Black Bear Management in GVRD Parks

Preliminary Review

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1. Executive Summary

The goals of this Preliminary Review of Bear Management in GVRD Parks was to develop priority interim procedures for park staff to manage human/Bear interactions in order to reduce conflicts between humans and bears, be consistent with current best management practices, be compatible with procedures of other local jurisdictions, build towards a comprehensive bear hazard analysis and protect the health, wellness and existence of bears where the safety of humans is not compromised.

Research was conducted through interviews of staff and review of other agency management plans for bears. A number of recommendations were made from the research.

Recommendations:

Policy

- Develop a vision statement on bears including goals and objectives to help guide the management of bears and people in their parks
- Actively work toward the proactive management of bears on GVRD lands

Attractant Management

- Continue to bear proof garbage cans and dumpsters in parks where bears are found. Bear proof recycling containers. Garbage cans or dumpsters where food waste is commonly thrown out should be a priority for being bear-proofed.
- Regularly wash garbage cans with ammonia to reduce odours and thus reduce their attractiveness to bears
- Examine potential attractants in greater detail to discover where potential problems may be being created
- Complete an assessment of bear attractants and areas of potential bear-human conflict

Staff Training

- Provide field staff with adequate training so that they understand concepts such as habituation and food-conditioning, the various types of bear-human interactions, the appropriate responses to bear situations, and bear behaviour including defensive and predacious behaviour
- Provide staff with reliable bear information and training so that they can respond to public queries on bears with clear and consistent information

Procedures and Policies

- Develop Area Closure Guidelines
- Improve the monitoring and recording of bears including developing a recording form to be used throughout GVRD lands
- Update the warning signage procedures and consider permanent signage alerting park users to the presence of bears in the parks

Visitor Information

- Develop GVRD materials to educate parks users about bears. Information on bears should also be posted on the website.
- Review the "Caution Bear in Area' sign to see if additional information on appropriate behaviour should be added

Cooperation with Other Agencies

- Continue to investigate where they can cooperate and coordinate with bordering municipalities and other agencies in the management of bears
- Continue to develop a relationship with the COS including guidelines for translocations

2. Introduction

In the Lower Mainland, GVRD Parks and lands provide important natural spaces in an increasingly urban environment. These lands provide significant habitat and travel corridors for wildlife and a number of these areas are home to the black bear (Ursus americanus). While normally peaceful, the black bear does have the capability to seriously injure or even kill humans and thus presents certain management concerns not true of other wildlife species.

However, while interactions between people and bears have the potential to create conflict, there are recognized methods of decreasing that conflict to keep both people and bears safe.

This document is the first step of examining the human-bear situation on GVRD lands and beginning to develop policy and procedures to manage bears. In the past, without policy or procedures in place, field staff have responded variably to bears on GVRD lands, and most of the responses have been reactive in nature. This initial report, as well as the Bear Hazard Assessment to be completed next year, are a start toward proactively managing bears on GVRD lands as well as to create consistency in the way bear and people are managed and the messages that are given to the public about bears. While some reactive management will likely always be a part of bear management, reactive management should diminish with further advances in attractant management, education, and planning.

2.1. Objectives:

Develop priority interim procedures for park staff to manage Human/Bear Interaction within Regional Parks which will:

1. reduce conflicts between humans and bears; and;
2. be consistent with current best management practices; and;
3. compatible with procedures of other local jurisdictions; and;
4. build towards a comprehensive bear hazard analysis; and;
5. protect the health, wellness and existence of bears where the safety of humans is not compromised.

2.2. Priority Procedures:

1. Waste Stream Management: A procedure on assessing the need for "Bear Proof" garbage containers, defining "Bear Proof" and the maintenance of the containers.
2. Bear Response: A procedure outlining a staff response continuum from bear observation to the management of a problem bear that identifies the role of staff, contractors and the Conservation Officer Service.
3. Documentation: A procedure outlining the proper documentation of bear observations, conflicts and incidents that could be used to begin to build a base line source of data that would be of use in a comprehensive bear hazard analysis. The development of the documentation format should 1). fulfill the needs of GVRD Parks; 2). be compatible with other agencies as possible.
4. Trail warning/closure procedures: A procedure outlining when to post or remove "Caution Bear in Area" and Trail Closure signage and related documentation.
5. Visitor Information: A procedure outlining appropriate publications that can be posted on kiosks and information boards; and a recommendation on which sites should post this information.

This work is really the first stage of planning in regard to bears in GVRD Parks. The goal of this document is to provide an interim program with respect to bears in GVRD Parks. Given the short timeframe of the research, in-depth, comprehensive research or development of procedures is not possible. However, this work will provide interim information which will support a Bear Hazard Assessment and conflict prevention plan to be completed in the near future.

To complete this report, interviews were conducted with staff from the six parks identified as having the most human-bear interactions as well as the LSCR and the watersheds. Municipalities bordering the parks were also contacted for information on how they deal with bears in their jurisdictions.

3. The Study Area

Six parks were involved in this initial study along with the Lower Seymour Conservation Reserve and the Capilano, Seymour and Coquitlam watersheds:

Capilano River Regional Park

Located on the North Shore between the District of West Vancouver and the District of North Vancouver, Capilano River Regional Park is 144 hectares in size. Common activities include walking and hiking, cycling, kayaking, fishing, picnicking, and visiting the fish hatchery.

Lynn Headwaters Regional Park

Situated in the District of North Vancouver, Lynn Headwaters Regional Park is one of the few parks in the GVRD system with wilderness or backcountry areas. At 3735 hectares, Lynn Headwaters is also the largest of the GVRD Parks. Common activities include walking, hiking and picnicking.

Belcarra Regional Park

Belcarra encompasses over 1100 hectares around the Villages of Anmore and Belcarra and the City of Port Moody. Sasamat Outdoor Centre is available as a rental facility. Camp Howdy is located on Indian Arm and, although it is not within the park boundary, the camp is accessed through the park.

Common activities at Belcarra include walking and hiking, horseback riding, cycling, swimming, picnicking, fishing, canoeing and kayaking.

Minnekhada Regional Park

Covering more than 200 hectares, Minnekhada is located on the edge of the Pitt River in northeast Coquitlam. . Minnekhada Lodge, a heritage building, is rented out for weddings and various other functions. Common activities include walking, hiking, wildlife viewing and picnicking

Derby Reach Regional Park

Derby Reach lies along the Fraser River in the Township of Langley and encompasses 300 hectares of land. Common activities include cycling, hiking, horseback riding, fishing, camping, picnicking, and using the dog off-leash area. The park has thirty-eight campsites along the river.

Kanaka Creek Regional Park

Located in Maple Ridge, Kanaka Creek is a linear park that follows the creek. This long, narrow park is 415 hectares in size. The Bell-Irving Hatchery and fish fence support enhancement activities for chum and coho salmon and cutthroat trout.

Common activities include walking and hiking, horseback riding, cycling, fishing, and picnicking.

Lower Seymour Conservation Reserve (LSCR)

An area of 5,668 hectares of forested valley, river flood plain and subalpine areas below the Seymour Watershed. Originally part of the closed Seymour Watershed, the area was first opened to the public in 1987 as the Seymour Demonstration Forest. In 1999, the GVRD changed the name to the Lower Seymour Conservation Reserve to better reflect the multiple interests and uses of the area, including those of water utility, ecological, recreational, and educational significance. The LSCR provides easy access into wilderness from nearby urban areas. Activities include nature appreciation, hiking, cycling, in-line skating, kayaking, mountain biking, fishing, interpretive programs and various research and demonstration projects.

