PROJECTS LIFE07NAT/GR/00291 & LIFE07NAT/IT/00502

ACTIONS C12 & C6: ESTABLISHMENT AND PILOT OPERATION OF A BEAR EMERGENCY TEAM (B.E.T)

FRAME, TASKS AND WORKING PROTOCOL

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CONTENTS

I. HABITUATED BEARS: (*Main literature source used: "Influence of human disturbance towards Brown Bears" – expert opinion based survey- Brown Bear research and Conservation group – Parco Naturale Adamello Brenta, 2007, 178pp.)*- **"Chapter 4": Bears habituation).**

A. Introduction:

Bears are highly intelligent, very adaptable, omnivore generalists, that readily learn from past experiences. Bears generally require large home ranges to obtain their daily, seasonal and annual nutritional needs.
However, in areas with abundant, high quality, calorically dense foods, bears can obtain all their daily needs in much smaller areas. Bears are highly evolved animals that have both genetic and culturally inherited or learned abilities to utilize resources within their home ranges and cope with environmental change (even human-caused changes) (Jonkel 1980 quoted by Gunther). Some bears are aggressive or bold, others shy and recluse.
Aggressive bears generally don't live long in areas with high densities of people, but are very successful in rugged, remote terrain, with low densities of people. Some bears will avoid areas of human disturbance completely, others will change diel activity patterns to avoid disturbance. Some bears will simply habituate to human disturbance.
The biggest factor that influences bears ability to cope with human disturbance is human-caused mortality. Since bears have low reproductive rates and generally have low population densities, they are very vulnerable to excessive human-caused mortality. If human-caused mortality is very low, bears can adapt to a high level of disturbance.
If human-caused mortality is high, it is unlikely that bears will be able to adapt to human disturbances because they will die before they can habituate. It is important to predetermine the consequences of land use impacts on bear habitat and work to mitigate the negative impacts through modifications in location and timing of human activities whenever possible, especially those practices that lead to excessive human-caused mortality (Jonkel 1980 quoted by Gunther).

B. Methodology used for the analysis

The evaluation of the level of disturbance that human activities cause on wildlife has been analysed in various contexts. At present, though, there lacks an overall methodology useful to quantify the entity of disturbance sources, both for the complex interactions between human activities and wildlife, and for the hard definition of indicators that can correctly represent such interactions.

More than that, from a review of existing bibliography about human activities influence on brown bear populations, it appears that literature about these issues is pretty scarce: also considering the great behavioural plasticity of brown bear, for the species it is not even available a widely accepted list of the activities or situations of human "origin" that can affect species conservation.
On the other hand, an estimation of anthropic impacts on the species appears critical, namely to give scientific support to decisional process referring to territorial management.

For this reason the Park decided to conduct a survey based on summary of qualified and scientifically accredited opinions (expert based opinions). Such an objective was realized compiling and distributing an appropriate questionnaire to bear experts: knowing their opinions and advice, supported by acquired experiences and eventually by some scientific researches, is thought to be of help to evaluate bear/human activities relationships.

In order to identify experts qualified to give advice on assessing and managing human impacts on brown bears, the Park asked assistance to the International Association for Bear Research and Management (IBA). After consulting with the Bear Specialist Group and its European brown bear team chairs, IBA's governing Council provided a list of top

European and North American biologists with expertise and practical experience in this field, to whom the Park submitted a questionnaire related to the possible effects caused on brown bears by structures (forestry roads, ski lift, etc.) and various activities (forestry cuts, off-the slopes skiing, etc.).
Among the identified experts, the following 8 have agreed to cooperate to the present project taking part to the work group:

1. Mike Gibeau (Canada - University di Calgary)
2. Kerry Gunther (USA - National Park Service U.S. Dept. of the Interior)
3. Djuro Huber (Croatia - University di Zagabria)
4. Jonna Katajisto (Finland – University di Helsinki)
5. Bruce McLellan (Canada - Ministry of Forest and Range- B.C. Government)
6. Yorgos Mertzanis (Greece – Callisto: Wildlife and Nature Conservation Society)
7. Chris Servheen (USA - University of Montana)
8. Jon Swenson (Norway - Norwegian University of Life Sciences)

The questionnaire submitted was realized following an accurate analysis of the existing bibliography and was subdivided in 5 thematic branches (for an overall of 39 questions):

- disturbance on bear: this section aimed at defining what could be detrimental for the species and at analysing the effects of disturbance on habitats and individuals;

- ideal and disturbed bear habitat: loss and fragmentation: the goal of this branch was to examine in detail causes of fragmentation and loss of bear

1.1 Can bears get habituated (i.e. become more tolerant) to any disturbance sources (including people)? If so, which are those disturbance sources?

Experts opinion summary Bear can get habituated to some disturbance sources: 8 out of 8. Disturbance sources to which bear can get habituated are: - long lasting, predictable, site related and innocuous disturbances: 7 out of 7.

In order to answer the questions of this section of the study, it is useful to remind certain principles and definitions applied in animal and further on, in bear behaviour (Mertzanis).

In animal behaviour, "habituation" is the third of the three major concepts of learning behaviour theory, the other two being: "conditioning" and "extinction" which have been experimentally evidenced after (Thorpe 1956, Scott 1958, Marler & Hamilton 1966, Hinde 1970 in McCullough 1982 quoted by Mertzanis).

"Conditioning" is learning involved in receiving a reward or punishment for a given response (behavioural act) to a given stimulus. The animal responds to the stimulus in a trial-and-error fashion: when the behaviour of interest is shown the animal is immediately either rewarded (typically by food) or punished. Therefore conditioning can be either positive or negative. After several repetitions the animal associates a reward or punishment with its behavioural response to the given stimulus and learns to repeat this behaviour if rewarded or (in the opposite) to avoid it if punished. Therefore the behavioural response "learning" is reinforced (Mertzanis).

"Extinction" is the waning of a conditioned response once the reward or punishment process is stopped (Mertzanis).

"Habituation" (a concept similar to "extinction") is the waning of a response (Mertzanis) usually of an animal's flight response (Jope 1985, Herrero et. al. 2005, Smith et al. 2005 quoted by Gunther), when a reward or punishment is discontinued (Mertzanis), that is when a bear is subject to repeated exposure to inconsequential stimulus (Jope 1985, Herrero et. al. 2005, Smith et al. 2005 quoted by Gunther) . It is not the learning or the formation of a "habit" as it sometimes appears in the wildlife literature (Mertzanis).

Typically **"habituation" is shown in loss of fear responses**. If the stimulus (i.e. food for bears) occurs repeatedly without subsequent punishment the fear response declines (McCullough 1982 quoted by Mertzanis). Therefore in areas where bears and people come into frequent, benign contact and there are few human-caused bear mortalities, bears will habituate to people, many human activities, roads, vehicles, machinery and buildings (Gunther).

Bears can habituate to any long lasting and regular source of disturbance (Nevin and Gilbert 2005 quoted by Katajisto), especially small disturbance (Katajisto). That is, bear may become tolerant to disturbances that are site related like traffic on roads, hiking on certain trails, or skiing on certain slopes (Huber). And it
habituates most quickly to predictable stimuli that have no real effect on the bear (innocuous) (McLellan).
Examples include people hiking along fixed trails where they often hike at the same times of days during the same season (McLellan), traffic on roads or skiing on certain slopes (Huber). This means that bear does not run away from such disturbances, but the presence of such source still means the loss and fragmentation of habitat (Huber).

