BEAR-PEOPLE CONFLICT PREVENTION PLAN

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Ministry of Water, Land and Air Protection

BEAR-PEOPLE CONFLICT PREVENTION PLAN

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BC PARKS

BEAR - PEOPLE CONFLICT

PREVENTION PLAN

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SUMMARY

This bear-people conflict prevention plan provides direction and guidelines for staff to manage for the presence of bears within parks and protected areas of British Columbia. The intent is to define appropriate courses of action to minimize the probability of bear-people conflicts while maintaining natural populations of grizzly and black bears throughout provincial protected areas.

The focus of the plan is on preventing conflicts from occurring by eliminating access to human food and garbage, maintaining mutual respect and wariness between people and bears, and by managing visitor activities in areas of high seasonal bear use. It describes management actions for staff training, visitor information, facility location/design, food storage, garbage handling, and response to situations involving bears.

The plan provides decision criteria to determine when a bear becomes a "problem bear". Procedures ranging from the least to the most severe management actions are given to ensure that the causes, and not just the symptoms, of problems are treated. Guidelines on the appropriate use of bear warnings, area closures, aversive conditioning, immobilization, translocation, and destruction are given.

To ensure management actions meet plan objectives and are based on the best available information, a monitoring and research program is an essential part of this plan. Staff roles and responsibilities are clearly delineated to provide for consistent application and high priority of the management plan.

Each region of the Environmental Stewardship Division will be responsible for implementing this plan and for developing its own regional and park-specific Bear Emergency Plans in response to any incidents involving human injury or death. The emergency plan(s) could be park-specific or area-specific depending on the frequency of bear-people conflicts in the region. Interagency cooperation, particularly with the local Conservation Officer(s) is essential for an effective and coordinated approach to bear management in, and adjacent to, parks and protected areas.

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1.0 INTRODUCTION

Many provincial protected areas[1] in British Columbia contain important habitats for both grizzly bears and black bears. At the same time, the opportunity to see a bear in its natural habitat contributes significantly to most visitors' enjoyment of a protected area. However, this interaction can increase the potential for conflict and alter normal bear behaviour, as well as affect use of habitat by bears, and all bears are capable of injuring people and damaging property. These factors present a challenge to management when trying to maintain or conserve bears as an integral component of the ecosystem while providing for reasonable public safety. As recreational use of both frontcountry and backcountry areas continues to increase, so will the potential for bear-people conflicts.

Bear-people incidents in and adjacent to provincial protected areas reinforce the need for an organized prevention plan that addresses both public safety and bear conservation. This plan provides direction and guidelines on management actions designed to:

1) decrease the chances of bear-people conflicts from occurring (preventative management);

2) respond to incidents using clear decision criteria to determine when action must be taken against a bear (responsive management);

3) monitor and research bear-people interactions to ensure management actions are based on the best available information; and

4) assign clear lines of responsibility to ensure the program consistently receives high priority.

2.0 OBJECTIVES

While appropriate management actions may vary among protected areas and among regions depending on the specific circumstances of a bear-people incident, the following objectives are common throughout this Bear-People Conflict Prevention Plan:

1) to manage human presence with due consideration to the life requisites of bears and habitat requirements and use by bears;

2) to provide for the safety of park visitors and their property;

3) to maintain the natural distribution, abundance and behaviour of grizzly and black bear populations both within protected areas and across provincial landscapes as part of provincial bear management objectives;

4) to provide opportunities for visitors to understand, observe and appreciate bears while discouraging the process of habituation and food conditioning among bears.

[1] A glossary of terms is provided in Appendix 1.

Management objectives will differ between frontcountry and backcountry areas of protected areas because each exhibit different types of bear-people problems. Management efforts in the frontcountry should be directed at minimizing attractants and deterring bears from easily accessible areas developed for high human use. By following a plan that proceeds from the least to most severe management action, the causes of problems, not just the symptoms, can be treated. Elimination of unnatural food sources and management of visitor use (education, enforcement and area closures) should be tried before direct management of bears is required. Management efforts in the backcountry should be directed primarily at altering the distribution and activities of visitors rather than on taking actions against "problem bears".

This conflict prevention plan is based on the format and some of the concepts used in similar bear management plans prepared by the Alberta Department of Environmental Protection (1994) and Waterton Lakes National Park (1998). It includes many of the essential elements suggested by Taylor (1984) and the results of province-wide workshops within provincial parks in British Columbia (McCrory et al. 1987).

3.0 PREVENTATIVE MANAGEMENT

Preventative management focuses on preventing bear-people conflicts. Management programs will give strong emphasis to prevention since, if it fails, the result is impact on the resource or injury to people or damage to their property.

Preventative management includes staff training, visitor information and facility management (location, design, food storage and garbage handling).

3.1 Staff Training

Staff in provincial protected areas who are regularly engaged in bear management, facility management, and recreation services in areas of known or potential bear hazards will receive orientation in basic bear awareness and conflict prevention (Table 1). Staff should be familiar with all aspects of this provincial Bear-People Conflict Prevention Plan and the regional Bear-People Conflict Prevention Plan if one has been drawn up for their region. Contractors such as Park Facility Operators (PFO) should be trained and may be required to do so in specific situations. A training course on bear awareness has been developed as a one-day presentation. The course, Bear Awareness Orientation, includes presentations on bear biology, ecology, behaviour, species identification, causes and prevention of conflict, and this plan. Table 2 lists videos that can be used as part of the training. The Pepper Spray Course is usually given to staff at the same time as the Bear Awareness Orientation Course. This course provides staff with a means of defense or deterrent in the event of an attack.

Table 1. Bear management training requirements for protected area staff in British Columbia.

	STAFF				
	PFO	Ranger	Area Supervisor	Ecosystem Officer	Time
Prevention					
1. Generalized bear behaviour and safety	X	X	X	X	1.5 hour
2. Causes and prevention of conflicts	X	X	X	X	1 hour
3. Bear Monitoring Information System	X	X	X	X	<1 hour
4. Visitor Information and Management	X	X	X	X	1 hour
Response					
1. Familiarity with Regional Bear Emergency Plan	X	X	X	X	<1 hour
2. Pepper spray	X	X	X	X	1 hour
3. Aversive conditioning/deterrents	X[2]	X[a]	X	X	1 hour
4. Trapping/translocating		X[a]	X	X	1-2 hours
5. Immobilizing[3]		X[a]	X[a]	X[a]	2-3 days
6. Destruction		X[a]	X	X	<1 hour
7. Firearms Qualification		X[a]	X	X	2 days

[2] At the discretion of Regional Manager

[3] Requires provincial certification and is only available to qualified ministry staff

Further, specialized training is required for staff responding to bear-people conflicts (Table 1). This includes qualification in the use of firearms and certification in immobilizing equipment where needed. The Firearms Qualification Course is a requirement for any protected area staff that are designated to use firearms. Depending on the availability of other qualified ministry staff (e.g., Conservation Officer Service), specific training of protected area staff for bear immobilization will be limited since bear handling is infrequent in most regions and is potentially dangerous.

In protected areas where bear-people conflicts are particularly common, consideration may be given to hiring seasonal staff dedicated to bear-people conflict management. In Denali National Park, Alaska, "bear technicians" have been used successfully to help prevent, and immediately respond to, bear problems in both frontcountry and backcountry areas, (Dalle-Molle et al. 1989). To date, there has never been a bear-inflicted fatality in Denali National Park (A. Zuliani, pers. commun., 2001). Waterton Lakes National Park also hires two seasonal staff to respond to bear presence along roads to manage visitors and apply aversive conditioning to bears (R. Watt, pers. commun., 2001).

3.2 Visitor Information

All visitors to protected areas in British Columbia must have the opportunity to be informed regarding the presence of bears and how to behave to minimize the chances of conflict. Visitors should realize that they are "visitors" in bear country, and behave accordingly. Signs, brochures, or direct contact can be used to provide this information; current government policy requires that web-based products will be the main source of information available to park users and employees. Public safety and the welfare of bear populations ultimately depend on well-informed visitors and conscientious behaviour of people. Most visitors to parks are interested in bears and efforts should build on this interest. Information should enhance appreciation and respect for bears, and motivate people to make the extra effort needed to minimize conflicts.

Providing adequate visitor information and education also ensures the ministry meets its obligations in terms of public liability. Most litigation undertaken by victims of bear maulings against Parks Canada and the U.S. National Park Service has been based on the claim that the agency involved was negligent by not providing sufficient warning of the hazards of bears (Taylor 1984).

All protected area staff and PFOs, where appropriate, must be sufficiently knowledgeable about bears and protected area policies to be able to inform visitors about proper behaviour in relation to bears. Information will attempt to address the following elements of bear-people conflict prevention:

A. Bear ecology and behaviour
   - identification of bear species, sex/age class, bear foods, and bear sign;
   - techniques to avoid bears in developed and backcountry areas;
   - appropriate behaviour in case of an encounter, including proper use of pepper spray;
   - causes of conflicts between bears and people;
   - proper ways to store and handle food and dispose of garbage.

B. Management concerns emphasizing
   - process of human habituation and food conditioning;
   - consequences of feeding bears or failing to properly store food or dispose of garbage;
   - that a small chance of dangerous or fatal encounter will always exist no matter how careful you are;
   - common sense, education and enforcement are most effective in minimizing hazards.

C. Where and how to report bear observations.

D. Where to obtain current information on local bear hazards.

A list of pamphlets and other information media currently available is shown in Table 2.

The effectiveness of this type of information depends largely on the methods by which it is distributed and how relevant it is to a particular audience or protected area. Simply passing along information is often not sufficient; messages must be motivating and strongly worded to accomplish a desired change in visitor behaviour. In Yosemite National Park, mandatory viewing (for backcountry users) of the video "Forever Wild" was found to be the most effective interpretive tool for preventing bear-people conflicts (Keay and Webb 1989). The video described black bear ecology, identified the cause of bear-people conflicts and graphically portrayed the impact of improper visitor behaviour which ultimately resulted in a bear's death. At Bowron Lake Provincial Park all users of the canoe circuit must watch the Ministry of Forests Bear Aware video and another park specific video (by After Hours Video, CFJC – TV, Kamloops) that re-emphasizes use of bear proof caches. Signing and displays on bear-related regulations, bear behaviour and safety practices can be used as a major information source (G. Davidson, pers. commun., 2001).

As messages and audiences may vary somewhat between regions and protected areas, so will the most effective media vary. Communications planning is essential to identify the objective, strategy (including target audience) and the best means of delivery of key messages to prevent bear-people conflicts. As an example, specific communications strategies have been developed for Liard River Hotsprings Provincial Park that consider many communication elements (signs, interpretation program, satellite phones for rangers) (D. Roberts and P. Goetz, pers. commun., 2001).

In areas where bear-people incidents have recently occurred or where an increased likelihood of an incident is expected due to increased bear activity, warning signs will be posted at trailheads and campgrounds to advise visitors of existing risks. In such areas, patrols by Park Rangers, provision of information by PFOs, or intensive interpretation (where available) should be used to help ensure that food is kept secure from bears and that any bear sightings are reported immediately to protected area staff or the PFO. If public safety becomes an issue, the area will be closed to all visitor use (see Section 4.2).

Table 2. Public information and education media used in protected areas in British Columbia to prevent bear-people conflicts.

Media type	Comments
1. Audio-visual	
Staying Safe in Bear Country: a behavioural based approach to reducing risk (2001)	video about how to assess and react to bear encounters and/or attacks, produced by the International Association for Bear research and Management; available from WLAP library, Victoria
Bear Aware (1993) and Bear Aware: a self-guided training kit (1993)	videos produced by BC Ministry of Forests; available in all regions
BC Parks Bear Aware Orientation (1997)	video clips of bears illustrating different behaviours; available in all regions
Bear Attack: Encountering Grizzlies (1999)	a one-hour Discovery Channel video on grizzly incidents and techniques to use during encounters; available in all regions
Bear Attack: the Predatory Black Bear (1997)	a one-hour Discovery Channel video on bear attacks across Canada (includes bear attack at Liard River); available in all regions
Bears and Man (1974)	a National Film Board movie discussing bear-people conflicts and their causes; available from WLAP library, Victoria
Bear Attacks: Their Causes and avoidance (1991)	video: an interview with Stephen Herrero discussing his book of the same title; available from WLAP library, Victoria
Forever Wild (1991)	video from Yosemite National Park; available from WLAP library, Victoria
Bear Deterrence (1984)	video produced by NWT Dept. of Renewable Resources; available from WLAP library, Victoria
Working in Bear Country: for industrial managers, supervisors and workers (2001)	video produced by the International Association for Bear research and Management; available from WLAP library, Victoria
2. Pamphlets	
Bears and Cougars	designed specifically for protected areas in 2000
Safety Guide to Bears in the Wild	produced by the Wildlife Branch[4] to prevent bear-people conflicts in wilderness areas
Safety Guide to Bears at Your Home	same as above for residential areas
ATTENTION: You Are in Bear Country	designed specifically for South Tweedsmuir Provincial Park to prevent careless food/garbage storage and handling of fish remains
Know the Bear Facts	article included in the 1994 Visitor's Guide to the Peace Region
BC Bear Facts	fact sheet produced by the Wildlife Branch as part of the Be Bear Aware program
Warning: You are in Black Bear Country	Parks Canada pamphlet
Bears + Garbage = Danger	Wildlife Branch pamphlet designed for communities
3. Signage	
Caution Bear	"double" bear sign updated 1993; wording may not be strong enough in areas of known bear problems
You are in Bear Country	same concern as above
A Fed Bear is a Dead Bear	used in Wells Gray Provincial Park and the Alaska Highway to prevent careless feeding of bears
Garbage Kills Bears	bumper sticker developed by Wildlife Branch
Be Bear Aware	Wildlife Branch sticker about proper garbage and food storage
Warning: Garbage Kills Bears	sign for use inside protected area toilet buildings to discourage visitors putting garbage in toilets

[4] Wildlife Branch of the previous Ministry of Environment, Lands and Parks.

Visitors often bring dogs into parks, with the potential for unleashed dogs to provoke a bear into chasing them back to their owner. Where dogs are allowed, they must remain on a leash at all times, and visitors should be discouraged from taking dogs into the backcountry.

3.3 Facility Planning and Management

3.3.1 Location/Design

Visitor use patterns should be managed to minimize the amount of overlap between areas with high human use and areas with high seasonal bear use. This applies to the location of frontcountry developments, layout of trail systems and location of backcountry campsites.

Bear hazard evaluations will be part of any impact assessment[5] prior to locating new or upgrading existing facilities to avoid inviting conflicts and continuing management problems. Bear hazard evaluations include an assessment of the following factors (W. McCrory, pers. commun., 2001):

- Bear habitat suitability;
- Bear travel or habitat corridor use;
- Presence of bear mark trees;
- Food availability, especially large mammal carcasses;
- Trail design, including noise, tread and visibility.

Habitat components of the evaluations can be based on interpretations from existing detailed mapping such as Terrestrial Ecosystem Mapping (TEM) or Predictive Ecosystem Mapping (PEM), or from detailed ground surveys of actual bear signs and bear foods. Evaluations have been completed for a number of provincial protected areas and have provided recommendations for relocating trails or facilities, where necessary, to avoid high-quality bear habitat. In areas where TEM or PEM is completed, bear habitat evaluations should begin with simple suitability assignments of seasonal habitat value. However, these initial evaluations should be followed up with examination of patch (site)-specific values and an examination of habitat supply at the landscape or home range level (T. Hamilton pers. commun., 2001).

A Decision-Support Model for bear hazard assessment (McCrory et al. 1999) has recently been used in Yoho National Park, with the same method now being applied to Kakwa Provincial Park. This is a GIS-based approach that evaluates both bear habitats and movements and park visitor use and preferences. The method provides support to decision makers, requiring a large degree of interaction with park managers.

Seasonal closures and openings of trails and campsites could be used to accommodate seasonal cycles in bear habitat use (e.g., feeding on spawning salmon or berries). In areas with a demonstrated history of bear-people conflicts, existing facilities or activities will be modified or removed if they cannot be managed to ensure public safety or the welfare of local bear populations.

[5] Refer to the BC Parks Impact Assessment Process manual (1999).

Facilities can also be designed to help reduce encounters by making unnatural food sources largely unavailable to bears. Separation of food storage, preparation and eating areas from other areas will reduce the likelihood of bears being attracted to people's sleeping areas or other human-use areas. Improperly stored human food and garbage is most often the root cause of bear-people conflicts and must be the focus of management actions to prevent these conflicts in the long term.

Other unnatural food sources include palatable non-native grasses and forbs (e.g., clover, brome grasses, dandelions) planted during road construction or other developments. Replacing these non-native plants with non-bear foods may reduce the attractiveness of such development to bears (Heuer 1993).

Permanent and portable electric fences have been used successfully as a deterrent to keep black and grizzly bears out of backcountry campsites, guide camps, bee yards, garbage dumps, and construction camps (Bromley et al 1992). Electric fencing may also be effective in keeping bears out of some frontcountry situations within campgrounds (e.g., certain buildings or compounds). Permanent electric fences require less maintenance than portable fences but require a level of expertise to construct, whereas portable fences are less costly and can also be moved with less cost (Ciarniello 1997).

