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# **Comparison of Intervention Programs Designed to Reduce Human-Bear Conflict:**

## **A Review of Literature**



**March 2004**

**HDRU Series No. 04-4**

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## **HUMAN DIMENSIONS RESEARCH UNIT PUBLICATION SERIES**

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## ACKNOWLEDGEMENTS

I would like to express my thanks to the state black bear biologists and wildlife managers from Florida, New York, New Jersey, and Yellowstone National Park who took the time to personally provide me with much of the information presented in this document. Miriam Dunne and Kelcey Burgess from the New Jersey Fish and Wildlife Department provided background information, contact information, and valuable comments on the material provided in this report. Ken McKenzie, Ross Shremko, and Pat Carr of New Jersey Fish and Wildlife contributed helpful comments on drafts of this report. Many thanks to Ann Bryant and Lynda Smith for participating in informal interviews and providing historical and political contexts of human-bear conflict in their region. Judy Gillian and Stephanie Simik from the Florida Fish and Wildlife Commission, John Wiczorek of Bear Smart, and Heidi Kretser of Wildlife Conservation Society also provided context-specific information presented in this report. Dr. Barbara Knuth was instrumental in providing opportunity and review of the document. Bill Siemer and Daniela Raik of the Human Dimensions Research Unit provided helpful comments throughout the writing process. Funding for this study was provided by the New York State Department of Conservation, Pittman-Robertson Program, through Project WE-173-G (Subgrant 146-G), and the Cornell University Agricultural Experiment Station Federal Formula Funds, Project No. NYC-147433, received from Cooperative State Research, Education, and Extension Service and the U.S. Department of Agriculture.

## EXECUTIVE SUMMARY

Black bear populations are increasing throughout North America (McCracken 1995, Peine 2001). Typically, when areas of black bear population expansion overlap regions of substantial human use (e.g., a suburban neighborhood or tourist destination), conflict can ensue. Human-bear conflict is an effect that can have impacts for many people, including ecological, economic, health/safety, psychological, and social impacts. Causes of human-bear conflict vary.

Understandably, human-bear conflicts are a concern to wildlife managers. Many wildlife agencies and communities have formalized specific bear-related policies, management plans, or education programs to reduce human-bear conflict. Such policies, plans, and programs are often implemented as part of an integrated strategy designed to reduce non-hunting bear mortality. Education interventions are common in such communities, regions, or states where human-bear conflicts occur. Such programs take different forms, target diverse audiences, and have diverse effects. Similarly, there are numerous reasons why educational interventions are used in human-bear conflict management.

The Theory of Reasoned Action (TRA) offers a conceptual framework with which to consider community education intervention strategies designed to reduce human-bear conflict. The TRA can and has been used to predict what types of information might best influence attitudes towards specific wildlife management actions (Lauber and Knuth in review). Such information is often used by management agencies designing an education intervention strategy; the array of individual concerns regarding wildlife and the types of information that most effectively target those concerns may be translated into effective agency communication.

Six noteworthy North American black bear-related human education interventions were reviewed: Adirondacks, New York; State of New Jersey; Lake Tahoe, CA/NV; State of Florida; Whistler, British Columbia, Canada; and West Yellowstone, MT. All education interventions were designed to reduce human-bear conflict. Cases were compared according to essential intervention-related criteria such as: problem; education intervention; alternative actions considered; stakeholders involved; target audience of education program; criteria to evaluate success; and species targeted by the intervention.

Inductive findings from this review include: (1) human-black bear conflict is not a regional, small-scale phenomenon; (2) comprehensive, extensive, and well-known black bear education interventions are present in communities/regions where human-bear conflict has reached a “crisis” level; (3) education interventions are implemented and maintained by different stakeholders and interventionists; stakeholders’ motivations are diverse as well; (4) overall, evaluation of education interventions is lacking; and (5) most education interventions in these contexts appear to be implemented as a means to address human-bear conflict via direct human behavior modification, not direct bear behavior modification.

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## INTRODUCTION

The American black bear (*Ursus americanus*) is currently distributed throughout North America in at least 40 states, northern Mexico, and all the provinces and territories of Canada except Prince Edward Island. The black bear is one of three species of bear native to North America, and the only species currently inhabiting states east of the Mississippi. As opportunistic omnivores, black bears will consume insects, nuts, berries, acorns, grasses, roots, fish, and occasionally deer fawns or moose calves. They are resourceful creatures, taking advantage of “unnatural” foodstuffs when opportunities present themselves.

A number of stakeholders are interested in black bears and their management: wildlife-related recreationists (wildlife watchers, photographers, sportsmen, trappers); outdoor recreationists (others encountering bears such as campers or hikers); people concerned about animals, conservation, or the environment; private landowners; agriculturalists; and homeowners with the potential to have bears in their backyard.

Interactions between humans and bears can be positive and/or negative, depending on the circumstance and environment in which the interaction occurs. Herrero (2001) has noted that there are two types of negative encounters, *predatory/aggressive* and *defensive*. Each type of encounter occurs for different reasons and the injurious repercussions of each are different. Herrero’s research, however, is based primarily on national park or wildland encounters. Few suburban habitats have been considered. Many states are experiencing human-bear conflict in suburban/rural regions; therefore a third type of interaction should be added to the encounter list: *nuisance*. Nuisance encounters occur in populated areas, more-developed environments, and often entail property damage, and perceived threats to health and safety (as opposed to actual threats or dangers). This document will consider human-bear conflict to be any encounter that is aggressive, defensive, or nuisance in nature.

Stakeholders experience many bear-related “*effects*, or positive and negative outcomes of interactions among bears, people, and habitat” (NYSDEC 2003: 12). Bear-related *impacts* are effects that stakeholders “recognize and regard” as important (NYSDEC 2003: 12). Human-bear conflict is an effect that can have impacts for many people, including ecological, economic, health/safety, psychological, and social impacts. Causes of human-bear conflict vary. The long-term, habituated attraction to unnatural food sources is termed “food-conditioning” (McCarthy and Seavoy 1994; Whittaker and Knight 1998). Food conditioning is one factor that can increase the likelihood of human-bear conflicts (Peine 2001). Often such unnatural food resources are provided by humans, either deliberately (e.g., baiting) or unintentionally (e.g., improper garbage disposal) (Beckmann and Berger 2003). Another cause of human-bear conflict is noted by Peine (2001): during times of increase of the bear population and expansion of their range and/or decrease in the availability of natural foods, the likelihood of human-bear conflicts increases substantially.

Although the risk of minor or severe injury from black bears is low, it does exist (Herrero and Fleck 1990) and thus human-bear conflict is often a concern to stakeholders. Risk perception may influence people’s beliefs, attitudes, and support for different black bear management goals and approaches designed to deal with human-bear conflict. “Perceived risks may not correspond to actual incidence, yet perceived incidence of problems may be an important contributor to an overall preference for wildlife population sizes” (Knuth et al. 1992: 73). Management strategies can be adjusted to respond to such information. For example, “incorporating risk management into wildlife management plans encourages managers to predict the associated benefits and risks caused in other management dimensions” (Knuth et al. 1992:73). Variables influencing risk perception, such as feelings of dread, familiarity, knowledge, and certainty associated with the risk, feelings of trust toward and responsibility of black bear decision makers can be targeted in part through risk communication as part of the broader management of bear-related risks. It is important to note that these factors are functions of different influences, many of which are ongoing. Risk communication programs, while not the only means of influencing these variables, can be employed to guide, reinforce, or affect them.

