

BAITING THE BLACK BEAR

THE ECOLOGICAL AND SOCIAL IMPACTS OF NEW JERSEY BEAR AND DEER BAITING PROGRAMS



Black bear feeding at deer bait station in Sussex County, New Jersey, August 2006.

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Edited by: Susan E. Russell

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Editor's Note: The Animal Protection League of New Jersey does not subscribe to wildlife management jargon or euphemisms, such as "harvest" in lieu of "kill." The words, however, are terms of art in the field. Professor Eveland's use of them reflect his training and his choice. The words do not represent the views of the Animal Protection League of New Jersey.

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Professor Thomas Eveland

Tom Eveland earned his Bachelor of Science degree in Environmental Science and Master of Science degree in Biology from East Stroudsburg University in East Stroudsburg, Pennsylvania. Tom presently teaches courses in environmental science, earth systems, and water at Penn State University and earth science, ecology, and genetics at Luzerne County Community College near Scranton, Pennsylvania.

Tom's experience with black bears began in high school, when he worked summers and weekends as an assistant on black bear and elk projects. During that time, he assisted in the raising of two bear cubs, Chuck and Barney. In college, Tom participated in a Penn State black bear study that involved live trapping, radio telemetry and habitat analysis. His responsibilities included living in a tent for three months while running a live-catch trap line for bears. In 1989 and pursuant to a successful legal action, California courts declared Tom Eveland an expert on the black bear.

Tom was a member of the blue-ribbon panel that addressed the management of white-tailed deer within the boundaries of New York City. His master's degree research involved an intensive three-year study of the Keystone State's river otters.

His love for the out-of-doors has taken him to the great slabs of sea ice and harp seals off the coast of Labrador, the steamy swamps of South Florida for wild boars, and high into the Colorado Rockies for elk and mule deer.

Tom describes himself as an avid outdoorsman who lives for time afield. He enjoys most outdoor sports, writes extensively, and incorporates much of his field experience into his class lectures. And the more years he spends on this Earth, the more he appreciates wild things and wild places, where reality and solitude are a part of everyday life.

Tom's passion for hunting obviously diverges from views held by the Animal Protection League of New Jersey. His integrity, independence, and "tell it like it is" allegiance to biology continue to set an example in a field slow to challenge commercial and political imperatives. As this review amply shows, biologists and wildlife health experts are taking strong stands against baiting.

Abstract

The hunting of black bear (*Ursus americanus*) and white-tailed deer (*Odocoileus virginianus*) over bait is an overlooked yet critical component of New Jersey's black bear management program. Baiting for deer or bear changes the behavior of bears and leads to food conditioning and habituation to humans. Artificial feeding contributes to potential conflicts and property damage, alterations in bear behavior and foraging habits, increased or sustained reproductive rate, physical size, distribution, and numbers. Baiting has significant negative impacts on a wide range of non-target species, and contributes to forest degeneration, predation on ground-nesting birds, the spread of disease and invasive plants, increased illegal activity, and increased automobile-deer collisions (Canadian Cooperative Wildlife Health Centre 2003; Alabama Department of Natural Resources 2011). A number of states are reviewing their baiting policies and significantly modifying them.

Baiting is a controversial subject throughout North America, and responsible wildlife biologists are moving to discontinue the practice. Twenty-six states do not allow the baiting of deer. In recent years, Connecticut, Illinois, Michigan, New Hampshire, Vermont, Wisconsin and Wyoming have moved toward restricting baiting (Alabama Department of Natural Resources).

Bear baiting is banned in 18 of the 28 states that allow bear hunting (Humane Society of the United States, 2009). New York recently banned bear baiting to prevent potential human-bear conflicts. Citizens in Colorado, Washington, Oregon, and Massachusetts passed initiatives to prohibit bear baiting. New Jersey allows both deer and bear baiting. New Jersey hunters distributed an estimated 1,000,000 pounds of corn and other foodstuffs for deer bait in 1998-99. Since then, the number of deer hunters who hunt deer over bait has risen to 41 percent or higher (a 2010 New Jersey Division of Fish and Wildlife survey of bow hunters in New Jersey showed that 60 percent hunted deer over bait). The use of bait in black bear hunting is common. Accounting for the decline in New Jersey hunter numbers, there has been a related increase in the amount of artificial, human-derived foods distributed throughout the state's woodlands. Peer-reviewed studies show that bear hunting seasons do not provide clear evidence of reducing nuisance complaints.

Introduction

Bear baiting is banned in 18 of the 28 states that allow bear hunting (Humane Society of the United States, 2009), and New York has recently prohibited bear baiting to prevent potential conflicts. A number of states are reviewing their baiting policies and significantly modifying them.

SCDNR Wildlife Section biological staff opposes the practice of hunting deer over bait due to the aforementioned set of biological, social, and ethical concerns. The following discussion more fully describes those concerns and is based on data collected in South Carolina and other states (SCDNR 2010).

Baiting wildlife, particularly deer (*Odocoileus virginianus*) and black bear (*Ursus americanus*), is a highly charged issue throughout North America. Certain Canadian provinces and states allow bear baiting, others allow deer baiting, and still others, including New Jersey, allow both. Twenty-six states do not allow the baiting of deer. Bear baiting is banned in 18 of the 28 states that allow bear hunting (Humane Society of the United States, 2009), and New York has recently prohibited bear baiting to prevent potential conflicts. A number of states are reviewing their baiting policies and significantly modifying them (New York Department of Environmental Conservation, 2011; Alabama Department of Conservation and Natural Resources, 2011). In recent years, Connecticut, Illinois, Michigan, New Hampshire, Vermont, Wisconsin and Wyoming have moved toward restricting baiting (ADCNR, 2011).

Surveys record strong public antipathy toward the practice. The disapproval is shared by a majority of hunters in some surveys, yet a vocal and growing subset engages in the activity and opposes bans. In states where bear hunting is allowed, the majority of bear hunters appear to use bait.

The problems associated with baiting extend beyond ethics. Hunt managers and biologists are weighing in on the legitimacy of baiting as a method of harvest. Frequently, baiting pits responsible managers and biologists against vocal constituents. For example, South Carolina Department of Natural Resources wildlife biologists oppose baiting as hunter-client factions in the state clamor for it: “SCDNR Wildlife Section biological staff opposes the practice of hunting deer over bait due to the aforementioned set of biological, social, and ethical concerns. The following discussion more fully describes those concerns and is based on data collected in South Carolina and other states” (SCDNR 2010).

Is baiting a “fair chase” form of hunting? Does it control target species populations? Does it contribute to the spread of disease? Does baiting negatively impact non-target species, forest regeneration, and car accidents? The facts are in.

This assessment focuses on the extant literature on the baiting of black bear and white-tailed deer, and widespread bear and deer baiting permitted by the New Jersey Division of Fish and Wildlife (division). When appropriate, the author has drawn on both personal experience and contacts.

Background

Native to the Garden State, the black bear was unprotected and subjected to indiscriminate killing until 1954, when the legislature classified the species as a game animal. In 1958, the division and the New Jersey Fish and Game Council (council) permitted limited hunting until 1971, when the state closed the season.

The season remained closed until the division and council conducted a bear hunt in December of 2003. The six-day hunt ran concurrent with the state's firearms buck season. The total kill was 328 black bears/64 percent female, 36 percent male.

As a result of legal, political, and management factors, the season remained closed until 2005, when the division chose a similar, concurrent format. The total kill was 298 black bear/58 percent female, 42 percent male.

The season was closed under former Governor Jon Corzine as his administration attempted to develop comprehensive, non-lethal policies and procedures, and as the division and council continued to advocate for a hunt. With a change in administration, the council and the division conducted a bear hunt in 2010. The 2011 hunt maintained the concurrent format. Kill totals were 592/60 percent female, 40 percent male (2010); and 469/70 percent female, 30 percent male (2011). The 2012 hunt will run concurrent with the firearm deer season.

The division has traditionally permitted a variety of big game hunting techniques that include still, stand, and drive hunting. Historically and state by state, the hunting of animals over bait has been unregulated, loosely regulated, or banned. In South Carolina, for example, baiting became popular with some hunters during the mid-eighties and expanded rapidly. Other than its close association with market hunting and poaching, baiting for either deer or bear would clearly not have been on the scale seen today. Historical information on the extent of baiting in the recreational format is sketchy. Sales of bait stations, food, trail cameras, and other paraphernalia are healthy and on the rise.

The division's stated management goals (Carr and Burguess, 2011) for New Jersey's bear population are: (1) research and monitoring; (2) educating the public about black bear ecology; (3) proper control of human-derived food; (4) adjusting human activities while within bear range; (5) using aggressive lethal and non-lethal control measures against nuisance bears to minimize human-bear conflicts, and (6) training and bear population management.

New Jersey's response policy focuses on three categories (Carr and Burguess, 2011):

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Researchers in Wisconsin, New York, Virginia, West Virginia, California, and elsewhere agree that anthropogenic feeding creates nuisance bears. Most believe that controlling complaints means controlling this type of situation.

“DFW’s bear response policy, which errs on the side of human safety, contains the following Black Bear Rating and Response Criteria: Category I – bears which constitute a threat to life and property. Category I black bears are euthanized. Category II – nuisance bears that are not a threat to life and property. Category II black bears are aversively conditioned. Category III – bears exhibiting normal behavior and not creating a nuisance or a threat to human safety. Dispersing bears (“urban” bears) are Category III.”

The division stipulates that the “Council is legally mandated to provide for a recreational harvest of abundant game species such as black bears through the Game Code. A brief history of the rulemaking and legal issues concerning bear hunting in NJ was provided by Carr and Burguess (2010).”

The division cites two population estimates. Division biologists/technicians estimate 3,278 bears in the areas open to hunting. The second estimate of 3,438 is based upon a DNA study conducted by East Stroudsburg University in Pennsylvania.

New Jersey Division of Fish and Wildlife Black Bear Baiting Program

Thirty or forty years ago it was common to talk with hunters who had traveled to the Canadian provinces to hunt bear over bait. Sparse bear densities, thick habitat, and thousands of square miles with minimal human settlement made it possible to bait bears that had never seen humans.

