

**South Okanagan-Similkameen
Bear Smart Project:
Bear Hazard Assessment Report**



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1.0 Executive Summary

This bear hazard assessment report describes the features associated with human-bear conflicts specific to the South Okanagan and Similkameen and introduces ideas about how these conflicts might be addressed. This report discusses the local sources of attractants that draw bears into urban and rural landscapes. These include vineyards, windfall fruit/fruit trees, nut trees, garbage, bee hives, pet food, compost, and many other household and agricultural items.

Two map series form the foundation for the bear hazard assessment and this report. These maps plot the locations of telephone calls to the Ministry of Environment, Conservation Officer Service (COS). Calls were from concerned residents calling to report bear sightings. Calls can be distinguished by season and by bear attractant. One map series focuses on complaint calls about bears feeding on fruit, beehives, vineyards and other attractants. This map series also identifies (based on expert opinion) areas considered to be priorities for conflict management strategies. The second map series focuses on complaint calls about bears feeding on garbage and compost as well as complaint calls for which no attractants were given. This second map series provides additional focused interpretation for areas where calls are concentrated (circled areas). The circled areas on the maps (except for the Princeton/Hedley area) include call distribution graphs for 1999-2005. Data for the circled areas on the Princeton/Hedley area (RDOS areas G and H) maps are from 2002-2005. This report discusses these maps and interprets findings based on human-bear conflict research, and experience in other jurisdictions. The report also provides priority recommendations both for a local human-bear conflict management plan and to address Bear Smart criteria. Key recommendations are listed in the recommendations section and are focused on conflict management planning approaches. These include: suggestions for monitoring human-bear conflicts; community-based implementation of the management plan based on local input; and priorities for human-bear conflict education/partnerships.

2.0 Introduction

The South Okanagan Similkameen Bear Smart Project began in 2005. This project was launched with the support of the following partners: the Regional District of Okanagan-Similkameen (RDOS), SOS Stewardship/The Land Conservancy of BC (TLC), BC Ministry of Environment (MOE), Malaspina University College, and the City of Penticton. Until March 2007, The Land Conservancy administered the project funding and the initial role of coordinator to launch the project. Since then, RDOS has filled the role of administering project funding.

This project is modeled on the provincial Bear Smart Community Program¹ initiated to support local communities in their efforts to address the root causes of human-bear conflicts and therefore diminish the rate and intensity of human-bear

¹ Provincial Bear Smart Program was designed by Ministry of Environment (MOE) and its partners, British Columbia Conservation Foundation (BCCF) and the Union of BC Municipalities (UBCM).

conflicts, increase public safety and reduce the number of bears killed every year. Criteria for the Bear Smart program include preparation and implementation of both a hazard assessment and a human-bear conflict management plan which includes revision of planning and decision-making documents, implementation of a continuing education program, development/maintenance of a bear proof solid waste management system and implementation of bylaws to manage/limit bear attractants.

The scale of the SOS Bear Smart Project is unique. This project continues to explore possible economies of scale and supports ongoing local efforts to coordinate conservation-based planning by initiating its efforts within the South Okanagan Similkameen Conservation Program² planning boundary and then expanding to include all interested areas within the RDOS boundary. This will include up to 5 municipalities and all or parts of 9 electoral areas.

Table 1: Conservation Officer Bear Destructions and Relocations 2003-2007

year	2003/04	2004/05	2005/06	2006/07
Bear destructions: attractant = fruit only	n/a	n/a	n/a	11
Bear destructions: attractant = garbage only	n/a	n/a	n/a	3
Bear destructions: attractant = fruit and garbage	n/a	n/a	n/a	3
Bear destructions: attractant = other	n/a	n/a	n/a	1
Bear destructions: no attractant listed	n/a	n/a	n/a	7
Total Bears Destroyed	26	10	24	25
Total Bears Relocated	1	1	1	2
Total Bears Destroyed or Relocated	27	11	25	27

² South Okanagan Similkameen Conservation Program is a partnership of non-governmental, government, and First Nations organizations working together to conserve biodiversity.

Table one summarizes the known history³ of bears destroyed or relocated as a result of human-bear conflicts. These records come from local Conservation Officers who respond to calls about human-bear conflicts. Although the majority of calls do not end in destruction or relocation of a bear, some conflicts cannot be resolved. Preliminary, results suggest a somewhat consistent number of bears being destroyed each year with 2004 lower, perhaps due to natural population reductions/local displacements related to the 2003 Okanagan Mountain Park fire. Longer term monitoring is required to assess trends in bear destructions related to human population increases, land development and human-bear conflict complaints.

3.0 Goals and Objectives

The SOS Bear Smart Project seeks to achieve the following goals (consistent with the provincial Bear Smart Program):

1. address the root causes of human-bear conflicts;
2. reduce the rate and intensity of conflicts;
3. reduce the number of bears that must be relocated or destroyed; and
4. increase public safety.

The bear hazard assessment will address the following objectives in order to achieve these goals:

- A. Provide a framework for beginning a Conflict Management Plan (to be written concurrent with the bear hazard assessment).
- B. Develop a locally relevant approach to managing human-bear conflict in a landscape where agricultural crops (especially fruit) provide both a significant attractant and food source for local bears.

4.0 Study Area Description

Figure 1 shows the study area for the SOS Bear Smart Project. The study area includes larger communities like Naramata; Summerland; Penticton; Okanagan Falls; Oliver; Osoyoos; Keremeos/Cawston; Princeton and other smaller developed areas within the regional district. Indian reserve lands within the area also include Upper Similkameen, Lower Similkameen, Osoyoos and Penticton Indian Bands. More detailed maps address the settled parts of all RDOS areas including: areas A, B, C, D, E, F, G and H of the RDOS⁴.

The study area includes relatively high density development as well as rural, agricultural landscapes. The population residing within this boundary is approximately 70,000 (not including First Nations population), but since the area

³ This data is incomplete. It does not include bears killed by hunters, killed in defense of property or life, killed under localized permits to address problem wildlife, or by RCMP responding to calls when COs are unavailable. It may be suitable for monitoring purposes to provide a year to year indication about the extent that human-bear conflicts result in bear destruction/relocation.

⁴ Data for Princeton, Hedley and other small communities associated with those areas (areas within settlement in RDOS Area H) is more limited than for other areas included.

is a very popular tourist destination in the summer, local areas experience large seasonal increases beyond the resident population⁵. The study area is generally at low to moderate elevations (estimated elevation range is 340-1450 m) and includes Bunchgrass (BG), Ponderosa Pine (PP) and Interior Douglas Fir (IDF) biogeoclimatic zones.



Figure 1: Study area

Terrestrial Ecosystem mapping is available for most of the study area but is missing from the Apex and Twin Lakes-Willowbrook areas.

The South Okanagan-Similkameen is considered one of Canada's most endangered natural systems. It is known for its high species diversity due to a dry climate and desert-like local conditions. The size of local bear populations is unknown, but black bears are the dominant species.

Grizzly Bears are occasional visitors. Although the area once supported a self-sustaining grizzly population, almost all local grizzlies were eliminated in the

⁵ Areas like Fernie, Rossland and Whistler also experience periodic large increases in population from tourism. Thus, some of their human-bear conflict issues and solutions may be applicable to the Okanagan.

early-mid 1800s. The closest grizzly populations are in the North Cascades (west and south of the study area), and the Kettle-Grandby (east of the study area).

Habitat modeling work suggests that local habitat quality⁶ for bears is low (as compared to provincial benchmarks)⁷. Indeed, it may be that local orchards and vineyards help to support a larger black bear population than would otherwise be present.

5.0 Methods⁸

In 2005, Stephen Platt completed a nine week GIS project based on locally available data. His work provided the baseline for detailed data analysis in this report. There were seven main categories of data: Conservation Officer Call Records (bear sighting locations and associated possible bear attractants); bear habitat modeling; bear attractants (e.g. fruit trees⁹, vineyards, garbage, pet food/pets, composts, bird feeders); mapped key human use sites (schools, parks, playgrounds, campgrounds and recreational trails); as well as garbage routes (timing and locations) and land fill locations (both fenced and unfenced). Later, agricultural crops (orchards) and Conservation Officer priority areas were also added. Themes in the data were extracted or adapted to meet the requirements of this report.

5.1 Conservation Officer Call Records

BC Ministry of Environment Conservation Office records of phone calls of bear sightings form the foundation for understanding human-bear conflict issues in this local landscape. Many people who find bears in their yard or local community call the Conservation Officer Service (COS) for advice or assistance. Records of some of these calls were obtained from COS archives and transformed into a database available for GIS analysis. These records provide data for 1991-1993 and 1999-2005¹⁰. Only records from 1999-2005 were plotted in this report. These records include: caller contact info, bear locations, associated attractants (e.g. fruit trees, garbage, compost, pet food...), and date/time of call. Most of these records included sufficient information to map bear locations. These records are the product of voluntary calls, and so they do not represent an unbiased sample of bear interactions with the local landscape. Instead they provide a sample of known local bear-human interactions and may indicate trends in human-bear

⁶ Based on assessment of lands outside settlement areas.

⁷ Black Bear SOSCP Species Account, Les Gyug (2006) is mapped in the background of bear call maps in the results section of this report. Gyug notes that there is no habitat in the SOSCP area that compares to the provincial benchmark for bear habitat. Further he indicates that “The maximum rating for the SOSCP area is proposed here as 3 (Moderately High or 26-50% of benchmark densities).” See also section 5.2

⁸ Further details about the development and content of data used in this report are provided in the South Okanagan-Similkameen Bear Smart Project Progress Report 2005-2006.

⁹ Fruit trees in orchards and fruit trees in backyards are not treated separately in the data.

¹⁰ For Princeton, Hedley, Missezula Lake, Tulameen areas, data records are limited to 2002-2005 fiscal years. This information was added when the project was expanded to include the entire RDOS. Earlier records for the added areas (i.e. 1999-2001) were not readily available.

conflicts. Caution is required in interpreting year- to-year differences because of changes in data recording methods over time¹¹.

5.2 Bear Habitat Model

Adapting the generic Black Bear account (BC "Wildlife Habitat Ratings" website: <http://www.env.gov.bc.ca/wildlife/whr/provincialex.html>) based on coastal black bears, a South Okanagan-Similkameen black bear habitat model was developed in 2006 by Les Gyug. The model followed RISC standards¹² and used Terrestrial Ecosystem Mapping (TEM) available for the study area included portions of the Churn Creek Black Bear species account as well as the Merritt TSA Black Bear species account. Additional modifications to the model, based on conditions specific to the South Okanagan, were added. This model provides a mechanism to rate habitat quality for black bears within the Study Area, but outside communities. The bear habitat ratings are overlaid on mapped COS bear sighting call data in order to discover associations between suitable habitats outside communities and bear location. The bear habitat model also identifies local habitat capacity to support bears outside communities.

5.3 Agricultural Crop Mapping

The information on bear attractants associated with calls to the COS and mapped locations of agricultural crops (including orchards and commercial beekeepers) are available in a GIS dataset. This information provides a way to seek associations between bear calls to COS and spatial locations of specific bear attractants. This information is included to identify concentrations of attractants that may encourage bears to move from their native habitat to populated communities or to concentrate in certain human use areas.

5.4 Mapped Human Use Sites

A spatial database of school, campsite, park and trail locations was established based on address lists supplied by RDOS and supplemental internet searches. These mapped human use sites provided a way to compare locations of bear calls with areas of focused human use and concern. This information was used to identify human-bear conflict priorities. Although calls about bears may be more likely in more populated areas and in areas associated with significant human use (e.g. schools/daycares/trails/parks), the increased numbers of calls also suggests increased concern about bear sightings by residents. Calls concentrated near a school or trail may become a priority for the development or implementation of strategies designed to reduce Human-Bear Conflicts.

¹¹ The COS call system was revised in 2001 when field office telephones were forwarded to a single call centre. Since then, callers are screened and their information is recorded centrally. Data collection prior to 2001 was by various individual local conservation officers. Anecdotal comments suggest that some local residents may be less likely to call for a number of reasons: 1) they are unaware as to who to call, 2) they cannot speak directly to their local CO, 3) they are worried the bear will be destroyed, or 4) they are tolerant of bear sightings. The call records being used are incomplete for area H (Princeton/Hedley).

¹² The Resources Information Standards Committee (RISC) sets BC Government standards for collection, storage, analysis, interpretation and reporting of inventory data.

5.5 Garbage Route and Landfill locations

Landfill locations and route data for Keremeos, Kaleden, Cawston, Westbench, Naramata, Okanagan Falls, Olalla, Princeton and rural Oliver is available from the RDOS/local communities. Garbage Routes for Princeton and other areas not named (e.g. Osoyoos, Summerland etc.) are not available at this time. The available information provides an opportunity to compare and identify: interactions between timing and locations of calls to the COS; timing and the route of garbage pick up; and landfill locations. These data may help identify priorities for bylaw establishment (e.g. curbside and storage restrictions and restricting bear access to landfills (i.e. fencing required to exclude bears).

5.6 Priority Mapping by COS experts

Expert interviews with local conservation officers were conducted in February 2007. Local officers were shown large scale maps of the regional district and asked to provide subjective human-bear conflict ratings based on their experience with local bear calls. Areas were rated from 1 to 3 where a rating of 3 identified a high priority area for addressing ongoing human-bear conflicts; 2 identified an area of moderate priority; and 1 an area of low priority. Only certain localized areas received one of these ratings. Rated areas were those areas that had been a focus of conservation officer activity (i.e. COs drove to the area, assessed the problems through interviews and other techniques, set traps for bears, destroyed bears, provided education, and/or issued dangerous wildlife protection orders¹³ in one or more years. These maps are included as part of the information available to establish priorities for action.

6.0 Results and Discussion

6.1 Conservation Officer Call Records

6.1.1 Study Area Attractants

Figure 2 shows the association of COS call records, with different attractants (based on a sample of approximately 750 call records¹⁴). Up to 3 different attractants were listed for each call. Records were analyzed by looking at only the first attractant for those data records listing attractants¹⁵. The figure shows that the two dominant attractants were garbage and fruit trees. 36% of call records indicated that garbage and 31% indicated that fruit trees were

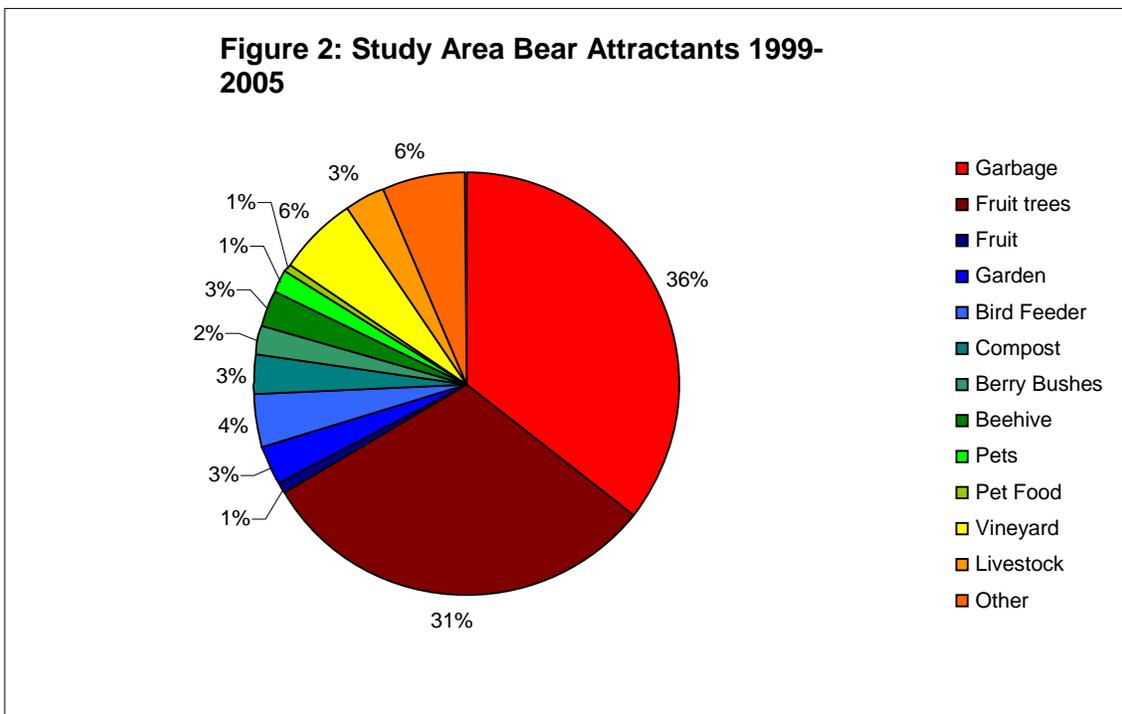
¹³ These orders are included as an option in the BC Wildlife Act (section 88.1). They allow Conservation Officers to issue orders to address attractants that could attract dangerous wildlife. The provision is available for review at http://www.qp.gov.bc.ca/statreg/stat/W/96488_01.htm

¹⁴ The total sample of calls with associated address and location information was 1300 records but approximately 42% of these calls (550) did not include information on attractants. Therefore, these calls were excluded for this particular analysis.

¹⁵ The data was also reanalyzed including all three attractant fields. This resulted in up to three records for some calls. The results were similar to those listed in figure 1 except that minor attractants scored slightly higher and garbage/fruit trees slightly lower. This second data analysis was excluded because all records were not equally independent (i.e. there were up to three records for some calls and only one for others).

present as attractants to bears. All other attractant categories were noted as the primary attractant in 6% or less of the calls.

These data should be interpreted cautiously. It is likely that both garbage and fruit are frequently associated with bear calls, but the relative proportions or extent of attractiveness of all the various types of “attractants” likely varies between individual bears. The attractants and extent of their attractiveness to bears may also be subject to change as development changes the proportion and availability of attractants. In addition, different callers may interpret bear behavior and bear attractants differently. There is no certainty that the items listed by callers were actually what attracted the bears or caused them to be present in the neighborhood.



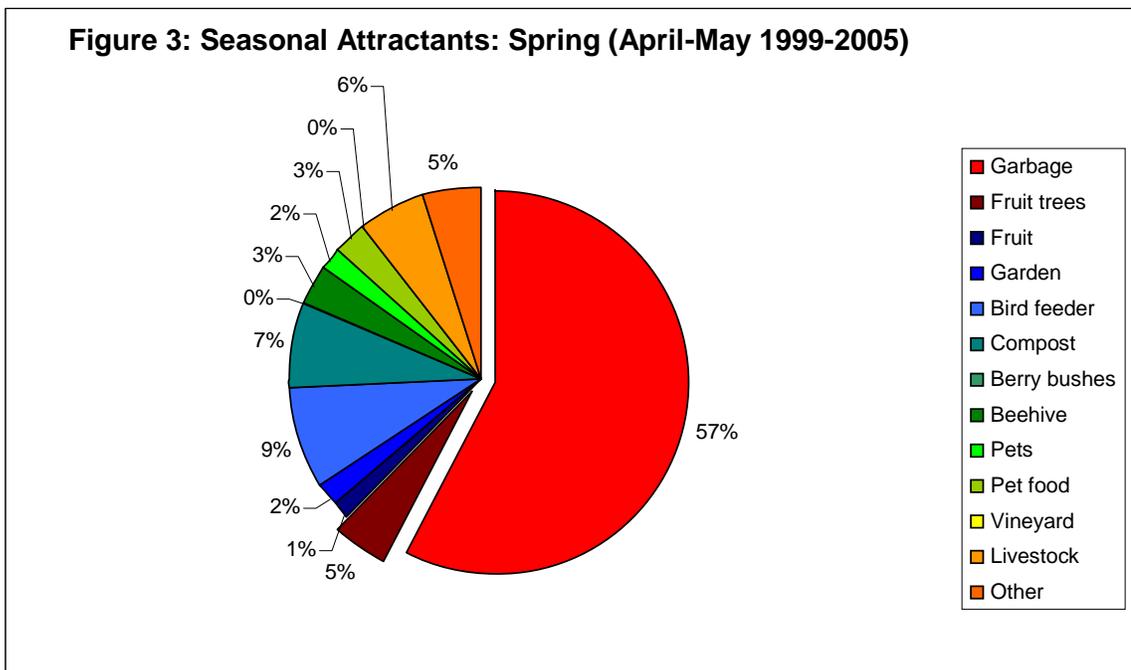
Furthermore, attractant categories accounting for low percentages of calls may be a reflection of low frequency occurrence of the attractant, or of low attractiveness of the food source to bears. Similarly, the COS caller data set may over-represent human-bear conflict incidents associated with back-yard fruit trees because fruit tree owners were more likely to seek help or be concerned about property damage than those who lose a dish of pet food to a bear¹⁶.

¹⁶ Commercial fruit growers may be less likely to call COS with bear sightings because COS is recommending orchard fencing rather than responding directly to property destruction complaints. Anecdotal evidence suggests local orchardists are using various strategies to address problem wildlife

At most, the attractant data suggests that bears are coming near homes to feed on garbage, fruit and other attractants. Also, a significant number of human-bear conflict calls to the COS are associated with fruit trees and garbage. Therefore, the management of these two common attractants may reduce the number of human-bear conflicts.

6.1.2 Seasonal Variation in Attractants

There were no obvious seasonal patterns in the occurrence of call records that listed no attractants. In spring, 41% of the records included no listed attractants. In summer, 46% of the records included no listed attractants. In fall, 40% of the records included no listed attractants.



including: tolerating losses, fencing-out wildlife, obtaining permits to destroy problem wildlife, or inviting local hunters to hunt in orchard areas.