In the context of human-bear conflict, risk perception can be considered to be innate risk judgments made by citizens (as opposed to risk assessments made by risk experts) (Slovic 1987). The notion evolved out of a need from decision makers to formulate policy that incorporated people’s opinions on and responses to risk (Slovic 1987). Definitions from the literature emphasize this need:

Table 1: Definitions of risk perception

Perceived likelihood of negative consequences to oneself and society from one specific environmental phenomenon (O'Connor 1999).
The outcome of risk judgments, characterized by the factors of dread and knowledge (Trumbo 1999).
Estimation of how important a risk is (Davies 1996).

Identifying, quantifying, and characterizing risk perceptions can inform effective and persuasive risk communication. Distinguishing between types of risk perception can highlight the subjective elements and complexities of risk perception. Cognitive risk perceptions are perceived probabilities of suffering injury or loss involving unsure hazards (Renn 1992). Affective risk perceptions are feelings of trepidation or concern about potential hazards (Sjoberg 1998). Individuals make judgments about risks based on hazard characteristics, or risk perception variables. The literature notes a plethora of potential risk perception variables, but Gore and Knuth (unpublished data, 2004) confirmed nine variables pertinent to human-bear conflict: *volition* (Zimmerman et al. 2001, Fischhoff et al. 1978), *certainty* (Siegrist 1999; Flynn et al. 1992), *dread* (Sjoberg 1998), *familiarity* (Siegrist 1999; Flynn et al. 1992), *responsiveness of decision-makers* (Crawford-Brown 1999), *trust in decision-makers* (Slovic 1993), *chronicity* (Slovic 1987; Grobe 1999; Weber 2001), *natural or man-made causes* (Cohn 2002), and *control* (Slovic 1987; Grobe 1999; Weber 2001).

Principal component analysis on these variables generated a rotated component matrix that revealed four component groups within which the nine variables could be simplified (Table 2). The component groups are: *responsibility-based* (voluntary exposure to risk, responsiveness, and trust); *knowledge-based* (familiarity, dread, certainty); *environment-based* (natural environment and control); and *chronic-based* (chronic nature of risk). These component groups illustrate risk perception is not a homogenous human concept associated with black bears and therefore can not be addressed uniformly. However, the variables can be simplified into groups, and thus it is possible that targeting a key variable in one component group may influence other known variables, thus providing a means to increase effectiveness and efficiency of risk communication. Additional factor analysis on these component groups could illuminate which group is most influential or central to risk perception toward black bears.<sup>1</sup>

	Component			
	Responsibility-Based	Knowledge-Based	Environment-Based	Chronic-Based
volition	<b>0.608</b>	0.287	-0.339	0.012
natural	0.136	0.024	<b>0.784</b>	-0.021
familiar	-0.053	<b>0.834</b>	-0.129	-0.010
dread	0.220	<b>0.605</b>	0.446	-0.186
chronicity	-0.032	0.079	0.028	<b>0.972</b>
control	0.050	0.174	<b>0.753</b>	0.046
responsiveness	<b>0.851</b>	-0.129	0.210	0.110
trust	<b>0.871</b>	0.019	-0.090	-0.165
certainty	0.012	<b>0.757</b>	0.227	0.244
Extraction Method: Principal Component Analysis				

Understandably, human-bear conflicts are a concern to wildlife managers. Many wildlife agencies and communities have formalized specific bear-related policies, management plans, or education programs to reduce human-bear conflict. Such policies, plans, and programs are often implemented as part of an integrated strategy designed to reduce non-hunting loss of bears. These programs often reflect public attitudes, such as risk perception, toward bears (Kellert 1994). Amato and Whitmore have suggested (1989: 17) that “public values... [regarding bears] drive the political process and greatly influence the level of commitment of the management agencies and the enforcement of laws and regulations designed to protect [bears].” Public values and perceptions of bears, as noted by Kellert (1994: 46) are influenced by “bears’ phylogenetic similarity to people, high intelligence, aesthetic appeal, relatively large size, capacity to stand erect, omnivorous diet, and rich historic and cultural relationship with people.”

<sup>1</sup> Limited sample size and the nature of risk perception quantification prevented additional statistical analysis to reveal which component group most influenced risk perception.

Strategies to reduce human-bear conflict are diverse. In addition to lethal control (e.g., euthanization, hunting seasons), non-lethal control can be used. Non-lethal control can be focused on bear ecology, resource use, and behavior, such as with sterilization, translocation, exclusion (e.g., electric fencing) or habitat modification. Non-lethal control can also be achieved by focusing on people, such as encouraging people to modify behaviors related to garbage disposal, harvesting of fruit trees, not hanging bird feeders, etc. Management strategies that focus on people often employ educational methods and techniques. This review will refer to this second type of non-lethal control, which might be called bear-related human behavior modification.

Education is widely used as a key component of human-bear conflict management. Education, in the environmental/wildlife sense, can be defined as, “the process aimed at producing a citizenry that is: (1) knowledgeable about the biophysical and sociocultural environments of which people [and wildlife] are part of; and (2) aware of [wildlife related] problems and management alternatives of use in solving those problems (O’Hearn 1982:2). Education can (1) facilitate understanding on public issues; (2) promote dialogue on public issues between and among stakeholder groups; and (3) contribute to informed decision making, both at the community and individual levels (Boggs 1991).

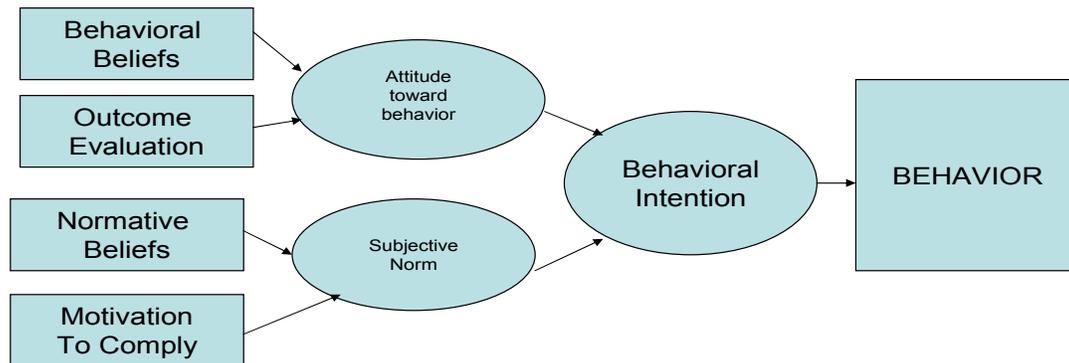
Education interventions are common in communities, regions, or states where human-bear conflicts occur. Education is often an integral part of black bear management strategies, regardless of whether lethal or non-lethal control is used. This literature review offers (1) a summary of noteworthy North American black bear-based human education interventions designed to reduce human-bear conflicts; (2) a comparison of case studies based on essential intervention-related criteria; and (3) inductive findings.