Baiting as a method of kill is a source of mounting concern in the United States and Canada. In parts of the United States high or even low bear densities and increased human development lead to higher levels of human/bear interaction. Increased human/bear contact, increased hunting pressure, and more intensive research have provided new insights into bear behavior, genetics, reproduction, nutrition, and baiting. The literature also addresses the impact of baiting on illegal hunter activity, human hostilities and altercations related to baiting, risk of disease, non-target species, forest degeneration, the spread of invasive plants, predation on ground-nesting birds, and public attitudes.

An incident recently featured on the hunter website, njhunter.com (<http://www.newjerseyhunter.com/article134281.htm>), highlights one form of hostility caused by baiting. A Randolph Township homeowner told the police that he had felt threatened when a hunter baited deer on public park lands reportedly twenty yards from his house. The hunter's trail camera recorded the homeowner pouring a substance on the bait. The episode underscores that baiting is occurring near and in residential areas, both drawing and keeping wildlife in those areas, and leading to wildlife crossing roads to reach food. Attracting wildlife to or near developed or residential areas introduces or exacerbates a host of problems. In numerous instances, experts report hunters feuding over bait piles and stations, and the wildlife drawn to bait. Disputes over baiting have fostered a more complicated debate: Does the individual who baits privatize the public resource?

Baiting as a method of kill is a source of mounting concern in the United States and Canada. Increased human/bear contact, increased hunting pressure, and more intensive research have provided new insights into bear behavior, genetics, reproduction, nutrition, and baiting.

Population Dynamics

The division also permits both deer and bear baiting. At first, baiting may seem merely another method-of-take to control a given species. A review of the scientific literature shows otherwise.

For years, bear hunters have provided an unknown amount of food to black bears (Ursus americanus) in Virginia, supplementing their natural food supply. Possible effects of feeding bears can be negative, such as food conditioning and habituation to people, or positive, such as enhanced or sustained reproduction especially in years of mast crop failure. (Gray, 2010)

Through baiting, supplemental food has been available to bears for over a decade, and for white-tailed deer (and bears), since 1998.

The division permits stand, still, and drive hunting as harvest techniques during the concurrent deer/bear season. The agency states that it employs the techniques for five reasons: (1) economics; (2) recreation; (3) tradition; (4) population control; and (5) reduction of agricultural or property damage.

The division also permits both deer and bear baiting. At first, baiting may seem merely another method-of-take to control a given species. A review of the scientific literature shows otherwise.

Initially, some states, including New Jersey, may have permitted bear baiting as a form of population or nuisance control. Yet data show that just the opposite may be occurring. As confirmed by research on a black bear population in Massachusetts (Elowe and Dodge, Journal of Wildlife Management, 1989), diet affects breeding:

“Data from 18 adult female *Ursus americanus* from an exploited population in W. Massachusetts bearing 62 cubs in 27 litter (31 m, 31 F) provided insights into nutrition and population dynamics. 26 of 28 females with access to high fat and carbohydrate mast diets produced cubs, but 10 of 10 females with low carbohydrate fall diets failed to produce cubs.”

Researchers addressing anthropogenic or human feeding of bears in Virginia noted the same effect (Gray, 2001):

“For years, bear hunters have provided an unknown amount of food to black bears (*Ursus americanus*) in Virginia, supplementing their natural food supply. Possible effects of feeding bears can be negative, such as food conditioning and habituation to people, or positive, such as enhanced or sustained reproduction especially in years of mast crop failure.

“The amount of food provided to bears by bear hunters in Virginia may have been more substantial than previously believed and likely provided bears with a high energy, stable food source that supplemented their natural food supply.”

While the division describes bear baiting as a harvest technique, it is much more. Through baiting, supplemental food has been available to bears for over a decade, and for white-tailed deer (and bears), since 1998.

Deer baiting became common in New Jersey in the late 1990s. Corn, a variety of grains, apples, and other food attractants have been allowed as deer bait in bear habitat, thus providing a supplemental, high carbohydrate food source for New Jersey’s bears, even in years of natural mast failure. Data from the New Jersey Fish and Wildlife Digest (August 2002, Vol.16, No.1) showed that litter size statewide averaged 2.8 cubs/litter, while litter size for females seven years old and older was 3.2 cubs/litter. In 2011, Carr

and Burguess recorded higher rates:

“DFW currently has 28 female bears fitted with radio collars to monitor reproduction and survival. The average litter size is 2.9 cubs per litter. The most common litter size is 3 (43%), followed by litters of 4 (23%) and 2 (22%). In the spring of 2010 Division personnel visually confirmed an adult female with 6 cubs of the year.”

Numerous studies throughout the scientific literature clearly implicate baiting, supplemental feeding, dumps, and/or other anthropogenic food sources in higher reproductive success:

“Alt (1989) reported that supplemental food supplied to bears by humans likely would have a positive effect on reproduction. Several studies have related nutritional condition to survival and reproduction (Brody and Pelton, 1988, Eiler et al. 1989, Elowe and Dodge, 1989, McLaughlin et al. 1994c) . . . Herrero (1983) suggested that food from dumps in Jasper National Park, Canada, may have positively affected reproduction in black bears that fed at the dumps, and Rogers (1976) found that bears that fed at dumps in Michigan had better reproductive success than bears that ate only natural food (Gray 2004).”

“Black bears (*Ursus americanus*) that frequented garbage dumps to supplement their diet were found to be heavier, and their reproductive rates were higher, than bears eating only a natural diet (Rogers et al., 1974).”

The reproductive impact of baiting would be more pronounced in poor habitat.

Age/sex data from bears shot over or near bait may not correlate with other age/sex data gathered by different techniques. Authors of a Wisconsin study (Treves, Kapp, MacFarland, 2010) analyzed 10 years of data:

“Age and sex profiles of bears taken by hunters differed significantly from those of bears live-trapped around sites of nuisance complaints. Hunters took significantly younger bears and a lower proportion of males. The most common method (shooting over bait) produced age-sex profiles most different from bears live-trapped after nuisance complaints...We conclude that the Wisconsin bear-hunting season did not show clear evidence of reducing nuisance complaints during 1995-2004...”

The hunts had not been designed to achieve that result. Baiting can mask the long-term population effects of hunting programs. The Canadian Cooperative Wildlife Health Centre (Dunkley and Cattet, 2003) conducted a comprehensive review of baiting and its ecological and social consequences.

The Centre cautions:

Corn, a variety of grains, apples, and other food attractants have been allowed as deer bait in bear habitat, thus providing a supplemental, high carbohydrate food source for New Jersey's bears, even in years of natural mast failure.

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Baiting can mask the long-term population effects of hunting programs.

Our results show that female bears in urban areas have higher age-specific fecundity rates. Despite this difference, female bears in urban areas never realized this putative gain in fitness because they experienced higher age-specific mortality rates, leading to the creation of sinks ($\lambda = 0.749$). (Beckman et al, 2008)

“The numbers of black bears killed by hunters over bait around Riding Mountain National Park (RMNP), Manitoba, is high. Given the low reproductive rate of black bears, the mortality resulting primarily from hunting is likely to be unsustainable (Paquet, 1991). The immediacy of this concern, however, might be obscured in the short term by source-sink population dynamics (Pulliam, 1988) where the protected area within the park provides a source of bears that disperse toward the baiting areas.

“However, over many years, it is possible that the genetic pool for black bears of RMNP will be reduced through high hunting success coupled with the selective killing of larger bears. Alternatively, the severe hunting pressure on local black bears could be offset by immigration from other outlying populations (Lampert, 1996)” (as cited in Russell, in press, 2012).”

Beckman and Lackey (2008) documented the effects of sinks created by human-derived food in urban areas:

“Our results show that female bears in urban areas have higher age-specific fecundity rates. Despite this female bears in urban areas never realized this putative gain in fitness because they experienced higher age-specific mortality rates, leading to the creation of sinks ($\lambda = 0.749$). Urban bears of the Lake Tahoe Basin are unable to repopulate vacated wildland areas.”

The Canadian Cooperative Wildlife Health Centre observes that some managers who promote baiting will claim that hunting black bears over bait can “potentially enable hunters to better discriminate target animals and avoid killing of sensitive sex and age classes, e.g., lactating females (Obbard, 2002).”

The Centre responds: “. . . hunter survey data from Ontario, Lampert (1996) concluded that the ability of the average hunter to correctly determine the sex of a bear over bait is poor (Fig. 8). The results from this survey, as well as results from other studies (Litvaitis and Kane, 1994), suggest selectivity is less important to hunters than successfully killing a bear, regardless of its sex or age class” (Dunkley and Cattet, 2003; as cited in Russell, in press, 2012).

The data show that baiting, dumps, and other anthropogenic food sources can cause unnaturally high reproduction in black bears. The effect is clearly visible in cub/litter ratios in New Jersey. Aside from the higher ratio of cubs/litter, anthropogenic food sources such as baiting may cause females to mature faster and to reproduce at an earlier age. Human-derived foods may also permit higher subadult survival rates in both sexes. Subadults are vulnerable during their first year alone and can suffer high mortality. However, readily available high caloric foods at deer and bear bait stations may counteract the role of natural selection in checking the population.

Illegal Activity

Researchers in other states associate baiting with the illegal take of bear, deer, and other species. Authors of a black bear study in West Virginia (Ryan, Pack, Igo and Billings, 2007) noted increased kills of black bear in deer baiting areas:

“It was legal to use bait to hunt white-tailed deer (*Odocoileus virginianus*) but not black bear, in West Virginia and hunting seasons for these species largely coincided during our study (West Virginia Division of Natural Resources, 2006). Black bear bow harvests increased over the study, with the most noticeable peaks during years of hard mast failure (Ryan et al., 2009).

“Because bait (e.g., corn, apples, horse feed) attracted both species, it could have presented hunters illegal opportunities to take black bears. Baiting for white-tailed deer has become more prevalent in West Virginia (Ryan et al. 2006), and possible illegal harvest of black bears should be considered by managers when recommending hunting seasons...”

In 2011, N. Gunter Guy, Jr., commissioner of the Alabama Department of Conservation and Natural Resources, released the “Alabama Baiting Committee Report,” a summary of the pros and cons of hunting over bait:

“Use of bait facilitates illegal activities such as shooting deer at night or shooting turkeys. The nocturnal movements associated with baiting enhance the opportunities of late shooting or even the establishment of lighted bait sites. In fact, warden reports from Michigan and Wisconsin and Alabama indicate frequent violations of hunting at night over lighted bait stations...”

