

PANEL 5: BEARS AND HUMAN BEINGS

Knowledge and Attitudes Concerning Black Bears by Users of The Great Smoky Mountains National Park

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INTRODUCTION

We have been interested in the interaction of black bears and people in the Great Smoky Mountains National Park. Beside its intrinsic interest, the primary impetus for the study is concern for the black bear's status in this area. As the land around the Great Smoky Mountains National Park has been developed commercially, the black bear has been confined to the Park and surrounding National Forest lands. The resultant reduction of the bears' foraging area seems to have reduced substantially the number of bears in the Smoky Mountains area. Further, the Park is used intensively by visitors (close to seven million in 1970). The close proximity of bears and people in the Park affects the habits of many, if not most, bears. They often lose their fear of people and become garbage eaters, campsite raiders and panhandlers.

It is unnecessary here to discuss in detail the many problems for both bears and people engendered by the intense use of the Park. These involve human injury and property damage by bears, foolish and even malicious behavior by tourists, roadbuilding and other developments by the National Park Service which encroach on the remaining wilderness, and serious poaching within the Park by local residents. Directly or indirectly all these factors combine to make the survival of the black bear in this area problematical.

One way to improve the general situation is to change the behavior of the Park visitors. If they became more informed about bears and the effects of their presence and actions on them and are familiarized with Park rules, presumably they would be more responsible in their treatment. More information would also enable Park authorities to take appropriate measures based on more objective data than is presently available. In order to facilitate this development, it is necessary to know more about the parameters of the visitors' knowledge and attitudes concerning bears. Even more crucial is actual observational evidence on how people respond to bears in various situations. Although some preliminary movie footage of roadside encounters between bears and tourists has been collected, we felt that prior to extensive observational studies (which by necessity will be limited to the more predictable and less serious types of encounters) a survey study was warranted to gather information on the general knowledge and background of tourists, which is difficult to obtain from individuals after candid observations have been made. Questionnaire studies are often a poor substitute for direct studies of an ethological nature. However, with unobtrusive, candid observations of groups of tourists interacting with bears *and* information concerning demographic variables, technical knowledge of bears and attitudes toward bears of various types of visitors, a relatively complete analysis of bear-human relations should be possible.

In the summer of 1969, Mr. Carlye Blakeney, then a graduate student in the Department of Forestry at the University of Tennessee, carried out a brief questionnaire study of 120 tourists in the Park. This study yielded some interesting findings. However, the relatively small number of visitors interviewed and the nonrepresentativeness of the sample made conclusions unwarranted. It was primarily a pilot study for the more intensive survey performed in the summer of 1970.

METHODS

A 42-item questionnaire containing questions roughly divided into bear knowledge, attitude, and demographic information was administered to users of the Park at seven different locations. Three of these locations were campgrounds (Cades Cove, Cosby & Elkmont); one was a tourist attraction (Clingman's Dome, the highest point in the Smoky Mountains National Park); one was the most popular hiking trail in the Park (Laurel Falls); another was a popular picnic area (The Chimneys); and the seventh was Newfound Gap, an overlook near the Tennessee-North Carolina line on the highest point of U.S. 441, the only road through the Park, which is heavily trafficked.

One hundred interviews were obtained at each site. The interviewers were instructed to obtain representative samples in age and sex of the people available. At each site half of the interviewed subjects were male and half female, leading to 50 interviews with each sex per site. This was considered appropriate since nearly all the Park visitors are in family groups or pairs. For age, the interviewers estimated the distribution of age at the site and sampled accordingly. Only one person from a given carload, campsite, picnic table, etc., was interviewed. The interviewers were also instructed *not* to avoid certain types of people, such as unpleasant or unintelligent looking ones (Sellitz, Jahouda, Deutsch & Cook 1959).

The questionnaire was administered in the Park primarily by Hietala with the assistance of volunteers (mostly graduate students and their wives in their 20's). These volunteers had a brief training period where the niceties of survey taking were explained to them. Interviews were conducted from July 2 to September 19, with over 95 percent of the interviews conducted during the peak summer vacation period from July 4 to September 7 (Labor Day). Prior to July 2 a 'dry run' of about 30 interviews was conducted to acquaint the interviewers with problems, such as misinterpretation of questions, embarrassment or annoyance at certain questions, and difficulties in sampling. Minor changes in wording and/or order of questions were made at this point.