## **CONCEPTUAL FRAMEWORK**

The Theory of Reasoned Action (TRA) (Ajzen and Fishbein 1980) depicts the interrelationship between an individual’s beliefs, attitudes, and behaviors. The interrelationship is such that understanding attitudes can allow for a prediction in related behavior. When this theory was developed in the late 1960’s, it filled an important void in the field of psychology, as it justified the development of interventions based on individual attitudes (Brown 2003). It has since transcended other disciplines.

According to TRA, an individual’s action is guided by an individual’s behavioral intention. Behavioral intention is influenced by an individual’s: (a) attitude toward the behavior; and (b) subjective norm (social pressure) regarding the behavior. Attitudes toward the behavior are influenced by: (a) behavioral beliefs; and (b) outcome evaluations (outcome being positive or negative). Subjective norms are influenced by: (a) normative beliefs (perceived peer approval); and (b) motivation to comply (Lauber and Knuth in Review). A conceptual model (from Ajzen and Fishbein 1980) simplifies the theory:

Figure 1: Ajzen and Fishbein's Theory of Reasoned Action (1980)



One implication of this theory regards individual behavior change; if attitudes can predict behavior, then changing attitudes can change behavior in a predictive way. This notion has been tested and supported in the health, environmental, and wildlife disciplines (Lauber and Knuth in review; Bamberg et al. 2003; Verplanken 1999). Intervention strategies can be designed to ultimately change or modify individual behavior by focusing on attitudes. Importantly, from a management perspective, “it is not always appropriate for government agencies to try and persuade the public” to take a particular stand on an issue (Lauber and Knuth, in review: 3). However, education or information interventions that encourage informed decision making and reasoned action on an individual level are popular and common in the wildlife management arena (Raik et al. 2003; Lauber and Knuth in review).

The TRA can and has been used to predict what types of information might best influence attitudes towards specific wildlife management actions (Lauber and Knuth in review). This information may be used by management agencies designing an education intervention strategy; the array of individual concerns regarding wildlife and the types of information that target most effectively those concerns may be translated into effective agency communication.

Education is often used when citizens play a role in decision making related to human-wildlife conflict or when individual citizen behavior has the potential to contribute to or reduce the likelihood of human-wildlife conflicts (Lauber et al. 2002). At the individual level, there is a “locus of control;” a personality construct referring to an individual's perception of the locus of events as determined internally by his/her own behavior vs. fate, luck, or external circumstances.<sup>2</sup> McCombs (1991) suggests that what underlies the internal locus of control is the concept of *self as agent*. Individual thoughts can control actions and this executive function of *thinking we can* affects beliefs and motivation.

<sup>2</sup> <http://www.ncrel.org/sdrs/areas/issues/students/learning/lr2locus.htm>. Accessed 12/2/03.

Education interventions may take different forms, target diverse audiences, and have similarly diverse effects. There are a number of potential reasons why educational interventions are used in human-bear conflict management. First, citizens are given an opportunity to increase their general knowledge about bear biology (e.g., habitat, food sources, signs), avoidance (e.g., noise production), campsite precautions (e.g., food storage and preparation precautions), and overall alertness to bears (Floyd 1999). “People who understand bears are more likely to coexist peacefully with them” (Freer, 1999: 65). Second, environmental knowledge and support for [endangered] species restoration programs have been positively linked in some instances (Reading and Kellert 1993). Third, increased knowledge and awareness can potentially increase the capacity of individuals and/or empower them to participate in wildlife decision-making processes they may have avoided previously. Participatory decision-making regarding controversial wildlife-related issues has been credited with better management decisions and conflict reduction (Lauber et al. 2002: 581). Fourth, education may facilitate understanding on public policy issues and promote dialogue on public issues between and among stakeholder groups (Boggs 1991). Education should not “be construed as an opportunity to advance a particular agenda or an agency’s view of what should be done...education should be conceptualized as a way to help people make informed choices about what *they* think should be done in a particular situation,” or what they can do personally in their interactions with wildlife (Lauber et al. 2002: 582).

The TRA offers a conceptual framework with which to consider community education intervention strategies designed to reduce human-bear conflict. In the following section, case studies of communities that have an (informal or formal) education intervention in place explicitly to mitigate human-bear conflict will be evaluated. Each case offers unique insight as to the types of education interventions that are currently used. To have a standard of comparison within the broader conceptual framework of the TRA, each community was examined according to nine criteria. These criteria compose a case matrix at the end of this document, and are discussed in further detail in the following section. Interestingly, with diverse locations, education interventions, interventionists, and target audiences between cases, all case studies echoed a similar root cause to the problem: human behavior (irresponsible, inappropriate, unintentional, and intentional).

## **CASE STUDIES**

Black bear populations are increasing throughout North America (McCracken 1995; Peine 2001). Typically, when these areas overlap regions of substantial human use (e.g. a suburban neighborhood or tourist destination), conflict can ensue. Education intervention is often used to mitigate such conflict. This is the case for communities in the High Peaks region of the Adirondacks; central Florida; northern New Jersey; Whistler, British Columbia, Canada; West Yellowstone, Montana; and others. The cases discussed here illustrate how different educational intervention strategies have been employed to reduce human-bear conflict. Some interventions resemble others, illustrating a potential general acceptability of education intervention programs. This section is supplemented in matrix form and presented in the appendix. The “Program

Review Matrix” presents the community, defined problem, education intervention, alternative actions considered, stakeholders involved, target audience of education program, criteria to evaluate success, and species targeted by the intervention.<sup>3</sup> Note that the defined problem in most of the cases revolves around food-related human behavior (e.g., direct or indirect, intentional or unintentional feeding of bears). Most cases have similar education messages as well, encouraging responsible food-related behavior at home and while on vacation.

Cases were selected based on: (1) the recommendation of New Jersey Division of Fish and Wildlife’s (NJDFW) Information and Education specialists and Division of Wildlife Services Section’s Black Bear biologists; (2) available information; and (3) uniqueness and creativity of education intervention. Information was gathered from: (1) state agency officials working on the program (where applicable); (2) a comprehensive search of gray literature; and (3) semi-structured phone interviews with stakeholders in leadership positions.

The cases reviewed in this document do not represent the universe of black bear education programs, scenarios of human-bear conflict, or efforts of stakeholders to reduce conflict. However, these cases are well known outside the regions in which they occur. They thus serve as promising cases to initiate discussion on human-bear conflict and related education programs. It is important to note that most if not all of the case studies reviewed in this document have used other intervention strategies to ameliorate human-bear conflict, such as aversive conditioning (New York, New Jersey, and Whistler, British Columbia, Canada, Lake Tahoe, etc.), or legislation making it illegal to feed bears. Those interventions will not be reviewed in this document.