New Jersey’s baiting policy and concurrent seasons are problematic. Baiting a bear is legal, but not, theoretically, when the hunter shoots while elevated in standing tree or structure:

“No person shall attempt to take or kill a black bear or have in their possession or control any firearm, or other weapon of any kind, while elevated in a standing tree or in a structure of any kind within 300 feet of a baited area” (NJ Fish and Wildlife Digest 2011. Hunting and Trapping Issue, Aug 2011).

Imagine a New Jersey hunter who possesses both a bear and a deer tag. He has maintained both deer and bear bait stations, and has put considerable energy, time, and expense into his operation. He uses trail cameras and automatic feed dispensers. For the first two days of the concurrent season he stands behind high shrubs or trees within 50 yards of his bear bait. He is not breaking the law. He is neither in a tree stand nor in a structure.

Researchers in other states associate baiting with the illegal take of bear, deer, and other species.

Use of bait facilitates illegal activities such as shooting deer at night or shooting turkeys. (ADCNR, 2011)

That deer/bear baiting presents or enhances the opportunity for illegal activity is a recognized reality in Michigan, Wisconsin, and Alabama. . . .New Jersey is not an anomaly.

Given the opportunistic and digestive characteristics of black bears and a wide variety of potential foods, every deer bait station is also bear bait station.

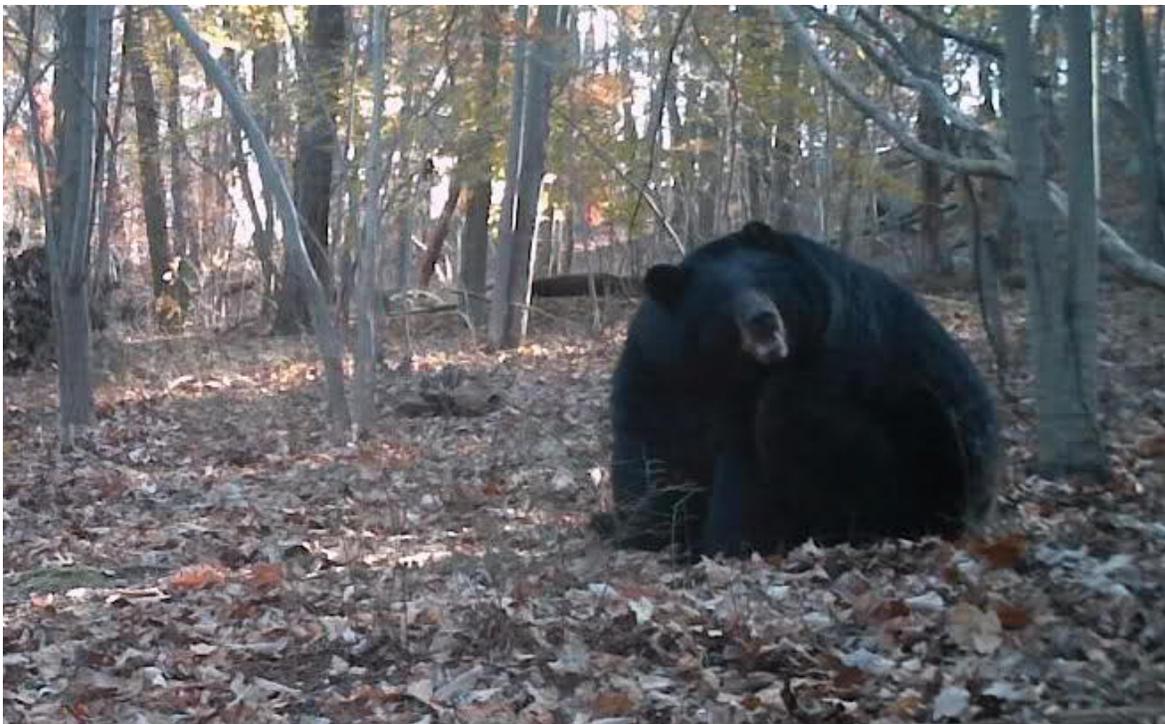
No bear shows, so on day three he moves to the elevated tree/deer stand a mere 25 yards from his deer bait. He is still “legal,” given that there is no required distance between deer bait and tree stands. The hunter has waited several hours in the cold when in walks a respectable black bear drawn to the deer bait. It would be illegal to shoot the bear. There is no witness, and the hunter possesses a valid, and unfilled, bear tag.

Should a black bear appear, there is little doubt that a hunter in possession of a bear tag while perched in a tree stand or ground structure near his/her deer bait would be tempted. The percentage of hunters that would actually take the shot is unknown—and unknowable.

That deer/bear baiting presents or enhances the opportunity for illegal activity is a recognized reality in Michigan, Wisconsin, and Alabama. The West Virginia Division of Natural Resources has cited evidence regarding the possible taking of black bear over deer baits. The potential number of bear taken illegally over deer bait stations in New Jersey is unknown. The state is not an anomaly. Given the opportunistic and digestive characteristics of black bears and a wide variety of potential foods, every deer bait station is also bear bait station. When combined with a concurrent six day firearm season, the estimated illegal bear take in New Jersey could be significant.



“These are just some pictures *from* our deer cams...” (text as captured). Black bear feeding at deer bait station in Sussex County, New Jersey, August, 2006.
<http://aplNJ.org/HunterBaiting.pdf>



Grossly overweight bear, New Jersey hunter website: “Bloomingdale, West Milford, Fat bear,” posted Nov 14, 2011. <http://www.newjerseyhunter.com/article114929.htm> “Something for the bear guys to look forward to.”



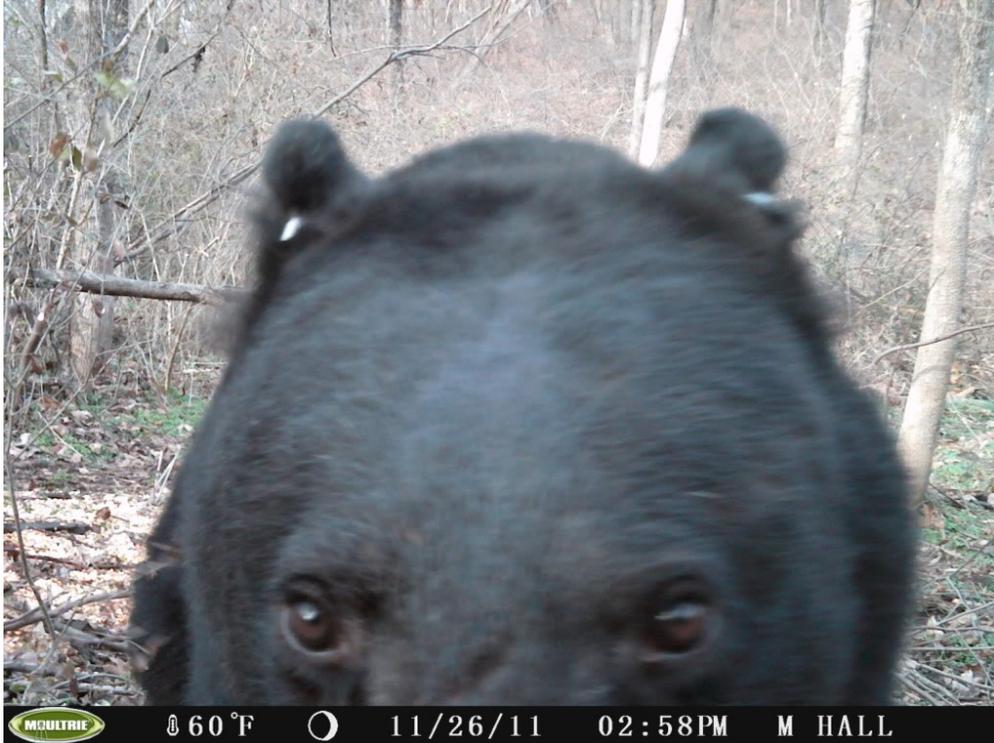
Family of bears at Mark T. Hall bait site, New Jersey, Nov 26, 2011.

<http://www.newjerseyhunter.com/article116356.htm>



Bear at Mark T. Hall's bait site, New Jersey, Nov 26, 2011.

<http://www.newjerseyhunter.com/article116356.htm>



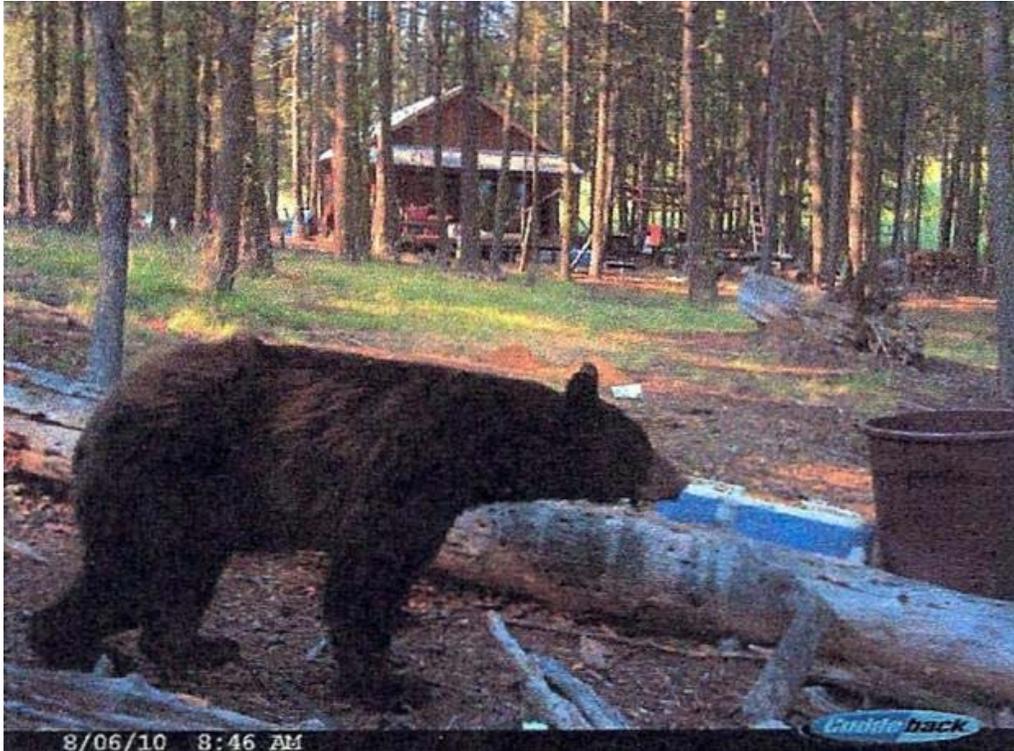
Bear at Mark T. Hall bait site, New Jersey. Nov 26, 2011.

