

Predators: Gauging the Need for Community Education Programs

Brande Overbey  
Miami University  
Chicago, IL USA  
July 2015

### Abstract

Conservation initiatives for large predators such as bears have a strong community engagement component. To minimize the risk that encounters pose to both humans and animals, it is essential that communities existing near predator territories be thoroughly educated about safety behaviors. In many American states, including Illinois, bears are not currently native. However, due to the recent rise in roaming animals from neighboring states, a need for educational programs is becoming increasingly apparent. During the month of June 2015, two separate research surveys were distributed to the public: one version to Illinois residents only; the other version to “bear country” residents, who live in bear-populated areas in North America. The purpose of these surveys was to measure reported fear of bear conflict and exposure to educational/management programs. The results of the data analysis showed an inverse correlation between attendance of community educational programs and self-reported reported fear of bears. These findings indicate that properly delivered community safety programs and educational literature can have a statistically significant impact on reduction of fear in the population. They also provide encouragement for the importance of developing such programs as an integral first step in creating bear-safe communities.

### Predators: Gauging the Need for Community Education Programs

About 20 million years ago, during the early Miocene Epoch, the most ancient form of bears first appeared on the Earth. Far from the formidable predators found today, these early ancestors of bears in the genera *Cephalogale* were small and raccoon-sized. Since then, a great deal of evolution has occurred to produce the varieties of bears present on earth today (McLellan and Reiner, 1994). In the modern world, eight forms of bears are now recognized as distinct species: the brown bear (*Ursus arctos*), American black bear (*Ursus americanus*), Asiatic black bear (*Ursus thibetanus*), polar bear (*Ursus maritimus*), giant panda (*Ailuropoda melanoleuca*), spectacled bear (*Tremarctos ornatus*), sloth bear (*Melursus ursinus*) and sun bear (*Ursus malayanus*). Bears are currently only found on the continents of South America, North America, Asia, and Europe. The sole African bear species, the Atlas bear (*Ursus arctos crowtheri*, a subspecies of brown bear), became extinct in the 1870's ("Atlas Bear," 2007).

Over humanity's own 15,000 years of evolution, bears have performed many roles: predator, food source, companion, and even object of worship in some cultures. In Asian countries such as South Korea, Laos, China and Vietnam, bears are occasionally kept in captivity to harvest their bile, which has traditionally been used in Chinese medicine practices for millennia (Feng et al., 2009). In Native American tribes, bears are commonly revered and are part of many cultural ceremonies and traditions ("History of Black Bears," 2015). In folklore and popular culture around the world, bears are depicted in whimsical ways; today's children are often familiar with Paddington, Winnie the Pooh, Yogi Bear, the Berenstain Bears, and the ever-popular teddy bear (Varga, 2009). Depending upon where in the world they are located, bears are treated by humans with emotions ranging from terror, annoyance, respect, and even adoration.

In the United States, our history with bears is a long and complicated one. When humans first entered North America, black and brown bears were common in every part of the continent, with polar bears found near the northern arctic waters. More recently, in the land that is now the US, Native Americans lived with close ties to the land and nature. Bears were highly respected and they were represented prominently in the mythology of nearly every tribe (“North American Bear Mythology,” 1998). As pioneers from Europe began to arrive to colonize this land, they brought with them very different viewpoints on nature and wildlife. To the settlers, wilderness was seen as menacing and bears represented a great threat to their families, food sources, and even future survival (“History of Black Bears,” 2015). Because of this, over the course of the 1800’s and early 1900’s bears were hunted and, in many parts of the country, brought to the brink of extinction. Grizzly bears (*Ursus arctos horribilius*, a subspecies of brown bear) were especially impacted, being eliminated from 98% of their original home range and reduced to less than 1,000 total individuals in the US during this time (Mattson, Wright, & Kendall, 2015).

