AN EVALUATION OF COMMUNITY-BASED SOCIAL MARKETING STRATEGIES USED TO REDUCE HUMAN-BEAR CONFLICT IN WHISTLER, BRITISH COLUMBIA

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Abstract: One of the ways communities in British Columbia have mitigated rising conflicts with American black bears has been to increase educational efforts, particularly door-to-door campaigns. It is not known if door-to-door education modifies human behavior enough to reduce the amounts of available anthropogenic attractants, and by extension conflicts with humans, for bears on private property. Community-based social marketing strategies (CBSM) have been shown to be effective at changing human behavior in other environmental education efforts. Sixty house visits in two neighborhoods in Whistler, British Columbia were divided into 3 treatment groups: control, regular and CBSM and visited in late spring and late summer. Levels of unsecured attractants noted at the first visit were compared to the levels noted at a second visit 4-8 weeks later. Residents in both educated groups (regular and CBSM) reduced available attractants to low levels after the education campaign, while controls did not. This report highlights the importance of door-to-door education efforts in a community with an established long-term education program.

Human-wildlife conflict is an issue all over the world, and occurs whenever interactions between humans and wildlife result in negative implications for both (Conover 2002). Conflicts with wildlife can be very costly economically, and can be directly detrimental to wildlife conservation by increasing mortality, or indirectly detrimental by decreasing human tolerance for wildlife, in particular for carnivores.

Conflicts between humans and bears usually stem from unsecured attractants. Bears that repeatedly access anthropogenic attractants are said to be food-conditioned and, unlike human-tolerant bears, are both more dangerous around humans and more likely to cause property damage (Herrero 1989, Gunther 1994). Because of these risks, and the ineffectiveness of translocating adult bears (Rogers 1986, Riley et al. 1994, Agee and Miller 2009), wildlife managers may employ several methods with varying success to address the issue. Mitigations include lethal bear management, attempts to modify bear behaviour and attempts to modify human behaviour. Modifying bear behaviour is usually only possible when attractants are unavailable to bears (Mazur 2010, Homstol 2010). Therefore, in order to maximize efforts to reduce human-bear conflict, modifying human behaviour (e.g. securing attractants) is necessary.

Modifying human behaviour usually includes education and enacting (as well as enforcing) laws to ensure the desired behaviour occurs. In communities attempting to reduce conflicts with bears, many educational programs include door-to-door campaigns requesting residents change their behaviour. Specifically, they ask residents to keep garbage and recycling indoors, in a closed garage, or in a certified bear-resistant bin; to compost in ways that minimize odours; to feed pets indoors or remove the uneaten contents of bowls immediately; and to abstain from feeding birds during the active bear season.
season. Door-to-door educational programs have traditionally measured success based on the number of people contacted. Ultimately, however, that goal should also include whether the residents actually changed their behaviour; i.e. secured their attractants from bears.

One of the more successful methods recently used to change human behaviour is community-based social marketing (CBSM). Using methods designed to identify and remove barriers to behaviour change, asking people to volunteer written commitments, providing convenient reminders (prompts) of the desired change, and by building community support and incentives to motivate change, CBSM techniques are proven to be more effective than more traditional methods (as reviewed in McKenzie-Mohr and Smith 1999).

Building on a base of research already completely in Whistler, British Columbia, I designed a pilot program to evaluate whether we could improve established educational techniques by using community-based social marketing. The project was designed to determine both the level of unsecured anthropogenic attractants, and how effective a door-to-door educational campaign is in changing human behaviour that would reduce the level of available attractants. This report details my educational efforts aimed at reducing human-bear conflict through human behaviour-modification, as it relates to securing anthropogenic attractants in Whistler.

STUDY AREA

Whistler is a resort community 125 km northeast of Vancouver in southwestern British Columbia’s coast mountains (Figure 1). Approximately 10,000 permanent residents live in Whistler and over 2 million people visit each year (Tourism Whistler 2010). Bear habitat surrounding Whistler is of high quality and supports a very dense population of American black bears (Ursus americanus). An altered landscape i.e. powerlines, three golf courses, two ski hills; as well as municipal policies that encourage residential areas to be very permeable to wildlife have resulted in black bear population densities of around 1 bear/km² (Appleton 2005). Conflicts with humans are also high, with over 300 reported human-bear conflicts during the summer of 2010 plus over 300 reported bear sightings (Doyle 2010).

