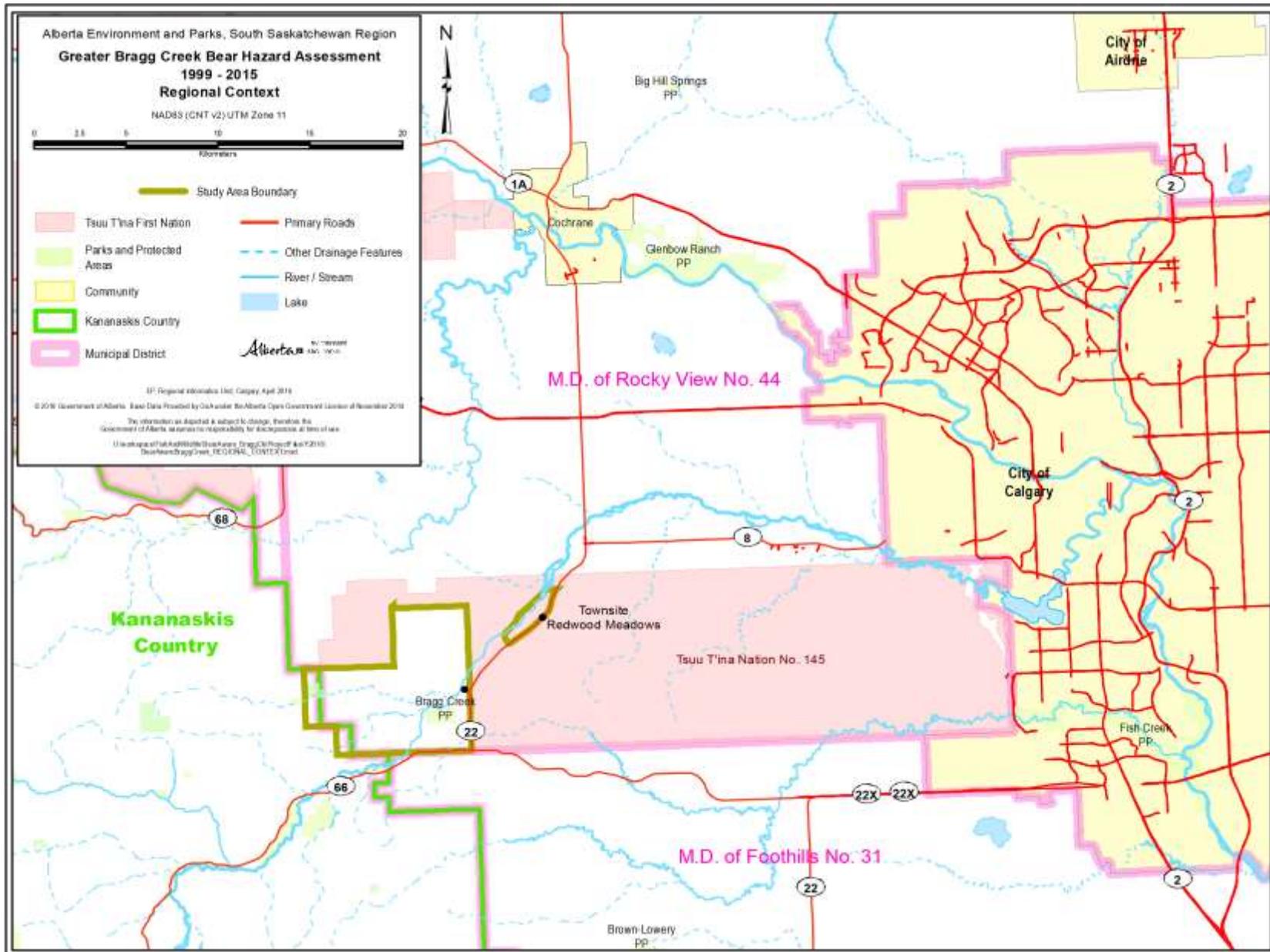


Figure 1. Greater Bragg Creek Regional Context

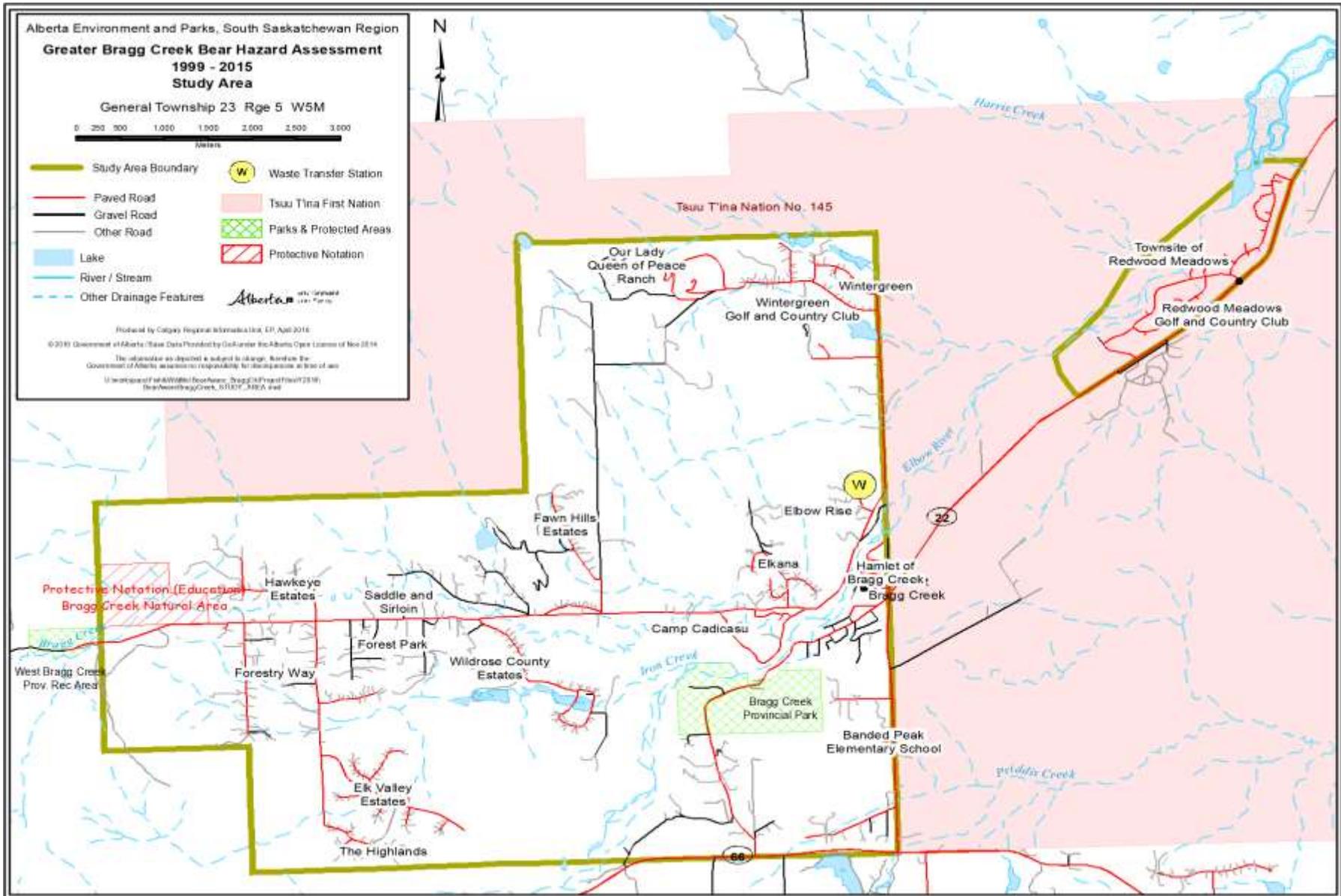


Figure 2. Greater Bragg Creek Study Area

steel bins are still used, however, the lids have been replaced with solid steel lids. Some household residential waste is also processed in an on-site compactor built for heavy-duty compression (Fox pers comm. 2007). The bins are emptied on a regular basis when they become filled. The site is open 2 days a week and manned while open. When closed, the fence gates are locked and the steel lids lowered to close the bins. The Bragg Creek Waste Transfer Station is not bear-proof but is clean and fairly well secured.

The Bragg Creek Waste Transfer Station is Rocky View's busiest site in terms of resident visitation (Walroth pers. comm. 2007). The average number of residents using the site is approximately 500 per week depending on the time of year and the weather (Luoma pers comm. 2016). Overall, a substantial amount of waste is being transferred through the facility on a regular basis. In light of existing use and as a result of anticipated population growth, the County is currently evaluating the need for upgrades to the Waste Transfer Station. These upgrades may include additions to on-site processing facilities, improvements to site configuration and extended business hours.

While the majority of residents in Greater Bragg Creek utilize the Waste Transfer Site, communities have the ability to organize and fund their own waste management programs. The Highlands area within Community Zone 4 (Figure 3) has weekly curbside garbage and recycling pick-up. It is unknown how long this has been in place.

### **3.2.1 Bragg Creek Commercial Waste**

Businesses in the Hamlet of Bragg Creek continue to process their own waste by contracting-out their waste transfer and disposal. Most businesses have temporary storage areas behind their facilities where

waste is deposited primarily in metal dumpsters. Certain restaurants also store discarded kitchen grease behind their facilities. The waste containers used by area businesses are not considered bear-proof.

### **3.2.2 Townsite of Redwood Meadows**

Redwood Meadows applies a more structured approach to waste disposal using a system of curbside garbage pick-up. The Town requires that garbage be bagged, tied and stored in closed garbage containers and placed at the roadside for pick-up on the morning of a specified day of the week.

As per the Redwood Meadows Residential Development Control Bylaw, "no garbage or waste shall be stored except in weather-proof and animal-proof containers". Furthermore, garbage is not to be put out before 7am on the day of pick-up. Failure to comply with these requirements may result in fines for residents. The Townsite does not currently specify what qualifies as an animal-proof waste container.

Incidental observations made of containers used by residents to store garbage revealed that the majority of containers used by residents are not bear-proof and some residents continue to put garbage containers out the night prior to pick-up day. This practice often results in animals getting into bins and scattering garbage. No occurrences of bears getting into curbside garbage have been reported. Offending animals have primarily been dogs and ravens.

## 4.0 METHODS

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### 4.1 Bears and Bear Habitat

Understanding the natural bear habitat potential of Greater Bragg Creek was a primary component of the initial hazard assessment completed earlier (Aspen Wildlife and Environmental Services and KBSIC, 2010). Such an understanding of habitat potential is useful for determining the likelihood of bears using the area and the potential for human-bear interactions. Since specific food habits data was not available for the Bragg Creek study area, bear habitat potential was described using information available for the Rocky Mountain and Foothills regions. Existing conditions with respect to bears and bear habitat were described with reference to several recent bear research studies and habitat evaluations conducted in the broader region. In 2010, information on black and grizzly bear habitat potential was derived from a large-scale habitat evaluation prepared in 1997 for the Jumpingpound Pipeline Region. Since this earlier assessment, little has changed in the study area either in terms of significant habitat condition or human development and it is not expected, therefore, that bear habitat potential has changed significantly since the 2010 assessment and it is, therefore, not reported in this report. There have been no recent updates to black bear or grizzly bear population data was available for the area although previous estimates from the broader region were documented.

### 4.2 Human-Bear Conflicts

Information on human-bear conflicts in the Greater Bragg Creek area from 2009-2015 was derived primarily from Alberta Justice and Solicitor General (JSG) District ENFOR Occurrence Reports as was done for the earlier assessment in 2008. These occurrence reports are generated each time a call or complaint is made to the local Fish and Wildlife District Office regarding some form of bear encounter.

As was done in the earlier assessment, each occurrence report for the study area was evaluated and relevant information was extracted and included in a larger database. Relevant information included: date, location, species, occurrence type, attractant type, season, and officer management action type. Where the specific location of an occurrence was not readily apparent, an attempt was made to determine the location by contacting the officer involved or by contacting the reporting party. Data from 2009-2015 occurrence reports was then added to the existing database containing human-bear conflicts for the Greater Bragg Creek area from earlier years. Information fields within the database were used to update information on:

- the number of human-bear conflicts by year and season;
- the species of bear involved in each occurrence;
- the types of human-bear conflicts experienced;
- the type of attractant involved;
- the location of conflicts; and
- conflict level

The date of each conflict was used to categorize conflicts by season: Pre-berry (den emergence to July 15, Berry (July 16 to September 15), Post-berry (September 16 to den up). The species of bear involved in conflicts was also readily available from the database. The types of human-bear conflicts in Greater Bragg Creek were identified based on categories described in Table 2. These categories were

intended to capture occurrences where a public safety risk was present. This was opposed to interactions that were categorized as sightings where any public safety risk was considered very low. Public reporting of bear sightings would be highly variable and greatly under reported. For this assessment, there was no evaluation of incidents that were considered to merely be “sightings”. Evaluation of individual occurrences as to any public safety risk, however, was not readily apparent without a more detailed review of each occurrence report’s detailed description. Such was required to determine conflict type and to document the attractants, if any, involved in the respective bear incidents. When provided, property damage associated with bear incidents was also documented. The JSG reports were also used to identify the site-

specific location of human-bear conflicts within Greater Bragg Creek. However, as indicated above, this information was not always present. Therefore, we tagged each human bear conflict to a broader Community Zone, as identified in Figure 3. There was no data available on human-bear conflicts within Bragg Creek Provincial Park.

Not all human-bear conflicts are created equal in terms of their public safety risk or seriousness related to property damage. For example, a bear seen walking through a yard would be considered a low level of conflict compared to a bear breaking into a garage or killing livestock. In an effort to evaluate this, each occurrence was classified as to a level of conflict. Human-bear conflicts were assigned to one of six Conflict levels: No Conflict, Low, Moderate, High, Very High, and Extreme (adapted from Wind River Bear Institute Conflict Level Indices Copyright 2003). Assignment was determined based upon criteria that included behaviour of bear, location of conflict, and the involvement of natural or unnatural food attractants. Conflict levels are described in Table 3. Conflict level evaluation was not done in the 2010 Greater Bragg Creek hazard assessment.