Fence specifications vary depending on the specific problem situation and the bear species involved. In Normal Wells, N.W.T., a solar powered permanent electric fence for 4.2 hectares has prevented most black bears from accessing the main garbage dump (D. Whiteman pers. commun., 2001; Latour & Hagen 1993). While the cost ($21,700 in 1991) was considered inflated due to the considerable experimentation that occurred while completing construction (3-4 weeks), the system was nevertheless inexpensive compared with heavier, chain link-type fencing. Similar electric fencing has been installed around all major community landfills throughout northern British Columbia, such as Stewart, Kitimat, Burns Lake, Terrace and Prince Rupert, as well as Haines Junction and Dawson City (Yukon). These fences have been effective in restricting the access of bears to garbage (F. McKenzie pers. commun., 2001).

Proper design, construction, maintenance and use of gates in electric fences are needed to avoid weak points, digging problems and gates being left open. Audits should be done on a periodic basis to maintain effectiveness and detect needed improvements. Alternating strands of positive and negative high tensile smooth wire with good tension provides good penetration of the fur. Voltage should be a minimum of 6000 volts, with 8000 to 10,000 volts for grizzlies (F. McKenzie pers. commun., 2001). Recent design innovations have resulted in a CSA approved electric fence that can produce pulsating high voltage with low amperage. This will prevent injuries to people accidentally touching the fence (J. Marley pers. commun., 1995).

Facility design also involves implementing hazard abatement procedures, such as the following:

- installing proper lighting and reducing bear cover where people have a chance to encounter bears, such as selected trails, campsites and playgrounds;
- avoiding placement of trails in noisy areas, such as stream edges;
- relocating trails or campsites that are in hazardous areas;

- closing narrow, grown-in trails (e.g., camper-made trails from campsites);
- having good sight lines along trails to enable both people and bears to detect each other within a reasonable distance to avoid surprises;
- brushing trails (minimum 1-2 m each side), campsites, playgrounds and parking lots to ensure good visibility and reduce bear cover;
- ensuring good walking surfaces on trails so people spend more time looking ahead and less time watching their foot placement;
- considering limits for visitor use; and
- avoiding developments in high quality bear habitats.

3.3.2 Food Storage and Garbage Handling

Control of human-generated food and garbage is essential to reduce the attractiveness of human-use areas to bears. The intent of using bear-proof food or garbage containers (Appendix 2) is to prevent bears from obtaining unnatural food. Without the reward of unnatural food, bears will revert to or continue their normal behaviour of feeding on natural food sources. This will discourage bears from learning to associate developed areas, campsites or the presence of people with a free meal.

a) Frontcountry areas

Most frontcountry campers are expected to provide some type of secure food storage (e.g., the trunk of vehicles). Coolers left unattended in the open are not secure from bears. Food storage lockers have been installed in some campsites where the level of bear-people incidents indicates they are needed. For example, steel lockers have been installed in Mount Robson Provincial Park at four different sites (H. Mulyk, pers. commun. 2001) and at Meziadin Lake Provincial Park where grizzly habitat is adjacent to the campground (H. Markides, pers. commun., 2001). This also benefits campers travelling without secure food storage capabilities (cyclists, hikers, etc.). Other methods of bear-proof food storage include secure, small buildings, elevated caches and canisters (see also Backcountry areas).

In areas of known bear hazards, all outdoor garbage cans, dumpsters, recycle bins and other food storage and garbage collection, handling or storage facilities in service, dayuse and campground areas must be designed to be bear-proof (see Appendix 2) and must never be allowed to overflow. Daily garbage pickup is required in areas of known bear hazards to ensure containers are not filled beyond capacity (even bear-proof containers loose their effectiveness if allowed to overflow!). All bear-proof garbage containers will be signed with "Bear Proof" signage to reinforce public education. Garbage "corrals" made of wood (2x4s) and used to enclose 45 gallon drums are not bear-proof and must be replaced with bear-proof containers in areas of known bear hazards.

Regular garbage pick-up and cleaning of facilities in areas where fishing takes place is essential. Anglers will be encouraged to put fish entrails in bear-proof containers where fish cleaning stations are present (see also Backcountry areas).

b) Backcountry areas

Designated backcountry campsites in areas of known bear hazards should be provided with bear-proof food caches (e.g., Bowron Lake and Kokanee Glacier provincial parks). These must be located at least 50 m from the nearest campsite, be properly signed, and built in accordance with a proven design (e.g., elevated wood poles, platforms or anchored metal boxes placed on the ground). In Mount Robson Provincial Park, elevated food caches (bear poles) are available, as well as lockers at the Berg Lake chalet (H. Mulyk, pers. commun., 2001).

Backcountry campers should be instructed in, and required to use, proper food storage methods. This could be done at protected area visitor centres and during backcountry registration. Ranger staff should handle specific unsafe procedures observed during routine monitoring. In other cases, up-to-date informational material and signs should be used. Required use of portable, bear resistant plastic food containers is an option in areas of bear presence. In Denali National Park, where there are no trees for hanging food in much of the park, these containers have been loaned out at no charge to backpackers going into areas which have historically had the most problems. The containers have proven very effective in reducing bear-people conflicts, closure days and property damage, and visitor acceptance of the containers was very high (Dalle-Molle et al. 1986). In Kluane National Park use of approved bear-resistant food containers is highly recommended by the Park Service on overnight backcountry trips. Portable bear-proof containers can be made from large diameter PVC pipe with capped ends.

With the exception of grey water pits (such as those being used successfully in Valhalla Provincial Park (M. Gall, pers. commun., 2001), no on-site garbage storage or disposal facilities will be provided for backcountry users. A policy of packing out all garbage should be enforced. Any attempts to use backcountry toilets as garbage dumps or burying of garbage will be prohibited through public information, signs and enforcement (see Appendix 3).

One of the most powerful attractants to bears are fish entrails, and leaving these on shore or packing them out both result in hazardous odours. If fires are permitted, complete incineration is the preferred method of disposal. In other areas, fish entrails should be disposed of by puncturing the air bladder and depositing them in deep water in the lake or stream from which they were taken (except where prohibited).

Hunters are encouraged, either through direct contact, media or signs, to remove gut piles or waste from the vicinity of popular use areas. Alternatively, protected area staff should be informed of kill site locations near hiking trails and campsites to avoid potential conflicts with scavenging bears (see also 4.2 Bear Warnings and Area Closures). In addition, concentrated feeds that hunters carry for pack animals and horses should be removed from backcountry areas or stored in bear-proof containers.

c) Private and commercial facilities

A strategy of reducing unnatural bear food sources and avoiding habituation must also apply to private or commercial facilities operating within (or adjacent to) a provincial park or protected area. While the *Park Act* does not apply to private inholdings, provincial waste management regulations under the B.C. *Waste Management Act* do.

Cooperative management strategies for dealing with bear-people conflicts should be worked out with other provincial agencies, municipalities and local residents (see also Section 8.0 Interagency Cooperation). Parks and Protected Areas Branch should encourage and work with nearby communities and other branches in Environmental Stewardship Division to apply strategies under the Bear Smart program (http://wlapwww.gov.bc.ca/wld/bearsmart).

Park Use Permits for commercial operators (e.g., guide-outfitters, river rafting companies) will require that bear-proof food storage and garbage handling "facilities" be used. When careless behaviour by a single operator can jeopardize others by raising the risk of dangerous bear encounters, peer pressure may help to enhance compliance.

3.3.3 Monitoring and Enforcement

Protected area staff and facility operators are responsible for ensuring proper food and garbage handling procedures are followed in the operating areas. In areas of bear hazards, any food, cooking equipment or other attractant that is left accessible and out in the open (other than at meal time) should be immediately rectified by requesting the visitor(s) to store their food and/or garbage properly.

Where visitors are absent from a campsite, and bears are not an immediate concern, an information pamphlet (Appendix 4) can be left. However, where a bear is known to be in the vicinity, the attractants should be cleaned up and put in a secure area, a note left, and the visitors dealt with appropriately upon their return. In some protected areas (e.g., Liard River Hotsprings Provincial Park), graphic warning notices are posted at messy campsites and continued violations result in enforcement action (usually eviction).

As part of the facility maintenance contract, garbage will be removed and firepits cleaned at least daily during seasons when bears are active in areas of potential bear hazard. Deficiencies should be brought to the attention of the facility operator immediately; if corrections are not made, the appropriate contract manager must be notified for follow-up.

All frontcountry garbage containers must be regularly inspected and kept in a condition that prevents build-up of old food material and bear-attracting odours; cleaning and disinfection should be done as considered necessary.

While public education and monitoring cleanup will prevent most problems associated with unnatural food attractants, highest levels of control can only be achieved through a more

aggressive law enforcement campaign. This will include mandatory enforcement action such as issuing tickets and eviction orders for failure to comply with food storage and litter regulations (e.g., Sections 30 and 33, Park and Recreation Area Regulation). Such efforts were successful in removing the availability of human foods in Yellowstone National Park (Meagher and Phillips 1983). Following the removal of human attractants, the main management problem in Yellowstone became the tendency for people to closely approach seemingly tame, habituated bears that were seeking natural foods (Guenther 1994). In response, Yellowstone National Park imposed a restricted activity order that forbids people from approaching to within 100 m of a bear.

4.0 RESPONSIVE MANAGEMENT

4.1 Criteria for "Problem Bear" Management

Monitoring changes in bear behaviour and occurrence from year to year and from day to day should be done through assessment of data recorded on Bear Observation Cards for all bears seen or reported (Appendix 5). Analysis of these reports by park will allow detection of long-term shifts in bear behaviour and development of appropriate responses. Staff should pay particular attention to subtle behavioural indicators (frequenting areas used by people, following people along or off trails, in camping areas at night, circling or stiff-legged stalking behaviour, people feeling uncomfortable about a bear) of impending potential predatory behaviour (McCrory Wildlife Services 1997).

For the purposes of this plan, a "problem bear" is any bear judged by its actions to be a threat to human safety or liable to cause property damage. The decision to declare "problem bear" status will depend on the behaviour of the bear(s), the degree of threat to public safety and the proximity of the bear activity to facilities or visitor use areas. Ascribing "problem" status to a bear will occur only after all other appropriate management actions have been exhausted or if the bear poses imminent danger to human safety.

Prevention and management of the human element will be the prevalent strategy for dealing with "problem bears". On occasion, however, handling of bears (capture, immobilization, translocation or destruction) may be required.

Every effort must be made to determine the validity and severity of reported bear-people incidents. If monitoring suggests the incident was caused merely by chance or human fault and there is no further threat to human safety or property, the bear will be left alone and no longer be considered a problem. Bears showing "defensive" aggression[6] will not necessarily be treated with severe management responses like translocation or destruction. However "problem bears" that have become habituated, food-conditioned, or show "offensive" aggression[7] toward people will be destroyed or, in rare cases, translocated.

[6] "Defensive" aggression is usually provoked and results in the bear swatting, charging, etc. when approached too closely (S. Herrero, pers. commun., 1995).
[7] "Offensive" aggression is usually initiated by the bear as attempted predation, tearing tents without food attractants, etc. (S. Herrero, pers. commun., 1995).

Table 3 lists six specific management responses to be applied for nine types of bear-people interactions that may occur in protected areas. The responses take into account the species, age and sex of the bear(s) involved. "Problem bear" status should be assigned to any bears involved in interactions 5-9 inclusive in Table 3. The first step is to monitor the bear's behaviour and interactions with people. The second step is to warn visitors (through contact or signs – see Section 4.2) of a potential "problem bear" in the area and increase patrols for sanitation problems. If the bear stays around facilities or people, and it is reasonably clear that in each reported case the same bear is involved, attempts to deter the bear from the area should be made using methods of aversive conditioning before food conditioning occurs. Aversive conditioning should be considered where a bear is not food-conditioned but is likely to become so, or where a bear has had a limited initial encounter with unnatural food (see Section 4.3). If public safety becomes a concern, area closures will be enforced until bear activity has ceased. Translocation (see Section 4.5), altho ugh of limited benefit and applicability, is the next consideration for a persistent bear or where aversive conditioning is not considered appropriate, provided local conditions allow for safe capture, transport and release. Translocation should be considered for habituated and/or food-conditioned female grizzly bears with cubs; all reasonable attempts should be made to avoid having to remove these family groups. The final step, destruction (see Section 4.6), should be considered as a last resort and reserved for bears displaying "offensive" aggressive behaviour, for strongly habituated and food-conditioned black bears, repeat offenders that return as "problem bears" following translocation, and bears posing imminent danger to human safety. "Problem" black bears that have been previously relocated or become strongly habituated and food-conditioned will normally be destroyed. Documentation of "problem bears" and related management is crucial (see section 4.7).

Any bear-people interaction resulting in persona l injury or death will activate a Bear Emergency Plan (see Section 5.0).

4.2 Bear Warnings and Area Closures

Bear warnings provide visitors with accurate and current information on area-specific bear hazards to allow for informed decisions about travel or other activities. These warnings will be posted at trailheads and campsites or communicated verbally in areas where "problem bears" (see Section 4.1) have been reported. Areas designated for a warning will be posted, at a minimum, with a "Caution Bear" sign (Appendix 6). To avoid visitors becoming too complacent and to maintain effectiveness, bear warning signs must only be used when needed and removed once area-specific bear hazards are gone.

Area closures will be imposed to ensure public safety and protection of natural values. C losures are appropriate in "problem bear" situations (Table 3) and must be considered prior to translocating or destroying a bear. The regional manager or designate will authorize all area closures and re-openings except in the case of a bear-related emergency, in which case closures are imposed immediately and formal approvals follow. Closed areas will be posted using the "Area Closed" sign (Appendix 7). Copies of all area closures will be forwarded immediately to all campgrounds (including private) and information centres in the vicinity of the protected area and to the local Conservation Officer.

Table 3: Criteria to determine appropriate management responses to interactions involving grizzly bears (GB) and black bears (BB). A Bear Emergency Plan will be activated following any interactions resulting in human injury or death.

Type of Bear-People Interaction	MANAGEMENT RESPONSE						
	None	Monitor	Warning	Deter	Closure	Translocate	Destroy
1. Bear sighting or sign reported	GB/BB	GB/BB[8]	GB/BB[a]				
2. Bear showing normal feeding behaviour and avoids people	GB/BB	GB/BB	GB/BB[9]				
3. Bear reacting defensively following surprise or provoked encounter (defensive aggression)		GB/BB	GB/BB		GB/BB[10]		
4. Bear tolerates people but ignores them and their facilities (no threat present)		GB/BB	GB/BB	GB/BB			
5. Bear shows repeated interest in people or their facilities; if allowed to continue, will likely result in food-conditioning or close approaches (first time "offender"); bear may have had an initial encounter(s) with unnatural foods but not considered conditioned; assigned "problem bear" status		GB/BB	GB/BB	GB/BB	GB/BB	GB/BB	
6. Received minimal or low level reinforcement to unnatural food sources		GB/BB	GB/BB	GB/BB	GB/BB	GB/BB	
7. Bear is heavily habituated to people and has repeatedly obtained unnatural foods; assigned "problem bear" status		GB/BB	GB/BB	GB/BB[11]	GB/BB	(GB)[12]	BB
8. Bear has previously been relocated and is unlikely to change its behaviour (repeat "offender"); assigned "problem bear" status				GB/BB[d]			GB/BB
9. Bear displays aggressive behaviour (non-provoked charges or predatory behaviour) and is an imminent threat to human safety (offensive aggression); assigned "problem bear" status			GB/BB		GB/BB		GB/BB

[8] Monitor and warn visitors, when sighting occurs near trails, facilities, or involves a female with cubs.
[9] Consider enforcement if interaction is a result of people intentionally approaching close to or harassing bear.
[10] Until bear is no longer in the area
[11] Under optimal conditions aversive conditioning may be attempted (see Aversive Conditioning Guidelines [BC Parks 2001].
[12] Special consideration should be given to female grizzlies with cubs.

The duration of area closures and warnings may vary from several days to several weeks depending on the location, the purpose of the closure and the nature of the hazard. In some cases, a closure may be put in place for the entire season (e.g., for frequent actual or expected bear use). Closures and warnings will be withdrawn only when:

- no further encounters have occurred (warnings only);
- the area has been monitored for at least two consecutive days with no further bear activity noted;
- all related investigations are complete; and
- documentation is complete (see Section 4.7 and Table 4).

In Liard River Hotsprings Provincial Park regular seasonal closures occur, restricting visitors to one of two hotspring pools, when bears begin to show up to feed on ripening berry crops each August (P.Goetz, pers. commun., 2001). In Garibaldi Provincial Park, concentrations of bears feeding on berries have resulted in campground closures, shifting visitors to alternate campgrounds when possible, selective closures (e.g., closed to school groups), or trail closures (D. Carmichael, pers. commun., 2001). Bear advisories and closures in Garibaldi Provincial Park are posted on trail heads, and reports provided to the local Chamber of Commerce, information centres and radio stations (D. Carmichael, pers. commun., 2001).

Protected area closures are also regularly posted in a timely manner on the Parks and Protected Areas Branch internet web site for individual protected areas (N. Chave pers. commun., 2001). Regional staff and facility operators should be diligent in notifying the web administrator to remove web notices when closures are withdrawn to avoid visitor complacency to the message.