Whistler is in the process of applying for Bear Smart Community status, having completed all six steps of a rigorous provincial program. These steps include: conducting a bear hazard assessment, implementing a human-bear conflict management plan, incorporating bear smart initiatives in Official Community Plans, enacting bear smart bylaws, implementing a bear-resistant solid waste management system, and supporting ongoing educational initiatives.

For CBSM to be effective, barriers need to be identified and removed in order to promote positive change. In 2007, the Get Bear Smart Society commissioned a focus group involving bear smart and non bear smart people in Whistler. The goal was to identify barriers to bear smart behaviour. Internal barriers identified included: lack of motivation and ownership, lack of caring for environmental issues, immaturity, lack of knowledge and understanding
of living in bear country, busy lifestyle, poor organizational skills, conscious risk taking and lack of incentives (Guidelines Research 2007). External barriers included: lack of an easily accessible municipal garbage system, garbage depot far from residences (particularly for residents without vehicles) and poorly managed strata garbage bins (Guidelines Research 2007). While, we as educators have little control over the external barriers noted; we do, however, have some influence over internal barriers. CBSM strategies can help by specifically addressing ways to influence attitudes and knowledge retention.

METHODS

Because human-bear conflict in Whistler is randomly distributed and difficult to predict (von der Porten 2010), I randomly chose two Whistler subdivisions in which to conduct door-to-door educational campaigns. I divided each subdivision (or portion of a subdivision) into three blocks and assigned each block as (1) control, (2) regular or (3) CBSM treatment group. Each treatment group consisted of a strip of 10 houses. I conducted two rounds of surveys: one in late spring and one in late summer.

At residences in all treatment groups, I rang the bell or knocked on the front door, asked residents if they had noticed any bear activity, and inquired if I could survey the property for bear sign. If permission was granted, I entered the property, noted bear sign, and catalogued unsecured attractants. For houses in the control group, this was the end of the treatment. I did not survey residences where no one answered the door.
For houses in the *regular* treatment group, in addition to surveying the property, I also distributed a standard black and white educational pamphlet containing information about what attracts bears to homes, how to identify and secure attractants from bears, and a local phone number to call if any bear activity is noticed. I asked residents to secure any attractants such as garbage and recycling.

I wore a British Columbia Conservation Foundation uniform when I canvassed houses in the *CBSM* treatment group. After asking the resident about recent bear activity, I informed them that I was initiating a community bear watch program to reduce available attractants and asked if they were willing to participate. Participation involved hanging a 35 X 10 cm sign (Figure 2) in a window and signing an agreement to keep attractants unavailable to bears. During the property survey, I invited the residents to accompany me if I found attractants, and provided ideas to secure the attractants or helped them as necessary. I gave them an attractive colour pamphlet containing a fridge magnet with reminders to secure garbage, recycling, BBQs, pet food and birdfeeders. Unfortunately, municipal bylaws prevented me from erecting larger neighbourhood lawn signs.

![I'm a good neighBEAR](image)

I'm a good neighBEAR

I don't attract bears to my yard

getBEARsmart.com

Figure 2. Participants hung a 35 X 10 cm sign in a window as part of a community bear watch program initiated for residents in the *Community-based Social Marketing* group in Whistler, BC.

At all residences, I categorized attractants as garbage, recycling, BBQs, vegetation, pet food, bird feeders, open doors or windows, or other. I assessed relative amounts of unsecured attractants to be at low, moderate or high levels. If a residence had two categories of attractants unsecured, I recorded relative amounts as moderate. I scored attractants as high if I noted more than two categories of unsecured attractants, or if any single attractant was present that a bear could spend more than a few minutes ingesting.

After 4-8 weeks passed, I revisited the residences and categorized attractants in the same way as pre-treatment visits. For analysis, I scored residences with no attractants as a 1, low attractants as a 2, moderate attractants as a 3, and high levels of attractants as a 4.
used an analysis of variance (ANOVA) design to compare the three treatment groups to each other, and paired $t$-tests to compare pre and post-treatment levels of unsecured anthropogenic attractants, using SPSS (version 17, Chicago, Illinois, USA).

RESULTS

I visited a total of 60 houses in two neighbourhoods over the course of the summer of 2010. Of the 60 houses surveyed in pre-treatment, 42% (n=25) had some level of unsecured attractants. However, only 5 scored in the high category, 10 in the moderate category, and 10 scored in the low category.