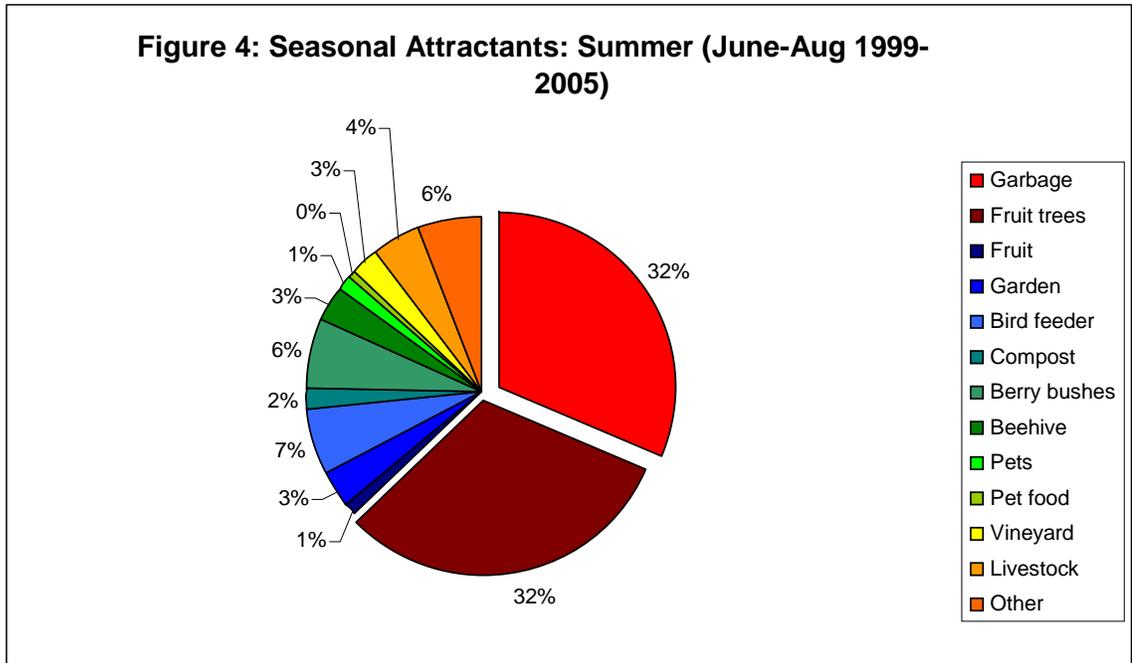
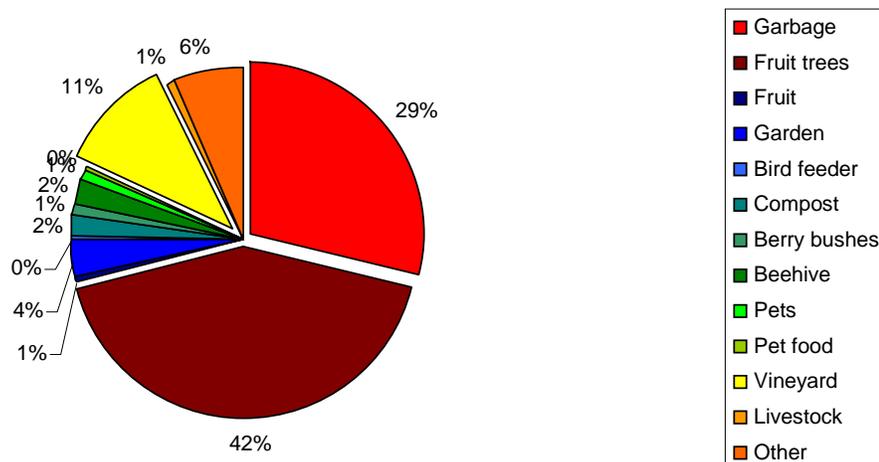


Figure 3, 4 and 5 indicate there is seasonal variation in the association of attractants and bear calls to the COS. In spring, for those calls where a primary attractant is listed, half the calls (57%) are associated with garbage as the primary attractants. The remaining attractant categories ranged from 1 to 9%.

In summer, for those calls where a primary attractant is listed, fruit trees and garbage are equally common (32% each). The remaining attractant categories range from 1 to 7%.

Figure 5: Seasonal Attractants: Fall (Sept-Oct 1999-2005)



In fall, for those calls where a primary attractant is listed, garbage has retained a similar percentage as that measured in the summer (fall: 29% versus summer 32%). Fruit trees are the most common primary attractant listed. 42% of the calls with listed attractants included fruit trees as a primary attractant. If all fruit or fruit bearing bushes, or vines are lumped together, this percentage rises to 55%. The remaining attractant categories range from 1 to 11% with vineyards rising from 0% (spring) and 3% (summer) to 11% in the fall and bird feeder falling from 9% (spring) and 4% (summer) to 0% in the fall.

Since fruit trees are blooming but do not bear fruit in the spring, results related to fruit could be explained by seasonal changes in attractiveness of fruit trees, berry bushes and vineyards to bears. Also, callers may be more concerned about bears in the local area when fruit trees carry ripe or ripening fruit. Seasonal differences in bird feeder attractants possibly result from changes in availability of that attractant and associated increases in the availability of other attractants such as fruit. Whatever the explanation, the association of attractants with calls to conservation officers appears to vary with the seasons. Garbage attractants appear to dominate in the spring whereas fruit attractants dominate in the fall.

Although we lack certainty about the causes of seasonal variations in call-attractant patterns, these data suggest that projects to address human-bear conflicts could consider seasonal variations in human-bear conflicts and their causes. Thus, education programs should help local residents understand the seasonal patterns, but should also indicate that efforts to reduce conflict must be made throughout the seasons of bear activity. Seasonal patterns can also be incorporated into management approaches by promoting proactive

actions to manage attractants. For example, garbage management could include fences to exclude bears from landfills, bear proof garbage storage, and bylaws to limit garbage availability on collection day.

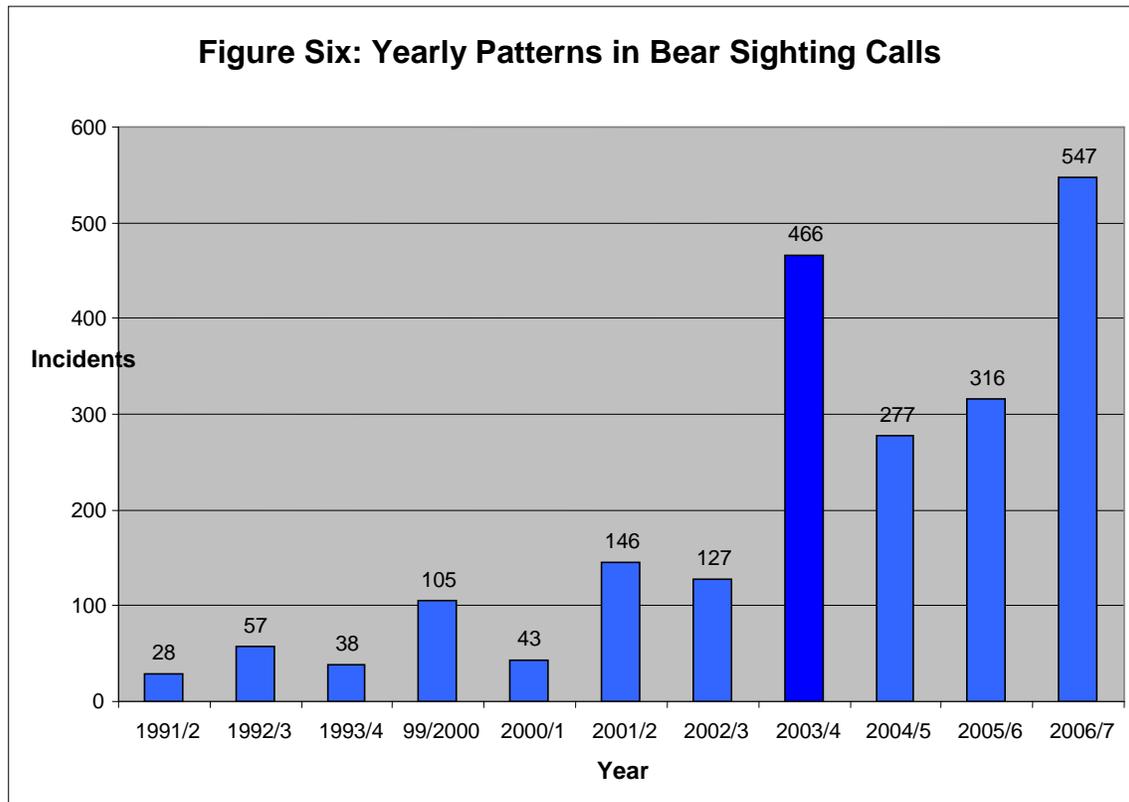
These provisions would be implemented throughout seasons of bear activity. In late winter-early spring, education and enforcement could focus on compliance with garbage management strategies to help avoid encouraging bears to habitually feed in local neighbourhoods. This approach might also reduce future issues with fruit depredations in summer/fall as could other actions. For example, actions to directly reduce fruit attractants could include: replacement of backyard fruit trees with less attractive species perhaps in partnership with the Sterile Insect Release Program (SIR); partnerships with food banks, The Okanagan Gleaners or other organizations that pick unwanted fruit; bylaws and education programs encouraging backyard growers to conduct regular clean ups of windfall fruit; and encouraging bear proof fencing for orchards. For fruit, education programs would begin in spring before fruit attractants were available and continue throughout the seasons of bear activity.

At a minimum, projects to address human-bear conflicts should consider the seasonal pattern in bear calls. Approximately 50% of the calls to the COS occurred in the two fall months (Sept-Oct), while approximately 20% of calls occurred in the two months of spring (April-May). In contrast, only 30% (approximately) of the calls to COS were recorded in the summer season although it was a month longer than the spring or fall time periods. Although this difference may be the result of local residents being on holidays (and thus unlikely to call COS), the increased local populations of visitors might tend to compensate for this effect. The data suggest that bears are not as abundant in urban and populated rural areas in summer or at least that they are not coming into conflict with people with as great a frequency as in fall. Summer may be a time when “natural” food resources away from populated areas are at their greatest abundance. Thus, bears may be less likely to seek food sources that place them in close contact with people.

6.1.3 Bear Attractant Kernel Analysis

Kernel analysis was used to compare the levels of attractants in an area and the relative travel resistance of the habitat to bears. Categories of known bear attractants were mapped based on assumptions about parcel density (i.e. areas of higher parcel density have more garbage) and attractants (various ratings assumptions were made about the relative attractiveness of agricultural attractants and their location either in rural or higher density/urban locations). Given the uncertainty within the basic data set and uncertainty about the accuracy of various assumptions (e.g. the model assumes that fruit

trees and vineyards equally attractive), this analysis has been excluded from the hazard assessment report¹⁷.



6.1.4 Yearly Patterns in Bear Sighting Calls

Figure 6 shows the year-to-year variation in bear calls (1991-1993 and 1999-2005.)¹⁸ There is an historical trend of increasing bear calls moving from 1991 to 2006/7. This is a consistent trend across the province possibly related to dry years and more frequent fires (Joanne Siderius, personal comm.). The larger number of calls in 2003 is likely due to several large local wildfires that occurred in August of that year. These fires apparently displaced a number of black bears into more developed local areas. These large scale displacements may have been partly responsible for the greater number of calls to COS after 2003 as compared to the years prior. Displaced bears may have learned the locations of local attractants and returned to those locations in later years. Also, fires may also have resulted in loss of feeding opportunities within bear habitat surrounding communities.

¹⁷ A discussion of this approach can be found in the South Okanagan-Similkameen Bear Smart Project Progress Report 2005-2006.

¹⁸ Because of the significant differences between 1991-1993 and 1999-2005, the earlier 3 years were excluded from the other data analysis included in this report; however these years were included in this section because they provide an historical context. Note that these yearly call numbers include repeat calls about the same bear.

Local conservation officers indicate that the relatively low number of calls about bears in the first three years of data (1991-1993) reflects a real trend toward overall lower numbers of human-bear conflicts in those earlier years. Since that time, large increases in local population and land development, and increasing recreation use of surrounding areas may have significantly altered local habitats and resulted in significant increases in human-bear conflicts.

These statistics are cause for concern, if they represent an increasing trend in human-bear conflict. Increases in calls to Conservation Officers could also be explained by increased human populations and local changes in neighborhoods (perhaps former city dwellers that are less tolerant and/or less experienced with bears are moving into more rural environments). Regardless of the reasons, bear calls are one indicator of human-bear conflicts. Various communities in BC have acted to address rising trends similar to those seen in the SOS area. Communities like Whistler, Canmore (Alberta) and Revelstoke have been successful in reversing these trends with a corresponding reduction in bear destructions, and risk to people and property. Despite these successes, occasional years with higher human-bear conflicts occur even in these communities thereby reinforcing the need for ongoing education and consistent implementation of measures designed to reduce conflicts.

Specific recommendations for the SOS area are provided in detail in the Conflict Management Plan. Some priorities are listed in section 7 (Recommendations) below.

Finally, Appendix 1 provides a summary table showing total black bear-related calls by community and year (April-March). These records include duplicate calls about the same bear either from the same or different addresses. They are included as an indicator of year to year patterns. Maintaining and enhancing this data base by adding information in future years should help to provide one indication of results/progress with Bear Smart initiatives. Note that these records do not include grizzly bear complaints because only 14 were received from 1999-2005.

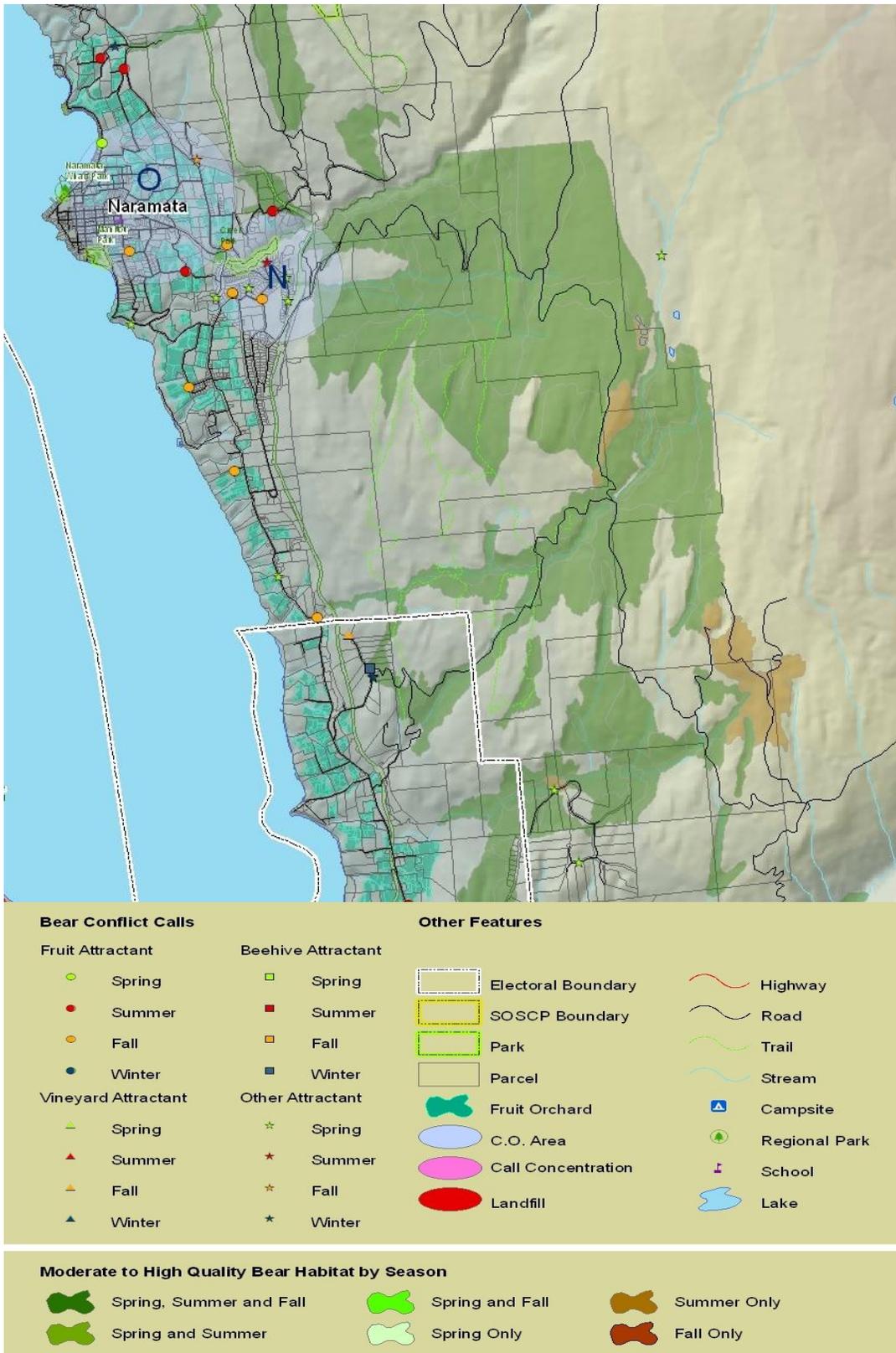


Figure 7: Sample Map of Fruit, Vineyards, Beehives and Other Attractants

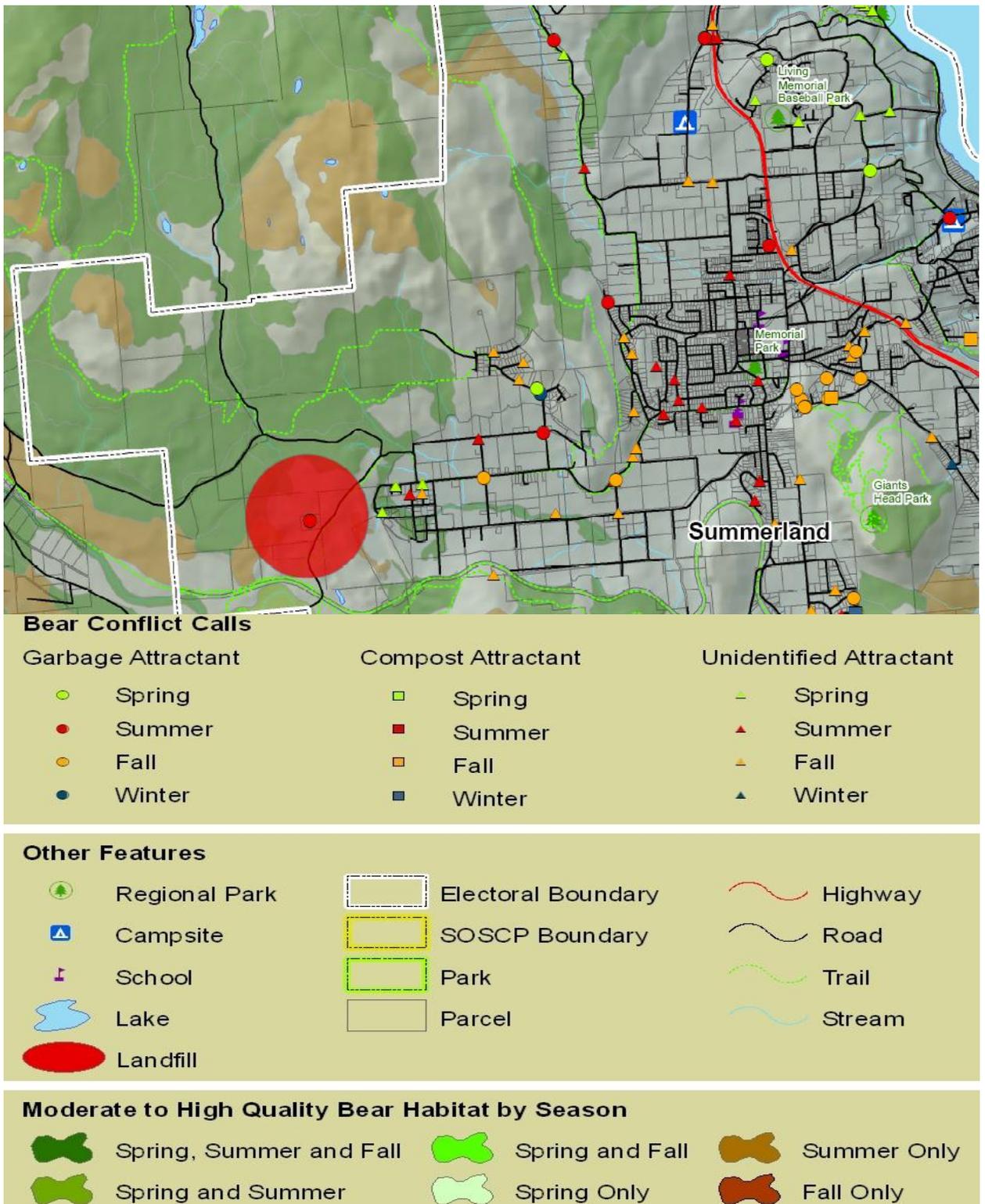


Figure 8: Sample Map of Garbage and Compost Attractants

6.1.5 Mapped Historic Human-Bear Conflicts

COS call data was also used to develop two series of 9 maps including the following areas: Penticton, Summerland, as well as RDOS Area A, BG, C, D east, D west, E and F. Locations of human use areas (schools, parks etc.) and landfill sites are plotted on both map series. The first map series plots locations where the caller mentioned fruit or fruit trees, vineyards, bee hives, and other¹⁹ attractants. This map series also provides an agriculture layer that locates commercial orchards (see figure 7 for example). The second map series plots locations where the caller mentioned garbage and compost attractants as well as locations where no attractants were discussed. These maps are included in a separate appendix (see appendix 4).

Both series of maps distinguish between the four seasons when calls occurred. Maps also provide graphs that distinguish the call year for areas where bear calls are concentrated. These graphs show evidence for the consistency of human-bear conflicts and will hence provide assistance in setting priorities. Area 2 (circled- Penticton garbage map), for example (see Figure 9, Figure 10), shows a higher concentration of bear calls, mainly in the fall season. The graph for area 2 (figure 10) shows almost all the calls originated in 2003. In contrast, circled area 1 on the same map shows a concentration of bear calls in a variety of seasons. The graph of call year for area 1 shows that calls originated in 5 out of the 6 years recorded. Thus, area 1 would be a higher priority for actions to address Human-bear conflicts than area 2, based on the mapped data.

¹⁹ The category “other” includes: berry bushes, bird feeders, gardens, barbeques, livestock, pets/pet food, and other unspecified attractants.