### **High Peaks Region, Adirondack Park, New York**

Since spring 2001, the Wildlife Conservation Society (WCS) has partnered with regional Eastern Mountain Sports (EMS) stores. This partnership was designed to educate backcountry campers about using bear-resistant food containers to store their food before embarking on their hike into the backcountry and for the duration of their trip. The issue, as defined by WCS, was that “escalating human-black bear conflicts in the Adirondacks needed to be brought under control in order to prevent a severe or fatal incident and to protect bears from avoidable elimination” (Kretser personal communication). The objective, again defined by WCS, was to, “form an innovative partnership between a conservation organization and a retail store to educate backcountry users BEFORE they arrive at a trail head (Kretser personal communication).”

After reviewing alternative options, including destroying bears as problems arise and restricting the number of campers using the backcountry, WCS and EMS embarked on a multi-step education campaign. WCS researched and purchased Garcia brand backpacker-friendly bear resistant food containers while working with regional New York State Department of Environmental Conservation Forest Rangers to formulate a

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<sup>3</sup> One case, the West Yellowstone Grizzly and Wolf Discovery Center targets black bears and grizzly bears as well as wolves. All other cases target black bears.

training program for EMS employees. EMS employees in the High Peaks area, along with those in Albany, Rochester, and New York City were trained and supplied with bear canisters to rent or sell to campers with a credit card deposit. To date, only one canister has not been returned. Additionally, Adirondack Loj employees (the Loj is run by Adirondack Mountain Club and is located at a major High Peaks trailhead) were given identical training and canisters to rent. Demonstration canisters and bear bags were put on display in appropriate places (EMS stores, ADK Loj trailhead), brochures were distributed to customers renting or purchasing bear bags and canisters, press releases were supplied to local newspapers, weather proof posters were designed by WCS and distributed to aforementioned EMS stores and 11 trailheads, and both groups' websites advertised "Friday Night Bear Clinics" at EMS stores.

The primary message disseminated by this education intervention is that proper food storage (specifically in the form of bear resistant food containers) is a highly effective tool for preventing human-bear conflict. The conservation impacts of human-bear conflict (food conditioned bears can become ill, aggressive, lose natural desire to forage) are emphasized. While the target audience of this education program is primarily backcountry (backpacking, canoe camping) recreationists, messages were also relayed to "front" country campers (car/campground camping).

The program has continued to grow, as more backcountry campers use the canisters and have fewer conflicts with bears. WCS holds the program to be a success at this point, as indicated by the reaction of back-country campers using the canisters, the response of EMS employees to WCS employees, and the reaction of NYSDEC rangers to reduced bear-related complaints from campers using the canisters.

There are no formal criteria to evaluate the success of the program in achieving the objective. However, informal evaluation of the program has incorporated a number of elements. At trailheads, personal interviews have been conducted to inquire about backcountry campers' food storage habits, and bear encounter postcards with self addressed stamped envelopes for users to complete have been posted. Canister evaluation cards were originally distributed by retail shops but lack of response has stymied that evaluation effort. Retail shops have communicated that bear resistant food container posters have helped with their educational goals. Anecdotally, reduced complaints to forest rangers at trail heads indicate success (Kretser personal communication).

Regulated hunting is permitted in specified areas of New York State, and lethal control may be employed if wildlife managers deem it necessary. Annual harvests hover at around 1,000; the 2000 harvest rate was 1,070 and the 2001 harvest rate was 801. In 2002, nuisance complaints regarding black bears exceeded 700). In the Adirondacks, black bear harvest rates have been 523, 728, and 523 for 1999, 2000, and 2001 respectively (Berchielli et al, 2003). In 2003, the only year WCS has recorded human-bear encounter information in the High Peaks, 97 self-reporting post cards were mailed in (Smith personal communication).

## Whistler, British Columbia, Canada

The Conservation Officer Service of the Ministry of Environment, Lands and Parks received 667 complaints about bears in the Whistler area between 1992 and 1997. At least 83 bears were destroyed during this period due to human-bear conflicts. In British Columbia for the same time period, approximately 12,000 of 41,000 complaints were attended to by conservation officers; 4,200 bears were destroyed and 1,400 relocated (Whistler 1998). Both black and brown bears are involved in human-bear conflict in British Columbia; both are targeted by education intervention.

Education has been used to reduce human-bear conflicts in the Whistler community since the late 1990's. In 1999, Whistler was the first recognized Canadian "Bear Smart" community on a list that now includes Banff, AB; Canmore, AB; Kamloops, BC; Lion's Bay, BC; and Revelstoke, BC. In each community voluntary, preventative conservation measures have been implemented to address the root causes of human-bear conflicts in order to reduce the risks to human safety and private property, as well as the number of bears that have to be destroyed every year. Designed by a partnership composed of the Ministry of Water, Land, and Air Protection, the British Columbia Conservation Foundation, and the Union of British Columbia Municipalities, the "Bear Smart" program sets forth six criteria a community must satisfy before being recognized. These criteria are:

- (1) Prepare a bear hazard assessment of the community and surrounding area;
- (2) Prepare a bear/human conflict management plan that is designed to address the bear hazards and land-use conflicts identified in the previous step;
- (3) Revise planning and decision-making documents to be consistent with the bear/human conflict management plan;
- (4) Implement a continuing education program, directed at all sectors of the community;
- (5) Develop and maintain a bear-proof municipal solid waste management system;
- (6) Implement "Bear Smart" bylaws prohibiting the provision of food to bears as a result of intent, neglect, or irresponsible management of attractants.<sup>4</sup>

Stakeholders defined collaboration as a key element of the education strategy implemented in their demographically unique community. In 1997 there were 7,000 permanent residents and over 40,000 guests on a busy summer weekend at the resort. Recreational opportunities abound in Whistler, and each user group must be targeted to make the education program successful. Collaboration has helped interventionists target different audiences.

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<sup>4</sup> <http://www.bearsmart.com/bearSmartCommunities/>. Accessed 10/21/03.