A specific circumstance that requires an immediate area closure is the presence of carrion or a carcass potentially available to bears near trails, general hiking areas or facilities. If the carrion cannot be removed, the area should be closed until the carcass has been consumed and any bears have left the area. For example, carcasses and gut piles left by hunters present a danger to hunters and other visitors. Hunters should be encouraged to report any animal remains left near a park trail or campsite so a decision on closure can be made. (Hunters should also be encouraged to carry pepper spray as a non-lethal option to assist in a safe retreat should a bear claim a hunter's kill -- it is illegal to kill a bear to defend hunted game). In addition, horses occasionally die on backcountry trips in protected areas. The owner should be required to immediately remove the carcass if it is near a trail or poses a risk to other users; however, where this is not possible, the owner must immediately report the location of the carcass to protected area staff and a temporary closure of the area must be imposed until all remains are disposed of.

Carcass situations can be extremely hazardous and should not be investigated without an armed backup, or a vehicle if in a frontcountry situation. Carcass situations in the backcountry should not be investigated on foot; helicopters are the preferred method of access. Where carcass situations are investigated by foot, two or more armed staff are required, and only under conditions of good visibility (i.e., any potential bear would be visible from at least 100 m).

Staff will not patrol an area that has been closed due to a bear hazard without radio or phone communication and authorized bear management equipment (firearm and pepper spray). Trained dogs are also recommended, if available, for added safety.

4.3 Aversive Conditioning

Aversive conditioning is a technique used to modify an animal's behaviour, causing it to cease undesirable activities, through the delivery of unpleasant stimuli. The main purpose of aversive conditioning in bear management is to prevent a bear from becoming used to, or losing, its natural fear of people (i.e., habituated). Aversive conditioning has also been used to reverse habituation and dissuade a habituated bear from associating people with food. Once a bear has become accustomed to human foods and garbage (i.e., food-conditioned), it may become aggressive in its attempts to acquire human food. Aversive conditioning is recognized as a potential deterrent to "problem bears" and, in some cases, may be the only viable option short of destruction. Deterrent techniques include the use of painful stimuli (rubber or plastic bullets, pepper spray), presentation of a loud noise (cracker shells, air horns) and the use of specially trained bear dogs (e.g., Karelian bear dogs) (Bromley et al. 1992) to shepherd bears out of conflict areas. Bears that are strongly habituated to human activity or are accustomed to feeding on unnatural foods (e.g., campgrounds or garbage dumps) are less likely to be successfully treated through aversive conditioning (McCullough 1982). Aversive conditioning could be used to "train" bears that have established a permanent home range covering the area of concern to avoid humans and unnatural food; because the bear is not removed from the area, other bears will be kept away from the human-use area through normal territorial interactions. Refer to the Guidelines for Aversive Conditioning of Bears (BC Parks 2001[13]) for criteria of bears that are suitable for treatment, and methods for its use.

Strong efforts should be made to deter a bear the first time, and every time, it enters visitor use areas, such as campgrounds, and before the bear receives any food rewards. This requires a committed effort and an ability to recognize individual bears to ensure that aversive conditioning is consistently applied. Aversive conditioning is not a substitute for preventative management actions to ensure the original attractants are removed.

One successful approach to the early treatment of "first offender" grizzly bears has been used in Denali National Park (Dalle-Molle and Van Horn 1989). Park rangers (dressed as campers) used soft plastic slugs fired from a 12-gauge shotgun on bears that had obtained food from backcountry camps. Five out of six grizzly bears and two out of three black bears "treated" this way did not return for additional food.

By not appearing submissive to bears and showing them even low levels of aggression, people can deter bears from becoming habituated. In Yosemite National Park, moderate levels of aggression (running towards and throwing objects at an approaching bear) were effective in chasing black bears out of campsites, particularly when done before the bear had received a food reward (Hastings et al. 1981 cited by Herrero 1985). Notably, this approach was used on black bears only and was not recommended for grizzly bears (Herrero 1985). This method is not to be used by protected area staff.

[13] These guidelines are to be revised in context of the corporate restructuring of 2002, to meet ministry-wide policies, strategies and responsibilities.

Application of aversive conditioning varies with each situation and the behaviour of individual bears. Different methods and equipment can be tried provided that the basic setup and application of the aversive conditioning guidelines are followed and it is well documented. All attempts, successful or unsuccessful, must be documented (see Section 4.7 and Table 4). The use of aversive conditioning techniques in protected areas in British Columbia will be strictly monitored, limited only to trained staff (at no time will visitors be advised or encouraged to use any form of aversive conditioning) and done under the following conditions (see also Table 3):

1. human food attractants have been removed from the area;
2. the bear to be treated is not heavily food-conditioned or strongly habituated to human use areas - the ideal candidate is a yearling to subadult bear;
3. only healthy bears that show no sign of offensive aggression will be treated;
4. the bear is marked, can be easily identified to enable monitoring the outcome of the aversive conditioning, or the area is heavily patrolled and all bears are treated until all undesirable behaviours cease.

A 12-gauge pump action shotgun is the most versatile delivery method for a variety of deterrents. By using a combination of pistol bangers, screamers, 12-gauge cracker shells, bean bags, rubber slugs and lethal force backup, it is possible to deter a bear from a site and still be prepared to destroy it, if necessary (Clarkson 1989). Lead birdshot will not be used for aversive conditioning of bears in provincial protected areas. Firearms must be used with discretion and care to ensure safety of visitors, staff, and the bear. Staff and facility operators must explain management actions with any visitors that may be present during the aversive conditioning procedure.

Further details and recommendations for aversive conditioning (including hazing and capture and "hard release") can be found in the guidelines for protected areas (BC Parks 2001).

All staff working in areas of known or potential bear hazards will carry pepper spray and be knowledgeable in its use for personal protection, i.e., must have successfully completed the Pepper Spray Course. Pepper spray, alarms and electric fencing may be useful as passive aversive conditioning agents in some circumstances. However, the limited range (3-5 m) and limited target (must contact bear's eyes and nostrils) of pepper spray makes it impractical as a safe method for active aversive conditioning of potential "problem bears". Experience with pepper spray suggests it works well in deterring bears in most cases, but may not work as well with some bears, such as female grizzlies with cubs or habituated black bears (Herrero and Higgins 1998). It must also be considered that pepper spray residue can act as an attractant to a site after its use for aversive conditioning (Smith 1998), and sites where it has been used should be carefully monitored as it could create attractant situations that could lead to encounters (McCrory 2000).

4.4 Immobilization

A bear may be immobilized for the purpose of translocation, removal from snares or marking for future identification by managers or researchers.

The capture team must consist of at least two people experienced in bear capture (at least one of whom will be armed) and must ensure, to the greatest extent possible, the safety of visitors, staff, and the bear. All protected area staff involved in immobilization must be trained and certified in the use of Class I drugs (e.g, Telazol) and in firearms handling (see Table 1). In the absence of certified protected area staff, drug immobilization should be referred to wildlife professionals (other regional Environmental Stewardship staff, Conservation Officer Service, or veterinarian). Other protected area staff may be present for the purpose of training or assistance.

A bear may be captured using a culvert trap, snare or drug-injecting dart during "free ranging" as appropriate for the situation. Once a bear is drugged, staff must ensure its safety until recovery. This includes monitoring vital signs and being cognizant of hazards such as drowning or attack by another bear. The immobilized bear must be kept in as quiet and cool a place as possible, and out of public view until it fully recovers, and leaves the site. Procedures and precautions are outlined in Langelier (1993).

Immobilization will not be attempted if there is a good chance the bear cannot be secured without injury (e.g., bear in trees over 10 m above the ground). In emergency situations, where a bear poses an immediate threat to human safety, the bear will be destroyed, not immobilized, to avoid the hazards of a partially immobilized, but potentially aggressive, bear.

All captured bears that are immobilized should be marked with ear tags to assist in the subsequent identification of individuals and monitoring of potential "problem" bears; future identification is facilitated by documenting placement and colour of ear tags. Eartags will be applied according to guidelines established by the Resources Information Standards Committee (1998).

If the capture operation involves radiocollaring bears, only functional "break-away" collars will be used. Young bears, because of the potential for substantial increases in neck size and subsequent problems with tight collars, will not be equipped with neck collars. Ear transmitters are an option for young bears.

Data regarding immobilized bears (drug dosage, recovery time, etc.) will be recorded on standard Wildlife Capture Data Forms (Appendix 8; see section 4.7 and Table 4); basic morphological measurements should also be included. Staff certified in the use of immobilizing drugs will be responsible for maintaining functional immobilization kits, including drug security, record keeping and drug and equipment inventory.

4.5 Translocation

Translocating "problem bears" to areas where they will presumably not cause further problems is expensive, time-consuming and largely ineffective in preventing further conflicts from occurring (Miller and Ballard 1982, Brannon 1987, Kansas and Raine 1987, Meagher and Fowler 1989, Clarkson 1993, Gillin et al. 1993). Many bears, both grizzly and black, are able to return to become "repeat offenders" because of continued availability of human food or other attractants at the original site; the eventual outcome is usually a destroyed bear.

Decisions to translocate bears from protected areas will be done with the advice, co-ordination and participation of the Conservation Officer Service and the regional Environmental Stewardship staff. All translocations will be conducted in accordance with Parks and Protected Areas Branch and Ministry of Water, Land and Air Protection policy and procedures[14].

To increase the likelihood of success in bear translocations, the following criteria for translocations from protected areas, which closely parallel criteria for translocations outside protected areas, must be met (see also Table 3):

1. human food attractants at the original capture site will be removed;
2. only healthy bears in good physical condition with a reasonable chance of survival will betranslocated; subadult bears (2-4 years old) are less likely to return;
3. bears showing offensive aggression or those with a past history of obtaining human food or garbage (including "repeat offenders") will not be translocated but will be destroyed (see Section 4.6);
4. where applicable, entire family groups will be translocated (translocation of orphaned cubs is not recommended);
5. suitable release sites are available (see below);
6. preference for translocation will be given to female grizzly bears.

Suitable release sites for "problem bears" should be established for each region in consultation with the Conservation Officer and Environmental Stewardship staff. Use of potential release sites that have been designated by regional staff will be required to relocate a bear outside of a protected area. Release sites within parks can be determined by protected area staff, but must be approved by the Regional Manager. Sites for translocation will be ecologically similar to the point of origin, away from human use areas (>75 km) and located beyond topographic barriers (e.g., very steep, rugged terrain; ice fields). Bodies of water do not constitute barriers to a bear.

Most capture and translocations of "problem bears" will be done using snares or culvert traps following the procedure outlined in the Standard Task/Equipment Procedures (ST/EP) Manual. Details of translocations should be documented on the Complaint/Occurrence Report (see section 4.7 and Table 4).

To provide future identification and a means for monitoring the effectiveness of translocations, each translocated bear must be marked. In the case of immobilized bears, ear tags should be used or radiocollars if the translocated bear is part of an approved and formally accepted research project. Bears captured in culvert traps but not immobilized should be colour marked (e.g., paint gun or spray paint) for temporary identification. Concerns over potential liability for marking "problem bears" are counterbalanced by the advantages of being able to recognize individual bears in the scientifically-based management program designed to reduce the incidence of bear-people conflicts.

[14] PPAB policy and procedures: Conservation Program Policies, Standard Task/Equipment Procedures (ST/EP) Manual, Public Safety and Park Security Manual . MWLAP policy and procedures: Problem Wildlife Management Policy and Procedures (Vol. 4, Sec. 7, Subsec. 04.01) and Preventing and Responding to Conflicts with Large Carnivores Procedures (Vol. 4, Sec. 7, Subsec. 04.01.1) [M. Badry, pers. commun., 2002].

4.6 Destruction

In some cases, it may be determined that an individual bear in a protected area poses an unacceptable hazard to human safety, and it must be destroyed. The removal of bears is not a substitute for preventative management of garbage and other attractants, and should only be considered as an emergency action or last resort.

Unless human safety is in immediate jeopardy, a bear will be destroyed only with prior authorization of the Regional Manager or his/her designate. The following criteria, which closely parallel criteria applied by the Conservation Officer Service, will be assessed to determine whether destruction of a bear in a protected area is appropriate (see also Table 3):

1. the bear is offensively aggressive towards people as shown by:
   - unprovoked attacks or repeated, unprovoked bluff charges;
   - predatory behaviour (stalking or chasing people);
2. the bear is food-conditioned, has previously been translocated or cannot be captured;
3. the bear is in poor physical condition or too young to translocate humanely;
4. there is no suitable release area for translocation available.

Bears that cause injury to humans as a result of natural defensive or protective behaviour should not be routinely destroyed nor, generally, translocated (Table 3). If a grizzly bear has seriously injured a person, reasonable attempts must be made to determine the circumstances before a decision to destroy any bear is made. The investigation to determine if destruction is the appropriate action must be timely and professional.

Except in an emergency, a bear should not be destroyed in public view. Protected area staff certified in the proper handling of firearms (Table 1) are authorized to destroy a "problem bear". If no certified staff are available, assistance should be requested from a regional Conservation Officer, other qualified regional staff ,or the RCMP. The preferred and most humane method is the use of a 12-gauge shotgun with lead slugs (e.g., Remington 870 with 3" magnum slugs). An alternative in some provincial protected areas with a restricted legal hunting season (e.g., Limited Entry Hunt (LEH)) would be to encourage hunters with permits to remove an individual bear that has been declared a "problem bear", provided public safety is not an immediate concern. This may prevent a non-problem bear from being removed from the wild.

The carcass of a destroyed bear should be disposed of away from public roads, trails and developed areas where scavenging wildlife (especially bears) will not itself present a hazard and where people cannot gain from the use of body parts. Bears that were drugged prior to destruction must be incinerated. In the case of grizzly bears, a Compulsory Inspection Data (CID) sheet available from the Conservation Officer Service must be filled out. For black bears, the sex, age estimate and general physical condition (including an estimate of weight) should be recorded as part of the documentation.

When a bear has been destroyed following an attack resulting in human injury or death, and there is no obvious behavioural reason for the attack, the carcass should be forwarded to the Animal Health Branch laboratory, Ministry of Agriculture, Food and Fisheries, Abbotsford, for a detailed necropsy (see also Section 4.7). If it is impractical to send out an entire carcass, a local veterinarian or the provincial Wildlife Veterinarian (MWLAP) must be consulted for any necropsy procedures.

4.7 Documentation

Whenever "problem bear" status has been declared, it must be documented and contributing factors identified, where possible (Table 4). Management actions involving area closures, aversive conditioning, immobilization, translocation or destruction will be documented on Complaint/Occurrence Reports (Appendix 9) with the following information included, when applicable:

- location, date and bear species involved;
- bear characteristics (size, coloration, markings, behaviour);
- site characteristics (food associations, human use, signs of property damage);
- notes on bear-people interaction (including contacts for further details);
- notes on management actions taken.

Any immobilization attempts will also be recorded on the Wildlife Capture Data Form (Appendix 8). If a grizzly bear is destroyed, a Compulsory Inspection Data (CID) sheet must be completed. In the event of a bear emergency (Section 5.0), detailed and accurate records must be kept in the event of liability or litigation proceedings, and to assess and ensure proper management procedures in the future. In no case should details be left to memory!

The regional ecosystem officer responsible for protected areas will ensure documentation is complete and will prepare a comprehensive annual report summarizing bear sightings, bear-people incidents and management actions taken.

5.0 BEAR EMERGENCY PLAN

In the event of a bear-related emergency, an immediate and effective response is required to ensure public safety and resolve the problem. Each region has separate Bear Emergency Plan(s) that are park-specific (as in South Tweedsmuir Provincial Park; McCrory and Mallam 1989a) or area-specific (as in West Kootenays; McCrory and Mallam 1989b) depending on the frequency of bear-people conflicts in the region[15]. A Bear Emergency Plan for a region or a protected area should clearly outline initial and follow-up response to any bear emergency involving human injury or death, or avoidance of high risk situations (e.g., bear feeding on a carcass on a main trail with hikers beyond the site). The plan should address:

[15] In addition, regional managers may require that a regional Bear-People Conflict Prevention Plan be prepared based on the format and contents of this provincial Bear-People Conflict Prevention Plan. The regional BPCPP outlines further details regarding duties and responsibilities of regional staff and priorities of regional management to prevent and respond to bear incidents.

- safe evacuation of victims and other public from the area;
- securing the area to contain the bear(s) and prevent public access;
- evaluating the circumstances and capturing or killing the bear, if required;
- organization, safety and documentation; and
- dealing with the media.

As part of regional protected area emergency planning, a Regional Protected Area Wildlife Response Team may be formed to deal with a variety of emergency situations in protected areas, with specific roles and responsibilities for individuals and the team. Each region will determine the level of detail regarding individual and team responsibilities that will be specified in the Bear Emergency Plan for an effective response to bear related emergencies. At a minimum, a local contact list of regional staff (protected area staff and Conservation Officers) that are qualified to respond to bear emergencies should be established.

The Conservation Officer Service of the Ministry of Water, Land and Air Protection may organize Regional Wildlife Attack Response Teams in some regions of B.C. to investigate wildlife attacks on humans. They are trained professionals from which protected area staff may request assistance in the event of a mauling or fatality. The Wildlife Attack Response Team is required to follow standard procedures for investigating and reporting attacks[16]; it is recommended that members of the Protected Area Wildlife Response Team be familiar with these procedures.

