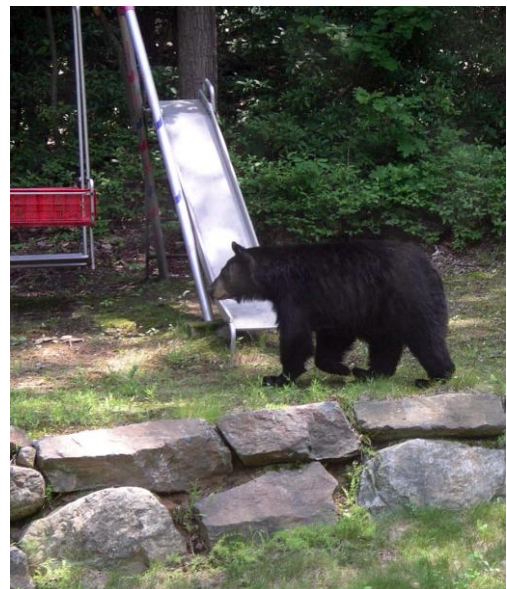


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# **Wildlife Risk Perception and Expectations for Agency Action: Insights from a Black Bear Management Case Study**



**November 2010**

**HDRU Series No. 10-4**

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## HUMAN DIMENSIONS RESEARCH UNIT PUBLICATION SERIES

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# **Wildlife Risk Perception and Expectations for Agency Action:**

## **Insights from a Black Bear Management Case Study**

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**Key Words:** behavior change, black bear, customer service, expectations, experience, human-bear interactions, risk communication, risk perception, *Ursus americanus*



## EXECUTIVE SUMMARY

### Background and purpose

- To craft effective risk communication and risk management strategies with respect to black bears, the New York State Department of Environmental Conservation (DEC) needs to understand residents' risk perceptions, the factors that influence those perceptions, and the factors that help explain why residents do or do not change their behavior after a problem encounter with a black bear. The case study reported here addresses those information needs. The study reported is one facet of a larger initiative to improve understanding of risk perceptions and the human-wildlife interactions that create or exacerbate risk. Such insights will contribute to improving management of human-wildlife interactions and the reduction of negative impacts.
- We designed this case study as a means to inform development of mail survey instruments. Subsequent survey research will allow us to pursue quantitative analysis on hypotheses about risk perception and public expectations related to carnivore interactions in residential areas.

### Research objectives

1. Increase understanding about public perceptions of emerging risks associated with human-wildlife interactions.
2. Determine how perceptions of wildlife-associated risks affect stakeholders' (a) attitudes about wildlife and natural areas; (b) behaviors in response to perceived risks; (c) expectations for wildlife and public land management; and (d) social acceptability of wildlife risk management strategies.

### Methods

- We worked with members of the DEC Bear Management Team in 2009 to identify an area where a cluster of human-bear interactions had occurred in a residential area in New York sometime in the previous 12 months. We identified one study location that fit our criteria—a neighborhood located approximately two miles from the village of New Paltz, New York.
- We employed a tiered-sampling approach. First, we focused on individuals who were involved in the case study event (i.e., interactions with black bears in a specific neighborhood during a 3-week period in August 2008). We identified these individuals from the DEC Region 3 bear report database. Next, we used snowball sampling (i.e., asking interviewees to suggest others they thought we should interview) to identify other area residents who became involved in the event. We also interviewed key informants (e.g., local police, nature center staff) who might be contacted about or have relevant knowledge of human-bear interactions.
- Interviews were opened ended, but followed an interview guide designed to explore interviewee's behaviors, attitudes and other traits before, during, and after the human-bear

interaction experienced by the interviewee. Interview questions were designed to explore key concepts such as threshold of tolerance for interactions with bears.

- We conducted interviews on site or by telephone in late April, 2009. We communicated with a total of 26 individuals. Full interviews were completed with 14 persons (10 residents who had experienced a human-bear interaction and 4 key informants). Snowball sampling led to contacts with 12 additional individuals (7 key informants and 5 homeowners) who provided information through a brief telephone conversation, but declined to participate in a full interview.

## **Key findings and discussion**

### **Pre-incident**

- Knowledge and experience. Most of the persons we interviewed were aware that bears are attracted to garbage and other anthropogenic sources of food before they encountered a bear in August 2008. Some did not fully appreciate how attractive bird feeders are to black bears and many were surprised that bears would enter their neighborhood.
- Personal experience and perceived risk. Previous research led us to expect that interviewees with some past bear-related experiences would be less concerned about the presence of bears in their neighborhood than would interviewees who never encountered bears before August 2008. Findings were consistent with that expectation.
- Mass media exposure and perceived risk. News coverage of the 2002 bear-related human fatality in New York was clearly salient in the minds of several interviewees. Two interviewees mentioned the incident and another made reference to the event as evidence that bears sometimes attack children. For those interviewees, media coverage about black bears generated anxiety about the possibility of a home entry by a black bear, motivating those residents to contact DEC. Some interviewees also believed it was very likely that a child in their neighborhood would be injured by a black bear (i.e., they overestimated the likelihood that a rare event would occur). Given our qualitative research design, we can only speculate about why some interviewees believed an attack on a child was so likely. One possible explanation for the tendency to overestimate rare events is a cognitive shortcut called the availability heuristic, wherein a rare event (e.g., a bear attacking a human) is memorable, salient in the actor's mind (due to widespread media coverage), and thus is overweighted in choices and related actions.

### **During incident**

- Perception of bear interactions. Though often alarmed initially about the presence of a bear right in front of them, most interviewees quickly interpreted the bear's behavior as nonaggressive and nonthreatening.
- Habituation. None of the people interviewed had been intentionally neutral toward bears and several tried to scare the bear away, even though they had never previously encountered a

bear. They made noise, as they believed experts recommend, but none took actions more aggressive than making noise. Few interviewees had a repeat encounter with a bear.

- Concerns. The biggest concern for most interviewees was the safety of children in the neighborhood. Pet safety was a secondary concern. Several interviewees were annoyed by the inconvenience that they would experience as a result of keeping garbage indoors. Most were not concerned about minor property damage or the prospect of cleaning up trash strewn about by bears.
- Problem-prevention behavior. Most interviewees were comfortable with removing bird feeders and modifying garbage routines, temporarily. Several expressed the belief that “garbage belongs outside” and they either did not change their behavior or quickly reverted to keeping garbage outside their garage or in a shed when they believed bears had left their neighborhood.
- Communication networks. Often, residents first called the local police department to report a bear sighting. Interviewees reported that police instructed them to contact DEC for further assistance, so DEC was generally called after the police. When callers learned that DEC would not come out to remove the bear, most people did not contact DEC again.

We documented a substantial amount of neighbor-to-neighbor communication about human-bear interactions in this case. A local childcare center (the site of one set of reported human-bear interactions) became an important node for interpersonal communication. The childcare center served approximately 50 youth and their families. Communication between parents and neighbors via the childcare center played a role in catalyzing dissatisfaction with DEC’s response to bear sightings in the neighborhood.

- Expectations of DEC. Interview data provide insights about the range of expectations that homeowners have when they contact DEC about a bear interaction. In this case, four of the ten homeowners we interviewed expected DEC to remove the bear that visited their yard (all wanted the bear to be humanely captured and released unharmed into some other area; all expressed that they desired a nonlethal management response). Two other homeowners expected DEC to provide on-site assistance that would deter the bear from returning. In each case residents were told by DEC that their staff typically do not remove bears or provide on-site assistance in situations like the one being reported. Expectations for service from DEC, realistic or not, were unmet for these six homeowners, all of whom expressed dissatisfaction, frustration, and anger or annoyance.
- Tolerance threshold. Data from interviews demonstrate that there is a proximity dimension of tolerance, which may change as people experience interactions with bears that are neutral and thus nonthreatening. For example, if one believes bears present a threat to children, having bears in the yard is too close because that threatens children. New information, combined with nonconsequential personal interactions with bears, led to a lowered risk perception (this finding is consistent with previous research in New York, which found that experience with bears, including mild nuisance experiences, lowers concerns about bears).

## **Post incident**

- Communication with police and DEC. Most interviewees stopped calling the police after one interaction, because they learned that the police are limited in what they can offer as a response to a bear near a birdfeeder or raiding a garbage can. Most interviewees also stopped calling DEC for relief when they learned that DEC does not offer on-site assistance in a typical situation, where human injury is unlikely and no major property damage has occurred.

Erosion of behavior modification. Universally, behavioral change eroded quickly and subjects returned to their pre-incident behavior patterns. Comments suggested that interviewees found that the new behaviors were inconvenient, took extra effort to implement, and offered no relative advantage at some point because bears had reportedly left their neighborhood. Interviewees regarded bear interactions as a novelty, and when the bears left their neighborhood, interviewees perceived no reason to maintain behavioral changes. These findings suggest that the underlying impacts which stimulated concerns about bears in this case were either reduced quickly or were sufficient to motivate only temporary behavior modification.

- Attitudes towards bears. Though some interviewees developed concern about the safety of children, their attitudes toward bears were neutral or positive before interactions and remained so after encounters.
- Changed expectations of DEC role. Expectations that DEC provides “curb” service quickly were recalibrated. Interviewees immediately learned that bears were not often removed by DEC and that they were unlikely to receive on-site assistance from DEC. After adjusting their expectations, many said they would not call DEC again if they had a bear encounter. Lingering dissatisfaction with DEC remained for several, however. Some interviewees said they would contact DEC again if they had another bear-related problem, and would demand some kind of assistance more aggressively. Others changed their expectations, but still wanted DEC to serve as a source of information upon request.
- Dread and bear-related risk perception. Risk perception is thought to have both a technical or cognitive component (perceived probability that an event will occur and perceived severity of consequences) and an affective or emotional component (concern, dread or outrage associated with an event). In this case, dread related to the potential consequences of a human-bear interaction dissipated quickly. Consistent with previous psychometric research on risk, we found that people reported reduced concerns about bears after they gained a sense of increased personal control over human-bear interactions (i.e., after receiving problem prevention advice) and, through nonconsequential (or at least tolerable) personal experience, learned that an encounter with a black bear typically does not have catastrophic consequences. Most interviewees believed that the probability of future encounters with bears was very low, which also explains why concern about bears dissipated quickly and pre-incident human behaviors were restored soon after interviewees believed bears were no longer frequenting their neighborhoods.