The “Bear Smart” education program implemented in Whistler and other “Bear Smart” communities includes an assortment of print, cable TV, radio, brochure racks, mail outs, public appearances, and signage to target specific messages to different segments of the population over the course of every bear season. Messages change according to time of year and target audience (tourists vs. residents). The ultimate educational message is, “Problem bears are often the product of human carelessness and indifference.”<sup>5</sup> Backcountry recreationists are advised to preplan trips in bear country, call authorities to inquire about recent bear activity, learn about bears before embarking on their trip, leash their dogs during backcountry adventures, store food properly, stay alert, and never feed a bear (intentionally or unintentionally). Homeowners are advised to not allow bears to feel comfortable in their backyards, remain calm if/when a bear approaches, call authorities in appropriate circumstances (i.e., not when a bear is just walking through a backyard), and never feed a bear. Homeowners are also encouraged to use the “Bear Aware” checklist, which includes promising to not store garbage outside, not feed birds at birdfeeders from May until November, remove ripe fruit promptly from trees, and feed pets indoors.<sup>6</sup>

The “Be Bear Aware,” a program of the British Columbia Conservation Foundation, has set objectives to reduce the incidents of bear-human conflict through education, innovation, and cooperation. Educational messages from this program echo those from the “Bear Smart” program, encouraging people to remove the food attractants they may directly or indirectly provide bears, using bear-proof food containers when possible, and reminding people that feeding bears is illegal in British Columbia. “Be Bear Aware’s” Program Delivery Specialists lead bear-proofing efforts at the community level. They assist local volunteers in identifying and resolving bear related issues. “Be Bear Aware” programs have been implemented throughout North America, in places like New Jersey; Lake Tahoe, California/Nevada; West Virginia, and Tijeras, New Mexico.<sup>7</sup>

“Be Bear Aware” has conducted a few self-evaluations. Last year a “Midnight Raid” was carried out as an evaluative effort. “Be Bear Aware” staff went out at night to see how many garbage cans were placed curbside on the night before collection day. Then, large bumper stickers were placed on the cans which stated that garbage kills bears. Without any contact other than through the normal media releases, staffers determined that there was a reduction of approximately 50% in the number of cans available curbside. In Kamloops, located in south central British Columbia, a test area was set up in a neighborhood where residents were prevented by bylaw from putting their garbage out. A survey of cans placed curbside was mapped on GIS with the locations of bear-human conflicts as reported by the Conservation Officer Service. According to an organization employee, a results map showed that there were very few bear complaints in the test area, while complaints were greatly increased in those areas where there was no bylaw (Wieczorek personal communication). These results were used as part of the arguments submitted to convince the Kamloops City Council to implement the bylaw city-wide in 2003, which has been the worst year for residential area bear-human

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<sup>5</sup> <http://www.bearsmart.com/aboutUs/Programs.html>. Accessed 9/19/03.

<sup>6</sup> <http://www.bearsmart.com/aboutUs/Programs.html>. Accessed 9/19/03.

<sup>7</sup> <http://www.bearaware.bc.ca/local.htm>. Accessed 10/21/03.

interactions on record in British Columbia (Wieczorek personal communication). Unfortunately, the “Be Bear Aware” program ran out of funding in October 2003 and was closed hastily; many regional personnel were thus unable to issue reports on evaluating activities in their area.

One stakeholder of note, the Jennifer Jones Whistler Bear Society (JJWSB), took a very active role in implementing the black bear “Bear Smart” education intervention in Whistler. Using local photography and focusing on Whistler as prime bear habitat, brochures were disseminated to residents via mail and to tourists via brochure racks. JJWSB also distributed Be Bear Aware stickers for garbage disposal receptacles, as part of another education intervention program, “Bear Aware.” In addition to disseminating educational messages from the “Bear Smart” and “Be Bear Aware” programs, JJWSB uses education materials that include a video created for presentation at schools, Spirit Days, Whistler-Blackcomb orientations, and orientation for other major employers. Elementary school education curricula met with such success that secondary school curricula are currently in the works. “Buy-in from our youths is key to success, both in the short term and for generations to come” (Whistler 1998).

Formal evaluation criteria aside, JJWSB notes, “as a result of programs initiated by JJWSB, the number of human-bear conflicts and the number of so-called problem bears destroyed in Whistler has dropped significantly (by about 75%).”<sup>8</sup> Furthermore, JJWSB is in the process of expanding the “Bear Smart” community program across a broader geographic area to include the whole province of British Columbia.

Regulated hunting is permitted in specified areas of British Columbia, and lethal control may be employed if wildlife managers deem it necessary. The Ministry of Water, Air, and Land Protection notes that hundreds and sometimes thousands of bears have to be destroyed due to nuisance reports.<sup>9</sup>

### **Lake Tahoe, California/Nevada**

Lake Tahoe straddles the borders of California and Nevada; bear population estimates for the entire state of California range from 25,000 to 35,000 animals and 200 to 300 in Nevada.<sup>10</sup> Lake Tahoe is known as bear country and human-bear conflict was commonplace during the 1990’s. In October 1998, a tourist reported a sow and her cub to California Department of Fish and Game officials (CDFG), claiming that the bears damaged his summer rental property. A permit was issued and the bears were destroyed, erupting in a “firestorm of protest.”<sup>11</sup> The CDFG reported that at that time they were receiving an average of three nuisance bear calls a week.

This incident served as a “focus event” motivating stakeholder groups to advocate for wildlife management policy change (Birkland 1998). The Bear Preservation League

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<sup>8</sup> <http://www.bearsmart.com/aboutUs/Programs.html>. Accessed 9/19/03.

<sup>9</sup> <http://wlapwww.gov.bc.ca/wld/bearsmart/bearsmintro.html>. Accessed 12/3/03.

<sup>10</sup> [www.tahoewildbears.org](http://www.tahoewildbears.org). Accessed 9/19/2003.

<sup>11</sup> [http://www.reviewjournal.com/lvrj\\_home/1998/Oct-09-Fri-1998/](http://www.reviewjournal.com/lvrj_home/1998/Oct-09-Fri-1998/).

(BPL), a volunteer staffed non-profit, formed as a way of furthering education of local residents soon after the Homewood bear killing (as the incident came to be known.) The BPL identified the problem as local residents feeding bears and leaving out accessible food sources, such as garbage cans.

In May 1999, the BPL formed an education intervention agreement with the CDFG. Nuisance complaints were filed with the CDFG and the BPL was given permission to respond to the individual(s) filing the complaint to see if any alternative action to killing the bear could be taken. Before the partnership, the CDFG policy was to investigate bear property damage complaints, which led to the bear being destroyed. At that time, and now, CDFG policy is to destroy a nuisance bear; there is no translocation or 3-strike policy.<sup>12</sup> Nevada will translocate bear but lacks a 3-strike policy. Over 120 volunteers took the full-day training course when it was first offered, allowing them to respond to complaints, educate residents about bear-related problems, and make recommendations to remove attractants, use bear approved bear-avoidance measures, document contacts, and follow up with additional help. These volunteers typically answer phone calls from concerned residents, conduct home visits if needed, and remain on call to use bear-avoidance measures. These volunteers seem similar to the Program Delivery Specialists of the “Be Bear Aware” program.

The BPL later worked to educate the North Tahoe Regional Advisory Council in the council’s quest to make it illegal to allow bears access to garbage. [Feeding bears is illegal in California, but apparently the law is not enforced] (Bryant personal communication). A similar ordinance in Nevada soon followed. A first offence leads to a written warning and the second offence brings a mandatory installation of an \$800 garbage bin within 30 days of the incident. This ordinance is enforced. The BEAR League estimates 60-70% of phone calls to their hotline inquire about how to keep bears out of garbage.