Habituation is adaptive and reduces energy costs by reducing irrelevant behaviour (McCullough 1982, Smith et al. 2005 quoted by Gunther). It also allows bears to access and utilize habitat in areas with high levels of human activity (Gunther and Biel 1999, Herrero et al. 2005 quoted by Gunther). Habituation is most likely to occur in areas with

concentrated, high quality food resources where exposure to humans does not result in painful stimulus or death for the bear (Gunther).
Some of the aforementioned behavioural patterns have been applied to bear behaviour relative to humans (Egbert & Strokes 1976, Jonkel 1970, McArthur 1980, Stokes 1970 and others in McCullough 1982 quoted by Mertzanis). They can be summarised as follows (Mertzanis):

1. bears that detect human food resources and successfully obtain them will be positively conditioned by food reward (Mertzanis). Bears visiting in garbage sites is an obvious example of bear habituation (Katajisto), but there are also other similar attractive activities, especially food sources, that bear can habituate to (Gibeau et al. 2002, Mattson et al. 1992, Wilson et al. 2006 quoted by Katajisto). In fact, bears are seen to lose their fear of humans at food sources (garbage sites, salmon streams) (Swenson).

2. Because the stimuli involved in human-related foods are broad (i.e. human scent, human presence, human structures and equipments, etc.) once bears are rewarded by obtaining food they may become conditioned to seek it in response to any of these stimuli <u>even if food per se is not detected</u> (Mertzanis).

3. Even if the reward is discontinued (i.e. the bears do not find food every time) extinction of conditioned behaviour will be slow and infrequent rewards (bear do have access to human related food resources) may perpetuate the behaviour (Mertzanis).

4. Frequent encounters between bears and humans without at least occasional reinforcement of fear in the bear by punishment <u>will habituate bears to humans</u> (Mertzanis).

5. **Habituation may also occur in the absence of food if natural patterns of bears bring them into frequent contact with humans** (Mertzanis).

6. Development of habituation fosters development of conditioning and vice versa. Commonly they are learned simultaneously (Mertzanis).

The aforementioned patterns must be connected to the ability of bears to learn (Mertzanis). Bears can learn and, as such, become 'habituated'. Some portion of the population can learn to adjust to humans, but not all individuals: some individuals are much more successful around humans than others (Gibeau). Again bears that are used to other bears around them may have different tendency to habituate (Smith et al. 2005 quoted by Katajisto).

Bears can make complex evaluations of benefits and risks (McCullough 1982 quoted by Mertzanis). **Therefore persistence, a variety of strategies and the absence of "punishment" lead the bear to become habituated to humans**. Bears learn also from the experiences of other bears. Young bears most often learn from any association among bears (McCullough 1982 quoted by Mertzanis).

Bears are omnivorous and opportunistic and therefore very keen at locating natural and human-related food concentrations. In the European landscape context, natural and human-related food resources (mainly cultivations, livestock and beehives) are in lots of cases spatially interrelated into a complex mosaic. For example in the case of Greece, bear habitat features in the area of north eastern Pindos mountains present these characteristics leading the bears to exploit both (natural and human-related) possibilities.

The graphic here below, on bears' feeding habits in the aforementioned area, clearly illustrates the importance of human-related food resources (in terms of cultivations) in

the bears diet and thus the bears adaptive behaviour in valorising both sources. It is worth mentioning though that this type of situation and scenario differs from the cases of absolute bear food positive conditioning (i.e. situations of parks with visitors leaving food remains for bears or even trying to feed bears) and subsequent bear habituation with all the inherent risks (Mertzanis).

In the case of the Greek context we could assume that bear are "used to" (and not "habituated") this configuration of the landscape and to the food possibilities it offers. This leads to the assumption that bears in such areas with continuous and extensive human presence get also "used to" the disturbance caused by the agricultural practices related to this system. Therefore conflict situations (in terms of damage caused on crop or livestock) may occur periodically (seasonally) but they rarely or never take the form of a "habituation".

There seems to be a balanced situation between "avoidance" and "opportunism" (Mertzanis). Indeed there is a very thin line (threshold) between opportunism and habituation and not always easy to define, keeping also in mind the individualized behaviour in bears: food opportunism can be basically seen as being part of an adaptive pattern/mechanism with purely self-sustaining/survival functions for the animal(s). There are anyway also some "rules" dealing also with the "fear factor".

In the **Greek context** foraging on crops it is more of a very well defined (spatially and temporally) feeding "habit". In this very context awareness of human presence is perceived at a certain given level which is more or less invariable (something like part of the landscape). And here the rule in force is "tolerance" provided that safety distances are kept and time rotation (between humans and bears using the same spot) as well.
So far field observations as well as telemetry data are supporting this interpretation of facts: bears are active in these fields mainly during night or very early morning hours. The fact that bears get "used to" the disturbance caused by agricultural practices, as stated above, implies more the concept of "tolerance" and opportunism" and less the concept of "habituation" sensus stricto.
According to McCullough (1982) a reasonable assumption of negative conditioning of bears towards such a behaviour ("habituation") **is the long lived impact of hunting** (Mertzanis).

In Greece, although bears are totally protected, they still live in areas where hunting has been an ever lasting practice. Many bears have been injured, or poached (usually in a wild boar drive hunt) over time and presumably this negative experience is memorized and transmitted as a negative conditioning versus human presence (Mertzanis).

McCullough (1982) states that mothers and other bears that avoid humans or take alarm, foster similar behaviour in young bears. Therefore the role of learning in producing "wildness" in bears and subsequent avoidance of humans should not be underestimated (Mertzanis).

According to the experience, **in USA** bear **"habituation" seems to be most prevalent in parks and reserves where hunting has been restricted for a long time.** In these cases negative (aversive) conditioning has its rules (McCullough 1982 quoted by Mertzanis): **as with aversive conditioning, early learning seems to be more effective. Thus young bears or bears recently exhibiting a "habituation" behaviour are the most likely candidates for reversing this behaviour (Mertzanis).**

1.2 Which are the consequences of habituation (positive and negative effects)?

Experts opinion summary

Positive consequences of habituation are the following:
- bears can use a greater portion of their range: 7 out of 8;
- it promotes appreciation for bears and eco-tourism, which may in turn favour bear conservation by local people: 2 out of 8;
- it causes an increased survival of some cohorts: 1 out of 8.

Negative consequences of habituation are the following:
- increased mortality risk for bears: 7 out of 7;
- attraction and food conditioning for bears: 1 out of 7.

Habituation has both costs and benefits for both bears and people (Herrero et al. 2005 quoted by Gunther).

Benefits to bears include:

1. a more balanced situation where long established disturbance factors in the immediate environment do not cause any more the expected negative effects upon bears in terms of displacement, ability to use habitat and subsequent energetic costs of using lower quality habitat. In other words some bears, (due to their innate behavioural plasticity) might be or become able with time to live along with a certain level of disturbance provided that this remains constant in all its parameters (intensity, magnitude, spatial occurrence etc) and therefore not undergo the negative effects of disturbance as described further above (Mertzanis). Particularly, habituation allows bears to use a greater portion of their habitat (Swenson) so that they can use important habitats in relative close proximity to humans (Gibeau), accessing natural food resources near areas with high levels of human activity (Gunther and Biel, Herrero et al. 2005 quoted by Gunther). Habituated bears no longer are displaced from quality habitats near sources of human activity and, in some instances, sub-dominant animals can find foraging opportunities that they may not otherwise (McLellan). In the end, habituation and use of roadside habitat could increase the carrying capacity for bears (Herrero et al. 2005 quoted by Gunther).

2. Some bears may habituate to people to avoid encounters with other bears or predators (subordinate cohorts such as subadults and females with cubs are the most likely segment of bear populations to habituate and use areas near human activity centres to avoid interactions with large male bears or other predators) (Herrero et al. 2005 quoted by Gunther).

