

Public Attitudes Towards Bears

Implications to the Management of Black and Grizzly Bears in the Yukon

Bath Associates
Yellowstone National Park
General Delivery
Canyon, Wyoming
U.S.A. 82190

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The opinions expressed in this report are not necessarily
those of the Government of the Yukon

Yukon
Renewable Resources

**PUBLIC ATTITUDES TOWARDS BEARS - IMPLICATIONS TO THE MANAGEMENT OF
BLACK AND GRIZZLY BEARS IN THE YUKON**

Alistair J. Bath
Bath Associates
Yellowstone National Park
General Delivery
Canyon, Wyoming
U.S.A. 82190

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TABLE OF CONTENTS

LIST OF TABLES	iii
SUMMARY	iv
ACKNOWLEDGEMENTS	vii
1.0 INTRODUCTION	1
1.1 Objectives	4
2.0 METHODOLOGY	5
3.0 TERMINOLOGY AND THEORY	7
3.1 What is a Perception?	7
3.2 Attitudes	8
3.3 Values and Beliefs	9
3.4 Relationships Between Attitude and Behavior	10
3.41 Understanding Beliefs	12
4.0 ATTITUDES TOWARD BEARS	16
4.1 Attitude Formation and Bear Management	16
4.11 Attitudinal Model - Classical Conditioning	16
4.12 Operant Conditioning	17
4.13 Modelling	18
4.14 Personal Experience	19
4.15 Social Influences	19
4.16 Knowledge	21
4.17 Observational Experience	21
4.18 Childhood Experience	23
4.19 Attitude Change in Adults	25
4.2 Previous Studies - Their Strengths and Weaknesses	28
4.3 Preliminary Observations of Yukoners Attitudes Towards Bears	47
5.0 IMPLICATIONS TO CONSERVATION EDUCATION	53
6.0 DIRECTIONS FOR THE FUTURE	59
APPENDIX 1: Bear survey administered to Whitehorse students	72
APPENDIX 2: Prioritization and proposal for future directions in Yukon bear management	73
APPENDIX 3: Brief research proposal to strengthen this report and provide necessary information to move forward into future phases (I through VI)	80

LIST OF TABLES

TABLE I	HAVE YOU EVER SEEN A GRIZZLY BEAR?	48
TABLE II	WHICH ANSWER BEST DESCRIBES YOUR ATTITUDE TOWARDS GRIZZLY BEARS?	48
TABLE IV	WHICH ANSWER BEST DESCRIBES YOUR ATTITUDE TOWARDS BLACK BEARS?	49
TABLE V	IN YOUR OPINION WHICH ANIMAL IS MORE HARMFUL? . . .	49

SUMMARY

The Yukon Department of Renewable Resources, Fish and Wildlife Branch, commissioned Bath Associates to review relevant attitude information and provide preliminary assessments of the implication of this work to current bear management in the Yukon. This involved a literature review of pertinent materials in the field of human dimensions in wildlife resources (i.e. quantitative survey research focusing upon public attitudes, knowledge levels, compromises and educational aspects of wildlife issues). Such research offers a human component to the wildlife management equation, traditionally focused upon wildlife and habitat.

The first section of the report briefly defines some of the sociological terminology used in this type of research (i.e. attitudes, perceptions, beliefs). In addition to the available literature, preliminary perspectives of Yukon public attitudes toward bears were obtained through telephone interviews with individuals from different facets of Yukon life (i.e. placer miners, hunting guides, teacher). A survey was also administered to 112 biology students in one school in Whitehorse. Such information is not representative of the respective groups but it does offer some initial data on public attitudes toward bears and their management in the Yukon. Most individuals expressed positive attitudes toward bears.

Many factors can affect attitudes toward bears. Some of these are discussed in the report. Accurate knowledge about bears and positive personal experience (viewing bears) can lead to positive attitudes toward the animal. A step to improving public attitudes

is to encourage the public to see bears as symbols of wilderness rather than lethargic garbage eaters, camp nuisances, or vicious man-killers. Informative talks, films and education programs can help improve knowledge and thus attitude toward bears.

Little quantitative research has been done on public attitudes and public knowledge about bears. This report briefly evaluates and summarizes the findings of approximately fifteen studies. Perceptions and beliefs about bears, whether factual or not, seem to play an important role in forming attitudes toward the animal. Public attitudes may also differ between grizzly bears and black bears, with the former being more respected and feared. Black bears are seen as more abundant and more a nuisance.

As the Yukon Department of Renewable Resources, Fish and Wildlife Branch, has never collected quantitative data on a large scale on Yukon resident attitudes toward bears and public knowledge about bears, much research needs to be done. A baseline data study is needed.

Future public attitudes could be monitored in accordance with policy changes against the established baseline. An identical procedure was used in black bear management in the Catskills region (New York). Future directions for the Yukon could take many forms. This report recommends implementation of six phases of surveys of public attitudes toward bears and their management. Each phase addresses a specific segment of the Yukon population (i.e. aboriginal peoples, Whitehorse residents, residents outside of Whitehorse, various interest groups, childrens' attitudes, and effectiveness of bear conservation educational programs). Such

quantitative data will help the resource manager to make more effective decisions representative of the entire wildlife constituency.

ACKNOWLEDGEMENTS

Bath Associates would like to thank all those individuals who were willing to be interviewed about their attitudes toward bears and experiences with the animal. A special thank-you is sent to Mr. Lee Kubica, biology teacher at F.H. Collins secondary school in Whitehorse, for assisting in the data collection of student attitudes toward bears. We would also like to thank those in the Yukon Department of Renewable Resources who reviewed this document and offered suggestions for improvement. The final report is a better one with their help.

1.0 INTRODUCTION

Human dimensions in wildlife resources information is becoming an increasingly important tool for wildlife managers, and a necessary component of wildlife management in order to effectively implement sometimes controversial wildlife programs for an ever growing and changing wildlife constituency. Much as a business company needs information about its customers and potential customers to effectively market its products, so too must wildlife managers learn more about their constituency to market management programs (Duda 1986). Wildlife management has been defined various ways throughout history but all definitions consist of two parts: a biological component and a human component. This is indicated very clearly by the following definition:

"Wildlife management is the science and art of changing the characteristics and interactions of habitat, wild animal populations, and people in order to achieve specific human goals by means of managing wildlife resources. In one form or another, everything done in wildlife management is done for the people" (Anderson et al. 1987).

Management agencies need to have an understanding of the values, needs, perceptions and actions of their respective wildlife constituency (Filion 1980). One way to gain this understanding is to collect quantitative and representative data on the desired population through a survey. This is the essence of human dimensions in wildlife resources research. Specifically, it is

defined as that research which "...focuses on the public's knowledge levels, expectations, attitudes and activities concerning fish and wildlife resources and associated habitats. There is a close tie between human dimensions and conservation education research" (Adams 1988).

However, human dimensions research has only recently emerged as an integral part of current wildlife management. Most of the research in this area has been done by members of the Human Dimensions in Wildlife Study Group. Early human dimensions research focused upon the traditional lines of wildlife management. Studies of hunter attitudes, characteristics, behavior and satisfaction levels were completed. More recently human dimensions research has focused on nonconsumptive wildlife use activities. Recent trends indicate that an increase in nonconsumptive wildlife use is occurring nationwide (Witter and Shaw 1979). Human dimensions in wildlife resources research continues to focus upon the resource management needs of the management agencies.

Such research has a variety of applications (Hendee and Potter 1971) and significant importance to wildlife management programs (Hendee and Schoenfeld 1973). For example, hunter surveys have been used to measure the size and distribution of harvests, hunter satisfaction and can be helpful in setting hunting regulations (Filion 1980). Understanding wildlife user preferences can aid in prioritizing management programs and minimizing specific management problems. Decker and Purdy (1988) suggest data on stated preferences for wildlife population levels (either absolute levels

and levels relative to those existing at a particular time) can be indicators of a wildlife acceptance capacity for each wildlife constituency (hunters, aboriginal people, miners, etc.). An application of this particular aspect of quantitative survey research is presented later in the report. Identification of public attitudes (representative of the entire population, rather than specific groups, or vocal individuals at public hearings) can be particularly useful in forming conservation education programs and buffering potential conflicts. Recently (1984), the Yukon Fish and Wildlife Branch spent much effort and funds in Faro to promote improvements in garbage management and safe behavior around bears with little effect (Smith and Lindsey 1989). A better understanding of public attitudes, knowledge levels, and specifically the attitude-knowledge relationship would allow education efforts to be focused upon aspects which can induce attitude change. Thus, funds are better spent and results better realized. Quantitative survey research (i.e. human dimensions in wildlife resources research) can also provide information on the trade-offs people are willing to make for use of the resource (Filion 1980).

Due to the recent development of the field of human dimensions in wildlife resources, many topics have not yet been explored. Little work has been done on assessing public attitudes towards grizzly and black bears. As bear management becomes increasingly difficult with increasing demands on existing habitat and conflicts with other land uses, it has been realized that information is

needed on the human element of bear management. Like many wildlife management issues, bear management is often more a social and political one than a biological one.

The Yukon Department of Renewable Resources management policies and plans are founded on two types of resource data: 1) biological information and 2) public input. Although considerable biological data has been completed, a comprehensive survey of public attitudes toward wildlife management issues has never been attempted (Wildlife Branch 1981). In an effort to address the importance of public attitudes toward black and grizzly bears and their management in the Yukon, the Yukon Department of Renewable Resources Fish and Wildlife Branch commissioned Bath Associates to review relevant attitude information and provide preliminary assessments of the implications of this work to current bear management in the Yukon.

1.1 Objectives

This report focuses upon the human dimensions element of black and grizzly bear management in the Yukon. Specifically, the report has the following objectives:

- 1) to identify and clearly define the necessary terminology and theory used in human dimensions research (i.e. perception, attitude, behavior, and the interrelationships between these terms)
- 2) to identify aspects of attitude formation and their relationship to bear management
- 3) to briefly summarize the existing attitudinal survey research addressing bears
- 4) to obtain some preliminary Yukon perspectives about bears

- 5) to offer insights into the direction of educational programs based on the results of attitudinal survey research

Each of these objectives is addressed under separate headings in this report.

2.0 METHODOLOGY

As immediately apparent, much of this report will involve a literature review and presentation of previous results. The first objective will be addressed using literature from the psychological, behavioral geography and human dimensions in wildlife resources disciplines. It is important for resource managers to understand the jargon of the trade. Each term (perception, attitude, behavior) is defined and demonstrated through the use of an example. The second objective will also be met through the use of available literature. Much literature exists on attitude formation and while space does not permit a full discussion of this topic, several aspects are briefly discussed with a particular emphasis upon how attitude formation may relate to bear management. The little research on attitudes toward bears makes this section somewhat speculative. Through a library search, existing human dimensions studies on bears were found to address objective three. Each study is briefly evaluated and the key findings presented.