In June 2003, the Tahoe Council for Wild Bears, a council of 11 groups ranging from agency to local and regional special interest, private corporations and federal agencies, announced a partnership with Safeway supermarkets. Safeway stores in California and Hawaii distributed one million paper grocery bags that display a “keep bears alive and wild” message. An artistic illustration of a bear, accompanied by important tips on living in bear country has been praised by partners as cutting across demographics and encouraging responsible behavior (bagging and properly disposing of trash). This is an especially interesting education intervention, as it uses food as the mode of intervention as well as using food as the central component of the educational message. A recent education intervention by the BEAR League involves a preview slide playing in all local movie theaters with a message telling viewers, “Bears are not the problem, people are; please store trash responsibly.”

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<sup>12</sup> A 3-strike policy is common in many states with human-bear conflict. A bear is given three strikes or chances during nuisance encounters, before it is destroyed. Often times bears are translocated, aversively or negatively conditioned, and/or tagged during the first or second strike.

California permits sport hunting in specific regions of the state; in 2002 1,736 bears were harvested. The season is typically closed when the harvest reaches about 1,700 bears. In 2000, California had 260 statewide reported black bear incidents; in 2001, 133 statewide incidents were reported.<sup>13</sup> Local information for Lake Tahoe is currently unavailable.

### **State of New Jersey**

Over the past thirty years, the black bear population in New Jersey has increased, along with available forested habitat and human population (Carr and Burgess 2003). Faced with a unique mosaic of forested lands and suburban landscapes, the approximately 1,900 black bears are increasingly coming into conflict with people. In 1995, the Division's Wildlife Control Unit received 285 complaints about bears. In 2000, the number soared to 1,375 complaints resulting in \$200,000 worth of damage.<sup>14</sup> Human-bear conflicts are covered extensively and exhaustively in local and regional media.

In 1997, an intensive education intervention was implemented, including presentations to school children, civic organizations, communities and other groups, as well as the development of an educational video, public service announcements, brochures, signs, and other educational materials. These efforts were intended to increase overall resident knowledge of the state's growing black bear population and how to coexist. The key content areas of the messages echo those in the "Be Bear Aware" program; New Jersey is a member of the program. Messages include informing residents that they are in bear country and that certain actions, such as proper garbage disposal and feeding birds at feeders are risky and to be avoided. Residents are advised to feed pets inside and what to do/who to call if they have a problem. Bumper stickers, websites, public presentations, coloring books, bookmarks, book covers, posters, and video clips have all been used as delivery mechanisms for educational messages. In a public service announcement, Department of Environmental Protection Commissioner Bradley M. Campbell notes, "We cannot change their [bear] behavior; it is up to us to change ours."

Although black bears were historically considered a game species by the state, in 1971, due to dwindling population numbers and decreasing habitat suitability, bear hunting was eliminated. Important information regarding current population size estimates, state-wide distribution, and home-range use was gathered and disseminated via conferences, websites, and other media. In summer 2003, the New Jersey Fish and Game Council approved a game code permitting limited black bear hunting. Since that time, efforts have been made to educate state residents and individuals living in bear-inhabited areas about the management implications of a hunt, as well as the details of the hunt.

The Bear Education and Research Group (BEAR), a non-profit organization, has also offered education to residents of bear-inhabited regions, describing specific, non-lethal, techniques they can use to reduce bear conflicts in their backyards. BEAR is part

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<sup>13</sup> <http://www.dfg.ca.gov/hunting/bear/mgmtharv.html>. Accessed 12/3/03.

<sup>14</sup> <http://www.state.nj.us/dep/fgw/bearq&a.htm>. Accessed 9/19/03.

of a larger coalition of local and national special interest groups working with select county and community governments. Through special presentations, regular meetings, newsletters, public rallies, and a website, BEAR has been working to foster education about black bears and minimize human-bear conflict in bear-inhabited regions of the state.<sup>15</sup> Many of BEAR's messages focus on demystifying bears, and encouraging homeowners to not feed bears. Messages are also disseminated that advocate non-lethal management of black bears such as aversive conditioning. New Jersey is also a "Be Bear Aware" program participant.

Black bear hunting is permitted in specified areas of New Jersey, and lethal control may be employed if wildlife managers deem it necessary. Winter 2003 is the first scheduled hunt in 33 years; 328 bears were harvested. Nuisance reports regarding human-bear conflict for 2003, so far, total 1,350.<sup>16</sup>

### **Central Florida**

Unlike the other cases documented in this report, black bears are listed as threatened by the state of Florida; six fragmented regions are home to an estimated 1,500 to 2,500 black bears. Black bear conservation and awareness is a driving factor behind much of the black bear education in the state. With 500-1000 new residents a day, Florida is home to many individuals who are unaware that bears inhabit the state and unaware about what to do during an encounter [or how to avoid a negative encounter]. Direct and indirect human-bear conflicts persist; although many conflicts are due to food conditioning by humans, human encroachment on suitable bear habitat has forced the black bear to adapt quickly at living in humanized environments. Nuisance complaints to regional agencies have increased steadily since the 1970's (Simik personal communication).

The problem, as defined by the Florida Fish and Wildlife Conservation Commission, is to conserve the bear population and minimize conflict so bears do not have to be destroyed [a 3-strike policy exists but is not universally enforced]. Another problem defined by the Commission lies in the face of budget cuts and reduced staff to respond to nuisance complaints. The agency used to translocate bears but this option is increasingly unpopular among managers. Managers cite scientific evidence refuting the overall effectiveness of translocation and the desire for communities to take more responsibility for their actions (Simik personal communication).

A number of black bear education interventions have been implemented over the past five years by the Florida Fish and Wildlife Conservation Commission, in partnership with groups such as Defenders of Wildlife. A Florida Black Bear Curriculum, first implemented in 1999 to educate school-age children and teachers, is now distributed state-wide and outside bear-inhabited regions. This curriculum is being adapted by other

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<sup>15</sup> BEAR receives support from a host of local, regional, and national organizations, and local and regional governments.

<sup>16</sup> <http://www.nj.com/news/ledger/jersey/index.ssf?base/news-5/107034848372970.xml>. Accessed 12/3/03.

states seeking to educate about bear habitat, biology, and conservation. Only one portion of this curriculum, a video, has been formally evaluated; it was found to be ineffective and removed from the intervention. A postage free feedback postcard is included with the curriculum guide for educators (primarily school teachers) to make comments regarding the “usefulness, appropriateness, user-friendliness, relevance, and overall quality” of the curriculum, as well as a section for write in comments. The aforementioned video was evaluated in this way.

The Bear Community Liaison program, now in its second year, targets residential housing developments or homeowners’ associations to provide information about nuisance bears. Serving as a community link to the state agency, a liaison is provided with educational materials to share with fellow residents about responsible garbage disposal and how to deal with nuisance bears. Liaisons are given set criteria to evaluate a nuisance activity, and can contact a homeowner filing a complaint. They visit the homeowner, provide a situation analysis, and can attempt to remedy the problem with the educational materials provided or call in wildlife officials (e.g. in instances of illegal feeding). The program seems to be received well but has not been evaluated formally.

