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Preliminary Bear Hazard Assessment of the Municipality of the Crowsnest Pass April 2006

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Introduction

As the urban and rural footprint and associated human activity in Alberta continues to increase so does the potential for human-bear interactions and conflicts. Alberta Sustainable Resource Development (ASRD) has recently developed the Alberta Bear-Smart Program (ABSP) as a province wide initiative with the goal of reducing human bear conflicts. The premise of this program includes a shift from traditional reactive wildlife management where problem bears are relocated and/or destroyed to a more proactive approach that addresses the attractants that lure bears into a community and identifies strategies for reducing human bear conflicts. The successful management of human bear conflicts will benefit from a multi-pronged approach where education, policy and enforcement issues are addressed. The ABSP requires engagement and coordination between local citizens, the business community, industry, and municipal and provincial governments. The potential benefits of a successfully implemented ABSP include increased human safety, reduced bear mortalities and relocations and enhanced habitat security for bears.

Bear Smart programs have been adopted and implemented in national and provincial parks across Canada. Bear Smart Community Programs were initiated in British Columbia by the Ministry of Water, Land and Air Protection (MWLAP) in 2002. The Bear Smart Program is a community driven process that is usually conducted in two phases. In the first phase the sources of conflict between humans and bears are identified and in phase two a human-bear management plan is produced and implemented. In B.C. there are many communities that are currently working towards implementing Bear Smart programs including Revelstoke and Whistler.

To initiate this program in Alberta, ABSP is launching a pilot project in the Municipality of Crowsnest Pass in southwestern Alberta. As a first step in this initiative, ASRD hired the Miistakis Institute to conduct a Preliminary Bear Hazard Assessment. The goal of the assessment is to identify sources of human and bear conflict in the Crowsnest Pass. The assessment provides a general overview of community specific attractants (natural and un-natural) and practices that contribute to human bear conflict. It also provides direction of initial steps for the community to become "bear smart" as well as identifying important information gaps.

Study Area

The Municipality of Crowsnest Pass (MCP) is situated in a 32 km long corridor bisecting the Rocky Mountains in southwestern Alberta and southwestern British Columbia. Elevation of the municipality ranges from 1,113 m at the valley bottom to 2,804 m at the mountain peaks. The region is characterized by a rapid ecological transition from the prairies to the alpine. This compressed environmental gradient and influence of warm Chinook winds result in a rich diversity of flora and fauna. A full complement of large carnivores and ungulates can be found in this region including grizzly bears (*Ursus arctos*), black bears (*Ursus americanus*), bobcats (*Lynx rufus*), lynx (*Lynx canadensis*), cougars (*Puma concolor*), coyotes (*Canis latrans*), wolves (*Canis lupus*), wolverine (*Gulo gulo*), elk (*Cervus elaphus*), mountain goats (*Oreamnos americanus*), moose (*Alces alces*), mule deer (*Odocoileus hemionus)*, white-tailed deer (*Odocoileus verginianus*), and Rocky Mountain bighorn sheep (*Ovis canadensis*).

Bear occurrences in the MCP are influenced by human settlement and human activity which occurs primarily along the valley bottom adjacent to the Crowsnest River. Highway 3, which runs the length of the municipality, is a major transportation route supporting over 6,000 vehicles per day (Alberta Transportation and Infrastructure 2005). There is also a national railway line running parallel to Highway 3 that supports an average of eight trains per day. There are five principal settlements connected by Highway 3 including, Coleman, Blairmore, Frank, Hillcrest and Bellevue. Additionally, group country residential subdivisions are occurring outside of the principal settlement footprint. Some of the new subdivisions occur north of Frank, at McGillivary Creek, east of Blairmore and at the end of the Tecumseh road. The population in MCP has fluctuated over the past 70 years between 6000-9000 and is currently at the lower end of this range (Oldman River Intermunicipal Service Agency, 2001). Additionally, the Pass is an important recreational area for southwestern Alberta residents. Recreational activities include camping, fishing, hiking, recreational vehicle use and hunting.

The areas to the north and south of the MCP are predominately public Forest Reserve that provide important bear habitat. In addition to habitat, the Crownest Pass provides an important linkage area for large carnivores including bears as it connects the protected area complexes of Waterton/Glacier in the south with Kananaskis/Banff in the north. The Pass also provides a rare east west linkage through the Rocky Mountains. This linkage is important for ensuring regional connectivity of large mammals. Due to the location of the Pass within the Rocky Mountains, the linear nature of settlement and the associated human activity, there are a high number of bear human conflicts in the MCP. ASRD, Fish and Wildlife Division, has logged a total of 1500 enforcement hours responding to human bear conflict calls over the previous five years. Of 330 reported calls, enforcement officers have spent an average of 4.5 hours responding to each call. This represents a significant allotment of staff resources being spent predominately on

reactive bear management. Reactive management does little to reduce the frequency and intensity of problem bears. Therefore, understanding the sources of the conflict in the MCP and working to alleviate them is a necessary step in achieving a Bear Smart community.

Methods

To conduct the Preliminary Bear Hazard Assessment we adopted the approach outlined by Davis et al. (2002). We also used methods detailed in an existing bear hazard assessment for the Resort Municipality of Whistler, British Columbia (McCory 2004). Our approach included the following components;

- Review historic human-bear conflicts based on wildlife occurrence reports;
- identification of sites, trails and practices considered high risk for human-bear conflict;
- identification of natural and non-natural bear attractants;
- identification of bear habitat suitability adjacent and surrounding the community;
- identification of human bear issues occurring outside of the region that may impact the effectiveness of Bear Smart; and
- identification of future initiatives that may increase human-bear conflict;
- review current bear aware initiatives in the MCP.

Other bear hazard assessments have varied in intensity and level of detail and have used a combination of qualitative and quantitative techniques (Maltby 2000, Wellwood 2001). Our methods relied on existing data sources and a local expert workshop. The majority of information used in this report was obtained during a one day workshop (March 22 2006) with local experts including ASRD, Fish and Wildlife Division staff and local wildlife biologists. At this workshop, participants where guided through a series of maps of the MCP and asked to address the different components highlighted above. Additionally, we undertook a quantitative assessment of ASRD, Fish and Wildlife Division Enforcement Officer Occurrence records that involved human bear conflicts. Other information was obtained from existing data sources, such as grizzly bear modeling efforts by provincial biologists and university researchers.

Historic Bear Conflicts

ASRD has used two major databases for storing enforcement related occurrences, AIRS and ENFOR. AIRS, a historic database, was used from 1982 to 1995. AIRS was replaced by ENFOR in1999. In this hazard assessment we reviewed ENFOR records that were located within five kilometers of the Municipality of the Crowsnest Pass.

There were a number of significant issues related to using the ENFOR database. ENFOR does not include database fields that specifically address attractants; we therefore extracted attractant information from the database using details from each occurrence record. In some cases the details were considerably vague. For example, in the case of distinguishing natural from cultivated vegetation, we assumed that if the attractant was near a residential area it was cultivated, otherwise it was recorded as natural.

Accurate spatial representation of ENFOR data is hampered by the generality of the location descriptions used for each record (i.e. in most cases only legal land descriptions are provided). Therefore as a first step in spatially representing the bear occurrence data we determine the accuracy of each record. By querying the points in relation to the centroids of townships, sections and quarter sections it was possible to determine a base accuracy of each point. Any point that was not in close proximity to a centroid was determined to be more accurate. Furthermore a list of all records with identified attractants was provided to Fish and Wildlife whom used a GPS unit to provide an accurate location for each record. In the future spatial accuracy will be greatly improved as Fish and Wildlife now use GPS units to more accurately position their enforcement records.

Sites of Potential Risk

Sites of potential risk were mapped as part of the expert opinion workshop. Campgrounds, playgrounds, school yards, event grounds, and the golf course were mapped as accurately as possible using an air photo base map (1 meter resolution) with features overlaid including roads, hydrology, and landmarks. Each location was then reviewed for its potential for human-bear conflicts by identifying attractants, such as fruit trees, garbage, and distance to bear habitat or important movement areas.

A limitation of this assessment is that recreational trails were not discussed in detail at the expert workshop. We were not able to provide accurate spatial information regarding trails. The only available digital trail information is owned by a commercial enterprise. The Southwest Alberta Business Development Institute provided information from the SW Alberta Adventure map. Trails from this map were on-screen digitized from a PDF file. These trails are not accurate and have been included only as a point of reference.

Natural Attractants

At the expert opinion workshop participants mapped the main natural attractants within the MCP. These predominately included natural vegetation such as berry patches that occur throughout the Pass.

Non-Natural Attractants

At the expert opinion workshop participants mapped the main non-natural attractants within the MCP. These included garbage dumps, areas with a high concentration of fruit

trees and agricultural lands. As part of this component, garbage handling bylaws were investigated through conversations with the Municipality.