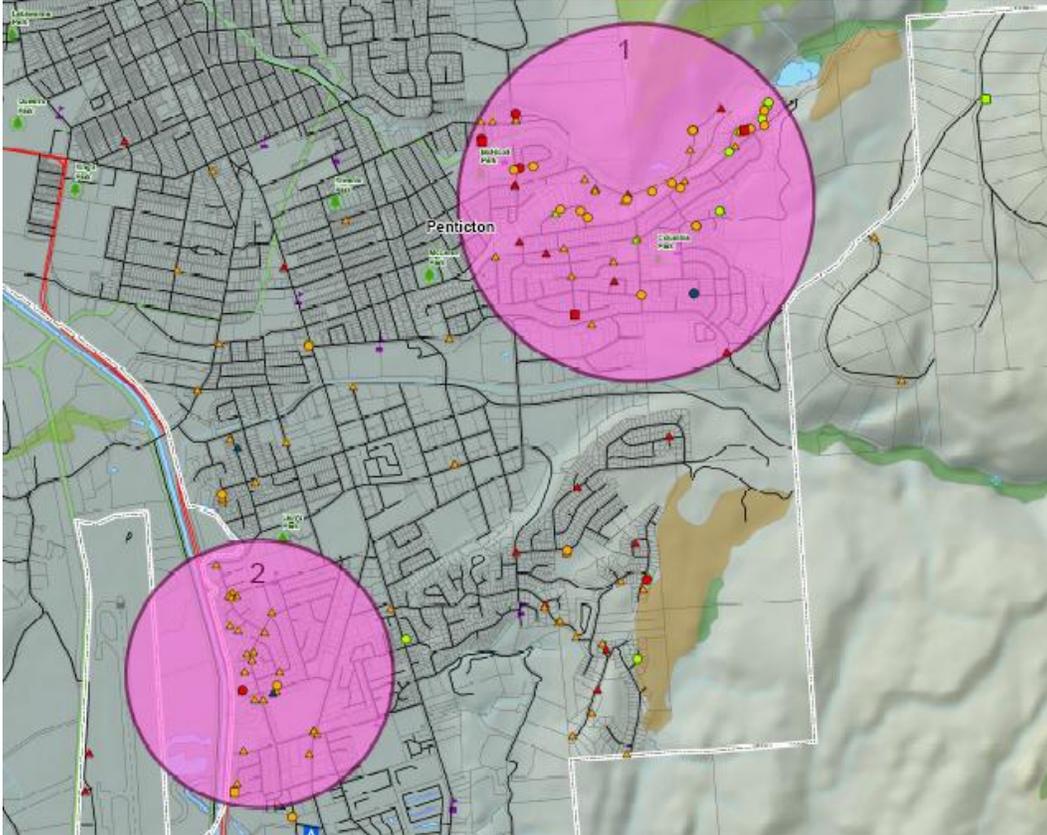


Figure 9: Area 1 and 2 on Penticton Garbage Attractant Map

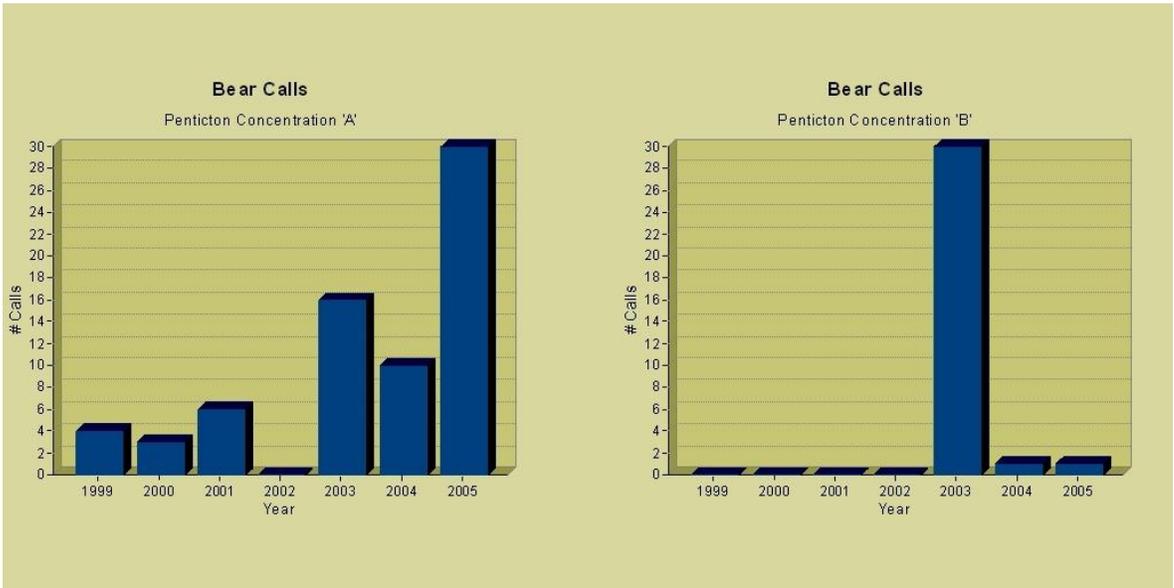


Figure 10: Graphs of Bear Calls vs. Year for Penticton Garbage map

Of course, other factors might also influence priorities. In general, these maps show the distribution of bear calls and show the concentrations of call locations (squares, circles, triangles and stars), particularly those associated with garbage attractants. Such concentrations of call locations were not observed on the fruit attractant maps, except in the Westbench/Sage Mesa Drive Neighbourhood (RDOS area F). These results suggest that garbage-habituated individual bears (or family groups) may be moving between neighbourhoods. Alternatively, neighbourhood concerns about garbage may be heightened in a certain area, possibly associated with human use sites like school or parks. The concentration of calls associated with fruit in the Westbench neighbourhood may also be explained by the heightened neighbourhood concerns associated with a school²⁰. Conservation officers note that problem bears may have been lured into this neighbourhood by an adjacent area that received unorganized and unauthorized garbage disposal (now closed). Bears that began by eating garbage at this site may have stayed to feed on fruit in the adjacent neighbourhood.

Another prominent trend observed in both map series is increasing numbers of bear calls from south to north. These findings are apparent even on the fruit maps despite the concentration of fruit growing in the Oliver and Osoyoos areas. These results are discussed further in the next section on the bear habitat model.

In addition to these general results, Appendix 2 provides a summary of specific findings associated with each of the maps generated.

6.2 Bear Habitat Model

Interpretations based on the bear habitat model are significantly limited because of the coverage available. TEM mapping is only available over parts of the SOSCP boundary and thus the habitat mapping does not provide coverage of higher elevations (i.e. not available for MS, ESSF, IMA zones) or anywhere outside the SOSCP boundary. The available bear habitat mapping suggests that the increasing incidence of bear calls moving from south to north might be at least partly explained by similar improvements in bear habitat quality from south to north²¹. Unexpectedly, differences in bear call data were not detected with similar observations of differences between west facing (habitat on east side of valley is poorer) and east facing (west side of the valley is better) areas.

Interpretation of habitat influences is compounded by the apparent influence of agriculture modifications of bear movements. Agricultural lands appear to help

²⁰ The concern may not be so much the school as the presence of children within the neighborhood and their potential vulnerability when they are outside on school grounds or walking/biking to/from school.

²¹ Other explanations for this difference may also exist. For example, local residents of smaller (southern) communities may be less likely to telephone a conservation officer to address human-bear conflicts. While there may be local differences in communities, this does not explain the overall pattern within the SOS boundaries given that even small communities like Ollala have a disproportionately high concentration of bear calls.

support more bears than would otherwise occur²². These modifications are not integrated into the model, which is based on unmodified (native) habitats. There is no basis to integrate native and modified habitats since Resource Inventory Standards Committee (RISC) models do not typically address human-modified habitats.

Thus, although climate, vegetation and water availability vary within the SOSCP, the model is insufficient to fully detect their influence. There are options to improve the model as PEM mapping extends to areas outside the SOSCP boundary. This would help with understanding of landscape habitat values for undeveloped areas. Also, the effects of climate change are being registered in the local area and are predicted to influence biogeoclimatic zones and habitat suitability for a wide variety of species. Climate change may significantly alter habitat values, vegetation as well as influencing bear behaviour in the coming years.

A noticeable trend on some of the map sheets was the apparent absence of fall bear habitat. It is hard to know, however, if this limitation is real, given a bear's ability to move between habitats. If fall habitat is limited or of lower quality, this may partly explain the extent of bear calls in fall, particularly given the bear's fall demand for high-energy food, a requirement for successful hibernation.

6.3 Agricultural Crop Mapping

Ministry of Agriculture and Lands has recently completed some work mapping locations of agriculture in the RDOS. Categories mapped included commercial orchards. This layer is included on the map series with bear calls linked to fruit attractants. It provides an opportunity to compare locations of commercial orchards with human use locations and may be useful in setting priorities for addressing human-bear conflicts. In communities like Summerland and Westbench/Sage Mesa (RDOS area F) where schools are located in areas with a concentration of bear calls, this agricultural map layer may provide insight about how the distribution of fruit trees, orchards and human use areas influence bear behaviour.

The agricultural mapping layer helps to explain why bear calls associated with fruit attractants are not clumped as are many of the bear calls associated with garbage attractants. The orchard mapping shows the wide extent of fruit orchards within the study area. Even this mapping tends to underestimate the extent of fruit availability as it does not address hobby orchards or back yard trees. Options to improve on fruit mapping information may exist through partnerships with the Sterile Insect Release Program (SIR) and as new mapping is developed (e.g. maps of vineyards). The SIR program has mapped a number of species of backyard fruit trees and is involved in a project to replace these

²² Anecdotal data from local COS suggests black bear females with twins and triplets have become progressively much more common along with vineyard and orchard development.

trees or manage fruit to address Coddling Moth. There may also be some common education objectives between this program and Bear Smart.

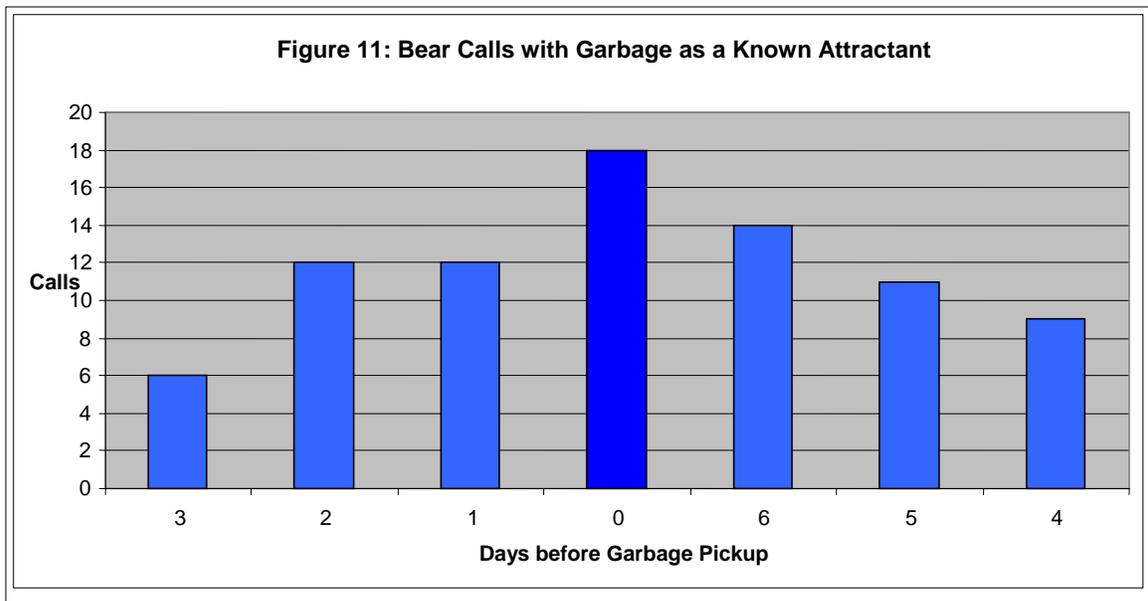
The agriculture mapping of orchards confirms that fruit attractants are widespread within the SOS. This wide distribution likely provides at least part of the explanations for the lack of call concentrations related to fruit attractants. Unfortunately, similar maps of available garbage attractants are not available. We do not know whether call concentrations associated with garbage result from garbage concentrations, local caller behaviour, sensitivity related to human use sites, more conflict prone behaviour of garbage-eating bears or other factors. Work from other areas appears to suggest that bears that consume garbage frequently come into conflict with humans and are more likely to be destroyed (Brown, 2001; Stringham, 1989).

6.4 Mapped Human Use Sites

A map layer that identifies schools, regional or local parks and trails was developed during the preliminary work in 1995. This layer helps to highlight sites where attractants and human use sites overlap concentrations of bear calls. In some cases, bear calls were concentrated in neighbourhoods near schools or local parks. These sites could be selected as a priority for future actions such as warning signs, bear proof containers, education, bylaw enactment, and other options. Further discussion of detailed locations is provided in Appendix 2.

Although interface areas are not specifically mapped, properties on the edge of bear habitat can influence bear behaviour. As the first point of contact, rural properties may have the potential to either promote or reduce the likelihood of bears moving into more populated neighbourhoods. For example, there are a number of bear calls associated with the campground and properties at the north-west corner of Skaha Lake. Management of garbage, fruit and other attractants in this area might prevent local bears from moving from the campground to the more developed areas in Penticton.

Small communities surrounded by suitable undeveloped habitat (areas like Olalla for example) are likely to be visited occasionally by bears. Management of attractants in “buffer” areas could reduce human-bear conflicts.



6.5 Garbage Route and Landfill Locations

Bear call data was also compared to garbage route information to assess if there was a possible relationship between the day garbage was collected and the number of bear calls. It was not known if bears have learned to associate garbage day with improved feeding opportunities and therefore if bear calls in a neighbourhood were more likely on garbage days (when neighbourhood cans would be placed at the curb for pickup). Figure 11 shows the relationship between bear calls and days of the week where day zero is the day of garbage pickup. Only calls where garbage was mentioned as an attractant were used. There appears to be a trend. Bear calls are more frequent on garbage day and gradually less frequent as time from garbage day increases. These differences are not sufficient to draw conclusions because of inadequate sample sizes²³ but they suggest that garbage supply may be influencing bear behaviour. These data also support anecdotal evidence that bears respond to patterns in the timing of garbage availability (Austin, 1995).

Landfills were also plotted on maps. The Campbell Mtn. landfill is fenced to exclude bears. There are unfenced landfills located at the following locations: Oliver, Summerland, Princeton and Osoyoos. Keremeos has a waste transfer station which is also unfenced. Okanagan Falls landfill is unfenced, but household garbage is not processed at that location. The District of Summerland, the Town of Princeton and the Town of Osoyoos operate their own landfills; the remaining landfills and transfer station are operated by the regional district. To reduce human-bear conflicts, it is a high long-term priority to enclose all landfills

²³ Limited historical data on garbage routes resulted in elimination of data collected before 2003. Since many calls did not list garbage as an attractant, these data were also eliminated. Finally, some areas do not have curbside pick up. The result was small sample sizes.

receiving garbage attractants (e.g. household garbage) with electric fencing²⁴. Since landfills (even fenced landfills) can attract bears from significant distance, landfill locations also may be points of first contact between bears and the community. Bears that move into the community may initially be attracted to landfills and enter the community first at these sites. Thus, management of attractants in the local area surrounding the landfill may be particularly important. Landfill fencing is sometimes initiated gradually because of concerns about landfill-habituated bears moving into communities with associated increased potential for human-bear conflicts. Stringham (1989) references observations of this behaviour and locally this has been noted both in Revelstoke and Ootischenia, outside Castlegar (Joanne Siderius, personal comm.). Locally, conservation officers and RDOS staff have experience using a planned approach to installing fencing at the Campbell Mtn. site and address landfill-habituated bears.

6.6 Priority Mapping by COS Experts and Comments about Local Attractants

A total of 26²⁵ areas were rated by experts as 1 (low), 2 (moderate) or 3 (high). These areas are found on the fruit map series Figure 7 shows examples of these areas shown as the circles labeled N and O. Area N is rated as high priority 3 whereas area O is rated moderate priority 2. In addition to maps in this series, a single map shows priority areas for area H (rural areas as well as communities like Princeton, Hedley, Tulameen, Coalmont and area.

Appendix 2 lists the priority areas by map sheet including the issues associated with these areas and possible conflict management actions for these areas. These areas are typically areas of bear call concentration, and/or locations that stand out as locations where conflict resolution solutions are available. These ratings emphasize garbage issues over fruit because Conservation Officers have found that food-conditioned bears (i.e. garbage eaters) tend to be less fearful of humans (i.e. habituated to humans) and are more likely to be a threat to public safety. They note that many fruit-eating bears adopt nocturnal habits, a strategy that tends to reduce their exposure to humans. Nevertheless, of the bear calls resulting in bear destructions in 2006/2007, more were associated with fruit attractants than garbage. These results are preliminary (first year for monitoring this statistic) and may reflect year to year variation or uncertainty about bear habits (i.e. bear killed in an orchard may also be food-conditioned to garbage).

Local conservation officers note that some growers have constructed fencing to exclude bears and prevent future property damage; others are relying on hunters to remove problem bears. Outside of no-shooting areas, earlier onset of local

²⁴ Creston has managed to avoid bear problems by stringent management of garbage without electric fencing for the whole landfill. In Creston, managers oversee regular turnover within the land fill and an electrified fence encloses the area where garbage attractants are temporarily stored.

²⁵ This includes 18 areas shown on map plus 1 additional priority area located within the regional district but outside the SOSCP TEM-mapped area.

hunting seasons and partnerships with local sportsman's organizations may help to provide growers with the option of phoning a local hunter directly to request removal of a problem bear²⁶. Many growers are probably tolerating bears feeding on windfall or tree fruit and COs are not typically responding to bear calls in commercial orchards and vineyards, but instead recommending options for electric exclosure fences.

Bears feeding on backyard fruit trees and associated human-bear conflicts may also increase as subdivisions expand into bear habitat, and as old orchards are converted to denser, more fragile spindle trees or subdivided. The capacity of local neighborhoods to safely support bears feeding exclusively on local fruit trees is unknown, and it is difficult to predict what would occur if the majority of commercial orchards and vineyards were fenced to exclude bears. If hungry bears are displaced from feeding in larger orchards, they may move to feeding more exclusively in back yards. There may be similar concerns with this displacement as there were with landfill closures, particularly if bears also encounter other attractants in those back yards. A local Working Group to explore commercial agricultural bear-human conflicts has been established.

7.0 Recommendations

The following are a list of recommendations (all high priority) for the enhanced understanding and interpretation of the SOS Bear Hazard Assessment.

High Priority:

1. Revise park and trail information as needed and identify bear movement corridors where possible in hazard assessment. **Substantially complete; some confirmation by experts still required.**
2. Present bear hazard assessment maps and major report findings to Regional District and interested local communities through Bear Stewardship Committee. **3 presentations completed.**

Bibliography

Austin, Robert. 1995. Bad news bears (garbage-eating bears). Internet article on *HighBeam Encyclopedia*. www.encyclopedia.com/doc/1G1-16971727.html

Brown, Gary. 2001. *Outwitting Bears*. New York: Lyons Press. 208pp.

Gyug, Les. 2006. Penticton Bear Smart Program Black Bear Account. Unpublished document. 14pp.

²⁶ Partnerships with the proposed *Provincial Agriculture Zone Wildlife Program* are possible. This program is being initiated by MOE. Its purpose is to recognize special agriculture zones with specific hunting objectives and opportunities.

Platt, Steve. 2006. South Okanagan-Similkameen Bear Smart Project Progress Report 2005-2006. Unpublished document. 40 pp.

Stringham, S.F. 1989. Demographic Consequences of Bears eating garbage at dumps: An Overview. Bear-People Conflicts- Proceedings of a Symposium on Management Strategies. M. Bromley, ed. Northwest Territories Department of Renewable Resources: 35-42.

Appendix 1: Total Black Bear-related Calls by Community for the Periods 1991-1993; 1999-2007

	Total Black Bear-related Calls by Community 1991-2007										
Year **	1991/92	1992/93	1993/94	1999/2000	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06*	2006/07
Community											
Apex	0	0	0	0	0	0	0	1	1	0	n/a
Faulder	0	0	0	0	0	0	0	0	3	0	n/a
Hedley	n/a	n/a	4	n/a	n/a	n/a	5	6	4	3	9
Kaleden	4	1	1	8	2	2	19	40	9	54	16
Keremeos	3	4	1	6	3	3	6	12	6	8	17
Naramata	0	3	6	9	4	23	2	11	4	42	96
Okanagan Falls	2	3	1	12	3	30	12	69	44	13	9
Ollala	1	1	6	0	0	2	2	7	17	13	39
Oliver	1	2	1	0	2	2	3	66	56	10	12
Osoyoos	0	1	0	5	1	8	3	7	6	5	3
Penticton	12	26	12	24	16	32	25	118	45	77	99
Princeton	n/a	4	2	n/a	n/a	n/a	34	46	34	26	26
Summerland	3	12	4	32	9	31	38	63	48	64	221
Tulameen	n/a	n/a	n/a	n/a	n/a	n/a	3	3	0	0	n/a
Unknown	0	0	0	0	0	0	0	1	0	1	n/a
Westbench	2	0	0	9	3	13	17	72	41	26	n/a
Willowbrook	0	0	0	0	0	0	0	0	1	3	n/a
Total Complaints	28	57	38	105	43	146	169	522	319	334	547

* 4th month – 11th month

** years are 4th month of 1st year to 3rd month of 2nd year

n/a means no data available

Appendix 2: Tabulated Hazard Assessment Comments and Priorities Identified by Area - Based on Fruit and Garbage Maps

Location	Maps	Conservation Officer Priority Areas	Call Concentration Area
Osoyoos and rural Osoyoos	elect_A_fruit_2009 elect_A_garb_2009	area B (low priority)	None

Key findings:

Bear Call Data: bear calls in all 4 seasons; fewer points than RDOS areas to the north; data isn't aggregated/tends to be linear and associated with commercial orchards but orchards also tend to be common and linear in their locations.

Garbage: only 3 points including 2 garbage, 1 compost suggesting garbage attractants may not be a major concern yet, or else locals not calling COS; priority for management of attractants in residential/farming areas immediately adjacent to the landfill; consider dump fencing if food attractants to be present in long term;

Fruit: Despite the extensive agricultural development in this area and abundance of local orchards, bear calls in this area remain very low

Other attractants: high variety of attractants reported; in addition to fruit and garbage: beehives, livestock, compost, birdfeeder and pet food are all listed; of these livestock and beehives are more common than expected

Bear Habitat Model: Indicates the presence of spring and summer habitat, but suitable native fall habitats appear to be significantly limited; overall (of areas mapped in RDOS), habitat appears poorest in this area

Agricultural Crops: Abundant fruit crops present; Very significant fruit attractants available

Human Use Sites: Priority areas of concern for management of attractants (garbage particularly) would be campgrounds on east shore of Osoyoos Lake (adjacent to orchards/vineyards); subdivision on Anarchist and Willowbeach area.