Beginning in the mid 1900’s, Americans began to recognize the importance of conservation and land management. They realized that deforestation and the destruction of native habitats, coupled with the slow reproductive rates of many large mammals such as bears, would bring about the extinction of these species if actions were not quickly altered. As land management, education, and tolerance increased, bear populations slowly began to rebound. Though they have not yet reclaimed all of their home range from previous centuries, bear species can now be found again in 37 US states (“History of Black Bears,” 2015).

Now that repopulation has taken hold for these species, another important conservation issue comes to light. As bears begin to move back into areas where they have not been found in many centuries and humans continue to encroach into wildlife areas, bear-human conflicts begin

to occur. Because bears have a natural need for very large open spaces and a broad ecological environment, this means that native animals may come into contact with the humans that they share territories with. It is believed that a viable bear population needs a minimum of 400,000 acres of habitat to sustain itself, meaning that those states with native bears must go to great lengths to ensure the safety of both their citizens and their bear populations. Along with a bear's excellent sense of smell and natural curiosity, its ability to roam 80 miles in a day makes bear-human interactions increasingly common ("Florida Black Bear," 2014). Over recent decades, the needs of wildlife management begin to shift in focus from repopulation and reforestation to public education and safety.

Across the US and Canada, residents of bear-populated states and provinces are provided with many opportunities for education and outreach, often known as "Bear Aware" programs. These community education programs are a first step toward teaching citizens how to live safely in close proximity to these large predators. Programs are often offered regionally by governments and zoos, though some are also available via the web for public use, such as the site offered by Sylvia Dolson and the Get Bear Smart Society. It is the goal of groups such as this one to replace fear with respect and understanding, thereby minimizing the risk of potential tragedy for human and bear alike (Dolson, 2015).

However, while "bear country" states and provinces (areas located within bear territories) may have access to programs such as these, other locations where bears are not currently native often do not. While this may seem logical, bear populations and especially individual animals continually move and adapt as ecosystems change and human encroachment increases. This means that areas where bears have not roamed for hundreds of years are now beginning to report sightings and encounters ("History of Black Bears," 2015). The reestablishment of North

America's largest land predator to communities unaware of how to deal with such an encounter becomes a formula for fear and misunderstanding. In Illinois, communities in the north are experiencing encounters with black bears from the neighboring state of Wisconsin, due to population growth and diminished viable habitat there (Williams, 2014). Though it is doubtful that bears will become native to Illinois in this lifetime, it is likely that interactions with lone animals will continue to occur and even increase (McFarland, 2015). It has become abundantly clear during recent bear sightings in Illinois that citizens are wholly unprepared for this contact. It is imperative that citizens of states bordering bear country receive ample opportunities for education about bear safety before an encounter occurs.

During June of 2015, research was conducted on residents of Illinois and on residents of traditional bear country states and provinces. Two separate surveys were distributed: one for Illinois residents and one for bear country residents, with a total of 453 usable individual responses received. The surveys were designed to measure the respondent's current knowledge of these animals (specifically, black bears), fear of encounters (for self and other), and exposure to available management programs. Bear country respondents were also asked whether they had attended a community educational program, to gauge the effectiveness of such programs in mitigating self-reported fear. All respondents were also surveyed regarding their support of lethal management methods for these animals.

It was predicted that self-reported fear of bear contact would be higher in the residents of Illinois than in the residents of bear country states and provinces, likely due to the availability of education programs in these locations. One of the most effective methods to combating fear is to utilize education to foster increased understanding and even empathy, which is what these programs typically aim to do.

The goal of this study is to bring to light the public's perception of black bears in their communities and Illinois residents' current lack of knowledge about how to live safely with these animals in their midst. Specifically, this study hopes to demonstrate the need for community education and awareness programs for citizens in states experiencing intermittent bear encounters, such as Illinois. This is the first step to successfully managing the arrival of this large predator to these areas, for the benefit of both humans and bears.