- Outrage and bear-related risk perception. A sense of outrage and distrust of risk managers can elevate risk perception. In this case, interviewees tended initially to overestimate the probability of a rare event (i.e., a bear injuring a child) and thus several became frustrated and dissatisfied with DEC's response (a response predicated on a judgment that the actual threat to human safety in this situation was very low). Comments from a number of interviewees illustrated how outrage grew quickly and lingered for some. Their sense of outrage seemed to exacerbate their sense that neighborhood children were at risk, and their belief that black bears can't be tolerated in residential areas.

### **Implications for future human dimensions (HD) research**

- Subsequent quantitative research on emerging wildlife-related risks in New York should include indicators of both affective and cognitive attributes of risk perception (e.g., indicators of perceived probability that hazardous events will occur [cognitive], as well as indicators of worry or concern about hazards). Subsequent research also should include indicators of stakeholders' perceived control over hazards (self efficacy and institutional efficacy), the level of dread associated with a hazard, and the level of outrage associated with the hazard or its management.
- Subsequent quantitative research in New York is needed to characterize stakeholder-defined impacts and should explore hypotheses related to impact hierarchy and cumulative impacts affects for specific emerging hazards.
- It would be useful to document key beliefs about species of wildlife that threaten human health or safety. Quantitative studies that shed light on key beliefs about wildlife (e.g., beliefs about species behavior, beliefs about food attraction [instrumental conditioning]) may be useful to understand problem prevention behavior, dread, and other aspects of problem interactions with common nuisance wildlife (e.g., coyotes, deer).
- Management strategies that involve lethal control of wildlife are typically controversial, especially in residential and urban areas. Future research should include efforts to understand the relationship between risk perception and support for both lethal and nonlethal wildlife management actions.
- Future studies with objectives related to risk communication should include measures of expectations and satisfactions related to agency communication and intervention in situations where wildlife present hazards to humans.

### **Management implications**

- In addition to providing guidance for future survey research, this case study serves a monitoring function that may inform the black bear management program. The case provides specific feedback about perceptions and expectations of stakeholders who contact DEC with concerns about the presence of black bears in their neighborhood. In particular, this study points out that in some management situations one of the most effective risk communication strategies may be interpersonal communication with individuals who are

nodes of communication in a neighborhood. This is a low cost, nontechnical response that may reduce outrage associated with agency decisions not to remove or relocate carnivores from residential areas.

- DEC receives telephone calls from stakeholders who contact the agency for advice or assistance to manage problem interactions with black bears. DEC uses these “complaint” reports as an index to trends in negative impacts created by human-bear interactions in a neighborhood or DEC region. In the case examined here, because residents learned that DEC would not respond with “curb service”, a reduction in complaints to DEC may indicate that stakeholders have simply stopped calling DEC for assistance, even though they may continue to suffer problem interactions with bears. This diminishes the value of number of complaints received by DEC as an indicator of human-bear interactions. It may be useful to DEC to develop additional indices of negative impacts on bear-management stakeholders.

## **ACKNOWLEDGMENTS**

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We gratefully acknowledge the contributions of our temporary research assistant, Tarah Rowse, who arranged and conducted all the personal interviews associated with this project.

The Cornell University Office of Research Integrity and Assurance (Institutional Review Board for Human Participants) reviewed our interviewee recruitment process and interview guide and granted approval for their use in this study (Protocol ID# 0904000301).

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# TABLE OF CONTENTS

	<b>Page</b>
EXECUTIVE SUMMARY.....	III
ACKNOWLEDGMENTS .....	IX
TABLE OF CONTENTS .....	XI
LIST OF FIGURES .....	XIII
INTRODUCTION .....	1
PURPOSE .....	1
RESEARCH QUESTIONS AND THEORETICAL FOUNDATIONS.....	2
How do Risk Perceptions Differ from Expert Risk Assessments?.....	2
What Factors Influence Risk Perceptions? .....	3
Characteristics of the individual .....	4
Perceived properties of the hazard.....	5
Perceived characteristics of the organization charged with managing the threat .....	6
How do Human-Wildlife Interactions Influence Attitudes and Behavior? .....	6
Attitudes.....	6
Problem prevention behavior.....	7
Are humans adapting to wildlife presence in ways that increase threats?.....	7
METHODS .....	8
Study Area .....	8
Sampling Approach .....	9
Interview Procedure.....	9
Analysis.....	10
FINDINGS .....	10
Pre-Incident.....	10
Knowledge and experience.....	10
Beliefs, attitudes, concerns .....	12
Human Behavior and Expectations During the Incident .....	13
Perception of events.....	13
Risk perception .....	13
Response to event .....	14
Communication networks .....	16
Expectations of DEC.....	17
Post Incident.....	20
Relief seeking.....	20
Personal behavior change .....	20
Beliefs, attitudes and risk perception.....	20
Changed expectations of DEC .....	21

## TABLE OF CONTENTS

	<b>Page</b>
DISCUSSION AND RESEARCH IMPLICATIONS.....	21
Cognitive Biases, Risk Perception and Behavior .....	21
Implications for future research .....	22
Threshold of Tolerance .....	23
Implications for future research .....	23
Beliefs about Wildlife .....	23
Implications for future research .....	24
Acceptability of Risk Management Strategies.....	25
Implications for future research .....	25
Stakeholder Expectations of DEC .....	25
Implications for future research .....	25
MANAGEMENT IMPLICATIONS.....	25
Managing Expectations.....	25
Risk Communication .....	26
Complaints as an Index to Human-Bear Interactions .....	26
LITERATURE CITED .....	27
APPENDIX A: RESIDENT INTERVIEW GUIDE .....	31

## LIST OF FIGURES

<b>Number</b>	<b>Title</b>	<b>Page</b>
1	A project concept map that provided guidance for questions during personal interviews.	10





## INTRODUCTION

New York State has an expanding population of black bears and human-black bear interactions in residential areas have increased in recent decades (NYSDEC 2007). Public attitudes toward black bears are generally positive in New York and support for black bear conservation is strong among citizens (Siemer and Decker 2002). Negative human-bear interactions occur, however, and those interactions have the potential to reduce public tolerance for bear presence and reduce societal support for black bear conservation. Managing negative human-bear interactions is thus an important facet of black bear management programs.

The New York State Department of Environmental Conservation (DEC) sponsored this study to better understand how problem interactions with black bears in residential areas influence people's attitudes towards bears, their willingness to take problem prevention measures, and their expectations of DEC as a wildlife management agency. In particular, the agency was interested in obtaining in-depth information about human-bear interactions in communities where human-bear interaction is novel. To craft effective risk communication and risk management strategies, DEC needs to understand resident's risk perceptions, the factors that influence those perceptions, and the factors that help explain why residents do or do not change their behavior after a problem encounter with a black bear. This case study is part of the first phase of a research project that addresses those practical information needs.

## PURPOSE

This research is one facet of a larger initiative to improve understanding of risk perceptions and of human-wildlife interactions that create or exacerbate risk. Such insight will inform management of human-wildlife interactions and the reduction of negative impacts.

Improving managers' knowledge of people's perceptions and behaviors with respect to carnivores is important because: (a) uninformed human responses to carnivores may increase potential risk; (b) adoption of recommended behaviors can diminish risks; and (c) stakeholder acceptance of management actions can affect the success of wildlife-risk-management strategies. Wildlife managers need more information about: (a) human behaviors before, during, and after interactions with carnivores and (b) the impacts experienced from such interactions. Knowledge gains will inform carnivore management decisions and outreach efforts designed to minimize negative wildlife impacts and maximize benefits of wildlife presence in residential and other high human-use environments.

The case study reported here and other facets of the project will address the following research objectives.

### **Research Objectives:**

1. Increase understanding about public perceptions of emerging risks associated with human-wildlife interactions.

2. Determine how perceptions of wildlife-associated risks affect stakeholders': (a) attitudes about wildlife and natural areas; (b) behaviors in response to perceived risks; (c) expectations for wildlife and public land management; and (d) social acceptability of wildlife risk management strategies.

We designed this case study as one means to inform development of mail survey instruments. We also will utilize other qualitative data (e.g., insights from interviews about human-coyote interactions in residential areas of New York) and literature review for this purpose. Subsequent survey research will allow us to pursue quantitative analysis on hypotheses about risk perception and public expectations related to carnivore interactions in residential areas.

In addition to providing guidance for future survey research, this case study serves a monitoring function that may inform the black bear management program. The case provides specific feedback about perceptions and expectations of stakeholders who contact DEC with concerns about the presence of black bears in their neighborhood. Such feedback may help DEC staff assess agency response to the increase in residential human-bear interactions that often occurs in areas of New York during late summer.

## **RESEARCH QUESTIONS AND THEORETICAL FOUNDATIONS**

This project builds upon HDRU studies focused on risk perceptions related to a variety of human-wildlife interactions, as well as the larger body of research on human perceptions of health and safety threats. In the following subsections, we summarize the broad research questions that we wanted to explore in this context and the theoretical foundations we relied upon when considering those questions.

### **How do Risk Perceptions Differ from Expert Risk Assessments?**

When managing risks associated with a public resource such as wildlife, it is important to be aware of the distinction between lay risk perceptions and technical risk assessments, as well as the way that those variables interact during the course of a management issue. Risk perception involves intuitive judgments that people make about hazards, activities, or technologies (Slovic 1987). The process of developing risk perceptions is individual, qualitative, and intuitive. Risk perceptions are influenced by both experiential and analytic modes of information processing. Gore et al. (2009:304) provide succinct descriptions of these modes of information processing in a recent article on application of risk concepts to wildlife management.

“The *experiential system* [emphasis added] is intuitive, largely unconscious, and fast; it engages first in response to a stimulus and is often associated with affect... The *analytic system* [emphasis added] is conscious, deliberate, and allows for the incorporation of logic and probability.” (Gore et. al. 2009:304)

Unlike risk perception, risk assessment is a technical/analytic process conducted to identify, clarify, and quantify the probability that threatening events will occur and the severity of effects

on people if those events do occur (Slovic 1987). Risk assessments generally reflect a collective or organizational view of threats and are useful to policy makers as they consider the societal-level impacts of a technology (e.g., nuclear power), human activity (i.e., driving an automobile), or health threat (i.e., radon gas exposure). Risk assessment focuses upon quantifying objective risks to society (ideally relying exclusively on the analytic mode of information processing), whereas risk perception is an individual cognitive judgment regarding how an event or condition may negatively impact the things an individual values (a process that may or may not involve consideration of impacts at the societal level). Given that risk perception and risk assessment are distinct concepts and processes, it is not surprising that in some cases perceived risks in a community can be far higher or lower than the assessed risk estimated by technical experts. Such disparity can translate into disagreements, miscommunication, and public distrust of public agencies that make risk management decisions based on input from technical experts (Slovic 1993). Slovic (1987) points out that, to avoid miscommunication and distrust it is important to identify perceived risk and the degree to which perceptions vary from expert assessments of threat in a given circumstance.