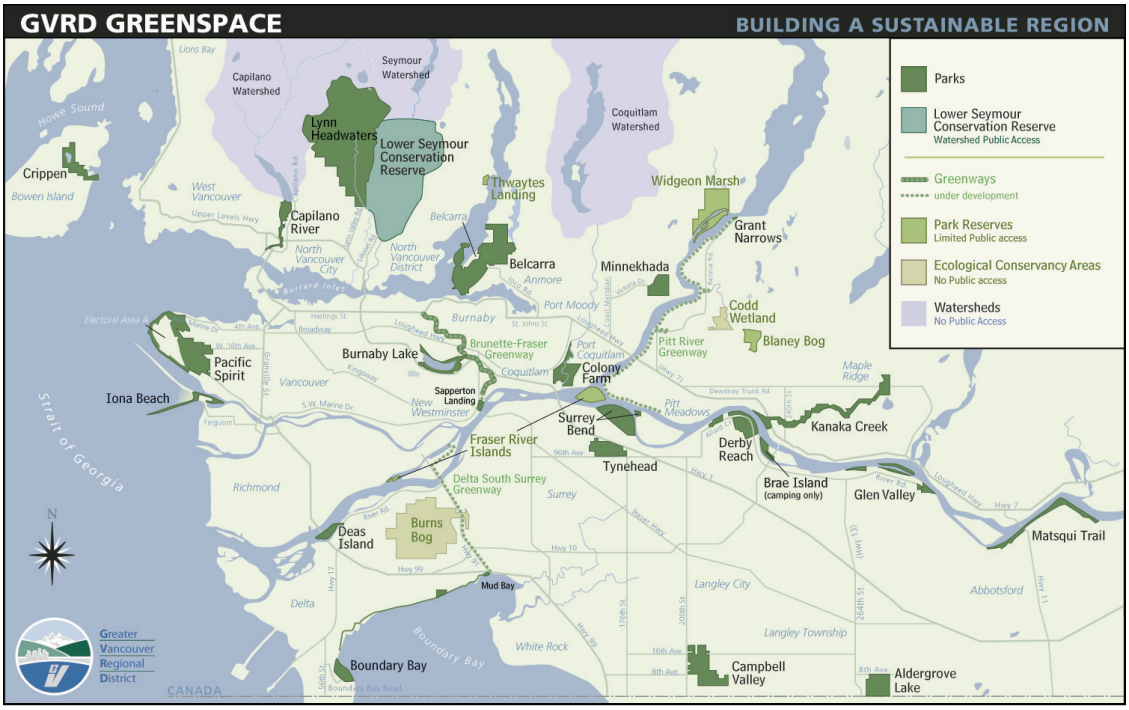
The Watersheds

The Capilano, Seymour and Coquitlam watersheds cover 585 square kilometers of forested land and combine with six storage lakes, six dams, 22 reservoirs, and more than 550 kilometers of water mains to make up the GVRD's portion of the Lower Mainland water system. All of the watersheds fall under the jurisdiction of the Greater Vancouver Water District and are primarily managed to maintain a high quality water supply for the Greater Vancouver area.

The watersheds are found at the southern edge of the Pacific Range within the Coast Mountains. Three biogeoclimatic zones are found within the watersheds: Alpine Tundra, Mountain Hemlock and Coastal Western Hemlock. The Mountain Hemlock Zone is located above 900 meters and is frequently used by bears for denning.

There are believed to be no grizzlies in the watersheds making the black bear the dominant carnivore. Plant foods include skunk cabbage and various berries. As well, the rivers support significant salmon runs which can be an important fall food source for bears. Some bears are also attracted to garbage, fruit trees and other attractants in adjacent residential areas.

Staff working in the watersheds frequently see bears. Previous research (BC MELP, 1993) identified the Seymour watershed as the area with the greatest bear activity, but as this research only occurred over two seasons in the 1990's, it is not known whether this still holds true.



4. GVRD Parks Perspective on Bears in Parks

GVRD Parks does not have specific statements on wildlife and how they will be managed on their lands. However, some statements from the Regional Parks and Greenways Plan (RPGP) may be used to begin to flesh out the GVRD Parks' perspective:

1. The RPGP contributes to the Green Zone by protecting biodiversity.
2. Currently less that 5% of parklands are actively developed for public use and amenities, with over 95% of the land base being managed for conservation.
3. Securing sufficient parks, conservations areas and greenways to respond to urban growth and development will require cooperative approaches with municipalities, provincial agencies, private land owners and community organizations.
4. GVRD is uniquely positioned to provide outdoor recreation and conservation programs which foster community development and social responsibility.
5. The key strategic issues to be addressed in the RPGP include: protecting conservation values

while accommodating visitor use.

6. The RPGP identifies important links to local and provincial parks and open space plans, where GVRD will partner with municipalities, provincial agencies and community groups to advance outdoor recreation services and environmental stewardship.
7. GVRD will secure and protect sensitive habitats along wildlife and utility-greenway corridors with a priority on urban growth areas.
8. Partner to develop and implement regional biodiversity management strategies.
9. Promote responsible user behaviour.
10. Assist in education, stewardship and other activities that advance appropriate recreation use, environmental and social responsibility;
11. Conducting research and developing management tools that advance biodiversity conservation and mitigate user impacts;
12. Supporting environmental curriculum development and work experience programs like stewardship or conservation corps.

While the above quotes do not specifically speak to the GVRD management philosophy regarding bears, they do begin to outline the role GVRD can play within the region.

For the purpose of this report, the perspective that bears are a natural part of the landscape of GVRD Parks has been adopted. The goal is to leave bears in their natural habitats within parks, but human safety is the foremost consideration in managing bears. This perspective also recognizes that important role that people play in keeping bears safe.

GVRD Parks should develop a vision statement on bears including goals and objectives to help guide the management of bears and people in their parks. While this may be part of a larger vision statement on wildlife, it should contain specific references to management of wildlife that has the potential to be dangerous.

4.1. Recommendations

Develop a vision statement on bears that includes goals and objectives for managing bears in GVRD Parks.

5. Management Strategies

Management of bears can be divided into two main categories: reactive and proactive.

Reactive management responds to conflicts as they occur, while proactive management is aimed at preventing human and bear interactions by anticipating the source of these conflicts and mitigating them by providing long term solutions. Obviously, of the two, proactive management is better. Advance planning enables people to learn from experience and to prevent problems from occurring.

Most of the bear management in GVRD Parks has been reactive management with staff in the different parks responding variably when situations arise. Examples of proactive management include the installation of bear-proof garbage containers and bear aware training for staff.

This initial report, as well as the Bear Hazard Assessment to be completed next year, are the beginning steps toward proactively managing bears in GVRD Parks. While some reactive management will likely always be a part of bear management, reactive management should diminish with further advances in attractant management, education, and planning.

5.1. Recommendations

GVRD should actively work toward the proactive management of bears within their lands.

6. Attractant Management

Managing bear attractants is essential to the coexistence of people and bears. Bears are constantly on the lookout for food sources and it is the responsibility of the humans who live, work and play around them to ensure that bears do not gain access to human food sources. Bears that access human food sources often alter their wild behavior and foraging habits to continue to obtain it. Such bears tend to start associating food with people and often come into increasing conflict with humans leading to unsafe situations for people, property damage, and frequently, the destruction of the bear (United States Department of the Interior 1992). Even a low rate of exposure to human food or garbage will reinforce problem behaviour in bears (McCullough 1982).

As omnivores, bears eat a wide variety of foods. Their sense of smell is their most powerful sense and they can smell certain foods from a kilometer away or more. Human food may become available to bears from several sources: intentional feeding by visitors, inadequate garbage collection schedules, inadequate design of garbage and/or food storage facilities, improper food storage, food left unattended, and improper use of bear-proof garbage cans. In addition to food and garbage, many other items can also be bear attractants. The following list outlines some of the bear attractants that may be found in GVRD Parks:

Garbage – improperly stored garbage is one of the main reasons bears come into conflict with humans.

Petroleum Products – bears are attracted to many petroleum products including rubber, tarpaper, paint, turpentine, kerosene, and charcoal fluid. In one park, a bear got into enzymes used for toilets.

Fruit Trees – bears are attracted to fruit trees when the fruit is ripe. Fruit should be picked as it ripens and no fruit should be left on the ground. Electric fences are very effective around fruit trees.

Artificial or Non-native Plants - such as Himalayan blackberry, roadsides and trails seeded to grass and clover also attract bears.

Barbecues – the smell of food cooking can attract bears from long distances. Barbecues should be burned clean after use.

Woodpiles – even woodpiles can be attractants for bears as they attract rodents which bears eat.

Hatcheries – from fish to fish food, hatcheries can provide numerous bear attractants.

Campsites – campsites not kept clean of human and pet food can attract bears. Coolers should be kept inside a vehicle and no food or toiletries should be taken into a tent.

Natural Bear Foods - Plants-black bears eat a wide variety of plants, but often berry plants are the ones that will entice bears into areas used by humans. Fish, particularly salmon during spawning season, attract bears.

It has been well documented in both Canadian and American parks that cleaning up food and garbage problems significantly decreases the problem rate with bears (Philipp 2000).

6.1. Definition of a Bear Resistant Container

Since bears are incredibly capable of getting into containers holding food, containers are probably more accurately labeled bear resistant than bear proof. A bear resistant garbage container should have the following properties:

- A securable container capable of withstanding the forces of a bear – sometimes considered a minimum of 136 kilograms of force. Some companies have had their products "tested" by captive bears
- When secured and under stress, the container does not have any cracks, openings, or hinges that would allow a bear to gain entry by biting or pulling with its claws
- The container should be permanently anchored into the ground so that it cannot be flipped and/or should have a locking mechanism that prevents it from opening if it is flipped
- Wood containers are not considered bear resistant unless they are reinforced with metal
- Bear-proof receptacles should be easy to use and readily available

Containers only remain bear resistant if they are properly maintained. They should be checked regularly for cracks or openings and to ensure that all parts such as hinges and closing mechanisms are in working order.

Non-Bear-Proof Recycling Containers

6.2. Attractants on GVRD Lands

At the present time, there is no GVRD-wide system for the management of bear attractants and thus the various groups involved

are all at different places in their management of attractants. The Bear Hazard Assessment will look into attractant management in much more detail than can be accomplished in this preliminary report. Note that in this report, smaller garbage receptacles are referred to as cans, while the larger receptacles are referred to as dumpsters.

Capilano River

Staff have been replacing cans with bear-proof containers. About three-quarters of the garbage cans in the park have been bear-proofed leaving six more to be done. Currently, the bags in the non-bear-proof cans are changed every morning in the summer and also every evening if the park is really busy. The garbage cans in the outlying areas have been bear-proofed but the picnic area has yet to be done. The dumpsters in the park have been replaced with metal lids, but are not specifically bear-proof.