RESULTS AND DISCUSSION

The survey forms were scored according to a code book and punched onto IBM data cards. Tabulation was facilitated by sorting the cards with an IBM card sorting machine. The data gathered permit a myriad of analyses, and only a partial and limited description of our findings can be presented here. Although 700 surveys were taken, only 500 were used in these analyses. Two of the three campsites were omitted so as not to weigh the data too heavily in their favor. Subsequent analysis of these other two campsites (Cades Cove & Cosby) will determine the amount of variation between sites of the same activity. This is only a preliminary report, and space limitations preclude consideration of the

interesting site differences uncovered, as well as many other details and statistical analyses and discussion.

DEMOGRAPHIC CHARACTERISTICS OF THE INTERVIEWED PARK VISITORS

Age

Table 1A shows the age classes into which the 500 Park users fell. Here as elsewhere in this paper the unknowns primarily represent persons who did not choose to reveal the requested information. Persons younger than older teenagers were not interviewed since they were usually accompanied by adults; therefore, the first category listed is for those 25 and under. If we take that as one category and the rest of the ages up to 65 in 5-year blocks, it can be seen that until age 50 a rather even distribution of ages is represented.

Education

Table 1B indicates the highest year of education completed by the interviewed Park visitors. The modal and median level of education achieved was graduation from secondary school, that is grade 12. Less than 10 percent of the people had an education that stopped at grade school (grade 8) or less. However, over 20 percent of the interviewed did graduate from a 4-year college or attained even higher academic levels.

Occupation

The classification of the visitors into occupational groups was somewhat difficult. The classifications, if anything, probably erred on the high side. That is, a person is more likely to exaggerate his job than to underestimate it, and we were prone to rank people in the 'higher' category if questionable. Also, part-time workers, such as housewives, were ranked for the paid job, not as housewives. As can be seen in Table 1C, the occupational level of the visitors differed widely. Housewives were the largest occupational group, understandably so since 50 percent of the interviewees were women.

Population

Table 1D relates to the percentage of interviewed Park users who come from hometowns of various populations. It can be seen that 10.6 percent of the visitors are from rural areas, defined as communities of less than 1000. About one-third of the visitors come from small towns with population sizes of 5,000-50,000. Small cities of 50,000-100,000 are less represented, whereas over 23 percent of the subjects came from areas of 100,000-500,000.

VISITOR BEAR KNOWLEDGE

The survey contained 10 questions which attempted to assess technical bear knowledge on the part of the Park visitors. The questions ranged from factual ones, such as bear names, which are clearly right or wrong, to several for which adequate information is not yet available, such as longevity in the wild. However, based upon our best estimates, the response of a person was labeled as right or wrong. He was then given a score equal to the number of correct answers. Tables 2-4 present the scores given to the ten questions by all 500 people surveyed.

TABLE 1. DEMOGRAPHIC CHARACTERISTICS OF INTERVIEWED PARK USERS (Percent)

A. Age										
<26	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	>65	Unknown
13.8	11.8	13.8	15.0	16.6	12.4	7.0	4.8	3.0	1.6	0.2
B. Highest Year of Education Completed										
<5	6-8	9-11	12	13-15	16	17-18	>18	Unknown		
1.4	7.6	11.2	37.6	19.8	13.8	5.4	2.6	0.6		
C. Occupation										
Unskilled	Low level white collar	Skilled	Housewife	Student	Teacher (sub college)	High level white collar, executive	Professional	Retired	Unknown	
10.0	12.6	19.6	28.6	4.2	4.2	10.0	9.0	1.6	0.2	
D. Population of Area of Residence										
≤1,000	1,001-5,000	5,001-20,000	20,001-50,000	50,001-100,000	100,001-500,000	500,001-1,000,000	>1,000,000	Unknown		
10.6	11.0	16.6	16.8	8.0	23.4	5.6	7.6	0.4		

Knowledge of Bear Names

Table 2 lists the response of all tourists to the questions concerning what young bears, female bears, and male bears are called. Virtually everyone recognized that a young bear is called a cub, while only about 10 percent knew that a female bear is called a sow and that a male bear is called a boar.

TABLE 2. KNOWLEDGE OF BEAR NAMES (Percent)

Young Bear		Female Bear		Male Bear	
Cub	97.6	Sow	10.2	Boar	9.6
Other	0.8	Other	20.4	Other	20.0
Don't Know	1.6	Don't Know	69.4	Don't Know	70.4

Food Habits

Table 3A shows that over two-thirds of the population correctly recognized that the black bear eats primarily material of plant origin. Since the bear is classed with the carnivores, such a high percentage of correct response indicates the familiarity that people have with bears at a certain level

Running Speed.