### **Methods**

The method used to collect data in this study was a simple survey format, containing seven questions for Illinois residents (Appendix A) and eight questions for bear country residents (Appendix B). The surveys were prepared by the primary researcher and reviewed by Jennifer Matiasek, Research Program Coordinator at Brookfield Zoo in Brookfield, Illinois. The surveys were presented to respective residents using social media and networking amongst colleagues and conservation groups in North America. These groups included Get Bear Smart Society (Whistler, BC, Canada); the Grizzly and Wolf Discovery Center (West Yellowstone, MT, USA); Conservation Northwest (Bellingham, WA, USA); Raincoast Conservation Foundation (Sydney, BC, Canada); WildSmart (Canmore, AB, Canada); Canadian Parks and Wilderness Society – Southern Alberta Chapter (AB, Canada); and Wisconsin Black Bear Education Center (Wausau, WI, USA). Results were collected anonymously using Survey Monkey, and respondent location was tracked via a question upon the completion of the survey. Demographics on gender and race were not collected for this survey. The survey was open for response from June 11<sup>th</sup> to July 1<sup>st</sup>, 2015, and 453 usable responses (311 Illinois responses, and 142 bear country responses) were collected in total (see Figures 1 and 2 below).

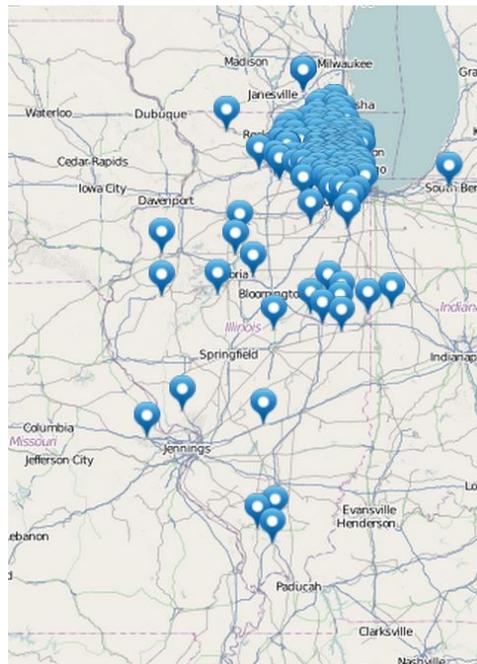


Figure 1. Illinois Respondent Map. Created by self-reported location data (data reported from locations in Indiana was included, due to the extreme proximity to Illinois).

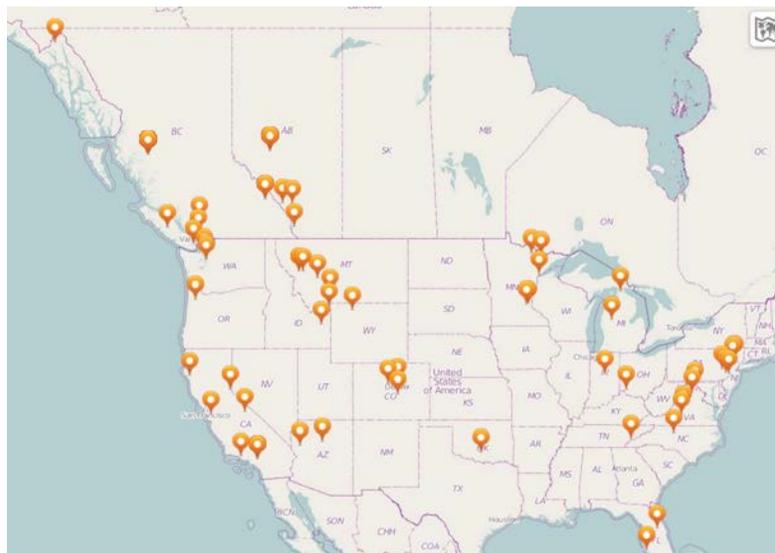


Figure 2. Bear Country Respondent Map. Created by self-reported location data (data reported from locations not in bear country was removed from analysis).