**Table 2. Human-Bear Conflict Types**

| <b>Occurrence Type</b>   | <b>Description</b>   |
|--|--|
| <i>Human-Bear Conflict Incidents with no known attractants</i> | <ul style="list-style-type: none"> <li>➤ A bear is encountered in a developed area such as in a resident’s yard, or on a resident’s deck and is perceived as a problem or potential threat to human safety.</li> <li>➤ Occurrence report does not indicate the presence of any specific bear attractant(s).</li> </ul> |
| <i>Human-Bear Conflict Incidents with attractants</i>          | <ul style="list-style-type: none"> <li>➤ A bear is encountered in a developed area such as in a resident’s yard or on a resident’s deck and is perceived a problem or potential threat to human safety.</li> <li>➤ Occurrence report identifies the bear attractant(s) involved.</li> </ul>                            |

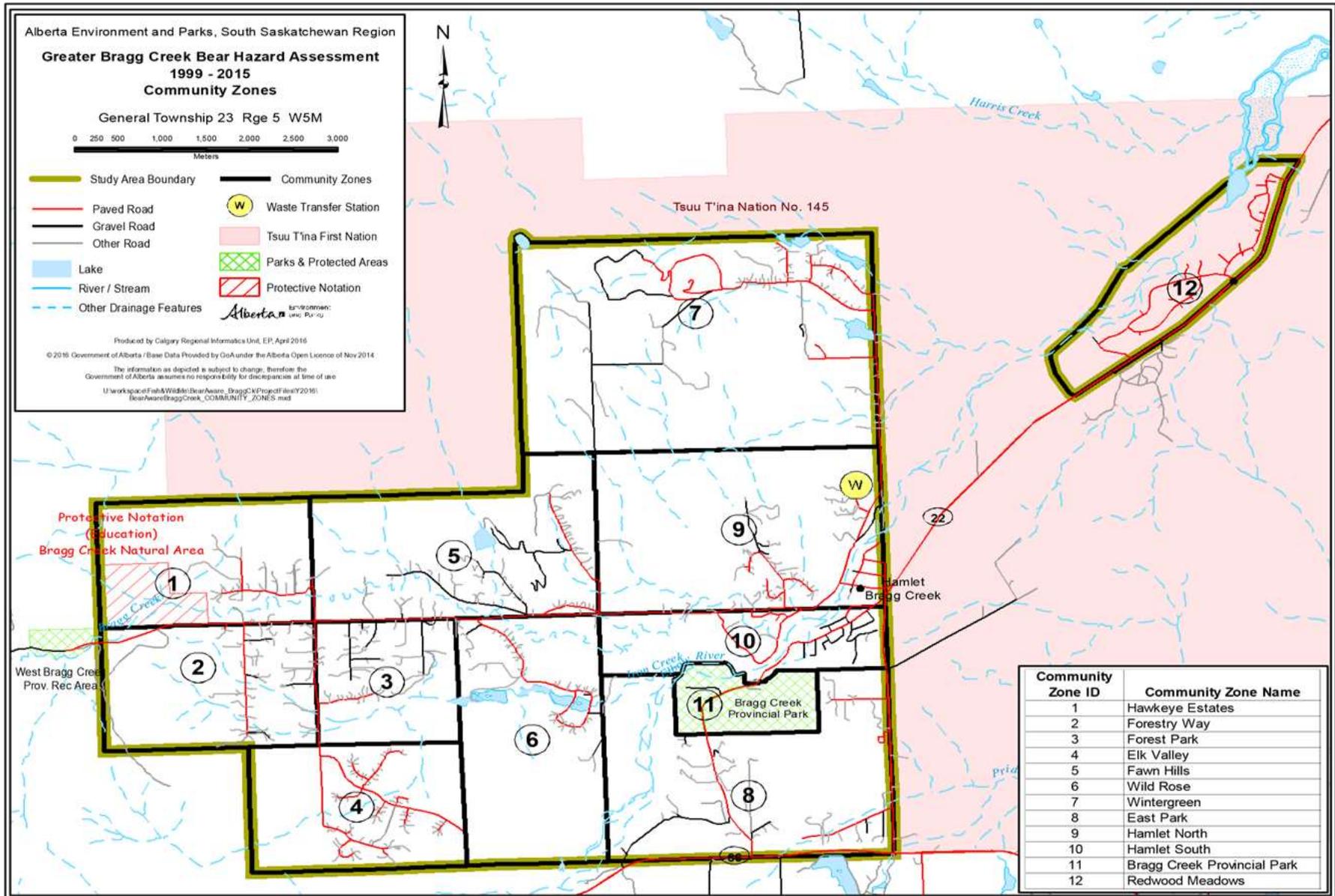


Figure 3. Human-Bear Conflict Community Zones

**Table 3. Conflict Level Descriptions**

| Conflict Level                 | Description  |
|--------------------------------|--|
| <b>No Conflict (Sightings)</b> | Bears feeding on natural foods in non-developed areas including backcountry trails, train tracks or travelling in non-developed areas (i.e. trails) or developed areas such as day use areas, golf courses, campgrounds (frontcountry, backcountry or random);   |
| <b>Low</b>                     | Bears feeding on natural foods (except carcasses) in or adjacent to <u>unoccupied</u> developed areas (trailheads, campgrounds, picnic areas, barns), golf courses during the day; feeding/ travelling in urban green space, facility/ playfield; feeding on unnatural food in non-developed areas or travelling through residential properties (backyards), travelling frequently through cgs or repeated sightings on trails |
| <b>Moderate</b>                | Bears feeding on non-natural/ natural foods (except carcasses) not secured at or adjacent to <u>occupied</u> developed area (trailheads, campgrounds, picnic areas, playfield, barns, residences), golf courses during the day; predating on domestic animals in non-developed areas; makes physical contact with manmade structures (decks, dumpster, pickup beds); standing ground   |
| <b>High</b>                    | Bears feeding on lightly secured non-natural foods (coolers, non-bear proof garbage cans) in or adjacent to developed area; partially enters 2 or 3 sided structure, minor property damage, closing distance (non-aggressive) to people for food or non-food related closing distance incidents  |
| <b>Very High</b>               | Bears depredating (i.e. hunt, chase, harass) on wild, or domestic animals (dogs, cats, rabbits) or feeding on carcasses in or adjacent to developed areas including trails, major property damage, enters 4 sided structure ; depredating on livestock in non-developed or developed areas; charges people (no contact) including surprise encounters, defence of young or defending carcass                                   |
| <b>Extreme</b>                 | Bear injures or kills people   |

Fish and Wildlife Officer’s actions to bear incidents were classified based on 5 broad categories as per AEP occurrence reports (Table 4).

**Table 4. Bear Management Action Types**

| <b>Management Action Type</b>    | <b>Description</b>   |
|----------------------------------|--|
| <i>Left Alone</i>                | ➤ A bear occurrence is reported as a sighting; or an Officer resolves the report over the phone; or an Officer visits the site of the occurrence but no further action is taken.   |
| <i>Trap Set But Not Captured</i> | ➤ An Officer has deemed the bear involved in the occurrence a concern requiring further action. A trap is set for the purpose of relocating the bear but a bear is not captured. No further action is taken.                           |
| <i>Relocated</i>                 | ➤ An Officer has deemed the bear involved in the occurrence a concern requiring further action. A trap is set for the purpose of relocating a bear and a bear is captured. The bear is relocated outside the Greater Bragg Creek area. |
| <i>Hazed</i>                     | ➤ The Officer responds to a bear occurrence report, finds the bear at the location of the occurrence and initiates hazing actions.   |
| <i>Destroyed</i>                 | ➤ The Officer responds to a bear occurrence report, finds the bear at the location and destroys the bear because it is severely injured or is deemed a significant public safety threat.   |

### **4.3 Future Recommendations for Management of Human-Bear Conflicts**

Recommendations for reducing or eliminating the sources of human-bear conflicts in Greater Bragg Creek were developed based on an evaluation of government occurrence records collected in the course of addressing conflicts as reported by the public. These records provided evidence of the existing conditions and potential bear hazards in the region. In

making recommendations, reference was made to other bear hazard assessments prepared for other communities in British Columbia and Alberta. Local provincial gov’t staff including Fish and Wildlife Officers, the Area Bear Conflict Specialist, and the Area Wildlife Biologist provided insight into management measures expected to reduce or eliminate bear conflicts in the region.

## 5.0 RESULTS AND DISCUSSION

### 5.1 Bears and Bear Habitat

In southern Alberta, grizzly bears and black bears are primarily restricted to the Rocky Mountains and the Foothills Natural Region in the west (Kansas 2002). Greater Bragg Creek is located at the approximate eastern extent of the range of both bear species. Currently, there is no census data available for use in estimating the number of grizzly bears and black bears occupying the Greater Bragg Creek area.

However, a DNA census was recently completed west of Bragg Creek for the purpose of developing regional grizzly bear density and population estimates (Alberta Grizzly Bear Inventory Team 2007). The census area extended from Highway 1 to Highway 3 (from the Bow Valley to the Crowsnest Pass) and included areas of Kananaskis Country west of Bragg Creek. The census results indicated the average number of grizzly bears at any one time was 89.9 in this area or a density of 11.8 bears/1000km<sup>2</sup>. An additional 43 bears were predicted to move in and out of this area, but were not considered full-time residents. The census found the distribution of grizzly bears to be clumped along the western side of the census study area, adjacent to the continental divide.

While the majority of these bears are well west of Bragg Creek, there were bears captured in the eastern Foothills including 2 bears (one male and one female) captured between west Bragg Creek and Sibbald Flats. A nine year study completed by the Eastern Slopes Grizzly Bear Project (2005) provided similar results with respect to grizzly bear density in the Bow River Watershed as a whole.

No recent surveys have been completed to determine the density or overall population of black bears in the area. In 1993, Alberta's total black bear population was estimated at 40,000 bears on the basis of Landsat satellite imagery (forest cover, land disturbance), and estimated average bear densities from specific study areas (AEP 1997). The calculated average black bear density was 84/1000 km<sup>2</sup> (AEP 1997) for the province as a whole. The density of black bears within different natural regions of the province varies widely depending on habitat conditions and historic levels of human use (AEP 1997). A study conducted in the Sheep River area, just south of Bragg Creek, estimated black bear density to be 233/1000 km<sup>2</sup> (AEP 1997).

#### 5.1.1 Natural Bear Habitat Conditions

A number of factors are likely to influence the occurrence of black bears and grizzly bears in Greater Bragg Creek. There are habitat factors that influence bear use of the landscape, such as the availability of food, cover, bedding areas, mating areas and den sites. Bears are also sensitive to non-habitat factors such as human disturbance and may avoid areas of high human development and activity. They may also be attracted to areas of human activity if they are able to access unnatural foods such as fruit trees, livestock or residential garbage.

In areas of relatively low human activity, bear use of the landscape generally corresponds to the location of concentrated seasonally-preferred foods (as quoted in ESGBP 1998). In the Rocky Mountain and Foothills regions, preferred grizzly bear spring forage generally consists of *Hedysarum* roots (*Hedysarum* sp.), green grasses and over-wintered bearberries (*Arctostaphylos uva ursi*) (Hamer and Herrero 1986, Kansas 2002). Spring forage sites include dry, steep, south and west-facing grasslands and open forests

above tree-line (Hamer and Herrero 1998, Kansas 2002). In late spring and summer, grizzly bear forage consists of horsetail (*Equisetum arvense*), cow parsnip (*Heracleum lanatum*), grasses, sedges and other green vegetation commonly used in areas such as gully bottoms, riparian forests, wetlands and ground water seepages (Hamer and Herrero 1998).

In late summer and fall, grizzly bears switch to feeding on berries, primarily Canada Buffaloberry (*Shepherdia canadensis*) (Kansas 2002). This species is widespread, occurring under a variety of site conditions, while it may be most productive in open-canopied, well-drained, early succession forests and low shrublands (Kansas 2002). Grizzly bears also feed opportunistically on mammals, from ground squirrels to ungulates, as well as insects, such as ants and wasps. Carrion is also a major attractant for bears. Insect forage sites include shrublands, dry south and west-facing forests and old burns (Hamer and Herrero 1998).

Black bears of the Rocky Mountains and Foothills regions exhibit somewhat similar feeding habits to grizzly bears. A study of black bear feeding ecology completed in 1986 in the Sheep River area (just south of Bragg Creek) determined that black bears primarily feed on forbs, grasses, bearberries, horsetails and mammals in the spring; forbs, cow parsnip, ants and buffaloberries in early summer; raspberries (*Rubus idaeus*), buffaloberries and ants in late summer; and bearberries, bog cranberries (*Oxycoccus* sp.), wasps, mammals and forbs in the fall. Forb species used by black bears included pea vine (*Lathyrus* sp.), wild vetch (*Vicia Americana*), hedysarum (*Hedysarum alpinum* and *H. sulphurescens*) and clovers (*Trifolium* sp.). In general, the habitat types used by black bears in the Sheep River area were shrublands, meadows, riparian areas and mixed and deciduous forests. Lodgepole

pine forests were also used in the fall for feeding on bearberry and bog cranberries.

The availability of hiding or security cover is another factor influencing black bear and grizzly bear use of the landscape. Black bears are seldom found more than several hundred metres away from the cover provided by trees and shrubs or terrain features that have the capacity to conceal a bear (Herrero 1985). By contrast, grizzly bears do not require as much cover as black bears (Herrero 1985). For both species, cover use will depend on a bear's prior experiences with people and whether the bear is wary of, or has become habituated to people. Wary bears are most likely to flee from people once a critical distance is reached and flight is commonly towards cover (as quoted in Oldershaw 2001). Both species will select forage sites near cover to permit greater detection of intruders and to improve the odds of quickly escaping detection themselves (as quoted in Oldershaw 2001).

Developing some understanding of the natural habitat potential of an area is useful for determining the likelihood of bear occurrence and the potential for human-bear interactions. For example, a community that has abundant high-quality habitat, productive feeding sites and good hiding cover in close proximity to residential and commercial areas, is more likely to experience frequent bear encounters and, subsequently, greater bear-conflict risk. For Greater Bragg Creek, information on the bear habitat potential of the area was available from a large-scale habitat evaluation prepared in 1997 for the Jumpingpound Pipeline Region. This habitat evaluation was reported on in the first hazard assessment for the greater Bragg Creek study area (Aspen Wildlife and Environmental Services and KBSIC, 2010). In general habitat suitability of the study area varied between season for both black and

grizzly bear with suitability being lowest during spring and summer but becoming higher in early fall as berry production was high.

### **5.1.2 Bear Habitat Loss and Alteration**

Human land use and activities can have an adverse effect in terms of bear habitat loss or habitat alteration. Bears may be directly affected through removal or degradation of suitable habitat or indirectly through sensory disturbance and bear avoidance of habitat in proximity to human developments and activities (ASRD 2008). Although bears are adaptable, the extent to which such habitat changes can occur before influencing the survival and/or reproduction rates of bears is not known (ASRD 2008).

Current conditions in Greater Bragg Creek suggest that suitable habitat is relatively abundant for both black bears and grizzly bears, primarily in summer and early fall. Some of this habitat will have been lost with the development of residential centers at Redwood Meadows and Bragg Creek and with approximately ¼ of Greater Bragg Creek having been subdivided into country residential acreages (MD of Rocky View 2007). Equally, habitat loss has resulted from land clearing for agricultural pursuits.

However, a substantial portion of the available bear habitat remains relatively intact. In some areas, such as the golf courses at Redwood and Wintergreen, site clearing and the cultivation of lush green vegetation may have even enhanced local habitat conditions. This has been the case in the Bow Valley adjacent to Banff National Park where bears are known to frequent golf courses to feed on lush grasses on golf course greens and berries in golf course roughs (Honeyman 2007). Clearing associated with the ski resort at Wintergreen may have also resulted in such local habitat enhancements. Further evaluation of

habitat conditions and bear use of these areas would be required to confirm this is the case.

Bears are sensitive to human disturbance and may avoid areas of high human development and activity. Bears of Greater Bragg Creek are likely to experience some level of sensory disturbance and will subsequently avoid habitat adjacent to residential areas. However, there will also be certain individual bears that will have developed a tolerance for people in order to use habitat in proximity to people. Equally, some bears in the area are likely to have become human food-conditioned when provided access to unnatural foods such as fruit trees, livestock or residential garbage.

### **5.1.3 Bear Movement Patterns**

Bears inhabit large home ranges and move within and across habitats in response to the seasonal availability of preferred foods. Understanding the nature of bear travel patterns helps us predict where bears and people might overlap in their use of the landscape. In general, bears have the ability to travel almost anywhere they choose, however, they typically choose the easiest route available between forage areas (MacHutchon 1996). The path of least resistance is typically along valley bottoms, creeks and rivers, over low mountain passes or drainage divides (MacHutchon 1996, ESGBP 1998), or along ridge tops (Russell et al 1978). Bears are also likely to seek out areas that provide good cover when moving between forage sites (ESGBP 1998).

Physical barriers to bear movement include terrain features such as outcrops, cliffs, steep cut-banks or high steep-sided mountain slopes (MacHutchon 1996). A bear hazard assessment prepared for the Town of Stewart, British Columbia noted that large glaciers and steep mountain valleys served as barriers and funnels for the movement of bears along valley

bottoms (Wellwood 2001). Human infrastructure, developments and activities can hamper bear movements. Bears sensitive to human disturbance may alter their travel patterns to avoid areas of high human use. Depending on the density and volume of traffic, roads can be a deterrent to bear movement (ASRD 2008).

In Greater Bragg Creek, the complex drainage system and open ridgelines characteristic of the area are likely to create a network of movement corridors between areas of quality habitat for bears. Local Fish and Wildlife Officers provide anecdotal evidence of bears and other wildlife regularly traveling along area ridgelines such as the north-south ridges at Two Pine and Elkana Estates and the height of land that runs from Priddis Creek to Bragg Creek Provincial Park through Banded Peak School. Extensive woodlands are likely to provide good cover to accommodate bear movements.

Few terrain barriers to bear movement, such as steep mountain slopes, cliffs and outcrops are expected to interfere with bear movements through Greater Bragg Creek. Bears may, however, avoid traveling through open pasture lands preferring to move under cover or along the forested edge. Area roadways may have an adverse effect on bear movements. Highway 22, in particular, experiences heavy traffic volumes and high speeds, especially over the summer months. Bears are likely to avoid traveling across this highway, perhaps modifying their travel patterns to do so at night when traffic volumes diminish. Bears crossing Highway 22 are at high risk of mortality from vehicle collisions. Secondary roadways in Greater Bragg Creek with relatively less traffic volume and lower traffic speeds are expected to have less adverse effect on bear movements while

subsequently leaving bears subject to reduced risk of collisions.