One issue is that there is a main garbage dumpster on the road by Camp Capilano which has two unlocked doors. Since children often stay at the Camp, this is a concern.

Bears often frequent the blackberries along Rabbit Lane in West Vancouver.

Capilano River has trouble with dogs off-leash which could bring a dog into conflict with a bear.

Lynn Headwaters

All garbage cans have been bear-proofed. The metal lid on the dumpsters is currently being replaced with a bear-proof lid. The new lids will be single rather than the current double lid and will not open if the dumpster is tipped. As well, the new dumpsters will be heavier to lift.

Bears have been seen around the barbecues in the picnic area.

Belcarra

About eight years ago, the park dumpsters had plastic cathedral lids and bears were able to lift them and/or break them. In 1996, a bear was getting into the dumpsters and became garbage-conditioned and was trapped by COS. Since then, the lids have been replaced with metal lids which are chained and locked at each corner. However, during my visit, a bag of garbage was sitting on top of the dumpster. As the location of the dumpster is right beside a residential road, the garbage bag may have been left by either a park visitor or someone driving by.

Staff has made efforts to prevent garbage cans from being tipped over by wildlife. At Admiralty Point, Woodhaven Parking Lot and Jug Island Beach, cans are suspended by chains. Other garbage cans are stored in a corral to prevent them being easily tipped over. However, while this may save staff from having to clean up garbage from overturned garbage cans, in no way does it prevent wildlife from accessing garbage.

Example of a Dumpster with Chained Lid

A potential issue in Belcarra is that children at Camp Howdy pass the dumpsters on their way to the beach.

Minnekhada

Minnekhada does not have bear-proof garbage cans and garbage cans have sometimes been knocked over by bears. In areas where this was a problem, staff have suspended garbage cans on chains. However, as mentioned above, these cans are not bear-proof and bears can still gain access to the garbage inside.

Ineffective Approach to Bear-Proofing Garbage Cans

Summer efforts to prevent problems with bears include emptying garbage cans every night and washing the cans with bleach once a week as well as chaining dumpsters at the corners to prevent access by bears.

Buildings in the park are often rented for weddings and other events that create considerable food-related refuse, which is put in the dumpster. These events occur most frequently on Saturday. Recently, a new contractor has started emptying dumpsters on Sunday which leaves the garbage from these events in the dumpster for only one night as opposed to the several nights that was previously the case.

The blueberry farms around park also attract bears. Only one owner is using an electric fence to keep bears out of the berries.

Derby Reach Regional Park

As of the spring of 2006, bear-proof garbage cans had been installed in the 38-site campground. Nine of the thirteen cans installed are double bins that have separate sections for garbage and recycling. This leaves sixteen garbage containers to be bear-proofed. The current Park Operator has only been at the park for a year, but was unaware of any problems with garbage or the campground.

The Park surrounds privately owned cranberry fields on three sides. Along the Fort-to- Fort Trail, there are heritage fruit trees that are remnants of the park's agricultural past. Bears find these attractive and their lower branches are kept trimmed to reduce their attractiveness to bears. Removal of the fruit trees as exotic species would be in order if bear management were the only concern. The trees, however, are recognized as cultural resources that are preserved as part of the history of the area. This poses a dilemma to park mangers; whether a culture resource should be protected even if it adversely affects a natural resource.

Bears feed on blackberries found along the Fort-to-Fort and the Edge trails. Recently 2.5 hectares of blackberries were removed from the Fort-to-Fort Trail for field management which may decrease its use by bears. The bear was also sighted feeding in a field of long grass, but this grass has also been cut for field management.

Kanaka Creek Regional Park

Garbage cans have historically been knocked over around the hatchery (four cans) and Cliff Falls (two cans). These six cans are being replaced with bear-proof cans. Others garbage cans have not been bothered by bears up to this point. To reduce the attractiveness of garbage cans to bears, staff empty garbage before the end of the late shift.

The hatchery is also appears to be attractive to bears. Kanaka Creek also has some problems with dogs off-leash.

LSCR

All garbage cans were bear-proofed four or five years ago and the garbage cans are washed out with ammonia once or twice a summer. The dumpster is located inside a chain link enclosure that is topped with barb wire. These measures have greatly decreased problems with bears in the LSCR. Before the bear-proof containers were installed, Conservation Officers were called 6-12 times a year. Managing the garbage has also reduced staff time as they used to spend a lot of time cleaning up spilled garbage.

Signs have been posted around Rice Lake asking fishermen to either throw fish guts in the lake or to dispose of them outside of the park. This measure has also reduced problems.

In 2004, there were problems with garbage and bears related to construction contractors. Even the vegetable oil used on their equipment was discovered to be a bear attractant.

The area is also well used by movie crews; at one time, there were about 80 productions a year. They can bring a variety of attractants into the area. For example, they arrive with their own caterers. However, they are often there only short-term and so have usually left before the bears get to know them as a food source.

Watersheds

There is one bear-proof garbage can at each watershed gate. The watersheds have a policy that garbage taken in has to be taken out. Staff visit all sites every day to check for garbage.

The Smitherite dumpsters are locked with a chain and carabineer and signed to remind people to lock after use.

6.3. Recommendations

It is progressive to see that GVRD has already been installing bear-proof containers. Garbage cans and dumpsters in parks should continue to be bear-proofed where bears are found. Even allowing a bear to access garbage once is one time too many. GVRD also needs to be aware of its responsibility as a role model for the greater community.

A number of parks have taken measures such as suspending garbage cans from chains or placing them in corrals to prevent them being tipped over. While this may prevent the cans from be tipped over, these actions do not prevent bears from getting food from them and thus becoming food-conditioned. Staff also mentioned that they are bear-proofing cans where there have historically been problems and that there is no need to bear-proof cans that have never been a problem. However, once the cans that have been providing meals are bear-proofed, bears are likely to begin hitting up

other cans – particularly if they have gotten garbage can meals in the past. Recycling containers should also be bear-proofed. Garbage cans or dumpsters where food waste is commonly thrown out, such as outside the rental buildings at Minnekhada, should be a priority for being bear-proofed.

A number of areas have been washing their garbage cans with ammonia on a regular basis to reduce odours and thus reduce their attractiveness to bears. This would be a good strategy to adopt across all GVRD lands.

In addition, dumpsters should be bear-proofed. While chaining the corners prevents many bears from gaining access, large bears can break the chains. As well, bear-proof dumpsters are less subject to human error than chains that have to be removed and reclosed each time garbage is added or emptied.

Potential attractants need to be looked at in greater detail to discover where potential problems may exist. Other parks where camping is occurring such as Brae Island, Matsqui, and Tynehead should also be analyzed for attractants and potential conflicts. A Bear Hazard Assessment is recommended as it would involve studying the parks and other areas in more detail and examining the specific attractants on GVRD lands.

7. Bear and Human Interactions

While black bears are powerful mammals with few naturally occurring enemies, they are remarkably tolerant of humans. Interactions between people and bears are usually benign (Kolenosky & Strathearn 1987).

Most bears, except those that have learned to associate people with food, will generally try to avoid people. In fact, bears will alter their behavior to avoid people. While bears are usually diurnal (most active at dawn and dusk), in areas where there is a lot of human activity, bears often become increasingly nocturnal to avoid contact with people. Research in Yosemite Park found that bears most often responded in a neutral fashion when encountering people with less than 2% of bears reacting in an aggressive manner. (Hastings et al. 1981). Aggressive behavior was correlated with the month of June, younger visitors and close distances between bears and people. More research is required to reinforce the validity of such findings.

Although black bears are generally non-aggressive towards humans, attacks resulting in injury and even death do occur. The best way to reduce risk during a bear encounter is to understand as much as possible about bear behaviour and motivation and then to respond appropriately. As well, much of preventing problems between humans and bears involves taking a proactive approach – particularly when it comes to dealing with attractants.

7.1. Bears Within GVRD Lands

Limited records of bears have been kept by GVRD Parks and thus the existing records combined with the interviews of several staff members have been put together to begin to create a record of bears within GVRD lands. In some parks, staff believe that the bears are mostly transient, while other parks appear to have resident bears or bears that regularly travel through the park. Most bears in GVRD Parks are not habituated and show the desired behaviour of moving away from people when they encounter them.

Since few records exist for bear sightings, staff were asked to estimate the numbers of bears seen each season in their park. For Capilano River and Lynn Headwaters, additional information came from the North Shore Bear Hazard Assessment (McCrory 2006).

At **Capilano River**, approximately twenty bears are sighted over the season. The greatest concentration appears to be between the dam and Capilano Camp. Most of the sightings are on the North Vancouver side of the park. About one or two bears are seen near MacIntyre every season. Bear scat is frequently seen and bears are sighted once in a while along Rabbit Lane in West Vancouver.