BEAR MOVEMENT AND TRAVEL BARRIERS

An existing data source, developed by local wildlife biologists and ASRD Fish and Wildlife staff was used to identify general wildlife movement areas across Highway 3. This data source identified six core movement areas. This was used as a starting point in the workshop to refine bear movement areas and discuss natural and un-natural barriers to movement.

BEAR HABITAT

We addressed existing bear habitat models in this Bear Hazard Assessment. We did not however include a spatial assessment of high risk areas using existing habitat models. While there are a number of modeling efforts that may be useful for a more in-depth assessments of high risk habitat, most apply to grizzly bears and are broad in scale and not appropriate for the Municipality of the Crowsnest Pass. In this report we used a resource selection function model created by Scott Neilson with the University of Alberta in conjunction with the Foothills Model Forest for reference purposes.

Results and Discussion

Historic Bear Conflicts

The ENFOR database included 333 bear occurrence records for the MCP collected between 1999 and 2005. Black bears constituted 79% of historic occurrences with 263 of the 333 records. The occurrence records were categorized into the following attractants, with garbage being further broken down into a separate table:

Attractant	Occurrences
Garbage Total	63 (17.1%)
Ornamental Plants	61 (16.6%)
Bird Feeding	18 (4.9%)
Livestock	13 (3.5%)
Natural	13 (3.5%)
Other Feeding	8 (2.2%)
Campsites	7 (1.9%)
Pet Food	5 (1.4%)
Carcass	5 (1.4%)
Golf Course Vegetation	4 (1.15)
Human Food	3 (> 1%)
BBQ	2 (> 1%)
Road kill	1 (> 1%)
Apiaries	0 (0)
Other	10 (2.75%)
Unknown	155 (42%)

Attractant	Occurrences
Garbage (not specified)	22 (34.9%)
Residential Garbage	34 (53.9%)
Commercial Garbage	4 (6.35%)
Compost	3 (4.8%)
Recycling	0 (0)

Of the 368 occurrence records assessed in this analysis the majority of records are recorded as unknown (42%). The unknown category includes bear sightings where an attractant was not necessarily established. The two main attractants include garbage and ornamental plants which represent 70% of the total occurrences with known attractants. Of the garbage occurrences, residential garbage represents over 50% of the records. Map 1a displays the distribution of garbage and ornamental plant occurrence records throughout the valley and a breakdown of known attractant occurrences by quarter section. Map 1b is a visual display of known attractant occurrences by quarter section. Maps 3, 4 and 5 display the distribution of garbage and ornamental plant occurrence records for each community. These maps do not include bear sightings and unknown attractant occurrences.

Fish and Wildlife Enforcement Officers respond to all human bear complaints, the responses that impacted bears are presented in the following table.

Action Taken	Occurrences	Bears
Animal Killed	9	13 (16%)
Animal Scared	21	35 (42%)
Animal Relocated	24	33 (40%)
Closed Area	2	2 (2%)

In several instances an occurrence record involved more than one bear and therefore the number of bears involved out numbers the occurrence reports. The predominant management actions taken include aversive conditioning (42%) and relocation (40%). For more information on the process of bear management undertaken by Fish and Wildlife refer to ASRD Bear Matrix Protocols.

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Trails

Recreational trails can be a potential bear hazard as they tend to funnel human traffic from settlements into the surrounding green areas along valley bottoms and riparian areas that are frequented by bears. For this assessment trails were not assessed in detail (i.e. specific points along trails associated with prime bear habitat) and therefore should be readdressed in the future. During the workshop, participants identified a number of trails that have a high level of human activity, these included, Fireman's Pass, east Hillcrest to the Hillcrest bridge, Sarots Road, Miners Path, York Creek and the trail between Blairmore and Coleman. They also mentioned that there are a number of trails running parallel to the Crowsnest River that are frequented by fisherman.

Map 2 displays the trails in the Crowsnest Pass. As there are no detailed spatial layers representing trails in the Crowsnest Pass, the data on the map was approximated and should be treated as such.

Golf Course

Golf courses are particularly lush and provide a desirable food source for bears. These areas become especially attractive to bears in the spring when grasses on golf courses are available before other food sources. Further, the fragmentation caused by fairways

promotes growth of plants including Saskatoon berries along its perimeters which are also attractive for bears.

There is one golf course in the Pass, located on the north side of Blairmore. There were 4 occurrence records in ENFOR related to the golf course.

Playgrounds and Schoolyards

Many play grounds and school yards in the Pass are a potential bear hazard due to the availability of grasses and other food sources including fruit trees. Many are adjacent to forested areas that provide security cover for bear movement. Fencing has been put in place largely to keep children off the streets with the sides bordering green space largely left unfenced. At many of these sites, attractants, such as fruit trees and garbage bins are located in or adjacent to the sites. These areas have the potential to be problematic because once bears enter the fenced areas it is difficult to remove them. This situation can be particularly dangerous as small children frequent these areas.

The following is a list of play grounds and school yards along with the concerns associated with each as described by participants of the expert workshop. These can be viewed on Maps 3, 4 and 5 with the corresponding map code.

Map Code	Name	Occurrences	Near Cover	Fenced	Attractants	Near Travel Corridor	Notes
S1	MDM	Occasional		No			
S2	ISS	Occasional	Yes	Partial			
S3	Crowsnest Consolidated High School	Seldom	No				
S4	Horace Allan School		Yes		Apple trees	Yes	
P1			Yes	Yes	Apple trees	Yes	Along Drum Creek
P2			Yes	Partial			Adjacent to thick cover
P3a	Frank Playground						
P3b	Snake Park	Common	Yes	Partial	Fruit trees and garbage		
P4		Seldom	No	Yes	Garbage and Grease Bin		Near KFC

P5a	Fireman's Park	Common	Yes	No	Berries	Yes	Adjacent vegetation is thick
P5b		Common	No	Partial	Fruit Trees	Yes	
P6		Common	Yes		Fruit Trees and berries		Thick Cover
P7		Occasional	No		Apple Trees		Apple trees nearby
P8	Phlumerfelt		Yes	No			Hiking Path
P9	Pine View	Rare		Yes			
P10		Occasional	No	Yes	Fruit Trees		
P11	Cameron School	Rare					

Bus Stops

Workshop participants suggested that bus stops should be examined as potential high risk areas. There is concern that some bus stops are located in close proximity to bear attractants or close to vegetated areas that could be used by bears for feeding or to move through the area. With children waiting at a bus stop in the early morning hours when bears are active, this is a potential hazard that needs to be examined in more detail.

As far as can be determined there is no spatial dataset that document the bus stops in the Pass. The school board does however maintain an address list of bus stops. Evaluating these bus stops for potential hazard as well as referencing their locations would be required for further review of this potential conflict area.

Event Grounds

The only event ground noted in the Crowsnest Pass was the rodeo grounds, located west of Bellevue. Aside from general garbage issues, this area has not historically been a problem.

The largest public event in the Pass is Thunder in the Valley which takes place in July in Blairmore. Historically, the amount of garbage generated and disposed improperly has been a significant issue. Additionally, waste bins, dumpsters and portable toilets have not been promptly emptied or removed in a timely manner.

Campgrounds and Day Use Areas

There are a number of commercial and public campgrounds and day use areas located within the Crowsnest Pass. Random camping and day use is occurring to some extent along the Crowsnest River throughout the Pass. Campgrounds and day use areas pose a number of potential bear hazard risks as they are often positioned in or adjacent to, riparian areas which are being used as movement corridors for bears. They also provide

a number of non-natural attractant issues including garbage, poorly stored food, and cooking residue.

These locations are displayed on Map 2. Sites of particular interest for past bear conflicts include the Scout Camp, random camping southeast of Emerald Lake, the Bible Camp, Tecumseh Guest Ranch and Lost Lemon Campground. Lost Lemon Campground is also located in a natural travel area where two creeks come together.

NATURAL ATTRACTANTS

Natural attractants can be found throughout the valley in the abundant green spaces surrounding the communities. The predominant natural attractants are:

- Saskatoon (Amelanchier alnifolia)
- Chokecherry (Prunus virginiana)
- Raspberry (Rubus idaeus)
- Buffalo Berry (Sheperdia canadensis)
- Moose calves (Alces alces)
- Thimbleberry (Rubus Parviflorus)
- Spring Greenup

Maps 3, 4 and 5 display the main hot spots of natural attractants for each community as defined by expert opinion and ENFOR records.

NON-NATURAL ATTRACTANTS

Using the historic information in ENFOR it was determined that garbage and cultivated plants are the main non-natural attractants, representing 70% percent of all known attractant issues. Bird feeders and livestock ranked third and forth respectively. A full break down of historic attractants can be found in the Historic Bear Conflicts section.

It was mentioned by workshop participants that the gravel pit near the Bohomilecs was traditionally used by highway maintenance staff to dispose of road-kill. Although road-kill along Highway 3 was not an attractant rated highly in the ENFOR database, it is worth noting that ASRD requested the highway maintenance contractors stop placing road-kill in this pit when new acreage developments were developed adjacent to the pit. Currently, highway maintenance contractors remove road-kill to more remote locations in the Pass.