## **5.2 Human-Bear Conflicts**

### **5.2.1 Types of Human-Bear Conflicts**

The initial Bragg Creek assessment evaluated conflict data covering the period 1999-2008. For this updated assessment, an additional 107 occurrence records were evaluated covering 2009-2015. Seventy-three of these were considered public safety related - the remainder were classified as sightings and were not considered for this assessment). Including the 73 additional conflicts from 2009-2015, a total of 298 public safety related conflicts were compiled from available data sources for the entire period between 1999 and 2015 (Table 5).

Of these 298 conflicts, 287 (96%) involved black bears and 11 (4%) involved grizzly bears. Human-bear conflicts between 1999 and 2015 were separated into 2 categories: public safety incidents with no known attractants, and public safety incidents involving attractants (Table 5).

Of the 298 reported conflicts, a total of 215 (72%) were public safety incidents involving attractants and 83 (28%) human-bear conflicts involved no known bear attractants. Where no attractants were apparent, incidents involved bears persistently in people's yards and/or on people's decks, patios or balconies. Residents involved in these incidents commented that these bears did not appear to be afraid of people and did not scare easily, or that these bears hung around their homes for several days straight or intermittently throughout the season. In 2003, a female black bear with 3 cubs, was shot and killed by a resident in Wild

**Table 5. Human-Bear Conflicts between 1999 and 2015**

| Occurrence Type                     | Black Bear | Grizzly Bear | Total | Percent |
|-------------------------------------|------------|--------------|-------|---------|
| Human-Bear Conflict - No Attractant | 81         | 2            | 83    | 28      |
| Human-Bear Conflict - Attractant    | 206        | 9            | 215   | 72      |
| Total                               | 287        | 11           | 298   | 100     |

Rose after the bear had come up onto his porch. As well in 2011, a resident shot and killed a black bear that had come into a yard and was threatening some domestic livestock. There were 2 reported cases of a grizzly bear involved in public safety incidents where there were no known bear attractants. One grizzly bear entered a resident’s yard and was subsequently chased off by the resident’s dog. A second grizzly bear was shot but not killed in an encounter with a hunter on lease lands just outside the northwest portion of Greater Bragg Creek.

**5.2.2 Attractant based Human-Bear Conflicts**

The majority of human-bear conflicts continue to involve attractants. Figure 4 shows the wide range of attractants bears accessed during these incidents. The primary attractants in the study area continue to be garbage and bird seed from feeders (35% and 25% respectively, N = 245) (Figure 4).

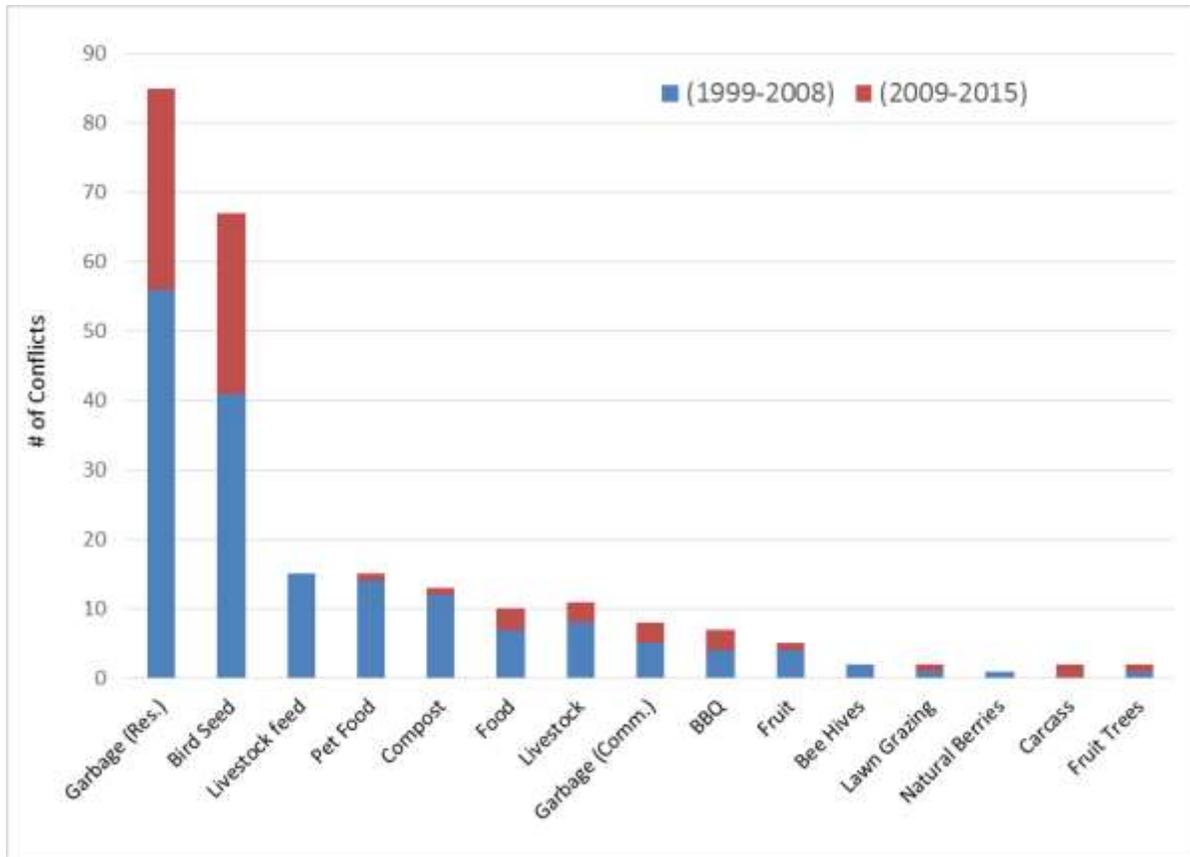
This pattern is seen as well in the additional records from 2009-2015 (Figure 4). A total of 36 or 16% of the incidents involved bears accessing more than one attractant in the same incident. Black bears continue to be responsible for the majority of these attractant-

related public safety incidents (206 or 96%, N = 215). Incidents involving these attractants are described below in further detail.

**5.2.2.1 Garbage**

Garbage related conflicts increased to 82 occurrences involving black bears and residential garbage with the inclusion of additional data from 2009-2015. There were no known cases of grizzly bears accessing garbage during the same time frame (1999-2015).

The number of garbage related conflicts remains highly variable between years (Figure 5) and there has not been any significant changes in the average number of conflicts when comparing 1999-2008 to 2009-2015 (5.6 conflicts/year and 4.4 conflicts/year respectively).



**Figure 4. Attractants involved in Human-Bear Conflicts (1999-2015).**

A number of these incidents involved black bears breaking into outdoor garbage storage structures, in particular wooden storage boxes and sheds, commonly used in Bragg Creek (Figure 6)

Of particular concern are the increasing number of black bears breaking into garages or walking into garages with open doors to access garbage or look for garbage. Between 2009 and 2015, there were 14 instances of bear going into garages for garbage. In the previous 10 year period, there was only one reported instance of this happening.

In 8 of these instances property damage was done to either the garage door or side entrance door. In addition to breaking into the garage, in 2013, a black

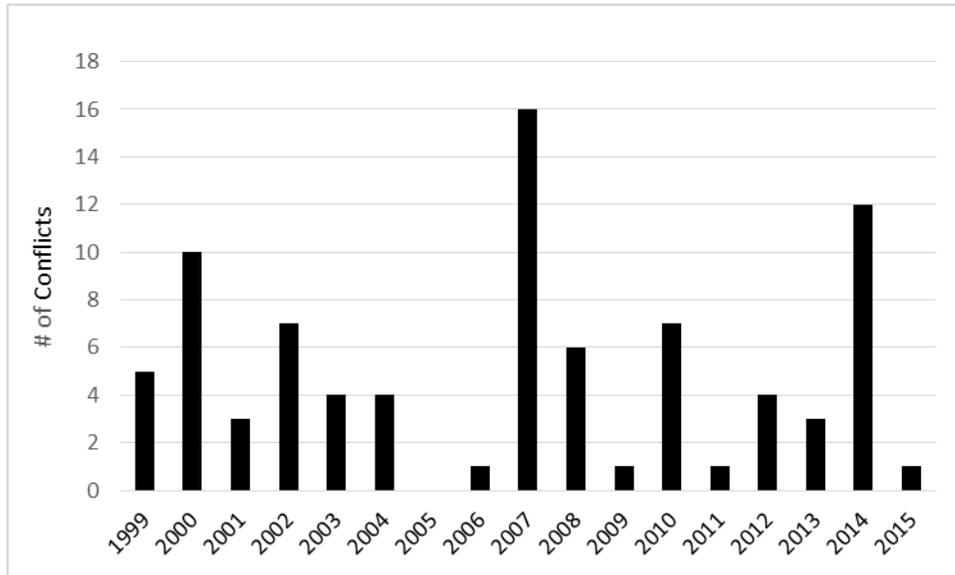
bear also broke into a house looking for garbage. This bear was destroyed.

On 6 occasions between 2009 and 2015, black bears tried to get into garbage being stored in bear-proof bins at homeowner’s residences but were unsuccessful and failed to obtaining any food reward. So although attracted by the garbage, these bears were not rewarded and left the area. All these homeowners had bears getting into their garbage previously and these bears were likely returning looking for food.

On August 26<sup>th</sup> and September 22<sup>nd</sup> 2007, there were 2 separate incidents involving black bears entering the Bragg Creek Waste Transfer Station and

accessing dumpsters full of residential waste. The Waste Transfer Station does not have a bear-proof waste management system and, in one case, a black

bear was able to tear open the metal grate lids on the primary storage container (Figure 7). In both cases,



**Figure 5. Annual Residential Garbage-related Conflicts (1999-2015)**

the bear was trapped and relocated from the study area. Since those incidences in 2007, there have been no further problems at the Bragg Creeks Waste Transfer Station that have been reported.

Between 1999 and 2008, there were 5 reported incidents involving black bears accessing commercial garbage. Since 2008, an additional 3 instances of bears getting into commercial garbage were reported up to 2015. These bears were able to get garbage through access into non bear-proof dumpsters at several different restaurants in the Hamlet of Bragg Creek.

The same restaurants have been involved in multiple incidents and bears have had to be trapped and removed. Seven black bears (incl 4 cubs) had to be captured and relocated as a result of these bears getting into commercial dumpsters during 1999-2015). There have also been 2 instances of black bears getting into a non-secured garbage dumpster at a local golf course. In 2011 this resulted in 4 bears (sow and 3 cubs) being destroyed.

Examples of common practices for managing commercial garbage in the Hamlet are presented in Figure 8.



**A** Intact wooden garbage container.



**B** Container torn apart by a black bear to access stored garbage.

**Figure 6. Wooden Garbage Storage Containers Commonly Used by Bragg Creek Residents**



**A** Metal grate on waste container temporarily repaired after it was torn open by black bear in 2007.



**B** Waste materials left over from black bear accessing residential waste container at Transfer Station in 2007.

**Figure 7. Damage and Debris from Black Bear accessing Bragg Creek Waste Transfer Station in 2007 (A,B) and Current Bins (C,D).**



**A.** Current Metal Bins and Lids in place at Bragg Creek Waste Transfer Site - 2016



**B.** Metal Lids on Bins at Bragg Creek Waste Transfer Site - 2016



**C.** Typical waste disposal system in commercial areas of the Hamlet of Bragg Creek as of 2016.



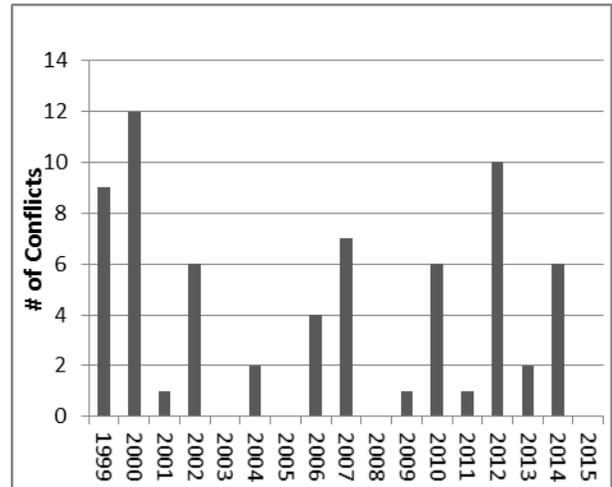
**D.** Example of non bear proof outdoor grease storage container still in use by area restaurants as of 2016

**Figure 8. Approaches to Waste Commercial Management in Effect in the Greater Bragg Creek Study Area - 2016 (A-D)**

### 5.2.2.2 Bird Seed

Bird seed continues to be the second most common attractant encountered in bear conflicts in the study area (Figure 4). Including an additional 26 conflicts from 2009-2015, there were now a total of 67 black bear incidents involved bears accessing bird seed.

There have been no known incidents involving grizzly bears and bird seed during the timeframe of this assessment. As with garbage, the number of bird seed conflicts was highly variable between years and there does not appear to have been any changes in frequency when comparing years from the earlier assessment (1999-2008) to the additional years of this assessment (2009-2015) (Figure 9).



**Figure 9. Annual Bird Seed Conflicts (1999-2015)**

Bears either tore down feeders or accessed bags of poorly stored bird seed. Access into yards and/or onto decks was common with such incidences. In several cases, residents noted black bears hanging around their homes and feeding on the bird seed for multiple days.

**Figure 10. Black Bears Accessing Bird Feeders in Greater Bragg Creek**



### **5.2.3 Other Attractants**

Combining more current records from 2009-2015 to those from 1999-2008, it can be seen that bears continued to access livestock feed, such as chicken feed, grain, and horse crunch when these items were stored in unsecured sheds and barns. Grizzly bear #85, a radio-collared grizzly bear, was responsible for 3 public safety incidents involving livestock feed accessed at an acreage in the western portion of Greater Bragg Creek. Additionally, an adult female grizzly bear broke into a trailer being used to house exotic chicken in 2014. This bear was captured and relocated to Kananaskis Country.

Black bears accessed poorly stored pet food (15 occurrences or 6%), compost (11 occurrences or 4%) and food for human consumption (12 occurrences or 5%). There were also several reported cases of black bear and grizzly bear predation on livestock that included sheep, goats, and chickens. There were 2 instances of grizzly bears suspected of killing a cow and several sheep at 2 different locations within the study area. Bee hives were also visited and destroyed by black bears in 2 incidents. Food residue on barbeques attracted black bears in 6 reported cases. Fruit trees attracted black bears to area acreages on 2 (1%) occasions while an open-air fruit stand, located in the Hamlet of Bragg Creek attracted black bears in 4 reported cases.

Attractants accessed by bears in Greater Bragg Creek were similar to those reported in other areas. The Bow Valley reported bears accessing a range of unnatural foods that included garbage, golf course vegetation, bird seed, grain, ornamental fruit, and human food (Honeyman 2007). However, the primary attractant involved in Bow Valley bear incidents was buffaloberry, a natural food source that bears access in and around area communities, campgrounds and recreation facilities. The

Crowsnest Pass documented bears accessing garbage then bird seed, livestock, and natural foods (primarily berries and green vegetation) (Miistakis 2006). Bear-proof Waste Management initiatives in Canmore have reduced the frequency of garbage-related incidents.

### **5.2.4 Property Damage**

Between 1999 and 2008, bears caused property damage in 51 (35%) incidents involving attractants (includes livestock kills). During 2009-2015, another 23 incidents of property damage were reported. Two of these involved grizzly bears. Property damage continues to make up just over 30% of attractant-related human-bear conflicts. Cases of property damage included broken bird feeders and wooden garbage containers, as well as damage to the siding of buildings, fences, beehives, garage doors, storage sheds and granaries.

### **5.2.5 Bear Attractants by Community Zone**

Human-bear conflict incidents involving attractants were compared amongst Community Zones to assess the distribution of attractant related conflicts within the study area. Between 1999 and 2015, all zones experienced at least 1 bear incident involving attractants (Table 5). The Hamlet of Bragg Creek, comprised of Community Zones: North Hamlet and South Hamlet, experienced more incidents involving residential garbage than any other zone within the study area. These were followed by the Redwood Meadows and Wild Rose Community Zones.