As seen in Appendices A and B, the surveys primarily recorded guests' knowledge of two predators (coyotes and black bears), self-reported fear of contact with these animals, and exposure to existing community educational programs. Coyotes were included in both surveys for comparison purposes only, since these predators are currently native to Illinois. This data was not included in this analysis since it was not pertinent to the current hypothesis.

Once all data had been collected, it was measured to extract specific information based upon several factors: reported knowledge, reported fear (self and others), exposure to educational/management programs, and support of lethal management and control methods. For the purposes of this study, of particular interest were two factors: self-reported fear, and exposure to educational programs. It was hypothesized that exposure to such programs would reduce the individual's fear of bear contact for both self and others.

### **Results/Data**

The results of the survey data (Tables 1 through 7, below) brought to light a number of different factors pertinent to bear education and conservation initiatives. Bear country residents reported significantly higher knowledge of and significantly lower fear of bears in comparison to Illinois residents. Bear country respondents indicated that they were 'Very Knowledgeable (5)' about bears **54.93%** of the time, in comparison to Illinois residents' **1.29%** (Table 1). In regards to fear, bear country respondents selected 'Very Fearful (5)' only **4.93%** of the time for themselves, and **9.15%** for other. Illinois residents on the other hand reported 'Very Fearful (5)' **23.79%** of the time for themselves, and **33.76%** of the time for other (Tables 2 & 3). It was also noted that community bear education programs were attended by **82.39%** of respondents in bear country (Table 5). In comparison, only **2.9%** of Illinois residents rated themselves as 'Very Aware (5)' or 'Aware (4)' of the existence of such programs (Table 4). It is important to note,

however, that **60.13%** of Illinois residents reported that they were ‘Not at all aware [of such programs], *but interested in learning more* (2).’ Also demonstrated by the survey was decreased support for lethal management techniques (i.e. hunting, or biological control by local and state agencies) in bear country residents, with **72.56%** of respondents selecting ‘Do not at all support (1),’ in comparison to only **46.95%** of Illinois residents (Table 6).

**Table 1. *Reported Knowledge of Black Bears***

Rating	Illinois	Bear Country
(5) Very knowledgeable	1.29%	54.93%
(4)	10.61%	31.69%
(3)	25.40%	10.56%
(2)	37.94%	2.82%
(1) Not at all knowledgeable	25.08%	0.7%

**Table 2. *Reported Fear of Black Bears (Self)***

Rating	Illinois	Bear Country
(5) Very fearful	23.79%	4.93%
(4)	22.83%	7.04%
(3)	16.08%	16.20%
(2)	18.65%	31.69%
(1) Not at all fearful	18.65%	40.85%

**Table 3. *Reported Fear of Black Bears (Other – Children, Livestock, and/or Pets)***

Rating	Illinois	Bear Country
(5) Very fearful	33.76%	9.15%
(4)	16.72%	19.01%
(3)	16.40%	26.01%
(2)	16.08%	28.87%
(1) Not at all fearful	17.04%	17.61%

**Table 4. *Knowledge of Management Programs (i.e. Education)***

Rating	Illinois	Bear Country
(5) Very aware	1.29%	63.38%
(4) Aware	1.61%	17.61%
(3) Only generally aware	21.54%	9.86%
(2) Unaware, but interested	60.13%	9.15%
(1) Unaware, not interested	15.43%	0.7%

Table 5. Participation in Educational Programs (Question Included in Bear Country Only)

<u>Response</u>	<u>Percentage</u>
Yes	82.39%
No	18.37%

Table 6. Support of Lethal Management Programs (i.e. Hunting, Biological Control)

<u>Rating</u>	<u>Illinois</u>	<u>Bear Country</u>
(5) Very much support	8.36%	6.34%
(4)	6.43%	2.82%
(3)	19.94%	4.93%
(2)	18.33%	13.38%
(1) Do not at all support	46.95%	72.56%

Table 7. Have You Ever Seen a Bear Outside of Captivity?