### **What Factors Influence Risk Perceptions?**

Through well-designed communication campaigns, wildlife management and other state agencies could inform development of risk perceptions among their stakeholders, ultimately influencing subsequent behavioral intentions of those stakeholders. Previous research gives reason to believe that understanding how wildlife-related risk perceptions are formed and the factors leading to such perceptions will be very useful to agencies as they design risk communication messages and strategies.

Broad categories of influences on risk perception have been established through decades of research on a variety of threats to humans, but additional context-specific research is needed to improve understanding of how people form risk perceptions about wildlife (i.e., what factors influence construction of risk perceptions). More research is needed that systematically investigates *why* people are concerned about specific wildlife-related threats to the extent that they are. Answering these “why” questions in a specific context can help managers construct communication initiatives that address the specific factors that contribute to concern about a given human-wildlife interaction. In a specific situation, for example, technical experts may assume that health or economic effects will drive community tolerance of a threat, but human dimensions research may identify other factors (e.g., distrust of government, concerns about the fairness of how risk burdens are distributed) that play a greater role in threat tolerance.

Our expectations about factors that might influence risk perception in the context of black bear management were informed by seminal research by Paul Slovic and others (Slovic 1987, 1993; Fischhoff et al. 1978; Kasperson et al. 1988). Research on a wide range of threats to human health and safety has identified several broad categories of factors that may influence an individual’s risk perceptions, including: (1) characteristics of the individual; (2) characteristics of the hazard; (3) characteristics of the organization charged with managing the threat; (4) cognitive processes; and (5) social and cultural influences. We sought insights about the first three categories during our interviews.

## **Characteristics of the individual**

Sources of information. When we began this study we were aware that it would be important to note interviewees' information sources, because studies have linked formation of risk perceptions to the sources of information used by an individual. While experts will have access to information from technical threat assessments, most of the public's information will likely come via a second or third party, often heavily mediated, which may have already added its own interpretation to the information about a wildlife-associated risk. Lay people become aware of risk objects or events through three primary pathways: (1) direct experience/exposure to some object or event (e.g., direct experience with bears or coyotes); (2) informal communication with friends, colleagues, or co-members of social organizations; and (3) exposure to media coverage concerning aspects of the object or event. While pathway (1) can potentially exert the strongest influence on risk perceptions, in contemporary society, mass media is expected to be the primary conduit bringing information from experts to the lay public, and for dictating discourse on any major threats presented by carnivores. The strength of each pathway varies by individual and by context. This study focuses on a subgroup of persons who have had direct personal experiences with black bears, providing opportunities to explore how those experiences may influence perceptions. We know from previous HDRU research that personal experience with black bears is a variable that helps explain variance in concern about interactions with bears and sensitivity to the presence of bears (Siemer et al. 2009). We expected qualitative interviews in this case to yield insight about why personal experience with bears might influence risk perceptions, attitudes, and behaviors.

Communication scholars have documented that media reporting on risk-related events often does not mirror the actual prevalence of such events. In some cases media coverage may overestimate the probability and or severity of threat events, leading to social amplification of risks (Kasperson et al. 1988, Pidgeon et al. 2003). In such cases media attention can amplify public perceptions of risk such that they exceed scientific assessment of the risk. Media coverage may, for example, allow individuals to perceive a threat as more salient to them, or it may excite fear by presenting details of a hazard but no means for dealing with it. We have begun to explore some of these media-related research questions in the context of black bear management in New York. Gore and Knuth (2009: 1407) found "a small social amplification of risk associated with black bears from exposure to media, specifically newspapers" in four townships in southeastern New York. Their results demonstrate that in some cases "mass media can affect the operating environment of a wildlife-related risk communication program" (Gore and Knuth 2009:1411). Another study found no change in bear-related risk perception after a bear-related human fatality in New York in 2002 (Gore et al. 2005). Findings from media content analysis (Siemer et al. 2007a) and a statewide survey conducted in 2002 (Siemer and Decker 2003) found that concern about black bear-related risks was not related to use of print media, but higher than average levels of television viewing was associated with higher levels of concern (Siemer et al. 2009).

Value orientations. Fulton et al. (1996) proposed that an individual's "value orientations" (basic beliefs) provide a foundation for higher-order cognitions, such as attitudes and norms. Fulton et al. (1996) proposed a set of value orientation scales to measure wildlife-related basic beliefs and found that wildlife benefits/existence orientation was predictive of attitudes toward

hunting and fishing and behavioral intentions to hunt or fish. Value orientation scales have subsequently been refined and modified for use in multiple studies and have proven useful as predictors of attitudes toward wildlife and acceptability of wildlife management actions.

Application of the cognitive hierarchy framework described in Fulton et al. (1996) has provided some support for assertions that “individual behavior toward wildlife is driven by specific attitudes and these attitudes are directed by wildlife value orientations” (Teel et al. 2007: 300). More specifically, research on residential human-wildlife conflicts supports the hypothesis that people who perceive benefits from a wildlife species tend to be more tolerant of problem interactions with that species (Decker et al. 2002). Siemer et al. (2009) found that a high wildlife benefits orientation (a variable correlated with wildlife-related activity involvement) was a predictor of lower concern about interactions with black bears, so we were prepared to listen for clues in interviews that might yield additional insights about people’s orientation toward wildlife and their perceptions of bear-related risk.

Demographic characteristics. Multiple studies have found that concern about human safety is higher among women than among men with respect to a range of technological hazards (Davidson and Freudenburg, 1996, Gustafson 1998). Some studies also have found that concern about potentially dangerous wildlife is higher among women than men (Zinn and Pierce 2002). We were aware that several demographic variables (e.g., age, educational attainment, income) might be associated with risk perception, and we noted demographic characteristics of interviewees, but we elected not to focus on demographic traits in this phase of our study.

### **Perceived properties of the hazard**

Through personal experience, interpersonal communication and media use, individuals receive information and develop perceptions about the properties of a given hazard or threat. Psychometric studies of risk perception have provided insights about properties that predict acceptability of a given hazard (Fischhoff et al. 1978, Slovic 1987). Some of the more influential characteristics include:

- controllability (whether one has personal control over exposure to the hazard),
- dread (degree to which outcomes from exposure produce fear and anxiety),
- seriousness (perceived severity of consequences associated with hazard exposure),
- immediacy (whether effects are immediate or chronic),
- familiarity (whether the hazard is old and familiar or new and unknown),
- frequency of exposure, naturalness (whether the threat is naturally occurring or man-made), and
- uncertainty (degree of scientific uncertainty about consequences of exposure).

Gore et al. (2007) found that perceived frequency of exposure to bear-related risks, perceived severity of consequences associated with exposure to bears, perceived certainty of negative consequences, and familiarity with bear-related hazards were predictors of bear-related risk perception. We were familiar with this body of psychometric research, so we used probing interview questions to gain information about these kinds of perceptions and we analyzed

interview data for clues regarding how interviewees viewed human-bear interactions as a potential hazard to themselves, members of their family, or pets.

### **Perceived characteristics of the organization charged with managing the threat**

We began this study with the knowledge that wildlife management in New York State is embedded in a broader social, cultural, and political environment that includes growing public concern about technological risks and declining trust in all levels of government (Slovic 1993). Research by Gore et al. (2007) led us to expect that trust might play a role in stakeholder-agency relationships in this case. Gore et al. (2007) found that some factors influencing perceived risk associated with human-black bear interactions in Adirondack campgrounds loaded onto a construct they labeled “agency capacity”, which included trust in and responsiveness of DEC in addressing human-bear interactions in campgrounds.

We entered the case interviews with the assumption that perceptions of DEC, combined with perceptions of the threat itself, would influence expectations of DEC. We also began the case study with a knowledge about the relative acceptability of various bear management actions, based on results from a statewide mail survey in 2002 (Siemer and Decker 2003). Personal experience with a black bear interaction gives people new information, so that their opinions about response to a bear are no longer hypothetical (i.e., they will have first-hand experience upon which to answer questions such as, “how do you think DEC should respond to a bear in someone’s yard?”). We hoped that interview data would yield additional insights about the ways in which personal experience with a bear encounter might influence acceptability of management actions.

## **How do Human-Wildlife Interactions Influence Attitudes and Behavior?**

### **Attitudes**

Human dimensions studies generally find that people tolerate more negative interactions from animals with which they associate positive attributes. Conversely, tolerance for negative interactions with species generally viewed negatively tends to be lower. Survey research also suggests that the relationship between attitudes and risk perception is recursive. In other words, attitudes may influence risk perception and perceived risk may in turn influence attitudes. In this case, we knew from a recent statewide survey that most residents of New York State hold positive attitudes towards black bears and enjoy knowing that bears exist in the state (Siemer and Decker 2003). We also were aware of work by HDRU colleagues (Kretser et al. (2009) demonstrating that personal experience with wildlife-related damage (especially severe damage) can have a strong influence on attitudes toward a species and the degree to which one perceives interaction with that species as positive or negative. Thus, we expected to find positive attitudes towards bears in this sample group, but we anticipated that we should listen for signs of attitude change after a bear-related encounter that was evaluated as problematic by an interviewee.

## **Problem prevention behavior**

Wildlife professionals generally agree that human-bear conflict can be reduced if people can be persuaded (through education, laws, regulations, mandates) to reduce availability of anthropogenic food sources (Beckmann 2009). Changing human behavior (rather than bear behavior) is often identified as the keystone in programs to reduce human-black bear conflicts (Beckmann 2009). But convincing people to change their behaviors has proven to be a daunting challenge. HDRU-DEC evaluation of a pilot program to encourage human behavior changes that prevent negative human-bear interactions in residential areas demonstrates how difficult it is to get people to modify their behaviors voluntarily (Gore 2006, 2008).

Qualitative interviewing with homeowners affords opportunities to learn why people do or do not take problem-prevention actions around their home, even after experiencing a bear-related problem. Understanding why behaviors change should help wildlife managers design more effective interventions to promote problem prevention behaviors.