The following information on the Capilano River Area is from the North Shore Bear Hazard Assessment (McCrory 2006) from research conducted July 26, 2005:

Capilano Dam to Upper Levels Highway. Capilano Pacific Trail

On the west side of the canyon for about 3 km to the suspension bridge was mostly second-growth mature cedar and Douglas fir mixed with some old-growth. The capability was a trace for the mid summer and fall including:

- salmonberry (Tr)
- red huckleberry (Tr-L/M-ripe)

Skunk cabbage was incidental. There was no bear sign.

The steep canyon is likely an impediment to east-west animal travel as it is 200–300 m deep in some places. Bears may use the man-made bridges at night.

While no evidence of bear travel was noted, this is a good travel corridor between the protected Capilano Watershed above and the ocean, including providing a travel route underneath the Upper Levels Highway.

The DFO Hatchery has 3-4 single and double Haul-All bear-proof containers.

Trail down to the Upper Levels Highway - The trail opens up more and is lined with salmonberry (M) that were finished by the end of July. There are also dense thickets of blackberry (H) with a high productivity of green fruit. Mountain-ash is incidental with a high productivity of fruit, which is 90% ripe. The trail has a 0.3–1 m wide fringe of green grasses. There is a trace of horsetail but it is the species with the much longer leaves.

At the gate there is one bear proof garbage container. There is an old landfill which has walls of blackberry.

Summary: Overall the area has a trace capability in the forest but the semi-open areas of salmonberry and blackberry have a moderate summer-fall capability.

There was no bear sign whatsoever over about 10 km of trail. This is a high people use area.

Lynn Headwaters estimates about fifteen bears a year. Generally, bears are seen in May and then tend to move to higher elevations where there is a fair amount of food. The previous Park Operator estimated about 6-7 resident bears in the Grouse Alpine area and also commented that there were some sightings in Hanes Valley which is a sixteen kilometer trail connecting the Grouse Alpine with Lynn Headwaters. The trail is on the east side of the valley and most bears are sighted on the west side.

Bears are also often seen crossing the entrance road. Staff began bear-proofing garbage cans about 6-7 years ago and finished about four years ago. Bear-proofing the garbage cans significantly decreased bear problems. Now, bears are more often in neighbouring residential areas where garbage is still accessible than in the frontcountry area of the park.

The following information on Lynn Headwaters is from the North Shore Bear Hazard Assessment (McCrory 2006) from research conducted July 28, 2005:

At the headquarters/gate area there are large lawn areas and a park HQ/residence. The parking lots and HQ have single Haul-All BP canisters. There was one large Save-On dumpster at HQ with plastic lids that was non BP. This used to be a water supply area but it had a landslide and is no longer used

for domestic water (Mae Murray, pers. comm.).

This is a large green space protected area for black bears with the Lynn Valley and Lynn Canyon Parks below providing travel corridors linking the large backcountry to the seashore area for black bears. According to park ranger Andy Robinson (pers. comm.) there are two large black bears that sleep in the daytime on the hiking trails in Lynn Park and they have to close the area so tourists can by pass the bears.

There are no salmon that spawn in Lynn Creek.

Lynn Loop Trail. (July 28/05) is a 5 km loop with two basic habitat types.

Mountain forest - all mainly second-growth hemlock and Douglas fir with a closed canopy. There were some old burned snags and stumps of large redcedar indicating the previous forest cover. Apparently during the early days of logging the steam donkeys started many forest fires until someone invented a spark arrestor (Mae Murray, pers. comm.). Much of the old cedar forest was likely prime black bear denning habitat but no longer.

The capability was a trace for the mid summer and fall including:

- salmonberry (Tr)
- red huckleberry (Tr-L-ripe)
- salal (Tr)

Devil's club and skunk cabbage were incidental. There was no bear sign.

Lynn Creek Riparian Habitat – is mainly an old logging road through red alder-cottonwood-maple. The bear foods include:

- salmonberry (H/fruits over)
- grasses (Tr - L). Fringe along road/trail
- red elderberry (Tr/H-ripe)

At **Belcarra**, it is believed that five to six resident bears are seen about ten times over the season. Most bears are seen along Tum-tumay-whueton Drive. This appears to be a travel corridor.

There may be high numbers of bears in the Buntzen Ridge Trail because there is an abundance of berries, but it is only patrolled by staff once a week so its use by bears is not known.

At **Minnekhada**, staff estimate twenty resident bears. Bears are frequently sighted on Oliver Road as they cross from the park to the blueberry fields.

Staff believe the same bear has been visiting Derby Reach for the past three summers. The bear/s frequents the Fort-to-Fort Trail where it has been seen in the heritage fruit trees in the morning. The bear/s also visit the blackberries along the Fort-to-Fort and Edge trails. The bear/s has also been sighted in the bog and along the waterline in the evening.

The Park Operator at **Kanaka Creek** feels that the number of bears in the park has been decreasing over the years likely as a result of surrounding development. In 1989, there were about four to five bears in the park and today the average is about two bears per season. Bears are often found from 112th north to the top of the park in the bush. Bears are also in the Cliff Falls area, around the hatchery and along the creek.

Michael Allen, who has done research on bears around Whistler, estimated a population of seventeen bears in the **LSCR**. There are many bear sightings in the LSCR. For example, the Operations Foreman once saw fourteen bears (including two sows with three cubs each) in about fifteen minutes while driving twelve kilometers. Many people report bear sightings to the front gate and reports from the public seem to be increasing.

The river corridor is highly used by bears. By using the bridges bears can move quickly around the

region. For example, by using Lynn Canyon Pipe Bridge, a bear can be in Lynn Valley in minutes versus hours or days. Bears are also often seen around the hatchery and the Seymour Falls Dam around the end of the spawning season between August and September. The highest numbers of bears are usually seen in the spring, and in the fall for the Coho run. The calls to the CO's tend to be bears in the summer.

Watersheds - In the Coquitlam Watershed, staff believe the number of bears has been decreasing over the years while there are increasing staff reports of bear sightings in the Capilano and Seymour Watersheds. Most bear sightings are from the main road likely because staff are frequently driving the road. High use areas include along the rivers and around the hatcheries.

The Black Bear Inventory Project of the Seymour Watershed (1993) identified that bears do travel among the continguous Lower Mainland watersheds. Previously, it was believed that only males were making such journeys, but a tagged female with cubs traveled from the Seymour to the Capilano watershed one spring during the research.

An encouraging result of the study was that none of the sixteen tagged bears were found in the surrounding urban areas during the course of the study.

7.2. Human-Bear Interactions on GVRD Lands

Despite a healthy population of black bears on GVRD lands, the only injury in connection with a black bear was a scratched and sprained finger. It is unconfirmed whether this injury was actually caused by the bear. Outlined below are various human-bear interactions that occurred on GVRD lands as reported by staff. The difference in levels of detail likely represents the differing amounts of time Park Operators have been at their Parks. For example, the Park Operators at Belcarra, Minnekhada and Kanaka Creek have been in their parks for 15+ years. As this information was obtained by staff interviews, it is unlikely to be complete.

Capilano River – Dumpsters and garbage cans have been damaged by bears.

Lynn Headwaters – Spring 2005 – Two staff individually saw a bear along the entrance road when cycling to work in the morning. The bear moved away from staff but seemed to try to identify the second staff person before moving into the bush. Staff decided to try to scare the bear to a less populated part of the park since it did not seem afraid of people and people would soon be coming into the park. They returned with a truck and chased the bear, blowing the horn. After three times, the bear moved into the bush. She later returned and was again chased with the truck and a bear banger was set off. She ran into the bush and a cub, which had not been seen before, fled down the road and into the bush. Likely, the sow returned for her cubs. Later, staff heard reports of a sow and two cubs in the area at the same time so there were probably two cubs.

Estimated late June, early July 2001 – staff member came over rise on Lynn Creek Crossing about nine kilometers from the office and surprised a bear. The bear took off in the other direction and the staff yelled, "whoa" in surprise and backed up along the trail. The bear stood on its back legs and snorted. Then as the staff member started back along the trail, the bear followed crashing through the bush below for about 500 meters. Every once in a while it would stand on its back legs. The bear was estimated to be about 2-3 years in age.

Minnekhada – Staff reported two more serious incidents in the last twenty years:

1. A mother and children came around a corner in the trail and surprised a bear. They claimed the bear chased them.
2. 2005 – A woman called the COS complaining that a bear chased her dog. Her dog was off-leash.

Derby Reach – Bears have broken branches off the heritage fruit trees. In the summer of 2005, a bear moved within 200 meters of people in the Day Area. It appeared to have accidentally wandered into the area and left quickly when it saw people.

Kanaka Creek – Garbage cans are often knocked over around the hatchery. As of April 2006, the hatchery garbage can had already been knocked over.

In 2005, a bear got into bucket of enzymes used for the toilets.

In 2004, there were bear problems around the hatchery related to a senior's lodge outside the park that left garbage accessible to bears. A bear became food-conditioned and began visiting the park. The COS was called by the lodge and trapped the bear.

During the summer of 2004, garbage cans were knocked over. Because Maple Ridge does not have curb-side pick-up, people sometimes bring garbage to the park to dump it.

In either 1998 or 1999, a fisherman was chased by a black bear at the fish fence. The man was going up the creek to fish and a bear charged him. He threw rocks. The area was being cleared for subdivisions and the activity may have stressed the bear (A full account of this incident can be found under Bear Incidents in the Lower Mainland).