Conservation Officer Priority Areas: Area B associated with beehives and fruit trees; enhanced fencing could help address conflicts at this location

Call Concentration Area: none

High Priority Recommendations: Focus on enhancing understanding of issues associated with commercial fruit attractants; bear-proof fencing Osoyoos landfill

Location	Maps	Conservation Officer Priority Areas	Call Concentration Area
RDOS Electoral Area BG (Keremeos/Cawston/Ollala and associated rural areas)	elect_BG_fruit_2009 elect_BG_garb_2009	U (low priority)	Area 3

Key findings:

Bear Call Data: Limited data points; calls associated with fruit attractants slightly more common than garbage points; bear calls are focused on the area associated with Olalla as well as a few in Keremeos/Cawston and Hedley

Garbage: rural areas pose some unique challenges; management of garbage attractants may be top priority in small rural communities; concentration of bear calls in small community of Olalla related both to compost and garbage; garbage issues are in spring, summer and fall; priority for management of attractants in residential/farming areas immediately adjacent to the landfill; consider landfill fencing if food attractants to be present in long term;

Fruit: bear calls (associated with fruit) are moderate; lower than more northern areas but slightly higher than Osoyoos

Other attractants: pets, pet food bird feeder, livestock, beehive and garden also mentioned; again beehives were more common than expected (9 calls in a variety of areas)

Bear Habitat Model: Similar to area A; fall habitats limited although more present than area A; this maybe more a consequence of terrain in the area and extent of available TEM mapping

Agricultural Crops: Abundant fruit crops present; Significant fruit attractants available; bears maybe focusing as much on beehives associated with pollination of fruit crops as on the fruit crops themselves

Human Use Sites: Given proximity of schools (Hedley/Keremeos) and parks to fruit and riparian areas on this map, priorities include bear proof garbage containers/management of fruit attractants (for any adjacent fruit trees)

Conservation Officer Priority Areas: Area U: Hedley-fruit trees in residential areas, Hedley creek is bear movement corridor, Pub has issues with grease barrels and garbage in shed; CO estimates 15-20 complaints per year (not all in database); 2002? is remembered date of last bear destroyed associated with pub; address issues by education and bear-proof garbage containers as needed

Call Concentration Area: call concentration area 4 associated with Olalla; primary attractants listed are compost and garbage but minor indication of fruit attractants as well; recommend bear-proof garbage containers, education/support related to management of fruit attractants and enhanced monitoring of bear calls

High Priority Recommendations: Focus on enhancing understanding of issues associated with commercial fruit attractants; bear-proof fencing Keremeos transfer station; managing attractants in Ollala (bear proof garbage containers; education/support to manage fruit attractants; enhanced monitoring).

Location	Maps	Conservation Officer Priority Areas	Call Concentration Area
RDOS Electoral Area C (Rural Oliver, Willowbrook) and Oliver	elect_C_fruit_2009 elect_C_garb_2009	areas C (low priority) and D (low priority)	Area 4

Key findings:

Bear Call Data: bear calls associated with fruit most common; garbage related bear calls are focused on areas immediately north and on outside boundary of Oliver

Garbage: garbage issues found in spring-fall focused on areas just north of Oliver; bear-proof garbage cans especially associated with human use sites might significantly reduce issues with garbage. Oliver landfill not far from Spring, Summer bear habitat and local movement corridors; priority for fencing if food attractants are going to be present in long term

Fruit: Extensive agriculture (fruit/vineyards) associated with the highway/low elevation area); significant bear calls associated with fruit; more than Osoyoos or Keremeos

Other attractants: Bird feeder, compost, beehive, pet food, garden and livestock reported; beehives mentioned much less than adjacent areas; garden which could also include commercial farms were more common as were calls with no attractant listed (could indicate education need or reflect locals response to COS priorities)

Bear Habitat Model: map indicates poor habitat on east slope (west facing areas), immediately west of Tuc-el-nut lake and south of Willowbrook

Agricultural Crops: abundant in area with associated focus of bear calls linked to fruit attractants; could be a priority area for addressing bear impacts to fruit

Human Use Sites: Local campgrounds are priority areas of concern for management of attractants (likely both garbage and nearby fruit attractants); see also COS priority mapping

Conservation Officer Priority Areas: area C: Garbage (minor issue is fruit trees); local lots are hobby farms with a few old orchard tree on each property; options to address include: RDOS Garbage Storage/Fruit Attractants Bylaw; Bear Aware Education; area D: Campground and retiree trailer park between Gallager and Tuc-ul-nuit. Garbage attractants are the issue; options to address include: RDOS Garbage Storage/Fruit Attractants Bylaw; Bear Aware Education

Call Concentration Area: call concentration area 4 associated with campground; same area recommended as COS priority area D; note most calls were in two years.

Highest Priority Recommendations: Focus on enhancing understanding of issues associated with commercial fruit attractants; fencing Oliver landfill

Location	Maps	Conservation Officer Priority Areas	Call Concentration Area
RDOS Electoral Area H (North of Princeton, SE Area H, Tulameen, Coalmont, Missezula Lake, Bankeir (Chain/Osprey Lakes) and associated rural areas such as East Gate near Manning Park)	elect_H_fruit_2009 elect_H_garb_2009 map of area T	areas T, W, X , Y, Z(moderate priority)	None

Key findings:

Bear Call Data: bear call data for 2001-2005 only

Garbage: Concerns in rural areas where local landfills are not available and people store garbage prior to trucking it to the Princeton landfill; animal proof garbage storage is a priority for these areas. Use of bear-proof containers is recommended.

Fruit: Chokecherry and wild berry bushes more of a problem in this landscape than fruit orchards with are not common in this landscape.

Other attractants: significant issue in area H in general; education about bear attractants would be helpful

Bear Habitat Model: bear habitat mapping not currently available

Agricultural Crops: Not mapped in this area; some backyard fruit trees

Human Use Sites: Map doesn't show all the areas; there are MOF (rec sites) or province (provincial parks) within the area.

Conservation Officer Priority Areas: Area T: East Gate has occasional problems with garbage attractants; address by education as needed and bear-proof garbage containers; Recommendations specified for areas W, X, Y and Z in Appendix 3; not enough bear data points plotted to provide additional advice. [Note: many of the complaints do not get recorded in database because Princeton CO is well known to local residents; he gets calls at home.]

Highest Priority Recommendations: Focus on enhancing understanding of issues associated household/yard attractants and bear proof solid waste systems.

Location	Maps	Conservation Officer Priority Areas	Call Concentration Area
RDOS Electoral Area H (Princeton)	Princeton_fruit_2009 Princeton_garb_2009	area V (high)	None

Key findings:

Bear Call Data: bear call data for 2001-2005 only

Garbage: landfill currently unfenced; anecdotal reports from COs and others of bears and other wildlife at the dump, although the bear calls are not aggregated near the landfill due to buffer between settled area and landfill; benefits of fencing landfill would be reduced issues associated with landfill deer population (20+animals) feeding on prunings as well as reduction in bears moving garbage into the bush and creating potential health issues

Fruit: Chokecherry and wild berry bushes more of a problem in Princeton than fruit orchards which are not common in this landscape.

Other attractants: dominate the Princeton map; include a range of different attractants with [wild] berry bushes, bird feeders, and vegetable gardens being most common.

Bear Habitat Model: bear habitat mapping not currently available

Agricultural Crops: N/A

Human Use Sites: Princeton School/city park; other congregation areas managed by MOF (rec sites) or province (provincial parks).

Conservation Officer Priority Areas: Area V: Princeton- unfenced landfill; chokecherries south of town on Tulameen River and elsewhere; estimated 100-150 complaints per year; address by fencing landfill and chokecherry management if possible; [Note: many of the complaints do not get recorded in database because Princeton CO is well known to local residents; he gets calls at home.]

Highest Priority Recommendations: Focus on enhancing understanding of issues associated household/yard attractants; fencing Princeton landfill to address bear attractants and other wildlife conflicts.

Location	Maps	Conservation Officer Priority Areas	Call Concentration Area
Penticton	Penticton_garb_2009 Penticton_fruit_2009	None	Area 1,2

Key findings:

Bear Call Data: noticeable call variation (5-15 calls per year with 2003 showing the largest number of calls (fire/dry summer with failed native berry crops); also appears to be a trend of gradual increase in bear calls

Garbage: bear calls for which no attractant was identified dominate the garbage map (bear calls associated with garbage attractants also common); within call concentration areas, numbers of calls associated with garbage and unidentified attractant were equally common suggesting that garbage may dominate in these areas; garbage is an attractant in all 3 seasons (spring-fall)

Fruit: •Most calls reference fruit (rather than vineyard, beehive or other) and occur in fall; Points not aggregated but associated with commercial orchards or suggest possible travel routes by bears

Other attractants: calls associated with other attractants were fairly common and included bird feeder, livestock, pet food, pets, barbeque, compost, beehives and garden

Bear Habitat Model: mapped bear habitat appears noticeably more abundant on west side (east facing) than west side (west facing)

Agricultural Crops: commercial orchards abundant along the parts of east side Okanagan and Skaha Lakes within city limits

Human Use Sites: schools, parks and trails associated with Penticton Creek (including Columbia/Carmi/ Upper Carmi) would be a priority for signs, bear proof garbage containers, and management of adjacent fruit attractants; the neighbourhoods adjacent to Ellis Creek including camping areas/beaches along the north end of Skaha beach

Conservation Officer Priority Areas: None within city of Penticton; although several circles overlap, the focus of those areas is outside the city

Call Concentration Area: two call concentration areas (1 and 2); histogram on garbage map indicates that area 2 problems were limited to the dry year/major fires (2003) - no action recommended at this time; bear calls appear to be increasing associated with concentration area 1:

Highest Priority Recommendations: Management of garbage attractants through education, bylaws, bear proof garbage containers

Location	Maps	Conservation Officer Priority Areas	Call Concentration Area
Summerland	Summerland_garb_2009 Summerland_fruit_2009	area R (high priority)	None

Key findings:

Bear Call Data: noticeable variation in calls (2 in year 2000 to 21-21 calls in (2002, 2003 and 2005); highest number of bear calls associated with any community in the RDOS and highest number of calls in 2005

Garbage: bear calls are dominated by those associated with garbage and those for which no attractant was identified; calls aren't as noticeably aggregated as they are in Penticton; they are all over the area; Landfill located at the end of a bear movement corridor, between quality bear habitat and the community; this is the highest priority for fencing of a landfill to exclude bear from household garbage attractants

Fruit: Fruit calls are not necessarily associated with commercial orchard mapped areas; Calls are distributed across Summerland/ not aggregated even in COS priority area

Other attractants: calls associated with other attractants were fairly common and included bird feeder, livestock, pet food, pets, barbeque, compost, beehives and garden

Bear Habitat Model: mapped bear habitat abundant and high quality to west of community

Agricultural Crops: commercial orchards abundant and within and adjacent to developed residential areas in Summerland

Human Use Sites: schools, parks and trails especially those associated with bear movement corridor (trout Cr) behind the landfill.

Conservation Officer Priority Areas: One COS priority area (Area R) in Glen fir /Giant's Head subdivision; lots of trees and mini orchards; fruit and garbage; interface area; garbage storage issue; proximity to school; COS recommend education, fruit attractants management and waste bylaws as well as a focus on areas associated with local schools.

Call Concentration Area: none

Highest Priority Recommendations: Focus on enhancing understanding of issues associated with commercial fruit attractants; fencing Summerland landfill; bylaws to manage attractants/education especially Glenfir/Giant's Head neighbourhoods

Appendix 3: Comments and Ratings for Conservation Officer Priority Areas²⁷

Map Name	COS Priority Area	Priority Rating	Identified Issues	Possible Measures to address Issues
Area A	B	1	Fruit and Bees	Commercial fruit/vineyards; Upgrade Fencing
Area B/G	none			
Area C	C	1	Garbage (minor issue is fruit trees); local lots are hobby farms with a few old orchard tree on each property	RDOS Garbage Storage/Fruit Attractants Bylaw; Bear Aware Education
	D	1	Campground and retiree trailer park between Gallager and Tuc-ul-nuit. Garbage attractants are the issue.	RDOS Garbage Storage/Fruit Attractants Bylaw; Bear Aware Education
Area D east	H	2	Tickleberrys ice cream; adjacent to Shuttleworth Cr movement corridor. Garbage attractants are the issue	RDOS Garbage Storage/Fruit Attractants Bylaw; Bear Aware Education; bear proof garbage containers; public information signs
	I	2	Heritage Hills area; Garbage attractants are the issue	RDOS curbside pick up bylaw; Bear Aware Education
Area D west	E	2	St. Andrews golf course area; interface area near bear habitat; garbage and grease management	Use Wildlife Act DWP; RDOS Bylaws to address attractant management; bear-proof garbage containers; public education; public safety signs?
	F	2	Twin Lake Golf course; Community housing; Mtn ash along the golf course; non-bear proof dumpster; fruit trees in campground	Public education; bear proof garbage containers; RDOS Bylaws to address attractant management; options to manage fruit trees (pick fruit, gleaners, replacing attractant trees etc.)

²⁷ These comments apply to the Conservation Officer Priority Areas shown on the detailed fruit maps.

Map Name	COS Priority Area	Priority Rating	Identified Issues	Possible Measures to address Issues
	G	2	Trout lake area; Garbage at local residences is the issue	Public education; bear proof garbage containers; RDOS Bylaws to address attractant management
	J	1	Kaleden; fruit attractants and garbage attractants at local campground	Bear proof garbage containers; Public education; RDOS Bylaws to address attractant management
	K	1	Apex Mtn; garbage attractants are the issue	Opportunity to require bear-proof dumpsters/garbage storage, grease management and other measures as need to require attractant control as condition of future development permit
	L	3	NW corner of Skaha Lake; grapes on deck; garbage management; plum trees	RDOS Garbage Storage/Fruit Attractants Bylaw; Bear Aware Education
	M			see area F
Area E	N	3	primary issue is garbage storage; secondary is fruit	RDOS Garbage Storage/Fruit Attractants Bylaw; Bear Aware Education
	O	2	garbage; possibly backyard fruit	RDOS Garbage Storage/Fruit Attractants Bylaw; Bear Aware Education
	P	1	commercial fruit; interfaces with bear habitat; occasional grizzly; problem area during Okanagan Mtn Park 2003 fire	Help develop information on Exclosure Fencing; build on COS and information available for reference
Area F	M	2	Penticton Indian Reserve and adjacent Westhills, West bench and Sage Mesa subdivisions; unofficial garbage "dump" on reserve & fruit attractants/ garbage in nearby subdivisions	RDOS Garbage Storage/Fruit Attractants Bylaw; Bear Aware Education; focus on area around the West Bench school

Map Name	COS Priority Area	Priority Rating	Identified Issues	Possible Measures to address Issues
	Q	3	fruit attractants/ garbage in Westbench/Sage Mesa Dr. subdivision;	address by RDOS Garbage Storage/Fruit Attractants Bylaw; Bear Aware Education; focus on area around the West Bench school;
Summerland	R	3	Giants Head Mtn; lots of trees and mini orchards; fruit and garbage; interface area; garbage storage issue; proximity to school Glenfir Subdivision; proximity to Glenfir school; Garbage management	RDOS Garbage Storage/Fruit Attractants Bylaw; Bear Aware Education; focus on area around the schools
Area G/H	T	1	East Gate- occasional problems with garbage attractants;	address by education as needed and bear-proof garbage containers
	U	1	Hedley-fruit trees in residential areas, Hedley creek is bear movement corridor, Pub has issues with grease barrels and garbage in shed; estimate 15-20 complaints per year; 4 years since last bear destroyed;	address by education and bear- proof garbage containers as needed;
	V	3	Princeton- unfenced landfill; chokecherries south of town on Tulameen River and elsewhere; estimated 100-150 complaints per year;	address by fencing landfill and chokecherry management if possible;

	W	2	Chain/Osprey Lakes- Garbage and bird feeders mainly issues with summer residents; hunting and waste attracting bears; occasional complaints on Hayes Creek;	address by education, bear-proof containers, garbage pick up if possible;
	X	2	Miszezula Lake-similar to area W;	See area W
	Y	2	Coalmont-management of garbage attractants; fewer issues than Tulameen; unofficial garbage accumulation site outside Coalmont/ mostly just brush;	address with education, bear-proof garbage storage, garbage pick up if possible; address unofficial garbage accumulation site through monitoring;
	Z	2	Tulameen- similar to Coalmont, but more issues with garbage	See area Y

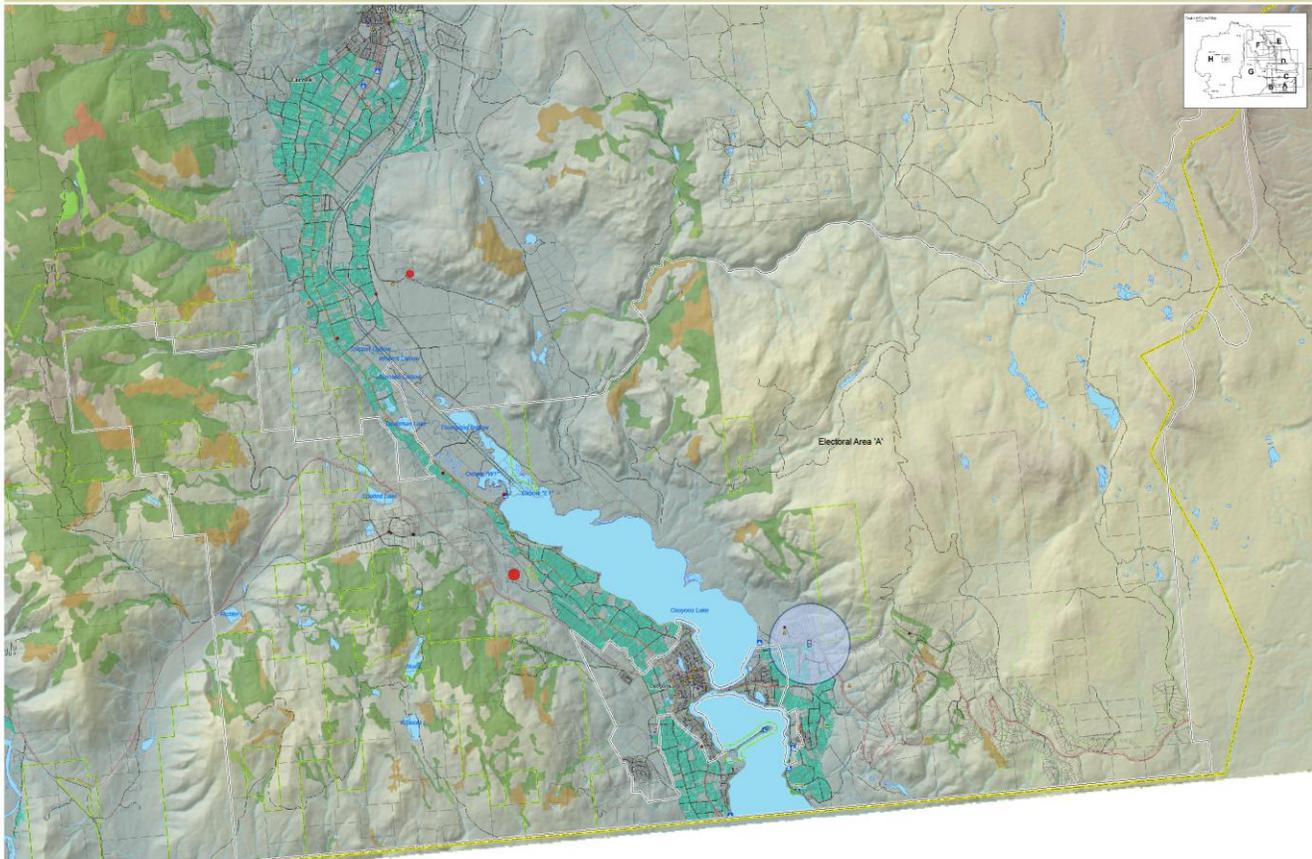
Appendix 4: Maps of Bear calls associated with Fruit, Vineyard, Beehives and other identified Attractants for: RDOS Electoral Areas A, Area BG, Area C, Area D east, Area D west, Area E, Area F, Area H, Summerland, Penticton and Princeton; map of COS priority areas for Area G/H [Princeton]



South Okanagan - Similkameen Bear Smart Project

Bear Calls (Fruit, Vineyards, Beehives and Other Identified Attractants)

Electoral Area 'A'



Bear Conflict Calls		Fruit Orchard		Vineyard Attractant		Beehive Attractant		Other Attractant	
Spring	Summer	Spring	Summer	Spring	Summer	Spring	Summer	Spring	Summer
Fall	Winter	Fall	Winter	Fall	Winter	Fall	Winter	Fall	Winter

Moderate to High Quality Deer Habitat by Season	
Spring, Summer and Fall	Spring Only
Spring and Summer	Summer Only
Spring and Fall	Fall Only

Other Features	
Electoral Boundary	Partial
SRSP Boundary	C.D. Area
Forest	Landfill
Fruit Orchard	Lake
Stream	Highway
Road	Trail
Regional Park	Canal



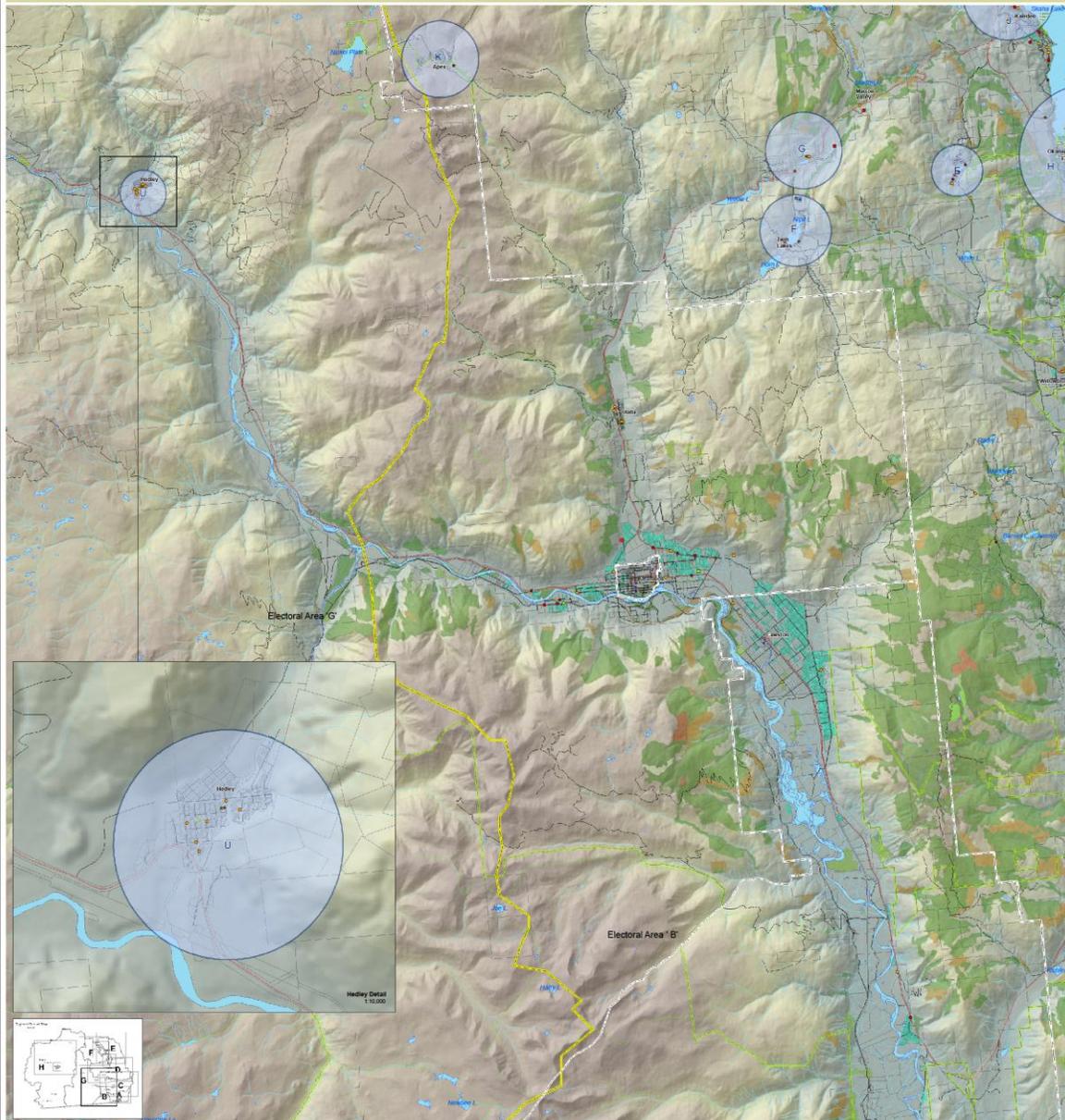
This map is part of a series of maps produced as part of the South Okanagan - Similkameen Bear Smart Project. The project is a collaborative effort between the Similkameen Regional District, the Okanagan Regional District, and the British Columbia Ministry of Forests, Lands, Natural Resource Operations and Rural Development. The project is funded by the British Columbia Ministry of Forests, Lands, Natural Resource Operations and Rural Development. The project is a collaborative effort between the Similkameen Regional District, the Okanagan Regional District, and the British Columbia Ministry of Forests, Lands, Natural Resource Operations and Rural Development. The project is funded by the British Columbia Ministry of Forests, Lands, Natural Resource Operations and Rural Development.