In addition to the available literature, some preliminary perspectives of Yukon public attitudes toward bears were obtained through unstructured interviews with the following individuals:

- i) Mr. Norm Easton, Yukon College, Anthropology/Archaeology
- ii) Mr. Dave Stockdale, Yukon elementary school teacher
- iii) Mr. Grant Abbott, a mining geologist
- iv) Mr. Gerry Klein, a placer miner
- v) Mr. Clay Martin, a hunting guide
- vi) Mr. Barry Tokarek, a former conservation officer
- vii) Mr. Guenther Glaser, a relatively new Yukon resident from Europe

These individuals were chosen as representatives of certain facets of life in the Yukon. It should be made clear that initial attitudes obtained from these individuals may not be representative of the groups they supposedly represent. The interviews with these individuals offer only some preliminary perspectives, and as such, the results should be regarded carefully. For accurate representation, attitudes would need to be empirically documented.

Additional information on childrens' attitudes toward bears was obtained through a questionnaire with the cooperation of Mr. Lee Kubica, biology teacher at F.H. Collins Secondary School in Whitehorse. A small bear survey consisting of six items (see Appendix 1) was given to students in the above mentioned school. Mr. Kubica administered the survey to students between the ages of 15 and 19 years old in his grade 10 and 11 biology class. A sample size of 112 was obtained from the students. Due to the small sample size and the selection of students from a particular school, and a particular class (biology), conclusions can not be accurately drawn to the student population in the Yukon. However, the results of this survey may offer some preliminary perspectives of Yukon childrens' attitudes toward bears. The results of the survey are presented later in this report.

The fifth and sixth objective of this report are addressed using the author's knowledge and expertise in the field of human dimensions research, and should be treated as the author's point of view. As so little research has been done in this area, insights into the direction of educational programs are speculative. The report is designed as a preliminary "look" into the importance of public attitudes in the development of bear management programs in the Yukon.

3.0 TERMINOLOGY AND THEORY

In this section of the report, the following terms will be defined and illustrated with examples: perception, attitude, value, behavior and belief. The attitude-behavior relationship will also be explored.

3.1 What is a Perception?

Perception is a broad term which can range from the physical aspects of perception, to the inferences made when perceiving other people (Schiff 1971). The definition of perception offered by Schiff (1971) discusses two aspects of perception: physical aspects and social aspects. The physical aspects are concerned with the physical properties of a stimulus which could be hue, saturation and brightness, the receptor organs, the eye and its intricate parts, and the transmission of impulses from the receptor to the brain. Human dimensions researchers are interested in social perception. "Social perception is concerned with the impression one has of a social stimulus or set of stimuli, as that impression is modified by the perceiver's past experience in

general, his previous experience with that same or similar stimuli and the individual's state at the moment he is viewing the stimulus of interest" (Schiff 1971).

3.2 Attitudes

An attitude has been defined as "...a general and enduring positive or negative feeling about some person, object or issue" (Petty and Cacioppo 1981). Although one could have a neutral attitude, generally attitudes are thought to be positive or negative feelings towards something. Campbell and Stanley (1963) discuss attitude as "a view of the world". They also state that attitudes must consist of a behavioral component or a "disposition to respond". One model discussed by sociologists and psychologists states that the broad term "attitude" consists of three distinctive components: (1) affective (2) cognitive (3) behavioral.

The affective component consists of an individual's feelings of liking or disliking an object. For example, in outdoor recreational pursuits, one might like hiking or like wilderness. A wildlife example may be someone disliking bears. The cognitive component consists of an individual's beliefs about the object. These beliefs about an object may or may not be true. For example, hiking is healthy, wilderness is safe, bears kill people. Each of these beliefs can affect the affective component of attitude. The behavioral component is simply how a person will react or behave towards an object. Following through with our examples, people may be hiking, camping in the wilderness, and killing bears illegally. Studies dealing with the human dimensions in wildlife resources

attempt to identify each of these components of attitude and their interrelationships. Examples of attitudes toward wolves (a species eliciting more negative attitudes than bears) have been discussed in considerable detail by Kellert (1985) and Bath (1987a,b,c). Several studies have also explored attitudes toward bears and these will be discussed.

3.3 Values and Beliefs

Values are even more permanent than attitudes. Values "...are life goals or abstract basic orientations towards the world" (Rokeach 1968). A much larger concept than attitudes, a value can be clearly distinguished from an attitude as values do not have a specific target or object. Beliefs according to Schiff (1971) lie somewhere between perceptions and attitudes. As a component of attitude, a belief can not be as inclusive as an attitude, but because a variety of aspects of stimulus are present, and the subject of the belief need not be present for the belief to be held, beliefs are more general than perceptions (Schiff 1971).

The common understanding of the meaning and perspective of these terms is essential to understand human dimensions research and subsequent discussion in this report. The reader should be aware that volumes of literature exist on these terms (and many more). This report has only briefly discussed some of the terms used in public attitude research. Following is a discussion on the relationship of attitude and behavior.

3.4 Relationships Between Attitude and Behavior

Managers are primarily concerned with human behavior towards bears, particularly those that influence bear behavior and/or bear survival (Smith Pers. Comm. 1989) Here we examine the relationship between attitude and behavior. This relationship has been discussed in considerable length. Some scholars feel no relationship exists while others feel a definite relationship exists. A brief overview is presented here.

Fishbein (1963) stated that attitudes are strongly related to behavior when both are measured accurately. In 1977, Ajzen and Fishbein (1977) noted that attitude can predict behavior if both coincide at the same level of specificity. Four elements of behavior were defined by Ajzen and Fishbein (1977): 1) action performed 2) target 3) context and 4) time. Firstly, what action are we interested in? For example, this action could be preventing wildlife extinction, or helping with an illness. The target is the specific object; one may wish to save the bald eagle or the snail darter, or help a friend or a stranger. The context or setting is also very important. These species (bald eagle, snail darter) may be saved in a provincial park close by or far away, on private land, perhaps even on one's own land. The friend or stranger being helped may be in one's own home, on the bus or in the office. The last element is time; does this behavior occur Monday morning at 10:00 am, or Saturday morning at 1:00 am.?

To demonstrate the interaction of these elements, think of the example of helping with an illness. Helping a friend (target) is

different from helping a stranger. Helping a stranger (target) in the street (context) at 10:00 am Monday morning (time) is different from helping that same stranger in the street at 1:00 am Saturday morning. In wildlife issues, individuals may be interested in preserving wildlife from extinction but may be very selective of species (i.e. bald eagle okay but not a snail darter) and in context (in a provincial park okay but not on his/her private land).

O'Riordan (1973) illustrates the importance of the time element in this example. To the backpacker in the wilderness a tree is tall (cognition), beautiful (affect) and should be protected, but if the backpacker is also a lumberman that same tree at a different time may be large (cognition), valuable timber (affect) and should be cut down. Another example illustrating the time element may be a man viewing a bear (nonconsumptive wildlife recreational activity), and later during hunting season, shooting that bear (consumptive wildlife recreational activity).

What are the basic conclusions of Ajzen and Fishbein's work? Attitudes and behavior correlate more highly when they are measured along similar levels and consider the elements of action performed, target, context and time. Lauer (1971) also suggests that inconsistencies in attitude and behavior result from two types of attitudes: extrapolated (referring to an imaginary situation) and existential (actual situation). Each of these attitudes must be considered separately to predict behavior accurately. An index of multiple actions correlates more highly with attitude than a single

act. For example, one may have a positive attitude towards recycling and recycle cans, bottles and only buy recyclable products. All these actions would reemphasize a positive attitude toward recycling. Predicting behavior from attitudes is not easy but can be done if each is measured at the same level of specificity.

3.41 Understanding Beliefs

According to some models, an attitude consists of three components, one of which is beliefs or the cognitive component. Beliefs are thought to be related to behavior as they contribute to the formation of attitudes (Mitchell 1979). Not all beliefs are equally important to the individual (Rokeach 1968). The more central a belief, the more resistant it is to change. The more central the belief changed the more widespread the repercussions to the rest of the belief system (Rokeach 1968). For example, a belief that one holds very central to oneself is one's name. If this belief could be changed, it could have major repercussions. One can affect peripheral beliefs which in turn can alter behavior. Petty and Cacioppo (1981) suggest the following example: "a specific car gets good mileage (affecting belief) so that the liking (affective) of this car increases (attitude change) and more likely to buy car (behavioral component)". In a wildlife issue, belief about a species can affect attitudes towards that species. Bath (1987 a,b,c) showed that individuals with higher wolf knowledge scores tended to hold more positive attitudes toward the animal. This is important information for educators. Although

education is the presentation of facts so the target group can form a rationalization for their own belief (Bailey 1984), it is possible to specifically gear education programs towards changing those beliefs which will change attitudes. Even with beliefs about one species, we may be measuring more than one wolf knowledge score for instance. Lauer (1971) suggests that attitudes are often multidimensional and due to this multidimensionality there will be inconsistency in predicting behavior. With the sophisticated statistics available to us today this problem can be minimized. Reliability estimates can be used to measure the reliability of the attitude measurement, and Factor Analysis or Principal Components Analysis can determine whether attitudes are multidimensional. Upon identifying different components, each component could be used to predict behavior. Bath (1987 a,b,c) found attitude towards the wolf (unidimensional) explained 72% of the total variance in understanding willingness to reintroduce the animal into Yellowstone National Park. In understanding beliefs a similar approach can be taken. The wolf knowledge score (Bath, A.J. 1987 a,b,c) produced an acceptable but not high reliability estimate indicating knowledge may be multidimensional. Principal Components Analysis identified three components of wolf knowledge. It is possible to look at how each component relates to attitude and using discriminant analysis the researcher can see how each component varies across special interest groups. One can then focus specific educational programs to specific dimensions and specific groups. Multidimensional situations must be addressed

with multivariate statistics. Using multivariate statistics is a partial answer towards a better understanding of attitude and behavior.

Up to this point our discussion has focused upon understanding the complex relationship between attitude and behavior. Lauer (1971) suggests that we have missed the entire focus of the discussion. "We should not be hung up on the correlation between attitude and behavior...Attitude research is of great significance for the understanding of social phenomena" (Lauer 1971). Attitudes influence both perception and learning. Attitudes also affect the behavior of those who are the objects of the attitude. Pettigrew (1964) found that white attitudes towards blacks can affect black personality and behavior. The effects of teachers attitudes on pupil's performance was also documented by Rosenthal and Jacobson (1968).