<http://www.newjerseyhunter.com/article116356.htm>



Hall and daughter with bears killed at or near bait site, New Jersey. "Hey DORIS [Bear Group attorney] THIS ONES for you (pix)."

<http://www.newjerseyhunter.com/article116807.htm>



Above and below: Fish and Wildlife authorities seized trail camera photos that allegedly show suspects baiting bears near a cabin in Okanogan County, WA.





An example of the hostilities that arise from baiting: (captured from New Jersey hunter website) “. . .this jerk, which is the psychiatrist suspected takes my camera to the police. . .” Allegedly, the bait was on public park land a reported 20 yards from the property owner’s house. <http://www.newjerseyhunter.com/article134281.htm>



Examples of poor bear bait site clean-up, Alaska Department of Fish and Game.



From native forest to introduced plants – exotic plant species thriving along an ungulate shooting lane in Saskatchewan. L. Dunkley.



Exotic plant seeds left remaining and germinating at ungulate bait site in Saskatchewan. L Dunkley.

Behavior

The effects of human-derived foods on bear behavior are well established. Authors of a Virginia study report that feeding associated behavioral changes can impact reproduction, survival, harvest rates, nuisance occurrences, population size and dynamics, and distribution (Gray, Vaughan, and McMullin, 2004). An extensive study in Yosemite National Park demonstrated how home range, physical size, and the basic natural ecology of black bears has been altered by human food enrichment (Matthews, Greenleaf, Leithead, Beecham, and Quigley, 2003).

The deliberate, collateral or unintentional feeding of bears is significantly altering bear ecology throughout North America. Feeding entails three behaviors: habituation, operant conditioning, and classical conditioning:

Habituation – A simple type of learning that involves a loss of responsiveness to stimuli that convey little or no information (Campbell and Reece, 2005).

Examples of habituation can be found in public parks. When engaging in natural patterns and movements in the daily quest for food, shelter, and mates, a wild animal will see, hear, and smell humans. If there is no reward or punishment (stimuli that convey little or no information), the animal will simply become habituated, or used to, people. There is no reason to flee from, or be attracted to, humans.

Operant Conditioning – A type of associative learning in which an animal learns to associate one of its own behaviors with a reward or punishment (Campbell and Reece, 2005).

Animal behaviorists consider operant conditioning as possibly the most effective approach for behavior modification.

Initially called “trial-and-error,” operant conditioning involves rewarding or punishing a specific behavior. A common toad instinctively eats any flying, crawling, or hopping insect that crosses its path. When attempting to dine a millipede, which releases a chemical that causes vomiting, the toad quickly becomes sick. The toad learns through operant conditioning (trial-and-error) that ingesting a millipede is not a good idea and leads to a bad experience.

Classical Conditioning – A type of associative learning; the association of a normally irrelevant stimulus with a fixed behavioral response (Campbell and Reece, 2005).

Classical conditioning can involve both artificial and natural stimuli. The owner of a dog may ring a bell and follow up with a canine food reward. The dog learns to associate an artificial stimulus, the ringing of a bell, with the natural act of eating. Eventually the dog may salivate when hearing the bell, even in the absence of food.

The effects of human-derived foods on bear behavior are well established. Authors of a Virginia study report that feeding associated behavioral changes can impact reproduction, survival, harvest rates, nuisance occurrences, population size and dynamics, and distribution (Gray, Vaughan, and McMullin, 2004).

The deliberate, collateral or unintentional feeding of bears is significantly altering bear ecology throughout North America.

One of the biggest problems pertaining to the public and black bears is caused by baiting. Whether it's feeding wildlife in your back yard or spreading bait in front of trail cameras, black bears tend to hang around bait as long as it is available. . . They will begin to associate humans with food, which increases the chance of a human and bear encounter. (ACDNR, 2008)

Human scent undoubtedly remains at feeding sites after restocking by humans, and bears likely associate humans with the food they find at feeding sites. (Herrero, 1985)

Biologically, there is no difference between a bait station and a dump. Bait stations habituate bears to human-generated food, contributing to the potential for conflicts between bears and people in the park. (NPS)

Habituation and operant conditioning are generally cited in black bear literature. Operant conditioning is often referred to as “food conditioning”:

“Habituation, though not always dependent on food conditioning (McCullough 1982), is a possible consequence of feeding and can lead to encounters dangerous to humans as well as bears” (Gray et al., 2004).

Baiting conditions the black bear to associate food with humans:

“One of the biggest problems pertaining to the public and black bears is caused by baiting. Whether it's feeding wildlife in your back yard or spreading bait in front of trail cameras, black bears tend to hang around bait as long as it is available. If you don't want black bears scaring away your wildlife, stop feeding. Feeding can also cause black bears to lose their cautious nature toward humans. They will begin to associate humans with food, which increases the chance of a human and bear encounter. Generally speaking, nuisance bears result from conditioned feeding associated with people.” (ADCNR, Black Bear Sightings Increase in South Alabama, 2008).

“Feeding bears may increase their chances of becoming food-conditioned and habituated to people. Human scent undoubtedly remains at feeding sites after restocking by humans, and bears likely associate humans with the food they find at feeding sites. Bears that feed on garbage are more likely to encounter humans than bears that do not feed on garbage (Herrero, 1985). Bears may make other associations with odors in supplemental food, such as domestic animal carcasses, which may cause bears to kill livestock” (Huber and Reynolds, 2001; in Gray et al., 2004).

“For years, bear hunters have provided an unknown amount of food to black bears (*Ursus americanus*) in Virginia, supplementing their natural food supply. Possible effects of feeding bears can be negative, such as food conditioning and habituation to people...” (Gray, 2001).

“The high incidence of bear-caused human injuries was thought to be due to changes in bear behavior caused by the availability of human food and garbage. In short, bears were not behaving like wild bears, and the consequences to humans as well as to bears were unacceptable” (Kaeding, 1997).

“In a letter to the U.S. Fish and Wildlife Service, the director of the Pacific Northwest Region of the National Park Service stated his opposition to baiting on national forest lands abutting Crater Lake National Park. The director wrote, “Biologically, there is no difference between a bait station and a dump. Bait stations

habituate bears to human-generated food, contributing to the potential for conflicts between bears and people in the park” (in HSUS, 2009).

The Massachusetts Department of Fish and Game points to findings in Yosemite and the Great Smoky Mountains:

“Deliberate and inadvertent feeding by humans may lead to conflicts and property damage, as well as alterations in bear behavior, foraging habits, reproductive rate, physical size, distribution, and numbers.

“Defensive attacks are fairly common, especially in parks, camp grounds, and similar situations where humans and black bears are brought into close contact and bears are habituated or conditioned to humans and human foods. Injuries, typically minor scratches, occur when people crowd, pet, or hand-feed bears and intrude on the animal’s personal space. However, defensive attacks are much less frequent than suggested by the animal’s aggressive displays. In one Yosemite study, <6% of 992 human-bear interactions involved aggression, none of which resulted in physical contact. Similarly, <6% of 624 aggressive acts by ‘panhandling’ bears in the Great Smoky Mountains resulted in contact. Such incidents diminish when area managers remove artificial food sources and educate the public about bear behavior.”

Deliberate and inadvertent feeding by humans may lead to conflicts and property damage, as well as alterations in bear behavior, foraging habits, reproductive rate, physical size, distribution, and numbers. (MDFG)

The National Park Service documented extensive artificial feeding in Yosemite:

“Artificial feeding areas were established in 1937 in the west cut of YV in order to draw bears away from developed areas in the east end of YV. These feeding areas also provided opportunity to see bears. As much as 60 tons of human-food scraps were fed to bears annually (National Park Service, 2003).”

Baiting may condition bears to associate people with food and possibly lead to increased nuisance bear problems, or attract bears to areas where they have a greater chance of causing trouble. (Ternent, 2006)

By the 1940s, officials recognized that continued feeding and lethal control of bears that demonstrated threatening behavior toward humans had altered the natural ecology of the population in Yosemite National Park (Beatty, 1943; NPS, 2003; as cited in Matthews et al., 2003):

“Habituation, in turn, may lead to food conditioned behavior, a loss of fear of humans, and aggressive displays, which threaten visitor safety (McArthur and Jope, 1983). Habituated bears are more likely to be involved in human-bear incidents, may exhibit aggressive behavior toward people, and stand a greater chance of being killed to protect human safety and property (Gilbert 1989; Mattson et al., 1992).

“Baiting may condition bears to associate people with food and

The majority of wildlife professionals agree that

anthropogenic food conditions bears.

Conditioning leads to an increase in nuisance situations and creates potentially more serious/dangerous bear-human encounters.

Division policy should reflect that reality.

Banning feeding yet allowing widespread baiting makes no biological or public safety sense.

New Jersey's 2010 reduction of home safety buffers for bow hunting to 150 feet in residential neighborhoods means increased baiting for deer in residential areas – in bear country.

possibly lead to increased nuisance bear problems, or attract bears to areas where they have a greater chance of causing trouble. Baiting also may increase bear-vehicle collisions and the potential for disease transmission. Finally, baiting may invite more poaching activity, because hunters see more bears (Ternent, 2006).”

The majority of wildlife professionals agree that anthropogenic food conditions bears. Conditioning leads to an increase in nuisance situations and creates potentially more serious/dangerous bear-human encounters. Division policy should reflect that reality. Banning feeding yet allowing widespread baiting makes no biological or public safety sense.