South Okanagan - Similkameen Bear Smart Project

Bear Calls (Fruit, Vineyards, Beehives and Other Identified Attractants)

Electoral Areas 'B' and 'G'



Bear Conflict Calls				Moderate to High Quality Bear Habitat by Season				Other Features					
Fruit Attractant	Vineyard Attractant	Beehive Attractant	Other Attractant										
Spring	Spring	Spring	Spring	Spring, Summer and Fall	Spring Only	Summer Only	Fall Only	Electoral Boundary	Fruit Orchard	Highway	Campsite	Regional Park	
Summer	Summer	Summer	Summer	Spring and Summer	Spring Only	Summer Only	Fall Only	SOSCP Boundary	C.O. Area	Road	School		
Fall	Fall	Fall	Fall	Spring and Fall	Spring Only	Summer Only	Fall Only	Park	Landfill	Trial			
Water	Water	Water	Water					Parcel	Lake	Stream			

This map is part of a series of maps created as part of the Thompson Similkameen Bear Smart Project. It is intended to provide information on bear habitat and attractants in the region. The map is not intended to be used for legal purposes. The map is not intended to be used for legal purposes. The map is not intended to be used for legal purposes.

Scale: 1:50,000



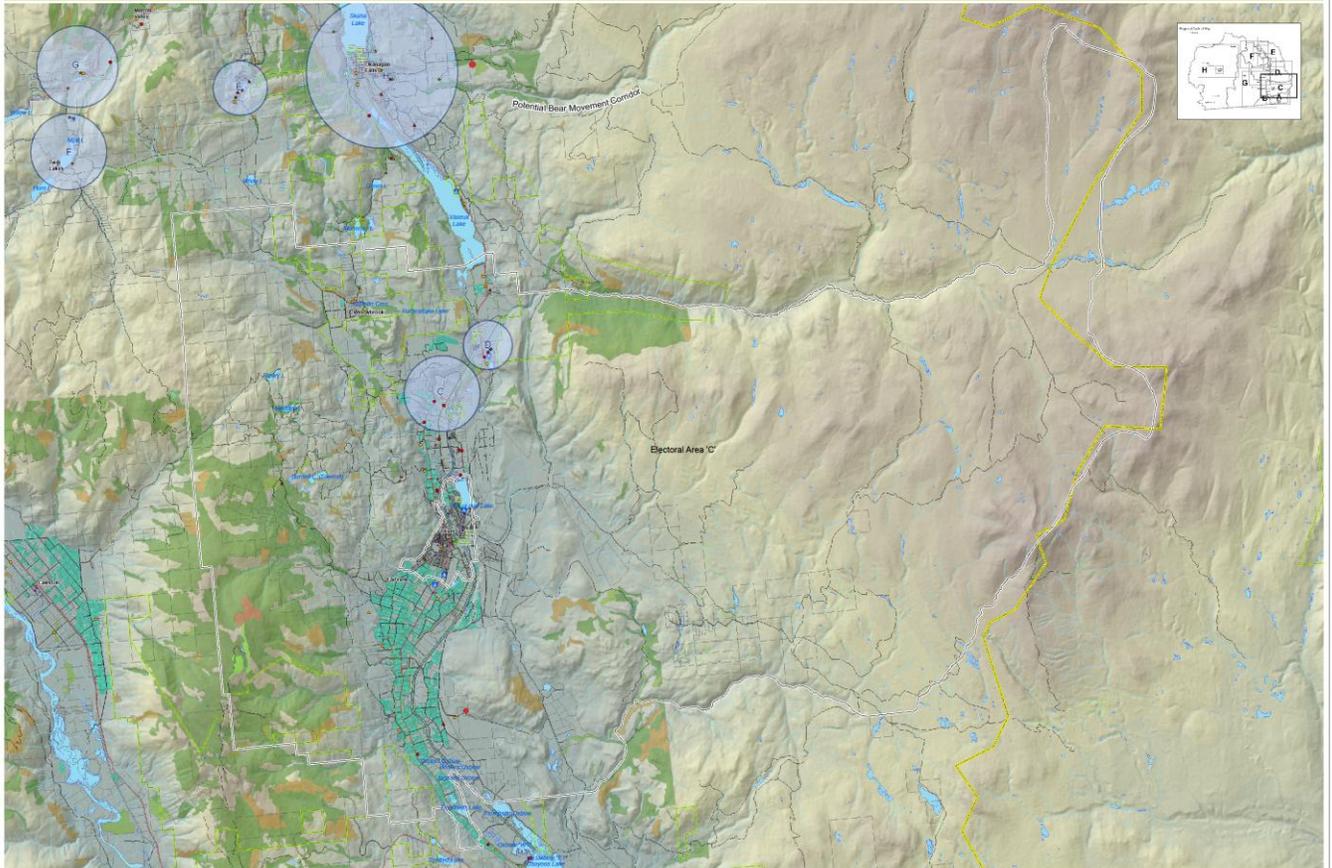
Map Created By: Mike Bennett, March 2015
 Edited By: Mike Bennett, March 2015
 Regional Director: Thompson Okanagan



South Okanagan - Similkameen Bear Smart Project

Bear Calls (Fruit, Vineyards, Beehives and Other Identified Attractants)

Electoral Area 'C'



<p>Bear Conflict Calls</p> <table border="0"> <tr> <th>Fruit Attractant</th> <th>Vineyard Attractant</th> <th>Beehive Attractant</th> <th>Other Attractant</th> </tr> <tr> <td>Spring</td> <td>Spring</td> <td>Spring</td> <td>Spring</td> </tr> <tr> <td>Summer</td> <td>Summer</td> <td>Summer</td> <td>Summer</td> </tr> <tr> <td>Fall</td> <td>Fall</td> <td>Fall</td> <td>Fall</td> </tr> <tr> <td>Winter</td> <td>Winter</td> <td>Winter</td> <td>Winter</td> </tr> </table>	Fruit Attractant	Vineyard Attractant	Beehive Attractant	Other Attractant	Spring	Spring	Spring	Spring	Summer	Summer	Summer	Summer	Fall	Fall	Fall	Fall	Winter	Winter	Winter	Winter	<p>Moderate to High Quality Bear Habitat by Season</p> <table border="0"> <tr> <td>Spring, Summer and Fall</td> <td>Spring Only</td> </tr> <tr> <td>Spring and Summer</td> <td>Summer Only</td> </tr> <tr> <td>Spring and Fall</td> <td>Fall Only</td> </tr> </table>	Spring, Summer and Fall	Spring Only	Spring and Summer	Summer Only	Spring and Fall	Fall Only	<p>Other Features</p> <table border="0"> <tr> <td>Electoral Boundary</td> <td>Parlot</td> <td>Fruit Orchard</td> <td>Highway</td> <td>Campsite</td> </tr> <tr> <td>SDSCP Boundary</td> <td>C.O. Area</td> <td>Lake</td> <td>Road</td> <td>Regional Park</td> </tr> <tr> <td>Park</td> <td>Landfill</td> <td>Stream</td> <td>Trail</td> <td>School</td> </tr> </table>	Electoral Boundary	Parlot	Fruit Orchard	Highway	Campsite	SDSCP Boundary	C.O. Area	Lake	Road	Regional Park	Park	Landfill	Stream	Trail	School	<p style="text-align: center;">1:45,000</p> <p style="text-align: center;">0 1 2 3 4 5 6 7 8 9 10</p> <p style="text-align: center;">Kilometers</p> <p style="font-size: small;"> This map is a product of the South Okanagan Similkameen Bear Smart Project. It is a collaborative effort between the Regional District of Okanagan-Shuswap, the Regional District of Bulkley-Nechako, and the Regional District of Bulkley-Nechako. The map is based on data provided by the Regional District of Okanagan-Shuswap and the Regional District of Bulkley-Nechako. The map is not intended to be used for any other purpose. </p>
Fruit Attractant	Vineyard Attractant	Beehive Attractant	Other Attractant																																									
Spring	Spring	Spring	Spring																																									
Summer	Summer	Summer	Summer																																									
Fall	Fall	Fall	Fall																																									
Winter	Winter	Winter	Winter																																									
Spring, Summer and Fall	Spring Only																																											
Spring and Summer	Summer Only																																											
Spring and Fall	Fall Only																																											
Electoral Boundary	Parlot	Fruit Orchard	Highway	Campsite																																								
SDSCP Boundary	C.O. Area	Lake	Road	Regional Park																																								
Park	Landfill	Stream	Trail	School																																								



South Okanagan - Similkameen Bear Smart Project

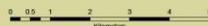
Bear Calls (Fruit, Vineyards, Beehives and Other Identified Attractants)

Electoral Area 'D' (east)



Bear Conflict Calls				Moderate to High Quality Bear Habitat by Season		Other Features			
Fruit Attractant	Vineyard Attractant	Beehive Attractant	Other Attractant	Spring, Summer and Fall	Spring Only	Electoral Boundary	Fruit Orchard	Highway	Campsite
Spring	Spring	Spring	Spring	Spring and Summer	Summer Only	SOSCP Boundary	C.O. Area	Road	Regional Park
Summer	Summer	Summer	Summer	Spring and Fall	Fall Only	Park	Landfill	Trail	School
Fall	Fall	Fall	Fall			Parcel	Lake	Stream	
Winter	Winter	Winter	Winter						

Scale: 1:35,000



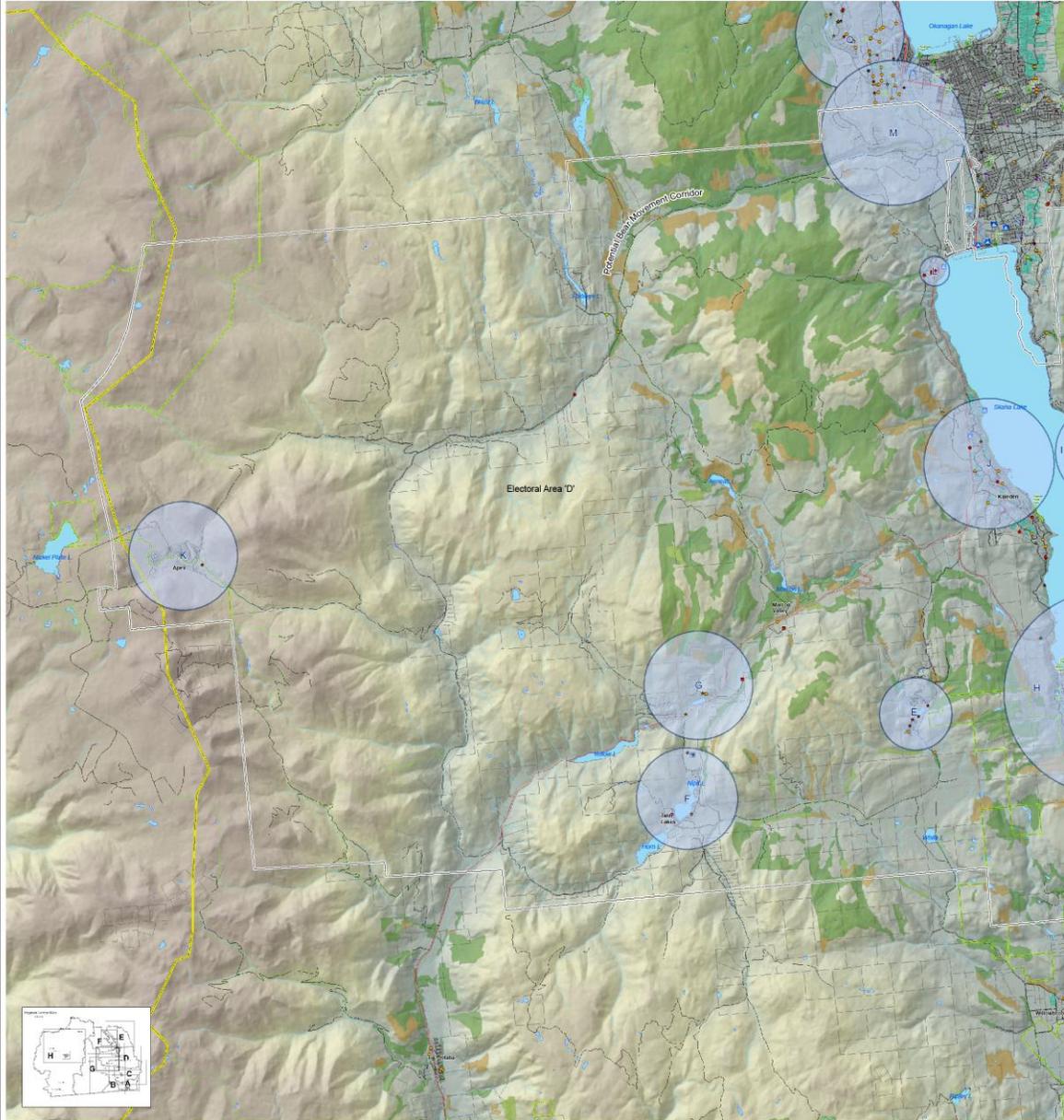
This map is part of a series of maps created as part of the Okanagan-Similkameen Bear Smart Project. It is intended to provide information to landowners and the public about bear attractants and potential bear movement corridors. The map is not intended to be used as a legal document. The map is based on data provided by the Regional District of Okanagan-Similkameen and other sources. The map is subject to change without notice. The map is not intended to be used as a legal document. The map is based on data provided by the Regional District of Okanagan-Similkameen and other sources. The map is subject to change without notice. The map is not intended to be used as a legal document. The map is based on data provided by the Regional District of Okanagan-Similkameen and other sources. The map is subject to change without notice.



South Okanagan - Similkameen Bear Smart Project

Bear Calls (Fruit, Vineyards, Beehives and Other Identified Attractants)

Electoral Area 'D' (west)



Bear Conflict Calls				Moderate to High Quality Bear Habitat by Season		Other Features	
Fruit Attractant	Vineyard Attractant	Beehive Attractant	Other Attractant	Spring, Summer and Fall	Spring Only	Electoral Boundary	Campsite
● Spring	▲ Spring	■ Spring	* Spring	Spring and Summer	Summer Only	SOSP Boundary	Regional Park
● Summer	▲ Summer	■ Summer	* Summer	Spring and Fall	Fall Only	C.O. Area	Trail
● Fall	▲ Fall	■ Fall	* Fall			Landfill	School
● Winter	▲ Winter	■ Winter	* Winter			Lake	Stream
						Highway	
						Road	
						Trail	
						Stream	
						Lake	

Scale: 1:35,000

Other Features: Electoral Boundary, SOSP Boundary, Parcel, Fruit Orchard, C.O. Area, Landfill, Lake, Highway, Road, Trail, Stream, Campsite, Regional Park, School.

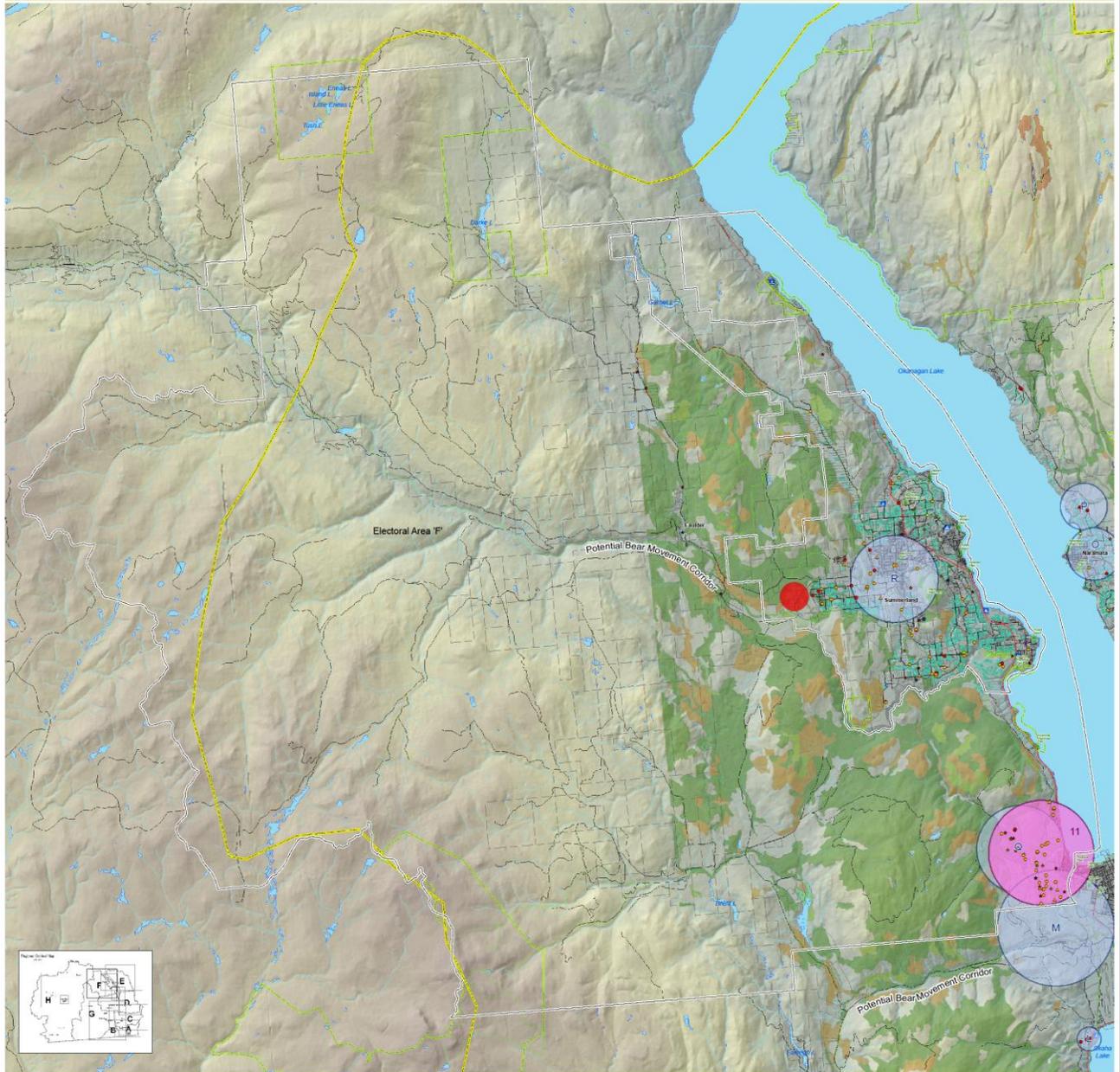
Disclaimer: This map is a part of a series of maps created as part of the Okanagan-Similkameen Bear Smart Project. It is not intended to be used as a legal document. The map is based on data provided by the Okanagan-Similkameen Regional District and other agencies. The map is not a guarantee of accuracy. The map is for informational purposes only. The map is not a guarantee of accuracy. The map is for informational purposes only.



South Okanagan - Similkameen Bear Smart Project

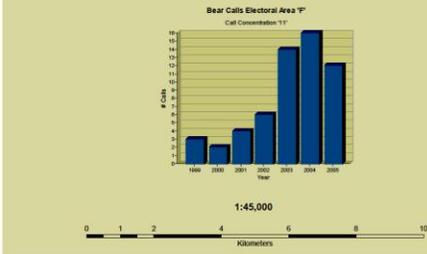
Bear Calls (Fruit, Vineyards, Beehives and Other Identified Attractants)

Electoral Area 'F'



Bear Conflict Calls		Beehive Attractant		Other Features	
● Spring	■ Spring	□ Electoral Boundary	— Highway	— Road	— Trail
● Summer	■ Summer	□ SOSCOP Boundary	— Road	— Road	— Trail
● Fall	■ Fall	□ Park	— Stream	— Stream	— Stream
● Winter	■ Winter	□ Pasture	— Campsite	— Campsite	— Campsite
▲ Vineyard Attractant	▲ Vineyard Attractant	○ Fruit Orchard	— Regional Park	— Regional Park	— Regional Park
▲ Spring	▲ Spring	○ C.O. Area	— School	— School	— School
▲ Summer	▲ Summer	○ Call Concentration	— Lake	— Lake	— Lake
▲ Fall	▲ Fall	○ Landfill			
▲ Winter	▲ Winter				

Moderate to High Quality Bear Habitat by Season	
● Spring, Summer and Fall	● Spring and Fall
● Spring and Summer	● Spring Only
	● Summer Only
	● Fall Only



This map is part of a series of maps created as part of the Okanagan-Similkameen Bear Smart Project Hazard Assessment Report. For more information on map content and interpretation of map data, please refer to the report and also, Okanagan-Similkameen Bear Smart Project Conflict Management Plan available from the RDOOS website, accessible for use by Engineers and Public Works, South Okanagan.

Incident call locations are mapped points where reported bear incidents occurred. Each individual point represents a separate report of a bear incident to the Conservation Officer of B.C. Each point is symbolized according to the season the incident occurred and by the primary attractant for the bear (fruit, vineyard, beehive or other identified attractant).

Seven years worth of incident reports were collected and mapped (1999 - 2005).

There are a total of 22 maps associated with this project.

Modest to high quality bear habitat cover areas to remain where bear habitat is of all moderate quality.