We have discussed the relationship of attitudes to behavior. If we change behavior does a change in attitude result? Evidence suggests that behavioral changes do change attitudes. Hyman and Sheatsley (1964) in changing discriminatory practices documented a change in discriminatory attitudes. Breer and Locke (1965) have suggested attitudes can change due to participation in a special task group. For example, participation in the Defenders of Wildlife may change one's attitude toward development which causes wildlife habitat destruction. Looking at how behavior affects attitude is another logical way to discuss the attitude-behavior relationship.

The previous discussion has presented several points of importance to resource managers: 1) there is a complex interrelationship between attitude and behavior 2) attitudes can be used to accurately predict behavior if both are measured at the same level of specificity considering time, context, target and action performed 3) the nature of the attitude-behavior relationship is a multidimensional one which must be addressed with multivariate statistics 4) the situational context may be the most important concept in understanding the attitude and behavior relationship 5) in those surveys asking for the public's attitude on an issue (i.e. a position or a vote), the verbal behavior of response may very accurately predict overt behavior. For example, attitude toward wolves predicted willingness to reintroduce the animal very well (72% explained variance) in a study by Bath(1987 a,b,c). In this case attitude was related to a voting situation, not an acting situation, by the respondent. On the other hand, knowledge of the correct behavior in bear country and what people actually did in bear country was totally inconsistent (McCool et al. 1988). In this case the situational context is quite different. "Attitudes become factors in behavior in specific social contexts, intervening with other variables in that context" (Lauer 1971). 6) Increased knowledge of the animal or resource has been shown to increase positive attitudes towards the animal. Further, the measuring of attitudes accurately can then predict behavior. Quantitative survey research can document attitudes and explore relationships using various statistical procedures; thus

offering better understanding of the human component of the wildlife management equation.

4.0 ATTITUDES TOWARD BEARS

4.1 Attitude Formation and Bear Management

Attitude formation is defined as the "initial change from having no attitude toward a given object to have some attitude toward it, either positive, negative or in-between" (Petty and Cacioppo 1981). For the purpose of our discussion, the "given object" is bears. Many factors may influence attitude toward bears. An individual's personal background, sociodemographic characteristics (age, sex, income, education level, etc.), culture, bear knowledge and bear experience may all play a role in attitude formation. Other factors such as one's resource and ecological background, experience viewing bears, rural versus urban upbringing, the media (television, newspapers, etc.), and current knowledge of the status of bear populations may also interact to form positive, negative or indifferent attitudes toward bears. Herrero (1976) suggests that "the formation of one's perceptions seems to be imbedded in our lifestyle, education system, and attitudes toward nature". To better understand the complexities of attitude formation, before tying the discussion back to bear management, some review of the social psychology literature on the topic will prove useful.

4.11 Attitudinal Model - Classical Conditioning

Attitudes are learned in three ways: 1) classical conditioning 2) operant conditioning and 3) modelling (Petty and

Cacioppo 1981). Attitudes may be influenced through personal experiences and through social influences (reference groups). An example of classical conditioning in the literature is the association of a bell with food by a hungry dog. The food (unconditioned stimulus) causes the hungry dog to salivate (unconditioned response). When conditioned, the ringing of a bell (conditioned stimulus) can cause the dog to salivate (conditioned response). How can this information be used in attitude formation? Staats and Staats (1958) applied this understanding and state that if an object or recommendation is affiliated repeatedly with anything that causes a favorable or unfavourable response, the object will come to elicit the same type of favorable or unfavourable response. Thus, if bears could be associated with a favorable response (perhaps wilderness protection) bears may also be regarded favorably.

Further research has questioned the work of Staats and Staats (1958) implying their results are a function of demand characteristics (i.e. respondents knowing how to correctly respond) and that such association does not truly exist (Page 1969, 1974). For resource managers, getting the public to associate bears as symbols of wilderness and/or indicator species of the health of ecosystems may produce more favorable attitudes toward the animal.

4.12 Operant Conditioning

A second type of associative learning of attitudes is operant conditioning. Operant conditioning "occurs when some response becomes more (or less) likely because of its positive (or negative)

consequences" (Petty and Cacioppo 1981). If a certain expressed attitude is rewarded, the attitude becomes stronger and more positive. For example, if an individual was interviewed about their attitudes toward bears, and after each time a positive attitude was expressed on a particular item, the interviewer said "good", responses to additional items would be favorable. In this case attitudes are formed by positive reinforcement by the interviewer. Larger rewards could induce more favorable responses. The participation of agricultural individuals in a burrowing owl conservation effort was small until the Prince of Wales visited those farmers participating in the program. This reward of meeting the Prince produced a tremendous increase in participation in the burrowing owl conservation project (Herrero Pers. Comm. 1989). This example may also be used as an example of the third means of forming attitudes, modelling.

4.13 Modelling

Modelling refers to the observing of others, and the formation of attitudes by emulating the model or "significant other" (Petty and Cacioppo 1981). This means of attitude formation is significantly important in the formation of children's attitudes toward objects. This method may prove most useful for bear management in the Yukon. For example, placer miners in general have negative attitudes toward bears and often, due to dirty camps, have significant problems with bears. This usually results in the shooting of the "problem" bear (Tokarek Pers. Comm. 1989). If a significant placer miner (perhaps Mr. Klein) could be shown to

other miners to be using effective measures (i.e. bear fence) that reduce bear problems without killing the animals, attitudes of other placer miners may change as they model their operations after the "significant other". Publicity of the success of a conservation-minded placer miner may also be the reward needed to encourage others.

4.14 Personal Experience

Personal experiences can influence the direction and formation of attitudes toward objects. Repeated exposure (familiarity) to an object can lead to favorable attitudes for initially positive and neutral stimulus but negative stimuli can produce more unfavourable attitudes (Petty and Cacioppo 1981). Frost (1985) suggests that a negative experience with a grizzly bear such as damage to property can negatively influence behavioral actions toward the bear. On the other hand, Pelton et al. (1976) discovered individuals either personally injured or suffering property damage by black bears did not form negative attitudes toward the animal. This may imply attitudes differ in tolerance of black versus grizzly bears. Tokarek (1989) suggested that black bears were considered a nuisance to miners in the Yukon, while grizzly bears were tolerated as they were rarely seen. Certainly positive bear experiences can only improve attitude towards the animal.

4.15 Social Influences

Social influences (reference groups, mass media, etc.) play an important role in attitude formation. The family is an early

influence and a powerful one in molding acceptable attitudes toward issues and objects (Petty and Cacioppo 1981). A father who hates bears and shoots them on sight can have a dramatic effect on a young adult's formation of attitudes toward bears. Friends can also have a significant influence upon the strength and direction of the attitude. Reference groups are also important and are defined as "a group whose standards and beliefs an individual accepts and measures herself/himself against, regardless of whether he/she is a member" (Petty and Cacioppo 1981). Environmental and conservation groups can play an important role as a reference group. Members of such groups typically have higher wildlife knowledge scores and more positive attitudes toward wildlife (Kellert and Berry 1980). Although most individuals obtain their knowledge of wildlife issues through the media, social psychological research suggests that attitude change is rare through the use of the media (Petty and Cacioppo 1981). The media may influence attitudes in a manner not yet discovered by social psychological research. One only has to recall the recent incident where three whales were trapped in the ice near Point Barrow, Alaska. There, the positive attitudes expressed toward these individual whales from the public across the continent were phenomenal. Surely the media not only creates issues, but also influences attitudes towards those issues through its presentation of the issue. More research is needed to understand the role the media play in attitude formation.

4.16 Knowledge

Little human dimensions research has been done in identifying factors which specifically affect attitude formation in regards to bears. Frost (1985) suggests that many Mission Valley, Montana residents do not know the actual grizzly bear population size and consequently "it seems illogical to assume that the Valley residents can fully appreciate the grizzly's plight" (Frost 1985). Marsh (1970) reiterates this fact stating that unless the public is aware of the viability and trends of bear populations, any threat of extinction can hardly be appreciated.

4.17 Observational Experience

Attitude toward bears may be influenced by past bear viewing experiences. Frost (1985) suggests that the comfort level of people with grizzly bears increased for those who had seen the animal several times. Increasing opportunities for bear viewing, such as those being done at the McNeil River Sanctuary (Faro and Eide 1974), may prove beneficial to creating and then maintaining positive attitudes toward bears. Much can be learned from the nonconsumptive wildlife use literature particularly whale watching. Tilt (1987) found viewing whales in the wild greatly increased the public's commitment to the cause of whale conservation. Participants also were willing to pay more money to go whale watching if the extra money were to go into whale research. Appreciation of whales lead to an appreciation of marine mammals in general (Tilt 1987). Such information may directly apply to grizzly bears, and to a lesser degree, black bears. Bear viewing

opportunities may create positive attitudes toward the species as well as generate possible revenue for bear management in the future.

Bear viewing opportunities may differ considerably and to produce the necessary positive and ecological perspective such viewing experiences should occur in a natural setting. Opportunities such as those provided several years ago in Yellowstone National Park (viewing grizzlies at the dump) probably did not create positive attitudes toward the bear. Likewise watching black bears begging for food along the roadside does not instill the appreciation of an animal and its natural habitat. Public interpretive programs describing the bear's behavior in a natural setting may prove beneficial in creating positive enduring attitudes toward bears.

In Faro, visitors are encouraged to visit the local dump to view grizzly bears (Smith and Lindsey 1989). As previously mentioned such viewing opportunities may not instill visions of bears as wilderness symbols. It should be documented whether such bear-dump interaction is wanted or not wanted by Faro residents. Dumps have been closed in Yellowstone National Park for several years and feeding of the bears is strictly prohibited. Although, some visitors comment upon how they liked seeing bears, most also realize the ecological importance of returning the bear to natural foods. Such knowledge of Faro residents' attitudes toward bear-dump viewing could greatly influence future education and management programs.

Public exposure to agency responses to problem bears may affect attitude formation toward bears. For example, killing bears secretly may lead the public to mistrust the agency, and create a greater affection for the animal. On the other hand, the public may see the act as an indication that too many bears exist and perhaps more should be killed. A quantitative study of public attitudes toward bears, and toward this issue, may allow managers to better understand the public's viewpoints. Smith and Lindsey (1989) suggest "poor public attitudes" exist and that Faro residents expressed concern over agency attempts to reduce bear viewing opportunities at the dump. Are these the concerns of a few local residents at a public hearing or is it the concerns of the majority of Faro residents? It is necessary to get accurate data to best develop management programs.

4.18 Childhood Experience

As attitudes are learned at childhood, adult attitudes are greatly influenced by childhood events (Duda and Bates 1987). Children who fished, hunted or actively observed birds, knew more about wildlife in general than those individuals who did not participate in such activities. Duda and Bates (1987) discovered that children who did not participate in any type of wildlife-related activity, as well as having low knowledge scores about wildlife, these children identified more with individual animals than populations and ascribed anthropomorphic characteristics toward animals. Children experiencing no contact with wildlife also had far more fear of wild animals (Duda and

Bates 1987).