A cougar was at the waterfront approximately thirteen years ago. The COS was called, but cougar moved along on its own. Now the area is developed and cougar, deer and bear are rarely seen.

LSCR – A man on a racing bike collided with a bear.

In the spring of 2005, a bear bluff charged a few people.

In 1994 or 1995, a young cougar chased a rollerblader, a jogger and a biker. The cougar was shot by the COS. The LSCR was closed during this incident. During the same year, staff encountered a fresh kill and later discovered it belonged to a cougar and three young.

Large numbers of human-bear interactions are reported on Dog Mountain. BC Parks look after this area for the most part, but it is patrolled by LSCR twice a month in the summer.

Watersheds

In the Coquitlam Watershed, a bear treed a worker who was kept up the tree for about 5-10 minutes. The COS was called.

Fifteen years ago, a Capilano Watershed worker went up transmission line to get away from a bear.

7.3. Bear Incidents in the Lower Mainland

Management of bears is more complicated than many other species of animals because bears have the capability to seriously injure or even kill a human. In spite of this capability, black bears are normally tolerant and tend to retreat in confrontational situations.

There is no record of a person ever being killed by a bear in the Lower Mainland. Some Conservation Officers believe the culling of bears that show aggressive tendencies may play a role in preventing serious incidents. Research by Stephen Herrero suggests that black bears are more likely than grizzlies to treat people as prey. And in the last decade or so, incidents with black bears have increased. Still, it is rare for black bears to kill or injure people.

In the Lower Mainland, the attacks per capita are low based on the number of people-bear interactions. A Conservation Officer speculated that this may be a result of bears frequently seeing people and growing used to them.

While research suggests that black bears are more likely than grizzlies treat people as prey, there have been no attacks in the Lower Mainland that could conclusively be determined as predacious. Over the last twenty-five years, there have only been three more serious incidents with bears in the Lower

Mainland as identified and described by the Conservation Officer Service:

Mission

In Mission, in January, a child was playing with his German Shepard dog and a friend around a large stump in the forest at the back of their acreage. They disturbed a bear that was denning in the stump. It emerged and went after the boy. It swiped at him tearing his jacket and swiped again catching the boys face and opening a wound that went from the corner of his eye across his cheek. The boys had a young dog with them who jumped in after the boy was swiped and managed to distract the bear. The two boys ran for home. The wound on the boy's face required twenty stitches. The dog was unharmed. The date of this incident is not known as formal reports were not kept at the time.

Pitt Meadows

In August 1995, in Pitt Meadows, a woman was taking photographs along a gated road in the Pitt Polder. A female bear which had two small cubs charged out of brush and attacked the woman. It was biting at the back of her head and dragging her until she passed out. When she came to she had been dragged about 25 feet into the grass. The bear was not on her but she could hear it nearby. She was able to get up and get back to a traveled road for help without further incident. At the hospital her scalp at the back of her head was peeled back and there were numerous bite wounds. These required many stitches and she spent a couple of weeks in the hospital recovering.

Two weeks prior to this incident in the same area a woman was riding her bicycle on the same road. A bear charged out of the brush and knocked her off her bike. She passed out and when she came to the bear was gone. She had a bite on her buttocks and scrapes from the fall. The Conservation Officer Service considered this to be the same bear.

A couple of weeks prior to the woman on the bike being attacked, a bear in the same area bluff charged a man three times. This was believed to be the same bear.

The female bear was destroyed. She was not in good condition and did not have much fat on her. A necropsy revealed that she was an older female and had an infection in her gums that went all the way up to her nasal cavity.

Maple Ridge

In Maple Ridge at Kanaka Creek during the spring a man who was going fishing in hip waders encountered a bear in front of him in the river. He threw rocks and yelled at it but it came at him. He turned and ran to get away but the bear pursued him. He stumbled and fell trying to get up the bank. The bear caught him. He hit it in the mouth and the bear left. His only injury was a scraped and sprained finger which was treated by ambulance attendants. Conservation Officers were unable to confirm his statement that the bear actually caught him and the injury was caused by the bear.

The Park Operator who was at Kanaka Creek at the time of this incident had a slightly different version of this story based on speaking to the construction worker that the man ran into when running from the bear. The man went down to the river to go fishing in his hip waders and encountered a bear. He thought that when you encountered a bear you were supposed to wave your arms above your head and shout and proceeded to do so. In response, the bear charged him. The man was so frightened that he took off running and ran through the blackberries south to where the area was being cleared to build the Maple Crescent subdivision. The Park Operator believed that the bear had been living in the area that was being cleared for the subdivision as a bear had been known to be living in that area and conjectured that the bear may have been stressed as a result of losing its habitat.

7.4. Habituation

The concept behind habituation is that if an animal frequently encounters humans or their artifacts without negative consequence then their tendency to avoid people and human developments will decrease over time. Habituated bears appear to feel comfortable in the presence of humans. Habituation may lead to the regular use of developed areas, human trails, campgrounds or roadsides by bears (note, however, that it is natural behaviour for animals to use human trails. Like humans, animals use trails to travel more easily through an area). Bears that are not afraid of humans may spend more time in human areas increasing both the likelihood of them coming into contact with humans and to becoming human food-conditioned.

While habituation is assumed to have occurred when bears tolerate people at close distances, bears have different personalities and thus have varying levels of tolerance for people and some bears can be naturally tolerant of people without ever having become habituated.

Some research has suggested that habituation can actually decrease the chance of dangerous interaction between bears and humans as bears grow used to the humans in an area and learns to tolerate their activities. However, habituation becomes a problem when it leads to human food-conditioning.

7.5. Human Food-conditioned

As bears are frequently on the move in their never-ending search for food – and curious - it is normal for them to travel through human areas. Human food-conditioning occurs when a bear gains access to human food or garbage. The bear has then been 'rewarded' by getting food and is likely to return or seek out similar situations to get that same food reward. Often, human food-conditioned bears become progressively more willing to approach people and structures to get a food reward, increasing the likelihood of human-bear conflicts. According to Canadian bear biologist Stephen Herrero (2003) human-generated food sources are one of the main factors contributing to negative bear-human conflicts including human injury and fatality. Still, black bear aggression toward people resulting in injury is extremely rare, even with habituated and food-conditioned bears.

7.6. Bear-human Interactions

Bear-human interactions can be divided into the following categories:

Sighting/Observation

An observation of a bear where a bear may or many not have been aware of the person(s) involved and there appeared to be no clear response to humans.

Bear encounter

A situation of close proximity between bears and humans where the bear was clearly aware of the human presence. This category includes situations in which a bear advanced upon humans but no physical contact resulted, such as a curious approach or distant bluff charge, where a bear moved away, or where it showed no reaction but could have.

Confrontation

An interaction between a bear and person in which a bear charges a person, approaches or follows a person, enters an area when people are obviously present, or obtains human food directly from people.

Bear incident

Any situation where a bear made physical contact with a person, where damage or loss was caused to property or food, where a bear charged to within close proximity of people, or where people took extreme evasive action such as climbing trees or playing dead.

7.7. Response to Bear Situation

Problem Bear Status

Identification of a problem bear situation is guided by the Bear-People Conflict Prevention Plan (British Columbia Ministry of Water, Land and Air Protection 2002), which defines a "problem bear" as "any bear judged by its actions to be a threat to human safety or liable to cause property damage". (2002 p.12).

If the situation is potentially dangerous, park staff should immediately contact their supervisors and the BC Conservation Officer Service. The final decision to declare "problem bear" status will depend on the behaviour of the bear(s), the degree of threat to public safety, the proximity of the bear activity to facilities, visitor use areas, and other areas.

The first and most critical step is to identify the type of bear situation as quickly and accurately as possible:

BEAR SITUATION RESPONSE GUIDELINES

These have been adapted from the provincial Bear-People Conflict Prevention Plan (2002, Table 3, p.14) and McCrory (June 2002). Supervisors should be contacted in all of these situations. Staff safety is the number one priority in all bear interactions.

Non-habituated Black Bear Remaining in Area

- Monitor bear's behaviour closely, including anything unusual.
- Caution visitors. Post warning signs or close if considered necessary.
- Closely monitor areas for attractants.
- A non-habituated black bear should leave when people approach or stand its ground but then leave. A bear exhibiting other behaviour should be monitored and/or action taken depending upon its behaviour.
- Allow bear sufficient time to move out of area on its own, allow 3-6 hours depending on location and activity of the bear (e.g. feeding on berries).
- Bear aversion by trained staff or COS may be appropriate in this situation.

Black Bear Appears Habituated to People or Conditioned to Food/garbage, Little or No Fear of People, Cannot Be Moved Off or Routinely Returns, Exhibits Minor Aggression (i.e. growls, aggressive stance and/or jaw snapping) or Minor Property Damage

- Consult with COS to deal with situation.
- Remove visitors from area and close as required.
- Bear aversion by trained staff or COS may be appropriate in this situation.
- Bear may have to be removed depending upon its behaviour.