Table 3B gives responses to the question of whether the bear runs faster than, slower than, or about equal to human. Again over two-thirds realized that the bear, at its best, can run faster than a human, while only 12.2 percent felt that they, or at least a good physical specimen of *Homo sapiens*, could locomote more rapidly than a bear.

Recognition of Park Ranger

The Park presently has a policy of deterring bears from panhandling and bothering people along roadsides and campgrounds by 'tapping' them on the snout with a baseball bat. This stimulus does seem to dissuade the bear, and it soon learns to depart from an area upon the arrival of a Park ranger with or without a baseball bat, leading to the conclusion that the bear, in spite of his much maligned visual system, can recognize a Park ranger in uniform. Over two-thirds of the population agreed (Table 3C). However, this is one of those questions where 'yes' is considered a correct answer on the basis of present knowledge. Rigorous experiments of the type we are hoping to do with bear cubs will give us a better understanding of the bears' sensory abilities.

Bears as Pets

It is frequently claimed that many of man's foolish and unwary responses to bears stem from our culture which has in many ways attributed to the bear a friendly, gentle, even cuddly demeanor in addition to blatant anthropomorphism (largely due to its bipedal habits). Examples of this are comic strips such as Yogi Bear, Smoky the Bear fire prevention programs, teddy bear toys, etc. It is interesting then that over three-fourths said 'no,' to the question of whether a bear would make a good lifelong pet (Table 3D). If anything this answer is biased for having bears as pets since people limiting their answers to young bears or cubs were nonetheless classified as yesses. Our experience

TABLE 3. KNOWLEDGE OF BLACK BEAR FOOD HABITS, SPEED, VISUAL RECOGNITION, AND SUITABILITY AS PETS (Percent)

A. Diet			
Mostly Plant Matter	Equally Plant and Animal	Mostly Animal Matter	Other Response
67.2	26.0	5.4	1.4
B. Speed			
Faster Than Human	About Equal to Human	Slower Than Human	Don't Know
68.2	17.6	12.2	2.0
C. Recognition of Ranger in Uniform			
Yes	No	Don't Know	
67.0	31.0	2.0	
D. Good Pets			
Yes	No	Don't Know	
21.6	77.4	1.0	

is that while a bear cub may be an experience, even it would not qualify as a household pet except to those with the loosest concept of a pet or a house.

Newborn Cub Weight

In Table 4A are listed the responses of all the subjects to the question of the weight at birth of a black bear. The correct answer is approximately one-half pound. Scored as correct were all responses of less than one pound. Less than 10 percent of the population answered this question correctly, and more people claimed that the bear at birth weighed over 50 pounds.

Average Adult Bear Weight

Table 4B shows the distribution into categories of replies on this topic. Our knowledge of the black bear in the Smokies, while not complete, leads us to believe that 200-399 pounds encompasses most adult bears. A black bear 400 pounds or more in the Smokies is a giant. Nonetheless, most people think the average adult bear is 400 pounds or more. Although the world's record for a black bear is somewhat over 700 pounds, more than 14 percent of the people thought that the average weight of the black bear was over 800 pounds, with some answers going as high as 2,000 pounds. Clearly, people have an inaccurate,

TABLE 4. KNOWLEDGE OF BLACK BEAR NEWBORN CUB WEIGHT, ADULT WEIGHT, AND LONGEVITY

A. Weight of Newborn Cub (Pounds)									
<1	1-2	3-4	5-8	9-15	16-25	26-50	>50	Don't Know	
9.2	4.0	7.6	11.8	20.2	17.6	16.0	9.8	3.8	
B. Weight of Average Adult Bear (Pounds)									
<100	100-199	200-299	300-399	400-499	500-599	600-699	700-799	>800	Don't Know
0.6	4.4	12.4	24.8	13.4	15.8	5.8	4.0	14.0	4.8
C. Longevity of Average Bear (Years)									
<5	5-10	11-15	16-20	21-30	31-50	>50	Don't Know		
0.2	15.6	20.2	27.0	17.4	19.0	1.4	9.2		

conception of the size of the black bears. Perhaps they have been influenced by stories of the larger grizzly, brown or polar bears.

How Long Does a Bear Live?

Answers to a question on the longevity of the average black bear are presented in Table 4C. Although some actuarial studies indicate that the average black bear lives 10 years or less, the question seemed to be interpreted by most people as excluding mortality of cubs. Their interpretation was: Given a bear that is a young adult, how long is his life expectancy? We scored 11-20 years as correct responses. Certainly bears have been known to live in captivity and in the field 30 years or more.