Children's attitudes are also formed by reading the available books and many of these attitudes remain with the individual into adulthood. Such stories as "Little Red Riding Hood", "The Three Little Pigs", and Jack London's book White Fang all have had an influence on forming negative attitudes toward the wolf (Bath 1987a,b,c). The influence of similar bear literature upon attitude formation has not been explored. For example, the effect of the book Bear Attacks by Herrero (1987) upon attitude formation may be both positive and negative on "would-be" hikers in bear country. Some hikers may now feel attacks are rare and can be prevented, thus forming a positive attitude; others may form negative attitudes, now realizing the danger of the bear. It is important for resource managers to play a specific role in forming positive attitudes toward bears at an early age, as attitudes formed as children may continue through into adult life. As children can be influenced by a "significant other", in-class presentations by bear experts could prove extremely useful.

Fear may be a factor in attitude formation. Fear of bears may not be a bad thing and no one has done any research exploring if individuals can have positive attitudes but extremely high fear of the animal. Fear of the bear may reduce bear-feeding instances and minimize bear encounters caused by an individual wanting to get close enough for that good picture. Fear can be an effective means to change attitude and behavior, if the fear message is vivid, the threat believable, and if the message gives direct guidance on how

to handle the threat (Petty and Cacioppo 1981). It may be beneficial to use fear as a means to induce correct behavior while camping in bear country.

4.19 Attitude Change in Adults

As previously indicated, attitudes may form in many different ways. There are also many different theories of attitude change. Petty and Cacioppo (1981) summarize the many theories under seven approaches which in turn can be thought of as falling into two fundamental "routes" to changing a person's attitude. Each of these seven approaches is briefly mentioned followed by a discussion of the two fundamental routes.

The first approach to attitude change involves some of the earlier discussion in this chapter concerning conditioning and modelling. The use of rewards and punishments may affect existing attitudes. Secondly, the message-learning approach developed by the Yale School, studies the various factors which affect the receiving of a persuasive message. The third approach uses perceptual-judgement theories of persuasion. This approach concentrates on the individual's perception of the message and how attitudes form in the context of the individual's past experiences. Fourthly, several motivational theories can be used to change attitude. Individuals desire to maintain consistency between their beliefs, attitudes and behaviors. In an effort to maintain this consistency, they minimize cognitive dissonance (inconsistencies in attitudes). These last three approaches are concerned with how information is processed. The fifth approach suggests that change

occurs by the individual making inferences about what was said about themselves or what they perceive about their own behaviors. The sixth approach involves mathematical models which address how information once received is evaluated and integrated to form an overall attitude. The final approach suggests that information people create themselves can create attitude change. More information is available in Petty and Cacioppo (1981) upon these seven approaches. It is believed a discussion of the two fundamental routes and specific example will prove beneficial to illustrate attitude-change strategies.

Two fundamental "routes" exist to change a person's attitudes: 1) the central route and 2) the peripheral route. The former route emphasizes the information that a person has about the object while the latter includes basically everything else. The central route attempts to change attitudes by presenting factual information and promoting thoughtful consideration of the object or issue. Although attitudes are more difficult to change by this route, once altered, the new attitude lasts longer than attitudes altered by the peripheral route. The peripheral route is not dependent on information-based messages, but relies instead upon some association in the environment to change attitudes. This route is more emotionally based than factually based. Products or issues are associated with an attractive or well-liked object (Morgan 1988); for example, the use of "Bambi" in an antihunting campaign (Morgan 1988). Attitudes are easier to change by the peripheral route than by the central route but the resulting change

will not be as long lasting (Petty and Cacioppo 1981). The peripheral route is best to use when the issue is of low relevance to the recipient.

The discussion of the peripheral versus central route leaves the resource manager in an ethical dilemma. Do we change attitudes based upon emotion or biological facts? Is there enough time to change attitudes by the slower central route to save the grizzly, using biological facts? Is an increase in bear knowledge associated with a more positive attitude toward bears? Mihalic (1974) found an inverse relationship between biological bear knowledge and attitude. As knowledge increased among urban respondents, he found more negative attitudes toward the species. Emotion has been shown to be very effective in altering attitudes. It is used all the time by environmental groups. The pictures of baby seals with tears in their eyes were effective in stopping the seal hunt in Atlantic Canada. Bill Mason's film, "Death of a Legend", showing scenes of a wolf being killed, and new born pups attempting to howl was filled with emotional appeal. The film also was instrumental in ending the bounty on wolves in Ontario. Emotionally-laden arguments are used everyday to save wildlife species, wetlands and even historic buildings. It is the job of the resource manager to present the facts, but perhaps the "value" of the species, and an overall appreciation for nature should also be a part of programs designed to influence public attitudes.

Morgan (1988) in a program designed to change attitudes toward snakes outlines four specific attitude-change strategies which

could be applied to bears: 1) "mere exposure" 2) modelling 3) direct contact and 4) information. Extrapolating from Zajonc (1968) suggests attitudes toward wildlife species may be improved as a result of "mere exposure" to the species. Repeated positive exposure as mentioned earlier (bear viewing, whale watching) can change attitudes. Morgan (1988) discovered fearlessly demonstrating snake behavior (modelling) proved very successful in reducing fear of snakes. Such modelling is not possible with bears nor desirable as people need to maintain some respect or fear for these large unpredictable animals. Interpretive discussions while observing a bear may prove useful in affecting attitude. First hand involvement was very important in changing attitudes toward snakes (Morgan 1988). For bear management, although slides and informative talks are beneficial nothing can beat an actual bear sighting. The last strategy for inducing attitude change was information. Information alone about snakes was not shown to change snake phobic attitudes (Morgan 1988). The best strategy to change attitudes may be a combination of these four strategies.

4.2 Previous Studies - Their Strengths and Weaknesses

Although many biological studies of bears have been completed, little quantitative survey research (human dimensions research of bears) has been done. In this section of the report, each study will be briefly evaluated and the key findings presented in chronological order.

Marsh (1970) interviewed an unstructured sample of 100 park visitors at campgrounds and roadside halts in Banff and Glacier

(B.C.) National Parks. The sample size (n=100) is small and as respondents were not randomly selected careful consideration of the results is needed. Marsh (1970) discovered the majority of respondents (84 percent) had seen bears in the wild. This seems to be much higher than what would be found in a random selection of park visitors. Under 20 percent of respondents stated bears discouraged them from hiking and only 10 percent were discouraged from camping in the parks because of bears. Marsh (1970) found different attitudes toward grizzly bears versus black bears. Only two percent wanted all bears eliminated from the park, but 19 percent thought all grizzlies should be eradicated from the parks. Those respondents stating they were "unsure" increased from one percent for all bears eliminated, to 17 percent for grizzly bears to be eliminated. This suggests an interesting aspect of human dimensions in bear management. Managers may wish to address the two species differently in information programs and focus more attention upon attitudes toward grizzlies. Marsh (1970) states that it is important to understand where the public is coming from with their attitude toward bears. Does the public believe the population is increasing or decreasing? "Unless the public is aware of the viability and trends of bear populations any threat of extinction can hardly be appreciated" (Marsh 1970). Many visitors indicated a desire to see bears, which implies a desire to keep the species from going extinct.

Burghardt et al. (1972) conducted a study of park users attitudes and knowledge concerning black bears in Great Smoky

Mountains National Park. A 42-item questionnaire including bear knowledge, attitude and demographic items was administered using personal interviews to a sample size of 500 users. The research instrument was pretested and wording problems resolved before actual implementation. Although the sample size is indeed respectable, unfortunately respondents were not randomly selected and hence conclusions to the population can not be accurately drawn. Mihalic (1974) also questions the usefulness of the data. Understanding then that the responses are not representative of the visitor population, and may be biased by means of certain individuals answering the questionnaire, a discussion of the study's findings follows.

Males scored significantly higher on knowledge scores than females. There was some evidence to suggest that hunters and sportsmen were more knowledgeable about the outdoors and wildlife in general than nonhunters. More rural (<1000 population) and highly urban (>50,000 population) respondents scored higher on bear knowledge scales than respondents of small towns. Those respondents who attended naturalist talks scored higher, but this does not necessarily mean the talks affected knowledge. Those respondents who attended the naturalist talks may already possess greater interest and knowledge of wildlife. More respondents in the high knowledge category had seen bears both in the Smoky Mountains and other areas. This could imply that knowledge may increase with more exposure to bears. In this example, respondents received high knowledge scores suggesting that the visitor may not

be the emotional and ignorant individual usually stereotyped by the resource manager. Burghardt et al. (1972) also stated that "as people learn more about wildlife, they are more prone to want it protected" (Burghardt et al. 1972).

Bryan and Jansson (1973) designed a questionnaire to test knowledge of ecological requirements of bears, bear behavior patterns, ability to identify different species, and knowledge of appropriate reactions upon encountering bears. A survey of 393 persons was conducted in Edmonton, Jasper and Westlock, three communities differing in their size and rural to urban nature. There is no mention as to how the survey was conducted and whether the sample was randomly selected. Bryan and Jansson (1973) break down the sample of 393 into three groups and attempt to draw conclusions about each community. Such conclusions are tentative at best as sample sizes then become quite small. If the sample was not randomly selected (and it is not stated that it was), conclusions to the respective populations are further misleading. This study focuses upon the perception of a natural hazard. The accuracy of perception of the hazard (physical contact with a bear) was found to be a function of familiarity with wildlife. The more familiar with wildlife the more accurate perception of the hazard. Big game hunters and Jasper residents had the most accurate hazard perception. Bryan and Jansson (1973) also found those who do not visit national Parks and members of the agricultural community (Westlock) more strongly believed bears kill humans for food. Few respondents knew the difference between grizzly and black bears

suggesting this is an area to focus an educational program. A number of respondents admitted they would feed bears although fully aware of the regulations not to do so. This "...highlights the role of perception in the governance of behavior, for it is perception rather than reality that condones very inappropriate actions in the face of potentially dangerous situations" (Bryan and Jansson 1973). Another important finding by this study indicated a very strong reaction by respondents to what should be done with "problem" bears. The majority of respondents in all groups (Jasper, Edmonton, Westlock) believed that bears which caused property damage should be removed to other areas and bears causing human injury should be destroyed. This indicates a need by resource managers to focus educational efforts to explaining why bears act in certain ways. Illustrating to the public that a bear, which actively "preys" on man versus a defensive sow with cubs confronted suddenly by a hiker, requires a different management action, may move the public to a more compromising and acceptable position. Identifying such public perceptions before implementing management and educational programs can prove invaluable.