<u>Response</u>	<u>Illinois</u>	<u>Bear Country</u>
Yes	31.83%	92.25%
No	68.81%	7.75%

### **Discussion**

This research project presented an excellent opportunity to measure how fear of large predators can be affected by community education and management programs. Some findings, such as the correlation between attendance in educational programs and decreased fear, were anticipated. Other findings, such as the link between education and decreased support for lethal measures, and Illinoisans' desire for educational opportunities, were unexpected and quite enlightening from a conservation and community safety perspective. What do these findings mean to researchers and conservationists interested in promoting community safety and awareness of bear populations? The results indicate that properly delivered community safety programs and educational literature can have a statistically significant impact on reducing both fear of bears and support of lethal control methods for bear populations. This provides encouragement for the importance of developing such programs as an integral first step in

creating bear-safe communities. In communities where large predators have not been considered native for generations, but where they are beginning to roam, it is crucial to begin development of such programs before an incident occurs. In Illinois for example the public clearly desires such programs and materials, with 60.13% of respondents noting that they are unaware of programs but interested. This would seem to indicate that the public in these areas simply needs to be connected to such opportunities for education, perhaps through the aid of local or state organizations or conservation centers such as zoos. It is hoped that this will in turn reduce the level of fear in the population and potentially reduce public support for (and need of) lethal control methods in the future. Recent research also shows that currently, more residents of Illinois support protection of predator species than oppose it, indicating additional support for such programs (Smith, Nielsen, & Hellgren, 2014).

In another fear-based population survey study conducted in Sweden in 2014, Frank, Johansson, and Flykt attempted to differentiate further between various objects of fear and attitudes toward implementation of management actions, particularly towards both brown bears and wolves. They found that the higher the self-reported fear of attack, the greater the acceptance of management actions such as setting population caps and disseminating information about what to do when encountering large predators. These findings indicate that higher levels of self-reported fear lead to greater support for lethal management techniques for the feared species. They also indicate that, for those with high levels of fear, educational programs and community safety literature may be particularly effective. Thus interpreted, it can be assumed that in communities where fear is particularly high due to a lack of such programs, the implementation of them would be especially impactful.

One important factor to consider in the interpretation of this survey data is the role that socioeconomic factors may play in survey self-reporting. Wine, Gagné, S., and Meentemeyer (2015) found that three socioeconomic variables had at least as strong of an impact on self-reported data as species habitat variables did: building density, household income, and occupation. In application to our findings, it is pertinent to note that building density in the Chicagoland area is significantly higher than in many bear country areas. This could certainly play a role in reports of fear, as those living in dense cities may find it difficult to imagine a bear conflict scenario. Additionally, household income in urbanized Chicagoland tends to be higher on average than in many other parts of the country, and urban occupations tend to be quite different in scope than many of the most common rural occupations (“QuickFacts from the US Census Bureau,” 2015).

Because the size of the data pool was limited, and composition of respondents may have been impacted by the distribution groups used for collection of the responses, it is strongly desired that a follow up study be conducted with a larger, true random sampling of the population. This can help to establish a baseline of data for Illinois, moving forward with the creation of community safety and education programs for all transient large predators that have been seen recently there (e.g. black bears, gray wolves, and mountain lions). Once this baseline data is gathered, it will be helpful for use in comparison to “post education” results for the population. As noted in previous research, the evaluation of such programs is the key to understanding their capacity to minimize conflicts and foster increased harmony between bears and humans (Gore, Knuth, Curtis, & Shanahan, 2006).