Conclusion

This bear knowledge group of ten questions yielded ten scores upon which we could classify people based on the amount of bear knowledge that they possessed. The number of people getting an answer correct ranged from less than 10 percent on some questions to over 97 percent on others, leading to a good mix of easy and hard questions.

CHARACTERISTICS OF PARK VISITORS IN RELATION TO BEAR KNOWLEDGE

Based on the 'correct' answers noted in the previous section, each interviewed subject could be given a bear knowledge score of from zero to ten. The modal and median score was 5 correct answers, and a rather remarkable normal distribution was found. Less than one percent of the subjects got all 10 items correct, and only about 2 percent had 9 or 10 correct. On the other hand, no persons scored zero, and only one percent of the people had as few as one correct response. In order to compare users more easily on bear knowledge, sub-groups were formed based on those who scored above the median (6 or more correct) and those who scored below the median (4 or less correct). In the high knowledge subgroup, there were 168 subjects, and in the low knowledge subgroup, 210 subjects.

Sex

A greater proportion of males scored higher than females. About 35 percent of the males scored 4 or less correct answers, whereas almost 49 percent of the females were in this category. Conversely, about 19 percent of the males scored 7 or more correct answers, whereas only about 9 percent of the females were in this category.

Hunting

It has often been claimed that hunters and other sportsmen are more knowledgeable about the out-of-doors and wildlife in general than the nonhunter. Our findings somewhat support this conclusion. Approximately 37 percent of the hunters scored 4 or less, whereas 43 percent of the nonhunters were in this category. When it comes to high bear knowledge, the differences are more marked with about 27 percent of the hunters and only 11 percent of the nonhunters scoring 7 or better. The median score for both groups, however, was 5 correct answers.

Age

Age did not show a consistent relationship with bear knowledge. In the under 36 categories, there were about 35 percent of the above median subjects and about 41 percent of the below median subjects. In the over 50 categories, there were about 15 and 18 percent respectively. The median category was 36-40 year for both groups.

Population of Home Area

In Figure 1 the percentage of above and below median scores is broken down by population of home area. It is clear that both rural (i.e., ≤ 1000 population) and urban (i.e., $>50,000$ population) residents have more high bear knowledge people. A possible explanation for this finding for the rural resident is that he is likely to know about bears through personal experience and hunting as well as possessing general knowledge about large mammals. The highly urbanized person, on the other hand, probably benefits from a superior education or is motivated by the crush of the city environment to seek outdoor knowledge. The small town person, by this analysis, is deprived of both the personal and the 'academic' experiences which lead to greater wildlife knowledge and appreciation.

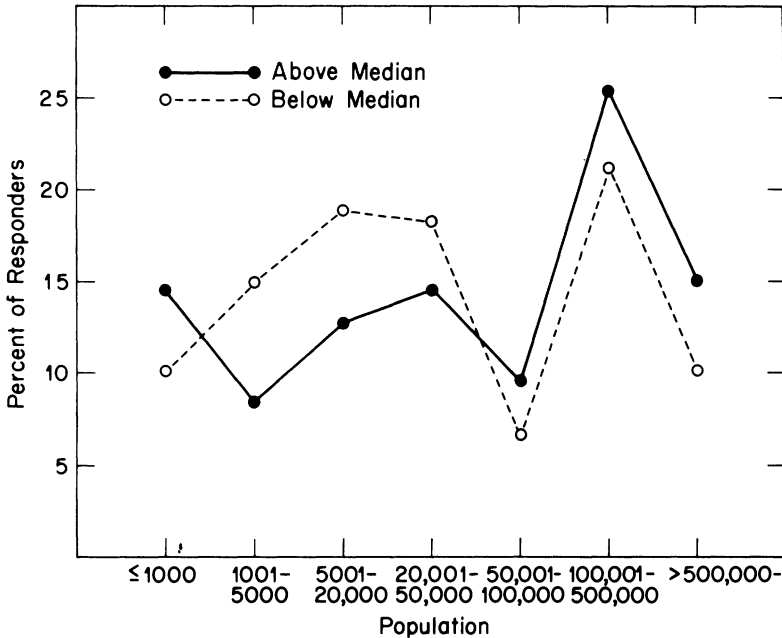


Fig. 1. The distribution in percent of the above and below median bear knowledge scores as a function of area of residence population.

Education

The median year of schooling for both high and low knowledge visitors was twelfth grade. However, while 49.7 percent of the high knowledge visitors had at least some college education, only 35.1 percent of the low knowledge visitors fell in this category.