Mihalic (1974) documented attitudes of visitors to Glacier National Park, Montana. A random sample (n=158) of summer visitors to the park were asked to respond to several questions concerning their attitudes toward grizzly bears. It is unfortunate the sample size is not larger as stronger conclusions would be possible. Mihalic (1974) found most visitors had a positive attitude toward grizzly bears (65%), slightly more than 20% had neutral attitudes,

with the remainder (15%) having negative attitudes. Many visitors expressed a great desire to view bears (77.8%) with 32.3% of all visitors specifying viewing a grizzly bear as their first choice. This clearly indicates the importance of grizzly bears for nonconsumptive wildlife use. Mihalic (1974) found attitudes toward grizzly bears differed between men and women; the latter expressing more hesitation to camp in bear country and more fear of the species. A study of Yukon public attitudes toward bears should be aware of this and incorporate this information into the experimental design. For example, sending a research instrument addressed simply to the head of household will solicit mainly a male response, thus missing female responses and considerably different attitudes. Mihalic (1974) discovered bear knowledge was inversely related to attitude. As knowledge increased, attitudes became more negative. He suggests that the innocence to the potential danger of bears may play an important initial role in forming the original positive attitudes toward bears.

Pelton et al. (1976) evaluated attitudes of visitors to Great Smoky Mountains National Park who were actually involved in a bear incident. A mail-out questionnaire consisting of 35 items was sent to a total of 231 individuals who experienced property damage and/or personal injury between 1968 and 1973. A response rate of 52 percent was achieved (N=119) consisting of personal injury responses (n=16) and property damage responses (n=103). The relatively small sample size makes conclusions tentative and the authors clearly state that statistical hypotheses were not tested

due to the small sample size. The majority of respondents (64 percent) felt that black bears did not pose a serious problem, whereas 31 percent felt they did pose a problem. Only one individual believed bears should not be allowed in the park. Such information would suggest bad experiences with bears do not necessarily change attitudes in a negative manner. This statement must be qualified. Most black bear injuries to humans were caused by the individual's own carelessness (often feeding bears). These individuals probably realized their own mistakes and hence do not blame the bears (Pelton et al. 1976). Attitudes of individuals involved in bear incidents where it is not so blatantly obvious they were at fault may prove quite different. An additional problem with noting that bad experiences do not necessarily change attitudes in a negative direction, is a lack of understanding of attitudes before the incident. For example, did the individual have a negative attitude of bears, and after the bear encounter, gain more respect for the animal? On the other hand, did the individual have a positive attitude toward bears and not change attitude? There are many difficulties in assuming the experience changed the attitude without having prior knowledge of the attitude before the experience.

McAllister (1977) as part of his undergraduate thesis conducted a survey of attitudes toward bears. An extremely small sample size of the Vancouver general public (n=42) and Sierra Club members (n=70) make the study extremely weak. The questions were also worded poorly. McAllister (1977) found the public was less

informed about bears than members of the interest group. He suggests respondents with children may be more sensitive to bear-man interactions than respondents without dependents. Urbanized respondents felt grizzly bears were more dangerous than the interest group respondents. The majority of respondents felt that grizzly bears should be allowed to exist in a natural setting. This result may be no more than a function of the Sierra Club members (numbering more than the Vancouver general public sample) stating their conservation viewpoint. Large sample sizes randomly selected are needed to accurately represent populations and draw meaningful conclusions.

Kellert and Berry (1980) conducted a nationwide study of American attitudes toward wildlife. Obtaining a large randomly selected sample, this study has been a landmark case in human dimensions in wildlife resources research. Although attitudes toward bears were not a primary consideration of the study, two aspects of the study offer a preliminary perspective. In a ranking of 33 species from strongly like ($x = 1.0$) to strongly dislike ($x = 7.0$), bears were rated 18th with a mean of 2.97 (slightly like 3.0.). Such species as walrus, whale and moose ranked slightly higher while frog, gorilla and wolf were slightly lower. Kellert and Berry (1980) also asked one trade-off type question which put the endangered grizzly bear against the timber industry and job creation. The question was as follows:

"It has been suggested that 5 million acres of national forest land be set aside so that the endangered grizzly bear remain undisturbed. The timber industry objects, saying that jobs and needed lumber will be lost. Would you agree to protect the endangered grizzly bear even if it resulted in the loss of some jobs and building material?" (Kellert and Berry 1980).

Although in all regions of the United States the majority agreed to protect the grizzly bear, significant differences were evident by region. For example, in Alaska 62.1% agreed and 30.4% disagreed while in the South only 47.8% were in favour and 47.2% disagreed. The Pacific public had 61.8% in favour and 34.8% against, the Rocky Mountains saw 58.7% agree and 38.7% disagree, the North Central and Northeast had 61.2% and 59.1% agree respectively and 34.7% and 36.6% disagree respectively. Such regional differences are interesting to document and provide insightful information to the resource manager who must approach the public in each region differently. For the Yukon bear management program, the results from Alaska may be quite relevant. Such information would suggest a positive attitude toward grizzly bears.

The only quantitative survey research completed in the Yukon to date was a hunter survey (Wildlife Branch 1981). Of 4,677 questionnaires mailed to all Yukon residents with valid 1980-1981 hunting licenses a total of 1800 (38.5%) were returned. The report states that: "this response is extremely high when compared to other mail surveys the Department has conducted" (Wildlife Branch 1981). Although the sample size is large, this response rate is very low in comparison to other studies completed in the human dimensions in research field.

This study indicated public support for lottery permit hunts for the grizzly bear, and some interest in an archery season for black and grizzly bears. A small percentage (8.9%) of hunters had their big game kills disturbed by bears. No indication of what happened, how they felt about this, or if their attitudes were different than other hunters was gathered. Further data is needed on public and hunter attitudes toward bears to aid a comprehensive bear management program.

One other study was conducted for the Fish and Wildlife Branch in 1981. A questionnaire consisting of fourteen items addressing topics of bear management, park purpose and personal impressions of grizzly bears was personally administered in a park setting (Henderson 1981). No indication of the sample being randomly selected, and a small sample size (n=111) suggest that conclusions be treated very carefully. Age of respondent appeared to be the most significant parameter, with the 20-30 age group having the highest element of preservation. Most respondents supported having bears in parks, and various means to restrict access or garbage control rather than eliminating problem bears. Henderson (1981) stated that negative media about bears had been unsuccessful in changing opinions. This does not seem supported by her research and is not cited. Other research suggests that the media can play an important role in forming attitudes as it is one of the most popular means of obtaining information by the general public (Bath 1987a,b,c).

Nelson (1983) suggests in his book, Make Prayers to the Raven. A Koyukon View of the Northern Forest, that many taboos and beliefs exist about bears for the Koyukon people. Bears have very powerful spirits and the Koyukon people are very careful not to upset these spirits as consequences may be anything from bad luck hunting to death. Females have many restrictions placed upon them in regards to bears. Women can not eat bear meat, talk about bears, view bears or come in contact with or step over bear hides. Koyukon hunters today have been so afraid of the younger generation breaking taboos that bear skins are rarely taken home anymore and instead left at the kill site (Nelson 1983). The skins are not sold as this would surely mean contact with women in the future. Bear heads are never taken home either, due to the strong spirits of the bears. These actions are of course quite contrasted by the trophy hunter who seeks the head and hide of the animal. The real bear hunting for the Koyukon begins in the winter when bears are killed in their dens (Nelson 1983). The Koyukon hunters also believe that cubs found with a female bear must be killed although the cubs can not be taken home. In addition, the Koyukon hunters believe that it is an offense to kill a creature without doing something to it, the animal is cut apart, as this is a gesture of nonwaste. In the Yukon, where the aboriginal people form a significant portion of the general public, resource managers need to identify and document attitudes of both aboriginal peoples and non-aboriginals, and be aware of potential conflicts over differences in attitudes and perceptions of existing bear

management practices.

Sundstrom's (1984) master's thesis discussed park visitor's behavior while in bear country. In considering visitors to Denali National Park and Preserve, Sundstrom (1984) found that visitor knowledge of correct behavior differed considerably among park visitors. Hotel guests scored significantly lower than professional photographers. Visitors who hiked in the backcountry were more knowledgeable about proper bear behavior than visitors who had no intention of hiking the backcountry at Denali. An increase in knowledge about correct behavior in bear country occurred during a visitor's stay at Denali National Park and Preserve. Although knowledge scores did not significantly increase for day users, hotel guests, tour bus passengers, and professional photographers. Day users had the lowest mean knowledge scores while researchers had the highest mean scores. Low mean knowledge scores were particularly evident on the question concerning cooking distance from campsite and increased danger while hiking alone. These areas were highlighted for future information and educational programs. Sundstrom (1984) found written information was the most effective method for visitors to gain information. Unfortunately, he discovered visitor's knowledge was not a significant predictor of behavior. This human dimensions research was instrumental in getting bear resistant food containers for all backpackers, and overall aided bear management in Denali National Park and Preserve considerably.

A recent master's thesis (1985) completed at the University of Montana explored the perceptions of Mission Valley residents in Montana toward grizzly bears (Frost 1985). A questionnaire was administered to individuals living on private lands which were seasonally visited by grizzly bears, "and whose daily actions and/or long-range land management decisions might adversely impact the survival of the Mission area grizzlies" (Frost 1985). The residents perceived a need for more education of the public regarding grizzly bears, and a quicker response by game wardens to complaints when problems occurred. Frost (1985) found that residents had little knowledge of the grizzly bear. Knowledge level about grizzly bears was highly associated with what individuals believed should be done with grizzlies in the area, whether the animal was liked, level of comfort near the animal, and a behavioral intention score outlining actions that would be taken with problem grizzlies. Many residents wanted to protect grizzly habitat but did not know how. Few residents knew the population size of grizzlies in the immediate area. Frost (1985) suggests that fear of the animal is quite evident among residents but comfort level increases after viewing the animal several times. Contrary to studies by Pelton et al. (1976) and Burghardt et al. (1972) dealing with black bears, Frost (1985) found that encountering grizzly bears on the property resulted in negative attitudes toward the animal. This suggests public attitudes toward the two species may differ and likewise management of each species should reflect these differences. Frost (1985) found significant

differences in attitudes toward grizzly bears between American Indians in the Mission Valley area and the white residents in the area. Frost (1985) attributed these differences in attitude to the cultural/religious teachings of each race. Little research has been completed in identifying and documenting aboriginal attitudes toward bears. This research finding suggests differences do exist.