Maps 3, 4 and 5 highlight key non-natural attractant locations for each community as defined by expert opinion and ENFOR records.

Crowsnest Pass Garbage Disposal

Residential garbage in the pass is picked up at the curb or alley once a week and hauled to the M.D. of Pincher Creek Sanitary Landfill site, which is located roughly 12 km east of the municipality. There are no bylaws in regards to garbage pickup. Garbage bins very in type and in most instances are not bear proof. Workshop participants also noted that alley and curb-side pick-up garbage (usually put out the night before) attracts bears into the communities.

Commercial dumpsters are emptied as needed on a dumpster by dumpster basis.

Recycling in the Pass is done at 6 drop off sites in Coleman, Blairmore, Frank, Bellevue, and Hillcrest.

There are no specially designed bear proof garbage bins being used in the Crowsnest Pass. CNP Waste Disposal has been proactive in recommending to new rural residential communities to have a centralized dumpster rather then curb side pickup, but so far new developments have opted to pay for curb side pickup and there is little incentive for the community to adhere to the recommendation. Public garbage bins that are known to be a bear problem have been latched and chained down to try and prevent bear access.

Fruit Trees and other Ornamentals

The Crowsnest Pass has a large number of fruit trees, predominantly crab apple, that are a major attractant for bears and other wildlife. Often these trees are located in, or near, potential high risk areas such as playgrounds and school yards.

Other Attractants

While garbage and ornamental plants make up the majority of non-natural attractant issues, there are other issues that should be considered. Bird Feeders, wildlife feeding, livestock and pet food all have caused problems in the past and will likely to be an issue in the future unless addressed.

Bear Habitat, Movement and Travel Barriers

The community of the Crowsnest Pass is situated in an important regional movement corridor for grizzly bears and other carnivores. Other research has shown that to reduce bear-human conflict it is important to maintain existing travel routes that allows bears to filter through human communities (Ciariello 1997). Some studies have highlighted the congruence between grizzly bear movement and bear-human occurrence records (McCory 2003, Donelan and Paquet 1997). The topography of the Crowsnest provides many ridges and riparian areas for bears to move into, through and around human settlements. Research examining grizzly bear (and other carnivores) habitat and movement in and around the Eastern Slopes has resulted in a number of regional

models that contribute to our understanding of where bears are moving through the region. Researchers currently addressing grizzly bears include:

- Cheryl Chetkiewicz: University of Alberta PDh candidate, GPS collars on a number of grizzly bears in the Pass. Status: ongoing
- Clayton Apps, John Weaver Paul Paquet: Modeling of grizzly bear habitat and movement at regional scale using hair snagging and radio-collared data, Status: on-going
- Carita Bergman: developed a Grizzly bear habitat suitability model at a regional scale. Status: completed.
- Barb Schwab: Graph theory modeling for predicting grizzly bear movement. Status: project development
- Scott Nielsen: in conjunction with Foothills Model Forests developed a resource Selection Function model for grizzly bears (displayed on Map 6). Status: completed
- Michael Proctor: genetic analysis using mitochondrial DNA to assess movement across Highway 3. Status: completed

Wildlife traffic mortality and Road Watch observational data may also provide additional insight into where bears are crossing Highway 3.

These research projects are in various stages of completion and the objectives and specific focus need to be reviewed to determine which ones would be most useful for assessing bear habitat and movement through the region. Furthermore, the scale of the research may limit the use of the information in identifying local habitat use and fine-scale movement areas in the Pass. Additionally, there is little information available about black bear habitat and movement in the Pass, though it is believed they are crossing through the valley more frequently then grizzly bears.

As none of this research has been coordinated or compiled and addresses different spatial scales we have displayed (Map 6) the existing knowledge and expert opinion regarding bears crossing Highway 3 in conjunction with a resource selection function model. These areas represent broad movement opportunities and are not meant to represent exact paths. A process that reviewed these areas with existing bear habitat and movement models may help refine or prioritize these areas. The main barriers to bear movement in the Crowsnest Pass are Highway 3, the railway, and the human footprint including settlements and residences. It is important that existing movement areas are maintained to reduce potential conflict. Bear Smart communities need to be cognizant of the key areas and assess where current and new developments may threaten the integrity of bear movement. Additionally, some new developments may develop into new high risk area for human-bear conflict if they are located in key movement areas. Bear Smart communities should work with and support the municipality's efforts to coordinate development and wildlife movement.

FIRE SMART AND THE C5 MANAGEMENT PLAN

Fire Smart and harvesting under the C5 Management Plan while having no direct connection with bears in the Crowsnest Pass, does pose a future impact. As vegetation is thinned or removed new areas of natural attractants may be created, specifically buffalo berry which is an important food source for bears. This outcome may be beneficial if it draws bears out of the settlement areas, but may have the opposite effect depending on the location of the removal. It is important that Forestry and Fish & Wildlife work together to ensure human-bear conflict issues are considered in these planning processes.

FUTURE CONCERNS

There are a number of new developments at various stages of implementation occurring outside the existing settlements that have the potential to increase human-bear conflict through the development of trails, disposal of garbage, increase in natural and non natural attractants and proximity to important bear habitat and movement areas.

New developments include:

- Bridgegate: a large scale resort development planned for the east end of Crowsnest Lakes.
- PineView: expansion of existing development near the bottom of PowderKeg ski hill.
- Passburg monument subdivisions
- Wolfgang condo development to the east of Coleman

FACTORS OUTSIDE THE COMMUNITY

Public crown land extends to the north and south of the Crowsnest Pass providing a large number of designated and random camping areas. Bears frequenting these camping areas can become food conditioned if exposed to improperly disposed food. If these bears then move through the municipality they pose a risk of human bear conflict. Bears accustomed to humans and their food will pose an increased hazard because they are less likely to be deterred from the community without being removed and/or destroyed.

CURRENT APPROACHES TO BEAR MANAGEMENT

Fish and Wildlife Bear Response Matrix

Fish and Wildlife Officers use the Grizzly Bear Response Matrix and the Black Bear Response Matrix to guide their responses to bear conflicts within the Province. It was noted that fiscal constraints often limit the amount of adverse conditioning that can be accomplished.

Education

There are currently no organized or formal education processes being conducted that could facilitate the adoption of a Bear Smart community. Some educational brochures do exist on a variety of bear related topics, but nothing coordinated or made specifically for the Crowsnest Pass.

Conclusions

There are many sites of concern for human bear conflicts in the Crowsnest Pass, identified as public areas with a high level of human activity. These include school grounds, playgrounds, campgrounds and local hiking trails close to human settlement. These sites have all been identified on the various maps included in the report. However, the community would benefit from some type of process to prioritize these sites for their potential for human-bear conflicts.

There are a number of artificial attractants in the Crowsnest Pass that are attracting bears into the community and specifically to the high risk sites mentioned earlier. The main sources of attractants in the Pass, as identified in the ENFOR database and by the workshop participants, are garbage and fruit trees. Garbage is an issue that needs to be addressed by the whole community including individual citizens, businesses and the municipality. The existing residential garbage pick up system is problematic. Garbage is picked up once a week, rotating through the Crowsnest Pass and is often left out in waste bins that are not bear proof. Fish and Wildlife enforcement officers spend considerable amounts of time responding to bear issues related to garbage. Furthermore, local businesses are provided with dumpsters that are not bear proof and are only emptied as necessary. Depending on the type of garbage, some of these dumpsters are problematic, such as the dumpster that contains food-waste behind Fast Gas and A&W near Frank. Another significant issue is Thunder in the Valley, an event that attracts a large volume of people and as a consequence results in a large volume of garbage. In the past the garbage handling of this event has been problematic in relation to bears. Garbage issues could be addressed by using bear proof bins and altering residential garbage pick-up system. The Bear Smart community needs to address these issues through a combination of education, policy changes and enforcement.

Fruit trees, mainly crab apple, are scattered throughout the settled areas in the Crowsnest Pass. The fruit trees are temporally an issue in August and September when the fruit is ripe and falling off the trees. This attractant could be addressed by picking the fruit at the opportune time or by removing and replacing fruit trees with other tree species.

It is important to note that the community of the Crowsnest Pass is situated in an important movement corridor for grizzly bears and other carnivores. Other research has shown that to reduce bear-human conflict it is important to maintain existing travel routes that allows bears to filter through human communities. There were a number of key carnivore movement areas identified in the Crowsnest Pass. It is important that these areas be maintained to help reduce human bear conflict. Bear Smart communities need to be cognizant of the key areas and assess where current and new developments may threaten the integrity of bear movement. Additionally, new developments placed in movement areas have the potential to develop into new high risk area for conflict. This issue can be addressed by working with or supporting the municipality's and other efforts that plan congruently for development and wildlife movement.