Bird seed related conflicts continued to be more prevalent in the Elk Valley and South Hamlet Community Zones followed by Redwood Meadows, Wintergreen, and North Hamlet. Incidents involving pet food, human food and compost continued to be more common in the Hamlet of Bragg Creek (North Hamlet and South Hamlet Zones combined).

Incidents involving livestock feed were greatest in the Hawkeye Community Zone, where there were recurring incidents associated with grizzly bear #85.

**Table 6. Human-Bear Conflicts by Community Zone in Greater Bragg Creek Area (1999-2015)**

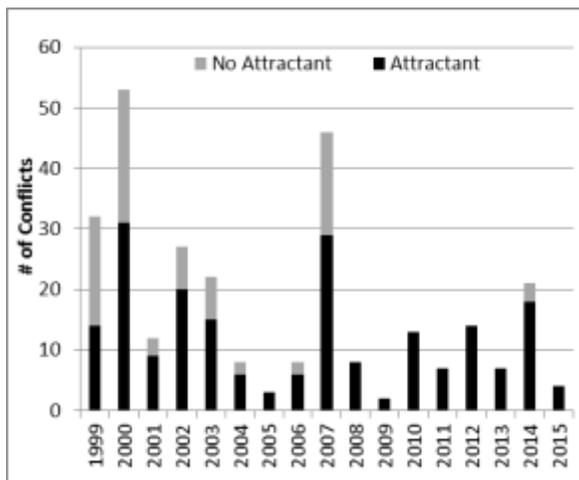
| Attractant                            | Greater Bragg Creek Community Zone |         |              |             |            |            |           |             |           |              |              |         |
|---------------------------------------|------------------------------------|---------|--------------|-------------|------------|------------|-----------|-------------|-----------|--------------|--------------|---------|
|                                       | Total*                             | Hawkeye | Forestry Way | Forest Park | Elk Valley | Fawn Hills | Wild Rose | Wintergreen | East Park | South Hamlet | North Hamlet | Redwood |
| Garbage Residential                   | 74                                 | 2       | 4            | 3           | 6          | 4          | 8         | 2           | 3         | 22           | 11           | 9       |
| Bird Seed                             | 58                                 | 2       | 5            | 1           | 12         | 4          | 3         | 5           | 2         | 11           | 5            | 8       |
| Livestock Feed                        | 14                                 | 5       | 2            | 1           | 3          | 2          |           | 1           |           |              |              |         |
| Pet food                              | 10                                 |         | 2            | 1           | 1          |            | 1         |             | 1         | 2            | 2            | 1       |
| Compost                               | 11                                 |         |              |             |            | 1          |           |             | 1         | 4            | 4            | 1       |
| Garbage commercial construction, golf | 8                                  |         |              |             | 1          |            |           | 1           |           | 1            | 3            | 2       |
| Food                                  | 10                                 |         |              | 1           | 2          |            | 1         | 1           |           | 2            | 2            | 1       |
| Livestock chickens, goats, sheep      | 8                                  |         | 1            |             | 3          |            | 1         | 1           |           |              | 2            |         |
| BBQ                                   | 7                                  |         |              | 1           | 1          |            | 1         |             |           |              | 2            | 2       |
| Fruit Stand                           | 5                                  |         |              |             |            |            |           |             |           | 5            |              |         |
| Bee Hives                             | 1                                  |         |              |             |            | 1          |           |             |           |              |              |         |
| Lawn Grazing                          | 1                                  |         |              |             |            |            |           |             |           |              |              | 1       |
| Natural Berries                       | 1                                  |         |              |             |            |            |           | 1           |           |              |              |         |
| Fruit trees                           | 3                                  |         |              |             |            |            |           | 2           |           | 1            |              |         |
| Total                                 |                                    | 9       | 14           | 8           | 29         | 12         | 15        | 14          | 7         | 48           | 31           | 25      |

**Shading** indicates the highest recorded value for bear incidents. \* Please Note that the totals here are different from those presented in Figure 6.0 as some incidents involving attractants have no known community zone.

## 5.2.6 Frequency of Human-Bear Conflicts

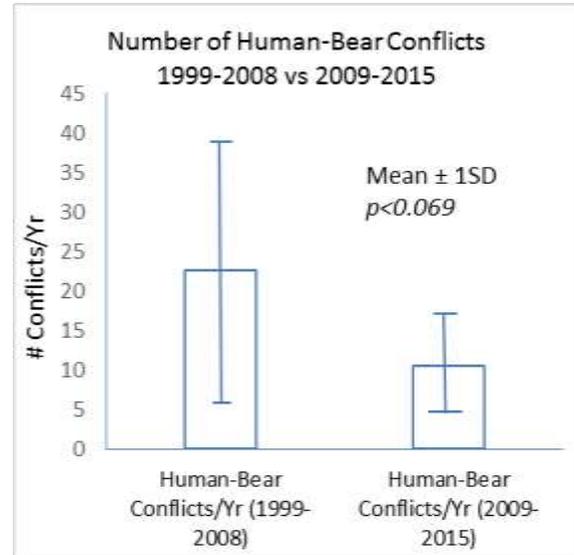
### 5.2.6.1 Annual

A total of 298 public safety related human-bear conflicts were reported between 1999-2015, of which 287 (96%) involved black bears and 11 (4%) involved grizzly bears. The number of human-bear conflicts reported on a yearly basis is presented in Figure 11. Annual black bear human-bear conflicts fluctuated widely between 1999 and 2015, from only 2 reported conflicts in 2009 to 53 in 2000 (Figure 11).



**Figure 11. Reported Black Bear Human-Bear Conflicts by Year (1999-2015)**

It was possible to compare the number of human-bear conflicts that have taken place in the study area since the first Bragg Creek Hazard Assessment was completed that covered years 1999-2008. An additional 7 years of conflict data for 2009-2015 was available. Accounting for the difference in the number of years, the mean number of conflicts/year in 2009-2015 was less than the number in 1999-2008, however this difference was not significant due to the high amount of annual variability (Figure 12).



**Figure 12. Human-Bear Conflict numbers (1999-2008) vs (2009-2015).**

Conflicts involving grizzly bears have been relatively few compared to black bears. No safety-related conflicts were reported for grizzly bears in 1999-2001, 2005-2006, 2010, 2012, 2013, and 2015.

Fish and Wildlife staff have noted a pattern of low but consistent grizzly bear human-bear conflicts in Greater Bragg Creek as well as other communities along the southern Rocky Mountain Foothills (Hawes pers. comm. 2008). Given the available data, it is difficult to determine what factors may be causing these yearly fluctuations, however, they likely reflect variation in the availability of seasonally important bear foods.

Bears commonly experience natural food shortages and the failure of a critical natural food, such as berries, can lead to increased competition among bears and can force bears to search for alternative food sources in residential areas (Tompa 1987, Mattson et al. 1992, Ciarniello and Paczkowski 2001, as quoted in Davis et al 2002). The result can be an increase in the number of bear incidents involving unsecured bear attractants. This negative effect of

natural food shortages is well documented (Hatler 1967, Knight et al 1988, as quoted in Davis et al 2002).

Anecdotal observations in the Greater Bragg Creek area suggested that in 2007, the buffaloberry crop failed, whereas berries were abundant in 2005 and 2006. Fish and Wildlife staff confirms the buffaloberry crop was considered to be marginal in 2007 for much of the southern Foothills (Hawes pers. comm. 2008, McKay pers comm. 2008). These observations support the assumption that there may be lower human-bear conflicts in good berry seasons (e.g. 2005 and 2006) compared to relatively high human-bear conflicts when the berry crop is poor (Figure 11).

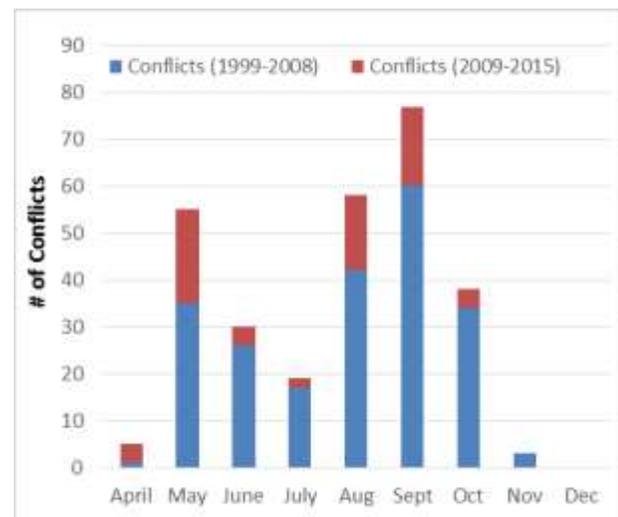
Another confounding factor relates to the variability around reporting. Some people are more or less inclined to report bear incidences than others and annual fluctuations in reported human-bear conflicts may reflect a personal preference by certain individuals to report or not report their encounters with bears. Some people do not wish to report incidences for fear over harm being done to the bear as a result of some potential management action. Mere sightings of bears are certainly underreported, however, it would be more likely for the public to report bear activity that was of a more threatening nature or incidences where some kind of property damage has taken place. For this reason, the number of more serious conflicts reported is likely to be a more accurate reflection of what is occurring.

Relatively high numbers of incidents in certain years may be associated with individuals that prefer to repeatedly call-in their bear encounters. Higher human-bear conflicts in certain years may also be associated with only 1 or 2 individual bears persistent in their search for food and resulting in more frequent

interactions with more people. Persistent conflicts by some individual bears eventually results in their being removed from the study. Subsequent years of relatively low levels of conflicts may then result after such bears have been trapped and removed from the area.

### 5.2.6.2 Monthly

The number of black bear human-bear conflicts recorded by month is presented in Figure 13. In general, there tends to be two peaks in bear conflicts – one in May (corresponds to the PreBerry season) and then another larger peak that covers the Aug-September period (corresponds with the Berry season). These results are influenced by the high number of reports in 2007, which primarily occurred in these summer months. At this time of year, roughly 2-3 months before hibernation, bears enter a hyperphagic state of excessive eating. During this phase, bears increase their food intake dramatically in order to accumulate large fat reserves needed to

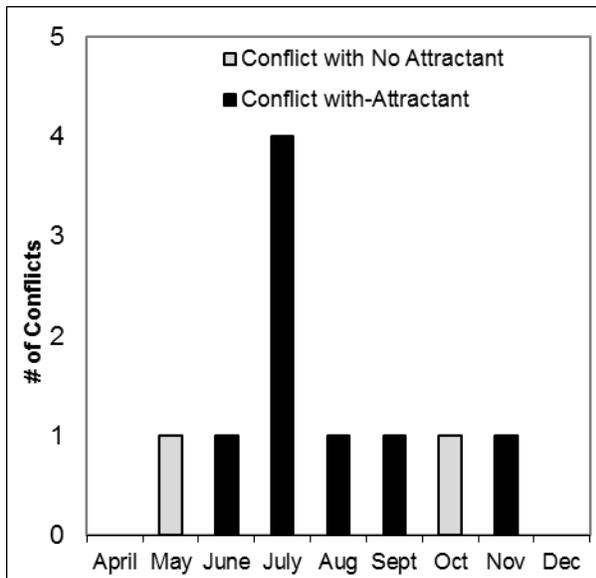


**Figure 13. Black Bear Conflicts by Month (1999-2015)**

survive up to 6 months of winter hibernation (Davis et al 2002). This phase is likely a key factor motivating bears to move into residential areas and

seek out alternative food sources in the months of August and September. The data also show an increase in human-bear conflicts in May when hungry bears having just left their dens are seeking natural food sources which, early in the year, may be in short supply.

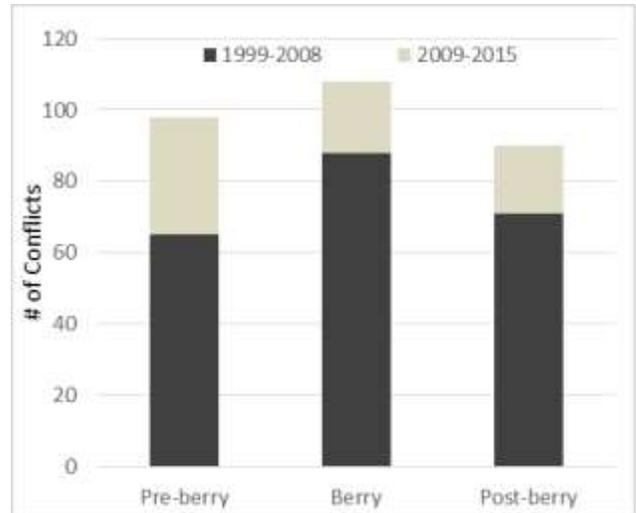
The number of grizzly bear human-bear conflicts recorded on a monthly basis is presented in Figure 14. Although sample size is small, there were relatively greater grizzly human-bear conflicts in May and July. Seasonal patterns in grizzly bear human-bear conflicts are difficult to discern given the low sample size (N =22).



**Figure 14. Grizzly Bear Human-Bear Conflicts by Month (1999-2015)**

### 5.2.6.3 Seasonal

We also looked at human-bear conflicts in the Greater Bragg Creek area relative to season in relation to berry production (Figure 15). Out of 296 reported conflicts, a total of



**Figure 15. Human-Bear Conflicts by Berry Season (1999-2015)**

108 (37%) of the human-bear conflicts took place during the Berry season, while 98 (33%) occurred during the Pre-berry season and another 90 (30%) took place in the Post-berry season.

Figure 16 shows the yearly proportion of human - bear conflicts) relative to berry production seasons. The high variability suggests that conflicts can occur during any of the berry related seasons.

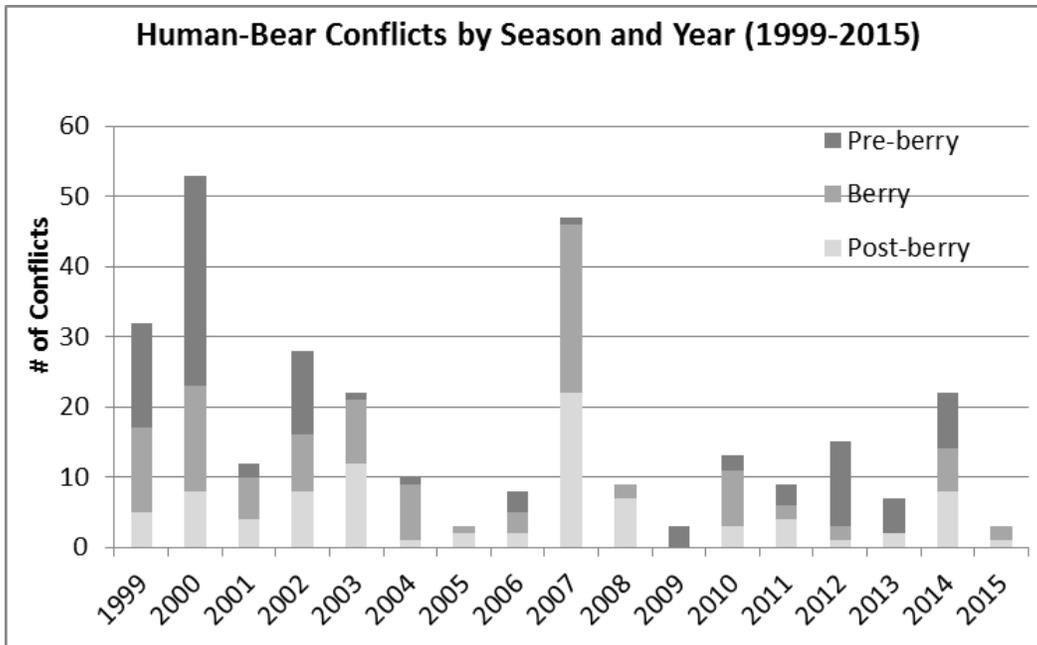


Figure 16. Annual Human-Bear Conflicts Relative to Berry Season and Year (1999-2015)

#### 5.2.6.4 Black Bears: Garbage and Bird Seed

Black bears were responsible for the majority of human-bear conflicts during the timeframe of this assessment (1999-2015) of which the primary attractants involved were garbage (85 or 35%, N = 245) and bird seed (67 or 27%, N = 245). Comparing the number of garbage related conflicts that have happened since the last hazard assessment, indicated that the number of garbage conflicts/year has not significantly changed ( $p = 0.51$ ) (5.6 vs 4.1 conflicts/year).