In the event of a mauling or fatality, the scene and situation should be investigated and documented by the Regional Wildlife Attack Response Team or Regional Protected Area Wildlife Response Team. It is recommended that the latter defer to the expertise of the former. Expert opinion for a professional site assessment is advisable in some complex situations that are difficult to interpret. Operational procedures and roles should be worked out internally as part of local agreements between the regional divisions of the Ministry of Water, Land and Air Protection (see also Section 8.0).

Evidence of injurious or fatal bear-human interaction must be documented completely on an Animal/Human Attack Report (Appendix 10), according to MWLAP ministry standards. A detailed interview form for documenting details of bear-people aggressive encounters (Bear-Human Aggressive Encounter Database) has been designed by Dr. Stephen Herrero at the University of Calgary. Copies of this interview form are available from the Parks and Protected Areas Branch, Victoria. Where a response team is not readily available or a delay may result in loss of evidence, then photographs of the site should be taken, witness statements should be recorded, and basic descriptions and measurements that address the information collected in the Attack Report should be made. Protected area staff should familiarize themselves with the type of information required to complete an Attack Report. The attack area should be secured and no evidence removed until the investigation is complete. Human safety is of the utmost concern: the public should be removed from the area and all precautions taken to minimize further risks during the investigation.

[16] MELP [MWLAP] Enforcement Program, chapter 6 Complaints and Occurrences, section 10 Problem Wildlife Management, subsection 07 Investigation of Wildlife Attacks on Humans. DRAFT (revised March 2000).

6.0 MONITORING, RESEARCH AND EVALUATION

An effective data recording system to document all bear and bear-people incidents is an essential component of this conflict prevention plan. Documentation is required to monitor whether current management strategies are working to achieve the plan objectives.

The bear monitoring system for protected areas in British Columbia (Table 4) builds on existing tools and includes a variety of forms appropriate to bear related monitoring and management actions. The intent is to encourage staff, facility operators, qualified contractors, volunteers and park visitors to provide information that can be used to make informed management decisions; to evaluate program strength; to build a reliable database on local bear population trends; and to be able to provide accurate information to the public.

Bear sightings, especially in situations where humans have disturbed bears, will be recorded on Bear Observation Cards (Appendix 5). Of particular importance are unduplicated sightings of family groups or of bears with characteristic markings that can later be individually identified. Data from the observation cards will be entered on computer databases in each region and summarized, by protected area, in the annual Bear Management Report prepared by protected area staff. Bear-people incidents should be recorded as per the guidelines in Section 4.7 (Documentation). The annual bear management report should also include current information on visitor use levels, both day use and backcountry use, by protected area.

Visitor trends and ecosystem changes are important in monitoring potential bear related hazards. Visitor use for each protected area should be monitored using available systems, with refinements made using trail counters or other methods. Ecosystem changes (e.g., wildfires, logging near park boundaries, high use trails in bear habitat) and visitor use should be documented and reported in the annual Bear Management Report.

In protected areas where detailed information on bear use is required, monitoring could be done using remote cameras along bear trails (as in South Tweedsmuir Provincial Park) or in other areas where high bear use is suspected. Monitoring of natural food sources, such as annual berry crops or salmon escapement and availability can provide an early warning system for the potential of "problem bear" encounters. Berry crops can be monitored to determine whether more bears should be expected to occur at lower elevations when high-country berry crops are low, as has been done in Whiteswan Lake Provincial Park; or to determine whether special conflict-prevention activities are required, such as warning users or closing areas with high potential bear activity, as has been done in Kokanee Provincial Park (M. Gall, pers. commun., 2001).

Research is essential to provide the information required to develop and refine an effective bear-people management program. Two projects (Ciarniello 1997, Himmer and Gallagher 1996) funded by BC Parks provided management recommendations aimed at preventing or reducing bear-people interactions in two very different environments. In South Tweedsmuir Provincial Park, grizzly bears concentrate along the Atnarko River in the coastal-interior transition zone during the salmon spawning season when large numbers of anglers also use the river.

Table 4. Bear monitoring information system for protected areas in British Columbia.

Type of Monitoring	Format / Form [a]	Responsibility [b]
1. Bear sighting	BOC	PO/RO/PFO
2. Bear-human encounter	BOC/COR	PO/RO/PFO
3. Management Actions		
Bear warnings	COR	PO/PFO
Area closures	COR	PO/RM
Aversive conditioning	COR	PO/RO
Immobilization	COR/WCDF	PO/RO
Translocation	COR	PO/RO
Destruction	COR/CID	PO/RO
4. Miscellaneous		
Legal harvest	From SSDB	RO
Poaching	BOC/COR	Contact local CO
5. Summary	Annual report	RO

[a] BOC = Bear Observation Card
WCDF = Wildlife Capture Data Form
COR = Complaint/Occurrence Report
CID = Compulsory Inspection Data Sheet (required for grizzly bears only)
SSDB = the Wildlife Program Summary Statistics Data Base

[b] PO = Park Officer (Area Supervisor or Park Ranger)
RO = Ecosystem Officer
PFO = Park Facility Operator

While some grizzly bears appear to have habituated to the human activity, notably subadults, lone adults and family groups may have become more nocturnal as a result (Himmer and Gallagher 1996). There are very few garbage/human food related incidents involving grizzly bears in this area. However, the seasonal overlap of high bear density and high human use is still cause for concern.

In contrast, Ciarniello (1995) reported that garbage and food-conditioning was an important root cause for the frequent black bear-people conflicts in the Liard River Hotsprings Provincial Park area in northern central B.C. A landfill outside the park provided free access to garbage during early and mid-summer (the site was closed in 1996). As the bears switched to berries, their use of the campground and hotsprings area (which represents one big berry patch) increased, as did the opportunity for bear-people interactions. While most of these bears appeared to be feeding on natural foods while in the park, their seemingly "tame" nature invited close approaches and careless human behaviour, creating potentially dangerous situations (Ciarniello 1997). Programs were subsequently initiated that increased bear awareness information, interpretation messages on bears, and food management. Two staff were also dedicated to focus on managing bears and park visitors during August, the period of highest bear and visitor use of the park (D. Roberts, pers. commun., 2001).

Further research to refine bear-people management in protected areas should evaluate the effectiveness and consequences of using prevention (food/garbage management, facility relocation, habitat changes to remove bear foods, etc.) and non-lethal methods (deterrents, aversive conditioning and translocation) to deal with "problem bears". This work should be limited to one or two protected areas with frequent bear-people interactions, be well designed, carefully monitored, adequately funded and include the use of marked bears.

The role of public information and education in preventing bear-people conflicts also needs further work. It is not clear what medium, or method, is most effective in changing human attitudes and communicating bear awareness. Is it innovative communication strategies or a more aggressive law enforcement campaign with mandatory fines or evictions for feeding, approaching and harassing bears? Effectiveness of recent bear videos that are receiving a wide target audience should be evaluated, as well as existing efforts on warnings and evictions for non-compliance by visitors.

Performance criteria should be used in each region to evaluate the success of the overall bear management program over time. Criteria will include:

- number of bear observations (by species) in developed facility areas per year;
- number of bear-people interactions reported per year;
- number of "problem bears" reported per year;
- number of bears translocated or destroyed per year.

Evaluations should be done over 5- or 10-year periods and be based on the annual bear management summaries prepared for each region.

7.0 ROLES AND RESPONSIBILITIES

Roles and responsibilities at the regional level may vary at the discretion of Regional Managers – certain duties may be temporarily assigned and/or additional duties and further details may be added to the list. Roles and responsibilities may change with any further corporate restructuring. Details of responsibilities and changes should be reflected in updates to regional Bear-People Conflict Prevention Plans.

Parks and Protected Areas Branch, Victoria, is responsible for:

- providing policy and program direction for bear-people management in parks and protected areas in British Columbia;
- facilitating and coordinating scientific research programs to maintain an adequate knowledge base for effective management;
- participating in the development of staff training programs and visitor information initiatives designed to prevent, and respond to, bear-people conflicts;
- maintaining and developing standards in facility design, construction and maintenance to ensure food storage and garbage handling practices do not generate conflicts with bears;
- providing policy and program direction on park information, interpretation and stewardship messaging initiatives designed to enhance bear awareness and prevent bear-people conflicts;
- providing advice and standards in the development of bear related signs, interpretative programming and other communications media relating to bears;
- providing policy and procedures for visitor and staff safety in areas of known bear hazards; and,
- coordinating the development of staff training programs designed to prevent, and respond to, bear-people conflicts.

Environmental Stewardship Division Regions are responsible for:

- implementing the protected-area Bear-People Conflict Prevention Plan in parks and protected areas in their region;
- developing, implementing and regularly updating the regional Bear-People Conflict Prevention Plan as required and region-wide or area-specific Bear Emergency Plan(s) as required;
- delivering bear awareness training as required at the regional level to ensure staff, volunteers and facility operators have received appropriate training and are knowledgeable in the prevention of, and equipped and able to respond to, bear-people conflicts;
- developing protocols with the regional Conservation Officer Service to respond to "problem bear" complaints;
- responding to and documenting bear emergencies and "problem bear" complaints and ensuring criteria and guidelines developed for dealing with "problem bears" are followed;

- supervising and monitoring food storage and garbage handling procedures used by visitors, facility operators and permit holders, and monitoring and maintaining conflict prevention equipment and facilities such as bear proof garbage containers, food caches and bear-aware trails and campgrounds;
- maintaining the bear monitoring information system (data forms and electronic database) and completing an annual regional Bear Management Report summarizing bear sightings, bear-people incidents and management actions taken;
- developing and managing research projects required for effective bear management;
- providing public education (various media) to reduce bear-human conflicts through front-line contact with park visitors; and,
- enforcing the Park Act and regulations.

Facility Operators that are contracted to provide recreation services are responsible for:

- maintaining clean facilities in the protected area;
- ensuring safe public conduct in the protected area;
- ensuring visitors practice good food management;
- reporting bear sightings and bear-people incidents in facility areas to protected area staff;
- assuring bear attractants are not create by their operation;
- providing or arranging approved bear awareness training for their staff;
- assuring visitors do not create bear attractants;
- implementing facility operator responsibilities as identified in regional and/or park specific Bear-People Conflict Prevention Plans; and,
- may be responsible for other bear-human conflict management activities negotiated and contracted with the Province.

8.0 INTERAGENCY COOPERATION

For this provincial Bear-People Conflict Prevention Plan to be effectively implemented, a coordinated approach to bear management is essential. Even if all potential sources of human food and garbage within a protected area were secured, attractants may exist on adjacent lands or inholdings, jeopardizing the safety of visitors in the protected area. Since bears move freely across administrative boundaries, interagency cooperation is also vital to ensure ecosystem-based management that focuses on local bear populations across their entire range.

The Memorandum of Understanding (1994) between BC Parks and the Wildlife Program[17] regarding management of shared wildlife populations promotes the signing of local agreements for dealing with problem wildlife in, and adjacent to, provincial parks [and other protected areas].

[17] This MOU remains in effect and effective despite organizational changes in 2002. The parties responsible are now Parks and Protected Areas Branch, Biodiversity Branch and Fish and Wildlife recreation and Allocation Branch, all of Environmental Stewardship Division, MWLAP

Guidelines outlining agency responsibilities have been completed in five of nine Environmental Stewardship regions: Peace, Kootenay, Lower Mainland, Okanagan and Thompson[18]. The objectives of the guidelines are to ensure visitor safety and effective conservation management in provincial parks and protected areas by promoting cooperation between protected area staff, other regional Environmental Stewardship staff and the local Conservation Officer Service. Interagency cooperation in bear management is also important for the exchange of information and advice, and for joint monitoring and research projects. Similar agreements should also be considered with other neighbouring agencies involved in bear management, such as Parks Canada.

In 2002, as a result of corporate restructuring, development of a coordinated ministry-wide strategy for dealing with wildlife-human conflicts was initiated. Common and complimentary goals, policies and strategies of branches within MWLAP that deal with problem wildlife, including bears, are to be brought together in one document to ensure effective communication among groups and best management of problem wildlife within and outside protected areas. This document may preclude the necessity to draw up additional memoranda regarding agency responsibilities.

To effectively prevent bears from becoming food-conditioned at garbage dumps, lodges or road-side recreation sites will require a provincial strategy that includes stiffer penalties for violating waste management regulations, more education and information, and incentives for municipalities, regional districts and private operators to use bear-proof containers and landfills. The Bear Smart program led by the Ministry of Water, Land and Air Protection has the potential to achieve this strategy.

9.0 ACTIONS

Staff Training

1. Protected area staff and contractors regularly engaged in bear management, facility management and visitor services in areas of known or potential bear hazards will receive orientation in basic bear safety and conflict prevention (one-day presentation).

2. In those regions and protected areas where bear-people conflicts are particularly common, consideration will be given to hiring seasonal staff whose job will be dedicated to bear-people conflict prevention and management.

3. All staff involved in responding to bear-people conflicts or carrying a firearm must first be trained to Parks and Protected Area Branch standards for firearm qualification and undertake annual re-qualifications. All staff working in areas of known or potential bear hazards must carry pepper spray and be knowledgeable in its use for personal protection.

[18] In the original documents, under the existing corporate structure, the agreements were made between six BC Parks districts and four BC Environment regions: the Peace Liard District (BCE Peace Liard Sub-Region), Kootenay District (BCE Kootenay Region), Garibaldi/Sunshine and Lower Mainland districts (BCE Lower Mainland Region) and Okanagan and Thompson River districts (BCE Southern Interior Region).

4. All staff involved in immobilization of bears must be certified in the use of Class I drugs and in firearms handling.

Visitor Management

5. Every visitor to a protected area in British Columbia must have the opportunity to be informed regarding the presence of bears and how to behave to minimize the chances of conflict. Visitor information needs to be motivating and strongly worded to accomplish a desired change in visitor behaviour to reduce, or prevent, bear-people conflicts from occurring.

6. Backcountry users will be required to pack out all their garbage; burying garbage or dumping it in backcountry toilets should be actively prevented through signs and enforcement.

7. Commercial operators regulated by a Park Use Permit in areas with known or potential bear hazards will be required to maintain bear-proof food storage and garbage handling "facilities".

8. Bear warnings will be posted, and communicated verbally, to provide visitors with accurate and current information on area-specific bear hazards to allow for informed decisions about travel or other activities.

Facility Management

9. Facility planning should ensure no development in areas with high seasonal bear use. This applies to the location of frontcountry developments, backcountry campsites and the layout of trail systems.

10. Seasonal closures of trails and campgrounds will be used to accommodate seasonal cycles in bear habitat use (e.g., salmon or berry feeding). Other options include electric fencing or vegetation management around campgrounds to reduce their attractiveness to bears.

11. All outdoor garbage cans and dumpsters in frontcountry areas of known bear hazards will be designed to be bear-proof. Regular (daily) garbage pick-up is required, particularly where known bear activity exists.

12. Most frontcountry campers will be expected to provide for some type of secure food storage (e.g., inside the trunk of vehicles); food storage lockers could be installed where the level of bear-people incidents indicates they are needed.

13. Designated backcountry campsites should be provided with bear-proof food caches (either elevated or in secure container). Visitors should be encouraged to use portable plastic food containers in high hazard areas, or in areas without trees or food lockers.

14. Area closures are appropriate in "problem bear" situations to ensure public safety and resource protection, and must be considered prior to translocating or destroying a bear.

Bear Management

15. Prevention and people management will be the prevalent solutions for dealing with bear-people conflicts; however, manipulation of bears may be required. "Problem bears" that have become habituated, food-conditioned, or show offensive aggression towards people will be translocated or destroyed. Ascribing "problem" status to a bear will only occur after all other appropriate management actions have been exhausted.

16. Field guidelines for responding to "problem bear" situations must consider the species, age and sex of the bear(s) involved. Most consideration will be given to female grizzly bears accompanied by young and all reasonable attempts will be made to avoid removing these family groups. "Problem" black bears that have been previously translocated or become strongly habituated and food-conditioned will normally be destroyed.

17. The use of deterrents or aversive conditioning techniques in protected areas will be closely monitored and limited to trained staff. Treatment will be applied only to non-aggressive, healthy bears that are not irreversibly food-conditioned or habituated, are marked or otherwise easily identified, and provided human food attractants are removed from the original site. The Guidelines for Aversive Conditioning of Bears (BC Parks 2001) must be followed.

18. All captured bears that are immobilized, whether translocated or not, should be marked with an ear tag to assist in future identification and monitoring of "problem bears".

19. If the capture operation involves radiocollaring bears, only functional "break-away" collars will be used. Young bears, because of the potential for substantial increases in neck size and subsequent problems with tight collars, will not be equipped with neck collars (ear transmitters could be an option for young bears).

20. Translocation of bears from protected areas will be limited to non-aggressive, healthy, mature bears with no past history of obtaining human food or garbage, and provided suitable release sites are available (see below). Where applicable, entire family groups will be translocated and female grizzly bears will be given preference for translocation. All translocated bears must be marked for future identification (ear tags, paint marking, etc.).

21. Release sites for bears translocated from and/or within protected areas will be determined in consultation with the Conservation Officer Service and regional Environmental Stewardship staff. The Regional Managers of Environmental Stewardship and Enforcement must be advised of all translocations.