In a state as densely populated as New Jersey, the placement of bait for bear or deer near or in human centers is ill-considered. In exurban or rural areas where properties abut woodlands or are comprised of sizable tracts, hunters can and do employ bait stations or piles on their own or a neighbor's property. The practice can attract bears to areas near other homes. Likewise, baiting occurs on Wildlife Management Areas and in public parks adjacent to residential neighborhoods. New Jersey's 2010 reduction of home safety buffers for bow hunting to 150 feet in residential neighborhoods means increased baiting for deer in residential areas – in bear country. In New Jersey, clustered bear complaints may be indicative not only of poor or no bear-proofing and occasional feeding, but baiting near neighborhoods, homes, and roads. The state's response, mainly a full-bore sport hunt, addresses none of the above factors.

Wildlife professionals stress that perceived safety threats posed by black bears are short on fact. According to the New York Department of Environmental Conservation:

“The likelihood of a bear becoming involved in an incident that results in injury to people is extremely low. Between 1960 and 2000, millions of people spent time living and recreating in areas of New York State occupied by bears, yet only eight people were injured by bears in that time. None of the injuries were serious. Since 2000, there have been two more serious injuries to people, including an unprovoked fatal encounter involving an infant. This incident was the first ever human fatality caused by a black bear in New York State, and only the second human fatality caused by a black bear in the northeastern United States since 1900. In early 2006, a young girl was attacked and killed by a black bear in Tennessee, the third bringing the total number of fatalities in the eastern United States to three.”

The Alabama Department of Conservation and Natural Resources concurs:

“Most people think of black bears as aggressive predators but nothing can be further from the truth. On the contrary, black bears

are actually poor predators. They mostly feed on plants, berries, nuts, roots and bark. Only a small percentage of a black bear's diet is protein and most of that comes from eating insects. Most public opinions on black bears tend to be negative because people are not educated about the species. Black bears are just like most all wild animals, in that they will almost always run when given the chance. Black bears are very shy animals. This is why most people have never witnessed one in person. Rarely, black bears may attack if they feel threatened or when a sow senses her cubs are being threatened. Although they are usually harmless, you should always avoid any kind of interaction with black bears. They are large and powerful wild animals" (ADCNR, 2008, as cited in Russell, in press, 2012).

Matthews and other researchers attribute 35 percent of human-bear conflict in Yosemite National Park to conditioned bears. The majority of other incidents were due to human error (Matthews et al., 2003, as cited in Russell, in press, 2012). At Yosemite, researchers examined causes of human-bear interactions:

"We quantified the proportions and trends of the causes of human-bear incidents. Yosemite National Park personnel coded each human-bear incident based on the apparent reason it occurred. Reasons included unknown; feeding, baiting, or harassing bears; food left unguarded; improperly disposed garbage; improperly stored food; improper storage of a bear attractant; accidental encounter; conditioned bear behavior; and other.

"Conditioned bear behavior, human error, and accidental encounters were documented as the cause of 35, 65, and < 1% of the human-bear incidents, respectively. Because accidental encounters were relatively infrequent, they were not considered further in the analyses. A significantly larger proportion of incidents were caused by human error than conditioned bear behavior ($Z = -3.96$, $df = 12$, $p < 0.001$). We detected no trend in the number of incidents that were caused by conditioned bear behavior ($b = 2.3$, $p = 0.808$, $n = 14$) and an increasing trend in the number caused by human error ($b = 23.4$, $p = 0.046$, $n = 14$)" (Matthews et al., 2003).

The Wildlife Conservation Society emphasizes that "focusing on bears as a public safety threat or as an economic nuisance is largely counterproductive. To solve these problems, the central focus needs to be human behavior" (Beckmann, Karasin, Costello, Matthews, and Smith, 2008; as cited in Russell, in press, 2012).

Telephone calls or incidents involving bears rise and fall depend upon natural and man-made variables. "Complaint" is to some extent a catch-all

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"Complaint" is to some extent a catch-all or misnomer. We should be mindful that the vast majority of calls are just that, telephone calls, most reporting the presence of a black bear.

In 2010, the former DEP commissioner told NBC News that he had “always questioned how we could verify to be sure the calls were real,” (NBC News, 8 Dec 2010).

From May, 2007 to May, 2010, a complainant and publicly avowed bear hunt advocate called 71 times regarding non-aggressive bears in the vicinity.

Non-threatening or nuisance calls made up 93.4% of all complaints.

We conclude that the Wisconsin bear-hunting season did not show clear evidence of reducing nuisance complaints during 1995-2004, probably because hunting was not effectively designed for that goal.” (Treves et al, 2010)

or misnomer. We should be mindful that the vast majority of calls are just that, telephone calls, most reporting the presence of a black bear. Complaint data produced by the division from 2008-2010 generated controversy. In 2010, Mark Mauriello, former commissioner of the New Jersey Department of Environmental Protection, told NBC News that he had “serious questions about the science that led to this hunt.” “I always questioned how we could verify to be sure the calls were real,’ Mauriello said in describing his discomfort in using phone calls as scientific evidence” (NBC News, 8 Dec 2010, as cited in Russell, 2011). From May, 2007 to May, 2010, a complainant and publicly avowed bear hunt advocate called 71 times regarding non-aggressive bears in the vicinity. Even so, the much lower percentage of complaints and potentially unsafe situations that are legitimate should be addressed in a responsible manner.

Taking division complaint collection methodology and results at face value, Category I complaints comprised 6.5% of bear incidents in 2011. Non-threatening or nuisance calls made up 93.4% of all complaints (Animal Protection League of New Jersey, 2012, Breakdown of NJDFW Black Bear Complaints by Category, 2001-2011).

Among the Category 1 incidents, New Jersey should prioritize minimizing attempted home entry (AHE), home entry (HE), and vehicle entry (VE) incidents. Such incidents are a public safety concern and suggest certainly no significant reduction in human- derived foods and attractants – either through baiting for deer, bear, or both, feeding in the vicinity, and unsecured dumpsters, trash, bird feeders, or other sources. Failure by the state to meaningfully restrict human derived foods, including baiting, can lead to potentially dangerous situations and bears losing their natural wariness of humans.

Wildlife departments that permit bear baiting for the purpose of removing nuisance bears may be doing so under false pretenses. The literature suggests that shooting over bait does not control nuisance bears.

The data generally demonstrate that hunting has no observable or long-term effect in reducing the human complaints/conflicts. Initial claimed decreases can and do rebound. Researchers in Wisconsin examined whether fewer nuisance complaints correlated with increased hunter harvest over time and “found no evidence of such a relationship” (Treves, Kapp and MacFarland, 2010). Ten years of Wisconsin hunt-nuisance data showed little or no correlation:

“We conclude that the Wisconsin bear-hunting season did not show clear evidence of reducing nuisance complaints during 1995-2004, probably because hunting was not effectively designed for that goal” (Treves, Kapp, and MacFarland, 2010).

In Nevada, wildlife officials tell the press that bear hunts do not reduce

human-bear conflicts: “Lackey [a biologist with the Nevada Department of Wildlife] Bricker, and Ansari all agreed on one point – a bear hunt will not help reduce the number of bear/human interactions.” (“Proposed Nevada bear hunt draws controversy,” The Union.com, 17 Nov 2011, in Russell, 2011). New Jersey wildlife officials and press spokesmen consistently claim otherwise.

Recreational hunts do not and to a large extent cannot target specific nuisance bears.

By far, the literature clearly favors the reduction, control, or total elimination, if possible, of all anthropogenic food sources. Researchers in Wisconsin, New York, Virginia, West Virginia, California, and elsewhere agree that anthropogenic feeding creates nuisance bears. Most believe that controlling complaints means controlling this type of situation. Maine is the only state that differed in regards to anthropogenic foods. Maine’s northern wooded tracts are not as developed as those of states to its south.

Aversive conditioning employs unpleasant and/or punishing experiences that conditions bears to fear humans and certain locations. This form of conditioning may involve *oleoresin capsicum* (pepper spray), whistles, rubber bullets, taste aversion chemicals, and electrification. The results are mixed.

In Sequoia and King’s Canyon National Parks, California:

“Aversive conditioning reduced but did not eliminate the occurrence of bears entering developed areas to forage on human food and trash in Sequoia National Park. Aversive conditioning was most effective on wild bears. With food-conditioned bears, effectiveness was related to how quickly bears received AC after first receiving human food. Aversive conditioning was least effective on yearlings. Overall, rubber slugs were only slightly more effective than other methods, and some bears became food-conditioned despite all treatments (Mazur 2008).”

“In Juneau, Alaska, increased bear activity in response to poor sanitation ‘led to high numbers of food-conditioned bears, with >300 complaints and 14 bears killed in 1987. Researchers used shotgun-fired rubber slugs and buckshot to deter nuisance bears, of which 43% abandoned the site. However, 93% remained in the general area and continued their nuisance activities” (Mass Wildlife-Black Bear Problem FAQs, 2012).

The results of New Jersey’s aversive conditioning program for nuisance bears are consistent with the literature:

“In 2010, 31 bears were euthanized for Category I behavior. DFW personnel captured 20 Category II bears at nuisance sites, applying aversive conditioning techniques to the released bears, and

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captured an additional 29 non-target bears at nuisance sites. In a study of the effectiveness of aversive conditioning on nuisance bears, DFW found that all bears, regardless of being conditioned or not, returned to urban settings within 17 days of treatment or capture. DFW determined that the treated bear stays away from the site where it was aversively conditioned for a short term period” (NJDFW Status Report, 2011).

The science in support of habituation and food conditioning through human- derived food sources, including bear and deer baiting and supplemental feeding, is dispositive. The black bear’s association of food with humans results in nuisance complaints and possibly more dangerous activities such as home and vehicle entry. The literature also shows that attempts to reverse food conditioning through aversive conditioning are limited, with the most effective methods providing short term relief. There is some disagreement on this score. Biologist Stephen F. Stringham, one of Alaska’s leading bear experts, has strong opinions:

“Once attractants are eliminated, and intrusions into human habitats are punished (e.g., with pepper spray), virtually every bear will quit raiding. Bears don't deserve capital punishment for problems that people create” (Russell, 2011).

Finally, enhanced feedback from residents who coexist with black bears in Lake Tahoe, Aspen, Jackson Hole, Juneau, the Adirondacks and the Catskills, and parts of northwestern New Jersey may benefit coexistence research. Many say that living with black bears is simply a part of daily life.