### **Action Component**

The initial step in taking action on this important conservation and safety initiative is to build resources for community education. Increasing awareness and adapting the behavior of the citizens is a fundamental component for the coexistence of humans and bears. It is crucial to not only teach citizens how to be safe around these predators, but also to teach them why the animals are an important part of a healthy world. Instructing citizens about the vital role that large predators play in a healthy ecosystem is an essential part of the success of such a program (Wilmers, Darimont, & Hebblewhite, 2012). Managing bear attractants and teaching people how to safely live near bears (non-lethal bear management) are the other key components to the community educational process. Without this knowledge in the population, bears can easily become habituated (unafraid of humans) or food-conditioned, which greatly increases the likelihood that the bears will need to be killed.

Any educational program that is developed for the community should also be formatted around a few key outcomes. Such programs should serve to help the public develop a greater understanding of these predators, increase support of “bear-proofing” in the community, promote safety strategies for humans entering locations where bear contact may occur, train people about what to do if contact does occur, and most importantly encourage tolerance of these animals (Dolson, 2015). Additionally, it is imperative that with any educational or community outreach program, post-evaluation of effectiveness and subsequent modifications be a standard component of the development process (Gore, Knuth, Scherer, & Curtis, 2008).

When formulating actual content for such programs, it is important to keep in mind recent research findings on creating tolerance for large carnivores in the population. While factors such as control over risk (e.g. bear-safe behaviors) and increasing emotional reaction to a

species are important in reducing fear, Bruskotter and Wilson (2014) found that these are only secondary factors to consider in increasing tolerance. The most important component to a successful tolerance-building educational program is to communicate the benefits of a species to its ecosystem and to the human population. Reducing fear-based reactions in the public may increase the safety of individuals and the animal in encounter situations, but building tolerance of the species will aid in the actual preservation of it overall (Slagle et al., 2013). Educating the public about the benefits that the species provides to a healthy ecosystem will increase the public's support for preservation and protection of the species, so it is a key concept to consider for inclusion in development of such programs (Bruskotter & Wilson, 2014).

It is also important to begin to train local and state wildlife and animal control managers (including police officers) on how to properly manage such interactions, if they are not already aware. This will help to reduce the risk of such animals automatically being killed upon contact, due to the perceived threat to the community or individuals because of lack of knowledge of proper technique. These organizations should be involved from the start in the development of both hazard assessments and management techniques (Dolson, 2015). Additionally it is useful to include local conservation groups and agencies, including parks and zoos, in the development process. These organizations and their staff can be incredibly helpful in educating the public on safety, tolerance, and the important role that large predators play in their ecosystems.

Social and mass media can serve as useful aids in spreading the word about available educational programs. These convenient and often free methods of communication have become especially useful in recent years as tools such as Facebook and Twitter grow in popularity. They enable conservationists to talk directly to the public about these issues, while the public also talks to one another about them (Mangold & Faulds, 2009). In community education and outreach

campaigns through social media, it is also important to focus upon removing uncertainty of campaign goals while highlighting contributions made by others in order to achieve true buy in and maximize participation (Staats, Wit, & Midden, 1996). However, one must consider that mass media can have a detrimental effect on such educational campaigns, by increasing risk perception (Gore & Knuth, 2009). Simply “getting the word out” is not enough, as it can potentially cause a panic by bringing the possible threat to light. It is essential that the information distribution be created in such a way as to highlight the rarity of such an attack, and focus instead on the conservation and behavioral reasons for the increased contact with the community, with a clear action component (Gore, Siemer, Shanahan, Schuefele, & Decker, 2005). Sensationalist journalism, especially prevalent in social and mass media and often seen after incidents of predator conflict, should be avoided.

To truly keep communities safe and reduce the number of bears killed due to human-animal conflict, it is vital that we all work together. It is imperative to understand the important role that not only science but also socioeconomic factors and even politics play in such a conservation initiative (Kellert, 1994). Conservationists and animal behaviorists contribute to the growing body of knowledge on how best to deal with these animals, while community officials can aid in providing education and support to residents. Local proponents of community safety and animal care workers such as zoo keepers can help to get the message out and boost the public’s (and subsequently, the politicians’) enthusiasm for such educational opportunities. The citizens themselves can participate in the programs or read the literature and make adequate preparation for such contact, sharing their newfound knowledge with others.