22. Unless human safety is in immediate jeopardy, a bear will be destroyed in a protected area only with prior authorization of the Regional Manager or his/her designate provided the bear is: offensively aggressive towards people; or food-conditioned and has previously been relocated; severely injured, in poor physical condition or too young to relocate humanely; cannot be captured, or a suitable release area for translocation is not available.

23. Bears that cause injury to humans as a result of natural defensive or protective behaviour should not be routinely destroyed nor, generally, translocated. If a grizzly bear has seriously injured a person, attempts must be made to determine the circumstances before a decision to destroy the bear is made. The investigation to determine if destruction is the appropriate action must be timely and professional.

24. If a bear has been destroyed following an attack resulting in human injury or death, and there is no obvious behavioural reason for the attack, the carcass should be forwarded to the Animal Health Branch Lab, Ministry of Agriculture, Food and Fisheries, Abbotsford. Alternatively, a local veterinarian or the provincial Wildlife Veterinarian (MWLAP) should be consulted for any necropsy procedures. The coroner and RCMP must be informed of all deaths.

25. Each region will have its own Bear Emergency Plan(s), specific to a protected area or geographic area, that clearly outlines initial and follow-up response to any bear emergency involving human injury or death. The plan must include a local contact list of regional protected area (and other) staff that are qualified to respond to bear emergencies. Regional Wildlife Attack Response Teams (Conservation Officer Service) are also available in some areas to assist protected area staff.

Monitoring

26. Monitoring and enforcement by protected area staff and facility operators is essential to ensure proper food and garbage handling procedures are followed. Problems cannot be prevented in the long term unless this becomes the focus of management actions.

27. An effective data recording system to document all bear observations and bear-people incidents is an essential component of this conflict prevention plan. Data is collected using existing tools (Bear Observation Cards, Complaint/Occurrence Report, etc.) and an electronic database is created.

28. Further research to refine bear-people management in provincial protected areas should evaluate the effectiveness and consequences of using prevention and non-lethal methods to deal with "problem bears". This work should be limited to one or two protected areas with frequent bear-people interactions, have clear and testable objectives, be designed for statistical validity, be carefully monitored, and include the use of radiocollared bears.

29. Performance criteria should be used in each region to evaluate overall success of the bear management program. Criteria include summaries of the number of "problem bears" reported, deterred, translocated or destroyed each year.

Interagency Co-operation

30. The MOU (1994) between BC Parks and the Wildlife Program on the management of shared wildlife populations spawned five local agreements outlining agency responsibilities for dealing with problem wildlife in, and adjacent to, protected areas. A ministry-wide strategy for reducing and dealing with wildlife-human conflicts is under development following corporate re-structuring in 2002.

31. Parks and Protected Areas Branch should participate in a ministry initiative to implement the provincial Wildlife-Human Conflict Reduction Strategy, whereby communities, land managers, industries and individuals are encouraged to accept their responsibility to reduce bear-human conflicts through preventative measures such as bear-proof containers, effective waste management regulations, and public education and information programs.

10.0 REFERENCES

Alberta Department of Environmental Protection. 1994. Bear conflict prevention plan: Kananaskis Country. Prepared as a cooperative project between Alberta Fish and Wildlife Service (Kananaskis Country), Alberta Parks, Alberta Forest Service, and Banff National Park. 35 pp. + app.

BC Parks. 2001. Draft Guidelines for the Aversive Conditioning of Bears. BC Parks, Parks and Ecological Reserves Management Branch, Conservation Services, Victoria, 36 pp. (*under revision in 2002, to address corporate restructuring and ministry-wide policies, strategies and responsibilities*).

Brannon, R.D. 1987. Nuisance grizzly bears, *Ursus arctos*, translocations in the greater Yellowstone area. Can. Field Nat. 101(4): 569-575.

Bromley, M., L.H. Graf, P.L. Clarkson and J.A. Nagy. 1992. Safety in bear country: a reference manual. GNWT Renewable Resources, Yellowknife. 134 pp.

Ciarniello, L. 1995. Management plan to reduce negative black bear-human interactions in Liard River Hotsprings Provincial Park, British Columbia. Report prepared for BC Parks, Peace Liard District, Fort St. John, B.C. 69 pp.

Ciarniello, L. 1997. Reducing human-bear conflicts: solutions through better management of non-natural foods. Report prepared by Westworth, Brusnyk & Associates Ltd. for BC Ministry of Environment, Lands and Parks, Victoria, BC. 139 pp.

Clarkson, P. L. 1989.The twelve-guage shotgun:a bear deterrent and protection weapon. PP 55-60 in Bear-People Conflicts - Proc. of a Symposium on Management Strategies, 6-10 April, 1987, Yellowknife, NWT. NWT Dept. Renewable Resources, Yellowknife, NWT.

Clarkson, P.L. 1993. The ecology and management of problem black bears at Norman Wells, NWT, 1985-1988. Manuscript Rep. no. 70. GNWT Renewable Resources, Yellowknife. 35 pp.

Dalle-Molle, J.L. and J.C. Van Horn. 1989. Bear-people conflict management in Denali National Park, Alaska. Pp. 121-127 in Bear-People Conflicts - Proc. of a Symposium on Management Strategies, 6-10 April, 1987, Yellowknife, NWT. NWT Dept. Renewable Resources, Yellowknife, NWT.

Dalle-Molle, J.L., M.A. Coffey and H.W. Werner. 1986. Evaluation of bear-resistant food containers for backpackers. Pp. 209-214 in Proc. Natl. Wilderness Research Conf. Gen. Tech. Rep. INT - 212, Intermountain Res. Station, Ogden, UT.

Geunther, K. A. 1994. Bear management in Yellowstone Natinal Park, 1960-93. Int. Conf. Bear Rres. And Manage. 9(1):549-560.

Gillin, C.M., F.M. Hammond and C.M. Peterson. 1993. Evaluation of an aversive conditioning technique used on grizzly bears in the Yellowstone Ecosystem. Int. Conf. Bear Res. and Manage. 9:503-512.

Hastings, B.C., B.K. Gilbert and D.L. Turner. 1981. Black bear behaviour and human-bear relationships in Yosemite National Park. Tech. Rep. No. 2. 42 pp.

Herrero, S. 1985. Bear attacks: their causes and avoidance. Nick Lyons Books, New York. 287 pp.

Herrero, S. and A. Higgins. 1998. Field use of capsicum spray as a bear deterrent. Ursus 10:533-537.

Heuer, K. 1993. Human-bear conflicts: a literature review of causes, symptoms and management options with an emphasis on aversive conditioning. Unpubl. rep. prep. for Canadian Parks Service, Banff National Park Warden Service. 34 pp.

Himmer, S. and M. Gallagher. 1996. Tweedsmuir/Atnarko grizzly bear study: final report (draft Feb 1996). Prepared for BC Parks, Cariboo District. 107 pp.

Kansas, J.L. and R.M. Raine. 1987. Translocation of black bears in Banff National Park. Preliminary overview and recommendations. Beale Associates, Calgary.

Keay, J.A. and M.G. Webb. 1989. Effectiveness of human-bear management at protecting visitors and property in Yosemite National Park. Pp. 145-154 in Bear-People Conflicts - Proc. of a Symposium on Management Strategies, 6-10 April, 1987, Yellowknife, NWT. NWT Dept. Renewable Resources, Yellowknife, NWT.

Langelier, K. 1993. Wildlife chemical immobilization: manual prepared for Ministry of Environment, Lands and Parks. 97 pp.

Latour, P. and R. Hagen. 1993. Use of electric fencing to deter black and grizzly bears from the Norman Wells dump. Dept. of Renewable Resources, N.W.T., Norman Wells, Manuscript Report No. 69, 27 pp.

McCrory Wildlife Services. 1997. Bear conflict prevention plan for Akamina Kishnena Provincial Park, B.C. (1997-2001). Report for BC Parks, Kootenay District, Wasa, B.C., 91 pp.

McCrory, W.P. 2000. A review of the bear-people management program for Kokanee Glacier Provincial Park, BC. Report to BC Parks, Nelson, BC. 88 pp.

McCrory, W.P., S. Herrero and G. Jones. 1987. Program to minimize conflicts between grizzly bears and people in British Columbia provincial parks. Pp. 93-98 in Bear-People Conflicts - Proc. of a Symposium on Management Strategies, 6-10 April, 1987, Yellowknife, NWT. NWT Dept. Renewable Resources, Yellowknife, NWT.

McCrory, W. and E. Mallam. 1989a. Bear management plan - South Tweedsmuir Park (1989-1994). Report prepared for BC Parks Prince George District, Prince George, by McCrory Wildlife Services, New Denver, B.C. 29 pp.

McCrory, W. and E. Mallam. 1989b. Bear management plan - West Kootenay District BC Parks (1989-1994). Report prepared for BC Parks, Southern Interior Region, Kamloops, by McCrory Wildlife Services, New Denver, B.C. Part 1, 34 pp, and Part 2 (Background Document), ~42pp.

McCrory, W.P., C. McTavish and P. Paquet. 1999. Grizzly bear background research document. 1993 – 1996 for GIS bear encounter risk model, Yoho National Park, British Columbia. A background report for the GIS Decision-Support Model for the Lake O'Hara/McArthur Valley Socio-ecological study. Parks Canada. 96 pp + app.

McCullough, D.R. 1982. Behaviour, bears and humans. Wildl. Soc. Bull. 10: 27-33.

Meagher, M. and J.R. Phillips. 1983. Restoration of natural populations of grizzly bears in Yellowstone National Park. Int. Conf. Bear Res. and Manage. 5: 152-158.

Meagher, M. and S. Fowler. 1989. The consequences of protecting problem bears. Pp. 141-144 in Bear-People Conflicts - Proc. of a Symposium on Management Strategies, 6-10 April, 1987, Yellowknife, NWT. NWT Dept. Renewable Resources, Yellowknife, NWT.

Miller, S. D. and W. B. Ballard. 1982. Homing of transplanted Alaskan Brown Bears. J. Wildl. Manage. 46(4):869-876.

Resources Inventory Committee. 1998. Standardized Inventory Methodologies for Components of British Columbia's Biodiversity: Live Animal Capture and Handling Guidelines for Wild Mammals, Birds, Amphibians and reptiles. Version 2.0. Prepared by Ministry of Environment, Lands and Parks Resources Inventory Branch for the Terrestrial Ecosystems Task Force Resources Inventory Committee, Victoria

Smith, T. 1998. Attraction of brown bears to red pepper spray deterrent: caveats for use. Wildlife Society Bulletin 26(1):92-94.

Taylor, J.S. 1984. Bear management plans in Canadian national parks: fifteen essential elements. M.S. Thesis. Univ. of Calgary, Calgary, AB. 347 pp.

Waterton Lakes National Park. 1998. Mountain District bear/human conflicts management plan: Waterton Lakes National Park. Prepared by the Mountain District Warden Service. 31 pp + app.

11.0 PERSONAL COMMUNICATIONS [19]

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[19] Asterisk indicates title and affiliation as of time of publication, rather than at time of communication.

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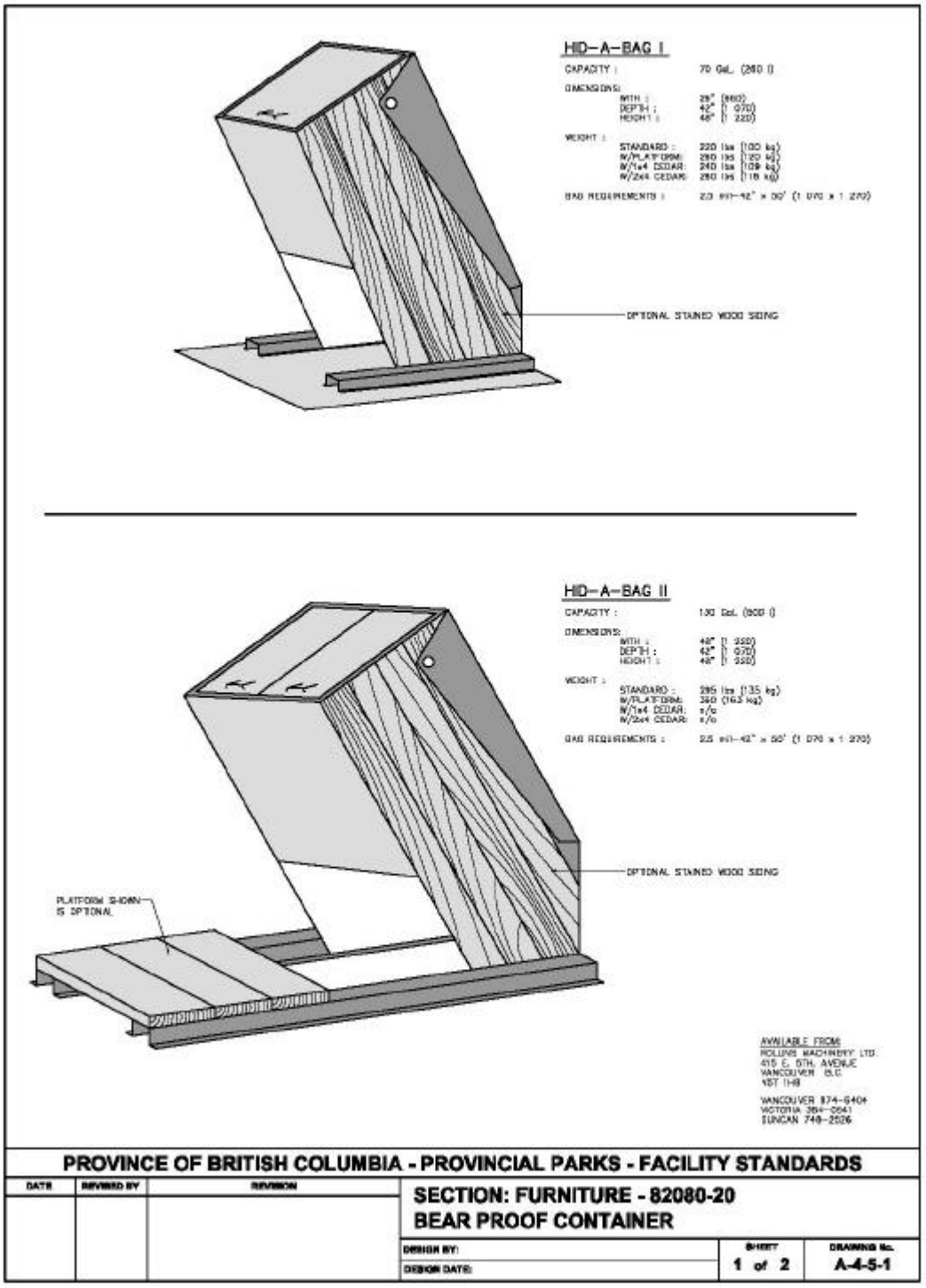
A. Zuliani, Park Ranger, Denali National Park, Alaska