The most recent education intervention is the implementation of the “Bear Response Agents” program. Five individuals received extensive training on handling nuisance complaints throughout the state. Their responsibilities include responding to complaints, speaking with landowners, providing literature, and trying to educate the landowner to mitigate the problem. Agents also participate in translocating bears, but are not authorized to translocate without agency staff. The nascent program has not been evaluated formally, but the reduction in agency staff hours dedicated to responding to nuisance complaints is evidence of success (Simik personal communication).

The Annual Umatilla Bear Festival, an event co-sponsored by the state agency, Defenders of Wildlife, the Florida Chapter of the Sierra Club, Walkabout Adventure, Inc., Wildlife Foundation of Florida, and the U.S. Forest service, is a popular event designed to promote bear awareness and conservation. It draws large crowds (an estimated 10,000 in 2000) and is a highly publicized and anticipated event. In 2002, the Florida Fish and Wildlife Conservation Commission contracted a graduate student to conduct a survey at the Bear Festival to, among other things, assess the perception of the educational aspect of the Festival. In the survey report, conclusions included respondents learning what the educational staff had set as “learning objectives” for seminars (“Imperiled Bears of Florida, Homeowners Guide to Living with Bears, How Many Bears? Florida’s Bear Populations, etc.). Respondents were asked to identify the reasons why they came to the festival; 57% said they attended to “learn more about bears.” Respondents were also asked to identify every message they recalled having seen or heard during the day. Answers included: never feed bears directly; how to avoid creating conflict; feeding is number one cause of conflict; use bear-proof garbage cans; avoid indirect feeding; install electric fences; and it is illegal to feed the bears directly. The most commonly recalled message, with 70%: feeding is the number one cause of conflict (Umatilla Chamber of Commerce et al. 2002).

There is no sport hunting permitted in Florida, however, lethal control may be employed if wildlife managers deem it necessary. The Florida Fish and Wildlife Commission notes between 1978 and 2002, over 5,777 reports of negative human-bear encounters were filed.<sup>17</sup>

### **West Yellowstone, Montana**

The West Yellowstone Wolf and Grizzly Discovery Center, in West Yellowstone, Montana, is a 10-year-old organization that switched from private to non-profit status in 1999. A number of bear-related stakeholders (e.g., Defenders of Wildlife, Wind River Bear Institute) sit on an advisory committee, and partner with the center on their educational endeavors. A captive animal center for grizzly bears and wolves that otherwise would have been destroyed for a number of reasons, the Center targets tourists to the area, visitors entering Yellowstone National Park, hunters, and the occasional local rancher or resident. Recent population estimates hold that approximately 600 black bear and 340 grizzly bear inhabit Yellowstone National Park. The lack of preparedness by the aforementioned stakeholder groups when encountering a grizzly bear, black bear, or wolf, is the key problem addressed by education efforts.

Backcountry campers are known to have encounters with both species of bear; however it is hunters who are experiencing the greatest increase in conflict with bears. Beyond the YNP boundaries, successful hunters often encounter YNP bears emigrating out of the park because they are interested in consuming a hunted animal's entrails intended to be left behind. Local ranchers occasionally visit the center to learn about what agency depredation compensation programs involve, but not to learn about bear biology or ecology. Specific problems related to black bears involve an overall complacency toward the animal; many people go out of their way to feed black bears for a number of reasons, but are unable to get rid of them. The center educates about the repercussions of feeding bears (West Yellowstone Wolf and Grizzly Discovery Center personal communication).

The Discovery Center has a grizzly bear and gray wolf habitat enclosure exhibit, where visitors can view live animals in a naturalized setting. Occasionally, when the animals are "off exhibit," curators give them backpacks or stuff sacks full of food and let the bears destroy the property so that the bags can later be displayed as evidence to center visitors. Such evidence is used during public outreach programs or school presentations given offsite in Bozeman or other neighboring urban areas.

The center will soon be the permanent home of the Minnesota Science Museum's traveling exhibit titled, "Bears: Imagination and Reality." This exhibit tells about bear biology, history, ecology, conservation, hunting, and research. Research tools such as collars, ear tags, scales, etc. are on display for a hands-on educational experience. The

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<sup>17</sup> <http://wildflorida.org/bear/conflicts.htm>. Accessed 12/3/03.

center is also in the final stages of completing a bear-proof container-testing protocol, where products labeled as “bear proof” or “bear resistant” can be field tested after leaving the design lab. The center’s resident bears will have a go at the products, and the protocol will offer a standardized comparison for shoppers looking for bear-responsible products and labeling. The center’s partnership with the Wind River Wildlife Institute has led to public education about the use of Karelian Bear Dogs in aversively or negatively conditioning bears in conflict situations. Dog demonstrations at the center are a popular event. The dogs are frequently used with grizzly bear management.

There has been no formal evaluation of the educational materials provided by the center; because of the target audience consisting mainly of one-time-visit-only tourists and visitors, it is hard to capture the effects of education. The center is considered a success by many accounts; it cares for animals that would otherwise be destroyed due to nuisance activity, and debunks many myths about and between grizzly bears and black bears (West Yellowstone Wolf and Grizzly Discovery Center personal communication).

Black bear hunting is permitted in specified areas outside and around Yellowstone National Park, and lethal control may be employed [outside and inside park] if wildlife managers deem it necessary. Wyoming’s 2002 harvest total was 323 bears; Montana’s harvest total is approximately 1,100 per year.

## **DISCUSSION**

Human-bear conflict is an increasingly important element of black bear management. Preventing human-bear conflict in a manner that is not lethal to bears and rests on modifications of human behavior(s) seems to be an increasingly desirable element of black bear management policy. Black bear-related human education intervention is one human-bear conflict management strategy used in many parts of North America to change such human behaviors, yet evaluations of these interventions are uncommon.

A number of similarities can be seen among the case studies examined. These similarities are inductive in nature, and thus serve to stimulate fruitful areas for further questions, discussion, or research rather than generalizable conclusions:

- (1) Human-black bear conflict is not a local, small-scale phenomenon; rather, the issue spans a diverse array of geographic and human demographic contexts;
- (2) Comprehensive and extensive black bear education interventions exist in communities/regions where human-bear conflict has reached a “crisis” level;

(3) Education interventions are implemented and maintained by different types of stakeholders and interventionists; stakeholders' motivation is diverse as well;

(4) Overall, evaluation of education interventions is lacking, even in communities with extensive programs; and

(5) Most education interventions in these contexts appear to be implemented as a means to address human-bear conflict via human behavior modification, not bear behavior modification.

This review of relevant literature indicates that research is needed to help define what constitutes success of education intervention programs, and evaluate under what circumstances education interventions are successful, especially with respect to changes in human behavior and attitudes toward bears.

Questions of interest include: When designing a black bear education intervention, how should the context of the community be considered? What lessons can be learned from implementing different education treatments in multiple communities? How does the role of the interventionist contribute to changes in attitudes and behaviors at the individual level? Are specific forms of bear-related education intervention superior in certain contexts in bringing lasting changes in human behavior? What is the role of understanding risk perception in designing a persuasive education intervention? Answers lie in understanding more fully the dynamics of communities experiencing conflict, and interrelationships between community members and interventionists.