Seasons are broken down according to the Species Account and are as follows:

Spring - April and May
 Summer - June - August
 Fall - September and October
 Winter - November - March

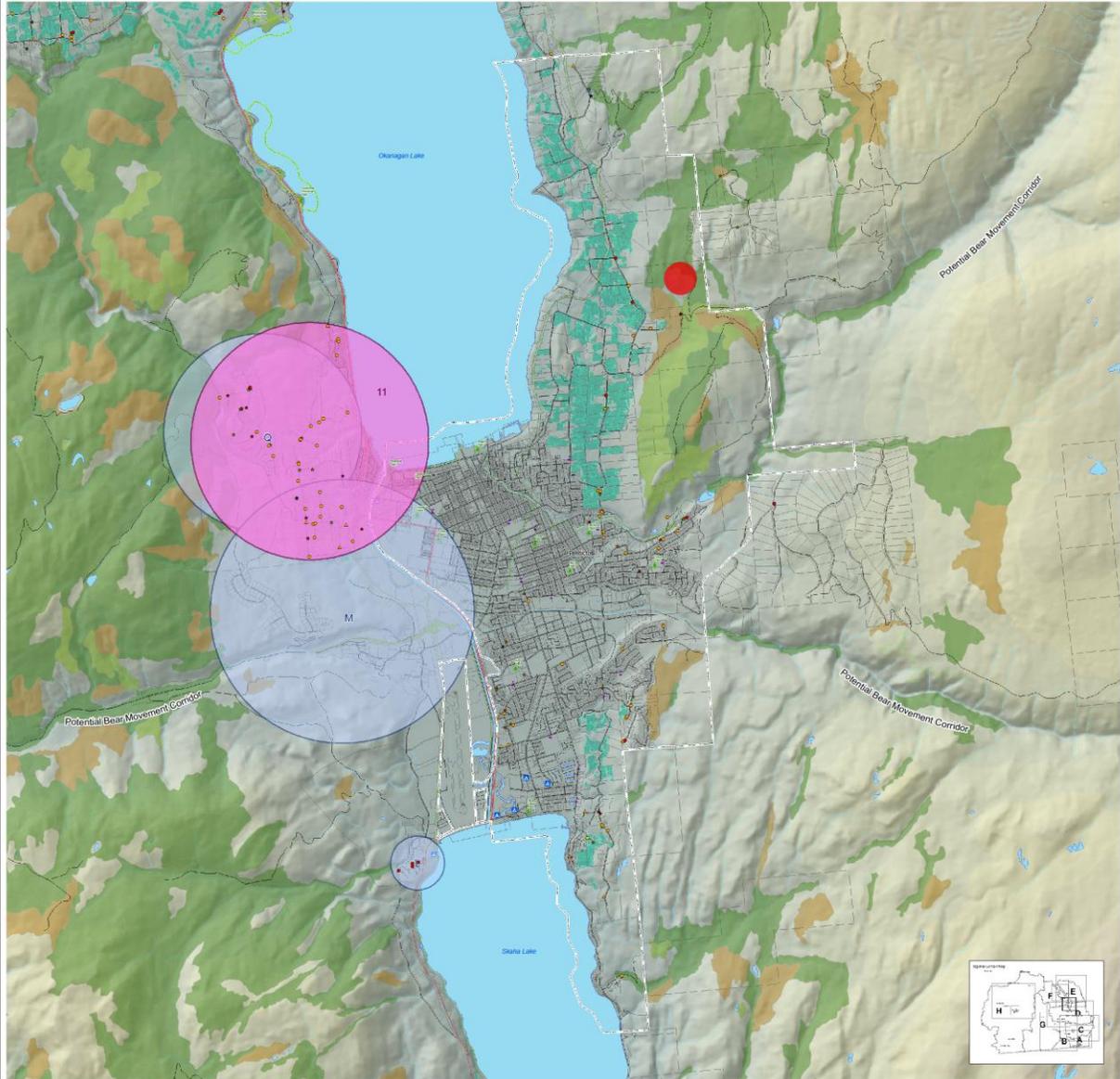
Map Created By: Mike Brown, March 2007
 2007 District Of Okanagan
 District of Summerland
 Regional District Okanagan-Similkameen



South Okanagan - Similkameen Bear Smart Project

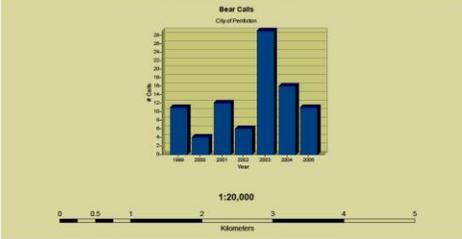
Bear Calls (Fruit, Vineyards, Beehives and Other Identified Attractants)

City of Penticton



Bear Conflict Calls		Beehive Attractant		Other Features	
Fruit Attractant	Spring	Beehive Attractant	Spring	Electoral Boundary	Highway
	Summer		Summer	SOSCP Boundary	Road
	Fall		Fall	Park	Trail
	Winter		Winter	Parcel	Stream
Vineyard Attractant	Spring	Other Attractant	Spring	Fruit Orchard	Campsite
	Summer		Summer	Call Concentration	Regional Park
	Fall		Fall	C.O. Area	School
	Winter		Winter	Landfill	Lake

Moderate to High Quality Bear Habitat by Season		
Spring, Summer and Fall	Spring and Fall	Summer Only
Spring and Summer	Spring Only	Fall Only



This map is part of a series of maps created as part of the Okanagan-Similkameen Bear Smart Project. For more information on the series and interpretation of map data, please see the report and also Okanagan-Similkameen Bear Smart Project. Contact: [Contact Information]

Incident call locations are reported points where reported bear incidents occurred. Each individual point represents a separate report of a bear incident to the Conservation Officer Office (COO). Each point is symbolized according to the season the incident occurred and by the primary attractant for the bear that caused the incident (where identified).

Seven years worth of incident reports were collected and mapped (1980 - 2005).

There are a total of 22 maps available with this project.

Mapscale is high quality bear habitat shown by the season where bear habitat is of at least moderate quality.

Seasons are broken down according to the Species Account and are as follows:

Spring = April and May
 Summer = June - September
 Winter = November - March

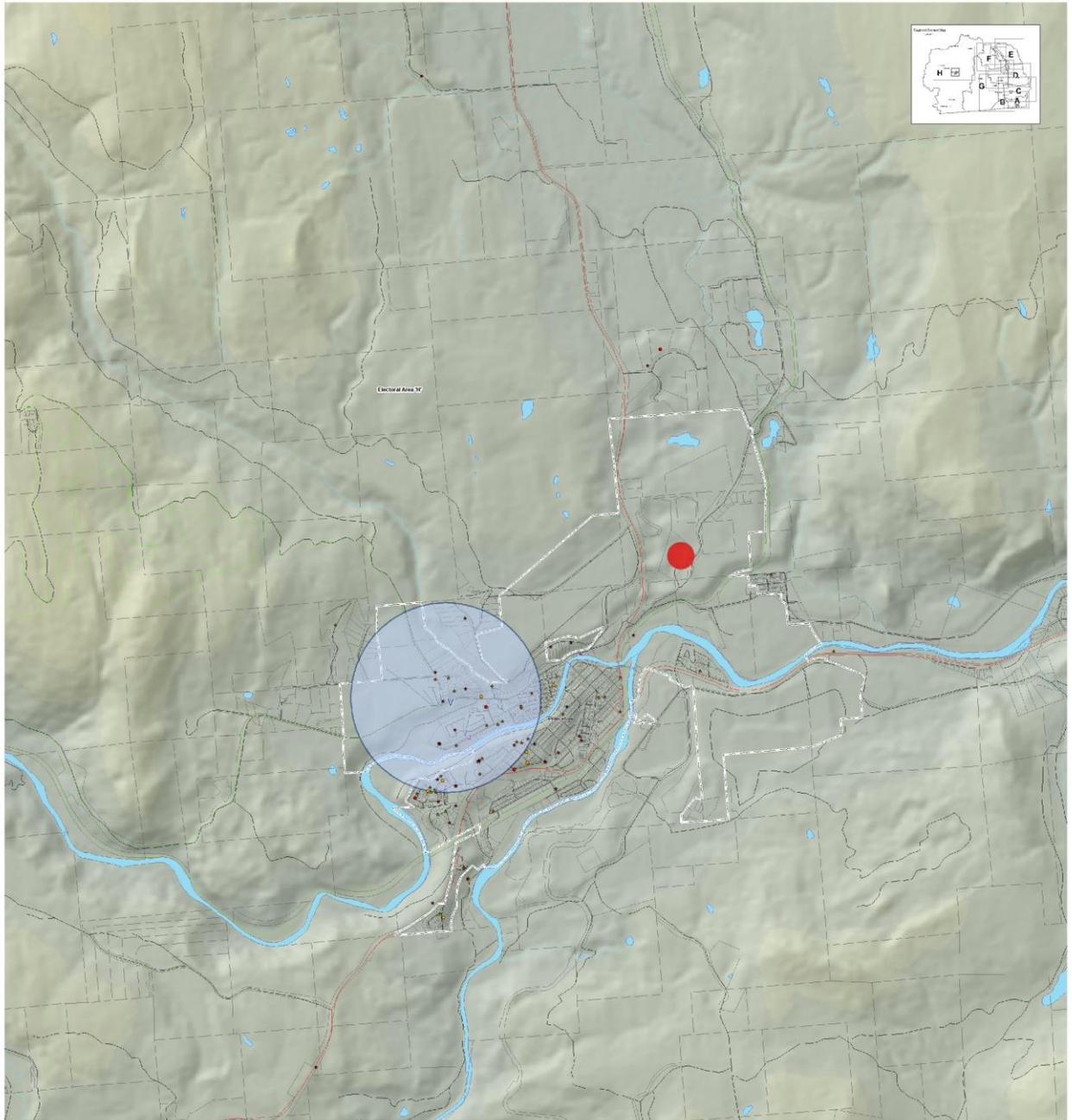
Map Created By: Mike Ewan, March 2007
 Map Revised By: [Name], October 2008, April 2009
 City of Penticton
 City Department
 Regional District Okanagan-Similkameen
 BC Conservation Officer Service



South Okanagan - Similkameen Bear Smart Project

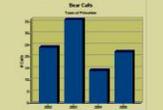
Bear Calls (Fruit, Vineyards, Beehives and Other Identified Attractants)

Town of Princeton



Bear Conflict Calls			
Fruit Attractant	Vineyard Attractant	Beehive Attractant	Other Attractant
Spring	Spring	Spring	Spring
Summer	Summer	Summer	Summer
Fall	Fall	Fall	Fall
Winter	Winter	Winter	Winter

Other Features			
Electoral Boundary	Fruit Orchard	Highway	Campsite
SCSOP Boundary	Landfill	Road	Regional Park
Park	Lake	Trail	School
Parcel		Stream	



This map is part of a series of maps prepared as part of the Okanagan-Similkameen Bear Smart Project. For more information on the project, please visit the project website at www.bearsmart.ca.

Incident call locations are indicated on the map where bear incidents occurred. Each individual point represents a separate report of a bear incident to the Conservation Office of BC. Each point is labelled according to the season the incident occurred and by the primary attractant for the bear (fruit, vineyard, beehive or other identified attractant).

Four years worth of incident reports were collected and mapped (2002 - 2005).

There are a total of 22 maps associated with this project.

Questions are invited when contacting the Project Accountant and are as follows:

Spring - April and May
 Summer - June - August
 Fall - September and October
 Winter - November - March

Scale: 1:12,000

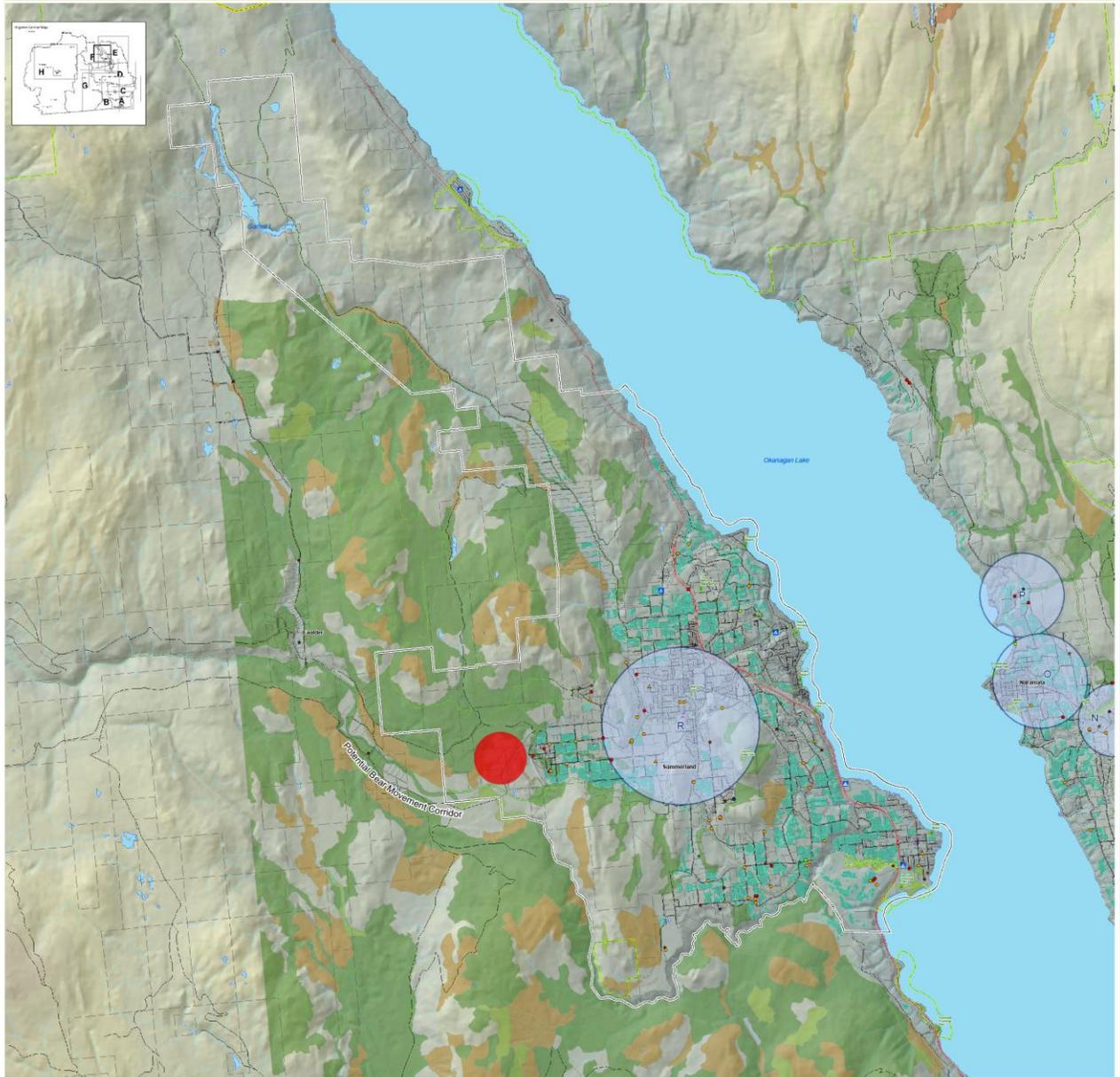
Map Created By: Rebecca McLean, April 2006
 GIS Department
 Regional District Okanagan-Similkameen



South Okanagan - Similkameen Bear Smart Project

Bear Calls (Fruit, Vineyards, Beehives and Other Identified Attractants)

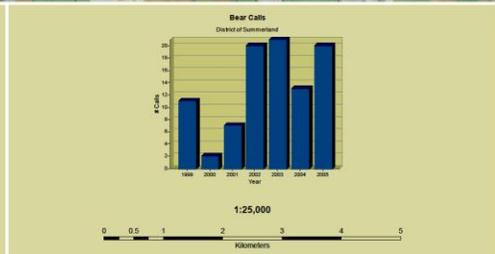
District of Summerland



Bear Conflict Calls		Beehive Attractant		Other Features	
● Spring	● Summer	● Spring	● Summer	□ Electoral Boundary	— Highway
● Fall	● Winter	● Spring	● Summer	□ SSOCP Boundary	— Road
● Spring	● Summer	● Spring	● Summer	□ Park	— Trail
● Fall	● Winter	● Spring	● Summer	□ Parcel	— Stream
● Spring	● Summer	● Spring	● Summer	□ Fruit Orchard	■ Campsite
● Fall	● Winter	● Spring	● Summer	□ C.O. Area	■ Regional Park
● Spring	● Summer	● Spring	● Summer	● Landfill	■ School
● Fall	● Winter	● Spring	● Summer	● Lake	

Moderate to High Quality Bear Habitat by Season

● Spring, Summer and Fall	● Spring and Fall	● Summer Only
● Spring and Summer	● Spring Only	● Fall Only



This map is part of a series of maps created as part of the Okanagan-Similkameen Bear Smart Project Hazard Assessment Report. For more information on this project and other information on resource files, please visit the report and the Okanagan-Similkameen Bear Smart Project Hazard Assessment Report available from the RCOG website: www.rcog.bc.ca (see Engineering and Public Works, Solid Waste).

Report and datasets are copyright projects which represent bear resources. Each individual user requires a separate report of their request to the Commission's Office of BC. Each point is identified according to the season the incident occurred and for the primary attractant for the bear (fruit, vineyard, beehive or other identified attractant).

Seven pairs worth of incident reports were collected and mapped (1999 - 2005).

There are a total of 22 maps associated with this project.

Medium to high quality bear habitat areas by season where bear habitat is of at least moderate quality.

Seasons are broken down according to the Species Account and are as follows:

Spring - April and May
 Summer - June - August
 Fall - September and October
 Winter - November - March

Map Created By: Mike Bousler, March 2007
 Map Revised By: Melissa McLean, April 2008
 District of Summerland
 Regional District Okanagan-Similkameen

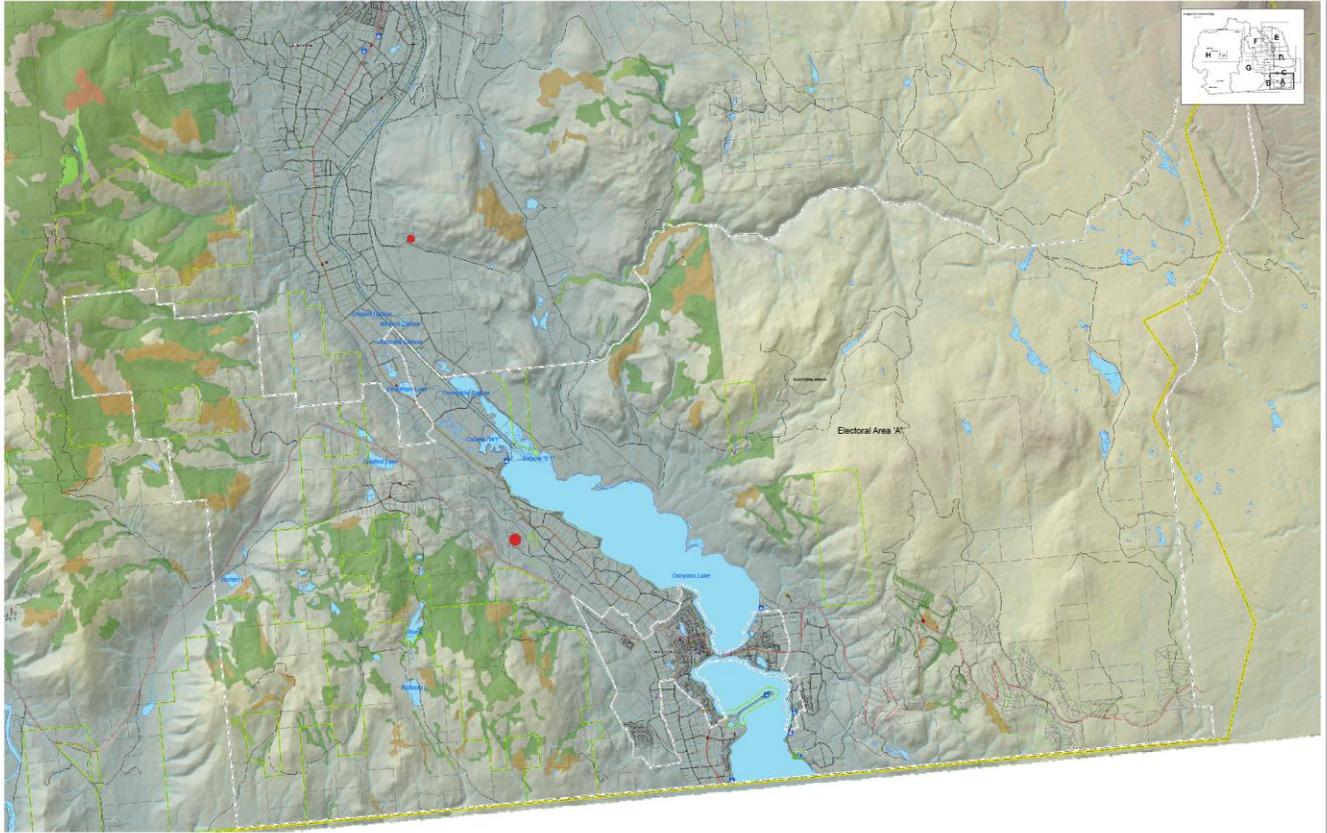
Appendix 5: Maps of Bear calls associated with Garbage, Compost and unidentified Attractants for: RDOS Electoral Areas A, Area BG, Area C, Area D east, Area D west, Area E, Area F, Area H, Summerland, Penticton and Princeton



South Okanagan - Similkameen Bear Smart Project

Bear Calls (Garbage, Compost and Unidentified Attractants)

Electoral Area 'A'