In the summer of 1988, Hare (1988) conducted several pretests of a possible research instrument to be used in the Yukon to obtain attitudes toward bears. Unfortunately, these questions were not tested in a statistical manner but were subjectively evaluated as good, bad, fairly difficult or difficult. This does not constitute a pretest. A pretest of items involves a review of the questions by a panel of experts, a testing of the research instrument with a minimum sample size ($n=50$), rewording questions and conducting reliability estimates (Cronbach's alpha for attitudinal items along a Likert format, and Kuder Richardson Formula 20 (KR-20) for dichotomously coded knowledge items). Both estimates are available on SPSS (Statistical Packages for the Social Sciences). Several pretests are usually conducted before the final instrument is accepted for actual implementation. Through preliminary interviews, Hare (1988) suggests that past experience with bears can influence attitude in both a positive and negative manner. Hare (1988) stresses the importance of knowing what the respondent thinks about the grizzly population as this may also influence attitude. For example, if the respondent believes the populations are declining, a more positive attitude and appreciation for the

bear's plight may be observed. On the other hand, the perception that the bear population is dramatically increasing may lead to the formation of a negative attitude. Hare (1988) also points out the difficulties of obtaining attitudes from the aboriginal peoples. As well as a reluctance to answer in written form, verbal responses may not be the best approach to obtain viewpoints from the aboriginal peoples in the Yukon.

McCool et al. (1988) presented a paper at the Second Symposium on Social Science in Resource Management addressing public beliefs about bears. The sample consisted of visitors aged 16 years and older who stayed overnight in the backcountry during the period July 18 to August 30, 1987. Two backcountry areas were considered. A mail-out survey was sent to the users after their trip was completed. Sample sizes of 186 and 460 were obtained from the two areas. Reliability estimates were completed on the items forming each attitude scale. This study has taken the time to statistically validate its findings and explores the presence of four types of attitudes originally developed by Kellert (1976). It is a strong methodological study. McCool et al. (1988) suggest that understanding the beliefs individuals hold about bears may help managers develop more effective content in informational programs. The four attitudes used were:

- i) ecologicistic - "viewing the grizzly bear as an essential component of a naturally functioning ecosystem"
- ii) naturalistic - "beliefs oriented toward the bear as an object of affection or appreciation"

- iii) moralistic - "to what extent are bears viewed as having rights to live"
- iv) negativistic - "believing bears are dangerous and cruel and should be eliminated"
(McCool et al. 1988)

Highly experienced campers scored significantly higher naturalistic scores than those campers with minimum experience. Those individuals who reported the highest frequency of encountering bears also scored the highest on each belief scale except the negativistic. The negativistic scale is measuring avoidance of bears. Campers who felt safer and perceived bears as less of a threat in certain areas did not abide by the recommended practices to avoid bears as frequently as those who perceived the bear as a real threat. Out-of-state attitudes and behavior differed considerably from local attitudes and behavior. These findings are important to resource managers, who can effectively gear education programs to certain groups addressing specific behavioral items.

Braithwaite and McCool (1988) discussed aspects of behavior in bear country and factors which influence this behavior. They found the adoption rate of correct behaviors was unacceptably low, questioning the effectiveness of information programs. Data were collected through a mail-out survey to backcountry users as previously described under McCool et al. (1988). Although 92% of all campers believed they had correctly stored their food, when a sample of campers were observed, only 3% actually used correct methods. Braithwaite and McCool (1988) suggest that reference group norms may be a powerful influence on the reception and

acceptance of correct behavior information offered by the national park. As participation in hiking is often a group activity, small group interaction is an important influence on behavior. The pressures to conform to the expectations of significant others may prove a more important predictor of behavior than the perceived correct behavior. This information is of particular importance to resource managers designing and implementing educational programs. Accurate information must be geared to those significant individuals in the group as it is these individuals who will disperse the information. Braithwaite and McCool (1988) suggest the importance of social-normative influences upon behavior. This is an interesting and worthwhile area for further research which holds extremely good benefits for conservation educational purposes.

Decker and O'Pezio (1989) identified that landowner acceptance capacity for bears was the limiting factor in considerations to increase the black bear population in the Catskill region of New York to near range carrying capacity. In an effort to improve landowner attitudes, thus making it easier to implement a bear population increase program, a mail questionnaire (72% response and n=1549) was done to gather information on landowner's knowledge of bears, sightings, tolerance of bears, nuisance or damage experience caused by bears, attitudes about bears, and preferences for population trends in the region. Landowners were surveyed prior and after a controlled increase in the bear population to determine changes in their beliefs, attitudes and experiences with bears and

whether their acceptance capacity for bears had been reached.

Decker and O'Pezio (1989) found that both actual and perceived conflicts influenced landowner's acceptance of bears. The more landowners knew about bears and had contact with bears, the more likely they were to accept more bears in the region. Decker and O'Pezio (1989) state: "peoples fundamental beliefs and attitudes about bears, and the nature and extent of interaction they believe they will have with bears, become significant factors to be considered in the process of bear population management." The results suggest misinformation or lack of information about bears may substantially increase landowner perception of bear-people conflicts in the absence of actual experience. Personal experience with bears and knowledge of bears tended to decrease perceived conflicts and to increase acceptance of bears.

This research has been very useful toward a comprehensive approach to bear population management. Upon identification of landowner misconceptions about bears, educational efforts to overcome these have been initiated (Decker and O'Pezio 1989). Public responses to management results are constantly being monitored, evaluated, and used to adapt subsequent management actions (Decker and O'Pezio 1989). This is an important aspect of quantitative survey research. Studies are not one-shot deals but need to be an aspect of each program on a continual basis. In the Yukon, a need first exists to obtain a baseline upon which changes can be monitored as new educational efforts and programs implemented.

The available human dimensions in wildlife research literature concerning bears suggests several important implications toward better bear management in the Yukon. Although the public majority seem to like bears, managers should assume that significant differences exist between males/females, aboriginals/non-aboriginals, hunters/nonhunters, urban/rural and various age classes. Past experiences seem to have some effect upon attitudes, but whether negative experiences produce negative attitudes remains unclear. The hazard perception of bears decreases with repeated exposure to the animal. It may prove important to always keep this hazard perception at a certain level to minimize careless injury encounters with bears. Personal experience in general seems to help improve positive attitudes toward bears. Knowledge of correct behavior while in bear country is weak. As tourism continues to increase in the Yukon and more people hike and camp in bear country the potential for bear encounters will increase. Educational programs to minimize these conflicts and acceptable methods to manage the "problem" bear will be needed. More public knowledge of bears does seem to lead to more positive attitudes toward the animal. The literature suggests attitudes toward black bears versus grizzlies may be different. Information should be obtained to document any differences, and these differences effectively represented in management actions. Monitoring of public attitudes toward bears as management programs change is important. In the Yukon, obtaining baseline information is essential first.

4.3 Preliminary Observations of Yukoners Attitudes Towards Bears

Preliminary perspectives on attitudes toward bears were obtained through unstructured interviews with representatives from the placer mining industry, mining geologists, livestock owners, new residents to the Yukon, hunting guides, aboriginal peoples and students in one Whitehorse school. As the sample sizes are small these attitudes should be treated as individual viewpoints rather than representative of the groups mentioned above.

In cooperation with Mr. Lee Kubica, biology teacher at F.H. Collins Secondary School in Whitehorse, Yukon, a six-item questionnaire was administered to students enrolled in his biology classes. A sample size of 112 was obtained as all students completed the questionnaire. Respondents ranged in age from fifteen to nineteen, although 81 percent of the population were sixteen (43%) or seventeen (37.8%). Only one respondent was fifteen (0.9%), two respondents were nineteen (1.8%), and eighteen respondents were eighteen years old (16.2%). Results of this survey are presented in Tables 1 through 5. Numbers in brackets indicate absolute frequency. All other numbers are calculated percentages. Most students stated they had viewed both black bears and grizzly bears. A question was not asked to determine if the students knew the difference between the two species. No respondents stated they did not know what species was observed. Most students expressed a positive attitude toward both grizzly bears and black bears. Approximately 40% of the students expressed a neutral attitude toward both species. Few respondents stated

TABLE I

HAVE YOU EVER SEEN A GRIZZLY BEAR?

Yes	No
(73)	(39)
65.2	34.8

TABLE II

WHICH ANSWER BEST DESCRIBES YOUR ATTITUDE TOWARDS GRIZZLY BEARS?

<u>STRONGLY LIKE</u>	<u>LIKE</u>	<u>NEITHER LIKE NOR DISLIKE</u>	<u>DISLIKE</u>	<u>STRONGLY DISLIKE</u>
(17)	(45)	(46)	(1)	(2)
15.3	40.5	41.4	0.9	1.8
55.8			2.7	

NOTE: Numbers in brackets indicate absolute frequency. All other numbers are calculated percentages. Numbers in bold are the total percentage of like and dislike responses respectively.

TABLE 3

HAVE YOU EVER SEEN A BLACK BEAR?

YES	NO
(89)	(23)
79.5	20.5

TABLE IV

WHICH ANSWER BEST DESCRIBES YOUR ATTITUDE TOWARDS BLACK BEARS?

STRONGLY LIKE	LIKE	NEITHER LIKE NOR DISLIKE	DISLIKE	STRONGLY DISLIKE
(12)	(50)	(44)	(2)	(3)
10.8	45.0	39.6	1.8	2.7
55.8			4.5	

NOTE: Numbers in brackets indicate absolute frequency. All other numbers are calculated percentages. Numbers in bold are the total percentage of like and dislike responses respectively.

TABLE V

IN YOUR OPINION WHICH ANIMAL IS MORE HARMFUL?

NOT HARMFUL	BLACK BEAR	EQUAL	GRIZZLY
(9)	(19)	(23)	(60)
8.1	17.1	20.7	54.1

NOTE: Numbers in brackets indicate absolute frequency. All other numbers are calculated percentages.

they had negative attitudes toward the animal. Slightly higher negative attitudes were associated with black bears. This may be due to a higher number of individuals viewing these animals around garbage and causing problems. It was previously believed that students may be very afraid of bears (Kubica Pers. Comm 1989). Mr. Dave Stockdale, an elementary school teacher, suggested children were extremely frightened of bears (Stockdale Pers. Comm. 1989). The shooting of a black bear in a camp while on a school camping trip did not seem to create any remorse feeling among the young children. On the contrary, many saw the experience as an adventure (Stockdale Pers. Comm. 1989). In an effort to identify this possible fear, a question was asked in the survey to identify which animal the students felt was more harmful. Although most students (54.2%) identified the grizzly as more harmful, 37.8% believed either the black bear or that both species were equally harmful. Approximately 8% of the students stated both species were not harmful. These preliminary results should prove encouraging to resource managers. As most students hold positive attitudes toward both black bears and grizzly bears, continued conservation of both species should be supported by this segment of the public.