Additionally, initiatives like Fire Smart and the ASRD forest harvesting plans will alter and change the vegetation dynamics of the surrounding forest reserve. This may work to the advantage of a Bear Smart community by encouraging wildlife to stay in proximity to the Forest Reserve. It may also have the opposite effect where enhanced vegetation could draw bears close to popular hiking trails or camp grounds. A Bear Smart community needs to be aware of these initiatives and the supporting research to determine the impacts to bear movement.

The issues relating to human-bear conflict should be addressed through a combination of approaches including education (with the goal of achieving voluntary behavioral changes), policy (legislation that reduces sources attractants) and enforcement (to endure compliance of the legislation). Given the high number of artificial attractants in the Crowsnest Pass, the implementation of a Bear Smart program in the Crowsnest Pass has the potential to greatly reduce human-bear incidences. Ideally this will also result in reduced Fish and Wildlife enforcement responses and bear mortality.

Recommendations

This section outlines recommendations to assist in the initiation of ABSP in the Crowsnest Pass. It does not outline specific strategies for their implementation but highlights key areas to assist ABSP in initiating sustainable bear management in the Crowsnest Pass. The recommendations have been broken down into three categories, data/research gaps, education, and policy.

Data Research and Gaps

Throughout the process of compiling information for the Preliminary Bear Hazard Assessment, we have identified the following data/research gaps:

- While research exists pertaining to grizzly bear movement and habitat use a formal review of the research objectives and results of the different research projects is required to assist in the analysis of identifying high human-bear conflict areas.
- While a large amount of research has been conducted related specifically to grizzly bears, black bears constitute the majority of the bear occurrences in the Crowsnest Pass. The identification of movement patterns and habitat selection is an important tool in determining problem areas and information specific to black bears would be beneficial.
- The bus stops and trails in the Crowsnest Pass are not currently mapped as spatial layers. This represents a significant limitation in this assessment as human bear conflicts occur on or adjacent to recreation trails and bus stops.
- A GIS-modeling effort that compares areas of prime bear habitat (regional-scale) and source attractants (local-scale) with sites of potential risk would assist the community in prioritizing mitigation efforts to reduce human-bear conflict by ranking each site. This would then allow for the development of specific strategies for each site based on the source attractant.

EDUCATION

- The development of communication materials that highlight the goals of Bear Smart and provide the community with specific voluntary actions to assist reducing human-bear conflict. This should include suggestions on how to reduce attractants around the home and community.
- The development and distribution of materials targeted at campground users that promote sustainable bear management practices, such as food storage and disposal as well as information on how to respond to bear sightings would assist in reducing human-bear conflicts.
- Work in collaboration with the municipality to address the bear-human conflict issues associated with the annual Thunder in the Valley event.
- Keep abreast of the on-going research involving bear movement and promote actions to maintain identified movement areas.
- Develop programs to address fruit tree issue within the Crowsnest Pass. Some suggestions that have been included elsewhere include a volunteer pick program with fruit made into products that can be distributed through the food bank and a nursery swap where you can replace your existing attractant plants for others.

POLICY

- Investigate bylaws used in other communities to address attractant issues including garbage, ornamental plants, bird feeders and livestock.
- Create guidelines for new developments in the Crowsnest Pass to facilitate Bear Smart initiatives. Working with developers during the planning stage can help mitigate bear attractants when it's most effective to deal with them.

- There is a need to explore other garbage handling options such as more frequent pick-up, purchasing bear proof bins or moving to centralized dumpster system.
- Support municipality efforts to implement planning processes that address carnivore movement through the Pass.
- Ensure consistent aversive conditioning is being undertaken to complement the community initiatives.
- Alberta Fish and Wildlife and Alberta Forestry should work together to ensure coordination between Fire Smart, C5 Management Plan and Bear Smart.
- Coordinate with highway maintenance contractors to identify appropriate areas where road kill can be disposed of.

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Appendix

Bear Aware Meeting
March, 22 2006

Attendance
Dale Patton
Kirk Olchowy
Terry Mack
Russ Stashco
John Clarke
Andrew Gustavson
Dave George

Miistakis
Ken Sanderson
Tracy Lee

Action Items

- **Wildlife officers** in Blairmore will GPS ENFOR records when possible to increase the positional accuracy of the information. Ken will send Kirk a copy of the database to work from.
- **Ken** to re-evaluate ENFOR data to include number of animals (as opposed to independent events.
- **Russ**: obtain FireSmart spatial layer for the Pass
- **Ken**: determine if there is a school bus route map available
- **Terry**: provide Ken with province bear matrix
- **Kirk**: confirm with the mayor that he is aware of Bear Smart
- **Terry**: look into a presentation about the financial savings in Canmore after the garbage systems was implemented.
- **Ken**: Send Terry an invoice asap

Introduction
Russ: Update with Alberta Bear Smart (meeting tomorrow with Provincial representatives), priorities in the province include Canmore and Crowsnest Pass. There is also a priority is the agriculture sector just east of the Pass.

Ken: Description of ENFOR database (since 1999). Need someone here that could GPS the bear records in ENFOR (Kirk suggestion). Hand out the ENFOR summary (two biggest attractants include garbage and ornamentals. Note that this is events, not number of animals.

Kirk: Trap set captured (only 5) not sure about this, seems lower than it should be. Must be a mistake in the ENFOR database. *Suggestion to pull out the animal numbers (not just events).*

Agenda

1. Highlight and map features in the Pass (schools and playgrouonds)

S = School
P = Playgound
C = Camping Area
BD = Ball Diamonds
D = Day use
E = Event grounds

Bellevue (mixed, topography is a big issue, they move down the ridges)

S1: MDM occasional sightings, not fenced

P5a: Firemans Park, bears common, berries issue, not fenced, natural corridor, adjacent to thick cover.
P6: bears common, fruit trees adjacent, berries on the east, thick cover
P7: play area, occasional bears, 2 blocks from apple trees, open

C1: highway municipal one along Highway
C2: girl scout camp ground, occasional bears

Walking Areas
Firemans Pass

Hillcrest
BD1: concern about garbage issues in development

P1: apple tree in center, apples picked by municipality, along Drum creek, play equipment and hoops, fenced
P2 : adjacent to thick cover, not fenced mostly

C4: sewage lagoons, east of the east hillcrest bridge, random camp

Walking Areas
East Hillcrest to east Hillcrest Bridge along the Road

Frank

P3a: Frank playground
C3: Random camping near Frank slide
C5: Random camping issue

Blairmore

S2: ISS School, fenced on three sides open to the back, occasional sightings in this narrow cover

P3b: Snake Park, bears common, near by fruit trees and garbage, terrain and vegetation are both issues, fenced on three sides
P4: playground Kentucky fried chicken, very occasional, adjacent to the dumpster, fenced, open habitat
P5b: bears common, close to fruit trees and bear travel route, fenced partial, open habitat

C6: lost lemon, garbage issues, big issue for bears, natural where 2 creeks come together

Other facilities:
Old dump site: historical
Albert Stella Arena: dumpster that is not emptied

Ski Hill: not an issue, people not up there very often in the summer.

Golf Course: Started to have bears on the golf course, saskatoon/buffalo berry along fairways that are attracting the bears.

Walking Areas
Sarots Road: Road people commonly walk on.
York Creek: along the creek
Between Blairmore and Coleman there is a trail that people commonly walk on.

Coleman

S3: Crowsnest Consolidated High School: not many bear issues, open habitat
S4: Horace Allan School: apple trees and travel route, wooded ridge to the west of the school.

P8: Phlumerfelt (no fence, cover, hiking path)
P9: Pine view play ground, fenced, not a problem
P10: occasional issue, fruit trees near by, open, fence
P11: Cameron School, no issues.

D1: Day use area, dog walking, garbage (cleaned up by locals), bears move through.

C7: Star Creek, random camping
C8: Crowsnest Mountain Resort, private ownership
C9: Knolls Flats, random camping

Walking Areas
Along the entire river, note that fisherman don't report many issues with bears

Sentinel

D2: Pump house
D3: Tourist Centre: garbage issue

C10: random camping area, Emerald Lake (southeast corner), garbage main issue

C11: Bible Camp, garbage, berries
C12: Island lake camp ground
C13: Allison Lake camp ground
C14: Tecumseh Guest Ranch, garbage issues, maybe some saskatoon berries

No landfill in the Pass.

Parks and Schools priority
Playground in Hillcrest
Coleman Elementary School Horace Allan

Snake Park
Allison Lake Campground (grizzly issue, natural foods along the trails)

These were mentioned but then it was suggested that prioritizing is difficult because they are all important..

2. Natural Attractants 9N)

Along riparian areas there are generally saskatoon berries, buffalo berry, chock cherry, raspberries, thimbleberry, cow parsnip. This is especially the case from Frank toward Hillcest along the river there are Saskatoon berries and chock cherries.