Disease

Deer and bear bait stations figure significantly in the spread of wildlife diseases. According to James E. Miller, certified wildlife biologist and past president of The Wildlife Society, an organization that represents state wildlife biologists, among others:

“It is well documented that baiting and supplemental feeding sites concentrate deer and have contributed significantly to the increased spread and transmission of diseases in white-tailed deer and other wildlife, including Bovine tuberculosis (TB) in Michigan and Chronic Wasting Disease (CWD) diagnosed in a growing number of states. Such sites have also contributed to the spread of other diseases such as rumenal acidosis, enterotoxaemia, aflatoxin fungi, etc. The spread of infectious and non-infectious diseases, plus the increased transmission of parasites, are exacerbated by the close contact at baiting and supplemental feeding sites. Recently, two hunters in Michigan have been documented to have been infected by Bovine tuberculosis (TB), the most recent (2004) while field dressing a deer without gloves. This strain of disease found in deer, cattle, and other animals since it was first discovered in 1994, was confirmed to be spread by the baiting and feeding of deer and over 500 TB-infected deer have been identified. This led to a ban on baiting in core counties with high incidence of infection in both deer and cattle. Additionally, TB infection from deer has now spread into other wildlife species, including black bears, bobcats, coyotes, elk, opossums, raccoons, and to more than 30 herds of domestic cattle causing significant livestock financial losses” (Miller, 2012).

The Southeastern Wildlife Cooperative Disease Study strongly opposes deer baiting:

“The Southeastern Cooperative Wildlife Disease Study (SCWDS), in a 2005 paper entitled Disease Risks Associated with Baiting of White-tailed Deer, stated: ‘Prevention is the only truly effective method to manage diseases in wildlife populations. Baiting increases risk for multiple diseases in white-tailed deer and other wildlife. As a highly experienced, professional, wildlife health organization, SCWDS strongly opposes legalization of deer baiting.’” (in ADCNR, 2011).

There is absolutely no benefit that deer and bear baiting could bestow on hunters, the environment, agriculture, or the citizens of New Jersey that outweighs the broader risks outlined by the field’s leading professionals.

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In a 2004 study of a black bear population in Florida, the home-range size of bears was decreased significantly because of extensive use of deer feeders..... (Miller, 2012)

Disruption of animal movement patterns and spatial distribution, alteration of community structure with reduced diversity and abundance, the introduction and invasion of exotic plant species, and general degradation of habitat are all major negative effects that have been documented at different locations throughout North America. (Dunkley and Cattet, 2003)

Non-target Wildlife

Deer and bear bait stations attract non-target wildlife. A Virginia study presents fairly typical results:

“Most respondents (77% of 133) reported that animals other than bears consumed food from their feeding sites. (table 2). Fourteen species other than bears reportedly used black bear feeding sites, as evaluated by tracks (80%) and sightings (68%); squirrels, raccoons, and ravens were the most common” (Gray, Vaughan, McMullin, 2004).

Miller (2012) cites a decrease in black bear home range as well as impacts on wild turkeys, songbirds, and non-target mammals:

“These practices create significant negative impacts on non-target wildlife species, as noted by several recent studies documenting that up to 98% of visits to feeders and bait sites were made by non-target species. In a 2004 study of a black bear population in Florida, the home-range size of bears was decreased significantly because of extensive use of deer feeders.....Wild turkeys, other game birds, song birds, and other mammals are also known to be negatively impacted by deer baiting and feeding” (Miller 2012).

The Canadian Cooperative Wildlife Health Centre gathered “available science-based information on the ecological and human social effects of artificial feeding and baiting of wildlife into one readily accessible document.” Authors Dunkley and Cattet concluded:

“Although the objectives for artificial feeding and baiting with feed often differ, the effects of these practices are considered together. In essence, both provide natural or artificial food for wildlife at specific locations in the environment.

“Significant ecological effects of providing feed to wildlife have been documented through observation and experimentation at the individual, population, and community levels. In Saskatchewan and Manitoba, the increased potential for disease transmission and outbreak is perhaps of greatest and immediate concern. Nevertheless, even if spread of disease is prevented, other significant ecological concerns exist. Disruption of animal movement patterns and spatial distribution, alteration of community structure with reduced diversity and abundance, the introduction and invasion of exotic plant species, and general degradation of habitat are all major negative effects that have been documented at different locations throughout North America. Although information gaps exist, current information appears sufficient to conclude that the potential for negative ecological

effects as a result of providing food to wildlife through artificial feeding or baiting is high. Nevertheless, our current understanding of the specific mechanisms operating between cause (feeding or baiting) and effect is often too crude to allow accurate prediction of the nature or magnitude of effect.

“The human social effects of providing food to wildlife concern numerous issues (economics, human safety, wildlife ownership, etc.), and perceptions regarding specific issues can be quite disparate. The science-based information is limited in part because philosophical differences lie at the root of many of the issues and science is not the appropriate tool for resolution, e.g., science cannot determine whether hunting over bait is ethical or not” (Dunkley and Cattet, as cited in Russell, in press, 2012).

The Alabama Department of Conservation and Natural Resources cites “multiple studies” that link deer feeding/baiting to forest degeneration. Other negative impacts are increased predation on ground-nesting birds and an increase in deer-vehicle collisions:

“Deer feeding/baiting may affect surrounding habitats and may cause ecological damage that affects a wide variety of wildlife that also depends on those habitats...Providing supplemental feed or bait may negatively impact populations of wild turkeys and other ground-nesting birds by concentrating predators, such as coyotes, raccoons, and opossums, near feeders .”

“In South Carolina, deer vehicle collisions are 9% greater in the low country, where baiting occurs, than in the upstate, where baiting is illegal. This is despite the fact that human population densities in the low country are 31% less than human population densities in the upstate.”

“Habitat and Ecological Impacts - Deer feeding/baiting may affect surrounding habitats and may cause ecological damage that affects a wide variety of wildlife that also depends on those habitats.”

“In multiple studies, changes in tree species composition, retarded forest regeneration, and delayed development of regenerating forest stands have resulted from the increased density of deer near bait stations because the deer continue to feed on natural browse.”

“A study investigated the effects on the structure of an eastern deciduous forest from 27 years of artificial feeding of ungulates, including deer. In the areas where feeding occurred, understory vegetation was decreased, little ground cover existed, and forest regeneration was hampered. Ground-nesting birds, including wild turkeys, were less abundant in the feeding areas.”

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“Concentrating deer near bait sites causes over-browsing of beneficial native plant species and increases the presence of less-desirable plant species within the vicinity (< 1 mile radius) of bait sites.”

“Fawn mortality may be increased around bait sites due to both poor habitat conditions common around bait sites and increased predator densities around bait sites.”

The damage caused by widespread baiting extends well beyond the spread of disease and increased nuisance behavior.

Physical Size

From a population standpoint, the impacts of anthropogenic foods on bears are obvious. The literature emphasizes higher cubs/litter, earlier reproduction by females, and higher survival rates for subadults.

When removing or securing human-derived food sources to restore and maintain the natural ecology of Yosemite's black bear population, park personnel reported that black bears in Yosemite Valley returned to more natural weights:

“Our results showed reductions in the size of bears in YV (Yosemite Valley) since the 1970's and consistency in size with bears in other areas of California. These results indicated that bears in YV returned to a more natural physical condition, following reductions in the availability to bears of human-provided food and garbage. Researchers in other areas have found that black bears with access to human food were significantly larger than wild bears (Alt 1980, McLean and Pelton 1990).”

Baiting begs the question of hunters fattening their own or others' trophies. Historically, the average weight of a New Jersey adult male black bear is approximately 400 pounds (NJDFW, Black Bear Biology and Behavior, May 2012). During the 2011 New Jersey hunt, a hunter killed a “trophy” or “record” male black bear weighing 829 pounds on December 9. On December 8, a hunter checked in with a 776 -pound male. The largest bear shot in the previous year's hunt weighed more than 750 pounds. In 2009, a Pennsylvania man was caught poaching a 700-pound “record” black bear over pastries (Field and Stream, 2009).

With female black bears, unnatural weights influence reproductive rates.

Researchers in other areas have found that black bears with access to human food were significantly larger than wild bears (Alt 1980, McLean and Pelton 1990).

Baiting begs the question of hunters fattening their own or others' trophies.

Non-hunters’ perceptions of baiting can create a poor image of those who participate in or allow the practices... (ADCNR, 2011)

Minnesota Governor Jesse Ventura said that “Going out there and putting jelly doughnuts down, and Yogi comes up and sits there and thinks he’s found the mother load for five days in a row-and then you back-shoot him from a tree? ... That isn’t sport. That’s an assassination.” (AP, in HSUS)

Normal people should be outraged at these practices....Bear hunters who set out sweets to attract your kill: Take a good hard look in the mirror. See if you can find a human being. (Duluth News Tribune, in HSUS)

Public Attitudes

Polls show that support for hunting quickly disappears if hunting is done for skins, trophies, tradition, or over bait (ADCNR 2011, Russell 2011).

A 2008 national survey by a natural resource and sport shooting polling firm reported that a mere 27 percent of the general public approved of hunting over bait. That number, which may be weighted toward hunter response, appears generous: “A 2004 Republican primary poll survey in Alabama revealed that “only 19% supported hunting over bait” (ADCNR, 2011).

Wildlife professionals caution that public distaste for baiting has the potential to diminish support for hunting:

“An overriding issue may be the opinions non-hunters, not those of hunters or biologists. A majority of Alabamians are opposed to hunting deer over bait. The practice of baiting lends ammunition and credibility to anti-hunting groups. Anti-hunting proponents claim that hunters are only interested in the kill, and baiting provides credibility to that statement.

“Non-hunters’ perceptions of baiting can create a poor image of those who participate in or allow the practices, and thus may erode the credibility of the wildlife agency and its hunting constituents” (ADCNR 2011).

Attracting a wild animal, let us say a black bear sow with cubs, to food, often recording the animals’ movements and habits with a trail camera, and showing up with a gun or bow when the animals are known to be present and feeding elicits strong response:

“Just before he left office in January 2003, former Minnesota Governor Jesse Ventura said that ‘going out there and putting jelly doughnuts down, and Yogi comes up and sits there and thinks he’s found the mother load for five days in a row-and then you back-shoot him from a tree? ... That isn’t sport. That’s an assassination.’ The Duluth News Tribune, the largest newspaper in northern Minnesota, where most baiting in the North Star State takes place, agreed with Ventura: ‘Normal people should be outraged at these practices....Bear hunters who set out sweets to attract your kill: Take a good hard look in the mirror. See if you can find a human being’” (HSUS, 2010).