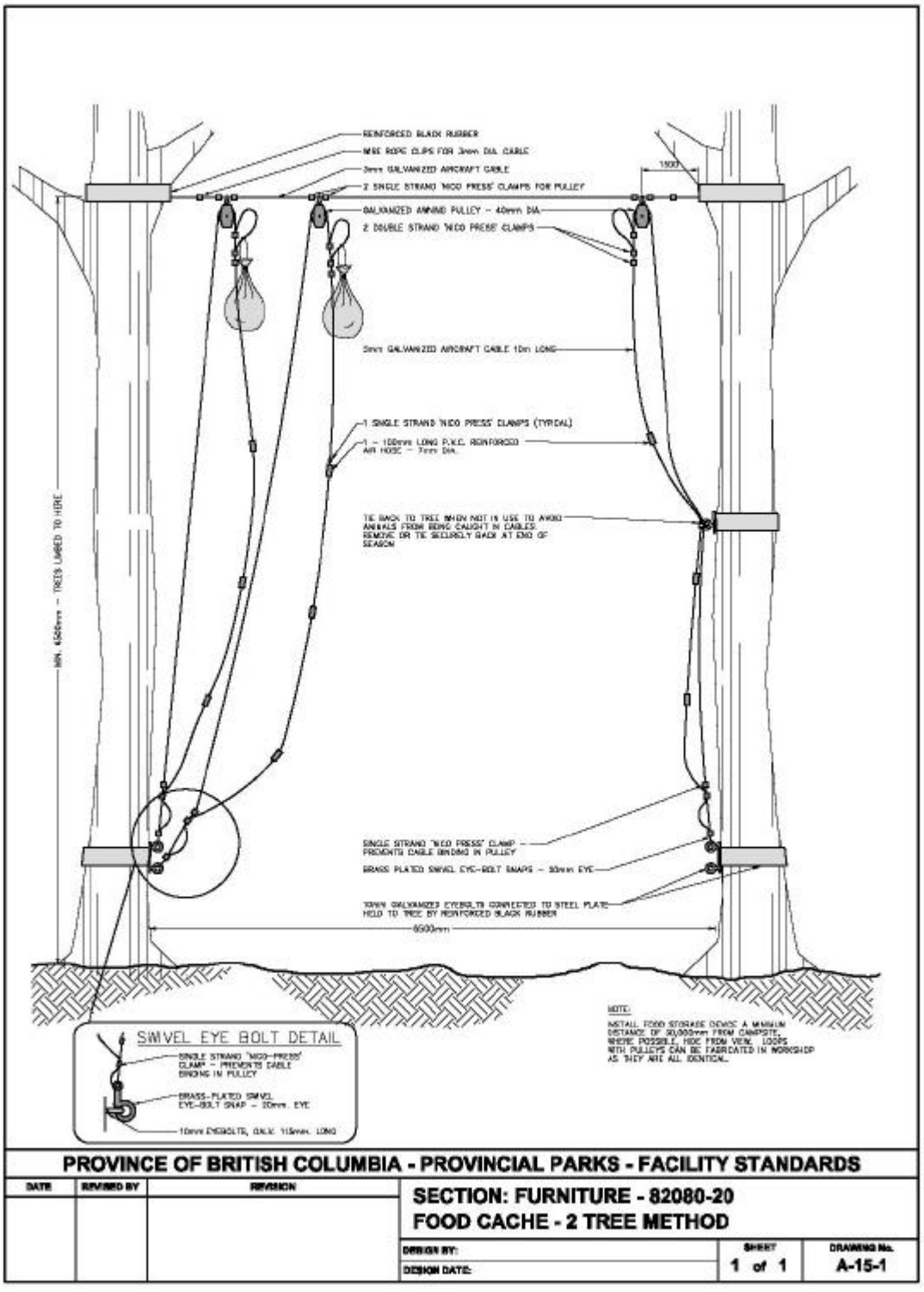
APPENDIX 1 Glossary

Aggressive behaviour	Defensive: Defensive aggression is usually provoked and results in the bear swatting, charging, etc. when approached too closely. Offensive: Offensive aggression is usually initiated by the bear as attempted predation, tearing tents without food attractants, etc.
Aversive Conditioning	A technique used to modify an animal's behaviour, causing it to cease undesirable activities, through the delivery of unpleasant stimuli. Application of a learning process in which an animal learns to avoid an object or area following a painful, unpleasant or threatening consequence (i.e., negative reinforcement; the goal is to have the negative reinforcement lead to subsequent avoidance of the associated food, place or event.
Conditioning	Conditioning is a simple form of learning, involving repeated exposure to a similar situation that benefits or threatens the well-being of the animal.
Food-conditioned Bear	A food-conditioned bear is attracted to human food or garbage (non-natural foods) as a result of food rewards. A food-conditioned bear soon learns to associate human presence with food availability.
Habituation	Habituation is defined as the reduction in the frequency or level of response following repeated exposure to an inconsequential (neutral) stimulus. Habituation to people by bears is a learning process manifested by a lack of, or decline in, fleeing response by bears to people.
Non-natural Foods	Foods of human origin and not naturally in a bear's diet.
"Problem Bear"	Any bear judged by its actions to be a threat to human safety or liable to cause property damage.
Protected Area	Protected areas under jurisdiction of the provincial government and referred to in this report include Class A, B and C provincial parks, Ecological Reserves, Recreation Areas and Protected Areas. These areas are designated under the *Parks Act*, the *Ecological Reserve Act*, the *Protected Areas of British Columbia Act* or the *Environment and Land Use Act*. Other protected areas under provincial jurisdiction, such as Wildlife Management Areas designated under the *Wildlife Act of British Columbia*, conservation lands, covenants, and Environment and Land Use Committee lands are not included in the term "protected area" for purposes of this report.

APPENDIX 2

Bear-proof garbage and food container designs.



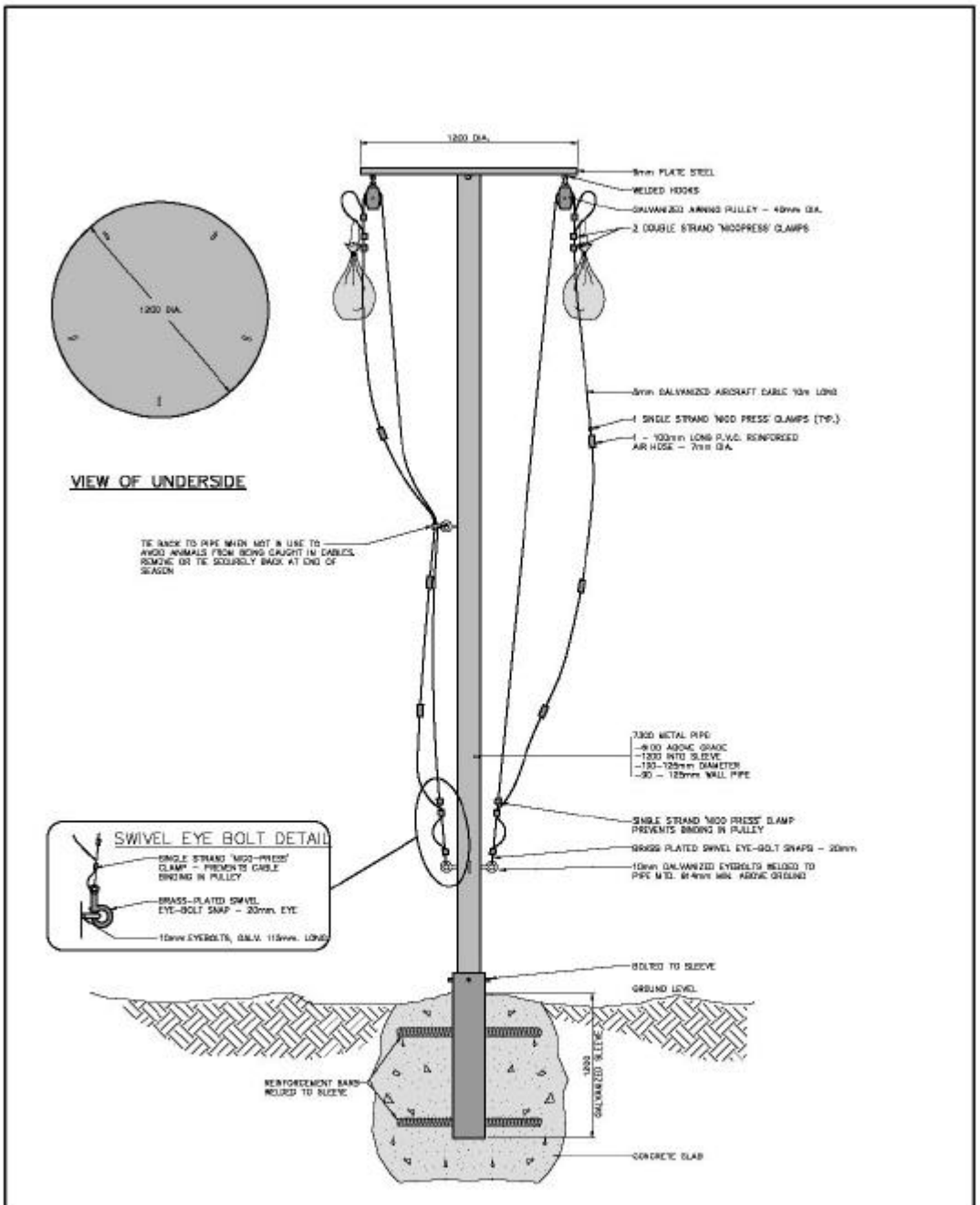


PROVINCE OF BRITISH COLUMBIA - PROVINCIAL PARKS - FACILITY STANDARDS

DATE	REVISED BY	REVISION

SECTION: FURNITURE - 82080-20
FOOD CACHE - 2 TREE METHOD

DESIGN BY:	SHEET	DRAWING No.
DESIGN DATE:	1 of 1	A-15-1



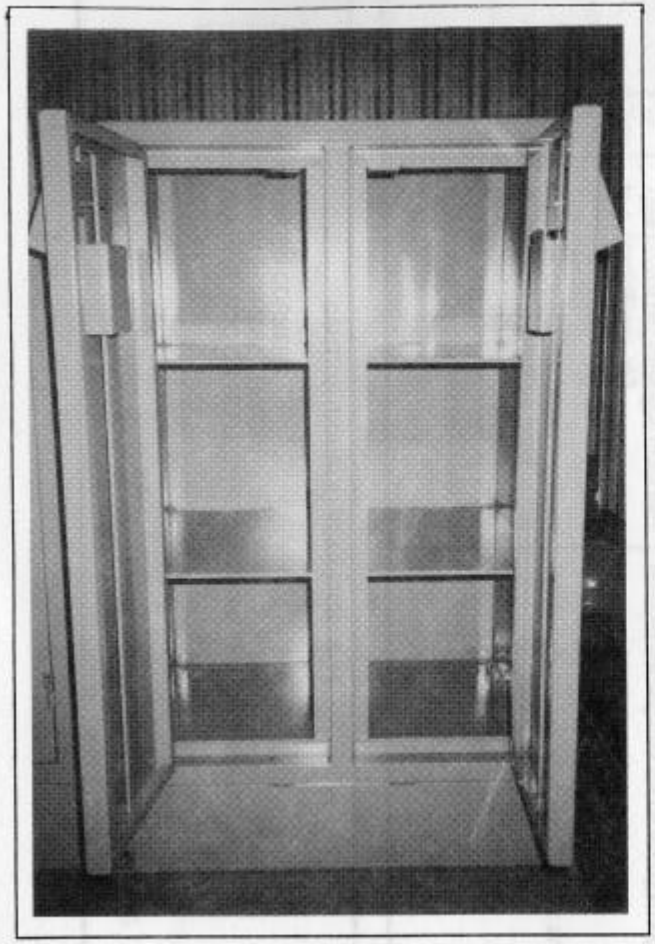
PROVINCE OF BRITISH COLUMBIA - PROVINCIAL PARKS - FACILITY STANDARDS

DATE	REVISED BY	REVISION

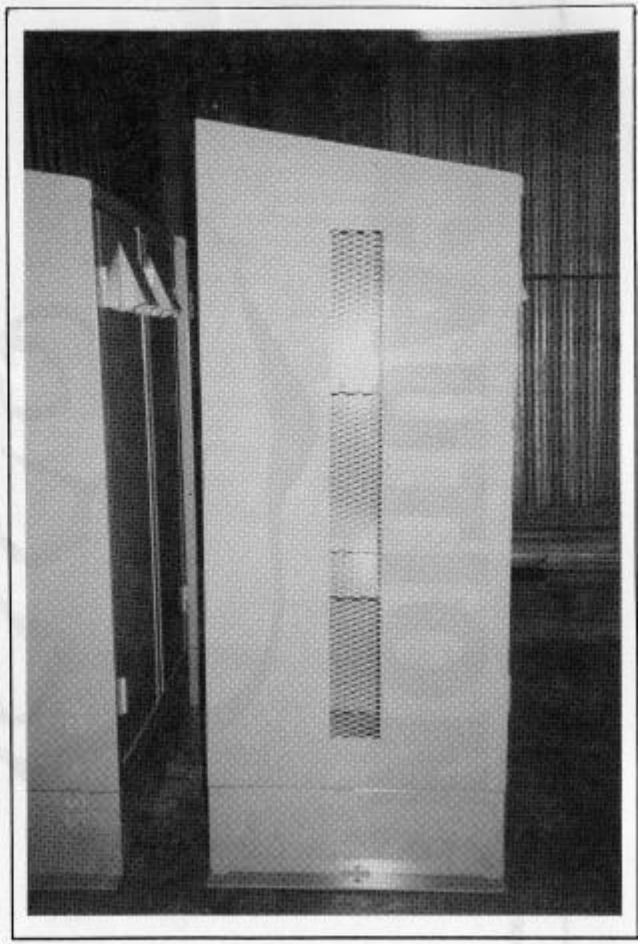
SECTION: FURNITURE - 82080-20
FOOD CACHE - STEEL BAR METHOD

DESIGN BY:	SHEET	DRAWING No.
DESIGN DATE:	1 of 1	A-15-2

FOOD CACHE
BEAR PROOF - RODENT PROOF METAL BOX - APPROX. COST $800.00



FRONT VIEW
32" WIDE X 48" HIGH

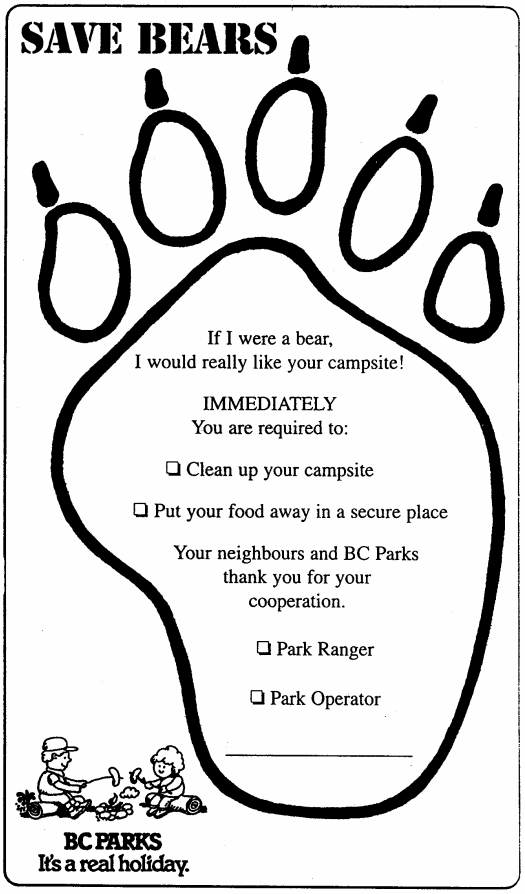


SIDE VIEW
24" DEEP 14 GA. FLAT STEEL

APPENDIX 3

"Warning: Garbage Kills Bears" sign used in protected areas in British Columbia to discourage visitors from putting garbage into outhouse toilets.

APPENDIX 4: Information Pamphlet (double-sided) for Unattended Campsites needing Cleanup of Bear Attractants



INFORMATION

BC Parks

BE BEAR AWARE

Please don't be an accessory to the death of a bear or another human being: Follow these important Park Rules.

1. Cook and eat away from your tent.
2. Always keep children nearby and in sight.
3. Hike as a group, make noise and watch for evidence of bears.
4. Stay clear of dead animals.
5. Reduce odours that attract bears (smelly foods/fish/perfumes).
6. Always inform Parks' staff of any bear sightings.

THE FOLLOWING ACTIONS WILL RESULT IN A TICKET AND POSSIBLE EVICTION FROM THE PARK.

1. Feeding bears or other wildlife.
2. Food items not stored in a secure place, ie. vehicle or provided facilities (food cache).
3. Leaving cooking utensils, coolers, grease or dish water lying around. Improper disposal of grey water.
4. Improper handling of garbage - use containers provided or pack it out.
5. Pets not on a leash (maximum length 6').

For more information on bears contact your local Parks office. Remember bears are not living stuffed animals, nor are they "*gentle bears*", they are wild and dangerous.

Thank you for your cooperation
BC Parks

APPENDIX 5

Bear Observation Cards used to record bear observation data in protected areas in British Columbia.

BEAR OBSERVATION CARD

B 0001

Return to: Local BC Parks Office

YY/MM/DD | Time (24 hrs) | District | Name of Protected Area

Observer Name, Address and Phone Number: _____

Location in protected area (i.e., name of campground, campsite, dayuse area, trail name, lake, stream, nearest geographic feature, etc.)_____

Elevation (metres or feet) | Observer Distance (metres or feet)

U.T.M. Zone | Easting or Longitude | Northing or Latitude

Weather: Rain, Overcast, Cloudy, Clear **Map Datum:** NAD27 ☐ NAD83 ☐ GPS ☐

Bear Species: Grizzly bear Black bear Unknown **ID Confidence:** High Medium Low

Colour code: Reddish-brown, Black, Grey, Dark brown, Light brown, Blond, Other:_____

Distinguishing features (tag, collar, scars): _____

Abundance: Common, Frequent, Occasional, Rare

Observation Type: sighting, track, scat, digging, hair, foraging sign, rub tree, bed, den

Number Observed:

Adult male ☐ Adult fem. ☐ Young of yr. ☐ Sub-Adult ☐ Unclas-sified ☐

Was the bear aware of your presence? Yes No N/A

Food association: none odour unattended garbage vehicle cache

Bear(s) activity: a) feeding b) hunting c) fishing d) scavenging e) drinking f) travelling g) bedded h) courtship/mating i) playing j) call k) fighting Other :_____

Reaction: a) indifferent b) flee c) curious d) food seeking e) illegally fed f) threatening g) charge h) rut i) fight j) play k) travel Other:_____

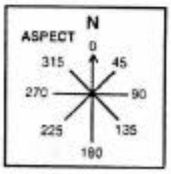
Estimated level of habituation: a) sighting or sign b) normal behaviour - avoids people c) reacts defensively after surprise or provocation d) tolerates but ignores people e) shows repeated interest in people f) habituated to people and their food g) displays aggressive behaviour, threat to humans h) unknown

Repeat offender: Yes No

If yes, provide background information (i.e., complaint/occurrence report) _____

Photographs: Yes No

Aspect Diagram



Notes: _____

Slope ____%

N.B. Ensure complaint / occurrence report and BC problem wildlife form (if required) are completed, if there was property damage or if further action required in dealing with bear sighting, i.e., destroy, relocation or aversive conditioning.

FM 602

APPENDIX 6

"Caution BEAR" sign used in protected areas in British Columbia to alert visitors to a bear in the area.