N1: saskatoon berries
N2: saskatoon berries
N3: major berry area along the river
N4: area around Bellevue, chokecherry, raspberry, saskatoon berries
N5: chokecherry, raspberry, saskatoon berries, buffalo berry (around Interp. Centre)
N6: edge of the golf course, on golf course as well, buffalo berry
N7: buffalo berry, maybe more of a movement area
N8: moose calves in spring attracting bears
N9: chokecherry, raspberry, saskatoon berries, thimbleberry
N10: chokecherry, saskatoon berries

Firesmart: Powerline, saddle mountain (Russ will obtain spatial layer for us)

It was noted that most complaints are non-natural.

Unnatural Attractants (U)
Road kill, bird feeders
U1-U4: Fruit trees (hillcrest)
U5-U7: Fruit trees (Bellevue)
U8: dumpsters at AW
U9: dumpsters at Shell
U10: services the new subdivision behind the Frank Interp centre.
U11: dumpster Rivers Edge
U12: dumpster at the arena
U13: Kentucky Fried Chicken dumpster
U14: York creek lodge dumpster
U15: Lost lemon dumpster
U16: Hospital and mall dumpster
U17: gold course dumpster
U18: Coleman Arena dumpster
U19: seven eleven, Popiels restaurant, subway dumpster
U20-U22: Fruit trees
U23: dumpster
U24: Sentinel dumpster
U25: highway pull-off cement pad (garbage)
U26: dump pit for road kill (kill pit)
U27: agricultural
U28: feeding wildlife
U30: old dump

N/U29: fruit trees and natural

Garbage: issue with curb side pick-up. Each town has the pick up day, people put it out at night and then bears get into it.

Suggestion of bringing the mayor down from Canmore to talk about their experiences with bear smart.

A concern that there are areas where the school buses stop that corresponds with bear movement or attractants. The bus stops change from year to year depending on where the kids live. Also how close are these bus stops from garbage dumpsters? *Get map of bus stops from MD.*

Event Grounds
E1: Rodeo Grounds

Thunder in the Valley: Blairmore, garbage big issue at this event (July 14-16)

Event planning is a big issue, how do we handle the garbage.

Issues that occur outside the Pass
May long weekend: Random recreational use on either side of the Pass. Random camping occurring in the Forest Reserve (different jurisdictions)

Non-Natural Features that influence movement
Highway 3
Traffic volume
Railway
Pipeline
Firesmart
Subdivisions

Bear Movement
Any creeks or water drainages (buffer the hydro layer). Example Bellevue ridges, covered with berries. Ridges near Hoarce Allan school. Cemetery at Blairmore is a crossing area. Coleman Phlumerfelt Park, miners path, refer to map. Golf Course, East Hillcrest, inbetween Coleman and Blairmore, Bohomlecs Ranch.

Corridor Project
Captured a number of back bears in the spring, but very few turned up as problem bears.

Kirk to send Ken the Bear occurrences trapping records from Cheryl's stuff.

Dale suggests getting the information on the first DNA study (Garth Mowat).

Priority Issues:

- Apples in Sept there is a big issue with this (local media helps provide awareness- place a notice in the local paper)

Strategies

Picking fruit: need to make sure the apples are dumped not all in the same spot, two year (2003-2004) program that was implemented (children involved).

Should look into the Galileo Program: Bear and people management, Education program, University of Calgary.

Incentives to cut fruit trees out and plant some thing else.

Afternoon Session

Bear Data for the Pass

Dale: Important to have the good habitat mapped that highlights the importance of the lower valley bottom as prime bear habitat.

Kirk: Bear occurrences mapped and they occurred on the watercourses. Suggests talking to Jim Clark about this.

Future Concerns

Bridgegate development: potential problem area because of potential golf course associated with the development.

Pineview being expanded. Near the Blairmore ski hill at base there is a proposed development.

Wolfgang condo development in elk winter range.

Passburg Monument subdivisions.

C5 management plan- clear cutting may produce future issues. Does Firesmart and C5 appreciate the need to suppress Buffalo berries. There may be a need to link Firesmart and Bearsmart. This is occurring in Canmore (Firesmart takes into consideration where it is attracting bears). There is concern about Deadmans Flats and the connection into the Pass as far as fire and pine beetle.

Bear Management Policy

Follow provincial matrix (bear dogs aversion). *Terry to get this matrix to Ken.*

Ken: Change in number in ENFOR over the years (have the number of reports increased).

Public education potential: due to dog aversion program.

Issue with limited resources for aversion at the scale needed.

There is a change of us seeing more grizzly bear activity in the Pass (do the ENFOR records support this).

Maybe recreational activity moving the bears from the forest reserve onto ranch lands.

Local by-laws: currently nothing but there is a new individual that is supportive and interested.

Data limitations/Research needs
Cougars are an issue, wolf activity also needs to be addressed. Moose and ungulates may also need to be addressed.

There is very limited information on where wildlife is moving north and south of the Highway 3.

Russ suggests Kirk talks with Daryl Johnston about Firesmart and influence on bears.

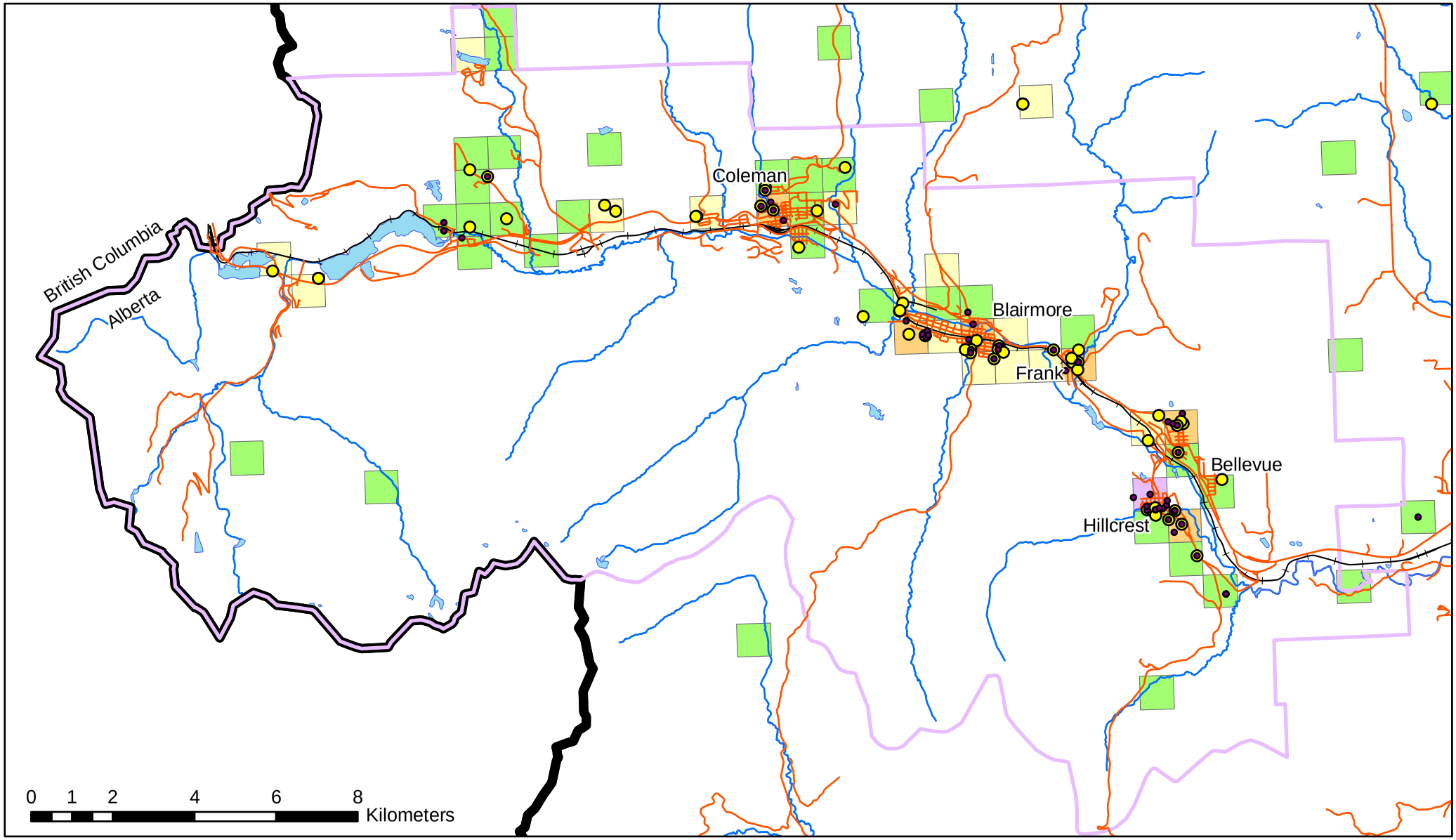
Priorities
1. Garbage handling for Bear Smart
2. By-laws: to enforce the garbage issue, bird feeders and fruit trees (includes all attractants).
3. Area structure plan (overall planning/prevention): before developers start (ie not planting attractants).
4. Reviewing 20 year plans for the community and how are the mammals going to move through this corridor. Need some strategic planning on where the subdivisions are going to go. There is some work that has identified these areas which helps people like NCC and RMEF to preserve these lands. Miistakis has been developing a model on comparing the developable lands and wildlife needs with the Municipality and NCC.