3. Habituation allows bear viewing which in turn may promote appreciation for bears and eco-tourism, which may promote bear conservation by local people (because bears provide financial returns) (Herrero et al. 2005 quoted by Gunther and Katajisto). Some authors see this as the only positive effects of habituation of such a large and potentially dangerous animal (Katajisto).

It is positive that bears may accept some types of disturbance as it is a way to cope with possible negative situations. However, people should not understand that this fact means that the source is not harmful at all: usually it means a loss and fragmentation of habitat (Huber).

Costs to bears generally mean an increased probability to be killed (Servheen): the risk of mortality rises when bears interact with humans (Gibeau). Again, it is not that bears

cannot live around people, it is people that cannot live around bears (Gibeau). In detail, such costs include (Gunther):

1. habituated bears using habitat along roadsides or railways are more likely to be injured or killed by vehicles (Herrero et al. 2005 quoted by Gunther).

2. Allowing habituation may not be appropriate in areas that allow hunting (Herrero et al. 2005 quoted by Gunther).

3. In some cases habituation may lead to attraction if it gets associated with some food sources, like garbage (Huber). It is clearly a negative effect (Huber), because habituated bears are more likely to become food conditioned if human activity is not strictly controlled (Herrero et al. 2005 quoted by Gunther): perhaps more often habituated bears are in close enough proximity to people that they find opportunities to become food conditioned (McLellan). Therefore habituation to associate humans to food may be detrimental (Jope 1985 quoted by Katajisto), because bears become aggressive about obtaining human foods or garbage and damage property or injure people in the process (Gunther et al. 2004 quoted by Gunther).
People may feel threatened by highly habituated bears and thus kill the bears or want the authorities to deal with them (McLellan): food conditioned bears are generally removed due to human safety concerns (Herrero et al. 2005 quoted by Gunther), either by the authorities or by the public (Swenson). Especially habituation that associate humans to food may be detrimental (Jope 1985 quoted by Katajisto): bears can learn that people sometimes are associated with food (McLellan).

In such a scenario, bears are usually losing or lacking fear of humans and this may lead to situations where closer encounters between habituated bears and humans may occur (Mertzanis). Then bears become a more serious risk to people (McLellan) and become so called "problem bears" (Mertzanis). Within the European context this type of behaviour may also lead to an increase of damage to livestock and crops (pattern of "serial" damage).

This scenario has happened **in Greece in 1994/95** in the case of a sub-adult male problem bear which caused serial damage upon apiaries and livestock on a daily basis for almost 2 consecutive months before being translocated (Mertzanis). Problem bears are usually removed from the population (McLellan).

4. Habituated bears are more likely to be killed illegally (poached) (Gunther).

Benefits to people include:

1. opportunities are provided for viewing and photography of bears (Herrero et al. 2005 quoted by Gunther).
2. Bear viewing provides economic benefits to many areas (Herrero et al. 2005 quoted by Gunther).
3. Habituated bears may be less likely to attack people during surprise encounters (Herrero et al. 2005 quoted by Gunther).

Costs to people include:

1. more interactions with bears may increase cumulative odds of injury (Herrero et al. 2005 quoted by Gunther).
2. Habituated bears in areas with roads may encourage traffic jams and serious collisions (Herrero et al. 2005 quoted by Gunther).
3. High cost of managing habituated bears (Gunther).

1.3 Can habituation modify bears behaviour towards disturbance sources? If so, in which way? With which effects?

Experts opinion summary

Habituation can modify bears behaviour towards disturbance sources: 5 out of 5;
in the following ways:

- reducing bears negative responses: 4 out of 5;
- creating attraction: 1 out of 5;

and with the following consequences:

- effects on population dynamics and individuals distribution: 1 out of 2;
- poorer conditions for bears in case of attractive sinks: 1 out of 2.

The answer to this question is partially included in the previous paragraph.
Habituation modifies a bears response to disturbance reducing displacement or avoidance (Herrero et al. 2005 quoted by Gunther): habituated bears avoid disturbance less (Katajisto) or they can learn to ignore stimuli (McLellan). For example, if the stimuli are people walking or camping, then the habituated bear will not flee from these situations (McLellan).

Habituation can also reduce human related changes in diel activity patterns and the chances of confrontations between bears and people (Jope 1985 quoted by Gunther). In general, habituation reduces negative responses. It works with all human activities where there is no detrimental impact (Servheen).

In some cases habituation may lead to attraction towards the disturbance source if it gets associated with some food sources, like garbage (Huber). In case of attractive sinks this could lead to poorer condition of those bears, in addition to direct mortality (Katajisto).

If different individuals, e.g. females vs. males, habituate differently habituation could also have unexpected effects on population dynamics and distribution of bear individuals (Rode et al. 2006 quoted by Katajisto).

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II. MANAGEMENT OF « PROBLEM » BEARS

1. Understanding 'Problem' Behaviour

(source: http://www.bearsmart.com/managingBears/Behaviour.html)

'Problem' bears are not born, they are the product of human carelessness and indifference. Not all bears develop into 'problem' bears. Bears sometimes become a problem when they are conditioned to non-natural food sources (ie. human garbage). Attraction to human food brings bears into more frequent contact with people, resulting in a higher probability of negative human-bear conflicts. So-called 'problem' bears may become bold in their attempts to get food from people and cause extensive property damage or in rare circumstances, injury or death to humans. Human habituated bears are those that get used to people and tolerate them at closer distance. When habituation is combined with food conditioning, a potential conflict situation can develop.

Bears that come into frequent contact with people are destroyed, not for what they have done, **but for what people think they might do.** Bears that are perceived as a threat to human safety and property are often destroyed. Very few bears are destroyed because of an actual and immediate threat to human safety.

The prevention, creation and termination of 'problem' bear behaviour relies on human understanding, cooperation and acceptance of bears. As humans expand their settlements and encroach upon sensitive wildlife habitats, it becomes critical to balance the needs of both wildlife and humans.

Since 'problem' bear behaviour is usually associated with the availability of non-natural attractants (ie. human garbage), a logical solution would be to limit the bear's reliance on garbage as a food source by providing bear-resistant waste facilities and eliminating backyard attractants. Such a proactive approach would also include increased public awareness and understanding through education, signage and enforcement programs. Limiting the source of the problem will be more effective in the long term than reactive methods like destruction and relocation (which is generally considered to be ineffective and costly).

Because we can not eliminate all potential causes of human-bear conflict or interaction, we also need a non-lethal way to deal with these situations. Non-lethal bear management is an effective way to deal with bears when they become a so-called 'problem'. Always ask wildlife managers to use non-lethal methods first.

2. Food Conditioning

Conditioning is a simple learning technique we use to train our pets by giving them positive feedback or a food reward if we want them to repeat a behaviour. Bears, too, need to be trained, usually through a crucial experience that initiates the chain of behavioral change. First, bears need an opportunity to learn where to get nutrient rich food from people. Then, its just a matter of time before the bear repeats the behaviour that produces the (food) reward.

For example, if a bear is attracted to the smell of garbage in a can it may push the can over, exposing the contents for consumption. The animal's action of pushing over the can was instrumental in obtaining a reward (food). Bears have the ability to learn from a single experience and this process may be all that is necessary for the animal to become conditioned to push over garbage cans to obtain food. As a result of learning, whenever the bear encounters garbage cans in the future, with or without any food odours, it will likely investigate them. In addition, the association between the smell and the reward has been made. In this situation the bear would likely be attracted to similar smells (eg. garbage on a porch). Regardless of the type of attractants, once bears have been successful in obtaining human foods, without any negative experience, they begin to develop new behaviour patterns and may continue to seek food at human use sites.