Occupation

Occupation was not related to bear knowledge to a marked degree. Unskilled and low level white collar workers accounted for 20.6 percent of the above median and 20.9 percent of the low median groups. Housewives were more common in the below median group, undoubtedly because it contained more women. Of the other occupational categories, only high level white collar and professional workers showed a divergence between groups with about approximately twice as many in the high knowledge category.

Attendance at Park Naturalist Talks

The Park Naturalist program is a popular one that entails considerable effort on the part of the Park personnel. However, primarily campers have access to this experience since most talks occur in the evenings at the campgrounds. Overall about 35 percent of the visitors had attended at least one Naturalist talk, although 68 percent of the campers at Elkmont had attended a Naturalist talk. With bear knowledge an encouraging but not dramatic relationship is seen with almost 40 percent of high knowledge visitors having attended a talk as compared to only 31 percent of low knowledge visitors. Such figures do not indicate that the bear knowledge was, in fact, acquired at the talk itself. The Naturalist talks vary in their content a great deal, and those who go out of the way to attend a talk may be those who already possess greater interest and prior knowledge of wildlife.

Source of Information on Black Bears

Although attending Park Naturalist talks did not dramatically raise the proportion of people scoring high in bear knowledge, perhaps there were other sources used which will better discriminate the high and low bear knowledge visitors. A question in the survey asked visitors their recent sources of bear knowledge. In Table 5 the various sources are listed in descending order of mention as determined by all subjects. More than one source could be mentioned. Almost 30 percent of the population had no recent source of information although the below median people were much more likely not to have any source of information. The second most popular response mentioned was the literature and brochures handed out by the Park. Again a large difference between the above and below median groups was apparent with the high knowledge visitors relying more on the Park literature. The road signs were the third most popular information source, and the below median groups mentioned this more than the above median group. Interestingly enough, the below median people were more likely to mention books and other written material as sources of information than the above median people. The exact meaning of this is not clear although it may indicate that most popular reading material dealing with bears is not very accurate.

Another interesting difference concerned the exhibit at the Sugarlands Nature Center in the Park. More than 4 times as many above median people mentioned that as a source than did the below median people. This indicates that these attractive informative displays could play a major effective role in visitor education. The Park Naturalist talks in contrast differed by only 0.5 percent, although in favour of the high knowledge visitor. Clearly such talks are not as effective as the Park literature and displays although a major effort to present bear information in them could alter the situation.

TABLE 5. PERCENT LISTING VARIOUS SOURCES OF INFORMATION ON BLACK BEARS AS RELATED TO BEAR KNOWLEDGE

Source (in decreasing order)	Above Median	Below Median	All
No recent source	25.9	36.7	29.6
Park literature	25.9	14.8	20.4
Road signs	14.5	20.5	17.4
Books, newspapers, magazines, etc.	10.2	15.7	14.0
Personal experience	6.6	5.7	5.8
Exhibit in park nature center	10.2	2.4	5.6
Television	4.2	3.3	5.4
Other people (friends, relatives, campers, etc.)	4.2	6.2	5.2
Park naturalist talks	4.8	4.3	4.6
Park rangers	3.6	2.4	3.4
Zoos or museums	1.2	1.0	1.0

Sighting of Bears in the Wild

Almost 71 percent of the visitors surveyed saw a black bear in the Park, whereas only 28.4 percent have seen a black bear in the wild elsewhere than in the Smoky Mountains. This indicates that of our population almost 50 percent (at the very least) of the population have experienced a black bear living free only in the Smoky Mountains. More persons in the high knowledge category have seen bears both in the Smoky Mountains and elsewhere.

VISITOR ATTITUDES

The questions discussed up to now have dealt primarily with factual information on bears and some of the characteristics of tourist bear knowledge. In this section attitudes and opinions are discussed.

Animals in the Park

Responses to a question as to what types of animals, if any, should be allowed in National Parks are given in the upper part of Table 6. In brief, combining all 500 persons together, almost 90 percent want all native animals to be in the Park. This result holds regardless of bear knowledge, but sex was a factor. Over 94 percent of the males wanted all animals in the Park as compared to only 85 percent of the females. As mentioned earlier, questionnaire studies are held somewhat suspect by the ethologist. He is convinced of the necessity of direct observation of behaviour. To check on the validity of this question, we immediately followed it with a similar inquiry as to what snakes, if any, should

TABLE 6. ATTITUDE TOWARD ANIMALS IN NATIONAL PARKS AS RELATED TO BEAR KNOWLEDGE (Percent)