Kirk to confirm with mayor that he is aware of the Bear Smart initiative.

KBD: part of bear smart program, manual just produced.

Make aversion conditioning a strong part of program so that Fish and Wildlife is following up. Need 2 collars and staff time. This will show we are being proactive as a government.

There is a need for incentives to inspire people to implement Bear Smart ideas like garbage handling. What kinds of incentives would they need- to purchase the garbage bins, collar bears ectra. There should be one garbage collecting system through this community. (Present the Canmore data that shows they are saving money). *Get them to present the savings to the Crowsnest Pass (Terry to follow up).*



ENFOR Bear Occurrences 1999-2005

Map 1a

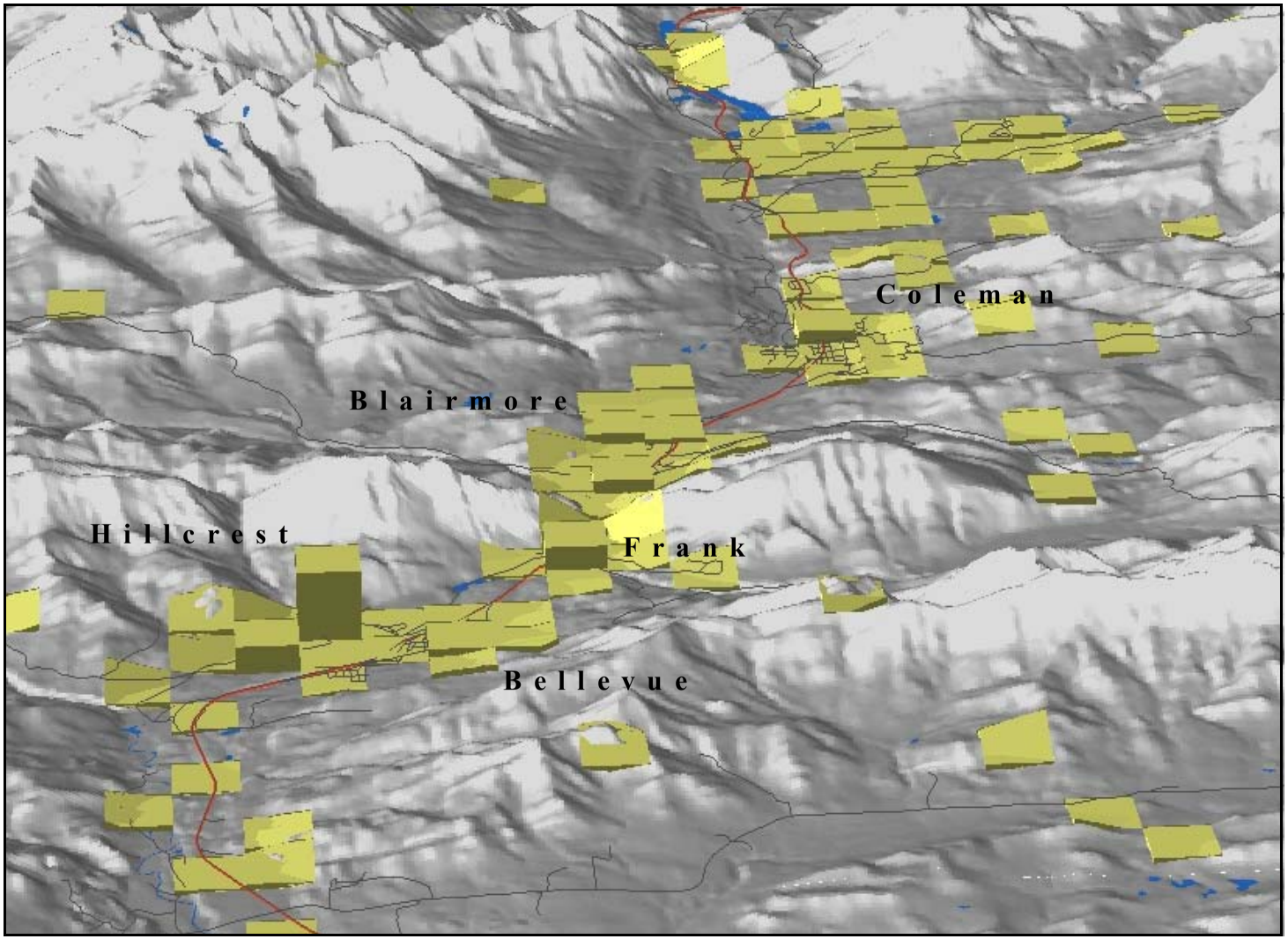
ENFOR Known Attractant Occurrences by Quarter Section

1 - 2 | 3 - 5 | 6 - 11 | 12 - 17

ENFOR Garbage and Ornamental Plant Occurrences

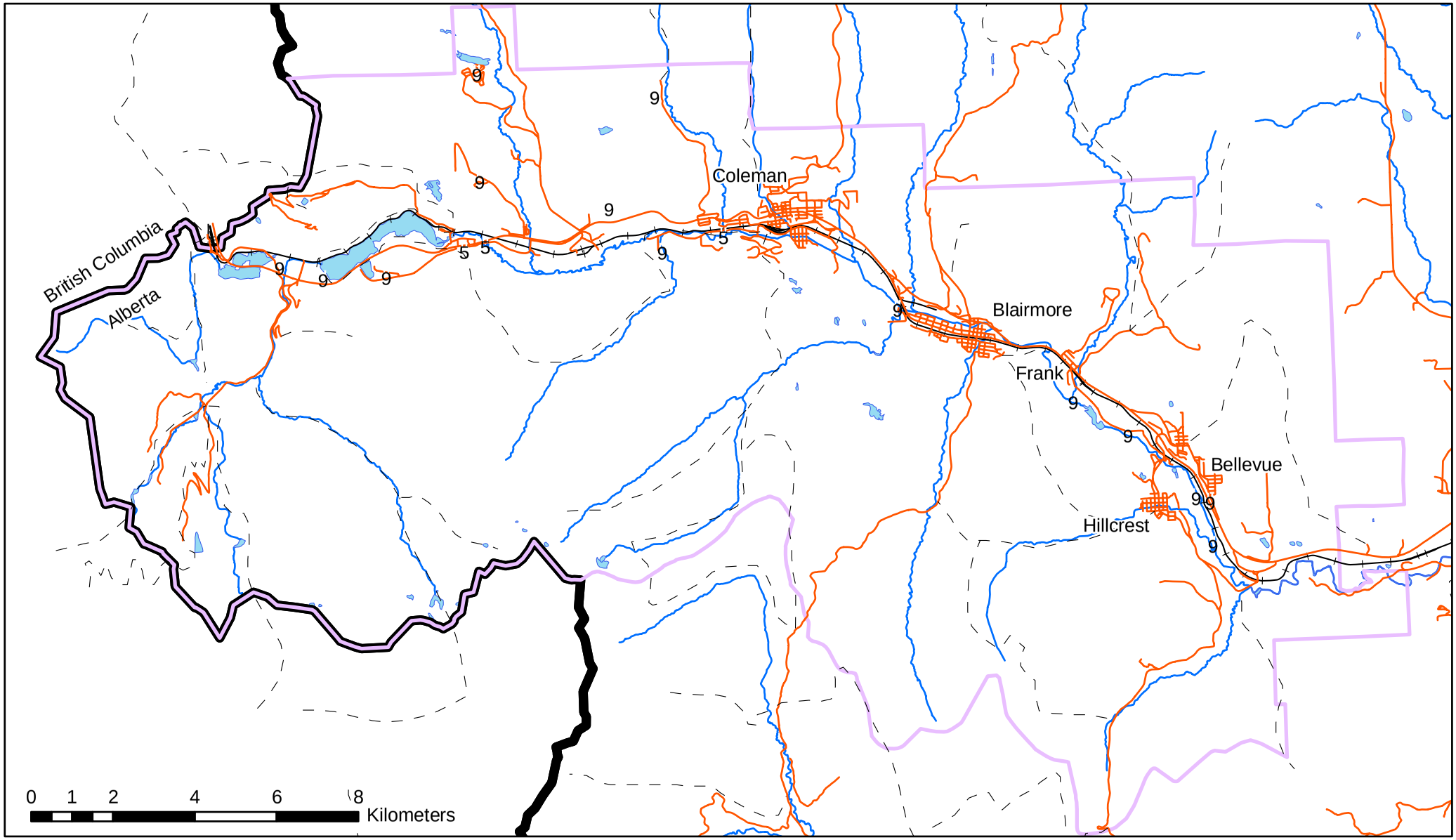
- Ornamental Plants
- Garbage
- Garbage and Ornamental Plants

Map Created By: Ken Sanderson, Miistakis Institute
April 27, 2006 Y:/bearhazard/enfor.mxd



ENFOR Bear Occurrence 1999-2005 Map 1b

A display of ENFOR records per quarter section, represented as yellow bars. The values are exaggerated to provide a visual display that highlights areas where occurrence are more prominent.