Cubs learn the fundamental skills of survival from their mother. If the mother spends most of her time foraging for food at a landfill or from another human garbage source, this is the behaviour the cubs will learn. Even adult bears possess the ability to learn through observation of other bears. Bears are highly intelligent creatures and effective learners. Throughout their life bears remain curious and continue to learn through trial and error.

III. Non-lethal Bear Management

(sources : http://www.bearsmart.com/bearsBackyard/Alternatives.html)

1. Introduction :

Traditionally, wildlife officials have managed human-bear conflict situations through **hunting regulations, destruction and relocation**. Thousands of bears are killed each

year in North America. Yet, these methods have not prevented conflicts or even reduced their numbers.

As people move into bear country in unprecedented numbers, there is increased concern for public safety, biodiversity conservation and reducing property damage. The ineffectiveness of traditional response methods and the need to maximize resources point to a clear need for a new approach.

The key to successfully managing human-bear conflicts is to first minimize the number of human-bear conflict situations (through effective waste management, education and enforcement) and, secondly, to deal with any resulting conflicts in a non-lethal manner.

Non-lethal alternatives provide an effective management tool and incorporate a more holistic, long-term approach to bear management. This approach has met with huge success in areas like Mammoth Lakes, CA, Yosemite N.P., and Whistler, BC where the number of human-bear conflicts has dropped significantly - requiring less resources to deal with problem situations and less bears being destroyed.

Non-lethal Bear Management uses negative conditioning to modify undesirable bear behaviour without destroying the animal. By utilizing human dominance, and demonstrating a body posture and vocalizations that speak the language of the bear, officers can command the bear's respect and reinstill its natural desire to avoid humans. These methods can be reinforced with the use of bear dogs, rubber bullets, pyrotechnics and bear pepper spray. Even hitting the bear with rocks will work. Bears can be taught to stay away from people and their property. This approach capitalizes on the bear's innate tendency to avoid conflict and fit into the natural dominance hierarchy. The bear is not physically hurt - it is a psychological experience that reinstills their respect for and hence avoidance of people.

Bears must be taught to respect humans and human territory. This is a trait that bears have lost over time through poor management strategies and a generally submissive reaction by people. We have baited bears with a food reward into human settlement areas and then punished them with death for accepting an easy meal.

It needs to be stressed that negative conditioning should aid, but not be a substitute for preventive measures that eliminate or reduce the potential for human-bear conflicts.

2. The Theory behind Non-lethal Bear Management

The key to effective bear management is being able to communicate in a way that facilitates an understanding by the bear. We must begin by looking at the situation through the bear's eyes, instead of ours.

If we observe bears interacting with each other, we can see that they communicate messages through their body posture, vocalizations and odour signals. If wildlife managers use some of these forms of communication in conjunction with non-lethal tools, then they can begin to communicate with bears on a level they can understand and ultimately condition or teach bears to respect our boundaries. These techniques require humans to think the way the bear is thinking, rather than imposing our way of thinking onto the bear, or trying to impart our own human sentiment onto the bear.

Bears communicate with each other by establishing a dominance hierarchy or pecking order in situations where they encounter each other. It isn't always size that makes one bear dominant over another, but the attitude of the dominant bear, or 'alpha', who is always in charge.

Bears communicate their dominance by intimidating their opponent; they do not fight with each other unless it's absolutely necessary. Fight risks injury, and that is not the bear's desire. It's all about posturing. Bears do not understand English or French, but they do understand a language of dominance and submission. The wildlife manager can assert his dominance by posturing or fooling the bear into believing the human is in control of the situation. He becomes the 'alpha' bear, if you will, or the one calling the shots. The wildlife manager's body posture and tone of voice can make it perfectly clear to the bear that it is not welcome in an area. If the bear is not being respectful of that message, the message can be reinforced with a rubber bullet in the hindquarter or a shot of bear pepper spray in its face delivered in an aggressive manner.

We must send bears a clear message that it is unacceptable to approach people or their property. Non-lethal bear management provides an effective tool for managing bears without compromising human safety or destroying the animal.

3. Killing is not the Answer

By removing a "problem" bear you've only created an opportunity for another bear to move into this newly available habitat niche. Consequently, the problem hasn't been solved. Wildlife officials have just committed to a perpetual cycle of killing, public outrage and negative press. However, once a community has invested in minimizing attractants and 'training' the resident bear population to a manageable level, only occasional retraining/reminders are required. We can save bear lives, create positive public relations and improve safety for people living and recreating in bear country. Most importantly, we have created an environment in which people and bears can coexist in harmony!

4. Effective Use of Tools: (source :"Non Lethal Black Bear Management by Sylvia Dolson, 2000).

4.1. Why Use Non-lethal Tactics?

1. Teaching bears the limits of unacceptable behaviour creates a safer environment for people living in and recreating in bear country.

2. Non-lethal means - rubber bullets, pyrotechnics and pepper spray - are one more tool wildlife managers will have in their arsenal of bear management techniques. Most importantly, non-lethal tools provide the officer with another option - an alternative to lethal means. If you don't have the tools, you don't have any options.

3. This protocol has proven to be a useful public relations tool, enhancing the public's perception of officers and their commitment to behave responsibly and ethically. A nonlethal bear control tactic is likely to be fully supported by the public. Members of communities are usually very unhappy with the high number of bears being destroyed each year.

They are angry and they want our governments to seek alternative management methods.

4.2. Non-lethal methods and bear behaviour:

Bears are behaviorally complex mammals and individual responses to repellents and deterrents should be expected (Gillin et al. 1992; Hunt 1984; Roop & Hunt 1986). Factors affecting a bear's response to treatment include temperament, dominance, reproductive status, past experiences with humans, and most importantly, whether the bear is a black or a grizzly.
Bears that have become habituated to human presence, but are not food conditioned, are generally considered less of a threat.

Naive and young bears will be the most easily and quickly discouraged. As bears gain reward experience from humans they will become more persistent and harder to dissuade to avoid certain situations - but certainly not impossible. In these situations the combination of a variety of stimuli, particularly if they address more than one sense, may contribute to the effectiveness of conditioning. Nonetheless, it is very important to catch the behaviour before it develops into a bad habit.
For most repellents that physically contact an animal; accuracy, range and impact appear to be the critical components. Where projectiles are used, animals should be shot in the rump to decrease the chance of an inaccurate shot damaging vital organs (Clarkson 1989). Use caution as there is a possibility of penetration when rubber slugs are used at a distance less than 25 meters or with smaller bears.
The negative conditioning process must effect the perceptive abilities of the bear so as to cause the animal to associate its target behaviour with the occurrence of the officer's aggressive actions and the stimulus being delivered.

Ideally, non-lethal tactics should be applied immediately rather than waiting until the bear exhibits further inappropriate behaviour. The whole conditioning process should be maximally unpleasant for the bear without causing physical damage to the animal.

It is important that non-lethal tools are used only when it is safe to do so. Bears hit with repellents and deterrents must have a safe avenue for escape left open to them.

The effectiveness of all non-lethal management tools depend on the method in which they are applied. The person delivering the stimuli MUST assume the position of 'alpha' bear in the negative conditioning incident. His body posture and voice MUST be consistent with the negative message being delivered by the repellents and deterrents, which are simply an extension of the person. Do NOT use non-lethal tools in a passive manner. This sends the bear a mixed message and reduces the effectiveness of negative conditioning dramatically.

Incomplete hazing is NOT recommended. Non-lethal techniques should be applied **aggressively** until the bear flees and is out of sight, at which time the delivery of all repellents and deterrents should cease.