## **Are humans adapting to wildlife presence in ways that increase threats?**

We assume that processes of habituation and conditioning, in humans and wildlife, play some role in creating threats to human health and safety. We know that both wildlife and humans become habituated to repeated, non-consequential stimuli. Common sights and sounds fade into the background and are paid little attention. Humans become habituated to the sights and sounds of common wildlife, for example. Lack of fear response suggests that many species of wildlife become habituated to the sights and sounds of human activity, as well.

Humans and carnivores also respond to one another based on instrumental conditioning (or instrumental learning). It is possible that instrumental learning plays a greater role than habituation in creating unsafe human-carnivore interactions. Both humans and carnivores have a capacity to learn from past behavior, tending to repeat behaviors that are rewarded and avoiding behaviors that are punished or go unrewarded. We know, for example, that black bears learn to associate food rewards with trash containers and bird feeders, and that food rewards reinforce behavioral attraction to anthropogenic food sources (a process referred to as food conditioning). Through the same process, humans learn that they can receive wildlife viewing rewards by displaying nonthreatening behavior toward wildlife. They also may receive social or legal sanctions for harassing or killing wildlife, which presumably discourage those behaviors. Zinn et al. (2008:395) articulate and discuss “the possibility that human conditioning to wildlife can facilitate or inhibit wildlife habituation to humans in a reciprocal relationship”. These are hypotheses or working assumptions, but they are grounded in empirically based research and observations. Zinn et al. (2008) cite experiences in national parks and other protected areas as strong circumstantial evidence of human-wildlife co-habituation and/or conditioning. Some observers note that residential areas can create the same conditions for habituation and conditioning as observed in parks and formally-protected areas. For example, based on observations in California, Kitchen et al. (2000) and Timm et al. (2004) noted that if coyotes are not harassed by humans and deterred from human-inhabited landscapes, they may habituate to the presence of people, with negative impacts on human safety.

Habituation and conditioning hypotheses warrant further exploration within the context of human-carnivore interactions in urban spaces (Zinn et al. 2008). A better understanding of co-habituation would aid managers in targeting specific human or animal behaviors that could lead to problematic encounters. Case studies like this one, allowing investigators to examine human behaviors toward wildlife before, during, and after encounters, are needed to understand how human behavior may influence animal habituation and the outcome of interactions.

## **METHODS**

We designed and in 2009 implemented a set of open-ended qualitative interviews to provide a rich description of human-bear interactions that took place over a three-week period in a residential neighborhood near New Paltz, New York in August of 2008.

### **Study Area**

We worked with members of the DEC Bear Management Team to identify the study area. We were interested in a case that involved a cluster of novel (new experiences for the affected community) human-bear incidents in a residential area sometime in the previous 12 months. We identified one study location that fit our criteria. The area was located approximately two miles from the village of New Paltz, New York.

New Paltz is located in New York's Hudson Valley (Ulster County) approximately 60 miles south of Albany. Though only 90 miles north of Manhattan, the Township of New Paltz maintains a relatively rural character, with dispersed residential development, orchards, vineyards, and crop fields. In 2000, the township had a population of 12,800, but over half of that population resided within the Village of New Paltz. Three-quarters of those living outside the village of New Paltz lived in owner-occupied dwellings. The majority (84%) of township residents living outside the village of New Paltz were white and over a third of township residents worked in the educational, health and social services sector. The majority (55%) of township residents outside the village were 25 to 64 years old.

The village of New Paltz is located 5 miles east of the Shawangunk Mountain escarpment and Mohonk Preserve, and only 10 miles from Minnewaska State Park Preserve. Thus, the area is a popular destination for day hiking, rock climbing, and other outdoor recreation. A state university of New York (SUNY) campus in the village drives local economic and cultural activity. The village bears the demographic characteristics of a college town. In 2000, 60% of village residents were between 15 and 24 years old, 72% of housing units within the village were occupied by renters, and educational, health and social services sector accounted for 39% of employment).

Records provided by DEC show that the Township of New Paltz had 19 bear reports from May 12, 2008 through August 25, 2008. Of these 19 reports, 13 were complaints and 6 were sightings.

Using complaint records and Google Earth, we were able to identify a particular study site within the Town of New Paltz where multiple reports were made during a short period of



time. The site was selected for its residential nature, cluster of incidents, and recency of reports (bear sightings and other interactions occurred over a three-week period in July - August, 2008). The study area was a residential neighborhood with individual homes on half-acre lots located on a set of dead-ended side streets connecting to one main road (NY State Route 32). Residential streets in this vicinity are surrounded by wooded areas that provide travel corridors for black bears and other wildlife. A key feature of the study site was a childcare center which served some of the township residents who contacted DEC with concerns about black bears.

## **Sampling Approach**

We employed a tiered sampling approach to collect information on the case from multiple perspectives. First, we focused on individuals who were involved in the case study event (i.e., interactions with black bears in a specific neighborhood during a 3-week period in August 2008). We identified these individuals from the DEC Region 3 bear report database. Next, we employed snowball sampling (i.e., asking interviewees to suggest others they thought we should interview) to identify other area residents who became involved in the event. These secondary individuals may or may not have had any direct interaction with bears.

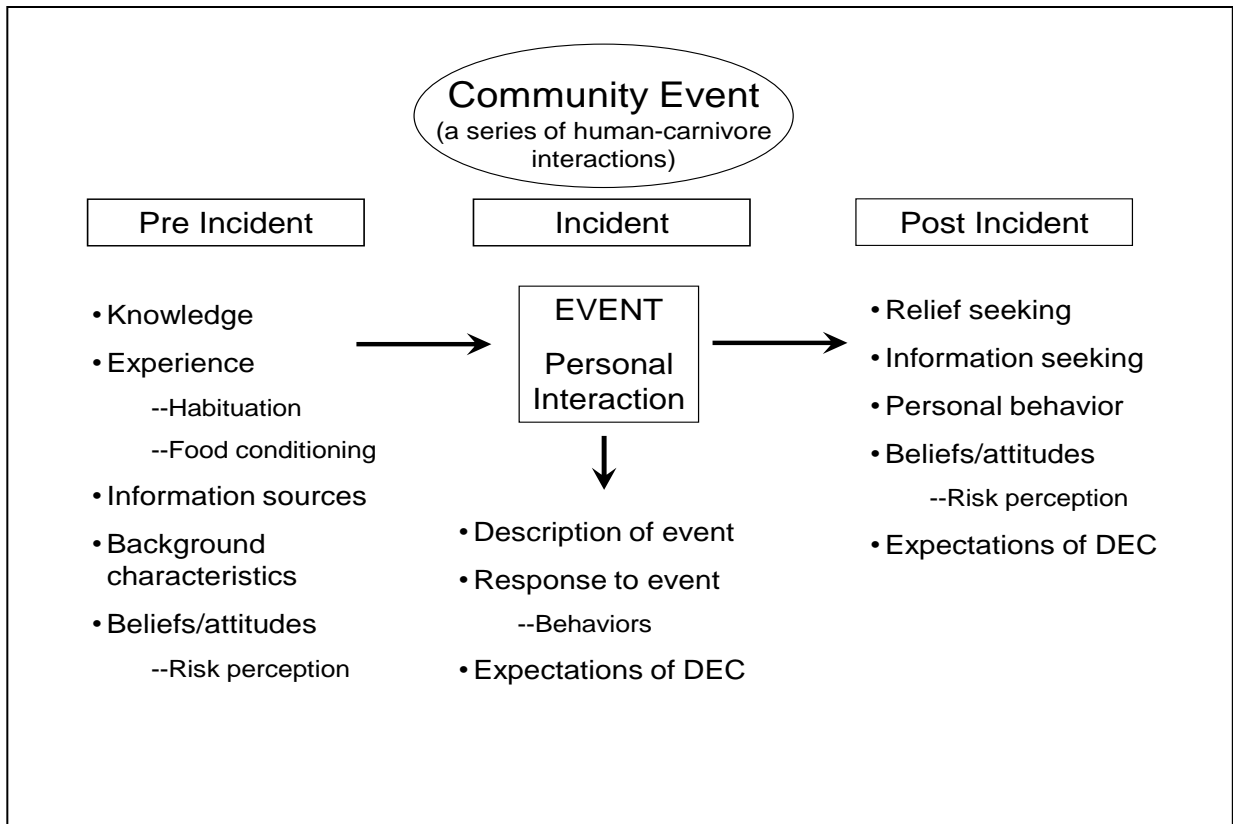
We also interviewed “key informants”; i.e., individuals who might be contacted about human-bear interactions or may have relevant knowledge about human-bear interactions (e.g., local police, local government leaders, nature center staff, nuisance wildlife control operators, wildlife rehabilitators).

## **Interview Procedure**

Interviews were opened ended, but followed an interview guide (see Appendix A) designed to explore interviewee’s behaviors, attitudes and other traits before, during, and after the human bear interaction experienced by the interviewee. Interview questions were designed to explore key concepts such as threshold of tolerance for interactions with bears and hierarchy of impact acceptance (Figure 1). The interview protocol and interview guide were reviewed and granted approval by the Cornell University Office of Research Integrity and Assurance (Institutional Review Board for Human Participants, Protocol ID# 0904000301).

We conducted interviews on site or by telephone in late April, 2009. Interviewees were contacted by telephone, informed that the researcher was conducting research for DEC, and asked to participate in the study. Interviews took place at a time and location designated by the subject. Locations of interviews were often the informant’s place of work, other locations included: coffee shops, diners, or informants’ homes. Duration of interviews with study area residents ranged from 40 to 51 minutes (key informant interviews varied from 14 to 36 minutes in duration).

We communicated with a total of 26 individuals. We completed full interviews with 14 persons (10 residents who had experienced a human-bear interaction and 4 key informants). Snowball sampling led to contacts with 12 additional individuals (7 key informants and 5 homeowners) who provided information through a brief telephone conversation, but declined to participate in a full interview.



**Figure 1.** A project concept map that provided guidance for questions during personal interviews.

## Analysis

All interviews were recorded with a digital voice recorder after obtaining verbal consent from each interviewee. One member of the research team listened to all of the interviews and coded responses to each question. Interviews were partially transcribed to record rich text examples, provide context for responses, and capture details in the interviewees' descriptions.

## FINDINGS

### Pre-Incident

#### Knowledge and experience

Interviewees had varying knowledge and experience levels, ranging from little or no experience with black bears to extensive knowledge and experience. Although some interviewees had seen a black bear in other places, none of them had encountered a black bear on their property before the 2008 event. Many were aware that bears occupied the general area around New Paltz, but most were genuinely surprised to see a bear so close to their home.