Recreation Sites in the Crowsnest Pass

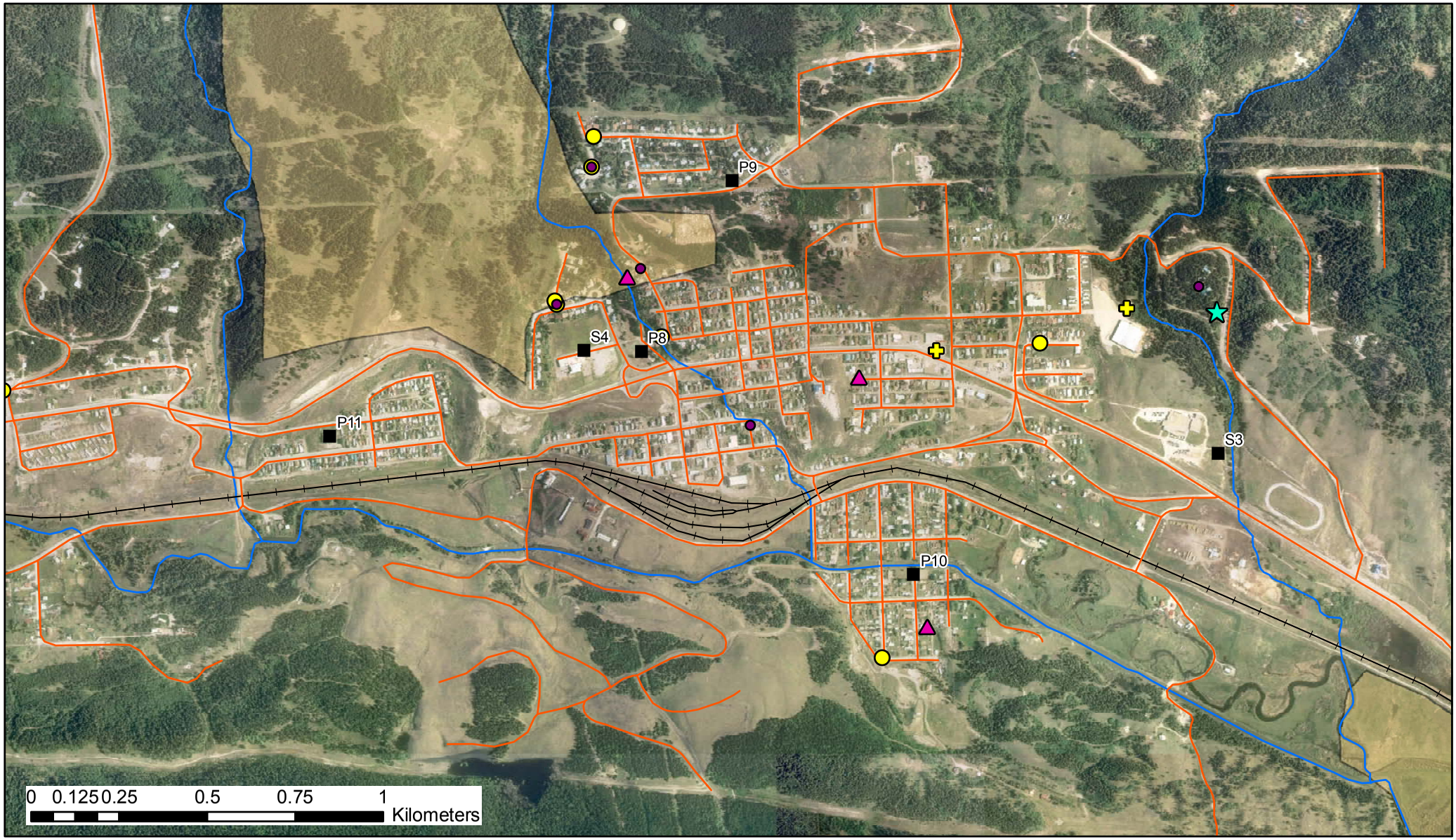
Map 2

5 Day Use Area

9 Campground and Random Camping

Trails

Map Created By: Ken Sanderson, Miistakis Institute
April 27, 2006 Y:/bearhazard/recreation.mxd



Coleman Sites and Attractants

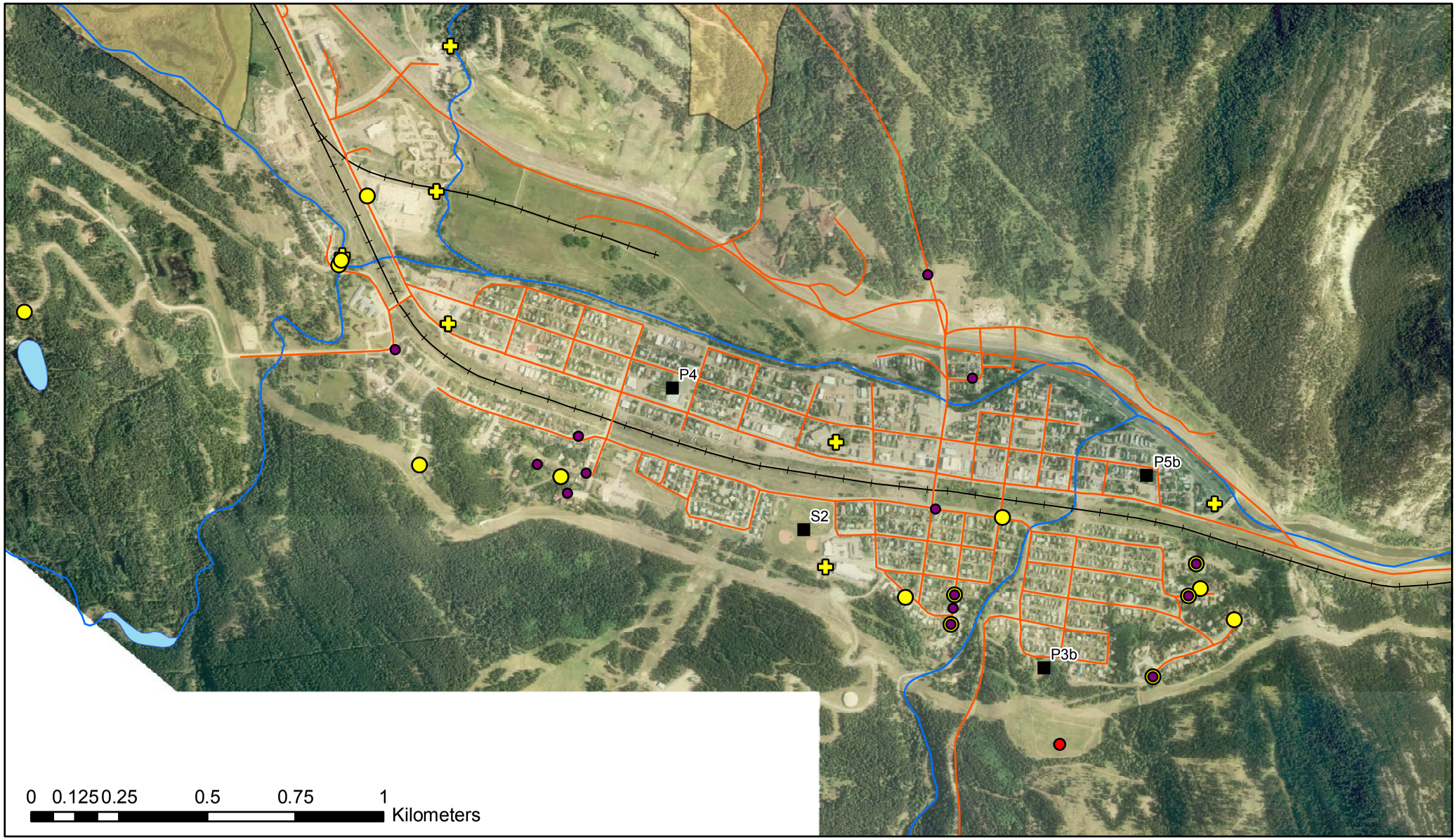
Map 3

Expert Opinion Attractants
- Historic
- Agriculture
- Garbage
- Feeding
- Fruit Trees
- Natural

ENFOR Attractants (1999-2005)
- Ornamental Plants
- Garbage
- Garbage and Ornamental Plants

- School or Playground

Map Created By: Ken Sanderson, Miistakis Institute
April 27, 2006 Y:/bearhazard/habitat map.mxd