The intensity of application of hazing requires a good understanding of bear behaviour and evaluating the bear's response to negative conditioning. It should also be based on the bear's history (whether or not he is a repeat offender).

For a young or naïve bear, for example, the hazing process could begin slowly, but deliberately, applying least force required. Under non-life-threatening circumstances, the officer might begin by simply asserting his physical dominance and using a tone that communicates the seriousness of the conversation. If the bear is not respectful of the officer's request, hazing should be stepped up to the next level. The officer might rush toward the bear, stamping his feet on the ground – essentially bluff charging the bear. Bean bags or rubber slugs could be used to step up the conditioning to

the next level. The use of screamers and bangers can be used to extend the officer's reach as the bear is leaving the area.
If, on the other hand, you are dealing with a repeat offender that has been caught entering a person's residence, nothing should be held back. A full-on assault should be launched, preferably with the use of bear dogs to reinforce your message. (see section of Bear Dogs)

Bears can become conditioned to the effects of non-lethal tools, particularly when they are deployed ineffectively (in a submissive or unconvincing manner). More powerful tools should be used only as they are needed, saving the biggest and most convincing only when absolutely necessary.

If Searles' program is used effectively, the wildlife manager wouldn't necessarily need any tools. He could send the bear a clear message based solely on his own behaviour, demonstrated through his body posture and the tone of his words. The key isn't what's in the tool kit, it's the method in which the tools are applied.

4.2.1. Underestimating the Bear:

One of the biggest mistakes a wildlife manager can make is to underestimate the intelligence and resourcefulness of a bear. Most of the time, we don't give bears the credit they deserve.
They are highly adaptable animals and know how to get themselves out of a bad situation with the least amount of energy expended and the least amount of risk to their own injury.
At any given time, a bear knows exactly where it is and where it wants to go. It has a built in GPS (global positioning system) or 'compass sense'. Bears are relocated great distances from their original site of conflict, but most inevitably find their way back (Miller & Ballard 1982; Rogers 1986).
The point is, the bear can also find its way directly back to the woods from the middle of a residential area, if it is given a clear message to do that. Bear dogs are very useful in these circumstances.
Town bears learn that human's yards and garbage cans provide a good food source.
A mother bear shows her cub the location of a good berry crop, and the cub may return to that same berry crop many years later (Gilbert 1989, 1999).
Why then, can't we use this ability the bear has to remember locations against it?

We can actually teach or condition the bear, through negative reinforcement, to stay away from human's cars and homes and furthermore re-instill the bear's natural wariness of humans.
We are simply capitalizing on what the bear already has the ability to understand.

5. Methodology/Protocol:

5.1. Clues and Hints (from Carey Hunt's "Partners in Life" black bear non-lethal management Program):

• Always make sure the bear can do what you are asking. Be sure you are giving it a clear, consistent message and options for leaving. Make the right thing easy, and the wrong thing difficult when setting up your lesson!!! Make sure that what you make a bear do is what you want it to learn!

• Remember you are working with a bear's attitude – that is what is getting it into trouble. Do not attempt to teach a bear to stop at specific distances from people, roads or houses. Instead, teach a bear to choose to move as a 'wild' bear would, using cover and moving away from people when confronted.

• Take time to stop and make a safe, meaningful lesson plan.

• Take time to talk to the public about what you are doing and how they can help.

• Know your projectile loads and make them count! Don't 'pepper' (same as nagging) the bear with 'hits' that are from too far away. (ie. bean bag rounds at 25 meters are too far – they are made for 5 meters. Use a rubber bullet instead. You lose credibility with the bear. The bear needs to know that it NEVER wants to get hit again – that its not worth it to go back and do it again.) Only take safe shots to the rump of the bear.Place your cracker shell rounds on the ground behind the bear.

• If you use dogs – know your dogs and make sure you have picked the right ones for the job at hand. Three to four dog and handler units is the preferred number to make up a 'team' for forcing a bear to move away, two units minimum. Within each team, make sure you have at least one dog that barks well and two dogs that can be turned loose on a bear if necessary. Take into account the species of bear you are working with when choosing which dogs to use

5.2. SITE SPECIFIC BEARS (ie. Campgrounds, villages, town site camp, house)

5.2.1. Lessons to be Learned by Bear:

• to choose not to enter these sites and view them as it would a dominant bear's personal space or 'boundaries'

• to learn that these sites are not worth investigating; and

• to stay in cover out of view from the perimeter of a site.

5.2.2. Tips for Teaching Site Specific Bears:

• PREVENTION IS KEY FOR SITE SPECIFIC PROBLEMS – Get rid of attractants if possible. If not, make sure all bear attractants are secure from bears. TALK TO THE PUBLIC about what you are trying to do.

• Decide what your site perimeter is that you will not allow the bear to be inside. DON'T LEAVE THE BEAR INSIDE THIS PERIMETER WHEN WORKING IT – this is confusing to the bear.

• When working the bear to get it out of a site, DO NOT SHOOT AT IT ONCE IT HAS EXITED YOUR PERIMETER – BE SURE YOU STOP AT THE PERIMETER. You must signal the bear as to what is 'safe'. This is a common error.

• If a bear begins to show itself near the perimeter but outside of a site, ask it to use cover and teach it as you would a roadside bear.

• Bears must be worked night or day to teach them to stay out of sites.

• Be sure to yell "Hey bear" before shooting, and continue to yell "Get out of here bear" while chasing it out.

• NEVER GO LOOKING FOR A BEAR IN A 'SAFE' PLACE! Do not push a bear you are working with OUT of a good spot by driving into a 'safe' spot for the bear to get a radio location or a visual. GET YOUR RADIO LOCATIONS FROM PLACES YOU DO NOT WANT THE BEAR TO BE…OR WHERE THE BEAR IS NOT. THIS IS ONE OF
THE MOST COMMON MISTAKES MADE and it is very confusing for the bear!!

5.3. Deterring / aversive practices:

• only personnel that have completed annual problem wildlife training and the annual firearms qualification should be authorized to haze bears and use deterrents

• members of the public should be secured or not present

• hazing should be administered by a minimum of two personnel (one armed with lethal ammunition) unless done from a vehicle or from vehicle side (5m or less)

• a safe and obvious escape route must be available to the bear

• deterrents and live ammunition should not be loaded in the same firearm

• 12 gauge rubber slugs, screamers and bangers should only be used when a clear lineof fire and a safe backstop exists

• 12 gauge rubber slugs will not be used at ranges under 22 meters, bean bags or rubber buckshot are preferred at close range

• cubs should not be hit with rubber bullets

• the preferred target area for pain deterrents is the hindquarter area

• pyrotechnics should not be used during periods of extreme fire danger rating

• an occurrence report should be completed in all circumstances of hazing or use of deterrents

• any bear subject to repeated (more than once) hazing should be evaluated

5.4. Relocation: The Truth About Relocation

(source: http://www.bearsmart.com/bearsBackyard/Relocation.html

5.4.1. Is Relocation a Viable Option?

One of the most difficult issues wildlife managers struggle with is the issue of **RELOCATION. Is it a viable option?**

Traditional relocation involves removing a 'problem' bear from the point of trouble to a wilderness area, in the hope that the bear will revert back to natural behaviour patterns and avoid humans and human settlements.

Unfortunately, bear relocations are viewed by some biologists to have limited success. Relocated bears experience considerable stress associated with locating new food sources, security habitat, and bedding and denning sites within the release area to the extent that it can affect their survival. Competition with resident bears of the new area may lead to injury or death inflicted by the more dominant bear in its quest for, or defense of, habitat. The bears that do survive, often become a 'problem' in the new area or return to their original territory where they continue to be a problem.