Most of the persons we interviewed reportedly were aware that bears are attracted to garbage and other anthropogenic sources of food before they encountered a bear in August 2008. Some did not fully appreciate how attractive bird feeders are to black bears. Although all were aware that bears lived in their region, many believed that bears were not living close by and were surprised that bears would enter their neighborhood.

Previous research led us to expect that residents with bear-related personal experience prior to the August 2008 event would have reduced risk perceptions associated with their bear interaction in New Paltz. Findings were consistent with that expectation. Interviewees who had had some bear-related experiences in the past tended to be less concerned about bears or alarmed by the presence of bears in their neighborhood than were interviewees who had never encountered bears before the events of August 2008.

Perceptions based on exposure to mass media coverage. Two interviewees recalled news coverage of the incident in New York when an infant was fatally injured by a black bear. Coverage of that event raised their awareness of bears and perception of bears as a threat to humans. Passages like the one below suggest that such media exposure could generate anxiety about the possibility of a home entry by a black bear in New York. Anxiety about the possibility that a bear may attack people can in turn motivate residents to contact DEC and demand some intervention.

[respondent mentioned media coverage of August 2002 incident] *...that was probably the first time a bear crossed my consciousness. ...I remember, I think I was vaguely aware that there were bear in these woods. Never saw them, but then when I heard that incident [i.e.,the bear-related human fatality in New York], I think like the rest of the public, I was kind of shocked. And then I think I paid more attention. I saw some news reports of bear sightings in New Jersey, and in Rockland County, the county south of here. I think it sort of raised my awareness in a negative way of bears, after that incident.* Interview #3

[What experience had you had with bears?] *Only anecdotes. So, several years ago there was a bear somewhere in the Catskills that snatched up a little baby, in a carriage, that must have had milk on it, and did away with the baby. And then you hear, I've heard stories about bears going into people's houses.* Interview #10

Potential influence of perceptions of other bear species. One interviewee mentioned mass media reports and personal experience related to brown bears (*Ursus arctos*) that seemed to influence perceived risk associated with black bears in New York. The following quote illustrates what may be an associative network of beliefs about a mental construct of "bears," wherein information about different species and human encounters with bears inside and outside New York contribute to the mental construct. The interviewee's comments show a recognition that brown and black bears have different traits, yet also illustrate the way that a powerful affective experience with brown bears could produce misplaced anxiety about encountering a black bear.

*... actually, I forgot to tell you, I went to Glacier National Park. You have to be careful about bears there. That was a scary experience. But I didn't see any. But when we were hiking in high grass I was terrified. But maybe for no good reason." ... "and then there was a story about somebody who came upon two [brown] bears, who wanted privacy. So the bear went after the man and the woman ran to get help and he survived, but he was clawed. So you hear those kinds of things and the image of a bear coming into your house is terrifying. Interview #10*

### **Beliefs, attitudes, concerns**

Most interviewees expressed an appreciation for nature. Although some characterized themselves as “neutral” toward bears (i.e., had neither strong interest nor negative feelings about bears), most interviewees said they had positive attitudes towards black bears. None of the interviewees wanted bears to be harmed in any way. Several were excited to see a bear, but also held concerns about the presence of a bear so close to their home.

*When the big predators come back it's good, but why are we seeing them around here, you know? Is it a good thing that they are coming back and they are so close? My Mom grew up in L.A., so her response would be, 'Oh my God! I'm gonna call the police!' And I'd just say, 'oh cool, a bear'.*

*[how do you feel about bears now? ] I still would rather not have them in my yard. Certainly if they were showing up on a regular basis I wouldn't be happy. But, you know, I guess once in a while like that it's not too big of a deal. ...if it's regular, then I would worry. Interview #8*

Several interviewees also voiced a belief that black bear habitat is decreasing and that interactions with bears may be increasing because people are intruding on bear habitat.

*Well, I want them to live and survive, and I understand we're intruding, so there needs to be a lot of education about bears. Now, one thing I would say that I would hate to lose is my compost pile. And I understand they like compost. Interview #10*

Tolerance threshold. Although most interviewees appreciated wildlife and had a positive attitude about black bears, several expressed the belief that having a bear in their back yard is “too close” (quotes provided earlier support this statement). Data from interviews demonstrate that there is a proximity dimension of tolerance, which may change as people experience interactions with bears that are neutral and thus nonthreatening. For example, if one believes bears present a threat to children, having bears in the yard is too close because that threatens children. New information, combined with nonconsequential personal interactions with bears, led to a lowered risk perception (this finding is consistent with previous research in New York, which found that experience with bears, including mild negative experiences, lowers concerns about bears [Decker and O'Pezio 1989, Siemer et al. 2009]).

## Human Behavior and Expectations During the Incident

### Perception of events

Several interviewees described encounters where the bear involved was exhibiting what they perceived as nonthreatening behavior. Interviewees interpreted bear reactions to them as nonaggressive, passive, and slow. Interviewees interpreted such behavioral responses as an indication that the bear they encountered did not feel threatened by people, took little or no notice of people, and had no interest in people. In other words, though often alarmed initially about the presence of a bear right in front of them, most interviewees quickly interpreted the bear's behavior as nonthreatening.

[How did you feel about all the interactions at that time?] ...*they seemed shy. They were not aggressive. I've read that they are very intelligent and I suspect that they are. They were foraging for food for the winter ... I was aware and a little apprehensive in the evenings coming home, because I didn't know where they might be. But I kept the lights on and I think the sound of the car engine would startle them. As I said, they seemed just shy and not aggressive.* Interview #5

### Risk perception

The biggest concern for most interviewees was the safety of children in the neighborhood. Pet safety was a secondary concern. Several interviewees were annoyed by the inconvenience that they would experience as a result of keeping garbage indoors. At least one interviewee was concerned about losing the opportunity to feed and view birds. Most were not concerned about minor property damage.

[Overall how do you feel about bears now?] *I don't want them [bears] around here, that's for sure. It just wouldn't work. It's just not a good combination [having bears near children is a bad combination]. I wouldn't trust them [the bears]. I wish that it could [work], it must be absolutely amazing, it's just not possible.* Interview #14

[Seeing a bear was reportedly "kind of cool"] ...*But I'd rather see it in a park or whatever, than here in my own back yard.* Interview #8

*Well, I wasn't delighted about it [the bear]. First of all, I like having a feeder out and I was a little annoyed that I had to take the feeder down. But, beyond that, as long as nobody got hurt, I was concerned for my grandson and wouldn't have liked it if he had been outside when the bear showed up. So that was one concern I had. And we have a lot of children in the neighborhood, so that would not be a good mix.* Interview #4

*I was a little concerned, because I had puppies and I have children, and I know in the neighborhood there are children. ... there is a daycare center. You know, so I just thought of a bear being in a residential area. But as he [the bear] took off, as I say, I thought it would be an isolated incident.* Interview #6

*You know, they [the bears] were just beautiful to watch, but I think for the safety of the neighborhood we were concerned because we also have young parents with young children, who stroll up and down the streets. It's a safe development and that's what they do, so I think there was concern. Certainly by the nursery [the local childcare center]. Interview #5*

*You know, it's the safety issue. I have a son who was 5 then. Dumped garbage on the lawn is something I can live with, it doesn't bother me. What bothers me is that a hungry bear, my son is a little taller now, but a hungry bear might just think, you know. It's just a little, that incident [bear-related infant fatality in New York] put bear-people relations back a long way. The thing with the mauled child. Because it's just a little too, I mean I think they are nice animals. I don't think they aggressively go after human prey, that's not what they do. But they are certainly opportunists, and it's just a little bit uncomfortable to think that an animal with the potential to cause harm could be one step off in our backyard. That would be my concern. ... it's just that bear can be unpredictable and they do have the potential. That's the problem. Interview #3*

### **Response to event**

**Habituation.** Habituation refers to a waning of response to a repeated neutral stimulus (Bejder et al. 2009, Manning and Dawkins 1992). For example, repeated exposure to the noise and movement of motor vehicle traffic on residential streets may become a neutral stimulus that elicits little visible response from common backyard wildlife (e. g., gray squirrels, songbirds). Their presence in residential areas is evidence that black bears have some ability to tolerate, and perhaps habituate to, the collective comings and goings of humans on the landscape.

Interview comments did not yield enough information to make firm statements about the ways in which direct encounters with people might be influencing bear habituation to humans in residential areas. In general, residents in the study area said that they tried to make noise to scare away the bear they encountered (i.e., a mildly negative stimulus). But none of the residents took actions more aggressive than making noise and very few interviewees had a repeat encounter with a bear. Thus, while bears were presented with mildly negative stimuli in a few instances, interview comments suggested that the bears involved in this case were seldom seen and received little direct harassment by human residents.

**Food conditioning.** Food conditioning is a form of instrumental learning (Barker 2001). In this case, food conditioning refers to the process by which black bears associate food rewards with a second, independent stimulus (e.g., the sight or smell of a bird feeder or garbage container). Some of those interviewed did not fully appreciate that their use of bird feeders could be a powerful attractant to bears and a contribution to food conditioning of bears.

*[What did you really know about bears?] Not a lot. What I have learned, because of what happened in the neighborhood, is that you are not supposed to have a bird feeder when the bears are out and about, which I would assume is around now. I don't think there was enough publicity about that, and people flocked to buy birdseed in the summer and feed the birds. Interview #10*

Keeping a distance from bears. Some interviewees understood that keeping some distance away from a bear was a technique to keep an encounter with a bear from escalating into an unsafe situation for people or their pets (one interview who believed maintaining some distance was important reasoned, “They are powerful and large, even though they are shy.”).