Question		Above Median	Below Median	All
Animals to be allowed in National Parks	None	0	0	0
	Only small ones	6.0	8.6	7.4
	All	90.4	88.6	89.8
	Other responses	3.6	2.8	2.8
Snakes to be allowed in National Parks	None	21.1	34.3	29.0
	Only non-poisonous ones	17.5	22.9	21.4
	All	61.4	42.9	49.4
	Other responses	0	0	0.2

be allowed in National Parks (lower part of Table 6). Over 50 percent of all visitors would be in favor of eliminating either all snakes or at least poisonous snakes in National Parks. Whereas in the preceding question bear knowledge did not play an important role, in this question it did with more of the high knowledge people in favour of keeping all snakes in the Park and more of the below median visitors in favor of exterminating all snakes. In any event, over 45 percent of the people who said that they favored all native animals in National Parks did not 'really mean it' when snakes were brought to their attention. This example illustrates the influence one question can have upon another, as well as the problems in interpreting attitudinal as contrasted with factual questions. For instance, if the snake question has been asked first and was then followed by the animal question, it is probable that the response 'all animals should be allowed' would have decreased in both groups and perhaps also have then discriminated visitors in relation to bear knowledge.

What Bear Behaviour is Troublesome?

In asking a question attempting to uncover this information, visitors were allowed to mention more than one type of behaviour. The responses are shown in Table 7. Overall, aggressive behaviors, such as advancing threateningly or growling, were considered most troublesome with sheer proximity running a close second. Stealing food was also mentioned frequently with the other major classifiable responses being cited by less than 6 per cent. As might be expected, site of interview was an important parameter in the responses given.

TABLE 7. TYPES OF BEHAVIOR BY BEARS CONSIDERED TROUBLESOME BY PARK VISITORS (Percent)

Response (in descending order)	Site				Sex		Bear Knowledge			
	Chimneys	Clingman's Dome	Elkmont	Laurel Falls	Newfound Gap	Male	Female	Above Median	Below Median	All
Advancing threateningly, growling, etc.	33	37	27	28	29	30.8	30.8	31.5	28.1	30.8
Coming too close	18	18	24	36	22	22.0	25.2	19.0	26.7	23.6
Taking food from where it's being stored	16	16	28	18	10	18.4	16.8	19.0	16.7	17.6
Coming into campsites, doing damage	6	1	15	4	2	7.2	4.0	7.1	4.8	5.6
Just being around	2	2	4	4	7	4.0	3.6	3.0	4.3	3.8
Raiding garbage cans	2	0	9	3	5	4.8	2.8	6.0	2.9	3.8
Bears aren't troublesome	2	6	5	0	2	2.4	3.6	2.4	3.8	3.0
Injuring people, biting, killing	4	3	3	0	3	3.2	2.0	1.8	2.4	2.6
Blocking traffic	2	1	3	2	3	3.6	0.8	2.4	2.9	2.2
Other responses	14	11	8	7	17	10.8	12.0	12.5	11.0	11.4
Don't know	8	9	0	3	6	4.4	6.0	4.8	6.7	5.2

The Elkmont campers were most concerned with food stealing and were more concerned with campsite damage and garbage-can raiding than any other group. The Laurel Falls hikers were the only group most troubled by a bear coming too close.

Although site was a factor, sex and bear knowledge, surprisingly, were not too important. Males and females had almost identical percentages and rank orderings. But it is interesting that 4 times as many men as women mentioned blocking traffic as a consequence of the presence of bears ('bear jams'). Men are undoubtedly more likely to drive and hence get annoyed in such situations, although a more basic sexual difference responsible for this result cannot be ruled out. It was surprising to us, nonetheless, that bear related traffic problems were not listed more frequently than they were.

What to do with Troublesome Bears

Bears that are potentially troublesome can lead to unpleasant incidents and, consequently, decisions what to do with them. Although the bear may not be technically at fault, it is easier and more politic for authorities to blame bears rather than visitors or their own policies. In asking a question as to what the Park should do with troublesome bears, a definition of a troublesome bear was not given, although if pressed the interviewer was instructed to say 'one that disturbed camping or picnicking.' As in the preceding question a person could give more than one answer. In Table 8 are the percentages advocating a given solution to a troublesome bear problem. Over half the visitors feel that the

TABLE 8. WHAT TO DO WITH TROUBLESOME BEARS AS A FUNCTION OF BEAR KNOWLEDGE (a percentage of replies mentioned an alternative)