The merit of relocating black bears has been questioned for some time now. In fact long distance relocation of black bears is no longer considered a viable option by the B.C. Ministry of Water, Land and Air Protection. This decision was as a result of the low success rate of relocation, the high cost, and the time consuming nature of this management technique. Because of the grizzly bear's threatened status, considerable effort is put toward relocating grizzlies.

Nonetheless, relocation can be effective under a variety of circumstances. For instance, if the bear is released in its original territory and is aggressively hazed and harassed - this will send the bear a clear message that its behaviour will not be tolerated and will further reinstill its natural desire to avoid humans discouraging its return. Concerns associated with traditional relocation are no longer an issue. (For more information, "Using Non-lethal Tools in Conjunction with Live Traps and Relocation" of the Non-lethal Bear Management Guidebook). Short-distance relocation can also be very effective when used to manage young adolecent males, as these bears have just been dispersed from their mother's natal range and are looking for a new home range.

Relocation, in itself, is not a viable long-term solution to human-bear conflicts, because the source of the problem remains. The stimuli that created the human-habituated or garbage-conditioned bear remains. Problem bear behaviour is almost always as a result of the availability of non-natural attractants (usually garbage); which is the direct result of human action and waste mismanagement.

This indicates a human management problem and should signal the need for human management action – by providing bear-proof waste facilities as well as providing information, education and enforcement programs. These proactive measures should be combined with non-lethal bear management techniques to mitigate any conflicts that still occur.

5.4.2 . Using Non-lethal Tools in Conjunction with Live Traps and Relocation: (source :"Non Lethal Black Bear Management by Sylvia Dolson, 2000).

If a bear can not be otherwise caught or a human-bear conflict situation occurs in **a heavily populated area** where forested cover is not quickly accessible, the bear may be live trapped and tranquilized for relocation. It is important that the bear is released in its original territory, but away from human settlement.

At the release site, the bear should be aggressively hazed and harassed before and during its release. Again, the negative conditioning process should be maximally unpleasant for the bear without causing any physical damage to the animal.

5.5. Non-Lethal Bear Kits: (source :"Non Lethal Black Bear Management by Sylvia Dolson, 2000).

Each kit contains:

- 1 Waterproof Carry Case
- 50 . 22 cal blanks
- 50 Bangers
- 50 Screamers
- 50 Flaming Whistlers
- 25 12 gauge Shell Crackers
- 10 Rubber Slugs - 12 gauge
- 3 Bean Bag - 12 gauge
- 3 Marking Device – 12 gauge
- 2 12 gauge lethal slugs
- Equipment required to deploy devices:
- 12 gauge shotgun
- 15 mm pistol launcher

- **Bangers -** These devices are launched from a 15mm pistol using a .22 cal blank. Thesecartridges explode with a loud bang after traveling 25m. The acoustics are very loud,providing a very good noise stimulus and are very consistent. The disadvantages are that theyare slow to reload and cumbersome in low light conditions.

- **Screamers** - These are launched from a 15mm pistol. With a reported range about 75m, screamers produce a loud screeching noise through complete travel, with a visual effect inlow light. They can have an inconsistent range and be very unpredictable. They provide a very good noise stimulus but share the same disadvantages as the bangers.

- **Flaming Whistlers** – Also launched from a 15mm pistol, they have a loud pronounced whistling with a highly visible sparkling tracer effect. High Fire Danger.

- **12 Gauge Shell Crackers** - These shells are designed to be used with the standard issue 12-gauge shotgun. Shell Crackers explode with a loud bang at the end of travel. They have an extremely long range (approx. 75m) and were found to be very consistent in range and accuracy, during practice. Caution must be exercised as the cardboard sometimes sticks in the barrel.

- **12 Gauge Rubber Slugs** - These slugs are designed to be fired from the standard issue 12-gauge shotgun. They are very accurate up to a range of 75m; however, there is the possibility of penetration if used at a distance of less than 25m.

Rubber slugs are not recommended for use on small or underweight bears. Follow-up shots can be made quickly.

- **12 Gauge Bean Bags** - Two types of beanbags can be used, one marking and one nonmarking.Both beanbags were designed to be fired from a 12-gauge shotgun. The marking beanbags contain a yellow dye designed to 'mark' the bear. Experience with these found them to be ineffective at leaving a distinguishable mark. They are accurate to 25m and are designed to be fired at a range less than that distance, ~ 6m.

5.5.1. Optional tools: (source :"Non Lethal Black Bear Management by Sylvia Dolson, 2000).

Pepper Spray - A very effective repellent for bears, when sprayed directly to the eyes of a bear. Capsicum is a local irritant of sensory nerve endings. Toxicity tests have shown no lasting harm to the skin or eyes of humans, dogs or rabbits. The effect of the spray lasts about 15 minutes and can be washed off with soap and water. Strength of the spray varies - 1% capsicum solution is recommended. Spray range also varies from 3m to 8m - check the directions carefully. It should be noted that wind, vegetation, or other factors may decrease the product's effectiveness. In several test studies, virtually 100% of bears were repelled by
pepper spray - the bears turned immediately and ran away. Only in rare cases were aggressive responses noted.

Paintball Gun – Paintball guns are effective for marking bears – paint is water soluble. Also effective for gently herding a bear through a busy residential area - stray pellets are not as likely to cause harm to bystanders.

5.5.2. Dogs and Bears:

There are many different breeds of dogs that can be used successfully to manage bears.
Karelian Bear Dogs (KBD) have been used for decades to trail and bay game species, particularly grizzlies. KBD's were initially used in Western Russia and Finland to hunt bears and also to guard the ranch and farm and the families that lived in them.
Today, **KBD**'s are used in 'bear shepherding" **to chase bears out of an area or protect property.** Bear conflict specialist Carrie Hunt, heads up the "Partners in Life" program at the Wind River Bear Institute in Utah. Hunt and her team of biologists and KBD's are working from Alaska to Alberta to Montana to modify bear behaviour so that problem bears do not have to be relocated or destroyed. In combination with pepper spray, rubber bullets and onsite trap releases, Hunt teaches bears to change undesirable behaviours. She teaches bears to behave in a manner that does not put them in conflict with humans.

Other breeds, like the Blackmouthed cur , are also being used with great success in Louisiana. The cur is a stock dog that is very obedient, highly intelligent, aggressive towards bears, but safe to work with near other dogs and people.
Most dogs can be trained to help deter bears from entering a yard or backcountry
camp. Backcountry hikers with an untrained dog, should be forewarned that their dog could provoke a bear or chase the dog back to its owner creating a potential conflict situation.
All dogs should be trained not to chase or harass other non-dangerous wildlife.

6. Documentation / data base:

It is important that all incidents/complaints are properly documented on standardized forms. If the complaint is attended, the following information should be noted:

1. date & time team personnel arrived/departed
2. location of incident
3. reason for incident/complaint
4. context of incident
5. name, phone number & address of person complaining
6. description of bear including identifying characteristics
7. nature of bear behaviour on arrival (if still on site)
8. non-lethal techniques used - number & type of devises deployed and order of deployment - was bear marked?
9. description of bear's reaction to hazing
10. follow-up action required (if any) ie. ensure removal of bear attractants (if cause)

All documentation should be organized and filed. Summary information should be produced regularly and distributed to all interested parties. Information should be reviewed by all those involved and evaluated to determine where improvement is necessary.

7. Responding to the Public: (source :"Non Lethal Black Bear Management by Sylvia Dolson, 2000).

In order to facilitate good public relations policy and a general atmosphere of cooperation, it is important that members of the community are dealt with in an appropriate manner.
Team personnel/NGO fielding telephone calls from the public should encourage and thank thecaller - make the caller feel that he is part of the solution.