[What ideas did you have about what to do if you ever saw a bear?] *The basic understandings that I had were to not try to interact with the bear, ...don't do anything to incite the bear ... or make it feel threatened. Basically leave it alone and keep at a safe observing distance. It's the same instruction that I gave to my kids... we don't discard animal products in our compost. We knew not to do that. Anybody who's doing composting, they tell you not to do that anyway. Our meat things are bagged and sealed even when we put them in the garbage. [we knew to] try to limit the odor that might attract them. Interview #11*

*Then, Pop. Out of a garbage can like 20 feet from me was a black bear looking at me. And that's when I was like 'Bear! Bear!' ...And my very first concern was the dog, because he can pull me down if he wants to, and I knew that I had to keep my cool and get the dog away. Because I didn't know the reaction –I didn't know the bear's reaction to the dog or the dog's reaction to the bear. So he was pulling me and growling and barking ... not aggressive, but ...I tugged him in really hard and I was screaming, 'Bear! Bear!' just to get [dog's name] to respond to me. And after two or three really good tugs he stopped pulling me. So I was just backing away and I was really loud, ...to keep the bear knowing I was there, ...and I backed away. And I was screaming at the top of my lungs 'Bear! Bear!' Because I wasn't sure if the bear had seen me. I was screaming just to keep our presence known. So I did get pretty far away and once I couldn't see the line of fire anymore, I started running [nervous laughter]. Not because I was scared really, but because of the adrenaline. Because I didn't know what was going to happen with the dog and the bear. ...The bear did seem to notice me at some point, but he didn't seem to care. What I was more concerned about was I heard there were babies [cubs] and I didn't know if I was in between them, where these babies were, and it was just sort of the unknown about it. Because I know that's when bears are aggressive. And that was another issue [that uncertainty], with [dog's name]. Not knowing where we were in space [in relation to cubs if they were there], what would become of it. I just got out of there as fast as I could. Interview #7*

[So how did you feel about all the interactions at that time?] *Well, they were wonderful to watch. I was inside the house. I have double doors and I have a metal door so, they weren't acting aggressively. I didn't think they were going to do anything aggressive and I certainly would have called if they had. Interview #5*

Erosion of behavior change. In every case, behavioral change by interviewees eroded quickly and subjects returned to their pre-incident behavior patterns. Comments suggested that interviewees found that the new behaviors were inconvenient, took too much effort to implement, and offered no relative advantage at some point because bears had reportedly left their neighborhood. In this case, the problem literally went away, so there was no incentive to maintain behavioral changes.

Behavior change was varied. Most interviewees were comfortable with removing bird feeders and modifying garbage routines, for awhile. Several expressed the belief that “garbage belongs outside” and they either did not change or quickly reverted back to keeping garbage outside their garage or in a shed.

[So were you doing anything different once you knew the bear was around?] *“Yeah, I stopped feeding the birds. [...Anything other than the birdfeeder? Anything with the garbage?] “Oh, the garbage. Now that you mentioned that. For awhile ...we used to put it out the night before, then we started putting it out very early in the morning instead. Now [now that bears are active again] we should probably start going back to that. ... The most important behavior change was related to bird feeding. Interview #10*

### **Communication networks**

The New Paltz Police department reportedly received 14 total calls about black bear interactions in 2008. Most of those calls (11 of 14) were associated with the case study event in August (there isn't a one-to-one correspondence between calls to DEC and calls to the police; some people called only the police or only DEC). A police department representative told us that residents called to let the police know that a bear was in the area. Callers reportedly did not feel personally endangered by the bear, but did express concern about safety of local children. A police department representative said that officers were dispatched to the scene in each instance, but in each instance the bear(s) had left the area before an officer arrived. The police department notified the New Paltz DEC office to inform DEC that bears were being sighted in the area and that they were being contacted by area residents.

Often, residents first called the local police department to report a bear sighting (in one case a homeowner contacted DEC first, was told that the agency could not send someone to his home, so he then contacted local police). Most reported that they were told (by the police dispatcher) that making loud noises would frighten the bear away. In some (but not all) cases, interviewees said they were told that an officer would be dispatched and that the lights of the police vehicle would also frighten the bear away. Interviewees reported that police instructed them to contact DEC for further assistance, so DEC was generally called after the police. When callers learned that DEC would not come out to remove the bear, most people did not contact DEC again.

We documented a substantial amount of neighbor-to-neighbor communication about human-bear interactions in this case. A local childcare center (the site of one set of reported human-bear interactions) became an important node for interpersonal communication. The childcare center served approximately 50 youth and their families. Communication between parents and neighbors via the childcare center played a role in catalyzing dissatisfaction with DEC's response to bear sightings in the neighborhood.

*One morning [at my childcare center], ...there had been an incident where, ... of course it was a big deal, you know. You are bringing your child to school and the director of the school is standing out there in the parking lot saying 'quick, quick' ushering everybody in*



*because they had a bear right in their parking lot. So I guess I did know about the bear. I guess I was already a little sensitive. And the scuttlebutt was, the gossip was that not only had they [staff at the childcare center] seen the bear, but they had a neighbor who also had a bear, more than one, like an entire family [of bears] under the porch, and that DEC's response was rather lackadaisical. Like, 'can't we all just get along and peacefully coexist?' So all of that was kind of floating around before I saw my bear. So when the police came [to his house] they only reinforced that gossip that I had heard about the DEC response being somewhat lackadaisical. Interview #3*

A few irritated individuals repeatedly contacted DEC, demanding some sort of DEC action/response. These individuals also contacted the town supervisor, a local newspaper, and other residents to encourage or demand actions of some sort.

Interviewees did not call nuisance wildlife control operators [NWCOs] and the two NWCOs we interviewed confirmed that they receive few phone calls about bears. Wildlife rehabilitators and town animal control staff were also called infrequently. A local nature center did receive calls about bears, with people generally calling for advice on how to keep bears away from bird feeders. Nature center staff noted that they often hear from residents who are reluctant to take down their bird feeders and are seeking ways to continue bird feeding without attracting bears.

One interviewee made attempts to inform town officials and town residents about the bear interactions. This person did not expect action by the town, but did believe that town residents should be informed about the presence of bears.

*I also went to a town board meeting because I thought that, based on the number of sightings that there were here, that they should probably release public information about what to do if you see a bear. ...not suggesting that the town do anything, just that they give instructions out, public information. The town board meetings are on cable, they go out on public access. So I felt that just by being there and bringing it up during public comment, that would get the information in front of a lot of people. Interview #11*

## **Expectations of DEC**

Interview data provide insights about the range of expectations that homeowners have when they contact DEC about a bear interaction. In this case, four of the ten homeowners expected DEC to remove the bear that visited their yard (all wanted the bear to be humanely captured and released unharmed into some other area; all expressed that they did not want the bear to be killed). Two other homeowners expected DEC to provide on-site assistance that would deter the bear from returning. One homeowner expected DEC to implement an information/education effort in their neighborhood to teach residents about bear-problem prevention (one interviewee was told that DEC does not distribute bear-related education pamphlets to entire neighborhoods, but a DEC representative sent her multiple copies of a brochure for her use in communicating with neighborhood residents). Another thought DEC would want to know about any bear observed and would want to track the location of the bear(s). One expected no action from DEC. Another said, "I didn't know what to expect from DEC."

In six instances a homeowner expected DEC to remove the bear or take action to deter the bear from returning to their property. In each case residents were told by DEC that staff typically do not remove bears or provide on-site assistance in situations like the one being reported. Expectations for service from DEC were unmet for these six homeowners, all of whom expressed dissatisfaction, frustration, and anger or annoyance.

Homeowners who expected DEC to trap and transfer bears out of residential neighborhoods quickly modified their expectations after learning this was not DEC protocol (though doing so didn't increase satisfaction with DEC response). Homeowners were simply unaware that the agency handles very few bears, so their beliefs were easily modified by adding new information. Some commented that after they spoke with a DEC representative, they understood and accepted DEC's policy. Others found the policy unacceptable and said they would continue to request that a bear be removed.

*I didn't want the bear killed, but I definitely wanted it tranquilized and taken away. You know? I wouldn't want to hurt the bear, of course. It's not their fault; it's our fault for building all these homes in their environment. ...I was very surprised they [DEC] didn't tranquilize them and take them away, considering that it is in a residential area. But they said that it would just come back. Interview #14*

*We never got too crazy about it [the bear]. I think, you know, as time went on and we started to get life back to normal and not worrying about it at all it was just like, OK. Even though at the time what the woman from the DEC said didn't seem that helpful, she was right, you know? That it did just move on and, maybe they will be back again, but who knows. Interview #9*

*So the police came, and the reason I got upset was, in my conversations with the police, ... they implied that they had had numerous calls to numerous people's homes, and there had been numerous bear sightings. That's what I was feeling a little bit upset about, that 'what the heck is DEC supposed to be doing?' Because I did think that the standard operating procedure was that when a bear is in the midst of the human population, that they basically tranquilize them and get them out. And after, over the course of the several weeks that we had the bear situation, I realized that wasn't always the case. ... it just seemed like the DEC response was, 'well, we just have to learn to live with bears.' And I felt, well yes we do in a sense, but you know, when there's little children around at some point. ...it seems to me to be a reasonable thing to do to take them off...north of here, I don't know. Interview #3*

Expectations related to communication. Several interviewees were frustrated when told that DEC "couldn't do anything" unless the bear was in someone's house or had actually injured someone. Some interviewees interpreted DEC responses as nonresponsive and unsatisfactory.

[after reports of bears in the neighborhood died down]... *There was nothing followed up with anybody—no local DEC came by, they didn't say 'this is typical, next year around this*

*time watch out, they usually come back’—which are things that I’ve heard. ... We didn’t hear anything back from them [DEC]. Interview #14*

*...you know what they should have done, was just said simply this is what we are doing. We’re gonna use traps ... not just saying there’s nothing we can do, hopefully he’ll leave. There should be paperwork put out saying this is exactly what’s happening. Because that’s the right thing to do.” Interview #14*

[What was your biggest frustration with it, lack of information] *Lack of action and information. And just the ‘who cares’ attitude. You know? [DEC staff say] ‘If you yell they won’t come near you.’ Well can you prove that? Are you 100%--are you going to guarantee that? That’s not true. Interview #14*

[Interviewee who would call police first if another bear were near his home] *... because they were the only ones to respond in any way, to try to do anything. But I would also let the DEC know. But I don’t know if I’d go through that frustration again, the number of calls I had to make and return calls and, you know, calling all the way from New Paltz to Albany. It was too frustrating, the lack of activity on their part. Interview #14*

Expectations regarding DEC actions. All of the residents interviewed wanted some form of nonlethal response to bears. Expectations for information about bears and keeping bears away from homes were common. Some also mentioned an expectation for an educational response.

[So what do you think should be done about interactions like these and who should be doing it?] *I think there should be an education thing. I think there should be experts from DEC coming into the schools. I think that is essential. ...I think parks department should be coming to schools...to make sure that everybody understands not to fear nature, not to have a dread fear of nature. Because you end up causing a lot more harm when everybody goes reaching for their rifles, or whatever other drastic measures they might take when fear is not proportional to the actual situation. And so the only way to create that climate and keep it going is to have a continuing education program interacting with the schools. ...a slide show or video showing all the native animals and their habits. ... and giving homes information and statistics about the dangers, where such dangers exist. That way you are not just presenting useful personal emergency information, but at the same time having everyone feel that the nonhuman animals of the area are part of our population. That it’s not just 12,000 humans. That we’ve got this great relationship with these other native populations that we share this land with. And to make sure that they understand that this is good. That there’s no harm here, there’s no risk...that we share this land, we don’t rule over it. Interview #11*

## Post Incident

### Relief seeking

Most interviewees stopped calling the police after one interaction, in which they learned that the police are limited in what they can offer as a response to a bear near a birdfeeder or raiding a garbage can. Most interviewees also stopped calling DEC for relief when they learned that DEC will not offer on-site assistance in a typical situation, where human injury is unlikely and no major property damage has occurred.