James Miller, former head of The Wildlife Society, cautions:

“In addition, numerous statewide surveys of hunters have shown that the majority of hunters oppose the legalization of baiting or feeding. It is impossible in the Southeast to justify the use of baiting or feeding as ‘Fair Chase’ or ethical techniques for hunting deer, and it jeopardizes the potential of legal hunters receiving a citation for hunting over bait if they are unaware of its presence

where they may be hunting. If the majority of the public who presently support recreational hunting are convinced that most hunting is done over bait or food, their support level will decline precipitously” (Miller 2012).

The public rejects the baiting of deer and bear as a viable hunting method. Twenty-eight states permit bear hunting without baiting. Pennsylvania does not permit bait stations (Ternent 2006). New York has recently banned baiting black bears to prevent potential human-bear conflicts. It is difficult to imagine any legitimate argument that would justify bear baiting in New Jersey or the nine other states wildlife departments that allow it.

It is difficult to imagine any legitimate argument that would justify bear baiting in New Jersey or the nine other states wildlife departments that allow it.

We should distinguish between what is legitimate science, and what is political or economic— a hunting technique favored by some, and encumbered by substantial negative ecological and social impacts.

Large scale deer and bear baiting has the potential to explode a bear population—or sink it.

In fact, the division appears to be managing the population for annual, big game hunting.

Research conducted by natural resource departments, the National Park Service, universities, conservation organizations, and other professionals throughout the United States and Canada clearly does not support pro-baiting claims.

Discussion/Conclusion

Review of the literature on bear and deer baiting leads to one conclusion. There are so many cons and so few pros. There is no ecologically justifiable argument for baiting. It is doubtful that a viable, biologically sound benefit exists. We should distinguish between what is legitimate science, and what is political or economic— a hunting technique favored by some, and encumbered by substantial negative ecological and social impacts.

Population

Given the facts, claims that baiting controls wildlife populations are misleading. Providing artificial nutrition is similar to “compensatory rebound effect,” which is the reproductive response of a species by which an increase of food resources caused by a sudden population reduction stimulates a surge in the birth rate. When deer, for example, experience a large harvest reduction, more food is suddenly available to survivors. Hence, fawn/doe ratios increase, females breed earlier, overwintering survival improves, and the overall remaining population increases. Large scale deer and bear baiting has the potential, let us call it Nutritional Stimulus Impact, to explode a bear population, or keep the artificially-fed bear population at annual huntable levels, because NSI, to a much greater degree than compensatory rebound, occurs without the initial reduction. In fact, the division appears to be managing the population for annual, big game hunting. During closed bear seasons, the division maximized bear populations by permitting extensive deer baiting in bear habitat. At the other end of the spectrum, killing a recently recovered species over or near bait may yet prove unsustainable as possible long-term sink effects come into play.

The literature shows isolated cases in which a state wildlife agency that allows bear baiting, deer baiting, or both will claim that it is simply a management tool to control specific wild populations. A percentage of hunters also believe this to be true. However, research conducted by natural resource departments, the National Park Service, universities, conservation organizations, and other professionals throughout the United States and Canada clearly does not support this claim. The data strongly show that baiting can impact and sharply increase populations of deer and bear. One state that does not allow bear baiting has even suggested permitting it for the purpose of increasing its bear population. For the black bear, the long-term potential for source sinks must also be considered.

There are a number of factors that control populations, or set biological carrying capacity. Climatic conditions, shelter, water, disease, predators, and available food supply determine the number of individuals a given habitat

can sustain. Should any of the factors change, so will the biological carrying capacity. Sharply increase food supplies and a dramatic upward surge within a population is not only to be expected, but predicted. It is not rocket science.

The natural processes that limit or control populations have been understood for centuries. The processes were recognized and promoted by Aldo Leopold, the father of wildlife management, as a necessary theme to be taught and thoroughly understood. They are the fundamental cornerstones of wildlife management. While allowing extensive baiting throughout the state and in bear habitat, the division publicized increased bear numbers.

Non-hunters and hunters alike may not fully comprehend the magnitude of the “feeding” program, or the Nutritional Stimulus Impact, discussed earlier. Many may believe that a few piles of bait are irrelevant in the context of a statewide wildlife issue. If we were discussing a few bait piles, they would probably be right.

Extensive Baiting

Based on information provided in the division’s “Governor’s Report on Deer Management in New Jersey,” the extent of deer baiting can be quantified:

“The survey indicated that 27.7 percent of the respondents hunted while elevated, or from a structure that was within 300 feet of a baited area. Based on this information, more than 25,000 hunters may have used bait during the 1998-99 deer seasons.”

In 1998-1999, deer bait in New Jersey consisted of an estimated 1,000,000 pounds of corn and other foodstuffs:

“Based on the hunter expenditures and average prices of items typically used (such as whole corn), it is likely that more than 1,000,000 pounds of bait were distributed during the 1998-99 deer hunting seasons.”

Since 1998-99, the number of hunters in New Jersey has declined. Nonetheless, there has been a significant upswing in baiting. The division’s figures pre-dated baiting for the black bear and the surge in baiting for deer.

By 2006, Responsive Management, a natural resource and sport shooting survey firm, reported that 41 percent of the state’s deer hunters hunted over bait (corn, sweet potatoes, and apples). Fourteen percent used time-released feeders and eight percent set out gravity-dispensed feeders. Eighty-eight percent of deer hunters who baited placed the bait on the ground (Russell, 2011).

According to the survey, the majority of New Jersey deer hunters who

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In 1998-1999, deer bait in New Jersey consisted of an estimated 1,000,000 pounds of corn and other foodstuffs. With ever more hunters baiting, and bear baiting, the amount of artificial food scattered about the state’s woodlands is massive.

New Jersey is feeding deer and bear, on a massive scale, for at least six months of the year.

By 2010, sixty percent of bow hunt respondents hunted deer over or near bait.

Well over the 1998-1999 estimated 1,000,000 pounds of supplemental foods, are scattered throughout the wilds of New Jersey each autumn.

Estimates in other states suggest that upwards of 80 to 90 percent of bear hunters use bait

Enough research has been conducted on deer and bear health and nutrition to indicate that this much supplemental food could/should cause significant population increases and/or high breeding rates, for deer and bear.

hunted over bait baited weekly pre-season, which begins in late September and ends January 31. Only a quarter of bait hunters said that they baited once or twice before the season began. During the season, deer hunters most commonly baited weekly (34 percent) but generally baited more often than in pre-season, with 68 percent baiting weekly or more frequently. New Jersey is feeding deer and bear, on a massive scale, for at least six months of the year.

“An Assessment of New Jersey Resident Bow Hunter Participation,” (NJDFW, July 2010) allows that seventy-eight percent of participating deer hunters use bow and guns; 14 percent hunt with bows only; and 4 percent hunt with guns only. The survey was not representative of the total hunter population as firearm license purchasers were not included in the survey.

The majority of respondents (93 percent) utilized elevated stands, 32 percent used ground blinds, and 28 percent still-hunted or stalked. Sixty percent of respondents hunted over or near bait. Most participants used multiple types of bait. Among the types bait, food attractants (i.e. corn, apples, etc.) were the most common bait choice at 92%; 37% used scent attractants and 20% used mineral licks (as cited in Russell, in press, 2012).

A collateral effect may be to delay or dissuade female black bears from denning. This may account for the large number of females and their young in hunt kill or harvest totals.

Accounting for a decline in hunters, the estimated 1,000,000 pounds of bait in New Jersey woodlands in 1998-99 has been exceeded by the surge in baiting for deer, and baiting for bear. Outfitters, guides, and individuals may each maintain many bait sites. Estimates in other states suggest that upwards of 80 to 90 percent of bear hunters use bait. New Jersey issues 7,000 to 8,000 bear hunting permits annually. While each permit holder may not maintain a bait site, a significant proportion will. The number of bear bait sites, and the amount of food, is substantial.

Most, if not all of the deer bait sites will contain some combination of corn, apples, and foodstuffs consumed by both deer and omnivorous bears. The bear bait sites may contain bread, doughnuts, buns, pastries, rotten meat, table scraps, animal carcasses, fish guts, grease and other refuse, often covered with liquid sugar, molasses, or honey. With the increase in deer baiting compounded by bear bait piles, a conservative total of 31,000 bait sites (bear and deer), or well over the 1998-1999 estimated 1,000,000 pounds of supplemental foods, are scattered throughout the wilds of New Jersey each autumn. Enough research has been conducted on deer and bear health and nutrition to indicate that this much supplemental food could/should cause significant population increases and/or high breeding rates, for deer and bear. With the black bear, it may ultimately cause sinks. Deer breeding rates are evidently countered by excessive killing.

The collateral damage to other wildlife could be significant. Ravens, crows, squirrels, turkeys and blue jays will feed on any corn or other grains at bait sites. Coyotes, foxes, skunks, crows, raccoons, ravens, feral dogs and cats, and other carnivorous species will feed on decomposing organic material at bear bait stations, and on ground-nesting birds. We might well expect the nutritional stimulus provided by artificial food to influence certain non-target species as well.

The number of deer and bear that would need to be harvested at each bait station to neutralize the potential increase fueled by bait is unknown. Conversely, and owing to a possible sink effect, the true number of black bear may be lower than assumed if and when baiting reduces bear range and large numbers are drawn to and killed at bait sites.

The literature establishes that supplemental feeding of wildlife can cause an increase in animal populations and other problems. The information is not new. The New Jersey Division of Fish and Wildlife acknowledged as much before legalizing statewide baiting for deer in 1998:

“Providing supplemental food for deer increases the biological carrying capacity, causes a dependency on humans, increases the potential for disease transmission among deer and can increase the incidence of deer-auto collisions where deer cross roadways to reach feeding sites. Concentrating deer through supplemental feeding can also result in increased landscape damage for nearby land owners and increased winter deer mortality...”

Millions of pounds of food provided by hunters at bait sites qualifies as providing a high caloric supplemental food source for the Garden State’s deer herd.