It is clear that as populations grow and humans and bears continue to encroach upon one another, contacts will only increase in number in the state of Illinois and elsewhere. It is our

shared responsibility to do what we can to prepare our communities for this eventuality and to teach the public how to embrace this preparation. Bear-safe communities did not become that way easily. In almost all cases, it is the dedication and diligent effort of local residents, officials, and conservationists who transform their “unsafe, bear-killing communities into examples of increasing co-existence” (Dolson, 2015). Regardless whether the individual is bear or human, even a single life lost due to lack of preparation is one life too many.

## References

- Atlas Bear. (2007). *Bears of the World*. Retrieved June 24, 2015, from [http://www.bearsoftheworld.net/atlas\\_bear.asp](http://www.bearsoftheworld.net/atlas_bear.asp)
- Bruskotter, J. T., & Wilson, R. S. (2014). Determining where the wild things will be: Using psychological theory to find tolerance for large carnivores. *Conservation Letters*, 7(3), 158-165. doi:10.1111/conl.12072
- Dolson, S. (2015). How to Become a Bear Smart Community. *Get Bear Smart Society*. Retrieved June 25, 2015 from <http://www.bearsmart.com/managing-communities/overview/>
- Feng, Y., Siu, K., Wang, N., Ng, K., Tsao, S., Nagamatsu, T., & Tong, Y. (2009). Bear bile: Dilemma of traditional medicinal use and animal protection. *Journal of Ethnobiology and Ethnomedicine*, 5(2). doi:10.1186/1746-4269-5-2
- Florida Black Bear. (2014). *Southwest Florida Water Management District*. Retrieved June 28, 2015, from <https://www.swfwmd.state.fl.us/education/interactive/springscoast/blackbear.shtml>
- Frank, J., Johansson, M., & Flykt, A. (2014). Public attitude towards the implementation of management actions aimed at reducing human fear of brown bears and wolves. *Wildlife Biology*, 21, 122-130.
- Gore, M. L. and B.A. Knuth (2009). Mass media effect on the operating environment of a wildlife-related risk communication campaign. *Journal of Wildlife Management*, 73(8): 1407-1413.
- Gore, M., Knuth, B., Curtis, P., & Shanahan, J. (2006). Education programs for reducing American black bear-human conflict: Indicators of success? *Ursus*, 17(1), 75-80.

- Gore, M. L., Knuth, B. A., Scherer, C. W., and P.D. Curtis. (2008). Evaluating a conservation investment designed to reduce human-wildlife conflict. *Conservation Letters*, 1(3): 136-145. doi: 10.1111/j.1755-263X.2008.00017.x
- Gore, M., Siemer, W., Shanahan, J., Schuefele, D., & Decker, D. (2005). Effects on risk perception of media coverage of a black bear-related human fatality. *Wildlife Society Bulletin*, 33(2), 507-516.
- History of Black Bears. (2015). *Black Bears: An Untamed Science Initiative*. Retrieved June 28, 2015, from <http://blackbearinfo.com/history/>
- Kellert, S. R. (1994). Public attitudes toward bears and their conservation. Proceedings of International Conference on Bear Research and Management 9:43–50.
- Mangold, W., & Faulds, D. (2009). Social media: The new hybrid element of the promotion mix. *Business Horizons*, 52(4), 357-365.
- Mattson, D., Wright, G., & Kendall, K. (2015). Dramatic Declines. Retrieved July 2, 2015, from <http://westernwildlife.org/grizzly-bear-outreach-project/history/>
- McFarland, J. (2015). Is there any truth to those tales about lions and tigers and bears in Illinois? *Illinois Department of Natural Resources*. Retrieved June 29, 2015, from <http://www.dnr.illinois.gov/OI/Pages/BAWildCampfireStories.aspx>
- McLellan, B., & Reiner, D. (1994). A Review of Bear Evolution. *Bears: Their Biology and Management*, 9(1), 85-96. doi:10.2307/3872687
- Native American Bear Mythology. (1998). Retrieved June 24, 2015, from <http://www.native-languages.org/legends-bear.htm>
- QuickFacts from the US Census Bureau. (2015). Retrieved July 2, 2015, from <http://quickfacts.census.gov/qfd/states/17/1714000.html>