The percentage of both garbage and bird seed related conflicts in relation to the total number of conflicts, however, was significantly higher in the 7 years since the last assessment (Figure 17). This was mostly because there had been a reduction in the number of other attractant types occurring during the last 7 years (2009-2015).

We looked at the yearly and monthly patterns in these garbage and bird seed-related black bear incidents. Black bear incidents involving garbage varied on an annual basis with the greatest number of incidents occurring in 2000, 2007, and 2014 (Figure 18).

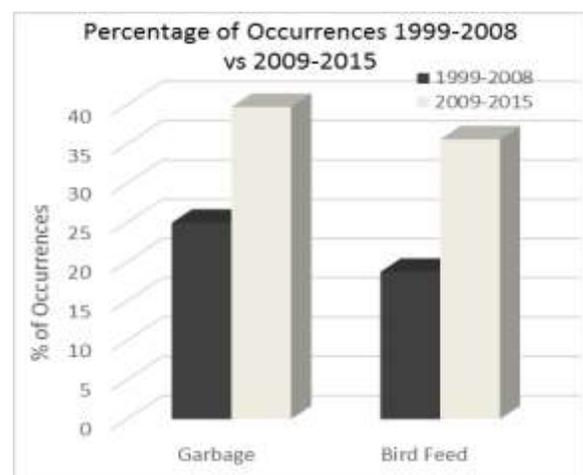


Figure 17 Proportion of Garbage and Bird Seed Conflicts in Relation to All Conflicts Comparing Periods 1999-2008 vs 2009-2015.

There were no reported garbage-related conflicts in 2005. The monthly pattern showed a steady increase in garbage-related conflicts from May to August with these conflicts peaking in September and October

and then dropping off in November, when black bear are likely entering winter dens (Figure 19).

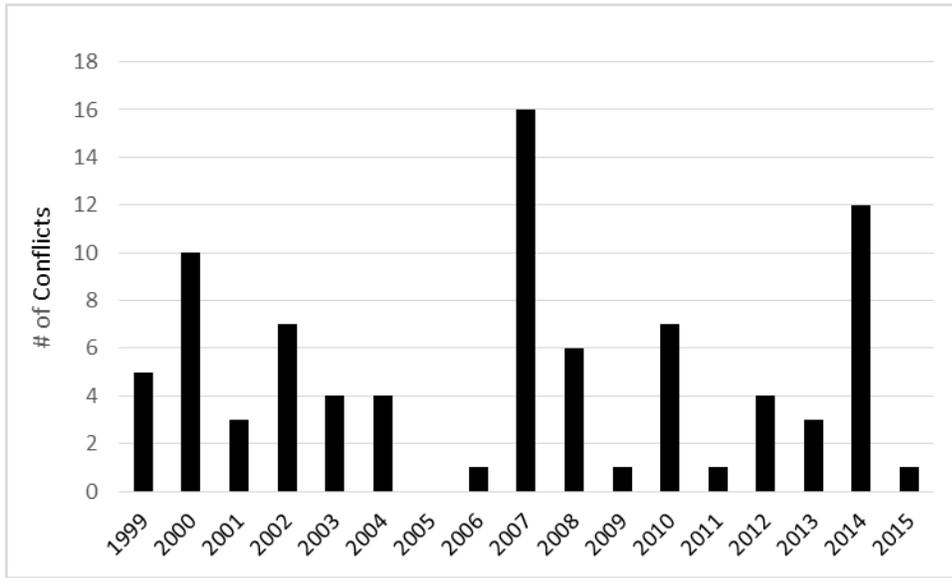


Figure 18. Annual Black Bear Human-bear conflicts: Garbage (1999-2015)

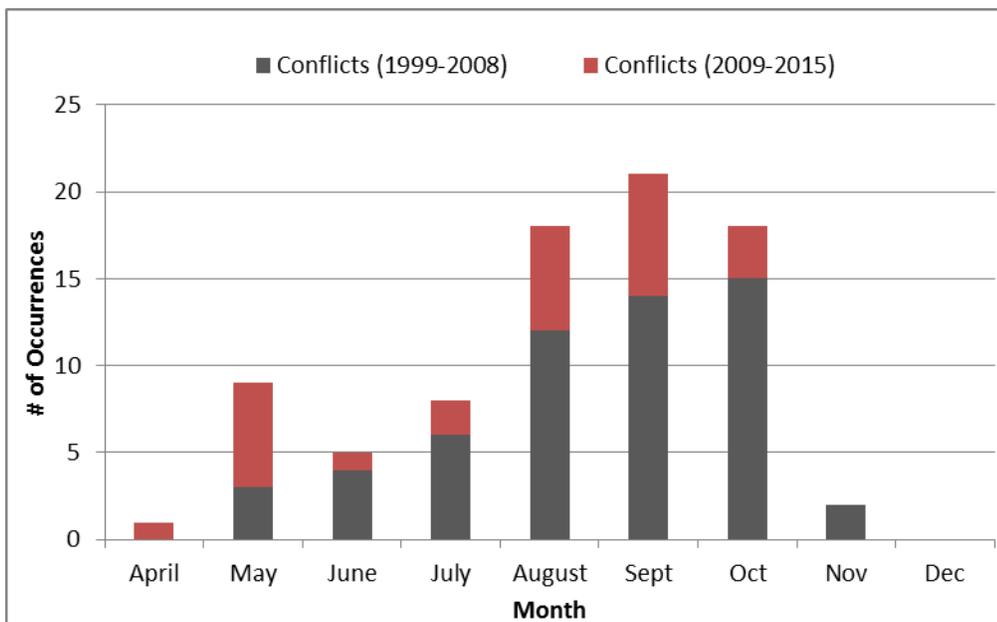
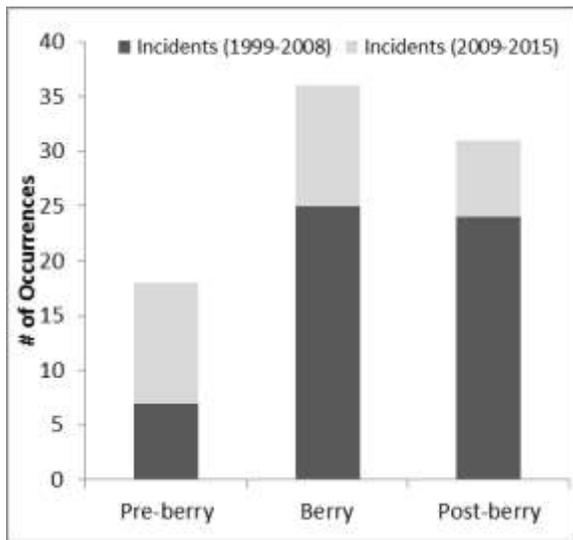


Figure 19. Monthly Black Bear Human-Bear Conflicts: Garbage (1999-2015)

We also looked at the relationship between garbage-related conflicts and the berry season. The majority of these conflicts took place during the berry and post-berry seasons (Figure 20). This seasonal pattern in garbage-related conflicts may correspond with hyperphagia when black bears are motivated to move into residential areas seeking out alternative food sources.

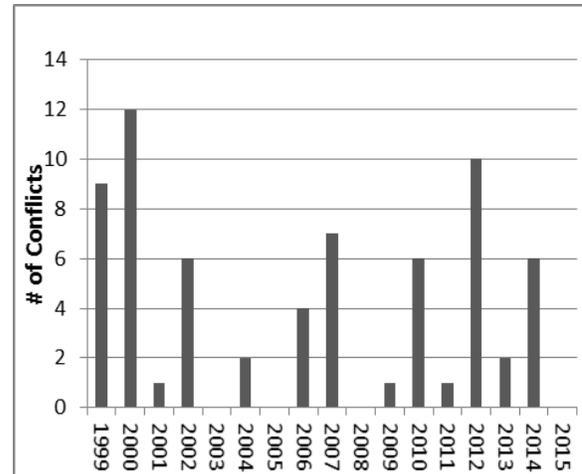


**Figure 20. Seasonal Black Bear Garbage Conflicts (1999-2015)**

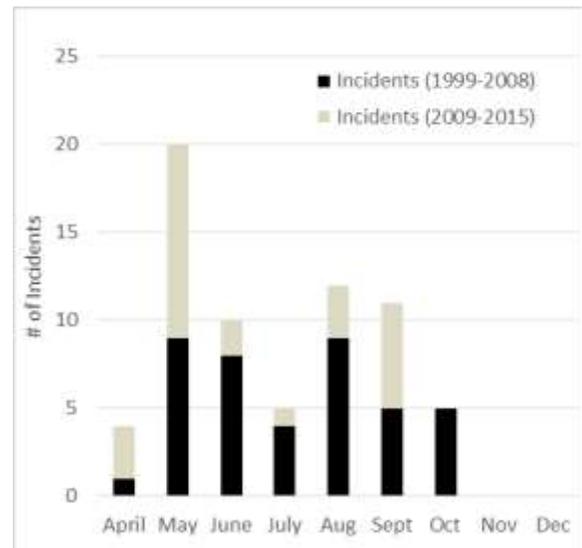
Black bear incidents involving bird seed also varied on a yearly basis with the greatest number of incidents occurred in 1999, 2000, and 2012 (Figure 21). Not all years have had bird seed related conflicts. There has been no change in the frequency bird seed related conflicts over the 7 years since the last hazard assessment. Mean bird seed conflicts/year for 1999-2008 and 2009-2015 were 4.1 and 3.7 respectively.

The monthly pattern shows bird seed-related black bear incidents to be somewhat more evenly distributed over the spring, summer and fall when compared to garbage, with a peak in conflicts in May

and August-Sept (Figure 22). This activity pattern continued over the 7 years since the initial hazard assessment. The May peak may correspond with bears just leaving their dens and when natural food sources may be in short supply. As well, these bears may have accessed birdfeeders not yet cleaned



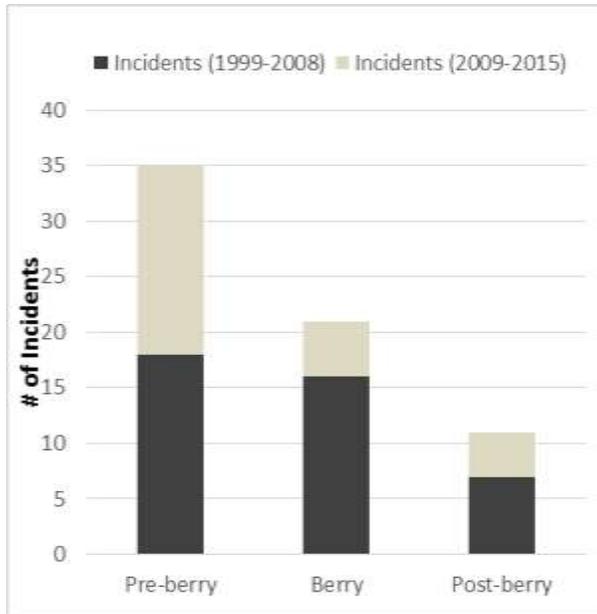
**Figure 21. Annual Black Bear Conflicts: Bird Seed (1999-2015)**



**Figure 22. Monthly Black Bear conflicts: Bird Seed (1999-2015)**

and removed after the winter months. The relatively wide distribution of bird seed-related incidents across

the summer season indicates persistent use of bird feeders by residents beyond the winter months. Figure 23 shows that the majority of bird seed-related



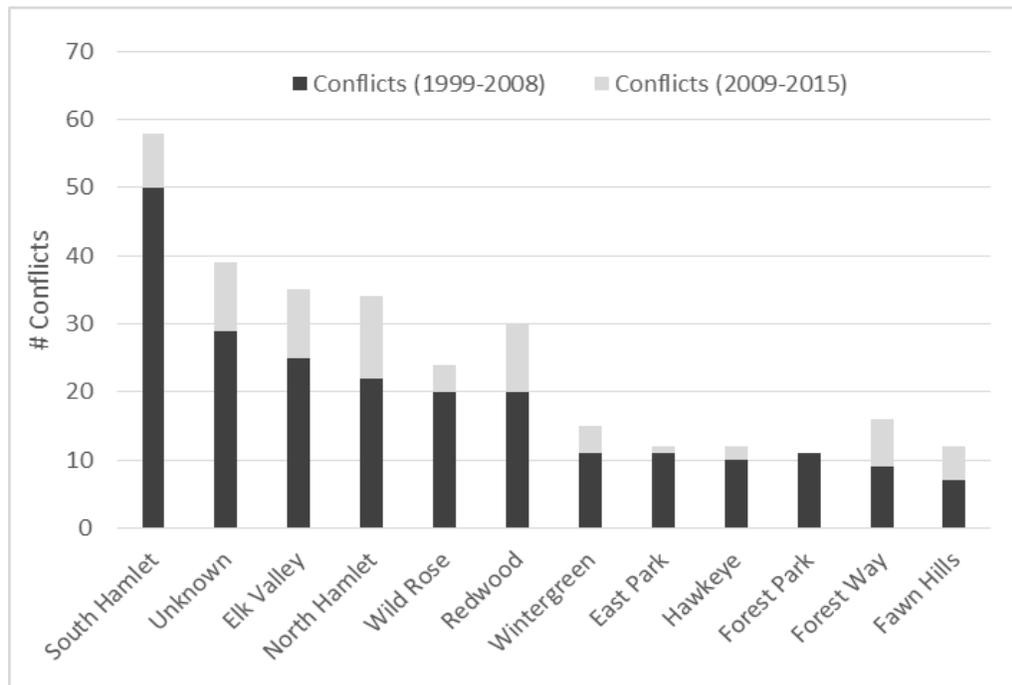
**Figure 23. Seasonal Black Bear Conflicts: Bird Seed (1999-2015)**

conflicts took place during the pre-berry and berry seasons and was consistent across time frames.

### 5.2.7 Conflict Location

The majority of reported human-bear conflicts between 1999 and 2015 were clustered within residential community nodes and assigned to a specific Community Zone (Figure 24) and mapped in Figure 23. As the spatial area of each Community Zone and their respective population density varied, caution is advised in comparing one Zone to another. There were 39 (13%; N = 298) human-bear conflicts where location information was not available.

Grizzly bear human-bear conflicts took place primarily in the western-most portion of the study area although conflicts were recorded as far east as Fawn Hills (on Range Road 52) and Wild Rose Estates, in the central portion of the study area (Figure 25). No grizzly bear conflicts were reported in the more populated Hamlet of Bragg Creek or in Redwood Meadows.



**Figure 24. Human-Bear Conflicts by Community Zone (1999-2015)**



### 5.2.8 Human-Bear Conflict Levels

Human-bear conflicts vary in their degree of severity from a public safety and/or property damage perspective. Excluding sightings, within the study area, of the 337 conflict related occurrences, the majority (46%) were of the Moderate category followed by Low (26%) (Figure 26). High and Very High categories of conflict were relatively less (11% and 17% respectively) prevalent and there were no conflicts in the Extreme category (i.e. injuries or death to people) for the time frame 1999-2015.

The high number of Moderate level conflicts were due to the high incidence of conflicts involving non-natural food attractants (primarily garbage and bird seed) around residences. Bears entering garages (either breaking in or walking in thru open garage doors) escalated many of these incidences into the High and Very High categories.

One would expect incidents in the Low category to be underrepresented since these types of incidences would predominantly be bears traveling through properties and people would be less likely to report such occurrences.

Of the 24 reported grizzly bear human-bear conflicts, 14 (58%) were of the Low category. Another 8 conflicts were of the Very High conflict level and were associated either with livestock killing or breaking into structures to access livestock feed.

Conflict levels can be examined by Community Zone (Figure 27) to get sense of where within the study area, the more serious conflicts have taken place over the last 17 years. Zones with relatively high numbers of High and Very High conflicts were South Hamlet, North Hamlet, and Elk Valley. Unfortunately there were a high number of incidences from the study area that could not be assigned to Zone due to a lack of location specific information.