Priority	$	For Information	Comments
OP-1	Dist or Reg	**To Order** Mail (do not fax) catalogue order form to A. MacGillivray, HQ. **Questions re: design and use** Call your Regional Operations Officer **Questions re: stock on hand, additional orders and distribution** Call the H.Q. Information Coordinator 387-4609.	New sign in 1993, if there is a known bear problem wording may not be strong enough. See E-25 for PMT. Provincially co-ordinated signs use this art.

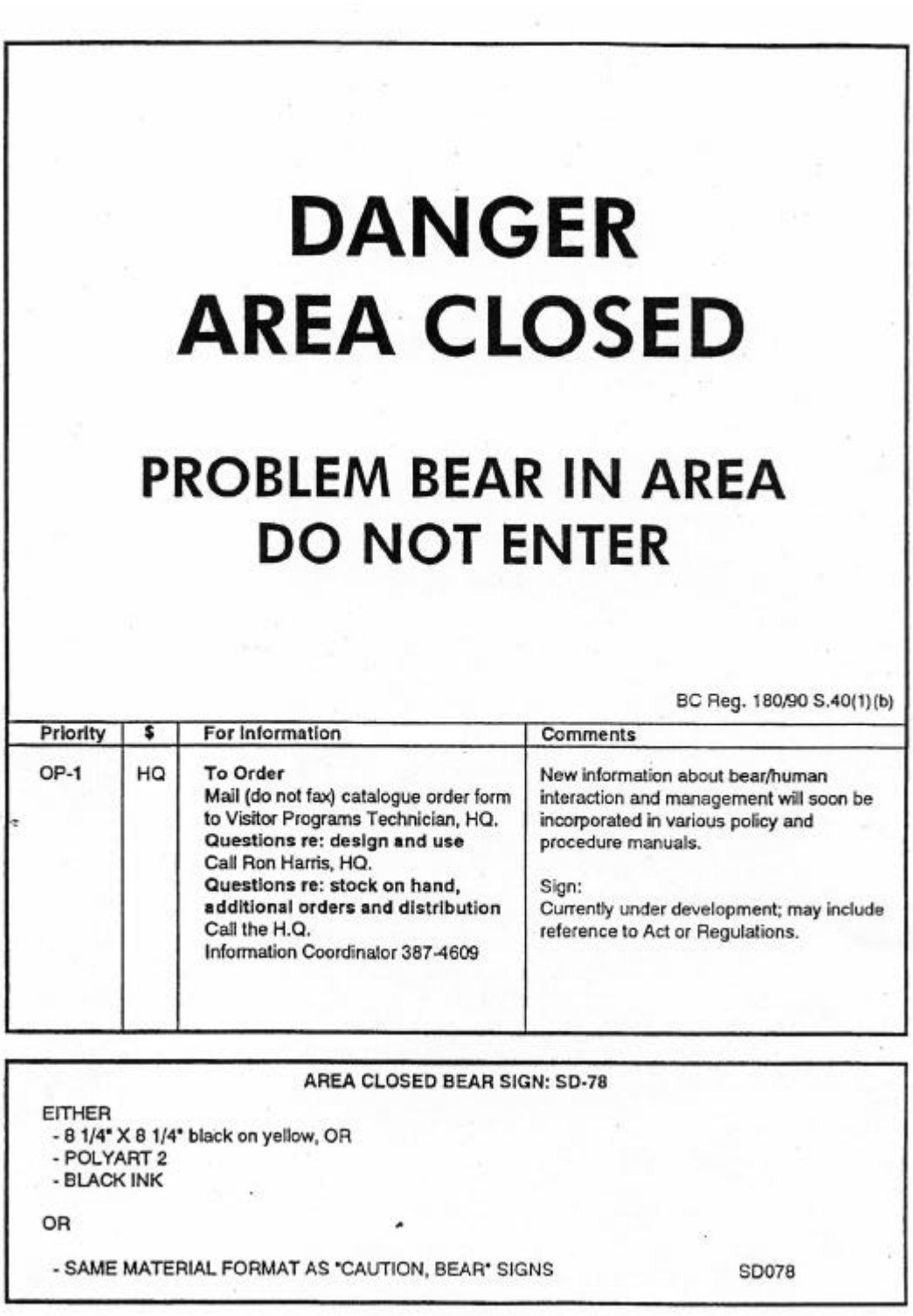
CAUTION (DOUBLE) BEAR SIGN: S-15

- 8 1/4" x 8 1/4", ROUNDED CORNERS
- SCREENED ALUMINUM (H38-5052 TEMPER)
- ONE SCREEN COLOUR (BLACK) ON REFLECTIVE "CAUTION" YELLOW (3M SCOTCH LITE YELLOW)

SNS15

APPENDIX 7

"Area Closed" sign used in protected areas in British Columbia to prohibit visitors from entering an area where bear danger is high.



DANGER
AREA CLOSED

PROBLEM BEAR IN AREA
DO NOT ENTER

BC Reg. 180/90 S.40(1)(b)

Priority	$	For Information	Comments
OP-1	HQ	**To Order** Mail (do not fax) catalogue order form to Visitor Programs Technician, HQ. **Questions re: design and use** Call Ron Harris, HQ. **Questions re: stock on hand, additional orders and distribution** Call the H.Q. Information Coordinator 387-4609	New information about bear/human interaction and management will soon be incorporated in various policy and procedure manuals. Sign: Currently under development; may include reference to Act or Regulations.

AREA CLOSED BEAR SIGN: SD-78

EITHER
- 8 1/4" X 8 1/4" black on yellow, OR
- POLYART 2
- BLACK INK

OR

- SAME MATERIAL FORMAT AS "CAUTION, BEAR" SIGNS

SD078

APPENDIX 8

Wildlife Capture Data Forms used in protected areas in British Columbia to document capture activities and bear data.

Based on Langelier, K. 1993. Wildlife Chemical Immobilization. Manual prepared for Ministry of Environment, Lands and Parks. 97 pp.

WILDLIFE CAPTURE DATA FORM

Case#: _____ Date (d/m/y): _____ First Capture: _____ Recapture: _____

Team Leader: _____ Assistant(s): _____

Location: _____ Weather: Wind, Temp: _____

Species: _____ Sex: _____ Weight: _____ (kg/lbs) (Estimate/Actual)

Description: _____

Capture Method: Live Trap: ____ Snare: ____ Leg-hold Trap: ____ Drugged: ____ Other: _____

IMMOBILIZATION: Range: _____ m

Drug #1: Type: _____ Conc.: _____ mg/cc Vial #: ____
Drug #2: Type: _____ Conc.: _____ mg/cc Vial #: ____

Dosage:#1 Weight ____ kg(lb) X ____mg/kg(lb) X 1cc/__mg = ____cc
Dosage:#2 Weight ____ kg(lb) X ____mg/kg(lb) X 1cc/__mg = ____cc
Total Volume in Dart: _____ cc Needle Length: 1" 1-1/8" 1-1/2" 2"

Dart # 1: Dosage _____mg Hit Miss Injection Site: _____
Dart # 2: Dosage _____mg Hit Miss Injection Site: _____
Dart # 3: Dosage _____mg Hit Miss Injection Site: _____
Dart # 4: Dosage _____mg Hit Miss Injection Site: _____

Antibiotics: _____ Anthelmintics: _____
Vitamins: _____ Other Injections: _____

Samples: Tooth: ____ Blood: ____ Fecal: ____ Parasites: ____
Other: _____

MARKING:
Tag #: _____ Type: _____ Colour: _____ Location: _____
Tag #: _____ Type: _____ Colour: _____ Location: _____
Collar Freq: _____ Type: _____ Colour: _____
Other Marking Methods: _____

DISPOSITION: Released _____ Transferred _____ Killed: _____
Location: Region/site _____
Date/Time: _____ Method: _____

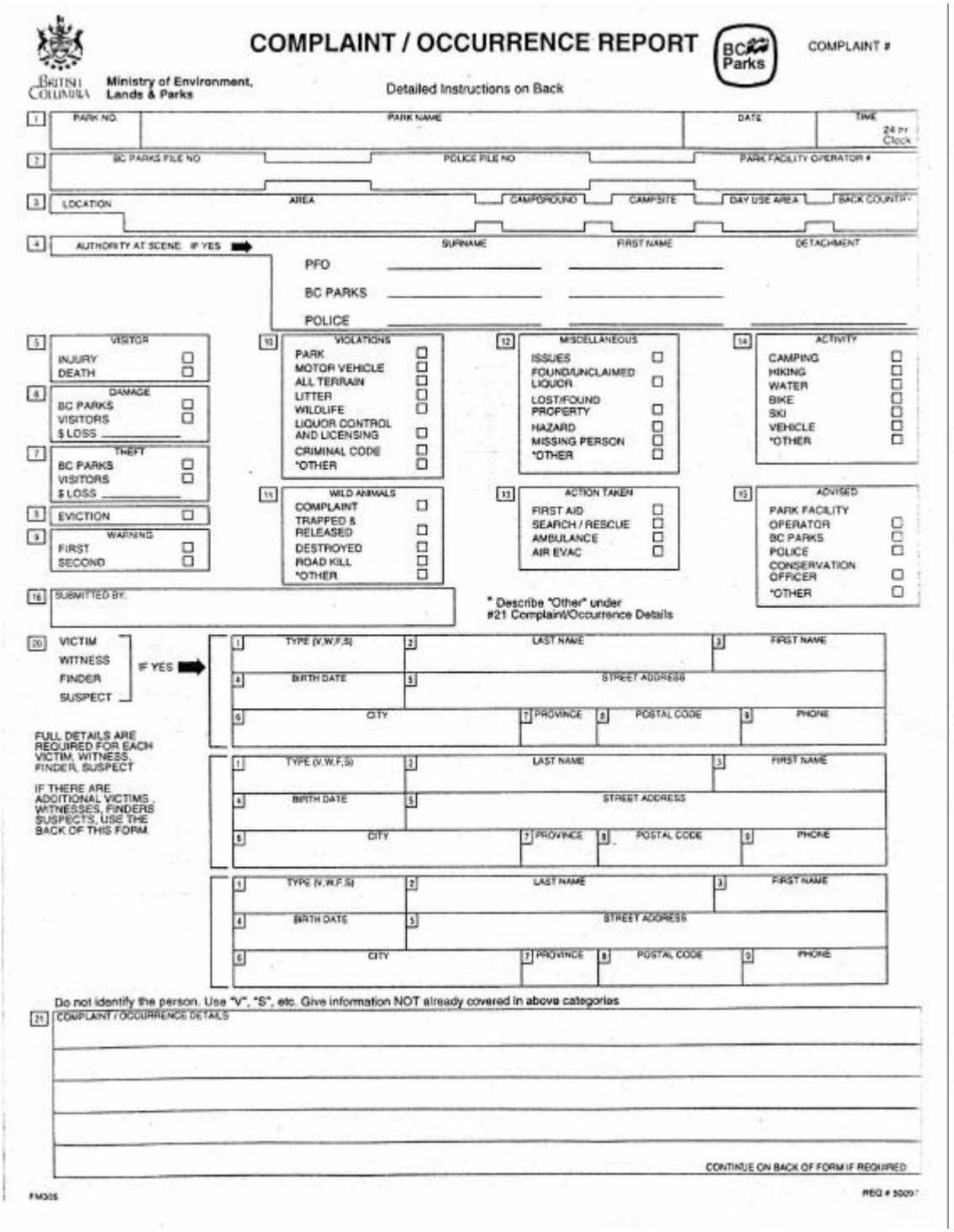
Monitoring:

Injection time: _____:_____
Sedation: _____:_____
Immobilization: _____:_____
Begin Handling: _____:_____
End Handling: _____:_____
Reversal: _____:_____
Type: _____
Dosage:____ mg
Site: _____
Head up: _____:_____
Standing up: _____:_____
Fully Recovered _____:_____

Time	Resp.	Pulse	Temp.

APPENDIX 9

Complaint /Occurrence Reports used in protected areas in British Columbia to document bear sightings, bear-people interactions and management actions (e.g., area closures, aversive conditioning, translocation, destruction) involving "problem bears".



COMPLAINT / OCCURRENCE REPORT

BC Parks

COMPLAINT #

BRITISH COLUMBIA Ministry of Environment, Lands & Parks

Detailed Instructions on Back

1 PARK NO. | PARK NAME | DATE | TIME (24 hr Clock)

2 BC PARKS FILE NO | POLICE FILE NO | PARK FACILITY OPERATOR #

3 LOCATION — AREA | CAMPGROUND | CAMPSITE | DAY USE AREA | BACK COUNTRY

4 AUTHORITY AT SCENE IF YES ➡ SURNAME | FIRST NAME | DETACHMENT

PFO

BC PARKS

POLICE

5 VISITOR
- INJURY ☐
- DEATH ☐

6 DAMAGE
- BC PARKS ☐
- VISITORS ☐
- $ LOSS _____

7 THEFT
- BC PARKS ☐
- VISITORS ☐
- $ LOSS _____

8 EVICTION ☐

9 WARNING
- FIRST ☐
- SECOND ☐

10 VIOLATIONS
- PARK ☐
- MOTOR VEHICLE ☐
- ALL TERRAIN ☐
- LITTER ☐
- WILDLIFE ☐
- LIQUOR CONTROL AND LICENSING ☐
- CRIMINAL CODE ☐
- *OTHER ☐

11 WILD ANIMALS
- COMPLAINT ☐
- TRAPPED & RELEASED ☐
- DESTROYED ☐
- ROAD KILL ☐
- *OTHER ☐

12 MISCELLANEOUS
- ISSUES ☐
- FOUND/UNCLAIMED LIQUOR ☐
- LOST/FOUND PROPERTY ☐
- HAZARD ☐
- MISSING PERSON ☐
- *OTHER ☐

13 ACTION TAKEN
- FIRST AID ☐
- SEARCH / RESCUE ☐
- AMBULANCE ☐
- AIR EVAC ☐

14 ACTIVITY
- CAMPING ☐
- HIKING ☐
- WATER ☐
- BIKE ☐
- SKI ☐
- VEHICLE ☐
- *OTHER ☐

15 ADVISED
- PARK FACILITY OPERATOR ☐
- BC PARKS ☐
- POLICE ☐
- CONSERVATION OFFICER ☐
- *OTHER ☐

16 SUBMITTED BY:

* Describe "Other" under #21 Complaint/Occurrence Details

20 VICTIM / WITNESS / FINDER / SUSPECT — IF YES ➡

1 TYPE (V,W,F,S) | 2 LAST NAME | 3 FIRST NAME
4 BIRTH DATE | 5 STREET ADDRESS
6 CITY | 7 PROVINCE | 8 POSTAL CODE | 9 PHONE

FULL DETAILS ARE REQUIRED FOR EACH VICTIM, WITNESS, FINDER, SUSPECT

IF THERE ARE ADDITIONAL VICTIMS, WITNESSES, FINDERS SUSPECTS, USE THE BACK OF THIS FORM.

1 TYPE (V,W,F,S) | 2 LAST NAME | 3 FIRST NAME
4 BIRTH DATE | 5 STREET ADDRESS
6 CITY | 7 PROVINCE | 8 POSTAL CODE | 9 PHONE

1 TYPE (V,W,F,S) | 2 LAST NAME | 3 FIRST NAME
4 BIRTH DATE | 5 STREET ADDRESS
6 CITY | 7 PROVINCE | 8 POSTAL CODE | 9 PHONE

Do not identify the person. Use "V", "S", etc. Give information NOT already covered in above categories

21 COMPLAINT / OCCURRENCE DETAILS

CONTINUE ON BACK OF FORM IF REQUIRED

FM305

REQ # 5009

COMPLAINT/OCCURRENCE REPORT

- This form can be used for any incident but must be completed for ALL INCIDENTS listed below. Fill in ALL APPLICABLE sections of this form.
- Notify the district office and HQ IMMEDIATELY for any SERIOUS incidents.

  (E.G. – Serious injury to a park visitor requiring medical aid, death of a visitor, major theft or damage in a park; and aboriginal issues.)

A complaint/occurrence report is required for the following incidents:

1. **Injury** to park visitor requiring medical aid
2. **Death** to a park visitor from any cause
3. **Theft** of park property
4. **Theft** from facility operator
5. **Theft** from park visitor
6. **Damage** to park property (vandalism)
7. **Damage** to visitor property
8. **Police** called to assist for any occurrence
9. **Hazard** reported or observed

*10. **Wild animals** (eg. bears, cougars, coyotes)

11. **Charge** instigated by facility operator
12. **Lost or Found** property
13. **Found or Unclaimed Liquor**
14. **Missing Person**
15. **Issues**
16. Any incident that may have a potential for legal action.

* For wild animal complaints, check to see if a conservation officer is to be advised.