If a caller is simply advising the official of a bear passing through the neighbourhood, then they should be thanked for the information. The caller should be advised to remove anybear attractants from their perimeter. This is an excellent opportunity to educate the caller. You should also ask the caller to speak to their neighbours and pass along this important information.
Lastly, the caller should be asked to report back if and when they witness that bear eating garbage or threatening human safety, property, or pets and livestock.

If a caller is reporting aggressive behaviour, an team member should be sent out immediately to evaluate the situation – particularly if the caller reports any behaviour suggestive of apredacious bear such as stalking, chasing or acting strange towards humans or their pets.
Team personnel should make every attempt to attend a call with back up. Back up officers should provide crowd control and be prepared with lethal means in the event that human safety is in immediate danger. Risk of injury to the public is very minimal, as bears will almost always flee a confrontational situation rather than fight.

As responsible wildlife managers, we must learn to give bears the benefit of the doubt more often. A bear should only be destroyed when there is clearly an *immediate* risk to human safety.

The public not only supports this type of bear control program, but are demanding non-lethal bear management alternatives. The use of this program will enhance the reputation of wildlife managers in the eyes of the public and furthermore build a system of mutual trust
and respect.

8. Long Term Benefits of non-lethal bear management:
(source :"Non Lethal Black Bear Management by Sylvia Dolson, 2000).

1.Non-lethal bear management techniques contribute to a more stable and natural population size, reducing population fluctuations.

2. By eliminating bears' access to non-natural food sources through responsible be ar-proof waste containment and reducing availability of backyard attractants; the bears' reproductive capacity will subside and in time curtail unnaturally high populations.

3. Furthermore, if we destroy a bear in an area, a new bear will simply move into that habitat niche. But if we properly train the resident bear population, they will also help us do our job by keeping other bears out, especially the younger subadult males (teenage troublemakers).

4. The use of non-lethal bear management techniques results in a smaller population of longer-lived unconditioned bears that cause significantly fewer problems and thus require less manpower to deal with.
People and bears can start to co-exist peacefully, because we will have re-instilled the bears' wariness of man and returned the natural balance to the ecosystem.

5. For a period of one to two years is recommended to aid in educating the community and facilitating an understanding of the transition period.

9. The Final Word: (source :"Non Lethal Black Bear Management by Sylvia Dolson, 2000).

What we know:

1. Where there is suitable habitat, bears will continue to exist.
2. The human population will continue to grow and encroach on bear habitat.
3. *People will be People* - they will continue to make attractants available to bears either intentionally or unintentionally. (Bear-proof waste containment, education and enforcement programs will reduce the availability of attractants dramatically - do not overlook these proactive measures.)
4. *Bears will be Bears* - they are ruled by their stomachs and will continue to seek out non-natural food sources if we permit them to.

Scenarios to solve the problem so far:

1. Do nothing - doesn't work
2. Relocation - has had limited success
3. Destruction - doesn't work

The Answer:
Managing undesirable bear behaviour with non-lethal tools is the primary "responsible" option - there should be no debate. It is a **NO LOSE** choice. **Relocation** can also be employed as a secondary non-lethal option where appropriate – particularly when combined with Searles' techniques at the release site.
According to Searles, "If the tools & methods don't work, you still have the option of destroying the bear - it's a 5 cent, 2 second solution. The point is, you will rarely have to choose that option."
The community members, who are the owners of our wildlife, should learn to support non-lethal options. Let's do the responsible thing!

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ANNEX

Bear Deterrents

Scarecrow
Our #1 choce. This animal repeller keeps bears and other animal "intruders" away with a blast of cold water - a humane and effective method of deterring animals from your yard. It is hooked up to a normal garden hose and mounted in the ground. When the motion detector senses movement, the Scarecrow sprays a 3-4 second burst of water and then resets itself. The spray head can be adjusted from 10°- 360° to cover a small or large area and has a 35 ft range for flexibility in placement. The Scarecrow is simple to use, safe and inexpensive.

To purchase: visit SmartHome.com or google "Scarecrow Animal Repeller".

Rex Plus Barking Dog Alarm - The Electronic Watchdog
Works to scare off bears or human intruders. Rex is a ferocious sounding dog who resides in a small box kept on your counter when you're not home. He operates by radar and knows when a bear is attempting to enter a house. If a bear comes too close Rex barks viciously and he stops as soon as the bear runs off. He is on guard as long as he's plugged in, barking when the bear is too near and not when the bear is gone. The BEAR League in Lake Tahoe tested this unit and says "Rex works great and never needs to be fed, watered or walked." Nonetheless, bears may become acclimatized to the sound over time and may not be deterred from the area; or they may not react at all to a recorded "bark". Be aware that Rex only works when the bear is within a few feet of the door or window and doesn't detect intruders further away in the backyard. We suggest using this product when you're away from the house and especially in homes that are vacant for long periods.

To order online, just google "Rex Plus Barking Dog Alarm" or check with local retailers that sell pest control or security products.

Unwelcome Door/Window Mat:

Unwelcome mats are basically boards full of nails pointing up, that are placed in front of doors and windows to discourage bears from entering buildings.

Unwelcome mats are simple and inexpensive to make. The sheet of plywood must be large enough so that a bear cannot lean from one edge and reach the door or window and should ideally extend past the sides of the door or window by 60 cm (2 ft). A 4x4 sheet of plywood would provide minimal protection for a single doorway, while a 4x8 sheet will be needed for most sliding patio doors. Use the thickest plywood possible and galvanized roofing nails with the large flat head. The nails should be long enough to stick out of the wood 2 - 2.5 cm (¾ - 1 in). If the nails are too long and not strong enough, the bears will discover that they can simply bend them over and step on them. The nails should be nailed into the board about 5 cm (2 in) apart so that there is no way a bear can get his paw on the board.

The sheet of plywood also has to be secured so that the bear cannot simply push it out of its way. If it is placed on a wooden surface, a couple of nails pounded through the plywood should secure it. If the mat is placed on dirt, pieces of rebar can be pounded through the corners into the ground to secure it.

Caution tape should be placed around the area of the mat so that people do not accidentally step on the nails.

Critter Gitter

The Critter Gitter detects animals moving into an area up to 13.5 m (40ft) away using passive infrared, body heat or motion detection and then emits ear piercing sounds and flashes lights. This detector has been designed to change its sound and light patterns with each intrusion and automatically reset itself.

One of the disadvantages of the Critter Gitter is that bears may become acclimatized to the sound and lights over time and no longer move from the area. However, an advantage is that the device alerts homeowners when a bear is around so that they can take the appropriate action. Keep in mind that the Critter Gitter will be triggered by any animal, including a raccoon, cat, dog, or coyote that passes by the sensor, day or night. This disturbance may not be acceptable to neighbours.

To purchase: contact Kodiak Wildlife Products Inc. Download Cataogue.

Bear Be Gone

Looks and smells like a trash can, but is actually a Bear Educational device. This proven field tested unit is designed to aid you as a tool in dealing with problem bears. The barrel is baited with food (ie. raw bacon drenched in honey) and armed with bear pepper spray. Once the bear takes the bait, he activates the triggering device and releases a blast of bear pepper spray directly into the bears face. The bear will relate this location with an unpleasant experience and be very reluctant to return. This unit must be used with extreme caution in public areas - warning signs must be posted. There is no long lasting ill-effect from bear pepper spray, but will cause about 15 minutes of severe pain.

To purchase call: Curley's Critter Catchers Mfg. at 909-592-6626 (CA)

If you're home..... use

Things you have around the house
If you're home when a black bear enters your property, there are lots of things you can do to deter it from coming closer or staying. Do not attempt to deter a grizzly (brown) bear on your own - call for help!