In the CBSM group, the occupants of three residences were empty in the post-treatment survey and I excluded them in analysis. As expected, there were no significant differences between the three groups in at the first visit ($F_{256} = 1.42, P = 0.25$). After door-to-door education, residents in the regular group reduced available attractants ($t = 0.6, P = 0.02$), as did residents in the CBSM group ($t = 1.1, P = 0.03$).

Figure 3. Relative unsecured attractants at residences in Whistler, BC educated using community-based social marketing, no education (control), and regular door-to-door education approaches (a pamphlet). Attractant availability was scored as 1 for no attractants, 2 for low levels, 3 for moderate levels and 4 for high levels.
Residents in the control group did not reduce attractants in the same time period ($t = 1.8, P = 0.29$). The three treatment groups did have differing attractant levels after education ($F_{2,56} = 3.62, P = 0.03$). Post-hoc Tukey tests suggested that the CBSM group had lower levels of unsecured attractants compared to controls ($P = 0.02$; Figure 3).

**DISCUSSION**

Community-based social marketing can be more effective at modifying human behaviour than more traditional methods of education (as reviewed in McKenzie-Mohr and Smith 1999). Providing prompts, incentives, asking for commitments and displaying signs declaring that commitment publically likely results in residents taking more ownership and responsibility for their own roles in attractant management, as well as encouraging neighbors to follow their example.

Differences in post-treatment between the two educated groups (regular and CBSM) suggest that CBSM may be more effective than regular door-to-door education techniques, since there were no differences between the groups in a one-way ANOVA in pre-treatment, but CBSM residents had significantly lower attractants in post-treatment than the control group while the regular treatment group did not. However, since the $P$-values were so similar for the pre vs post comparisons in both groups ($P = 0.02$ and $P = 0.03$), and the regular treatment group had the highest level of available attractants in pre-treatment (though not statistically significantly so), the differences between the two educated groups are actually relatively small. Future evaluations may find greater differences between the groups if residents with high levels of attractants are specifically targeted in a door-to-door education campaign, rather than randomly visiting residents who then had mostly no or low levels of attractants unsecured.

Community-based social marketing strategies involved a considerable time investment compared to regular door-to-door education. While I estimate that I spent a few minutes with each resident in the regular education group, I easily spent more than twice that time with residents in the CBSM group, sometimes well over 30 minutes if I was helping to secure attractants or explaining local bear population dynamics and local wildlife management programs. Very few residents refused the property survey, and only 3 residents in the CBSM group refused to display the window sign. All of the signs in the CBSM group were still displayed at the post-treatment visit.

It was surprising that the differences between CBSM and regular education strategies were so small. This may be partly due to my inability to use all CBSM tools that other successful environmental education programs have used. Tools I used included: prompts (fridge magnet), an attractive pamphlet, an endorsement (uniform) from a credible organization, a voluntary written commitment, and a window sign publically displaying that commitment. However, I was unable to mobilize volunteers from each block of CBSM to spearhead their own local efforts and municipal bylaws prevented me from erecting larger neighbourhood signs that would serve as additional prompts and contribute to community ownership. Nor was I able to utilize effective positive incentives; while there is a bylaw prohibiting residents from leaving bear-attracting items unsecured, the only incentive I used was that of avoiding a fine.
The lack of a difference between the two educated groups may also stem from prior education in the community. Most residents in Whistler seemed to be fairly knowledgeable in bear smart practices and securing attractants, having had active bear education programs in the community since 1996. Whistler residents usually know their neighbours and some passive peer pressure to keep attractants secured from bears may already be at work from residents communicating to each other that they had seen a bear in the area. Education cannot replace enforcement, and the reminder residents receive from a door-to-door educational campaign likely is successful in part because residents are educated about the garbage and attractant bylaw, requiring people to secure attractants from bears.

Education is only one of the tools in a holistic human-bear conflict management program. We can use education and CBSM strategies to remove internal barriers to bear smart practices, but removing external barriers is just as important. The most obvious external barrier to bear smart practices in Whistler is the lack of convenience of the solid waste management system, which makes it difficult for residents to secure or dispose of bear attractants regularly, particularly for those without vehicles.

RECOMMENDATIONS

I recommend door-to-door educational campaigns in Whistler, as they are clearly effective at reducing amounts of unsecured bear attractants. Despite the high level of education people in Whistler receive, having an educator at their door clearly resulted in higher levels of vigilance in keeping attractants secured. I recommend using CBSM strategies if manpower resources permit for the additional time commitment, and specifically for neighbourhoods with higher levels of unsecured attractants. Using too few CBSM tools may not yield optimum results.

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LITERATURE CITED