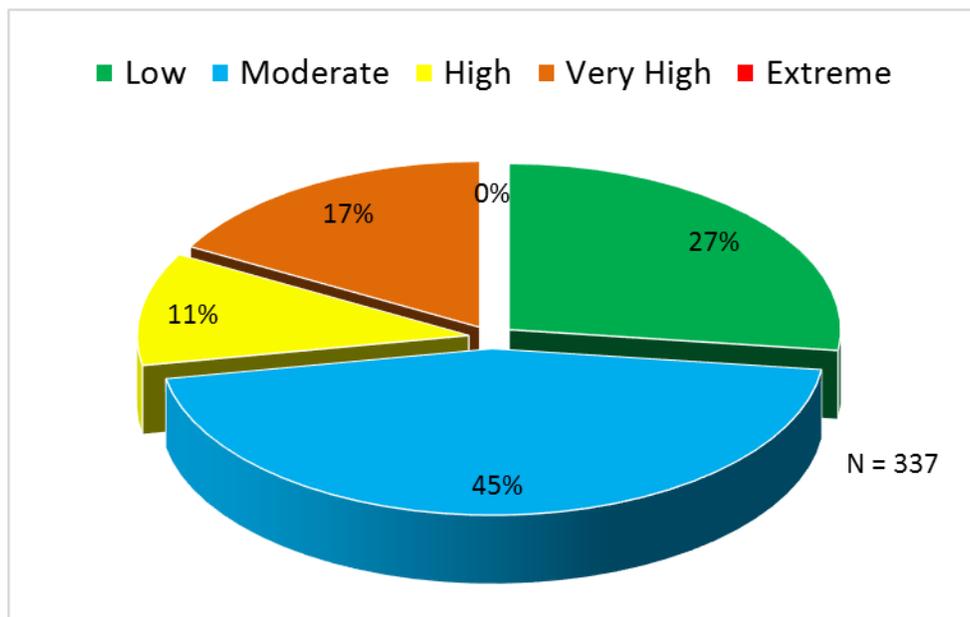
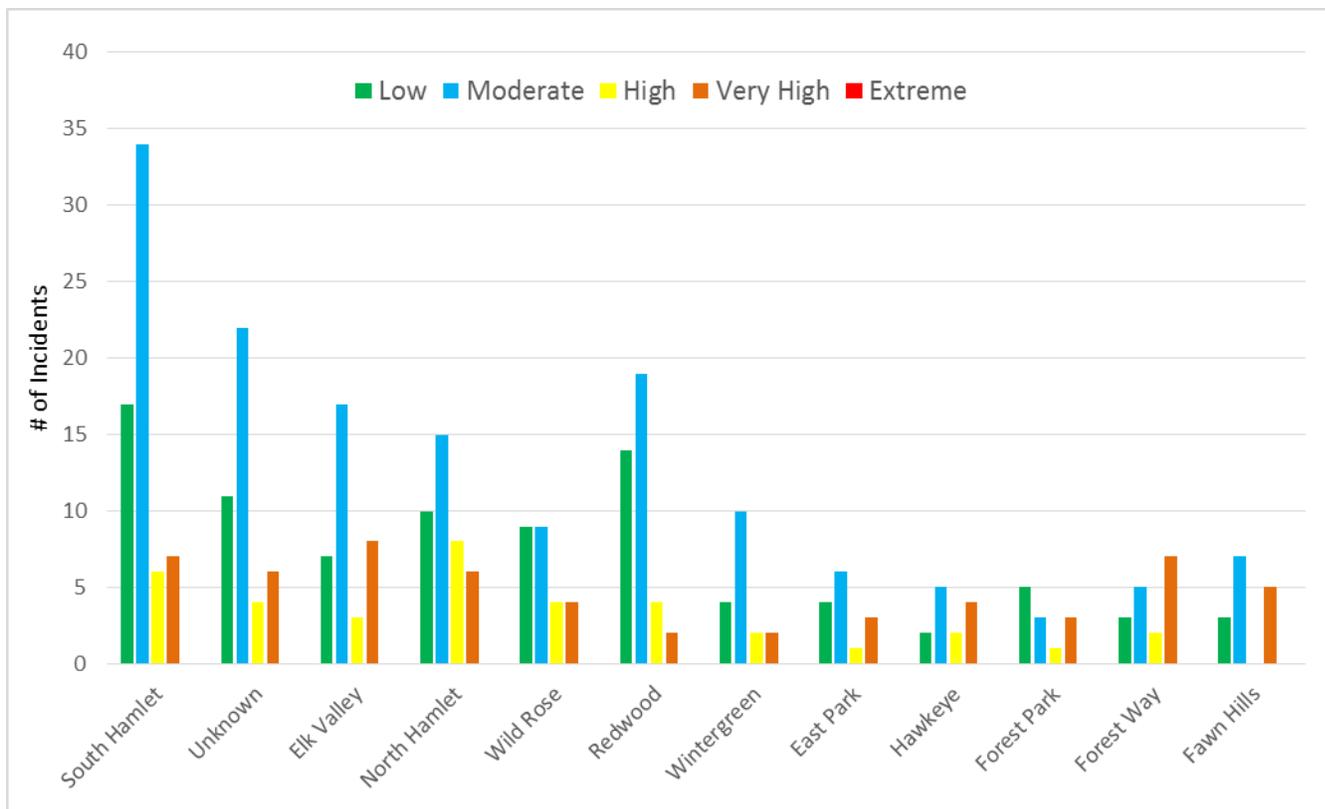


Figure 26. Proportion of Human-Bear Conflicts by Conflict Level (1999-2015)

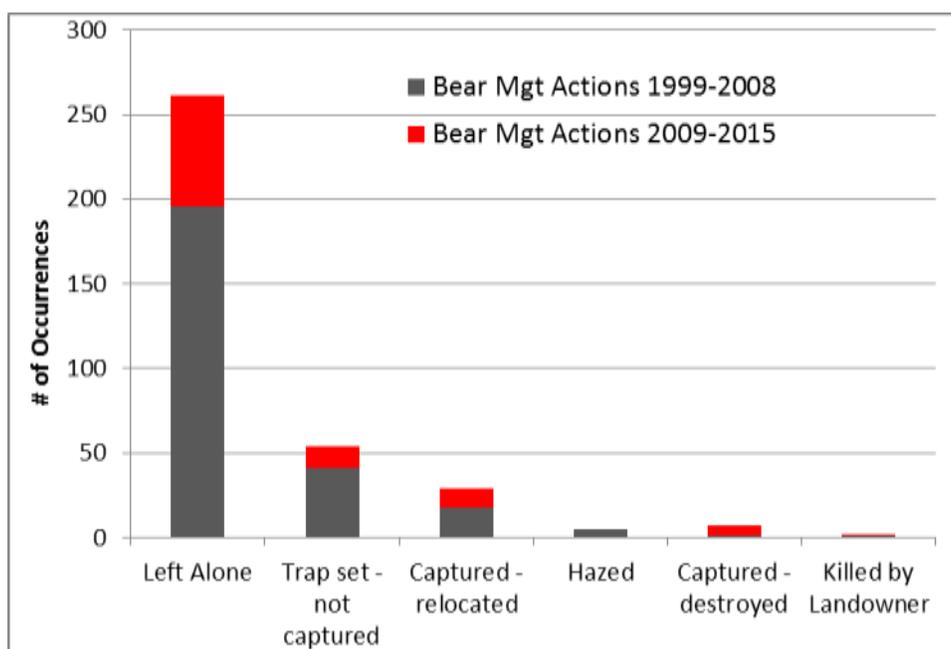


**Figure 27. Number of Human-Bear Conflicts by Conflict Level and by Community Zone, 1999-2015**

### 5.3 Bear Management Actions

Management actions taken in response to reported human-bear conflicts are presented in Figure 28. Duplicate entries, where it could be confirmed that the same bear was responsible for a number of incidences, were removed from the analyses before preparing the management action summary. The majority of bear reports were responded to with No Action as defined in Table 4. Out of 358 reported occurrences of both black and grizzly bears, 261 (73%) resulted in Fish and Wildlife Officers taking no action and leaving the bear alone. There were 95 (26%) of incidents where some form of action was taken by staff. In the event that a bear was deemed a public safety hazard, traps were set for the purpose of relocation. There were 54 (15%) of reported

incidents in which a trap was set but nothing was captured and 29 (8%) of cases where a bear was captured and relocated. Aversive conditioning or bear hazing was applied in 5 cases. There was one reported case of a bear being captured and subsequently destroyed during 1999-2008 after being severely injured but during the following 7 years an additional 6 black bears were euthanized. Four bears (sow and 3 cubs) were destroyed after repeatedly getting into a commercial garbage bin on a local golf course. Between 1999 and 2015, 2 other black bears were killed by landowners as a result of public safety concerns on private property. There have been no grizzly bears killed during this time frame through management actions in response to conflict. Garbage was involved in all instances when bears were killed as a result of management actions.



**Figure 28. Bear Management Actions 1999-2015**

**5.4 Data Limitations**

**5.4.1 Bear Habitat**

Greater Bragg Creek is at the approximate eastern extent of the range of both black bears and grizzly bears but seasonal habitat is available for both species. Information on the bear habitat potential and bear movement zones of Greater Bragg Creek was derived from models created for the broader region and was described in the earlier 2010 hazard assessment for Greater Bragg Creek (AESRD, 2010).

The HSI model results described there were useful in that they provide general information on seasonal bear habitat conditions in the Greater Bragg Creek region as a whole. Such models are theoretical, however, and rely heavily on professional judgment and general knowledge of bear habitat requirements. Both species of bears are generalists in their habitat

requirements and do not lend well to predictive models based strictly on habitat. They have a lower predicted power than other models that apply empirical data derived from field studies of bear habitat use (Carroll et al 1995). Empirical models are also more capable of evaluating habitat suitability with reference to non-habitat related factors such as response to human disturbance (Kansas and Herrero 1995).

In order to compare the relative bear conflict risk across Greater Bragg Creek, detailed local field surveys, possibly in combination with bear telemetry studies, would be required to evaluate the distribution and abundance of important foods and suitable hiding cover for bears. Currently, such detailed information is not available. Data from such studies would likely be required in order to make definitive conclusions regarding which local areas within Greater Bragg Creek are more likely to have bear problems as a

result of their proximity to habitat hot spots or movement zones for bears. In the interim, available data provides a general indication of the bear habitat potential of Greater Bragg Creek.

#### **5.4.2 Human-Bear Conflicts**

Fish and Wildlife Occurrence Reports were used to generate the information on the types of human-bear conflicts, the number of human-bear conflicts by year and season, and where these conflicts took place in Greater Bragg Creek. These occurrence reports provide an in-depth overview of the sources of human-bear conflicts in the region, however, there are inherent limitations associated with this type of data.

This data often does not provide information on the total number of individual bears involved in conflicts within the study area. This is because the occurrence reports are based on observations of bears made by residents with limited experience in distinguishing between species let alone individual bears. Incidents involving multiple bears are also often reported as only a single occurrence. As such, this assessment is limited to an analyses of reported occurrences and is not able to infer any information on the number of bears involved. It is also difficult to identify the primary causal factors affecting fluctuations in human-bear conflicts on a yearly and monthly basis.

Human-bear conflict numbers may be inflated in some instances by the activities of 1 or 2 bears persistent in their efforts to access unnatural foods at various people's residences. The occurrence reporting is also highly affected by the public's willingness to call in. Relatively high numbers of incidents in certain years may be associated with individuals that prefer to repeatedly call-in their bear encounters. Higher human-bear conflicts in certain

years may also be associated with only 1 or 2 individual bears persistent in their search for food. Subsequent years of relatively low numbers of conflicts may be the result of "problem" bears having been trapped and removed from the area. These inherent limitations make it particularly difficult to compare different communities within Greater Bragg Creek with respect to their relative bear conflict levels.

Fish and Wildlife Occurrence Reports do, however, provide a strong indication of the fundamental role attractants have played in causing human-bear conflicts in Greater Bragg Creek. These reports are valuable in highlighting the primary attractants involved in these conflicts: residential garbage, bird seed, livestock feed, and pet food. Substantial effort however, was required to pull this attractant information from the occurrence report database as this data is recorded in the form of a narrative and not in its own separate data field. Additionally there is no way to know if the information related to attractants was just not recorded. Currently, revisions have been made to the reporting system that now require staff to enter specific information on attractants and bear reaction. This change to the reporting system, however, is only mandatory for grizzly bear human-bear conflicts. Land Use type and bear behaviour are also mandatory requirements in the reporting system but only for grizzly bears. Black bear data related to attractants, behaviour, and land use type category can be entered by Officers but is not mandatory.

Other relevant information pertaining to the types of human-bear conflicts, specific conflicts locations and management actions could only be interpreted through a comprehensive review of the database - again making an accurate account of human-bear conflicts within Greater Bragg Creek more complicated. There were a number of records (13%)

where specific location information was not recorded. While it could be determined that the occurrence took place within the study area, it was not possible to assign the record to a Community Zone. In some cases, it was also difficult to identify whether certain conflicts were repeats of the same bear incident. Adjustments to the database with respect to what data is entered and how it is stored would make it easier to

summarize information relevant to bear hazard assessments more accurately and efficiently. These same issues and limitations persisted with the more recent conflicts data that was gathered for the purpose of updating the earlier hazard assessment done in 2010 that covered the years: 1999-2008.

## **6.0 MANAGING EXISTING AND POTENTIAL HUMAN-BEAR CONFLICTS**

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This bear hazard assessment added to, and updated the analysis done several years ago in Greater Bragg Creek for the purpose of identifying factors contributing to human-bear conflicts and examine if issue had changed over the 7 years after the first report was completed. Human developments and activities continue to be interspersed with an abundance of habitat considered suitable for both black bears and grizzly bears. Most human developments in the area are essentially islands within a matrix of bear habitat, with people's homes commonly backing onto natural areas. Bears are capable and predicted to move relatively freely within and across this landscape in response to the seasonal availability of preferred foods. A network of travel routes and extensive cover support bear movement across this landscape as well as through developed areas. In the intervening years since the last assessment, little has changed in the study area in this regard.

This overlap of bears and people leads to habituated bears. Bears moving through developed areas become human-habituated, losing their instinctive fear response as a result of repeat exposure to people

with no negative consequences. In this way, these bears have developed a tolerance that allows them to use habitat in close proximity to humans and human facilities. Such behaviour brings bears into more frequent contact with people and increases the potential for conflict. Such habituated bears have potential to opportunistically access unnatural food sources which could lead to bears becoming food-conditioned. These bears then become persistent in their pursuit of these unsecured attractants, in many cases causing property damage, as well creating an increased public safety concern for residents.

Between 1999 and 2015, numerous conflicts between bears and people were reported requiring a substantial investment in time and resources by provincial government staff in managing these conflicts and addressing safety concerns. Such conflicts are only expected to increase as the human population of Greater Bragg Creek grows at the rate Rocky View County anticipates.

A key objective of this follow up hazard assessment for Greater Bragg Creek is to recommend options for reducing or eliminating the source of human-bear conflicts in Greater Bragg Creek. The intent in

recommending these options is to benefit both people and bears by reducing the number of bears relocated and/or destroyed, reduce property damage, reduce investment in “problem” bear management, and reduce the risk of human injury conflicts. The recommendations focus on the key factors affecting people and bears in Greater Bragg Creek. Potential bear hazards have also been identified and evaluated with respect to recommended options for managing bear conflict risk. We caution that these recommended measures will not guarantee that bears do not access attractants. Rather they represent approaches, based on the expert opinion of bear managers, to securing attractants away from bears.

These recommendations are made with references to bear-conflict management initiatives implemented in other communities – in particular Canmore, Alberta. In the late 1990s, the Town of Canmore, responding to increasing concerns from the public and environment groups regarding bears accessing household garbage, implemented a bear-proof waste handling system and Waste Control Bylaw to reduce bear access to waste and other attractants. To date, the Town has experienced significant positive results especially with respect to restricting bear access to residential waste (A. Comeau, Solid Waste Services pers. comm. 2008, Honeyman 2007).