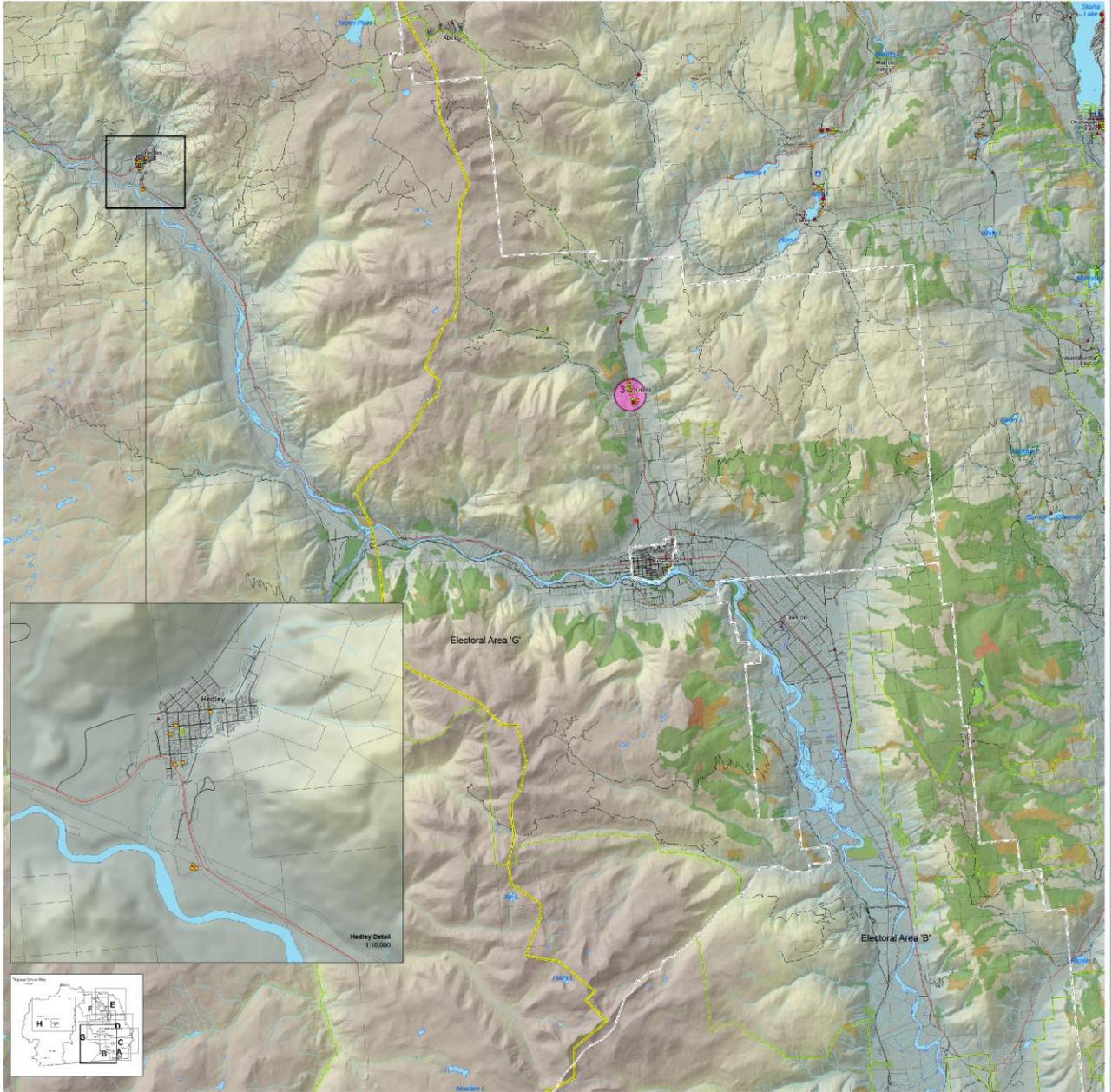
<p>Bear Conflict Calls</p> <p>Compost Attractant</p> <ul style="list-style-type: none"> Spring Summer Fall Winter 	<p>Compost Attractant</p> <ul style="list-style-type: none"> Spring Summer Fall Winter 	<p>Unidentified Attractant</p> <ul style="list-style-type: none"> Spring Summer Fall Winter 	<p>Moderate to High Quality Bear Habitat by Season</p> <ul style="list-style-type: none"> Spring, Summer and Fall Spring and Summer Spring and Fall Spring Only Summer Only Fall Only 	<p>Other Features</p> <ul style="list-style-type: none"> Electoral Boundary SOBCP Boundary Park Parcel Landfill Highway Road Trail Campsite Regional Park School Stream Lake 	<p>Scale: 1:20,000</p> <p>0 0.5 1 2 3 4 5 Kilometers</p> <p>Map created by: Mike Brown, March 2012 Data provided by: British Columbia, April 2010 Data provided by: Regional District of Okanagan-Similkameen, April 2010 Data provided by: Regional District of Okanagan-Similkameen, April 2010</p> <p>This map is a product of a project funded in part by the Regional District of Okanagan-Similkameen, Bear Smart Project. It is not intended to be used for any other purpose. The Regional District of Okanagan-Similkameen is not responsible for any errors or omissions on this map. The Regional District of Okanagan-Similkameen is not responsible for any errors or omissions on this map. The Regional District of Okanagan-Similkameen is not responsible for any errors or omissions on this map.</p>
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South Okanagan - Similkameen Bear Smart Project

Bear Calls (Garbage, Compost and Unidentified Attractants)

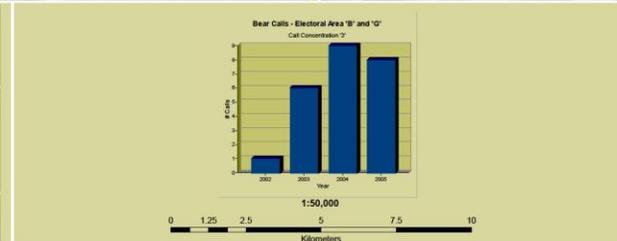
Electoral Area 'B' and 'G'



Bear Conflict Calls		
Garbage Attractant	Compost Attractant	Unidentified Attractant
Spring: Green circle	Spring: Red square	Spring: Blue triangle
Summer: Red circle	Summer: Green square	Summer: Blue triangle
Fall: Blue circle	Fall: Red square	Fall: Green triangle
Winter: Green circle	Winter: Blue square	Winter: Red triangle

Other Features		
Regional Park: Green outline	Electoral Boundary: Dashed line	Highway: Red line
Campsite: Blue outline	SOSCP Boundary: Yellow outline	Road: Grey line
School: Yellow outline	Park: Green outline	Trail: Dotted line
Lake: Blue outline	Parcel: Red outline	Stream: Blue line
	Call Concentration: Pink circle	Landfill: Red circle

Moderate to High Quality Bear Habitat by Season		
Spring, Summer and Fall: Green square	Spring and Fall: Yellow square	Summer Only: Red square
Spring and Summer: Green square	Spring Only: Yellow square	Fall Only: Red square



This map is part of a series of maps created as part of the Okanagan-Similkameen Bear Smart Project. Please refer to the project website for more information on the project and a list of participating municipalities. Please refer to the project website for more information on the project and a list of participating municipalities. Please refer to the project website for more information on the project and a list of participating municipalities.

Incident call locations are mapped points where reported bear incidents occurred. Each individual point represents a separate report of a bear incident to the Conservation Officer of IC. Each point is attributed according to the season observed and by the reported attractant for the bear (garbage compost or unidentified).

Seven years worth of incident reports were collected and mapped (1999 - 2005).

There are a total of 22 maps associated with this project.

Map Scale: Moderate to High Quality Bear Habitat across areas by season where bear habitat is of at least moderate quality.

Seasons are broken down according to the Species Account and are as follows:

Spring - April and May
 Summer - June - August
 Fall - September and October
 Winter - November - March

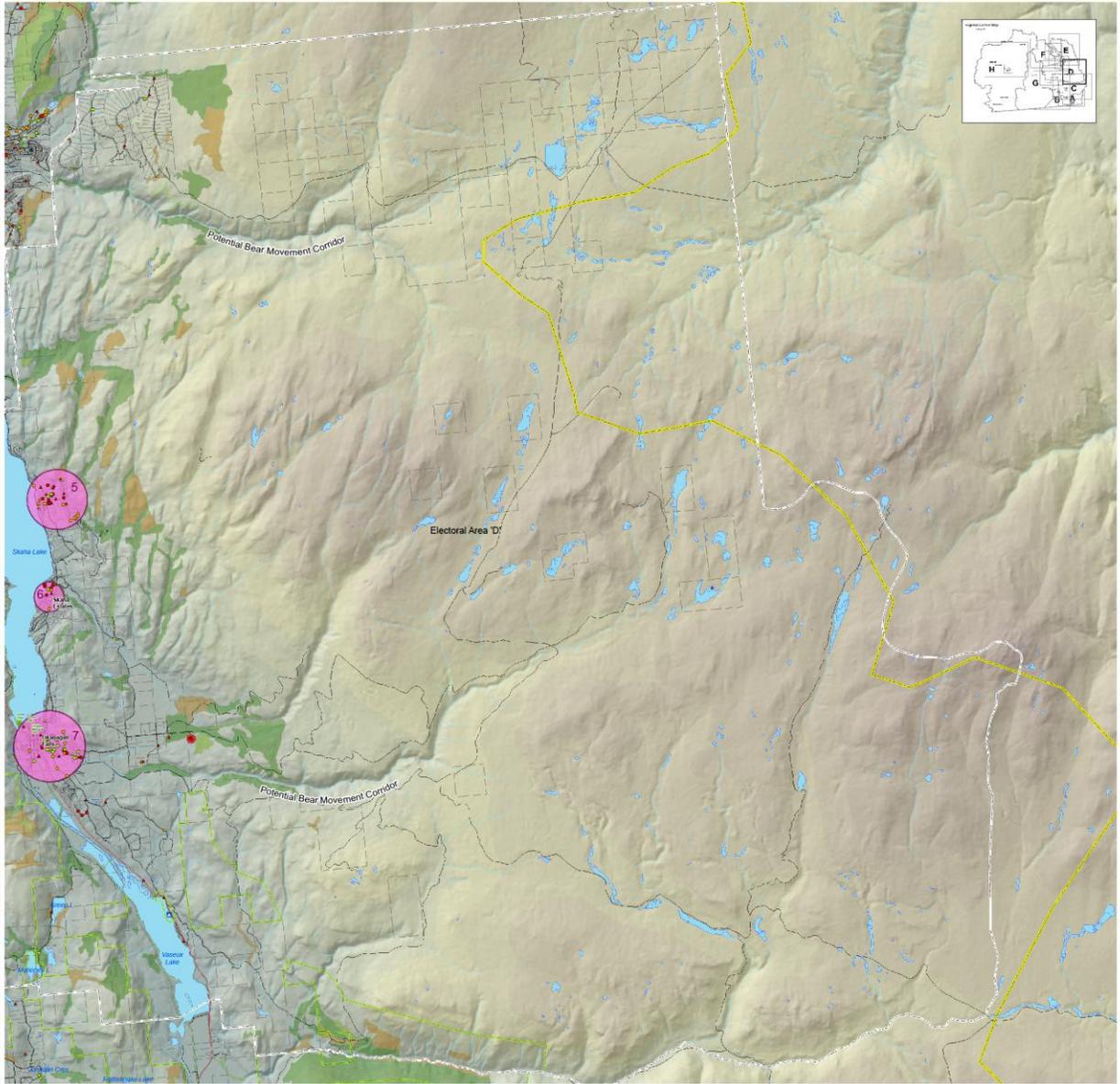
Map Created By: Mike Brown, March 2007
 Map Revised By: Theresa MacLean, April 2008
 GIS Department
 Regional District of Okanagan-Similkameen



South Okanagan - Similkameen Bear Smart Project

Bear Calls (Garbage, Compost and Unidentified Attractants)

Electoral Area 'D' (east)



Bear Conflict Calls

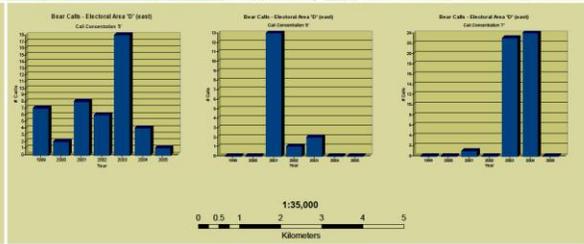
Garbage Attractant	Compost Attractant	Unidentified Attractant
● Spring	● Spring	▲ Spring
● Summer	● Summer	▲ Summer
● Fall	● Fall	▲ Fall
● Winter	● Winter	▲ Winter

Other Features

Regional Park	Electoral Boundary	Highway
Campsite	SOSCP Boundary	Road
School	Park	Trail
Lake	Parcel	Stream
Call Concentration	Landfill	

Moderate to High Quality Bear Habitat by Season

Spring, Summer and Fall	Spring and Fall	Summer Only
Spring and Summer	Spring Only	Fall Only



This map is part of a series of maps created as part of the Okanagan-Similkameen Bear Smart Project Regional Assessment Report. For more information on the content and interpretation of mapped data, please see the report and the Okanagan-Similkameen Bear Smart Project Council Management Plan available from the RDC's website: www.vrob.ca (see Engineering and Public Works, Salt Water).

Incident call locations are mapped points where reported bear incidents occurred. Each individual point represents a reported incident in the Incident to the Community to Date (ITC). Each point is numbered according to the season the incident occurred in. The following table lists the ITCs for the Garbage, Compost and Unidentified Attractants.

Seven years worth of incident reports were collected and mapped (1999 - 2005).

There are a total of 22 maps associated with this project.

Moderate to High Quality bear habitat shows areas by season where bear habitat is of at least moderate quality.

Seasons are broken down according to the Species Account and are as follows:

Spring = April and May
 Summer = June - August
 Fall = September and October
 Winter = November - March

Data Sources:
 Regional District Okanagan-Similkameen
 Bear Smart Project - Incident to Date, April 2006
 City of Vernon
 District of Summerland
 BC Government - Call Centre Service

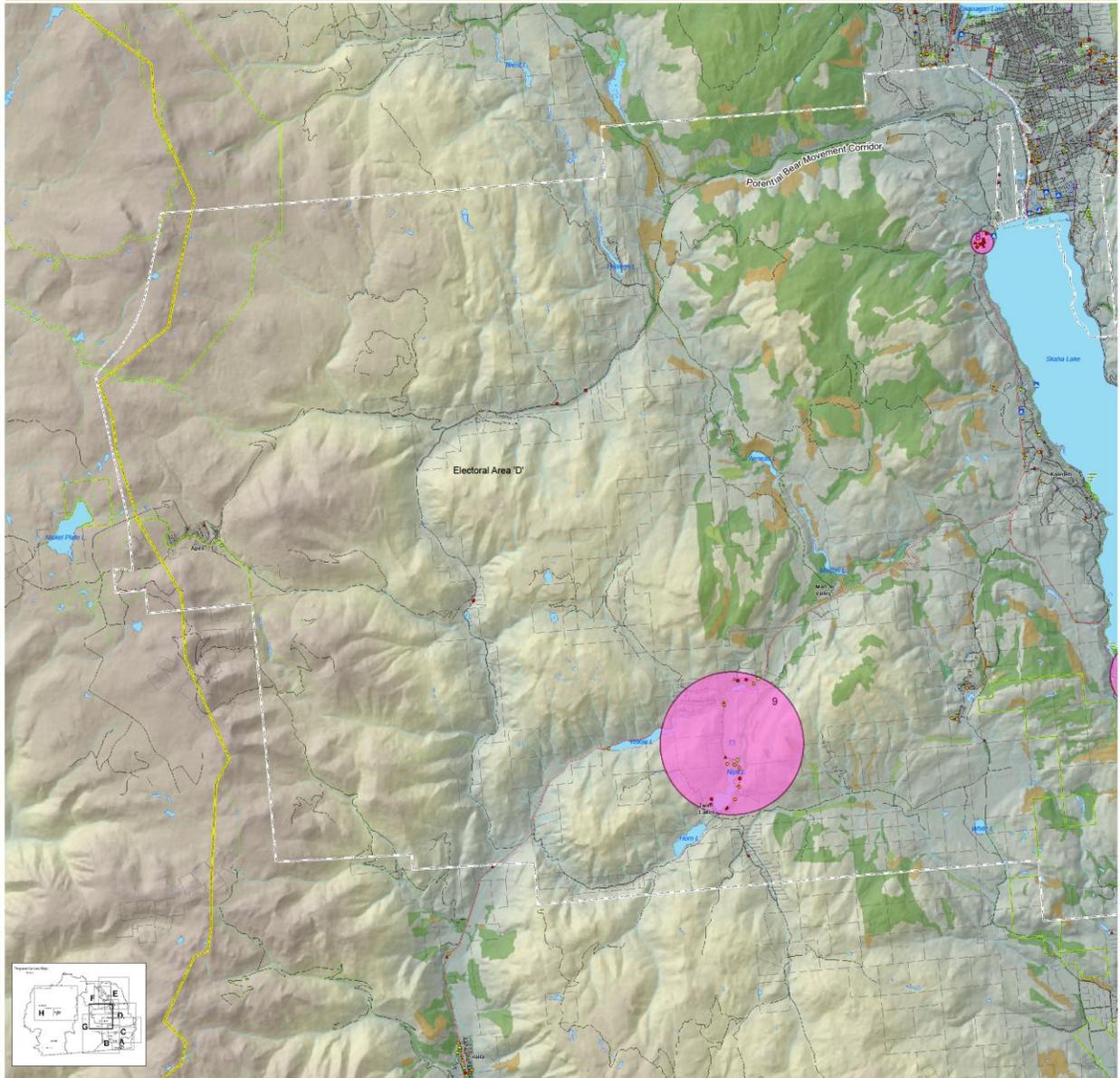
Map Created By: Mike Brown, March 2007
 Bear Smart Project - Incident to Date, April 2006
 City of Vernon
 District of Summerland
 Regional District Okanagan-Similkameen



South Okanagan - Similkameen Bear Smart Project

Bear Calls (Garbage, Compost and Unidentified Attractants)

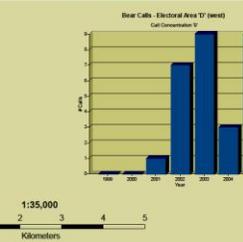
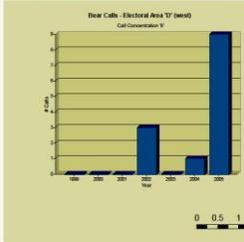
Electoral Area 'D' (west)



Bear Conflict Calls		
Garbage Attractant	Compost Attractant	Unidentified Attractant
Spring	Spring	Spring
Summer	Summer	Summer
Fall	Fall	Fall
Winter	Winter	Winter

Other Features		
Supershrink	Electoral Boundary	Lake
Compost	SOSSCP Boundary	Call Concentration
School	Park	Landfill
	Parcel	Stream
		Highway
		Road
		Trail

Moderate to High Quality Bear Habitat by Season		
Spring, Summer and Fall	Spring and Fall	Summer Only
Spring and Summer	Spring Only	Fall Only



This map is part of a series of maps created as part of the Okanagan-Similkameen Bear Smart Project: Hazard Assessment Report. For more information on map creation and interpretation of reported calls, please see the report and other Okanagan-Similkameen Bear Smart Project Conflict Management Plan available from the RCOS website, www.rcos.ca (see Engineering and Public Works, Solid Waste).

Incident call locations are mapped points where reported bear incidents occurred. Each individual point represents a separate report of a bear incident to the Conservation Officer of RCOS. Each point is geotagged according to the season the incident occurred and by the reported attractant for the bear (garbage, compost or unidentified).

Seven years worth of incident reports were collected and mapped (1999 - 2005).

There are a total of 27 maps associated with this project.

Modelling to high quality bear habitat cover areas to assess where bear habitat is of at least moderate quality.

Seasons are broken down according to the typical season and are as follows:

Spring - April and May
 Summer - June - August
 Fall - September and October
 Winter - November - March

Data Sources:
 Ministry of Okanagan-Similkameen
 City of Penticton
 District of Summerside
 RC Conservation Officer Service

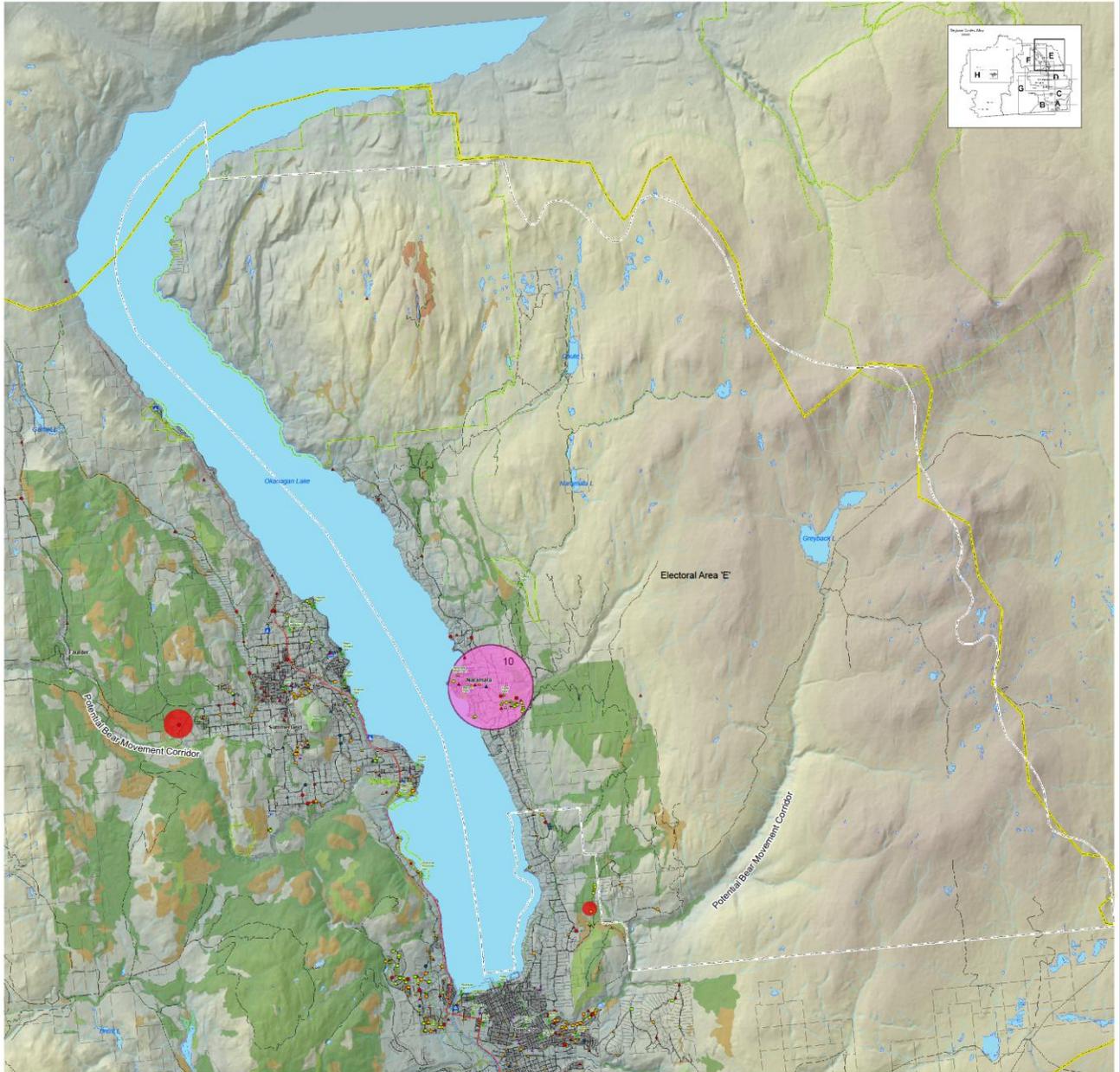
Map Created By: Mike Brown, March 2007
 Map Scale: 1:35,000
 2007 Engineering and Public Works, April 2008
 Project: Okanagan-Similkameen



South Okanagan - Similkameen Bear Smart Project

Bear Calls (Garbage, Compost and Unidentified Attractants)

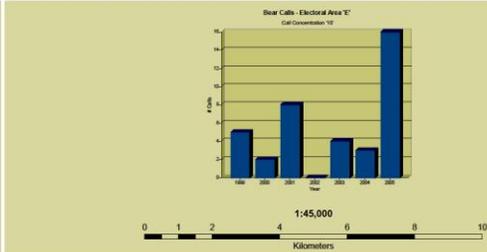
Electoral Area 'E'



Bear Conflict Calls		
Garbage Attractant	Compost Attractant	Unidentified Attractant
Spring	Spring	Spring
Summer	Summer	Summer
Fall	Fall	Fall
Winter	Winter	Winter

Other Features		
Regional Park	Electoral Boundary	Highway
Campsite	SOSCP Boundary	Road
School	Park	Trail
Lake	Parcel	Stream
	Call Concentration	Landfill

Moderate to High Quality Bear Habitat by Season		
Spring, Summer and Fall	Spring and Fall	Summer Only
Spring and Summer	Spring Only	Fall Only



This map is part of a series of maps created as part of the Okanagan-Similkameen Bear Smart Project: Hazard Assessment Report. For more information on map content and interpretation of mapped data, please see the report and also Okanagan-Similkameen Bear Smart Project: Conflict Management Plan available from the RCOS website: www.oks.bc.ca (see Engineering and Public Works, Solid Waste).