### Personal behavior change

Among those we interviewed, behavioral change eroded and subjects quickly returned to original behavior patterns. Perhaps this was because the behavior changes were inconvenient, the new behaviors took extra effort to implement and offered no relative advantage. In this case, the problem literally went away, so there was no incentive to maintain behavioral changes. One person commented that his interactions with bears were a “novelty” that he did not expect to experience again, and he thought it would have more of an effect on his behavior if it became routine for bears to appear at or near his yard.

[Did you do anything different after the period when the bear was around?] *No. And truth to tell, it's interesting psychologically. Once out of sight, out of mind. Which is maybe not such a good idea. I think more about spraying things against the deer than I think about bears. It's as if the bear thing is so unique that I think I'm assuming it will not happen again. But that's not valid either.* Interview #10

Information seeking. Obtaining information gave some a sense of control or a better understanding, such that their perceptions of risk were reduced.

[Did learning about bears and what DEC does make you more comfortable?] *Yeah, information helps a lot. Helps you feel calmer.* Interview #10

### Beliefs, attitudes and risk perception

Attitudes toward bears were neutral or positive before interactions and, for several persons we interviewed, remained that way after encounters.

*I would have no problem if it did happen again [if bears were in the neighborhood again]. That's just me. Like I said, this is not to me a terrifying animal and I don't want to see nature unduly harmed for the sake of human sprawl. I might feel differently if it were a mountain lion, but ...* Interview #10

*I mean, I'm more worried about getting Lyme disease when I don't have health insurance, you know, than about meeting the bear. ...It was a good story to tell.*  
Interview #9

A few of those we interviewed maintained a generally positive attitude toward bears, but also held some concern about child safety that led to an attitude that having bears present in their neighborhood would be a bad thing.

### **Changed expectations of DEC**

Expectations of DEC service quickly adapted to reality. Interviewees immediately learned that bears were not often removed by DEC and that they were unlikely to get on-site assistance from DEC. After adjusting their expectations, many said they would not call DEC again if they had a bear encounter. Lingering dissatisfaction with DEC remained for several, however. Some interviewees said they would contact DEC again if they had another bear-related problem, and said they would more aggressively demand assistance. Others changed their expectations, but still wanted DEC to serve as a source of information when they experience a bear-related encounter or when bears are in their neighborhood.

[What do you think you would do next time? If you saw a bear again how would you react?] *Probably the whole thing would start again. But this time I might be a little more aggressive in getting them to do something if it's going to be an ongoing full summer thing. Again, I don't want to see them hurt the bear, but there has to be something they can do to protect the kids and the residents. There has to be.* Interview #14

[How do you think you would react now if you saw a bear?] *If I saw it on my property I'd be frightened. I'd call the DEC. So I would think about potential danger. Whether rightfully or not I have no idea. I just have no idea if bears in our area have tried to go into houses, for instance. ...it would be good to know more. Maybe the DEC should have a workshop for people who are interested.* Interview #10

*I know who to call now, I know what's gonna happen next when I do call. That it's mostly that they are just going to log it in a book. I'm not expecting them to come out and do anything about it. And the first time around I didn't know what to expect. I know that it's most likely just going to go away in time and I'll just be careful.* Interview #8

## **DISCUSSION AND RESEARCH IMPLICATIONS**

### **Cognitive Biases, Risk Perception and Behavior**

People often use cognitive shortcuts (i.e., heuristics) when making everyday decisions, and those shortcuts can bias decisions. In this case, interviewees seemed to overestimate the probability that a child in their neighborhood would be injured by a black bear. One explanation for the tendency to overestimate rare events is a cognitive shortcut called the availability heuristic (Tversky and Kahneman 1974), wherein a rare event (e.g., a bear attacking a human) is

memorable, salient in the actor's mind, and thus overweighted in choices and related actions. A child in the Catskill region (not far from New Paltz) was fatally injured by a black bear in 2002 and the incident received widespread media coverage (Gore et al. 2005). News coverage of the incident did not appear to raise aggregate levels of risk perception in the state (Gore et al. 2005), but the event was clearly salient in the minds of several interviewees in this case. In one instance, an interviewee specifically made reference to the bear-related human fatality as evidence that bears sometimes attack children. It is plausible in this case to suggest that media use influenced risk perception and behavior for some interviewees, perhaps through an availability heuristic.

Siemer et al. (2007) found that media use was not correlated with bear-related risk perception at an aggregate (population) level. Observations in this case may appear to contradict the Siemer et al. 2007 findings; however, media can activate concern in an individual in this specific context even if it doesn't elevate collective/general risk perception in a population. It is possible that people who contact DEC because of bear-related concerns are likely to include individuals who were strongly influenced by media coverage of the bear-related human fatality in 2002, but this is speculative.

The concept of risk has been defined as having both a technical or cognitive component (perceived probability that an event will occur and perceived severity of consequences) and an affective or values component (concern, dread or outrage associated with an event) (Sandman 2004). In this case, dread related to the potential consequences of a human-bear interaction dissipated quickly. Consistent with Slovic's (1987) psychometric paradigm, we found that people reported reduced concerns about bears after they gained a sense of increased personal control (self efficacy) over human-bear interactions (i.e., after receiving problem prevention advice) and, through personal experience, learned that an encounter with a black bear typically does not have catastrophic consequences. Most interviewees believed that the probability of future encounters with bears was very low, which also explains why concern about bears dissipated quickly.

By contrast, Slovic (1987) and others point out that a sense of outrage can elevate risk perception. In this case, interviewees tended initially to overestimate the probability of a rare event (i.e., a bear injuring a child) and thus several became frustrated and dissatisfied with DEC's response (a response predicated on a judgment that the actual threat to human safety in this situation was very low). Comments from a number of interviewees illustrated how outrage grew quickly and lingered for some. Their sense of outrage seemed to exacerbate their sense that neighborhood children were at risk, and their belief that black bears can't be tolerated in residential areas.

### **Implications for future research**

Subsequent quantitative research on emerging wildlife-related risks in New York should include indicators of both affective and cognitive attributes of risk perception (e.g., indicators of perceived probability that hazardous events will occur [cognitive], as well as indicators of worry or concern about hazards). Subsequent research should include indicators of stakeholders'

perceived control over hazards (self efficacy and institutional efficacy), the level of dread associated with a hazard, and the level of outrage associated with the hazard or its management.

### **Threshold of Tolerance**

We observed a “threshold of tolerance” for interactions with black bears that includes a dimension of physical proximity to bears. Having bears in the yard crossed the line of acceptability for interviewees concerned about the safety of children or their ability to feed birds. For those who did not feed birds and did not think children were threatened, close proximity did not breach any threshold of tolerance. Based in part on findings from a study on human-coyote interactions in two New York counties (Wieczorek Hudenko et al. 2008), we hypothesize that stakeholders would not tolerate such close proximity if they perceived that doing so would subject them to negative impacts. Our case study findings were consistent with the hypothesis that proximity threshold may change if one can be convinced that negative impacts can be minimal even when black bears live in close proximity to humans.

Observations were consistent with our hypothesis that stakeholders have a “hierarchy of acceptance” for bear-related impacts. In this case, the top concern for everyone involved was safety of children. Next in line (in terms of strength of feeling) was retaining the ability to practice bird feeding. These top concerns motivated interviewees to contact DEC, sometimes repeatedly, to ask for assistance or agency action. Of lesser concern to interviewees in this case were impacts associated with bears attracted to garbage (i.e., cleaning up the mess, minor property damage). The underlying impacts that stimulated these weaker concerns were not sufficient to motivate anything more than temporary behavior modification. Interviewees were not strongly motivated to change behavior based on inconvenience or minor property damage. Moreover, they were motivated to keep the smell of garbage outside their house, and they are motivated to put out birdseed because it gives them great satisfaction to watch birds at the feeder.

We speculate that wildlife management stakeholders may experience a “cumulative impacts” effect, wherein they experience a series of repeated negative impacts of different types that in aggregate become intolerable. We did not make any observations in this case that helped us consider the merits of that hypothesis. For most interviewees, because their first encounter was on or very near their home grounds, a threshold of tolerance was crossed during the first interaction with bears that they experienced.

### **Implications for future research**

Subsequent quantitative research in New York is needed to characterize stakeholder-defined impacts and should explore hypotheses related to impact hierarchy and cumulative impacts affects for specific emerging hazards.

### **Beliefs about Wildlife**

Stakeholders’ beliefs about a species of wildlife (black bears in this case) set the context for tolerance of that species in landscapes that include substantial residential development. Kretzer et al. (2009) found that landowners in northern New York who had experienced

problems with wildlife expressed lower support for programs protecting land and wildlife than did landowners who had not experienced problem interactions. Researchers speculate that generally favorable perceptions of large charismatic wildlife (e.g., bears, moose, deer) may create tolerance for those species among stakeholders who have no direct personal experience with those species; but this may be altered abruptly with experience (e.g., when an interaction is perceived as threatening). Smaller, less charismatic species (e.g., coyote, bats) may not be viewed as favorably in general, even among those who have never experienced problems with those species. We hypothesize that perceived risk may be higher in the absence of generally positive attitudes towards a species.

Beliefs about black bear behavior probably played a role in perceived risks related to bears. In this case, even though interviewees knew that bears lived in their general area, they did not believe bears would venture into their neighborhood. Perhaps such a belief was created through years of experience, when in fact no bears were observed in their neighborhood. This finding stimulates speculation about the stereotypes people may hold about black bears and how those stereotypes are influenced by personal experience. We might ask, for example, how common is it for residents of core bear habitat to perceive black bears as an animal that lives “deep” in the woods separated from human contact, when in fact bears can and do live in close proximity to human residences?

Several interviewees interpreted the slow movements of bears in the presence of humans, and apparent lack of fear response in the bears they observed, as indicators that bears are nonaggressive and nonthreatening to humans. These behavioral interpretations probably reduced risk perception in interviewees. Thus, the reflexive process of co-habituation that we hypothesize as occurring may be reinforced by both bears and humans.