## **6.1 Bear Attractant Management Options**

The fundamental source of conflicts between people and bears in Greater Bragg Creek continue to be bears accessing unsecured, non-natural attractants. This ongoing problem is evident in the intervening years since the last assessment where access to garbage (both residential and commercial) and bird seed continue to be the most prevalent attractant type in the area. Other attractants continue to range from livestock feed, barbeques, human food, and fruit

trees. The fruit stand in Bragg Creek where several bear incidents occurred in 2003 is no longer present.

The best approach to managing bear attractants is to secure them using bear-resistant or bear-proof containment, to secure them in other ways (e.g. electric fence) or to eliminate them altogether. Because residential areas within the study area are nested within good bear habitat, bears will continue to wander around looking for food. This behaviour will bring them into contact with human activity and, with it, the potential to access non-natural food sources. The key is for bears to not obtain any positive food rewards such that they will continue on and not become food conditioned and a safety risk.

Residential waste continues to be the primary attractant associated with human-bear conflicts in the community. Bears have accessed waste at residences, area businesses, and, in the past, the community’s waste transfer station. Since changes were made to the Bragg Creek Waste Transfer site, there have been no conflicts at the site since the last events in 2007. While still not completely 100% bear proof, improvements made to the surrounding fence, cleanliness of the site, replacement of metal screened bin lids with solid metal lids, and the constant human presence during open hours appear to have made a difference.

The greatest concern currently is that of residential and commercial garbage storage prior to it being picked up or taken to the community waste facility. The transfer facility is only open 2 days a week. Increasing the days the facility is open could result in less garbage having to be stored at residences. A key step would be to identify means of restricting bear access to waste materials that are temporarily stored at people’s homes and acreages. Table 6 presents recommended options for managing bear attractants

in Greater Bragg Creek. We recommend several options to address this first step:

**Option 1.** Residents should be encouraged to utilize bear-proof or bear-resistant waste containment systems for their personal household use. Criteria for bear-resistant or bear-proof containers are provided by bear experts, such as the Interagency Grizzly Bear Committee, who test and certify bear-resistant and bear-proof containers. The Committee applies the following definition to bear-resistant containers used for personal household use:

*“A securable container of a solid non-pliable material capable of withstanding 200 foot pounds of energy. When secured and under stress, the container will not have any cracks or openings or hinges that would allow a bear to gain entry by biting or pulling with its claws. Wood containers are not considered bear resistant unless they are reinforced with metal.”*

Alternatively, residents should be encouraged to store garbage and other attractants indoors or in a secure

out-building; one with secure windows and doors. The use of airtight containers reduces odors while electric fencing can be used to improve out-building security.

From 2006 to 2008, Bragg Creek BearSmart, in cooperation with the Karelian Bear Shepherding Institute of Canada (KBSIC), implemented a bear-resistant container loaner program that encourages area residents to secure household waste and other attractants. The program had 21 bear-resistant containers that residents could borrow or purchase for their personal use (Figure 29). Up to and including 2008, bins had been loaned out 23 times. Again in 2014 and 2015 bins were loaned out another 18 times. Some of these bins were loaned out to residences outside of the Greater Bragg Creek area. In addition, it is known that bear proof bins have been purchased by homeowners without participating in the loaner program. Since this program, we are aware of 6 incidences where bears tried to get into garbage stored in these containers but failed. It is recommended that this program be reinstated to support residents in their efforts to secure bear attractants.

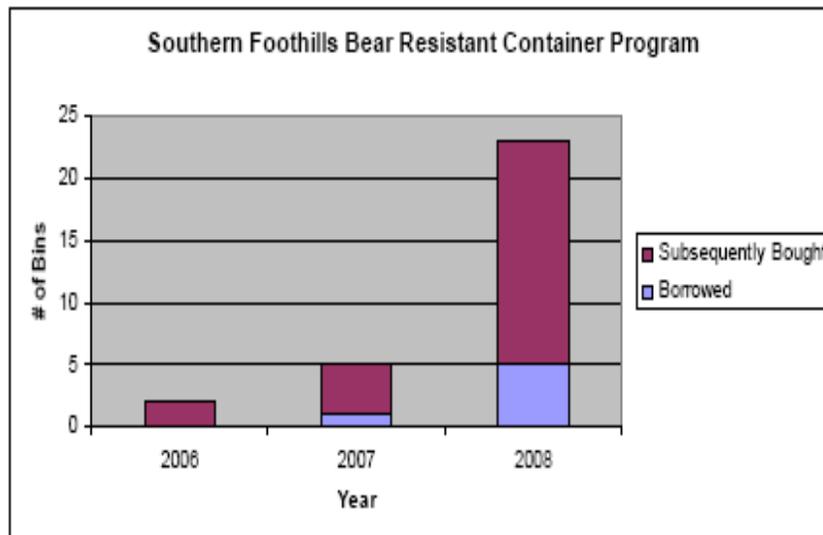


Figure 29. Bragg Creek Bear Bin loaner program (2006- 2008)

**Table 7. Bear Attractant Management Options**

| Attractant  | Recommendation Management Options   |
|---|---|
| <b>Residential Waste (Storage at Area Residences)</b> | <p><b>Individual household waste containment:</b></p> <ul style="list-style-type: none"> <li>• Store residential waste, including recycling, indoors or in a bear-proof out-building.</li> <li>• Store residential waste, including recycling, in bear-resistant containers (certified bear-resistant or bear-proof).</li> <li>• Regularly dispose of residential waste at the local waste transfer station.</li> </ul> <p><b>Community waste containment:</b></p> <ul style="list-style-type: none"> <li>• Install multiple bear-proof residential waste containers in area communities (for example 1 for every 20-35 households).</li> <li>• Conduct regular maintenance of community waste containers to ensure they remain bear-proof after wear and tear.</li> </ul>  |
| <b>Residential Waste (Transfer)</b>                   | <p><b>Community waste pick-up:</b></p> <ul style="list-style-type: none"> <li>• Use a self-loading truck to empty community bear-proof residential waste containers and deliver waste to the appropriate off-site facilities.</li> </ul> <p><b>Local Waste Transfer Station:</b></p> <ul style="list-style-type: none"> <li>• Ensure the existing Bragg Creek waste transfer station and its operation is bear-proof using bear-proof fencing and/or bear-proof waste containers, and/or bear-proof recycling containers and vigilance during operating hours.</li> <li>• Continue to provide regular and frequent opportunities for residents to drop off their garbage.</li> </ul> <p><b>Curb-side pick-up:</b></p> <ul style="list-style-type: none"> <li>• Curb-side pick-up using only curb-side bear-resistant containers (certified bear-resistant or bear-proof).</li> <li>• Require that residential waste only be put out only in the morning of the day of pick-up remain at the curb within specified time-frames prior to pick-up.</li> <li>• Provide frequent and regular pick-up times.</li> </ul> |
| <b>Commercial Waste</b>                               | <ul style="list-style-type: none"> <li>• Contain all commercial waste, including restaurant grease and recycling in certified bear-proof containers.<br/><a href="http://bearproofcontainers.com/products.html">http://bearproofcontainers.com/products.html</a></li> <li>• Implement a regular waste transfer system that delivers waste to an off-site facility.</li> </ul>   |
| <b>Construction Waste</b>                             | <ul style="list-style-type: none"> <li>• Require that all construction crews use bear-proof waste containers for items (e.g. food waste) that are attractants for bears.</li> </ul>   |
| <b>Bird Seed and other Bird Feeders</b>               | <ul style="list-style-type: none"> <li>• Prohibit the use of bird feeders between April 1 and October 31.</li> <li>• Clean up spilled bird feed from around the base of any bird feeder.</li> </ul>   |
| <b>Pet and Livestock Food</b>                         | <ul style="list-style-type: none"> <li>• Store these items indoors or in some other secure outbuilding or bear-proof container.</li> <li>• Feed household pets inside.</li> <li>• If feed outside, removed leftover food immediately.</li> </ul>  |
| <b>Human Food</b>                                     | <ul style="list-style-type: none"> <li>• Store human food indoors or in a secure outbuilding.</li> </ul>  |

|  |   |
|--|---|
| <b>Compost</b>                                   | <ul style="list-style-type: none"> <li>• Discourage composting at people’s homes and acreages.</li> <li>• Exclude kitchen waste from individual composts.</li> <li>• Erect bear-proof electric fencing to deter bears from accessing the compost.</li> <li>• Establish a bear-proof community compost.</li> </ul>                                       |
| <b>Livestock (including Bee Hives)</b>           | <ul style="list-style-type: none"> <li>• Discourage residents from keeping bees and small livestock e.g. sheep, llamas, donkeys etc. on their acreages.</li> <li>• Enclose smaller livestock and apiaries in bear-proof electric fencing.</li> <li>• Use Guard dogs bred for protecting livestock to deter bears and other large carnivores.</li> </ul> |
| <b>Barbeques</b>                                 | <ul style="list-style-type: none"> <li>• Keep barbeques clean and store them indoors.</li> <li>• If stored outdoors, use a grease track and keep them as clean as possible.</li> </ul>  |
| <b>Vegetable Gardens</b>                         | <ul style="list-style-type: none"> <li>• Encourage the use of bear-proof electric fence or other means to keep bears (and other wildlife) away from vegetable gardens.</li> </ul>   |
| <b>Fruit Trees, shrubs and ornamental plants</b> | <ul style="list-style-type: none"> <li>• Discourage the use of fruit-bearing trees and shrubs in landscaping and ornamental gardens.</li> <li>• Encourage the replacement of fruit-bearing plants with other non-fruit bearing species.</li> <li>• Remove ripened and fallen fruit promptly.</li> </ul>   |
| <b>Commercial Fruit Stands</b>                   | <ul style="list-style-type: none"> <li>• Encourage commercial fruit operators to dispose of waste, such as rotten fruit, in a bear-proof manner either on-site in a bear-proof container or off-site at a municipal facility.</li> </ul>  |

**Option 2.** Use of community bear-proof (animal-proof) waste containers in area communities.

Neighbourhood animal-proof waste containers have been used in the Town of Canmore since 1996. Prior to this date, the Town provided its residents with a traditional curb-side waste collection program. In the fall of 1996, a dual system for handling waste was initially applied that included both curbside collection and neighbourhood animal-proof waste containers. There was some initial concern on the part of municipal councillors that Canmore residents would resist the use of the neighbourhood bins. However, the initial trial period revealed that residents found the neighbourhood bins more convenient as they were free to dispose of their household waste at any time. Now there are approximately 200 animal-proof waste containers located in neighbourhoods throughout Canmore (T. Holmes pers. comm. 2008). There is general consensus that this approach has proven effective in

restricting bear access to residential waste temporarily stored in Canmore neighbourhoods (Honeyman 2007, J.Jorgenson pers. comm. 2008, A. Comeau, Solid Waste Services pers. comm.2008). A bear hazard assessment prepared in the Bow Valley in 2007 confirmed that the bins have dramatically reduced the number of waste-related bear incidents in Canmore (Honeyman 2007).

Based on Canmore’s experience, the implementation of a neighbourhood bear-proof waste container system in Greater Bragg Creek, including Redwood Meadows (which currently uses a curb-side pick-up approach to handling waste) is an effective approach to municipal garbage management. Aside from reducing bear conflicts, this type of system will deter other animals such as birds, coyotes and dogs. This system has a significant up front cost to the community, though there are cost benefits associated with implementing such a system once the initial capital costs are realized (Phillips 2000 as quoted in

Davis et al 2002, Town of Canmore, no date). The replacement of curb-side collection using dumpsters that are emptied with a self-loading truck (a one-operator system) is one of the main cost-savings in switching to this system (Phillips 2000 as quoted in Davis et al 2002).

The second step in implementing a bear-proof solid waste management system is to identify an appropriate way of transferring waste from the community to a designated disposal site outside of bear range. The neighbourhood waste container approach inherently provides for the transfer of waste from the community to an off-site disposal facility. Alternatively, if a neighbourhood container system is not implemented, residents may continue to deliver their garbage to the Bragg Creek waste transfer station.

In 2007, it was confirmed that bears had been able to break into the existing solid waste and recycling containers used at the facility. Since then, upgrades were made to the station by repairing the fence and upgrading the bins so that solid metal lids now can be closed over the top of the bins. These replaced the metal grate lids that bears were able to break through. The site is also now enclosed by a 6 ft. chain link fence with a 3 strand barbed wire-overhang on top. Bear-proof electric fencing would go further to ensure the site is most secure. We also recommend that the current on-site waste and recycling storage containers be evaluated to ensure they are “animal-proof”. Information on animal-proof containers may be accessed from the Town of Canmore.

<http://canmore.ca/town-of-canmore-bylaws/472-waste-control-bylaw-09-2001-consolidated-2016/file>).

The Town has engineering guidelines that define an animal-proof waste container as “a receptacle for disposing of residential waste or commercial waste

constructed of metal and designed to be collected by automated means and which meets the specifications for Animal Proof” (Town of Canmore 2005). The specifications for being animal proof are extensive and include features such as self-closing doors and covered stainless steel gravity latch system that prohibit entry of an animal claw from reaching the latch trigger mechanism. The Town uses the Haul-All Equipment container system manufactured in Lethbridge because of its proven track record within the national parks, its aesthetic appearance, ergonomic access doors, and 20 year (min.) life expectancy (Town of Canmore 2005).

Upgrades would also be required to ensure that bears are not able to enter the station via the access gate. Currently there is a gap under the gate that would allow a bear to crawl under. Overall, further evaluation is recommended to identify the most appropriate design changes required to deter bears from entering the station. Mitigations applied in other jurisdictions, such as the Towns of Whistler and Revelstoke in British Columbia, Banff National Park and communities in the Bow Valley, should be reviewed to identify design criteria appropriate for the transfer station in Bragg Creek.

The third step in implementing a bear-proof solid waste management system in Greater Bragg Creek is to address the management of commercial and other waste generated within Greater Bragg Creek. Since 1999, 7 black bears have been captured and relocated while an additional 4 bears (sow plus 3 cubs) have been euthanized following conflicts with garbage from commercial operations that were using non-bear proof commercial bins similar to those shown in Figure 8. We recommend that, as with the Town of Canmore, all commercial outlets be required to use animal-proof waste containers for commercial waste that includes restaurant grease and recycling

materials. As well, any waste containers supplied in places like Banded Peak School and area parks and playgrounds should also be bear-proof.

Aside from residential and commercial waste, there are a number of other attractants associated with human-bear conflicts in Greater Bragg Creek (Table 5). Recommendations for managing these other attractants primarily include attractant removal or secure storage using bear-proof containers. It is recommended that residents not feed birds in the summer months when bears may access feeders (Apr 1 to Oct 31). For compost, it may be useful to implement a bear-proof community compost centre. The centre would provide area residents the opportunity to reduce the amount of organic material being disposed of as waste while generating compost for community applications.

We also provide specific recommendations for the former fruit stand in the Hamlet in Bragg Creek. This stand experienced repeated bear incidents in the past and we recommend that any waste generated from such an enterprise be stored in on-site bear-proof containers or removed and disposed of regularly at an off-site facility. Currently this fruit stand has not been in operation for the last several years and it is unknown whether it may reopen in the future.

## **6.2 Municipal Bylaws**

The challenge to implementing attractant management initiatives is to achieve a high level of compliance on the part of community residents. Building public awareness of the causes of human-bear conflicts is a critical element of any initiative to restrict bear access to attractants and below we make recommendations for the design of a public bear education and awareness program to achieve this

goal. In addition to such a program, we recommend municipal bylaws be implemented to ensure the highest level of compliance with bear attractant management measures.

As indicated previously, the Town of Canmore has implemented a Waste Control Bylaw that addresses the effective management of community bear attractants. Similar bylaws have been implemented in numerous communities in British Columbia, including Revelstoke, Whistler, Prince George, and North Vancouver. Canmore's Waste Control Bylaw includes restrictions for animal attractants from residential and commercial waste ("foodstuff") to bird feed (includes hummingbird feeders), compost or kitchen organic waste, and recycling.

As per the bylaw, residents are required to use the neighbourhood animal-proof waste containers provided by the Town, while commercial premises are required to use such containers when contracting out their waste handling. Those who contravene any bylaw provisions are subject to fines. Bear incidents in Canmore involving garbage and bird seed in particular have shown a marked decrease overall since the Town bylaw has been in place (Honeyman 2007).