The behavior of black bears in conflict-ridden communities also deserves attention. As illustrated by the cases reviewed here, many black bear-related human education interventions are designed to change human behavior, specifically regarding intentional and unintentional feeding of bears, which in turn may influence bear behavior. Food-conditioned bears are commonly involved in conflict. Will black bear behavior change in response to changes in human behavior? Will removing the food reward reduce conflict? Does a change in bear behavior indicate a successful education intervention?

Human-wildlife, and indeed human-bear conflict, is increasing in frequency and magnitude (Messmer 2000; Conover and Decker 1991; Conover 1998). The most frequent type of conflict includes garbage raiding, birdfeeder damage, personal property damage, or general nuisance damage. This review suggests some areas of inquiry that may be helpful to inform problem solutions.

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## APPENDIX

COMMUNITY	DEFINED PROBLEM	EDUCATION INTERVENTION AND OBJECTIVE	ALTERNATIVE OPTIONS REVIEWED	STAKEHOLDERS INVOLVED	TARGET AUDIENCE	CRITERIA TO DEFINE SUCCESS (as defined by interventionists)	SPECIES	LETHAL CONTROL
<b>High Peaks Region, Adirondack Park New York</b>	Human-bear conflicts between back-country campers and black bears (stolen backpacks, bear bags, food, bears handing around campsites, bear-related injury) often leads to black bears being destroyed and personal property being damaged	<i>Objective: Educate people to use correct bear bag/food canister system BEFORE campers reach trail head (people won't turn around and go back into town to get correct gear). Intervention: Partnership between EMS and WCS to promote use and rental of bear proof canisters.</i>	Destroy nuisance bears as problems arise; restrict number of back country campers	WCS; local EMS managers; regional NYSDEC; EMS employees; back-country campers; bear canister company; Adirondack Loj employees	Back-country campers	Reduced complaints to forest rangers and at trail heads; no formal evaluation criteria	Black bear	Lethal Control practiced; hunting permitted

COMMUNITY	DEFINED PROBLEM	EDUCATION INTERVENTION AND OBJECTIVE	ALTERNATIVE OPTIONS REVIEWED	STAKEHOLDERS INVOLVED	TARGET AUDIENCE	CRITERIA TO DEFINE SUCCESS (as defined by interventionists)	SPECIES	LETHAL CONTROL
<b>Lake Tahoe, CA and NV</b>	Human-bear conflicts between residents/ tourists and bears (human negligence leads to bears being able to access garbage and human food) results in black bears being destroyed	<i>Objective: Reduce human-bear conflict and lethal control of black bears. Intervention: Tahoe council for Wild Bear's partnership between Safeway Supermarkets, Defenders of Wildlife, and BEAR League for grocery bag campaign [1 million paper bags will carry picture of bear and keep bears alive and wild message with websites listed on bags]. Bear Preservation League (BPL) and California Department of Fish and Game partnership where BPL's trained volunteers respond to resident's bear complaints to educate and advocate non-lethal control.</i>	Lethal control (in California); translocation; selective garbage container ordinances	Animal Protection Institute; BEAR League; California Department of Fish and Game; Defenders of Wildlife; Echo Lakes Environmental Fund; Human Society of the United States; Lake Tahoe Wildlife Care; McClintock Metal Fabrications Inc.; Nevada Division of Wildlife; Tahoe Regional Planning Agency; and U.S. Forest Service	All demographics; no intentional targeting of a specific sector of the population	No formal evaluation criteria	black bear	Lethal control practiced; hunting permitted in California
<b>Whistler, British Columbia, Canada</b>	Human-bear conflicts between residents/ tourists results in black bears being destroyed	<i>Objective: Reduce human (resident/tourist)-bear conflict. Intervention: Implementation of Bear Smart Community Program, which includes extensive ad campaign (print; radio; cable; TV), "Bear Smart" presentations to the public, website, distribution of education materials and pamphlets to schools, non-lethal bear management training workshops, signage, "We are Bear Aware" property stickers/signs.</i>	Lethal control; translocation; selective garbage container ordinances	Partnership between Resort Municipality of Whistler; Bylaw Services; and the Ministry of Water; Land and Air protection; First Nations; Jennifer Jones Whistler Bear Society	7,000 locals and up to 1 million tourists a year	75% reduction in nuisance bear complaints; no formal evaluation criteria	Black bear	Lethal control practiced; hunting permitted

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<b>(northern) New Jersey</b>	Human-bear conflicts between residents and black bears leads often to destruction of bears and threats to human property and safety	<i>Objective: Reduce human-bear conflict resulting in threats to human health and safety and often, destruction of black bears. Intervention: Public presentations, websites, school programs, camping programs, employee programs, brochures, video, newsletters, bear group meetings.</i>	Hunting season; lethal control; statewide ordinance prohibiting feeding of bears	New Jersey Fish and Wildlife; Bear Education and Resource Group (BEAR)	Students; teachers; all NJ residents; bear country inhabitants	Lack of extreme human-bear conflicts; increase in requests for presentations; no formal evaluation criteria	Black bear	Lethal control practiced; first hunt in 30+ years scheduled for fall/winter 2003
<b>Central Florida</b>	Human-bear conflict counteracts black bear conservation and coexistence with humans	<i>Objective: Promote black bear conservation and coexistence with humans. Intervention: Umatilla Bear Festival, Florida Black Bear Curriculum, Bear Community Liaison program, Bear Response Agents program, some program evaluation.</i>	Translocation; lethal control	Florida Fish and Wildlife Conservation Commission; Defenders of Wildlife; U.S. Forest Service; Central Florida school teachers; town of Umatilla	Students; teachers; residential housing development inhabitants; individuals filing bear-related complaints; volunteers	Curriculum seen as success because of growth and popularity of program; no formal evaluation criteria beyond festival survey	Black bear	Lethal control practiced; no hunting permitted
<b>West Yellowstone Wolf and Grizzly Discovery Center, West Yellowstone, MT</b>	Human-bear conflicts between YNP visitors (tourists, hunters) result in lack of accurate perceptions towards grizzly bears, black bears, and wolves	<i>Objective: Increase human understanding of grizzly bears, black bears, and wolves that result in human-bear conflict. Intervention: Serve as home to Minnesota Science Center's "Bears: Imagination and Reality" Exhibit, Live Grizzly/Wolf Exhibits (nuisance animals or cubs of nuisance animals), bear videos, brochures, display boards, outreach, website, public presentations, and Kerelien Bear dog demonstrations.</i>	N/A [they're contemplating what to do with extra 6 acres of land]	Non-profit organization working loosely with YNP, Defenders of Wildlife, Wind River Bear Institute; potential future alliance with US Forest Service	Tourists; visitors to YNP; ranchers; hunters, students	No formal evaluation criteria	Black bear; grizzly bear; wolf	Lethal control practiced; hunting permitted outside and around park boundaries