Another set of key beliefs in this case relate to food attraction of black bears. Wildlife managers in every state with a black bear population wonder why people don’t take preventative actions when they are aware that doing so would keep bears away. In this case we identified individuals who knew that food attracts bears at the time they contacted DEC, yet basic awareness of food attraction had not motivated them to take problem-prevention actions. In this case, homeowners seemed to believe that having a bear visit their yard was a one-time event and was not probable enough to warrant long-term changes in trash handling or bird feeder use.

### **Implications for future research**

It would be useful to wildlife managers to document key beliefs about species of wildlife that threaten human health or safety. Quantitative studies that shed light on key beliefs about wildlife (e.g., beliefs about species behavior, beliefs about food attraction [instrumental conditioning]) may be useful to understand problem prevention behavior, dread, and other aspects of problem interactions with common nuisance wildlife (e.g., coyotes, deer).



## **Acceptability of Risk Management Strategies**

Interviewees in this case held attitudes toward several bear management actions that were consistent with findings from a statewide survey of black bear management stakeholders in New York in 2002 (Siemer and Decker 2003). That survey found widespread public expectations that DEC should deliver high levels of on-site assistance in residential areas, and should do so without killing problem bears. Over 80% of survey respondents agreed with the statements, “DEC should try to minimize interactions between people and bears in urban areas” and “DEC should be more willing to capture and relocate black bears in urban areas than in rural areas.” In contrast, only 15% of 2002 survey respondents agreed that “DEC should be more willing to destroy black bears in urban areas than in rural areas.” In this case study, interviewees routinely expected DEC to trap bears in their neighborhood and release the animals in some other location.

### **Implications for future research**

Management strategies that involve lethal control of wildlife are typically controversial, especially in residential and urban areas. Future research should include efforts to understand the relationship between risk perception and support for both lethal and nonlethal wildlife management actions.

## **Stakeholder Expectations of DEC**

Findings from this case illustrate well-known connections between expectations and satisfactions. As satisfactions research would predict, stakeholders who did not receive expected services from DEC were dissatisfied with the agency’s response. It was not surprising to learn that many interviewees in this case expected DEC to provide on-site assistance. Those expectations are well known from agency experience and previous research. For example, a 1996 study of telephone service by the DEC Bureau of Wildlife (Connelly et al. 1996) found that callers often expected on-site assistance to resolve a nuisance wildlife situation, and urban callers were more likely than rural callers to expect such services.

### **Implications for future research**

Future studies with objectives related to risk communication should include measures of expectations and satisfactions related to agency communication and intervention in situations where wildlife present hazards to humans.

## **MANAGEMENT IMPLICATIONS**

### **Managing Expectations**

The relationship between expectations (for “customer service” from DEC) and stakeholder satisfaction manifest in this case has important management implications for DEC. It may be possible for DEC to utilize electronic communication (e.g., the DEC website, etc.) and other communication mechanisms to create realistic expectations of service from DEC. A key need in this area seems to be clear communication to develop accurate perceptions of the

application of trap and transfer activity (i.e., communication that encourages an accurate belief that DEC rarely moves bears).

### **Risk Communication**

Social networks play an important role in risk communication. The social network contagion theory of risk perception (Scherer and Cho 2003) posits that individuals adopt the attitudes and behaviors of those with whom they communicate and network (i.e., develop normative beliefs and behaviors). Communication among community members networked through the local childcare center in this case study illustrates how this can occur in a community experiencing a flurry of black bear activity.

Events like this, wherein a cluster of human-carnivore interactions take place in a neighborhood, may be more manageable if DEC crafts a communication response that takes social networks into consideration. If DEC staff conduct communication through important nodes in the network, the effects of that communication may be amplified. In this case communication with childcare center staff and to others who communicate through that node might have been very useful. Likewise, improved communication between DEC and local police may have been useful, given that a substantial number of residents in this case contacted police before contacting DEC. In other cases, similar nodes of communication may be apparent. Perhaps the clear take-home message is that, in small-scale management issues like this one, one of the most effective risk communication strategies may be interpersonal communication with individuals and organizations who are nodes of communication in a neighborhood. This is a relatively low cost, nontechnical response that may reduce outrage associated with agency decisions not to remove or relocate carnivores from residential areas.

### **Complaints as an Index to Human-Bear Interactions**

DEC receives telephone calls from stakeholders who contact the agency for advice or assistance to manage problem interactions with black bears. DEC uses these “complaint” reports as an index to trends in negative impacts created by human-bear interactions in a neighborhood or DEC region. In the case examined here, because residents learned that DEC would not respond with “curb service”, a reduction in complaints to DEC may indicate that stakeholders have simply stopped calling DEC for assistance, even though they may continue to suffer problem interactions with bears. This diminishes the value of number of complaints received by DEC as an indicator of human-bear interactions. It may be useful to DEC to develop additional indices of negative impacts on bear-management stakeholders.

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## APPENDIX A: RESIDENT INTERVIEW GUIDE

### INTERVIEW GUIDE HUMAN-BLACK BEAR INTERACTION

*This form will be viewed by interviewer only. It is designed for interviews with homeowners, not key informants in professions that respond to calls for assistance with a wildlife-related problem.*

*The following interview guide is for homeowner interviews in the New Paltz bear events case. The guide will serve as a starting point for discussion. The interviewer will listen to participants and go into greater depth on particular topics outlined in the study concept diagram (Figure 1 in this report), according to the experiences and perceptions described by any given participant.*

Thank you for taking the time to meet with me today. I appreciate your willingness to participate in our study. If you'll recall, the purpose of this interview is to discuss a period of time last summer [specify the time period] when there was a lot of black bear activity in your neighborhood.

I would like to use this digital recorder to record our interview to help me identify the most important points of our discussion today. But if you prefer, I can take notes instead. What would you be most comfortable with? [IF CONSENT NOT GIVEN, DO NOT RECORD INTERVIEW].

Your participation in this interview is entirely voluntary. You may choose to end the interview at any point or decline to answer any questions that make you feel uncomfortable.

#### **Introduction**

**I'd like to start by asking you a few questions about your personal background that may help us understand your interests and concerns about black bears in your area.**

1. Have you always lived in the New Paltz area?
  - a. [If they grew up somewhere else] Where are you from originally?
  - b. Was the area where you grew up more rural or more urban than where you live today?
2. What do you do for a living?
3. Do you have young children or grandchildren?
4. Do you have any pets that spend time outdoors?
5. Do you participate in any wildlife-related or outdoor activities?
6. What types of wildlife do you typically see around your home? Do you have plantings or feeders in your yard to attract wildlife?

**OK, I think that's a good point for us to move into my questions about your opinions on black bears in your area. Last summer, DEC received numerous calls about bear activity in the area and I want to ask you about your perspectives before and after that period last summer.**

### **Pre Incident - Guiding Questions**

I'd like to start by asking you a few questions about your experiences and attitudes about bears before the time last August when several people in your area were seeing bears.

1. What kinds of experiences had you had with bears before last August?
2. How much did you know about bears at that time?
3. How would you describe your attitudes about bears at that time?  
(positive/negative/neutral?)
4. Where do you usually get your information about local issues?
5. Before last August, did you have any ideas about what to do if you were involved in an incident with a bear?

#### Additional Probing Questions (Pre Incident)

- What did you expect the behavior of a bear in a residential area might be?  
(*Expectations*)
  - What organizations did you think would be involved if there was a bear in your area?  
(*Expectations*)
  - What did you think these organizations might do? (*Expectations*)
  - If you have had interactions with bear in the past, how often, how many, what were they like? (*Experience*)
  - Before the incident what bear behavior would have made you call someone? (If they need clarification: seeing the bear at all, if the bear was tearing down a bird feeder, if the bear was eating garbage from a trash can, if the... etc.) (*Risk Perception*)
  - Why would you have called someone? (*Risk Perception*)
  - When do you believe it is the right time to call someone or take action? (*Beliefs*)
  - What action do you believe you would you have personally taken had you seen a bear? (*Beliefs/Behaviors*)
  - What type of bear behavior would scare you? (*Risk Perception*)
  - Had you ever heard from your neighbors about bear issues in your area? (*Information sources*)
  - Have you read about bear issues in the newspaper in your area? (*Information sources*)
  - Have you heard about bear issues on the local TV in your area? (*Information sources*)
  - Are there any other instances where you heard about bear issues in your area?  
(*Information sources*)
6. [For people that we did not identify from the DEC complaint list] Have you ever contacted DEC or some other authority about a bear-related problem?
    - Why? Why not?

### **Incident – Guiding Questions**

OK, I think this would be a good point for me to transition into some questions about the events last August.



1. [For people who contacted DEC] Could you describe the bear interaction that occurred [last August]?
2. If you were involved somehow, what did you do?
3. Why did you react the way you did?
4. How did you feel about the interaction?
5. Was your experience first-hand or how did you hear about [the bear incidents last August]?

#### Additional Probing Questions (Incident)

- If the person saw, or was directly involved with a bear interaction, how far away was the bear, how long did they see the bear for, what was the bear doing? (*Descriptive characteristics of event*)
- Did you call someone, and who, or why didn't you call someone?
- Did you communicate with neighbors or other individuals about the incident? (*Behaviors*)

#### Post Incident – Guiding Questions

[These questions only apply if the person reported an incident. For people who did not contact DEC, we want to know why they did not call.]

1. What did you do in the months after [the incidents in your area last August]?
2. Did you make any attempts to seek information or support?
3. Did your attitudes about bears change after the incident? In what ways?
4. Have you shared your story with others since the [interactions last August]?
5. What do you believe should be done about interactions of this nature, and who should be doing this?

#### Additional Probing Questions Post Incident

- Do you think you would react differently the next time you saw a bear? (*Behavior*)
- What do you think you would do differently? (*Behavior*)
- Do you know more now about bears? (*Knowledge*)
- Are you still looking for more information? (*Information seeking*)
- Why do you feel the way you do now about bears? (*Beliefs*)

#### Conclusion

1. Is there anything else you would like to share about your experiences with or interests in bear-human interactions?
2. Is there anything you would like to ask me?
3. Do you know of anyone else who might offer a perspective on this issue?
  - a. Do you think this person's perspective will be similar or different from your own?
  - b. Can I tell them you referred me?

Thank you again for taking the time to participate in our study. Here is my contact information should you have any questions or comments about your participation in our study.