Significant Aggression (Non-Injury Related) and/or Property Damage from Black Bear

- Call COS to deal with the situation
- Notify other agencies.
- Obtain as much information as possible from witnesses, including location, species, if mother bear with young, other persons still in jeopardy, etc.
- Staff should only enter an area of a bear incident if properly equipped as dictated by the seriousness of incident (bear spray or lethal force back-up).
- Interpret situation, which could either be a mother defending young or bear attempting to get human food. If determined to be predaceous-type aggression or bear defending a large mammal carcass, treat with extreme caution as bear could cause human injury. Remove visitors from area and close as required. Predaceous behaviour will require destruction while defensive behaviour may require closure of the area until the bear moves on.
- Bear aversion is an option for a bear exhibiting defensive behaviour.

Large Animal Carcass Near Facility or on Trails With or Without Bear Feeding

- Call COS for help to deal with situation.
- Staff entering area to close the area or check on the carcass must take extreme care. They should never go alone and always have bear spray or lethal force back-up as it is possible that either a bear or cougar has claimed the carcass as a food source. If possible, a vehicle can be used to approach the area.
- Whether bear on carcass or not, remove visitors from area and close as required.
- Carefully monitor situation until carcass is consumed (which could take a number of days) or can be removed or moved to an area where people will not come across it while it is being consumed.
- Open area only after all remains are gone and bear(s) have left area.

Mauling by Black Bear

- Call ambulance and COS.
- Staff should only enter an area of a bear incident if properly equipped as dictated by the seriousness of incident (bear spray or lethal force back-up).
- Stabilize victim if possible.

- Evacuate and close the area or park as needed.
- Obtain as much information as possible from victims and witnesses, including location, species, if mother bear with young, other persons still in jeopardy, etc. Make sure to get complete contact information.
- Leave the area intact for an investigation. Keep people out of area.
- Notify other agencies.

7.8. Injured Black Bear

- Call COS or other trained staff to determine extent and location of injury.
- Close areas/park as needed.

Considerations for Serious Situations

Some rare, types of bear encounter situations not only present the danger of escalating where other visitors could be harmed, but can be dangerous for the staff trying to deal with the problem. Proper handling of a bear attack situation is thus critical in preventing additional complications.

- Parks staff should not generally handle very serious situations unless they decide to do so in an absolute emergency, have the proper training and armed backup, and have been given the proper authorization.
- The Conservation Officer Service, or the RCMP or police if the COS is not available, should be called to deal with serious situations.
- Staff should not enter an area where a mauling or other serious encounter has taken place without at least one qualified armed person for backup. Some situations can be highly dangerous such as a mauling or a bear feeding on carrion.

Accurately recording all information is paramount. All people involved should be interviewed. Record all information, including names and phone numbers.

GVRD Parks staff should inform other agencies of all major actions taken or of a problem bear that may travel to another jurisdiction.

Defensive and Predaceous Behaviour and Human Safety

Staff should pay particular attention to visitor reports or their own observations that indicate potential predacious behaviour. This includes bear(s) frequenting human use areas, approaching people without showing signs of stress, following people on or off the trail, stiff-legged stalking, attempting to circle around behind people, people feeling uncomfortable about a bear, or other suspicious-appearing traits.

Some behaviours that may appear aggressive, such as a mother bear defending its young or a bear defending an animal carcass represent normal defensive behaviours and should not necessarily lead to destruction. Defensive behaviours can include huffing, moaning, teeth popping, salivating, open mouth jawing or roaring, slapping the ground with a paw or bluff charges.

A bear should be considered for destruction only if its aggression appears related to predatory behaviour. Other situations that may require destruction include dangerous food-seeking such as ripping into tents, a history of artificial food/garbage problems in which the bear has lost its fear of humans and is not responding to bear aversion, a bear that is badly injured or in poor physical condition; or a bear that is too young to relocate and a rehabilitation facility is not available.

The Conservation Officer Service is using the Bear Aggression Index developed by Carrie Hunt (2003) to assess the safety risk for public of a bear before conditioning and the safety risk for team and the public during conditioning. Because most of the index involves a bear's response to conditioning, only a couple of levels are applicable to GVRD Parks as this time. However, it is suggested that as staff become trained in bear aversion, that this index also be adopted by GVRD Parks. The index has been reproduced below for information:

Bear Aggression Index: Immediate Response to Humans and Conditioning

Safety Risk For Public Before Conditioning	Index Level	Immediate Responses: Bear Attitude To Humans Before Conditioning
Excellent Safety	1	Leaves on approach
Good Safety	2	Stands ground on approach but then leaves
Moderate Safety	3	Leaves only after yelling/barking/ honking/firecracker
Moderate Safety	4	Stays and stands ground after yelling/ barking/honking but then leaves
Poor Safety	5	Stays and approaches after yelling/ barking/honking
Not Safe/Should Not Risk Conditioning	6	Stays and charges after yelling/barking/ honking
Safety Risk For Teams and Public During Conditioning	Index Level	Immediate Responses: Bear Attitude Response To Humans During Conditioning
Excellent Safety	1	Leaves on approach
Good Safety	2	Leaves after yelling/barking/honking
Good Safety	3	Stays after yelling/barking/honking, but leaves after firecrackers or projectiles/ dogs chase on or off-leash
Low Safety	4	Stays and stands ground after projectiles/dogs chase on or off-leash
Not Safe/Should Not Risk Conditioning	5	Stays and approaches after projectiles/ dogs chase on or off-leash
Not Safe/Should Not Risk Conditioning	6	Charges or attacks after projectiles/dogs chase on or off-leash

Area Closure Guidelines

Equipment such as adequate "Caution Bear" warning signs, "Area Closed" signs, and "DO NOT ENTER" ribbon should always be available. Closure signs should be posted where they are highly visible at all appropriate trailheads leading into the problem area and the barrier ribbon "DO NOT ENTER" placed across the trail or around the area. In serious circumstances, adjacent agencies should be notified of the closure of the area. Specific information on warnings of bear in area are dealt with under Signage.

Closures should be used in the following situations:

- A black bear is feeding on a carcass on a trail or near a facility;
- A large carcass is found in the area without a bear present;
- A bear has exhibited aggression and/or causes property damage and appears to remain in the area;
- A bear attack has caused human injury;
- Other circumstances deemed by park staff to be potentially dangerous to park visitors.

Procedures to be Developed

The following procedures need to be developed by GVRD Parks:

- Emergency contacts in order of priority
- Visitor evacuation plan
- Staff roles and responsibilities
- Area closure guidelines (procedures on how to close area or the park)

7.9. Recommendations

Field staff should receive training so that they understand concepts such as habituation and food-conditioning, the various types of bear-human interactions, the appropriate responses to bear situations, and bear behaviour including defensive and predacious behaviour.

Area Closure Guidelines should also be developed.

An assessment of bear attractants and bear-human conflict should be completed.

8. Documentation

The proper documentation of bear activity has a two-fold purpose. It enables staff to make effective short-term decisions around bears in the area and it also provides information to support planning and procedures for the long-term that take bears into account and to recognize shifts in bear behaviour.

At Capilano River, bear sightings information is kept on clipboard in staff room. Last season, staff at Lynn Headwaters began keeping a database of sighting with the date, location, observation, actions

taken, and who reported the bear.

At Belcarra, bear sightings are written on the dry-erase board in the staff area. Occasionally, the public phones the Central Area Office or the general GVRD phone number to report a bear. Bear sightings are not recorded at Minnekhada.

If a bear is sighted at Derby Reach, all staff members on shift are notified and the sighting is written up on the dry-erase board. Since all issues are posted on this board, staff on shift the next day always check the board. Sightings are passed to the East Area Office to be put on the website. Bear sign such as scat is noted on the Trail Patrol Checklist which is done weekly. At Kanaka Creek, a daily journal is kept and unusual occurrences are starred. Complaints and sightings are kept in the journal.

Records are no longer kept on bears in the LSCR. Wildlife sightings were documented up until 1989, but were then discontinued. E-mails are sometimes sent to staff in the area and to Lynn Headwaters. Michael Allen was supposed to complete a research project on bears in the area including population and den locations, but unfortunately, the research was never completed.

No records are kept on bears in the watersheds.

8.1. Recommendations

Overall, the record keeping on bears has been sporadic and limited. While some parks keep records for the use of park staff, these records have not been kept for past years and so there is no record of the numbers of bears in the parks or where bears tend to be found in the parks. Monitoring and recording of bears on GVRD lands should be improved. Consistent and accurate records of bears and visitor use is required to be able to make effective decisions to reduce conflicts between people and bears in both the short-term and long-term.

A proper observation form will also help staff to make decisions about what kind of behaviour a bear is exhibiting and when that behaviour might be of concern.