Blairmore Sites and Attractants

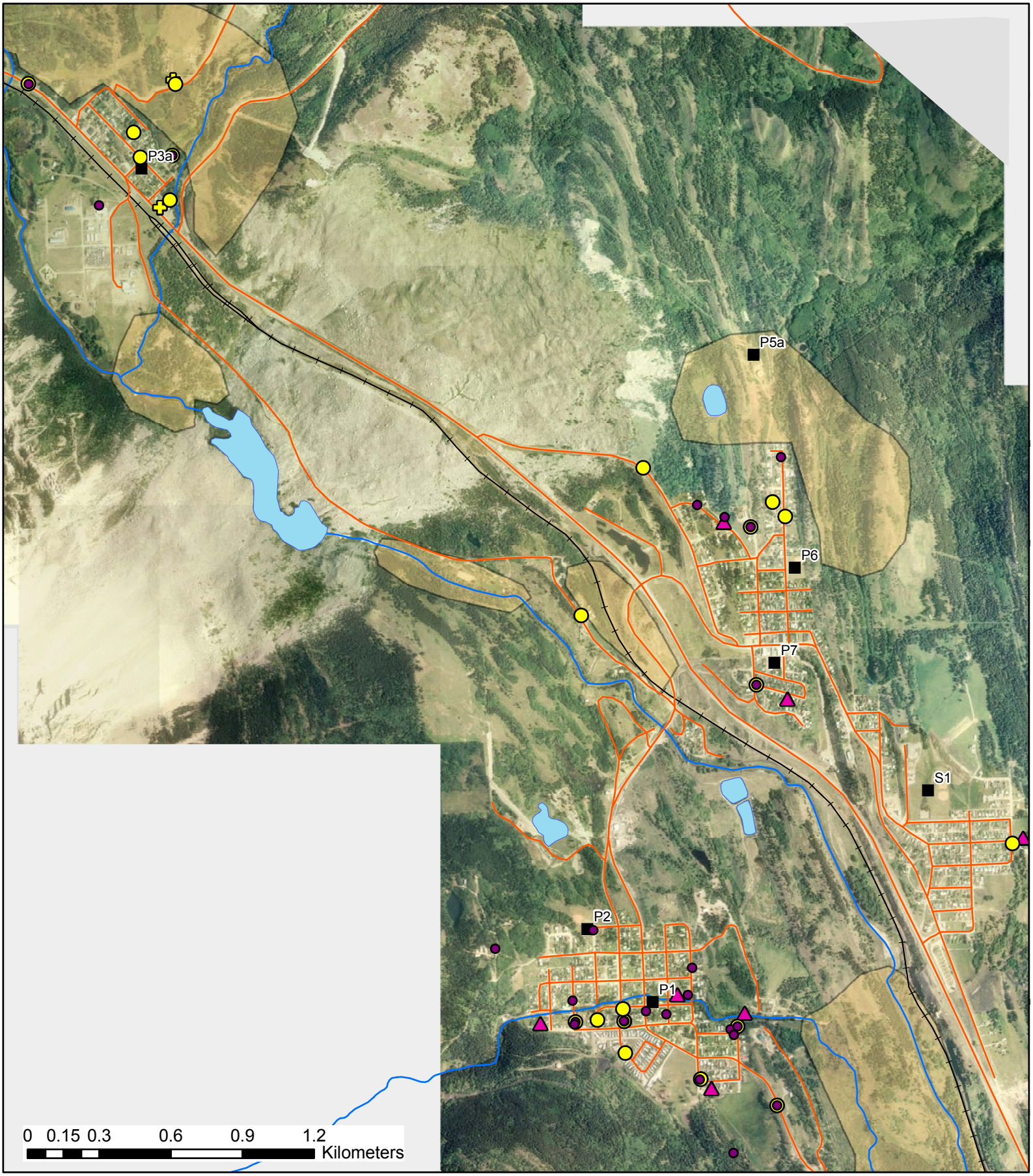
Map 4

Expert Opinion Attractants
- Historic
- Agriculture
- Garbage
- Feeding
- Fruit Trees
- Natural

ENFOR Attractants (1999-2005)
- Ornamental Plants
- Garbage
- Garbage and Ornamental Plants

- School or Playground

Map Created By: Ken Sanderson, Miistakis Institute
April 27, 2006 Y:/bearhazard/blairmore.mxd



Hillcrest, Bellevue and Frank Sites and Attractants

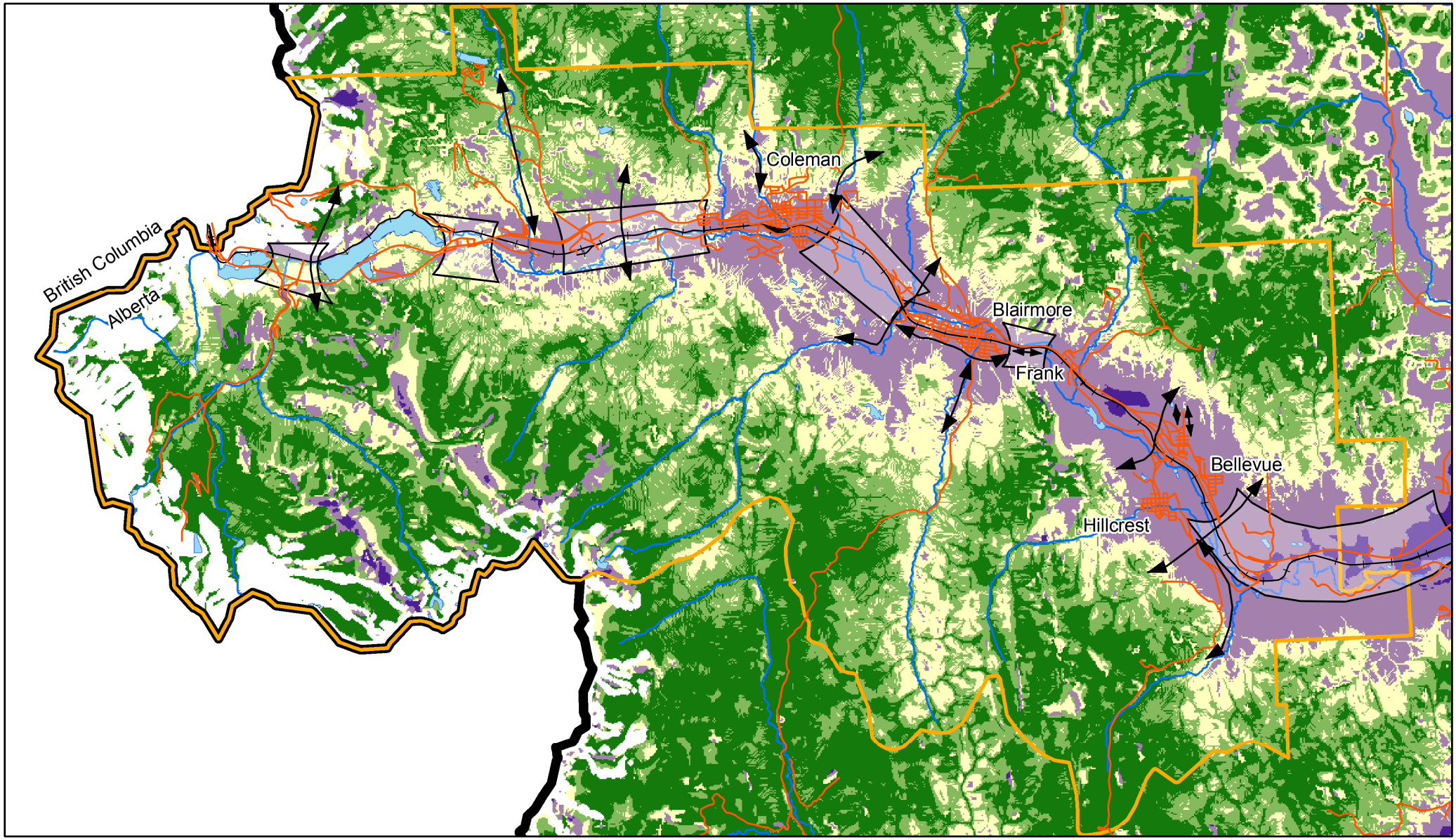
Map 5

Expert Opinion Attractants
- Historic
- Agriculture
- Garbage
- Feeding
- Fruit Trees
- Natural

ENFOR Attractants (1999-2005)
- Ornamental Plants
- Garbage
- Garbage and Ornamental Plants

- School or Playground

Map Created By: Ken Sanderson, Miistakis Institute
April 27, 2006 Y:/bearhazard/bellevue.mxd



Summer Resource Selection Function and Movement Areas

Map 6

0 1 2 3 4
Low High

Bear Movement Areas

General Movement Areas

Map Created By: Ken Sanderson, Miistakis Institute
April 27, 2006 Y:/bearhazard/habitat map.mxd