20 VICTIM / WITNESS / FINDER / SUSPECT — IF YES ➡

1 TYPE (V,W,F,S)	2 LAST NAME			3 FIRST NAME
4 BIRTH DATE	5 STREET ADDRESS			
6 CITY	7 PROVINCE	8 POSTAL CODE		9 PHONE

1 TYPE (V,W,F,S)	2 LAST NAME			3 FIRST NAME
4 BIRTH DATE	5 STREET ADDRESS			
6 CITY	7 PROVINCE	8 POSTAL CODE		9 PHONE

1 TYPE (V,W,F,S)	2 LAST NAME			3 FIRST NAME
4 BIRTH DATE	5 STREET ADDRESS			
6 CITY	7 PROVINCE	8 POSTAL CODE		9 PHONE

Do not identify the person. Use "V", "S", etc. Give information NOT already covered in above categories

21 COMPLAINT / OCCURRENCE DETAILS CONT'D

APPENDIX 10: Animal/Human Attack Report forms required to document details and evidence of an injurious or fatal bear-people interaction in British Columbia (MELP Enforcement Program [MWLAP, Planning, Innovation and Enforcement Division, Enforcement Program] revised June 2001).

ANIMAL/HUMAN ATTACK REPORT

The purpose of the Animal/Human Attack Report is to ensure that for every attack or contact by a predator (i.e. minor to fatal) the assigned officers:

1 collect all necessary attack information and site evidence;
2 describe the offending animal;
3 conduct a debriefing; and
4 compile all necessary information and place it on file.

The format of the report instructs the assigned officer of the sequential steps to be taken and the information to be documented, collected and processed. The report contains six forms.

FORM 1	Attack Summary
FORM 2	Site Inspection
FORM 3	Victim Evidence
FORM 4	Animal Evidence
FORM 5A	Transport - Animal Necropsy
FORM 5B	Laboratory Report - Animal Necropsy

The team leader is responsible for investigation, evidence collection, and completion and processing of the forms making up the Animal/Human Attack Report.

NOTE: DOCUMENTATION OF THIS INFORMATION IS CRUCIAL TO MINISTRY AND POLICE INVESTIGATIONS.

ANIMAL/HUMAN ATTACK REPORT

FORM 1
ATTACK SUMMARY

1. Occurrence Report #: _____
2. Compulsory Inspection #: _____
3. Lead investigating conservation officer:
   Phone: _____ District: _____ Region: _____
   Address: _____
4. Assisting conservation officer: _____
   Phone: _____ District: _____ Region: _____
   Address: _____
5. Assisting conservation officer: _____
   Phone: _____ District: _____ Region: _____
   Address: _____
6. Media contact person: _____ Phone: _____
7. Police contact name: _____
   Phone: _____ Detachment: _____
   Address: _____
8. Other agency contacts:
   Name: _____ Agency: _____
   Address: _____ Phone: _____
   Name: _____ Agency: _____
   Address: _____ Phone: _____
   Name: _____ Agency: _____
   Address: _____ Phone: _____

9. Location of attack: _____
10. Attack date: _____ Attack time: (24 hr): _____
11. Field investigation date(s): _____ Times: _____ to _____
    Times: _____ to _____
12. Species: Grizzly bear Black bear Cougar Other: _____
13. Management action: No action Relocate Destroy Other: _____
    Date: _____
14. Attack summary: **(NO INTERPRETATION. FACTS ONLY. INCLUDE DATES AND HISTORY OF PROBLEM)**

    _____

FORM 1
ATTACK SUMMARY

1. Debriefing:
The lead investigating officer, wildlife control officer, senior conservation officer and /or Regional Enforcement Manager and the regional public affairs co-ordinator met for a debriefing on:
Date: Place:

ANIMAL/HUMAN ATTACK REPORT

FORM 2
SITE INSPECTION FORM
(completed by Site Investigation Conservation Officer)

Investigating conservation officer: _____
Phone: _____ District: _____ Region: _____
Address: _____

THE FOLLOWING SEQUENTIAL STEPS MUST BE TAKEN:

1. Secure attack site with investigation scene tape. Use caution normally exercised at crime scene investigation.
2. Ensure that only authorized personnel are present.
3. Describe tracks present:
   (a) animal: _____ length (mm): _____ width (mm): _____
   animal: _____ length (mm): _____ Width (mm): _____
   animal: _____ length (mm): _____ Width (mm): _____
   (b) human: _____ length (mm): _____ Width (mm): _____
   human: _____ length (mm): _____ Width (mm): _____
   Human: _____ length (mm): _____ Width (mm): _____
   Use the track diagram on the next page to indicate measurements of tracks found at the attack site. Identify the species and portion of track that was measured (e.g. pad only, pad and toe, pad, toe and claws, etc.).
4. Describe presence and location of animal hair/tis sue/blood/feces: _____
5. Collect and label animal hair/tissue/blood/feces, in sealed plastic bags.
   Label identification nos.: _____
6. Describe and list attack victim's equipment, clothing, etc.: _____
7. Describe and attach photographs of attack scene (develop duplicates):
   - no. of photographs: _____
   - scene location: _____
   - animal tracks: _____
   - human tracks: _____
   - articles:
   - tissue/blood/feces: _____
   - debris: _____
   - summary: _____
8. Draw sketch of attack scene and tracks (attached page).

ANIMAL/HUMAN ATTACK REPORT

FORM 2
SITE INSPECTION FORM

Black Bear Tracks – The prints of the black bear are distinguished by toes that are splayed in a more rounded arc. Indicate on the diagram the exact measurement of track found at the site by showing which portion of the track was measured (i.e. pad only, pad and toe, pad, toe and claws).

Grizzly Bear Tracks - The prints of the grizzly bear are distinguished by an oval pad with closely spaced toes in a relatively straight toe arc. Clawmarks over twice as long as the toe pads are usually evident. In general, but not always, grizzly bear tracks are larger than black bear. Indicate on the diagram the exact measurement of track found at the site by showing which portion of the track was measured (i.e. pad only, pad and toe, pad, toe and claws).

BEAR TRACKS

FRONT

HIND

COUGAR TRACKS

FRONT

Cougar Track - The prints of cougar rarely show evidence of the claw. The front feet are larger than the rear and generally the toes spread wider with speed. A distinctive feature of this creature in snowy areas is tail marks on the snow. Indicate on the diagram the exact measurement of track found at the site by showing which portion of the track was measured (i.e. pad only, pad and toe, pad, toe and claws).

HIND

FORM 2
SITE INSPECTION FORM

Sketch of Attack Scene

Include path of animal(s), location/movement of people, key features, compass reading and distances.

ANIMAL/HUMAN ATTACK REPORT

FORM 3
VICTIM EVIDENCE

(attach information if required)

Investigating conservation officer:
Phone: _____ District: _____ Region: _____
Address: _____
1. No. of humans involved: _____ No. of humans injured: _____

2. (a) Victim's name: _____
Address: _____
Phone: _____ Age: _____
(b) Victim's name: _____
Address: _____
Phone: _____ Age: _____
(c) Victim's name: _____
Address: _____
Phone: _____ Age: _____

3. (a) Witness' name: _____
Address: _____
Phone: _____ Age: _____
(b) Witness' name: _____
Address: _____
Phone: _____ Age: _____
(c) Witness' name: _____
Address: _____
Phone: Age:

4. Summarize victim 2(a)'s activity before the attack (attach statement): _____
Summarize victim 2(b)'s activity before the attack (attach statement): _____
Summarize victim 2(c)'s activity before the attack (attach statement): _____

ANIMAL/HUMAN ATTACK REPORT

FORM 3
VICTIM EVIDENCE

5. Summarize victim 2(a)'s account of attack (attach statement): _____
   Summarize victim 2(b)'s account of attack (attach statement): _____
   Summarize victim 2(c)'s account of attack (attach statement): _____

6. Summarize witness 3(a)'s account of attack (attach statement): _____
   Summarize witness 3(b)'s account of attack (attach statement): _____
   Summarize witness 3(c)'s account of attack (attach statement): _____

7. Collect the following injury information from the attending physician(s):
   Claw injury: Yes _____ No _____ Teeth injury: Yes _____ No _____
   Wound measurement and locations - victim (a): ___
   Wound measurement and locations - victim (b): ___
   Wound measurement and locations - victim (c): ___
   Number of wound pictures attached - victim (a): ___
   Number of wound pictures attached - victim (b): ___
   Number of wound pictures attached - victim (c): ___
   Physician's name(s): _____
   Address(es): _____
   Phone number(s): _____
   Collect and preserve victim tissue sample. Label Identification Nos.: _____
   Collect samples from under victim's fingernails. Label Identification Nos.: _____
   Collect saliva sample from victim's bite marks. Label Identification Nos.: _____

8. Comments: _____

ANIMAL/HUMAN ATTACK REPORT

FORM 3
VICTIM EVIDENCE

9. Name of lab analysing tissue, fingernail, saliva, etc. samples: _____
Purpose of analysis: _____
Lab analyst's name: _____
Address:
Phone: _____

Purpose of analysis: _____
Lab analyst's name: _____
Address: _____
Phone: _____

Purpose of analysis: _____
Lab analyst's name: _____
Address: _____
Phone: _____

10. (a) Next of kin of Victim 2 (a): _____
Address: _____
Phone: _____ Relationship: _____
Date contacted: _____ Contacted by: _____
(b) Next of kin of Victim 2 (b): _____
Address: _____
Phone: _____ Relationship: _____
Date contacted: _____ Contacted by: _____
(c) Next of kin of Victim 2 (c): _____
Address: _____
Phone: Relationship:
Date contacted: _____ Contacted by: _____

11. Where possible, attach a copy of any additional/further report (such as Coroner's Autopsy report) or treatment information/documentation (such as the report of the attending physician or emergency medical treatment). Identify the attached documentation here: _____

ANIMAL/HUMAN ATTACK REPORT

FORM 4
ANIMAL EVIDENCE

To preserve evidence, immediately place plastic bags on head and paws, before moving animal from kill site. (Avoid shooting offending animal in head or abdomen to preserve samples for lab analysis. Shoot in neck or throat.)

Investigating conservation officer: _____
Phone: District: Region:
Address: _____
1. Offending species: _____ Sex: _____ Presence of young? _____
Estimated age: _____
2. Offending animal behaviour before, during and after attack: _____
3. Was offending animal behaviour consistent with:
- offensive/predatory reaction: Yes _____ No _____
- defensive reaction: Yes _____ No _____
- other, describe: _____
4. Did offending animal have complaint history? Yes _____ No _____
Xfile reference no.: _____ Comments: _____
_____
5. Describe other animals directly involved: _____
6. Location of dead animal: _____
7. Animal photos: Body: _____ Head: _____ Paws: _____ Teeth: _____
8. Animal description (metric measurements):
Body length: _____ Tail length: _____ Girth: _____ Weight: _____
9. Teeth (refer to attached diagram) - **cover head with plastic bag**
- Ensure lab collects material attached to teeth.
- Ensure lab collects victim's DNA sample from gum line, along teeth.
- Upper inter canine distance: tip-to-tip _____ mm.; maximum _____ mm
- Lower inter canine distance: tip-to-tip _____ mm.; maximum _____ mm
- Upper inter-3rd incisor distance: tip-to-tip _____ mm.; maximum _____ mm
- Lower inter-3rd incisor distance: tip-to-tip mm.; maximum mm
- Teeth condition: sharp: _____ worn: _____ broken: _____ missing: _____
10. Paws - **cover paws with plastic bags**
- Collect material attached to paws. Identification tag no.: _____
- Claw condition: sharp: _____ worn: _____ broken: _____ missing: _____

FORM 4
ANIMAL EVIDENCE

11. Paw description - **cover paws with plastic bags**
    - left front paw, width measurement: _____mm
    - right front paw, width measurement: _____mm
    - left back paw, width measurement: _____mm
    - right back paw, width measurement: _____mm
    - describe abnormalities:

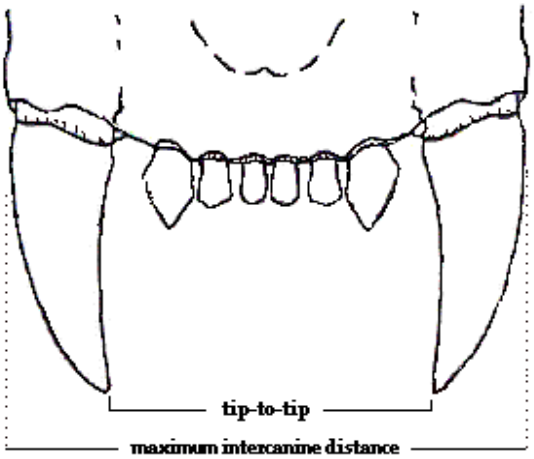
12. Hair samples. Identification tag no.: _____

13 Carcass. **Place plastic bags over head and paws and place carcass in plastic bag at kill site and in storage.**

FORM 4
ANIMAL EVIDENCE

INTERCANINE DISTANCE MEASUREMENTS:

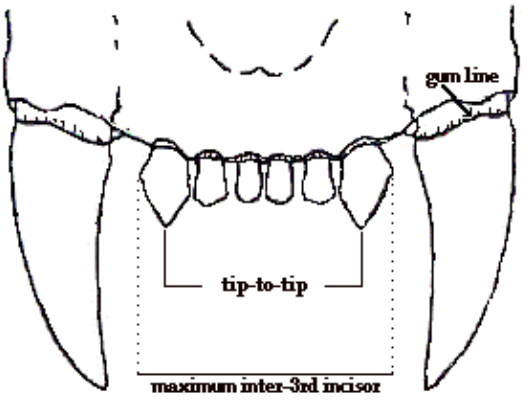
There are two measurements involved with the intercanine distance. This includes the tip-to-tip distance (distance from the tip of the upper right canine to the tip of the upper left canine). The second measurement is the maximum distance (measured from the point of greatest convexity on the lateral or outward surface of the right upper canine to the corresponding point on the outward surface of the upper left canine). The same measurements are made for the lower canine teeth.



Note: In the case of worn canines, measure from the centre of the tip.

INTER-3RD INCISOR DISTANCE MEASUREMENT:

Two measurements are made for the inter-incisor distance: tip-to-tip distance (measured from the tip of the upper right 3rd incisor to the tip of the upper left 3rd incisor) and the maximum inter-incisor distance (measured from the lateral or most outward edge of the upper right 3rd incisor to the lateral edge of the upper left 3rd incisor). The same measurements are made for the lower 3rd incisors.



ANIMAL/HUMAN ATTACK REPORT

FORM 5A
TRANSPORT – ANIMAL NECROPSY

Form 5A is to be completed by Investigating Conservation Officer and is attached to a blank Form 5B. Forms 5A and 5B accompany the animal/body parts to the lab.
NOTE: DIFFERENT LABS MAY BE USED FOR DIFFERENT ANALYSES.

Investigating conservation officer: _____
Phone: _____ District: _____ Region: _____
Address: _____

Police contact name: _____
Phone: _____ Address: _____
Detachment: _____

TRANSPORT ANIMAL WITH THE HEAD, PAWS AND BODY IN PLASTIC BAGS.
Species: _____
Date of capture: _____
Physical condition: _____
Wounds: _____
Injuries: _____

List samples and identification label numbers of body parts sent to lab:

Description	ID Label No.
1.	
2.	
3.	
4.	
5.	
6.	

Analysis instruction to lab as to parts and specimens to preserve and analysis to be conducted (e.g., identify stomach contents, collect tissue samples from teeth and claws, etc.). NOTE: ADDITIONAL TESTS COULD BE REQUIRED BY SEVERAL LABS. _____

ANIMAL/HUMAN ATTACK REPORT

FORM 5B
LABORATORY REPORT
ANIMAL NECROPSY

Laboratory name:_____
Address:_____
Phone number:
Date animal received:_____
File number:_____
Necropsy date:_____

EXTERNAL EXAM
Physical condition:_____
_____
Wounds:_____
_____

Plastic bags covering feet? Yes _____ No_____
Plastic bags covering head? Yes _____ No_____
Plastic bags covering carcass? Yes _____ No_____
Collected material attached? Yes _____ No_____
Claw condition: sharp:_____ worn:_____ broken:_____ missing:_____
Collected material attached? Yes ____ No_____
Hair:
Collected material attached? Yes ____ No_____
Carcass weight (metric):_____ Sex:_____
Nose to base of tail length (metric):_____
Photograph (on reverse side, not file # and date): Yes _____ No_____

FORM 5B
LABORATORY REPORT
ANIMAL NECROPSY

INTERNAL EXAM
Date:_____
Brain submitted for rabies analysis? Yes No

Circle "N" for normal or "A" for abnormal, then explain in "Findings".

Skin	N	A
Musculoskeletal system, skeletal muscles, bones	N	A
Oral cavity	N	A
Respiratory system - air passages, lungs	N	A
Circulatory system - heart, major vessels	N	A
Digestive tract - esophagus, stomach, intestines	N	A
Liver	N	A
Urogenital system - kidneys, bladder, gonads	N	A
Spleen	N	A
Lymph nodes	N	A
Adrenal gland and other glands	N	A
Nervous system	N	A
Other	N	A

Visible abnormalities:_____

If female, was she lactating? Yes No
Pregnant? Yes_____ No_____
Additional Analysis:_____

Collect animal hair for DNA analysis? Yes_____ No_____
Collect saliva for DNA analysis? Yes_____ No_____
Tissue collected:_____

FORM 5B
LABORATORY REPORT
ANIMAL NECROPSY

Collect animal hair for DNA analysis? Yes_____ No_____ Results (attach additional reports):_____

Findings:_____

Necropsy summary:_____

Veterinary Pathologist:
Name:_____
Signature:_____
Witness(es):_____ Date:_____