A recording form should be developed that contains the items below:

1. **Park name:**
2. **Date and time incident occurred:**
3. **If reported by member of public: name, phone number, and address of person and their activity at the time of observation:**
4. **Location of incident:**
5. **Distance from bear:**
6. **Date and time staff arrived:**

7. **Description of bear/s:**

- Any identifying characteristics: ear tag, collar, chest blaze, etc

Age if identifiable:

☐ Mother and _____ cub(s)

☐ Young Bear

☐ Adult

☐ Large Bear

☐ Has a form been filled out on this bear before _____ YES _____ NO

8. **Activity of bear at time of observation:**

☐ Standing

☐ Walking

☐ Running

☐ Digging

☐ Feeding on _____

☐ Other _____

9. **Response of bear to people:**

☐ Bear did not seem to notice people

☐ Bear left on approach

☐ Beat stood ground, but then left

☐ Bear approached people [1-2]

☐ Visitor and bear collided [2]

☐ Bear followed people [2]

10. **Attractants found: secured / not secured**

Attractant: ***(description)***

11. **Bear sign found.**

Location:

12. **Follow-up action if required:**

signs posted: ***(date, number posted, locations)***

COs called: ***(actions taken)***

[1] Bear showing behaviours that could be of concern and should be monitored by staff.

[2] Bear showing behaviour that is of concern. The COs should be contacted and appropriate action taken if necessary.

Decisions that need to be made by GVRD related to record keeping include:

- Who is responsible for record keeping in the parks?
- To whom should the records be sent? i.e. who will coordinate the records for all of the parks?
- Should the information be posted on the website?

9. Signage

In 2005, GVRD developed basic procedures around posting signs when bears were sighted:

- Only the approved departmental sign should be used
- Signs should only be posted when it is assumed a bear is spending a significant amount of time in an area or when a report or observation of bear activity/behaviour gives cause for some concern
- If a sign is posted, a "sign log' should be kept telling why the sign was posted. Further observations of the bear or bear sign should be recorded
- If there are no observations for a two week term the sign should be taken down

However, on the ground, various procedures are being followed from some areas posting signs to others not posting signs at all. Various signs are being used from the official yellow and green diamond-shaped Caution Bear in Area signs to grizzly bear signs to laminated signs that are dated and then left up until they "rot".

Warning signs provide visitors with current information about bears in the area that enable them to make informed decisions about their activities. In at least some, and perhaps all of the parks, consideration should be given to posting permanent signs identifying that the area is natural habitat for both bears and cougars and outlining appropriate behaviour in bear country. This would also be helpful from a liability perspective.

More research needs to be conducted to gain a better understanding of where the potential for problems with bears exists and then action should be taken to reduce that potential. Actions that other parks have taken include:

- Affixing signs to all picnic tables reminding campers about proper food and garbage handling practices
- Removing backpacks, coolers, etc. that have been left unattended and leaving a courtesy tag in their place letting people know that their item can be picked up at the office

9.1. Recommendations

The following procedures are recommended for the posting of signs warning that a bear is in the area:

- Information about the bear and the number of signs posted and locations should be recorded on the Bear Sighting sheet
- Warning signs should be posted where bears are known to commonly frequent seasonal habitats or where a bear is frequenting a area or when a report or observation of bear activity/behaviour gives cause for some concern
- Warning signs should be posted at all trailheads into the area and at other locations as required
- Length of warning may vary from a few days to several weeks or more. As noted, in areas of moderate to high bear use, permanent bear warning signs should be considered. For temporary postings, the signage may be removed after there have been four to seven consecutive days of monitoring without indication of bear activity. Leaving signs up when they are no longer accurate results in visitors becoming complacent and decreases the effectiveness of the signs as a warning system
- Signs should only be posted when it is assumed a bear is spending a significant amount of time in an area, when the bear is in an area where people might surprise it or when a report or observation of bear activity/behaviour gives cause for some concern. What constitutes a significant amount of time may vary from park to park and policy should allow park management staff to make decisions around what is appropriate signage in their park. For example, a small park like Capilano River may decide to post a warning sign for any bear that remains near a park trail for a few hours or more because the park is small and the trails heavily used – particularly if staff are receiving repeated reports from the public. On the other hand, a park like Belcarra may not post signs until a bear has remained in an area for a couple of days depending. Signage should also depend upon the behaviour of the bear; for example, a bear that avoids people is of less concern than one that demonstrates habituated or food-conditioned behaviour

10. Translocations

The watersheds are used by the Conservation Officer Service for short distance translocations. Bears that qualify for relocation are those that meet certain criteria including not aggressive, intact family units, not severely injured, and neither too old or young to survive on their own. Bears are ear tagged prior to release.

Within the GVRD watersheds, bears are released at:

Capilano – Clyde's Pitt – 14 km from the gate

Seymour – Sheba Pitt – 25 km from the gate

Coquitlam – 600 Pitt – 19 km from the gate

Staff were concerned about the number of translocations occurring and felt that not enough was known about the habitat into which the bears have been being released. In 2005, staff adopted informal guidelines that only two bears per season could be released in each watershed and that only bears found in the area could be released in that watershed (for example, a North Shore bear would not be released in the Coquitlam watershed). In spite of staff's concern about the numbers of bears being translocated into the watersheds, in 2005, only two bears were released in the watersheds; they were moved into the upper Seymour, but returned seven days later.

Staff mentioned that a sow and cubs relocated from the PNE to the Seymour Watershed came down to the hatchery, but then were not seen again.

10.1. Interim Guidelines For the Long Distance Translocation Of Black Bears From Surrey And Cultus Lake Conservation Officer Districts

The Conservation Officer Service has developed interim guidelines to guide translocations. While these are still in draft, they are currently in use:

Long distance (greater than 10 km) translocation of black bears from urban and rural areas of the lower Fraser Valley and Greater Vancouver North Shore is an option to resolve conflict where prescribed conditions regarding the bear's health and behaviour and environmental conditions.

Bear health and behaviour conditions

The conditions that must be satisfied for long distance translocations are:

1. The bear is healthy and does not have any significant injuries;
2. The bear has not demonstrated behaviours that are considered to pose a poor or unsafe safety risks to people. As a guide, Bear Aggression Index Level 5 and 6 (Carrie Hunt Bear Aggression Index) is considered poor or unsafe safety risks;
3. The bear has not demonstrated behaviours that indicate high habituation and/or food conditioning (associating people with food). As a guide Bear Conflict Level 5 or 6 (Carrie Hunt Bear Aggression Index) is considered high habituation and/or food conditioned.

Environmental conditions

Adequate food resources must be available at the release locations. Attention to food availability must be considered during the early spring and late fall periods. If adequate food resources are not available at the release site, translocation is not to be considered

Suitability

Suitable candidates for translocation are bears in their second year of life or older and females with cubs of the year. Preference will be given in the following order:

1. females with cubs;
2. females without cubs that are young enough and in good condition to contribute to the breeding population of the release area;
3. adult males that are large and strong enough to defend themselves from the aggressive actions of other bears;
4. subadult male bears.

To ensure there is capacity to accommodate the higher preference bears translocation of bears in category 3 and 4 above should be minimized in the spring and summer.

Translocation release site

Translocation release locations and the number of bears to be released to each have been determined in consultation with Environmental Stewardship wildlife staff.

The following sites have been approved:

- West side of Harrison Lake not north of Bremner Creek – maximum of 15 bears annually;
- Chehalis watershed north of Chehalis Lake – maximum of 10 bears annually.

Note: Members of a family group are counted individually when establishing the number of bears translocated, e.g. a sow with two cubs is counted as 3 bears.

11. Staff Training

GVRD field staff should be familiar and understand bear behaviour both to be safe while in the field as well as to provide a clear and consistent message to the public.

Currently the training received by staff varies. Probably the LSCR staff are given the most training on bears. In the past, staff from the North Shore parks, Lynn Headwaters and Capilano River, have sat in on LSCR trainings.

In the 2005 season, number of the staff received a two-hour training. The training included the Ministry of Forests Bear Aware video as well as an opportunity to fire off bear spray and bear bangers.

In the past, staff have also received training from Conservation Officers. This training was highly regarded by staff but has not occurred in at least four years. Currently two of the staff at Derby Reach have conservation officer training. Seasonal staff have often been provided with an orientation to bear spray by senior staff.

The information that staff most frequently identified as missing from their current training was related to understanding and recognizing bear behaviour. For example:

- Need formal training on bear behaviour / Procedure needed to identify problem bear
- More detailed training than two hour course: how to read a bear, behaviour patterns, myths and rumours (the numbers of people that have been attacked by bears in the Lower Mainland), bear sign.
- Recognizing an aggressive bear and knowing what to do.

Some staff also identified a need for information on cougars.

Another issue is that staff members are conducting hazing on bears without having had any training in bear aversion. In one instance this led to a sow being hazed with a truck while her cubs were hidden in the bush on the far side of the truck. Staff members who e conduct bear aversion should have

Information Display for Staff

proper training.

Staff also identified problems with seasonal staff misusing bear spray. Staff should be trained in the use and limitations of bear spray and have an opportunity to spray a can so they have a practical sense of its use.

The bear training for staff is currently being evaluated. Different levels of training are being considered so that some staff would have higher levels of bear training. The COS has just completed the development of a training CD. A copy of this CD is being obtained and will be evaluated for use by the GVRD.

GVRD Parks may want to develop a table of bear management training requirements for staff in different positions similar to the one found in the Bear-People Conflict Prevention Plan (2002 p.3).

12. Visitor Information and Education

The success of any park management program is dependent on well-informed and conscientious park users (Jingfors 1995). Education is fundamental to minimizing negative encounters between people and bears. Many people have little knowledge about bears or appropriate behaviour in bear country. Worse, many people have misinformation about bears.