- Slagle, K.M., Zajac, R.M., Bruskotter, J.T., Wilson, R.S. & Prange, S. (2013). Building tolerance for bears: a communications experiment. *Journal of Wildlife Management*, 77, 863-869.
- Smith, J., Nielsen, C., & Hellgren, E. (2014). Illinois resident attitudes toward recolonizing large carnivores. *The Journal of Wildlife Management*, 78(5), 930-943.
- Staats, H., Wit, A., & Midden, C. (1996). Communicating the Greenhouse Effect to the Public: Evaluation of a Mass Media Campaign from a Social Dilemma Perspective. *Journal of Environmental Management*, 46(2), 189-203.
- Varga, D. (2009). Gifting the bear and a nostalgic desire for childhood innocence. *Cultural Analysis*, 8.
- Williams, J. (2014, June 19). More Black Bears Could Be Headed To Illinois, Even Chicago: Experts. *CBS Chicago Local*. Retrieved June 29, 2015, from <http://chicago.cbslocal.com/2014/06/19/more-black-bears-could-be-headed-to-illinois-even-chicago-experts/>
- Wilmers, C., Darimont, C., & Hebblewhite, M. (2012). Restoring Predators as a Hedge Against Climate Change. In *Wildlife conservation in a changing climate* (pp. 330-346). Chicago, IL: University of Chicago Press.
- Wine, S., Gagné, S., & Meentemeyer, R. (2015). Understanding human-coyote encounters in urban ecosystems using citizen science data: what do socioeconomics tell us? *Environmental Management*, 55(1), 159-170. doi:10.1007/s00267-014-0373-0



Appendix B  
 Bear Country Predators Survey Questions

In general, how would you rate your knowledge of the following animals?	Very knowledgeable (5)	4	3	2	Not at all knowledgeable (1)
c) Coyotes	<input type="checkbox"/>				
d) Black Bears	<input type="checkbox"/>				

In general, how fearful are <u>you</u> of having an interaction with the following animals?	Very fearful (5)	4	3	2	Not at all fearful (1)
c) Coyotes	<input type="checkbox"/>				
d) Black Bears	<input type="checkbox"/>				

In general, how fearful are you of <u>others</u> (children, pets, livestock) having an interaction with the following animals?	Very fearful (5)	4	3	2	Not at all fearful (1)
c) Coyotes	<input type="checkbox"/>				
d) Black Bears	<input type="checkbox"/>				

Are you aware of management programs for the following animals in your state or province? (such as public education, tracking, or relocation)	Very aware (5)	Aware (4)	Only generally aware (3)	Not at all aware, but I'd be interested in learning more (2)	Not at all aware, and uninterested in this topic (1)
c) Coyotes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Black Bears	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How much would you support or not support lethal methods to control the populations of these animals in Illinois? (such as hunting or biological control by state agencies)	Very much support (5)	4	3	2	Do not at all support (1)
a) Coyotes	<input type="checkbox"/>				
b) Black Bears	<input type="checkbox"/>				

**Have you attended or participated in any such management programs (e.g. public education classes, reading of literature or educational materials about safely coexisting with these animals) in your state or province?**

c) Coyotes	Yes	<input type="checkbox"/>	No
d) Black Bears	Yes	<input type="checkbox"/>	No

**Have you ever seen a coyote in the wild?** Yes  No

**Have you ever seen a bear in the wild?** Yes  No

**What is the zip code (USA) or the name of the province (CAN) where you live?**