Of those individuals interviewed, no one expressed condemnation of bears and/or complete extermination of bears. All individuals felt bears had a right to exist and it was man who was infringing upon bears. At the same time, it was clear that man too could exist in certain areas, and bears were required to respect "man's home range" in the wilderness.

In discussions with miners, it was found that mineral exploration camps are smaller and more transient than the placer mining camps, and tend not to encounter bears as frequently. Close encounters with bears usually occurred around the camp. Most often the "problem" bear was a black bear. Individuals did not express different attitudes towards black bears versus grizzly bears, although some individuals were more concerned about grizzly bears. Respondents felt they could scare off a black bear but were much more wary with a grizzly bear. Most individuals did not have any close encounters with grizzly bears except the hunting guide who hunted in the high areas more densely populated with grizzly bears. Some individuals felt they learned a tremendous amount about bears through discussion with the Yukon bear management biologist, Barney Smith. One placer miner was impressed with the effectiveness of an electric bear fence which brought black bears to the perimeter of the camp but never inside (Klein Pers. Comm. 1989). After baiting the fence, Klein (1989) found the fence did not break as often when the bear contacted the fence. Klein (1989) recommended the measure to other miners and stated clearly that the fence was cheaper than trapping the bear and paying his men overtime to relocate it. Unfortunately most placer miners are not as conservation-minded or financially well-off ; the solution in their cases has been quite simple - shoot the bear (Tokarek Pers. Comm. 1989). As grizzlies are rarely seen they do not suffer as often the same fate as the black bear. While the black bear is viewed as a pest and is shot on sight, the grizzly bear receives higher

status in placer miners' eyes and is usually spared (Tokarek Pers. Comm. 1989).

Livestock owners also have a negative attitude toward bears. A study of 85 livestock operator attitudes toward bears revealed numerous negative attitudes (Tokarek Pers. Comm. 1989), although attitudes toward wolves were extremely negative. Those livestock operators who arrived at the Yukon from an urban setting (Ontario, B.C.) held significantly more positive attitudes toward bears than those operators who came to the Yukon from more rural backgrounds (Saskatchewan, Alberta). Bears did occasionally kill calves, chickens and other livestock. For the individual livestock operator their financial losses could be tremendous. Hobby farmers expressed more positive attitudes toward bears. The economic ties to the industry and the urban/rural background appeared important factors in the direction and strength of attitudes toward bears.

Interviews with individuals familiar with aboriginal attitudes toward the bear revealed interesting results. It was stated that every aboriginal person seemed to have a tale about bears (Easton Pers. Comm. 1989). Most of these bear tales have negative connotations and contain a great fear for the animal (Easton Pers. Comm. 1989). Although the sample size from Easton's (1989) work in the Yukon is small (n=15), initial results indicate some resentment toward bears as they are perceived as increasing and dramatically affecting moose numbers. The spiritual importance of bears is still very real today among both young and old. Although the younger individuals may not verbally admit to the spiritual

power of bears, their behavior often reflects their beliefs (Easton Pers. Comm. 1989).

An interview with a relatively new resident (5 years) to the Yukon revealed important differences between European attitudes and local attitudes. Due to the loss of much wildlife in Europe a greater appreciation for the Yukon's wildlife resource was demonstrated (Glaser Pers. Comm. 1989). Bears were seen as an integral part of the ecosystem and strong preservationist views were expressed. Although no special information was provided to a new resident to the Yukon it was felt the educational displays at the Kluane centre were excellent. Educational packages to new residents may be beneficial in informing newcomers of rules and regulations and offering an appreciation for the valuable wildlife resources in the Yukon.

5.0 IMPLICATIONS TO CONSERVATION EDUCATION

At the beginning of this report human dimensions in wildlife resources research was defined; as a part of that definition, it was mentioned that a close tie exists between conservation education and human dimensions research (Adams 1988). In this section of the report, the discussion focuses upon that link and the successful application of conservation educational programs to the results of human dimensions research. Suggestions of possible implications based upon available knowledge toward revising educational efforts are also offered.

The results of quantitative survey research may identify areas of bear knowledge where the public scores very low. Educational

programs can then focus upon these knowledge items and specifically address areas of concern. Programs can also be focused to specific age groups within the public and toward special interest groups. Human dimensions research will allow each segment of the population to be compared across knowledge items, attitude items and sociodemographic characteristics.

Duda (1988) has stated that there is no such thing as a generic educational program for a general public. Sociodemographic factors must be considered. An educational program for 25-35 years of age group may be significantly different than a program for an over 65 years of age group. Knowledge and attitude may differ across age; as age increases one may find more negative attitudes. Educational programs should be geared to that segment of the population holding negative attitudes and being weak in particular knowledge items in an effort to change attitudes and/or create a more informed public. Bear knowledge may be discovered to be a multidimensional issue. Segments of the population may score high on knowledge about bear reproduction and bear/cub ratios for example but low on population size and factors causing populations to decline. Educational programs must be aware of the various components of knowledge which may be found and how each component relates to attitude. Conservation educational programs then can maximize their effectiveness by focusing specifically upon components of knowledge which are most highly correlated with attitude. Superimposed upon this knowledge-attitude relationship could be locational setting, (rural versus urban), and age.

Consequently, a conservation educational program can be tailored to a specific knowledge dimension which correlates highly with attitude, for a specific large audience (age group, interest group), in a rural or urban setting. As Duda (1988) implies, resource managers can no longer expect one generic educational program to work for all. Human dimensions research can enable the resource manager to effectively identify important issues, design an effective program, and also implement it successfully.

The current Yukon conservation education strategy for bears is to provide information to various sectors of the Yukon public on black, grizzly, and to a lesser extent polar bears (Smith and Stiven 1989). As suggested by Duda (1988), it is a good idea to focus educational programs to specific audiences. The selection of key concepts to include in a program may be best made through discussions with bear experts and a preliminary study of public knowledge and attitudes toward bears. It is impossible to know before research is done what concepts may be most relevant to attitude change. Careful consideration should be taken in not overloading the public with too much information.

In designing an effective educational program, it is essential to identify what information about bears is most important to know. Although bear managers may wish the public to know everything from a bear cub's weight at birth to genetic variations among bears, it is both unrealistic and unnecessary for the public to obtain such information and become bear experts. The public must however be bear literate. What information is most important about bears?

Through a brainstorming session several issues may appear important (i.e. bear population size, knowledge of population increasing or decreasing, appreciation of habitat needs), but without human dimensions research specifically identifying weak knowledge areas and items particularly relating to attitude, it is difficult to design a conservation education program. Often what the manager believes important is significantly different than the public's beliefs.

If it is discovered urban residents are not knowledgeable about bears and/or correct behavior in bear country, educational programs should be conducted in these centres before people arrive or choose to arrive to bear country. Marketing agencies do this frequently. A recent example is the massive information and educational campaign TW Services, the main tour operator in Yellowstone National Park, Wyoming, USA, has undertaken in Europe to inform potential visitors to the park about the effects of the fires of 1988, urging individuals that the park is not totally burned over. Bear education programs should take the same active role. Within park settings, attractive informative displays have been shown to have an effective role in visitor education (Burghardt et al. 1972). Other means of diffusing information may be through bear viewing opportunities and interpretive talks by a bear expert (use of the "significant other"). Interpretive programs should emphasize more than the biological facts of bears. Such educational programs should incorporate other aspects of the bear such as its value as a symbol of wilderness, as an indicator

species within complex ecosystems, and its magnificence as the largest carnivore in North America. Mihalic (1974) suggests discussing in educational programs the relationships between female bears and their cubs, the intelligence of bears, and the historical man/bear relationships. In theoretical terms, resource managers should still attempt to change attitudes through the central route but perhaps expand this routes' boundaries from strictly biological facts. For example, suggestions of bears as a wilderness symbol and films depicting bear cubs playing may work. Although the knowledge and attitude relationship is a tenuous one, managers should be encouraged that Burghardt et al. (1972) found that "as people learn more about wildlife, they are more prone to want it protected" (Burghardt et al. 1972).

Several issues could be particularly addressed in an education program which seem important: 1) deliberate feeding of bears 2) bear-proof garbage management 3) tolerance of bears 4) sex-selective hunting and 5) international concern for bear populations (Smith Pers. Comm. 1989). Although bears are the animals most wanted to see by Yellowstone National Park visitors and many mention the days of bear feeding, most also realize the importance of bears feeding on natural foods. Information emphasizing the importance of nature, natural foods, and bears may not forage for themselves when people are not there to feed them resulting in bear starvation, may help eliminate bear feeding. A mix of factual knowledge and emotional appeal may help. Likewise, pictures of bear fur burning due to dump feeding may create public appeal to

create bear-proof garbage areas. Tolerance of bears may be best assessed using Decker and Purdy's (1988) concept of wildlife acceptance capacity.

The current point system to encourage sex-selective bear hunting in the Yukon should be continued. This is an economic incentive for outfitters to learn the different characteristics of male vs female bears.

In summary, knowledge and understanding of public beliefs about bears is necessary to form effective conservation educational programs. An understanding of the relationship between certain beliefs and attitudes can be used to focus programs specifically on important items. For example, if a group of individuals believe bears have cubs (two) every year, and/or that cubs have a high survival rate (100%) because bears have no enemies (excluding man), then the killing of bears may not be seen as a problem. On the other hand, a belief that every bear should be protected because it serves an important purpose, and killing one animal may cause the extinction of the species is not wanted either. Research indicates that the public view of animals may need to be broadened from individual animals to populations.

Frost (1985) found some residents wishing to protect habitat for the grizzly bear but not understanding how, or the amount of habitat required. Means need to be available for those who wish to participate in bear conservation.

It is recognized that in the public's eye all species are not regarded equally. The public tends to favour the glamour species

(Duda 1988). Fortunately bears do fall in this category, although from the preliminary perspectives of Yukoners toward bears, black bears may have fallen from this glamour status to that of nuisance in many areas. Managers need to be aware of the different attitudes toward the species and implement educational programs accordingly.

Public viewing of bears in a wilderness setting with interpretive programs may be the best strategy to creating positive attitudes toward the animal. Henderson (1987) suggests that "...wildlife watching can be beneficial to those who are directly involved in the industry and to those who provide support services for participants. Correspondingly, participants are rewarded with a life-long experience and wildlife conservation is enhanced". Positive bear experiences do seem to create positive attitudes toward bears.

6.0 DIRECTIONS FOR THE FUTURE

Many wildlife management agencies are seeing the importance of incorporating the human element into their day to day practices. The Wildlife Division of the Michigan Department of Natural Resources found human dimensions in wildlife resources research particularly useful in their formation of a black bear management plan (Langenau 1988). A questionnaire was designed to obtain information on the success rates of bear hunters, their attitudes toward baiting, commercialization, dog running, and season dates. Conflicts among user groups were revealed and the results indicated "the real problems in managing bears were people's perceptions"

(Langenau 1988). Quantitative survey research on public attitudes toward increasing bear populations in the Catskill region of New York proved invaluable in focusing educational efforts monitoring public sentiment, and implementing a black bear population increase.