Response (in descending order)	Above Median	Below Median	All
Remove to another area in park	57.2	41.4	51.2
Put in cage or zoo	13.9	24.8	19.0
Destroy bear (usually qualified as a last resort only)	18.7	19.0	15.8
Do nothing with bear	8.4	6.7	7.6
Remove outside of park	9.0	2.9	6.0
Don't know	0.6	4.8	2.8
Other	3.0	2.9	2.6
Leave decision to authorities	1.8	1.4	1.6
Establish special feeding area	0	1.0	0.8

proper solution is to remove the bear to another area in the Park. The second and third most popular solutions are to put the animal in a cage or zoo or to destroy the bear, although the latter was qualified by many people to be employed only as a last resort. All the other response categories were mentioned by less than 10 percent overall, although 'do nothing with the bear' was mentioned by almost 8 percent, indicating a sizable fraction of visitors who perhaps feel not only that people are at fault in most bear-human incidents but that the solution is to control human behavior rather than do something to the bear.

The most popular solution, removing to another area in the Park, was much more frequently mentioned by above median persons than below median people. This is interesting in light of the evidence presented in this volume and elsewhere that removal to another area within a park's boundary is usually unsatisfactory because of the homing ability of the bear. Most National Parks are not large enough to exceed the homing distance. However, the above median people were also three times more likely to mention removal of the bear to a wild area outside the Park and were far less favorably inclined to put a troublesome bear in a cage or zoo. In view of the high popularity for removal operations and the fact that destroying is acceptable to most people only as a last resort, if at all, authorities who attempt to eliminate troublesome bears by other means should expect to encounter some criticism and be willing to publicly justify their procedures and even educate the citizenry. The educated layman may be greatly influenced by television shows and other semidocumentary evidence based on dramatic removal and stocking operations without being aware of the difficulties involved and the need for scientific evidence. Of course, it is assumed that a park's bear-management techniques are based upon scientific information. Responding to criticism by referring to the aroused public as emotional or ignorant will be self-defeating since it is the high bear knowledge person who is most in favor of removal operations and wants the bears to remain free.

Why Are People Injured?

The evidence discussed above shows that troublesome bears are not primarily thought of as those which physically injure people. Yet human injury or death caused by bears are perhaps the most feared and certainly the most sensational types of bear-human encounters. Such incidents can precipitate campaigns and actions which could threaten the very survival of bears in National Parks and other areas (e.g. Moment 1970). While no death due to the black bear has ever been recorded in the Great Smoky Mountains National Park and the danger posed by even larger species may be overstated (Herrero 1970), the chance of physical injury is ever present. This is especially true when the often foolhardy behaviour of Park visitors is considered.

Table 9 gives the reasons listed by visitors concerning why humans are injured by bears. Feeding bears was the most popular response with more of the above median group listing it than the below median group. Annoying or taunting bears was second in popularity, although mentioned more by the below median group. All other answers were mentioned much less frequently with some differences between groups. Many human injuries caused by bears involve a sow with cubs. Although particularly true of grizzlies, it is nonetheless surprising that less than one percent of the subjects mentioned this as a factor. That bears are naturally vicious or actively seek to hurt people was hardly ever mentioned.

TABLE 9. VISITOR ATTITUDE CONCERNING WHY PEOPLE ARE INJURED BY BLACK BEARS AS RELATED TO BEAR KNOWLEDGE (Percent)

Reason (in descending order)	Above Median	Below Median	All
Feeding bears	36.2	27.1	30.6
Annoying bears	23.5	29.5	26.2
People go too close	7.8	12.9	11.2
Disregard rules	12.7	18.8	11.0
Careless, foolish, ignorant	6.0	9.0	7.2
Their own fault	6.6	2.4	4.0
Playing with bears	2.4	3.8	3.6
Other responses, don't know	1.8	4.3	2.8
Bears look cute, gentle	1.2	1.4	1.6
Trying to take photographs	1.8	0	1.2
Involves sow with cubs	0	1.0	0.6

Why Do People Feed Black Bears?

Since feeding bears is responsible for most bear injury reports in the Great Smoky Mountains, a question as to why people do this was included in the survey. Table 10 lists why visitors feed black bears. The most popular answer is that people are ignorant or stupid, and it was more likely to be mentioned by the above median than the below median person. The second most popular answer was that it is human nature to break rules. Almost as popular were forgetting the warnings or that bears look tame, gentle or harmless.

What About Park Regulations?

Should the regulations be essentially as they are now? Should they be more strict? Should they be more lenient or even left to the discretion of the tourist? The latter response was quite unpopular as shown in Table 11. In fact, two-thirds of those interviewed felt that the rules and regulations as presently stated were adequate. However, over a quarter of the people were ready and willing for more strict regulations or enforcement. The above median people were more disposed to tightening up, indicating that as people learn more about wildlife, they are more prone to want it protected. The primary rule in question is the one posted on many signs throughout the Park stating that it is unlawful to feed bears.