Incident call locations are mapped points where reported bear incidents occurred. Each individual point represents a separate report of a bear incident to the Conservation Officer of SO. Each point is symbolized according to the season the incident occurred and by the reported attractant for the bear (garbage, compost or unidentified).

Seven years worth of incident reports were collected and mapped (1999 - 2005).

There are a total of 22 maps associated with the project.

Moderate to high quality bear habitat shown by season where bear habitat is of at least moderate quality. Seasons are broken down according to the Species Account and are as follows:

Spring = April and May
 Summer = June - August
 Fall = September and October
 Winter = November - March

Date Sources: Map Created By: Mike Rowan, March 2007
 Regional District Okanagan-Similkameen
 City of Penticton
 District of Kelowna
 BC Conservation Officer Service

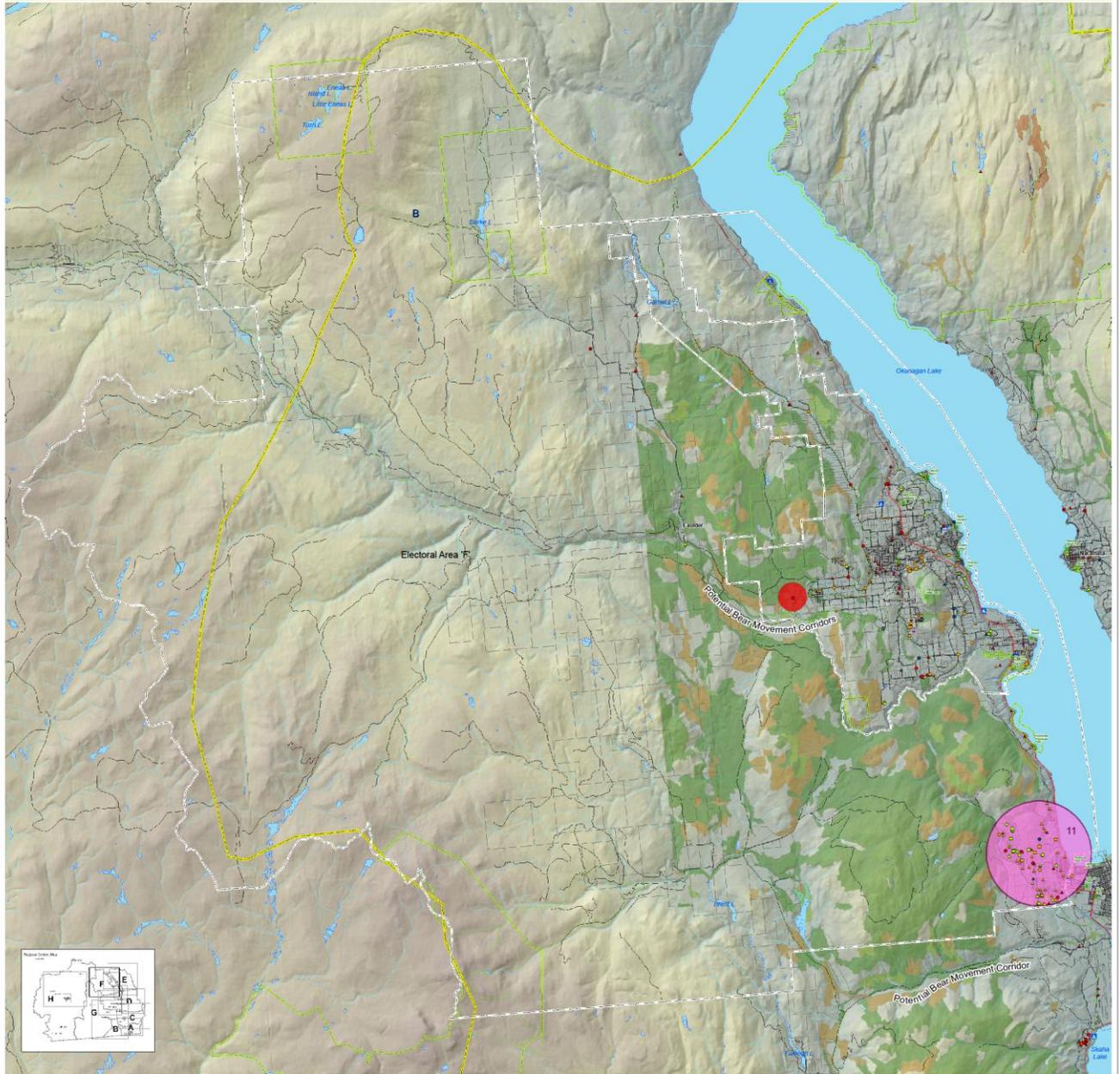
Map Created By: Mike Rowan, March 2007
 Regional District Okanagan-Similkameen
 City of Penticton
 District of Kelowna
 BC Conservation Officer Service



South Okanagan - Similkameen Bear Smart Project

Bear Calls (Garbage, Compost and Unidentified Attractants)

Electoral Area 'F'



Bear Conflict Calls

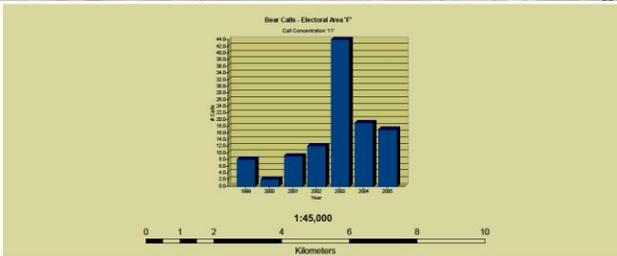
Garbage Attractant	Compost Attractant	Unidentified Attractant
● Spring	■ Spring	▲ Spring
● Summer	■ Summer	▲ Summer
● Fall	■ Fall	▲ Fall
● Winter	■ Winter	▲ Winter

Other Features

■ Regional Park	□ Electoral Boundary	— Highway
■ Campsite	□ SOSC Boundary	— Road
■ School	□ Park	— Trail
■ Lake	□ Parcel	— Stream
● Call Concentration	● Landfill	

Moderate to High Quality Bear Habitat by Season

■ Spring, Summer and Fall	■ Spring and Fall	■ Summer Only
■ Spring and Summer	■ Spring Only	■ Fall Only



This report is part of a series of maps created as part of the Okanagan-Similkameen Bear Smart Project. Habitat Assessment Report, Incident Call Report, and Potential Bear Movement Corridor Report are also available. For more information, please visit the South Okanagan-Similkameen Bear Smart Project website at www.soscp.ca.

Incident call locations are mapped points where reported bear incidents occurred. Each individual point represents a separate report of a bear incident to the Conservation Officer (CO). Each point is symbolized according to the season the incident occurred and by the attractant for the bear (garbage, compost or unidentified).

Seven years worth of incident reports were collected and mapped (2000 - 2006).

There are a total of 22 maps associated with this project.

Moderate to high quality bear habitat shown areas by location where bear habitat is of at least moderate quality.

Seasons are broken down according to the Species Account and are as follows:

Spring = April and May
 Summer = June - August
 Fall = September and October
 Winter = November - March

Data Sources:
 Regional District Okanagan-Similkameen
 Bear Smart Project
 District of Summerland
 District of Penticton
 BC Conservation Officer Service

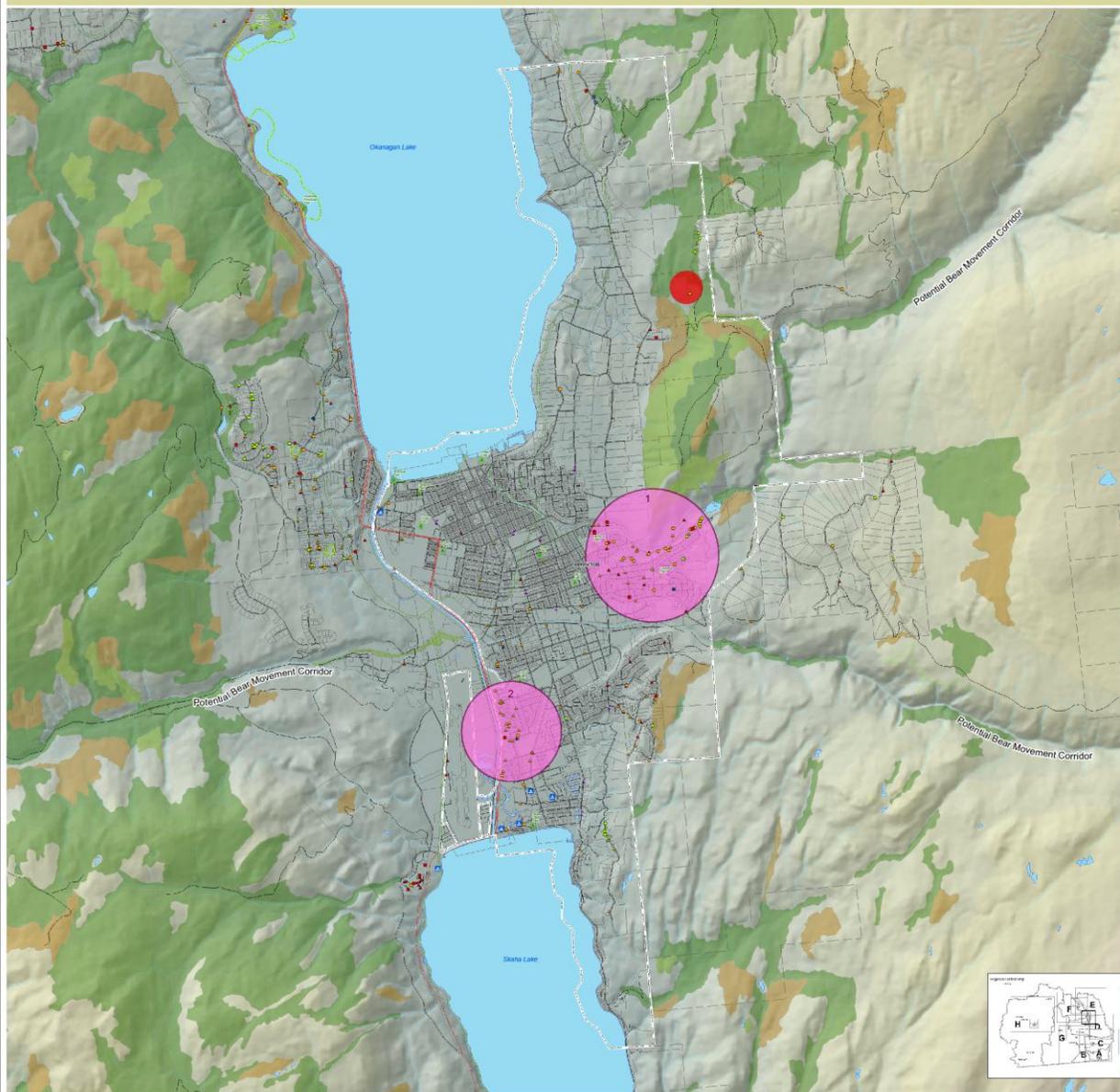
Map Created By: Mike Brown, March 2007
 Map Revised By: Rebecca Wilson, April 2008
 2008 Department
 Regional District Okanagan-Similkameen



South Okanagan - Similkameen Bear Smart Project

Bear Calls (Garbage, Compost, and Unidentified Attractants)

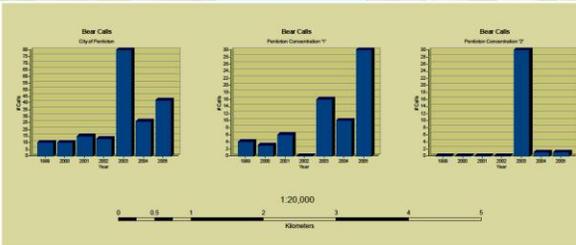
City of Penticton



Bear Conflict Calls		
Compost Attractant	Garbage Attractant	Unidentified Attractant
Spring	Spring	Spring
Summer	Summer	Summer
Fall	Fall	Fall
Winter	Winter	Winter

Moderate to High Quality Bear Habitat by Season		
Spring, Summer and Fall	Spring and Fall	Summer Only
Spring and Summer	Spring Only	Fall Only

Other Features	
Regional Park	Electoral boundary
Campsite	SOSCP boundary
School	Park
Lake	Percol
Call Concentration	Landfill
	Highway
	Road
	Trail
	Stream



This map is part of a series of maps created as part of the Okanagan-Similkameen Bear Smart Project Report Assessment Report. For more information on map content and interpretation of map data, please see the Report and also Okanagan-Similkameen Bear Smart Project Conflict Management Plan available from the SOCC website. Information on Bear Smarting and where reported bear incidents occurred. Each individual point represents a separate report of a bear incident to the Conservation Office of BC. Each point is symbolized according to the attractant that caused the bear incident and by the reported attractant for the bear (garbage, compost or unidentified). Seven years worth of incident reports were collected and mapped (1989 - 2005). There are a total of 22 areas associated with this project. Methods to high quality bear habitat areas by season which bear habitat is of at least moderate quality. Seasons are broken down according to the Species Account and are as follows: Spring = April and May; Summer = June - August; Fall = September - November; Winter = November - March.

Data Sources:
 Regional Council of Okanagan-Similkameen
 City of Penticton
 District of Greenwood
 BC Conservation Officer Service

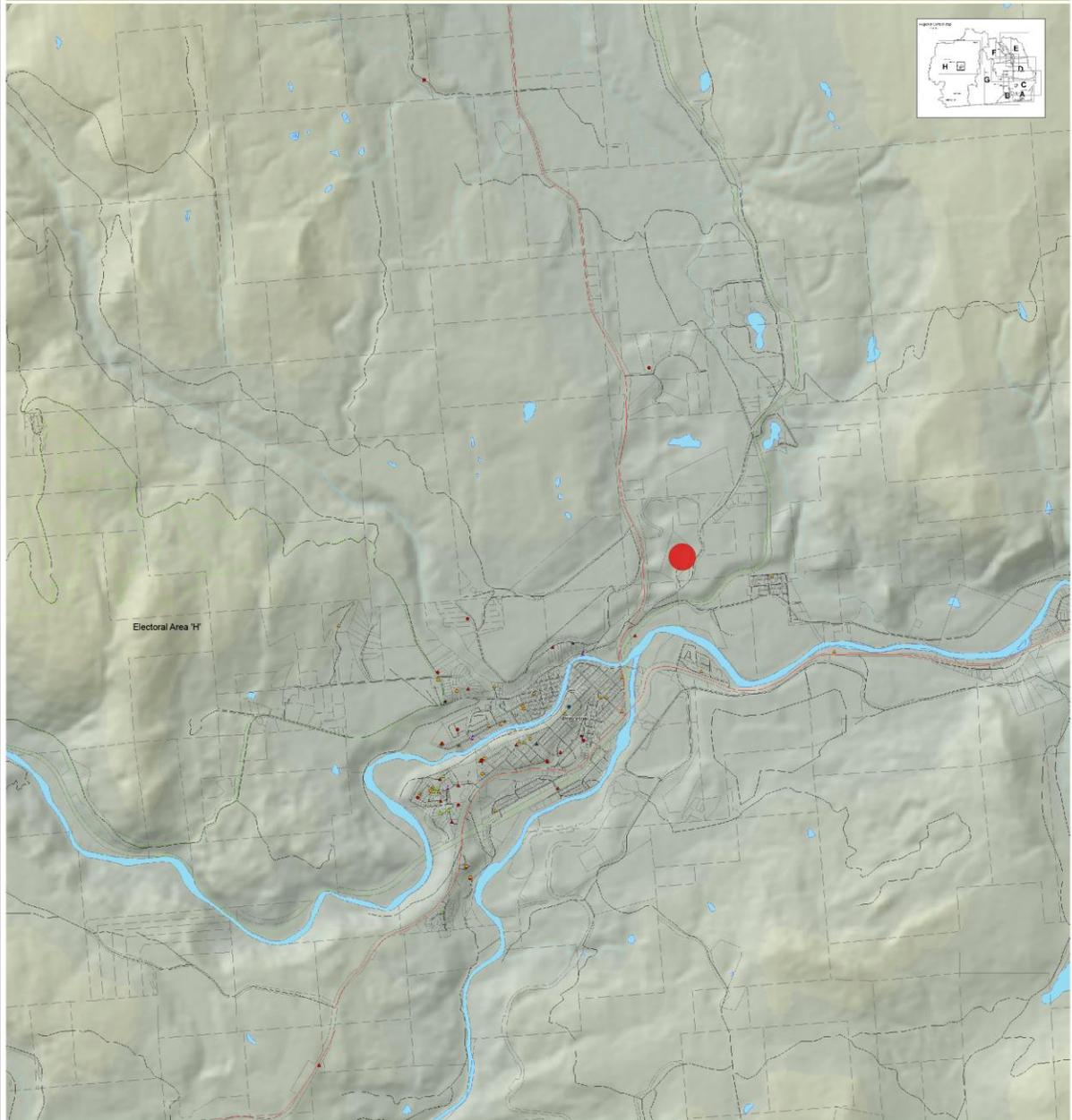
Map Created By: Mike Swanson, March 2007
Map Revised By: Rebecca McLean, April 2008
 SOCC Department
 Regional Council Okanagan-Similkameen



South Okanagan - Similkameen Bear Smart Project

Bear Calls (Garbage, Compost and Unidentified Attractants)

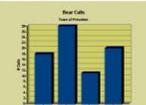
Town of Princeton



Electoral Area 'H'

Bear Conflict Calls			
Garbage Attractant	Unidentified Attractant	Compost Attractant	Other Attractant
Spring	Spring	Spring	Spring
Summer	Summer	Summer	Summer
Fall	Fall	Fall	Fall
Winter	Winter	Winter	Winter

Other Features			
Electoral Boundary	Fruit Orchard	Highway	Campsite
SORSCP Boundary	Landfill	Road	Regional Park
Park	Lake	Trail	School
Parcel	Stream		



This map is part of a series of maps created as part of the Okanagan-Similkameen Bear Smart Project. Related Assessment Report for more information on the threat and consequences of repeat calls, please see the report and the Okanagan-Similkameen Bear Smart Project Conflict Management Plan available from the RSOCC website: www.rsocc.ca (see Engineering and Public Works, Solid Waste).

Map data courtesy of the following: British Columbia, Ministry of Forests, Lands and Natural Resource Operations; British Columbia, Ministry of Environment; British Columbia, Ministry of Agriculture and Food; British Columbia, Ministry of Transportation and Infrastructure; British Columbia, Ministry of Health Services; British Columbia, Ministry of Education; British Columbia, Ministry of Social Development; British Columbia, Ministry of Child and Family Development; British Columbia, Ministry of Health Services; British Columbia, Ministry of Education; British Columbia, Ministry of Social Development; British Columbia, Ministry of Child and Family Development.

Four years worth of incident reports were collected and mapped (2002 - 2005).

There are a total of 22 maps associated with this project.

Map data courtesy of the following: British Columbia, Ministry of Forests, Lands and Natural Resource Operations; British Columbia, Ministry of Environment; British Columbia, Ministry of Agriculture and Food; British Columbia, Ministry of Transportation and Infrastructure; British Columbia, Ministry of Health Services; British Columbia, Ministry of Education; British Columbia, Ministry of Social Development; British Columbia, Ministry of Child and Family Development.

Map Created By: Rebecca M.A. April 2006
 Digitized by: Okanagan-Similkameen

Scale: 1:12,000

0 0.5 1 2 3 4 5 Kilometres



South Okanagan - Similkameen Bear Smart Project

Bear Calls (Garbage, Compost and Unidentified Attractants)

District of Summerland



Bear Conflict Calls

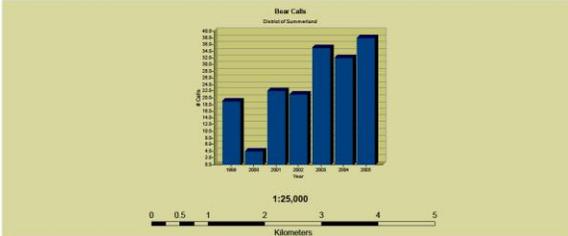
Garbage Attractant	Compost Attractant	Unidentified Attractant
Spring	Spring	Spring
Summer	Summer	Summer
Fall	Fall	Fall
Winter	Winter	Winter

Other Features

Regional Park	Electoral Boundary	Highway
Campsite	SOSCP Boundary	Road
School	Park	Trail
Lake	Parcel	Stream
Landfill		

Moderate to High Quality Bear Habitat by Season

Spring, Summer and Fall	Spring and Fall	Summer Only
Spring and Summer	Spring Only	Fall Only



This map is part of a series of maps created as part of the Okanagan-Similkameen Bear Smart Project. For more information on the current and future management of riparian areas, please see the report and plan Okanagan-Similkameen Bear Smart Project: Conflict Management Plan available from the SCSO website, www.scsos.com, or from the Okanagan and Similkameen Regional District.

Incident call locations are marked points where reported bear incidents occurred. Each individual point represents a separate report of a bear incident to the Okanagan-Similkameen Regional District. Call points are symbolized according to the season the incident occurred and by the primary attractant for the bear (garbage or compost).

Season points north of incident reports were collected and mapped (1984 - 2005).

There are a total of 22 maps associated with this project.

Modesto is high quality bear habitat where bears are known to occur.

Seasons are broken down according to the Species Account and are as follows:

Spring = April to May
 Summer = June to August
 Fall = September and October
 Winter = November - March

Data Sources:
 Regional District Okanagan-Similkameen
 City of Penticton
 District of Summerland
 BC Conservation Officer Services

Map Created By: WBA Brown, March 2007
Map Revised By: Melissa Hill, April 2008
 (2012 Amendment)
 Regional District Okanagan-Similkameen