The most important tool we have at our disposal is our own human presence, particularly the use of direct eye contact and a take charge ATTITUDE! First ensure that the bear has a clear and safe avenue of escape with no people or obstacles in its way. Look directly at the bear, facing it and standing tall. Yell at the bear and firmly tell it to leave! "Get out of here, bear!" Keep a can of pepper spray in hand (with the safety removed) in case the bear approaches you too close. Or gather a group of people together - the more people, the more intimidating you will appear to the bear - simply out number it.

You may use any of the tools noted below in order to appear even more intimidating to the bear.....

Stones aimed at the bear's rump - never throw stones directly in the bear's face. Stones should not be larger than a golf ball.

A **soup can filled with pebbles** and taped shut. Shake it vigorously and then, perhaps throw it beside the bear. These work particularly well in areas where bears may already encounter rattle snakes.

Big huge **beach balls** can be tossed at bears often times scaring the heck out of them, opening and closing an **umbrella**, shaking a big plastic (colored) **tarp** or a big plastic **garbage bag**, or banging **pots and pans** can work as well**.**

Varying your technique each time a bear attempts to return works better than always just banging pots and pans or sounding an air horn. Bears catch on quickly if everyone does the same thing, get used to it and soon ignore it.

Keep a **baseball bat** handy to beat on trees. If a bear climbs up a tree to escape, yell at them and beat the base of the tree. Keep them up there for a while, smacking the tree and telling them off. It really scares them. After

they've been picked on long enough go back inside your home, let them come down and watch them tear off.

These techniques have been provided courtesy of Ann Bryant *of the* Lake Tahoe BEAR League*.*

Super Soaker

Fill any Super Soaker water gun or similar product with water or vinegar and aim directly for the black bear's face. Please do NOT use any other liquids or chemicals other than water or vinegar. Always use deterrents from a secure vantage point, giving the black bear an easy route of escape. When using deterrents, the person should display a dominant body posture and a 'stern' tone of voice to ensure the black bear recieves a clear message. This lets the black bear know he has invaded your 'human' terriory and he is not welcome. Not recommended for use with grizzly bears.

Can be purchased anywhere toys are sold.

Falcon Supersound Signal Horn

Size: 1.5 oz air horn, air horns, boat horns

Mini-horn, max sound. Piercing blast can be heard up to 1/2 mile on land, a mile over water. 100% ozone safe, non-flammable. 4-1/2" tall. SS, non-corrosive diaphragm. Guaranteed unbreakable. Meets USCG recommendations for boats up to 39' (12 meters). Made in the USA.

The Mini-horn with the maximum sound. Just a touch of your thumb produces a piercing blast that can be heard up to a half mile over land and a mile over water. Palm-size convenience with unlimited uses from casual small-craft signaling to personal protection. Excellent for use in bear country! 122 db NON-OZONE depleting

Approximately 200, two second blasts

To purchase: contact Kodiak Wildlife Products Inc. Download Catalogue.

Laser Sighted Slingshot

Unlike the old slingshots, the Laser Slingshot hits targets with pin point accuracy. Wood balls, constructed from environmentally friendly, biodegradable material, are the ideal pellet to use with the laser sighted slingshot. The maximum size of stones used should be the size of a golf ball. Any pellet should not be aimed at the face due to the danger of hitting an eye, but rather aimed at the rump of a bear.

To purchase: contact Margo Supplies Ltd.

Bear Pepper Spray

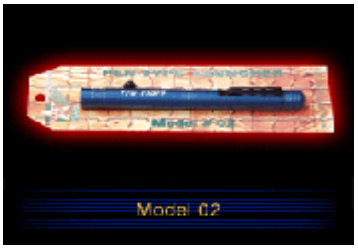
The last line of defense that repels bears in a non-toxic, non-lethal manner. The aerosol can shoots bursts of atomized Capsicum (a red pepper deriative) up to 8m. Spray is most effective at short range.

FRONTIERSMAN Bear Attack Deterrent is ideal for personal defence use when hunting, camping, fishing, hiking and biking or whenever enjoying the great outdoors. FRONTIERSMAN bear and grizzly bear pepper spray will not run the risk of permanently injuring either the bear or the outdoorsman. Holster also available.

To purchase: contact Kodiak Wildlife Products Inc. Download Catalogue.

Noise Deterrents

Signal Cartridges (bear bangers and flares) can be an effective way to deter bears, without resorting to lethal means. Signal Cartridges can be fired from signal launchers or pistols. Each system requires use of compatable cartridges. Both systems are highly effective, the system you choose will be more of a personal choice. Signal Launchers are easier to carry in a backpack. Pistols are often used by wildlife officers, as they can load 7 shots into a single revolver.



Signal Launchers
Tru Flare Pen Launchers are equipped to fire Tru Flare safety flares and bearbangers. They are compact, water-resistant personal safety devices. There are several different styles of launchers, pen-type, pull-type, bush-button, snap-in triple head. **Signal Kits**
Signal Kits come with a variety of signal launchers and signal cartridges, from the mini key-ring size to a kit that comes in a handy carry pouch and includes a pen launcher, 6 bangers and 6 flares. **Signal Cartridges: Bearbangers & Flares**
Flares and bearbangers are compact and water resistant. An inexpensive MUST for anyone who ventures into the back country, wilderness or out on the water.
To purchase: contact Kodiak Wildlife Products Inc. Download Catalogue.

Personal Bear Safety Protection Kits

An aid in preventing bear attacks! Includes:

- Bag
- FRONTIERSMAN Bear Spray in Holster
- 02 Centre Fire Pen Launcher
- 6 Bear Bangers - there is room in the kit for an additional box of flares or bearbangers
- Signal Horn
- Shoulder Strap

To purchase: contact Kodiak Wildlife Products Inc. Download Catalogue.

Single Shot Pistol
The Record is the most popular and economical model. Uses 6mm regular blanks.

Multi Shot Revolver
This rapid firing model features a swing out cylinder with blank ejector. This unit requires 6mm Hot Acorn Blanks.

To purchase: contact Margo Supplies Ltd.

15mm Scare Cartridges and Launchers
Pistol fired Bangers and ear piercing Screamers are practical, inexpensive, easy to use and very effective bear deterrents. Multiple fire launchers are safe to use. Quick Draw holsters provide fast deployment and easy, safe carrying. The launchers can be pre-loaded with blanks (primers), drawn from holster and loaded with cartridges as required. Also, the rapid firing of emergency signal flares can be accomplished by these launchers. These products provide the first step in non-lethal bear control.

To purchase: contact Kodiak Wildlife Products Inc. Download Catalogue.

To protect gardens, fruit trees or other bear attractants:

Trip Wire Fence System

The trip wire fence system is effective in detecting intruding bears or other wildlife. This compact system is simple to set up and operate. It is the most practical solution for fly camps and other situations which preclude the use of electric fencing. This lightweight (16 lbs.) system comes complete with 10 fibreglass posts, wire hangers, 200 m of trip wire, alarm controller, siren and 12-volt power supply.

To purchase: contact Margo Supplies Ltd.

Bear Alert Alarm System

Maximize the effectiveness of your bear proof electric fencing system. The alarm system is activated when the bear touches the hot wire. The bear receives a shock which causes a short on the fence wire, simultaneously tripping the siren. The audio stimulation frightens the bear and, more importantly, alerts camp personnel of the bear's presence. This system comes complete with alarm control box and siren. It can be rigged with any alarm device (ie. lights, security monitors, etc.) that is triggered by a switch closure. Also ideal for monitoring the perimeter of game (deer/elk) fencing.

To purchase: contact Margo Supplies Ltd.