Both interesting and effective public education materials and knowledgeable and conscientious park staff are required in order to have well-informed visitors (MacHutcheon 2000). Currently, a number of the parks are providing the copies of the provincial brochures on bears and cougars. These are placed in the brochure rack at the kiosk. Minnekhada has a brochure on bears developed by the Minnekhada Park Association, but it contains a number of points that are incorrect such as stating that bears have poor eyesight and that a black bear mother will fight to her death to protect her cubs. Other parks provide no information on bears or cougars unless the public approaches staff. The only other bear information that is posted are the "Caution Bear in Area" signs.

At present, staff members are providing a variety of responses to the public on bears. Developing a management statement and consistent and accurate policy on bears would provide staff with clear direction to respond to the public so that the public would be receiving consistent information on bears in all GVRD Parks. Staff that are dealing with the public also need to have good bear aware training. Without a good understanding of the principles and practices of staying safe around bears, staff will not be able to respond to important questions that may be asked by visitors and they may end up perpetuating misinformation (MacHutchon 2000).

In a 1996 visitor survey administered in the LSCR by Inter-Plan Resources Incorporated, respondents indicated an interest in receiving information on bears and bear safety and cougars. They also indicated that the use of trail signs was the preferred method of information delivery.

The LSCR and parks' interpretive programs could provide education about bears to the public. The number of programs delivering information on bears has not been investigated for this research. However, a quick perusal of the Summer 2006 Program Guide showed no programs related to bears.

GVRD Parks is in a unique situation when it comes to bears. While most visitors are aware that they may encounter bears when visiting parks such as BC Parks, the expectation of visitors to GVRD Parks is not known. The lack of information abut bears in the parks has the potential to create a liability issue; most litigation against Parks Canada and the U.S. National Park Service by victims of bear maulings has been based on the claim that the agency involved was negligent because they failed to provide sufficient warning of the hazards of bears (BCCPP 2002 p.4).

12.1. Recommendations

Staff should be provided with reliable bear information and training so that they can respond to public queries on bears with clear and consistent information. This will require the development of policy on how GVRD Parks manages bears within their lands.

While using provincial brochures on bears and cougars as public education materials in the parks is not a problem in the interim, GVRD should develop their own materials to educate parks users about bears. Information on bears should also be posted on the website. The "Caution Bear in Area' sign should be reviewed to see if additional information on appropriate behaviour should be added.

Suggested educational information should include:

- Techniques to avoid bears including food and garbage management
- Avoiding encounters and appropriate behaviour in an encounter
- The potential for unleashed dogs to provoke a bear into chasing them back to their owner
- Bear behaviour and ecology
- Where and how to report bear sightings

13. Neighbouring Municipalities

As most GVRD Parks, the six parks identified in this study border on various municipal lands as does the LSCR and the Capilano and Coquitlam watersheds. In total, about 66 kilometers of GVRD lands share a boundary with the built-up urban face.

As part of the bear plan research, the municipalities were contacted to find out whether they had any programs in place regarding bears. The research into municipal programs was important for two reasons: First of all, bears do not recognize jurisdictional boundaries and thus the way in which bears are being managed (or not managed) on adjacent lands affects the management of bears within GVRD Parks. For example, a cooperative initiative is required to ensure improved food/garbage control is implemented both in the parks and in adjacent areas around the parks with the aim to have a zero level of unnatural food attractants in the ecosystem.

Secondly, GVRD is interested in cooperative initiatives as well as developing procedures that are compatible with those of other local jurisdictions to both better manage bears in the region and to reduce efforts so that each jurisdiction does not end up reproducing the wheel.

While the North Shore, Coquitlam, and Port Moody have developed bear programs, other municipalities are not very far along when it comes to dealing with bear issues.

Capilano River and Lynn Headwaters

Capilano River is sandwiched between the District of North Vancouver and the District of West Vancouver. Lynn Headwaters is located on the northern edge of the District of North Vancouver. Staff have been sending bear sightings via email to the Ranger at the District of North Vancouver and to the Lower Seymour Conservation Reserve.

Around the year 2000, a coalition of concerned citizens became concerned over the number of bears being destroyed on the North Shore and came together with various agencies to form the North Shore Black Bear Network. Today, the North Shore Black Bear Network is a partnership of local and regional government groups, private endeavours, and many dedicated and hardworking volunteers

across the North Shore. It supports the co-existence of black bears and humans living in harmony.

Accomplishments of the Network include:

- Reducing the number of black bears killed on the North Shore
- Establishing a network of volunteers who respond to bear issues
- Setting up a bear telephone line for residents (604-990-BEAR)
- Creating a bear activity database
- Delivering bear programs to schools
- Educating residents on attractant management
- Bringing together stakeholders for monthly meetings to address bear issues on the North Shore
- Creating a website: www.northshorebears.com

Agencies involved include the District of North Vancouver, the District of West Vancouver, the City of North Vancouver, the Village of Lions Bay, the Conservation Officer Service, the Grouse Mountain Refuge for Endangered Wildlife and the North Shore Black Bear Society.

In July of 2005, two Bear Response Officers began working on the North Shore. During the season, just under 70 bears were removed from the North Shore – most through relocations with about ten being destroyed. In May of 2006, two Bear Response Officer positions were filled for a second season of work.

Also in 2005, two Bear Aware Coordinators were hired for the bear season with funding from the District of North Vancouver, the District of West Vancouver and the British Columbia Conservation Foundation. In 2006, one Coordinator was hired.

Belcarra

The Belcarra Regional Park surrounds the Village of Belcarra on three sides. With a population of 800, Belcarra only has three people working in the municipal office. The Village provides residents who are concerned about bears with provincial brochures and directs them to the COS. They also have information on their website including "The Bear Essentials on Bears in Belcarra" and links to provincial information on bears.

After a high number of problems related to conflicts between humans and bears that were experienced in Port Moody during the summer of 1999, various educational initiatives that focused on public safety and measures to reduce the attraction of bears into urbanized areas were proposed in 2000. Staff made networking connections with the COS, the police, other parks and public. A signage program was developed in their parks. In partnership with the Port Moody Police Department and the COS, background information was provided for articles in local newspapers and bear articles were put in every Focus newsletter. Brochures were distributed to the public. Brochure racks were stocked at the Library, Clerks Department, the Environmental Services counter and the kiosks in Shoreline Park to make bear education information available to the public. . A summary of information on black bears and cougars was placed on the City's website. An annual talk is given by Conservation Officers.

Two lunch hour bear aware training sessions were provided for Port Moody staff using the Bear Aware safety video produced by the Ministry of Forests. Drafting a safety policy was recommended and staff who required safety training for potential wildlife encounters were identified.

Examples of Bear signs used by the City of Port Moody

Minnekhada

Minnekhada park staff have a good relationship with the Coquitlam Animal Control Officers, but have never discussed bears.

Two Bear Aware Coordinators delivered a Bear Aware program in 2005 in Coquitlam and were hired again for the bear season in June 2006. The British Columbia Conservation Foundation paid for training and salaries and the municipality provided a work station with computer and fax and paid sundry expenses. The six month program commenced in May and ran until November.

The program involved setting up a local bear line at 604-933-6317 to provide bear-related information to residents. The Coordinators also focused on delivery of educational information in the form of brochures, face to face interaction, putting stickers on curbside garbage containers, providing display booths at special events, website information and compiling statistics on bear sightings and community concerns with interaction with bears. The Coordinators were re-hired for the 2006 season.

Between June and November 2005, 1060 calls related to bears were made to the COS call service in Victoria and the Coordinators received an additional 400 calls. The majority of calls originated within a block of creeks, greenbelts or power lines where bears had easy access to improperly stored garbage. Five bears were relocated and seven destroyed by Conservation Officers. Bear sightings appear to be increasing in the area in the last few years, which may be related to residential development that is reaching into previously undisturbed areas.

Municipal staff is seeking Council direction concerning proposed bylaw amendments that aim to better secure garbage in order to minimize the potential for attracting bears and other wildlife. Parks & Leisure staff members are also beginning to install wildlife resistant garbage bins in parks.

Derby Reach

Derby Reach borders on the Township of Langley. Park staff have not had much contact on bears but have a good rapport with the municipality.

The Township of Langley does not have any programs or materials on bears as they have had almost no calls about bears from residents. Any resident who phoned about a bear would be given the COS

number in Victoria. The Senior Bylaw Officer expressed an interest in having educational materials and so getting copies of the provincial brochures was suggested.

Kanaka Creek

The municipality of Maple Ridge gives the number of BC Enquiries to anyone who phones in about bears in order that people can be directed to the COS.

LSCR

The Operations Foreman often calls the District of North Vancouver Ranger, Andy Robinson, about bears because a bear in the LSCR is likely to travel into Lynn Canyon. On occasion, Robinson has been asked to help with bears in the LSCR but he is unable to respond to bears outside of the District of North Vancouver boundaries.

13.1. Recommendations

GVRD should continue to investigate where they can cooperate and coordinate with bordering municipalities and other agencies in the management of bears.

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