Within the study area, only the Townsite of Redwood Meadows has community waste management bylaws and a land use development regulation specific to their curb-side waste handling system that is intended to address animal conflicts related to garbage and bird seed. These bylaws require that residents set out their garbage no earlier than 7 am on the day of pick-up and that garbage containers be animal-proof. Unfortunately, most containers used by residents are not bear-proof. If a curb side garbage management system is to continue, it would be of value to include in the Townsite's bylaw specifications as to what

constitutes an animal-proof container, and to assess how best to encourage a significantly greater use of bear-proof containers by area residents.

Current enforcement of the Redwood Meadow's bylaw is restricted to officers appointed by the Townsite Council. Enforcement of the bylaws would be enhanced if authority was granted to Fish & Wildlife Officers.

### 6.3 Public Education and Awareness

Compliance with mitigations to eliminate bear attractants can be significantly increased with the implementation of effective strategies for building community education and awareness of bears and bear conflicts. The former Bragg Creek BearSmart Community Program provided a community bear education program that included a number of initiatives:

- Articles in the local paper on bears, attractants, and conservation.
- Distribution of BearSmart posters and brochures.
- BearSmart information displayed at local community events such as Bragg Creek Days and area farmers markets.
- A phone-in service provided to area residents calling in recent bear sightings.
- Email notices distributed regarding current bear sightings information.
- Presentations made to area residents on bears, attractants, and conservation.
- Human-bear conflict awareness messaging displayed on a prominent local bill board.
- Neighbourhood canvassing completed to build awareness in areas with recent human-bear conflicts.
- Television news reports on local human-bear conflict situations.

The Bragg Creek BearSmart program lost momentum after 2008 became mostly inactive. A revitalized program has recently been formed out of Redwood Meadow's *Sustainable Redwood* organization and is in the process of obtaining charitable status. Such programs are vital in the delivery of appropriate messaging to achieve education and awareness objectives with the goal of making Greater Bragg Creek safer for people and bears. Objectives for the Program should include:

1. developing a greater understanding of bears, their ecology and behaviour;
2. developing guidelines for residents to promote wariness in bears;
3. providing recommendation for what to do in a bear encounter;
4. facilitating support from local residents for bear-proofing the community; and
5. developing guidelines for residents to reduce bear attractants and help them deter bears from their homes and acreages.

Such a program should be developed that would reach different target audiences e.g. existing and new home owners, commercial operators, recreationists, students at Banded Peak School, and summer kid's camps, with specific information and materials related to their land use activities. Program delivery should be scheduled to target peak times of the year as identified in this hazard assessment when bear conflicts are most likely to occur and to prioritize deliver in communities where conflicts are high. We also recommend a cooperative effort involving multiple community stakeholders, including the Rocky View County, area businesses, the Province, and community residents to secure funding for long-term program implementation.

The Town of Redwood Meadows currently applies various strategies for distributing community information, including information on bears. Their communication strategy includes the distribution of “living with wildlife” pamphlets to new home owners and the posting of regular notices when bears are seen within the community. Redwood Meadows also employs an effective communication messaging system that can automatically send out electronic notices to all residents via email and phone. Only weakness is that not all residents have chosen to register their contact information with townsite administration. Notices only go to those that choose to register. Such a system should be considered for the Hamlet of Bragg Creek and other West Bragg Creek communities.

#### **6.4 Other Potential Bear Hazards**

With reference to bear hazard assessments prepared for other communities, we identified a number of other potential bear hazards within Greater Bragg Creek. We considered any place where there are groups of children playing outdoors and in natural or landscaped areas at risk of conflicts with bears. Banded Peak school and its associated playing fields are considered a potential high risk area. The school has, however, taken this into consideration and has applied mitigation measures that include bear-proof bins and a warning system in the event that a bear or other wildlife is seen traveling through school grounds. Students know that, if a whistle blows, they are to return immediately to the school. The school also has extensive fencing to deter wildlife from traveling in close proximity to the school. We recommend the school grounds be evaluated to determine whether any additional measures can be taken to reduce their bear conflict risk.

Kid’s camps in Greater Bragg Creek should also be evaluated to identify mitigations measures to reduce bear conflict risk. Incidental observations made of kid’s camps in the area have identified unsecured attractants, namely garbage, as a key potential bear hazard. As well, there may be challenges from a bear safety perspective associated with how these camps manage food storage and how they set up kid’s dormitories. Playgrounds in Bragg Creek and Redwood Meadows are also subject to potential bear hazards. Overall, we recommend that these areas be targeted as part of the bear education programming proposed for Greater Bragg Creek.

There may also be bear hazards associated with existing and proposed pathways within Greater Bragg Creek. Pathways developed through high quality bear habitat leave people at risk of encountering bears. Equally, pathways that are narrow with sharp bends and dips afford poor visibility and may further increase the chance of bear-people encounters. An evaluation of existing and proposed pathways is warranted to determine whether they travel through or feed in any areas considered high risk for encountering bears.

As indicated previously, there are areas of Greater Bragg Creek that may have indirectly experienced a degree of bear habitat enhancement. Site clearing and the cultivation of lush green vegetation may have enhanced local habitat conditions at area golf courses. Clearing associated with the ski resort at Wintergreen may have also resulted in such local habitat enhancements. We recommend that bear use of these areas be monitored to gauge whether they are associated with heightened bear activity and, therefore, an increased risk of bear conflict.

## 6.5 Future Community Development

Rocky View County anticipates significant population growth in Bragg Creek over the next 20 to 30 years (MD of Rocky View 2007). Growth is expected within the Hamlet as well as country residential areas outside the Hamlet. Substantial portions of the area are designated for new or infill residential development. Human-bear conflicts are expected to increase as the human population of Greater Bragg Creek grows.

To be proactive in reducing this conflict risk, we recommend that bear safety measures be identified at the time a development application is submitted to the MD. Recommended measures should include an effective approach to managing bear attractants in new communities, in particular household waste. Alternatively, developers of new residential areas should provide confirmation of adherence to municipal waste and/or attractant bylaws, as described above. The MD may also consider requiring that developers of new residential areas install neighbourhood bear-proof waste containers within these new communities and incorporate non bear attractant vegetation in any landscaping plans. The use of fruit bearing trees in landscaping should be discouraged. .

Careful consideration should also be taken when planning community green space. Green space can provide cover and enhance opportunities for bears to approach developed areas and access unnatural food sources. However, it can also provide natural feeding habitat as well as travel corridors for bears and other wildlife to by-pass area communities. We recommend that any green space designated for high human use, such as playgrounds, be developed to reduce natural food availability and increase visibility so people using it are not likely to

encounter bears. Green space designated for natural areas should also be included in development plans and should be designed in such a way as to encourage bears and other wildlife to move past rather than through the community.

Land use planning initiatives in general are likely to have an influence on bears, how they use the landscape, and how they interact with people. A review of existing planning and policy documents for the region would provide insight into any challenges associated with pro-actively managing for the safety of people and bears in the region.

## 6.6 Dealing with Problem Bears

The management of bears and human-bear conflicts represents a significant challenge in areas like Greater Bragg Creek where there is a history of bears interacting with and becoming habituated to people, while also becoming conditioned to human sources of food. When faced with concerns over human safety, the options for managing bears that are human-habituated or human-food conditioned are limited and have traditionally involved the relocation or destruction of bears.

Alternatives to these traditional techniques are being explored that involve teaching bears to avoid people and developed areas through an approach called “bear aversive conditioning”. Aversive conditioning has been applied in Kananaskis Country and the Bow Valley for a number of years using highly trained dogs in an approach call “bear shepherding”. This approach uses Karelian bear dogs in combination with other tools such as red pepper spray, rubber bullets and on-site releases to modify bear behaviour so that problem bears do not need to be relocated or destroyed (Wind River Bear Institute, 2008). A similar aversive conditioning program is being

implemented in Whistler, BC where personnel are also experimenting with taste aversion: teaching bears to avoid unpalatable food attractants (Dolson pers. comm. 2008).

Fish and Wildlife Officers in Greater Bragg Creek occasionally apply similar aversion techniques in the management of certain local bears albeit in an unstructured, ad hoc manner. However, the implementation of a program similar to that applied in the Bow Valley or Whistler would be somewhat labour intensive and would require additional support from trained personnel. Clearly the most effective means of reducing the human-bear conflicts in Greater Bragg Creek is to eliminate bear attractants. However, it would be of value to continue exploring the further application of these alternative bear management practices. Having multiple management options, including attractant management, public education programs and bear shepherding will increase the effectiveness of a community's overall bear management program.

## **6.7 Monitoring Human-Bear Conflicts**

A monitoring strategy should be developed that identifies tangible ways to measure the effectiveness of prescribed mitigations and allow for the development of new mitigations in response to unanticipated sources of bear conflict. Sources of data for monitoring include:

- the existing Fish and Wildlife occurrence database;
- a community bear sightings database;
- GIS maps of bear sightings and human-bear conflict incidences;
- bear-awareness surveys completed prior to and after bear management measures are implemented; and

- a regularly up-dated data inventory of bear attractant sources in the community.

Measurables that can be used to gauge the positive effects of human-bear conflict management measures may include:

- a trend towards a decrease in the presence of non-natural foods available to bears;
- a decrease in the number of human-bear conflicts reported to Fish and Wildlife enforcement services;
- a decrease in the number of bears destroyed through “problem” bear management initiatives;
- a decrease in the number of bears translocated from the Bragg Creek area;
- a decrease in property damage; and
- a decrease in resources expended in managing human-bear conflicts.

A system for reporting the results of human-bear conflicts monitoring on an annual basis would play a vital role in establishing the direction of bear conflict management efforts in Greater Bragg Creek over the long-term. Additionally, mitigation measures employed by the GOA to address conflicts e.g. bear proof bin loaner program, electric fence loaner program, cargo container program need a more effective process for determining the effectiveness of these programs. Currently there is no systematic approach to gathering and storing data associated with these efforts.

## **6.8 Data Gaps**

This bear hazard assessment and the earlier 2010 assessment provides an overview of existing conditions with respect to bear habitat, human land use, and human-bear conflicts in Greater Bragg Creek. Information on bear habitat quality and

abundance was derived from HSI models prepared for the broader area. However, these models are not considered suitable for use in evaluating local site-specific habitat conditions. Such site-specific information may be required if further evaluation is needed to compare the relative bear conflict risk between Greater Bragg Creek communities. It may also be required to evaluate bear habitat conditions, movement areas and overall bear conflict risk in areas proposed for future residential development.

Detailed information was available to describe most human land use infrastructure activities within the region. However, there is limited information available on recreational activities, especially those that may take place in natural areas surrounding residential developments. It is in these areas where the potential for human-bear encounters is

substantial. Information on the informal use of natural areas will likely be difficult to obtain without regular input from residents reporting their bear sightings and encounters. A review of available data on bear sightings and encounters in West Bragg Creek, just west of the study area in Kananaskis Country, may provide some insight into the number of human-bear encounters taking place in natural areas as well as the bear conflict risk associated with recreating in these areas.

## CONCLUSION AND NEXT STEPS

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The two bear hazard assessments now completed for the Greater Bragg Creek provide important documentation on bear conflicts and facilitates the prioritization of mitigation efforts to reduce conflicts. This more recent review of bear conflicts occurring over the last 7 years since the initial assessment indicates that public safety related conflicts are still occurring and the source of the majority of those conflicts are still related to unsecured attractants. To make progress in the evolution of the Bragg Creek area towards a bearsmart community efforts are needed to effectively manage attractants.

Overall, data is available now on bear conflicts that cover the last 17 years. This data indicates that the amount of conflict in Greater Bragg Creek between people and bears has been substantial and is not likely to decrease without efforts by communities to manage the source of these conflicts. Both black and grizzly bears will continue to occupy habitat within the study area and interactions with people will continue. The key is to minimize the number and duration of those interactions by not giving bears any reason to hang around human residences. These assessments provides options for measures to manage conflicts.

Key management recommendations focus on eliminating bear access to unsecured attractants, in particular household waste. Overall, these assessments provides the basis from which to develop and implement sound management actions that will make the community safer for residents while also supporting the conservation of bears. The next step will be to invite community stakeholders to provide their input on options for managing local sources of conflict.

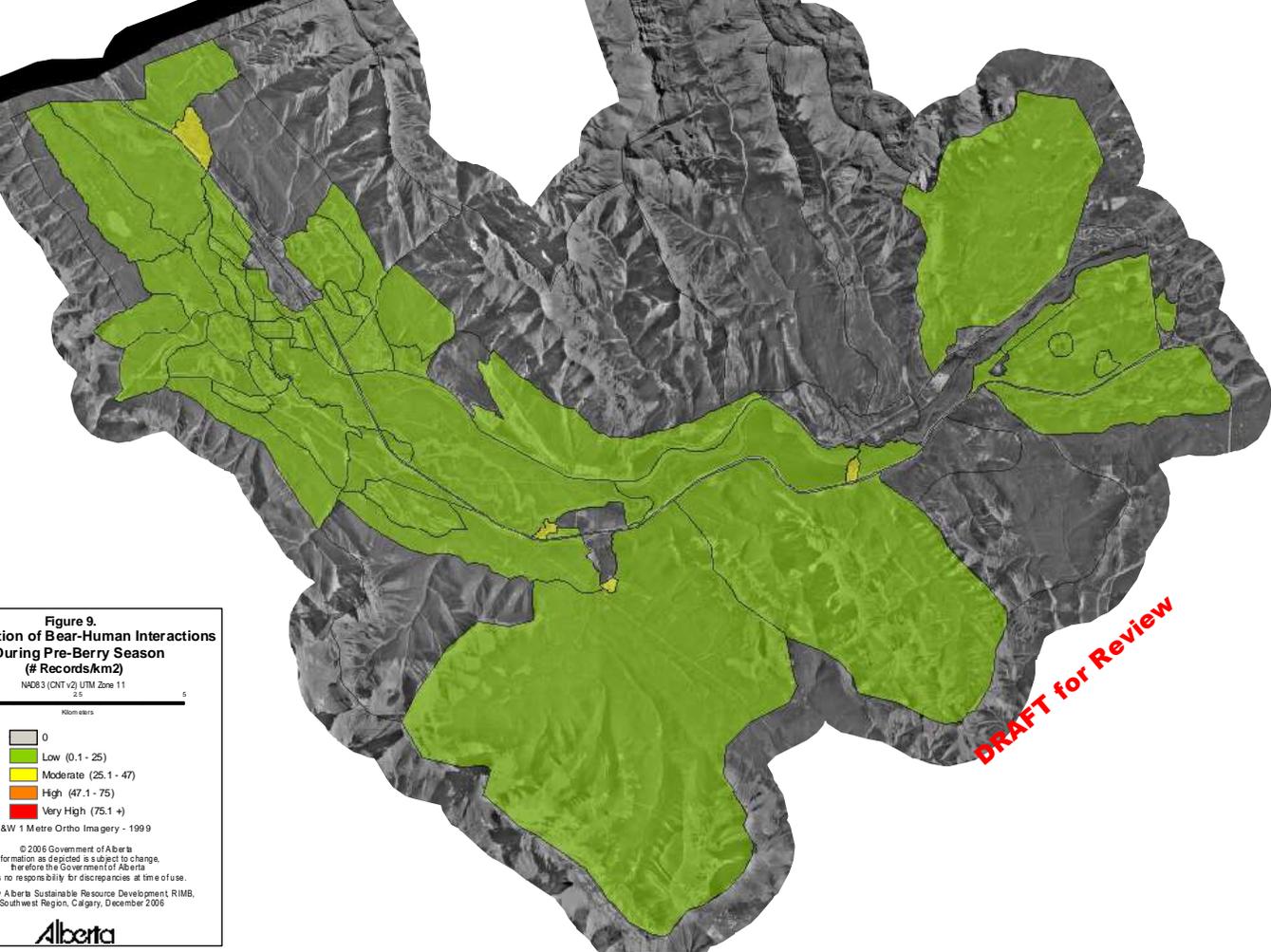
Presentation of the hazard assessment results in public community forums as well as in separate meetings with key community stakeholders should be conducted. At these presentations, community members and leaders will be given the opportunity to share their comments and concerns with respect to the assessment results and human-bear conflicts in general. It is hoped that the public forums and stakeholder meetings will provide valuable information on human-bear conflict management options that would work best for the region. Community feedback can then be applied in the development of an effective Bear -Human Conflicts Management Plan for the area.

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