Confrontation

Several questions in the survey deal with visitor attitude toward the seriousness of bear behavior and what one should do during an interaction with a bear. Only one of these questions will be discussed here, a hypothetical situation in which the visitor met a bear on a trail. The responses are listed in Table 12.

TABLE 10. VISITOR ATTITUDE CONCERNING WHY PEOPLE
BREAK RULES AND FEED BLACK BEARS AS RELA-
TED TO BEAR KNOWLEDGE (Percent)

Reason (in descending order)	Above Median	Below Median	A11
People are ignorant, stupid	25.3	17.6	21.0
'Human nature' to do so	13.9	13.3	13.0
Forget the warnings	9.6	11.9	12.6
Bears look tame, gentle	10.3	12.4	11.6
To take pictures	12.1	5.7	8.4
Curiosity	4.2	11.0	8.2
Showing off, wanting something to brag about	3.0	8.6	6.0
To observe them	4.8	7.2	5.4
Excitement	7.2	1.4	3.8
Other reasons	6.0	5.2	5.4
Don't know	3.6	5.7	4.6

TABLE 11. ATTITUDE ABOUT RULES CONCERNING BEARS AS RELATED
TO BEAR KNOWLEDGE (Percent)

Question		Above Median	Below Median	A11
Rules concerning tourist behavior towards bears should be	left to tourist	3.0	4.3	3.6
	left as they are	60.2	70.5	66.4
	be more strict or better enforced	34.3	21.9	26.0
	Other responses	2.4	3.3	3.0

TABLE 12. ANSWERS OF VISITORS TO QUESTION CONCERNING WHAT THEY WOULD DO UPON MEETING A BLACK BEAR ON A TRAIL (Percent)

Response (in descending order)	Bear Knowledge		Sex		
	Above Median	Below Median	Male	Female	A11
Walk slowly away	29.5	30.5	34.4	26.4	30.4
Stand motionless	24.7	22.9	26.0	24.0	25.0
Run away	14.5	20.9	10.4	23.6	17.0
Move aside, keep distance, avoid	22.9	10.9	22.0	11.2	16.6
Do nothing	1.2	2.9	1.6	2.0	1.8
Frighten or scare bear (shout, throw stones, etc.)	1.2	2.4	2.4	1.2	1.8
Try to hide	1.2	1.4	0.8	2.4	1.6
Climb a tree	1.2	1.4	0.4	2.0	1.2
Other responses	2.4	4.3	1.2	4.8	3.0
Don't know	1.2	2.4	0.8	2.4	1.6

The most popular response was to walk slowly away. This was mentioned by about 30 percent of all people. Whereas bear knowledge did not discriminate answers given to this response, males were more likely to mention it than females. The next most popular was to stand still, motionless, freeze, etc. The third most frequent response mentioned was to run away, certainly not too wise since running often stimulates chasing. Below median people were more likely to mention it than the above median, and females were more likely to list this as a response than were males. Since females are, on the whole, perhaps less adept at running than males, it would seem as if this was something of a panic response. A far less popular response of the same type was climbing a tree (black bears are good climbers), which was five times more likely to be mentioned by women than men. The fourth most popular alternative was to avoid, move aside, keep one's distance, etc. It was cited by more than twice as many above median than below median people and by males over females almost in the same ratio. All other responses were listed by only 3 percent or less of all visitors, but it is interesting that attempts to frighten, scare off or throw objects at the bear were listed by twice as many below median as above median persons and by twice as many males as females, indicating that ignorant bravado may be at work.

CONCLUSION

A large amount of data has been presented which, nonetheless, does not do justice to the survey as a whole. Certainly, many of the responses to given

questions could have been analyzed by looking at other factors than those emphasized here. However, the main goal would seem to have been realized—a better understanding of the knowledge and attitudes toward bears by Park visitors.

We warn against too literal generalizations of our findings. The limitations of both the survey approach and our particular application of it should be emphasized. Certainly our overall findings are not based upon a random analysis of all Park visitors. Nonetheless, we are basically confident in the value and reliability of such an approach and believe ours and similar surveys can provide much objective and useful information concerning bear knowledge and attitudes. With the current resurgence of interest in the environment and the place in it of wildlife, a similar survey in the Great Smoky Mountains National Park five or ten years from now might be especially interesting and informative.

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