Policy vs. Politics

Many businesses, including state wildlife departments dependent upon hunters’ license fees, live by the bottom line. Is baiting effective? Does baiting reduce the population? If half of the equation is considered, that is the numbers harvested, the data still do not support the baiting technique. The division’s own documents support this fact:

“Although hunters using bait reported a higher success rate than those who did not the actual impact of the regulation change or the total deer harvest appears to have been minimal. Changes in season lengths, bag limits and permit quotas had a greater impact on the harvest regionally and in most zones. The 1998-99 total deer harvest would have actually been less than the previous year, had the shotgun permit season not been extended into February” (Governor’s Report).

The 1998-99 hunting season and the regulation change allowing deer baiting

The New Jersey Division of Fish and Wildlife acknowledged its negative impacts before legalizing statewide baiting for deer in 1998.

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Many businesses, including state wildlife departments dependent upon hunters’ license fees, live by the bottom line.

Most, if not all, foods provided at deer bait stations should be considered bear food.

would have resulted in a lower harvest had everything else remained equal. When additive concerns, the nutritional stimulus provided by baiting, for example, enter the picture along with the possibility of increasing the bear population and non-target wild species that may also impact agricultural crops, the use of baiting as a harvest tool in agricultural areas is not only irrelevant, but highly inappropriate. Yet, in the same report, the Division states the following:

“...the permanent repeal of the prohibition on using bait for deer hunting is recommended.”

In fact, the division allowed and encouraged baiting well beyond agricultural areas, where baiting draws deer, bear, and other, non-target species, and throughout the state. Far from restricting baiting, the division has increased harvest, baiting, and hunter access to address deer problems, including damage to landscapes and deer-auto collisions that fourteen years of widespread baiting may well have exacerbated. The division promotes legislation (S1848) that encourages baiting on forest stewardship lands.

Addressing both deer and bear baiting is a requisite for this report. Obviously deer and bear are different species. Deer and bear, however, share biological and behavioral similarities in response to baiting. Most, if not all, foods provided at deer bait stations should be considered bear food. Any assessment of the impact of anthropogenic foods provided at bear bait stations requires the inclusion of deer bait stations.

Societal Carrying Capacity and Coexistence

Much of the folklore regarding bears is based upon interactions with bears of other species. If black bears wanted to hurt people they are certainly capable of doing so. Black bears in New York have a remarkable safety record around humans. (NYDEC, 2008)

Key differences between the species is the nuisance factor, misperceptions concerning the black bear, which experts describe as posing no significant threat to human safety, and the bear’s undeniable power in the eyes of the public. Even the most ardent supporter and lover of bears must admit that human/bear conflicts do occur. And even the most avid bear hunter must admit that hunting groups have exploited and/or overstated legitimate safety concerns for their own purposes.

By far, most nuisance complaints are non-threatening. The majority involve garbage, bird feeders, or other localized, non-confrontational incidents. Leading researchers repeatedly state that dangerous encounters are a rarity and that most encounters are caused by human error (Matthews et al. 2003; Beckmann et al. 2008; NYDEC 2007).

Perceptions and perspective are critical to proper management:

“Much of the folklore regarding bears is based upon interactions with bears of other species. If black bears wanted to hurt people they are certainly capable of doing so. Black bears in New York have a remarkable safety record around humans. Considering that there are thousands of bear/human encounters every year, making

that record even more remarkable. (See Section III, Black Bear Behavior Pertinent to Nuisance Situations, page 10). Black bears usually avoid humans if at all possible, however the act of avoiding people is less likely if bears are stressed for food or that particular food source is especially attractive” (New York State’s Black Bear Response Manual, 2008).

Unlike the white-tailed deer, the black bear is a powerful animal. Despite the bear’s nature and the record, the potential for an unfortunate if rare incident and sensational headlines is there; accidents do occur. The potential increases when trash remains largely unsecured and baiting is common. If one serious incident occurs, the overall impact on the bear population is never good.

Most bears are killed not for what they do, but for what people think they may do: “Black bears may be more susceptible to unjustified or illegal taking during times of drought because dry conditions tend to attract bears to human food sources and make bear activities more visible to people. Often these bears are killed due to the intolerance of property owners to the animals’ presence or perceived danger that the animal poses. Few if any animals are killed due to direct aggressive behavior towards humans. (NYDEC, 2011).

According to the New York Department of Environmental Conservation, familiarity and understanding lead to acceptance (NYDEC 2007, as cited in Russell, in press, 2012):

“However, the fact remains that people who live and recreate in bear range can expect to encounter bears, and we can expect some people to perceive encounters with bears as threatening. Some people may perceive the risk from black bears to be at much higher level than actual experience indicates is warranted. This is especially true in areas where bear ranges and occupancy levels are expanding and people have little first-hand experience with bears. However, as the uniqueness of such interactions lessens, so does the perceived level of threat. Familiarity with bears goes hand-in-hand with understanding them and accepting their presence” (NYDEC 2007).

When the fear levels of some people rise, tolerance goes down.

There are two types of carrying capacities; one is biological, the other societal or cultural. A wildlife management assumption is that the societal carrying capacity of a given species, particularly deer and bear, usually lies below the biological carrying capacity. The rule of thumb is that biologically an area could support 500 individuals of species x. However, due to human tolerance levels, the optimum population may be 300.

Societal carrying capacity can be subjective. As most politicians know, the public is divided on a range of wildlife issues. Negative or vocal views, even

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Favorable relations must exist between the two species for a high societal carrying capacity to be present.

But any wildlife department effort to reduce negative encounters is virtually useless when thousands of bear/deer bait stations are set up, much of the year, throughout bear habitat.

if a relatively small percentage of the whole, can hold sway. Depending on the objective, societal carrying capacity can be altered. Most homeowners do not mind, and many enjoy or feed, squirrels in their backyards. Issue a news release announcing that squirrels carry a deadly disease, or will attack infants, and that capacity would change. Early studies showed that complaints about certain species increased with negative local press.

Societal carrying capacity can be simplistic. Quantitative measurements include car accidents and complaints. Root causes, which can include exploitation itself and failure to restrict human-derived foods, are overlooked. Baiting, the focus of this report, is but one example.

Bear populations throughout North America and particularly black bears within the lower 48 states are largely dependent on human tolerance levels to set societal carrying capacity. It is fair to say that favorable relations must exist between the two species for a high societal carrying capacity to be present. A prolonged period of increasing nuisance complaints or a series of potentially dangerous or injurious events would quickly erode tolerance levels and lead to counterproductive or unwarranted solutions.

Science-Based Policy

Likewise, a state authority's response should follow the science. "If you only have a hammer, you tend to see every problem as a nail" can apply to departments philosophically and financially aligned with a hunting-based clientele and industry associations. Beyond the need to secure human-derived foods and other attractants, ongoing education is important, and that begins by understanding black bear behavior. Education can be nullified by mixed messages from the state natural resources department.

The public's perception of bears plays heavily in the management of a bear population. So does the state wildlife department's desire to provide a big game hunt, and hunter satisfaction, for its clients. It is here that policy can, and does, diverge.

Despite such conflicts, state wildlife departments should do all in their power to keep negative encounters between bears and humans to a reasonable minimum. Agencies must create and provide ongoing educational programs, enact and enforce strict laws, encourage meaningful local ordinances relating to garbage and feeding, and aggressively pursue any avenue that would minimize negative occurrences. But any wildlife department effort to reduce negative encounters is virtually useless when thousands of bear/deer bait stations are set up, much of the year, throughout bear habitat.

There is no doubt that bait stations habituate and condition bears. Baiting not only causes bears to lose their fear of humans, but also to seek out humans for food. The end result is the creation of a bear population with a significantly higher proportion of problem bears.

Sub-sets of hunters view baiting as necessary for population or nuisance control. Many hunters have a reasonably good understanding of wildlife biology and the wildlife they pursue. However, they are not professional biologists. When the public hears about a nuisance bear shot at a bait station or during a bait-hunt, it is easy to understand how some may conclude that bait sites control both population and nuisance complaints. Statements and written materials produced by the division and Department of Environmental Protection press spokespersons fuel misconceptions.

Certain state wildlife departments encourage baiting as a management tool to: (1) control populations; (2) reduce nuisance animals; (3) reduce agricultural damage, and (4) draw animals from parks, refuges, and other non-hunted areas to reduce populations.

The division disseminates this message to the public. As confirmed by the literature and science, the actual impacts of baiting are quite different. Baiting serves to: (1) increase target species populations and/or breeding capacity; (2) increase some non-target species populations; (3) produce more nuisance-prone individuals, including potentially more dangerous bears; (4) increase deer/car collisions in some areas; (5) spread disease; (6) encourage illegal activity, and (7) create significantly larger bears that far exceed natural size and weights.

All of the foregoing begs the \$64,000 question: Why would the division, or any state wildlife department for that matter, devise a program that is decidedly not based on “sound science,” promote the program under questionable pretenses, and then apparently mislead the public regarding its benefits? Possibilities may include: (1) tradition/philosophy; (2) politics, both departmental and personal; (3) economic gain (departmental, career); (3) satisfying, recruiting and retaining paying clients (4) commercial considerations and partnerships (the economic nature of said department/industry partnerships and the potential for abuse requires neutral or third party oversight), and (5) unpublished new and differing information.

The public expects wildlife biologists to design programs firmly based on sound biology. And the public has every right to expect that department programs do no ecological or social harm. Through the author’s experience, and in much of the literature, biology too often takes a back seat to economics and politics.

The literature provides ample evidence that deer/bear baiting should not be considered a scientifically legitimate wildlife management tool nor used by field practitioners. Still other potential problems are being identified.

Large-scale baiting programs have the capacity to dramatically alter breeding rates and/or populations of animals, target and non-target species alike, both physically and behaviorally, over sizeable areas. The sheer scale of baiting in New Jersey, for bear and deer, compounded by largely unsecured trash and

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the feeding of bear and/or deer, causes operant conditioning in the black bear. Baiting and the ongoing failure to meaningfully address unsecured trash in bins and dumpsters could very well be the underlying cause of any eventual human injuries or even the rare fatality.

In the author's opinion, the division is both culpable and liable for any injuries or fatal encounters that may occur. The division is fully aware of the physical and behavioral changes that baiting causes in New Jersey's wildlife. Baiting wild species has no place in responsible wildlife management nor should it be considered an act of "fair chase" by the hunting community. Its negative impacts are legion, and biologically indefensible. From a public safety perspective, baiting is downright dangerous.

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