For the Yukon, where no quantitative comprehensive study has been done, it is important to 1) obtain baseline public attitudinal and knowledge data and 2) monitor public attitudes and knowledge through changes in policies, plans and education efforts. Although wildlife management agencies have incorporated the public view through written comments to plans and policy changes, public hearings, and discussions among experienced staff, this qualitative data may not be representative of the wildlife constituency. In addition, it does not allow for specific identification of weaknesses in knowledge about wildlife, areas of compromise between groups, and accurate information on the amount and direction of differences between groups. Such information can offer wildlife managers the key to why education efforts are not working effectively, and what sectors of the public are particularly weak in certain areas. Traditional means of public input (public hearings, written comments) are often useful in defining the issue spectrum. Extreme viewpoints are usually presented by interest groups from both sides. The entire wildlife constituency (general public) usually is closer to the middle. Knowledge of the attitudes of this silent majority is necessary to 1) accurately represent the wildlife constituency and 2) ensure that

significant lobby groups do not dictate management decisions.

Wildlife management (defined below) has emphasized the importance of the people component for many years but only recently have agencies paid more attention to the people component of the wildlife-habitat-people equation.

"Wildlife management can be defined as "the science and art" of changing the characteristics and interactions of habitat, wild animal populations, and people to achieve specific human goals by means of managing wildlife resources . . . In one form or another, everything done in wildlife management is done for people" (Anderson et al. 1987).

The benefits of quantitative data to attitudinal survey research are the same for the biological and habitat components of the wildlife management equation. It can provide more accurate and representative data than qualitative data.

Many individuals have advocated that bear management is more than a biological understanding of the species. In regards to bear encounters, Stokes (1970) stated "humans have been responsible through their behavior for most of the damages and injuries sustained from bears . . . the problem is largely one of changing human habits and attitudes". Also in regards to bear encounters, Pelton et al. (1976) have stated that "ultimately the solution to bear human interactions lies with man and the alteration of his behavior and attitudes through education". Although the Yukon Department of Renewable Resources, Fish and Wildlife Branch, has a long history of public involvement in the decision-making process, only qualitative data exists, not representative of the entire wildlife constituency. Traditional means of public

involvement (i.e. public hearings, monitoring letters received, etc.) usually portray the extreme viewpoints. It is important to document the issue spectrum but decisions ultimately should not be made upon these lobby group viewpoints (Bath. In press.). It is the time for the Yukon Department of Renewable Resources, Fish and Wildlife Branch to incorporate quantitative data on the human element (human dimensions in wildlife resources research) into their management plans and into their bear management practices; thus the silent majority (and the entire wildlife constituency) are represented.

As little research has been gathered on Yukoners' attitudes toward bears, territorial-wide surveys are recommended. The research instrument would include various types of questions (i.e. opinion, attitude, awareness, knowledge, behavior, and activity items) and involve a large sample size to allow contact with as many residents as feasible, as this study would be the first of its kind. It is expensive to conduct a study which is well thought out, statistically reliable, valid, and most importantly representative of the entire Yukon general public. On the other hand, if a public outcry occurs about a topic which has not had any public involvement, and a legal battle occurs, costs in time, credibility of the agency, and actual dollars can far exceed the costs of human dimensions research. Working with the public through human dimensions research can lead to smoother implementation of wildlife programs which may be controversial, a better focused education program, and a publicly accepted

prioritization of department goals and programs. A study of Yukoners' attitudes toward bears could take many forms. It is recommended such a study be considered in several phases as outlined below:

- PHASE I - Whitehorse Residents Attitudes Toward Bears and Their Management
- PHASE II - Attitudes of Yukon Residents Outside of Whitehorse Toward Bears and Their Management
- PHASE III - Attitudes of Aboriginal Peoples Toward Bears and Their Management
- PHASE IV - Effectiveness of Educational Programs in Changing Attitudes Toward Bears
- PHASE V - Childrens' Attitudes Toward Bears and Knowledge of Bears
- PHASE VI - Attitudes of Various Interest Groups Toward Bears and Their Management

Each phase of the study may employ a different experimental design and methodology of data collection, but all could use an identical research instrument to allow for comparisons at later stages between groups. For example, personal interviews are the most appropriate technique in completing phase four. On the other hand with the cooperation of the interest group (i.e. obtaining membership lists, employee addresses), phase three may be able to be completed by the considerably cheaper mail-out method. The six phases listed above could be prioritized by the Fish and Wildlife Branch according to their specific needs. I have listed the phases according to my prioritization based on my understanding of the goals of Yukon bear management and in my opinion the immediate benefits of each phase. If funding exists, several phases could

be done concurrently. The phases are presently separately as a means to discuss each and allow for financial flexibility. I have offered in Appendix 2 a more detailed proposal of each phase and my recommendation for prioritization. Appendix 3 is an additional proposal to strengthen this report and provide the necessary preliminary information before proceeding with the phases outlined in Appendix 2.

Human dimensions in wildlife resources research is not a one-shot survey for a wildlife management agency. It is a continuing and integral part of a broader wildlife management. One can think of the field of wildlife management as continually expanding from its original big game and harvest focus, to a period of habitat manipulation, to a more human dimension (Duda 1988). This human dimension element is another step towards the better understanding of wildlife management. Using human dimensions research does not make wildlife management a popularity contest (Duda 1986). Decisions are based upon knowledge of the wildlife, the habitat, and the people who use the wildlife. Leopold (1943) stated, "wildlife management is comparatively easy; human management is difficult". As difficult as it may be, with a public which is becoming increasingly aware of the environment, and the use and abuse of its resources, managers are forced to adapt and consider more carefully its wildlife constituency to successfully implement new programs and effectively manage existing ones.

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APPENDIX 1: Bear survey administered to Whitehorse students

Adolescent Attitudes Towards Bears

DISTINCTLY CIRCLE THE MOST APPROPRIATE ANSWER TO EACH QUESTION BELOW.

1. Have you ever seen a Grizzly Bear?

Yes No

2. Which answer best describes your attitude towards Grizzly Bears:

STRONGLY NEITHER LIKE STRONGLY
LIKE LIKE NOR DISLIKE DISLIKE DISLIKE

3. Have you ever seen a Black Bear?

Yes No

4. Which answer best describes your attitude toward Black Bears:

STRONGLY NEITHER LIKE STRONGLY
LIKE LIKE NOR DISLIKE DISLIKE DISLIKE

5. In your opinion which animal is more harmful

Grizzly Black Bear Equal Not Harmful

6. Indicate your age: _____

Researcher: Alistair Bath
 Department of Geography
 University of Calgary
 2500 University Dr. N.W.
 Calgary, Alberta
 T2N 1N4

APPENDIX 2: Prioritization and proposal for future directions in Yukon bear management.

PURPOSE: To identify and document Yukon public attitudes toward bears and their management.

OBJECTIVES:

- 1) To obtain accurate and representative (quantitative) data of the entire wildlife constituency through the implementation of six phases of research studies to be discussed.
- 2) Each phase particularly addresses a segment of the Yukon population.

PHASE I: WHITEHORSE RESIDENTS ATTITUDES TOWARD BEARS AND THEIR MANAGEMENT

Purpose: To identify and document Whitehorse resident attitudes about bears and their management.

Objectives:

- 1) To identify and document Whitehorse resident attitudes about bears and their management
- 2) To identify and document public knowledge levels about bears
- 3) To identify and document particular weaknesses in knowledge that are related to attitude
- 4) To identify the best media to disperse bear information (i.e. talks, films, pamphlets, etc.)

Methodology: Several strategies could be employed here. A personal interview technique or telephone interview would elicit the best response but is considerably more expensive than the cheaper mail-out survey. Decisions upon methodology should be made when possible funding is allotted to quantitative survey research. The best procedure here would be telephone interviews conducted by an individual living in Whitehorse.

Costs: This could be relatively expensive involving a lot of time and people.

Benefits: Accurate representative information obtained, high response rate (>90%), good confidence in target selectivity and results.

Importance to Fish and Wildlife Branch:
This phase is prioritized as most important due to the fact that Whitehorse is the largest population centre and forms the largest part of

the wildlife constituency. Being an urban centre, relative to the rest of the Yukon, it may be found that attitudes and knowledge about bears may differ between Whitehorse residents and other residents of the Yukon. This difference would be important in developing territorial-wide education efforts and implementing programs in various regions.

PHASE II: ATTITUDES OF YUKON RESIDENTS OUTSIDE OF WHITEHORSE TOWARD BEARS AND THEIR MANAGEMENT

Purpose: To identify and document Yukon resident attitudes about bears and their management.

Objectives:

- 1) To identify and document residents outside Whitehorse attitudes about bears and their management of Whitehorse residents
- 2) To identify and document public knowledge levels about bears
- 3) To identify and document particular weaknesses in knowledge that are related to attitude
- 4) To identify the best media to disperse bear information (i.e. talks, films, pamphlets, etc.)
- 5) To compare differences in attitude toward bears and knowledge about bears between Whitehorse residents and the rest of the Yukon.

Methodology: Several strategies could be employed here. Telephone interviews may be a feasible option, although some individuals may be missed. Due to the dispersed nature of the population, the personal interview would not be a feasible option. Mail-out surveys may work although not a practical means to pick up aboriginal peoples attitudes which would be in the sample. The best procedure here may also be a telephone interview.

Costs: This could be relatively expensive involving a lot of time and people.

Benefits: Accurate representative information obtained, high response rate (>90%), good confidence in target selectivity and results.

Importance to Fish and Wildlife Branch:
This phase is prioritized second due to the importance of this component as a part of the baseline data on Yukon residents territorial-wide. Data obtain from phase I and phase II

would offer the resource manager an almost complete understanding of the entire wildlife constituency. Within these two samples, individuals from all facets of life would probably be included. It is however not reliable to pull out these views to represent specific groups. The data obtained would be representative of the rest of the Yukon. Breakdowns by city could not be done validly.

PHASE III: ATTITUDES OF ABORIGINAL PEOPLES TOWARD BEARS AND THEIR MANAGEMENT

Purpose: To identify and document aboriginal peoples attitudes about bears and their management.

Objectives:

- 1) To identify and document aboriginal peoples attitudes about bears and their management
- 2) To identify and document knowledge levels about bears
- 3) To identify and document particular weaknesses in knowledge that are related to attitude
- 4) To identify the best media to disperse bear information (i.e. talks, films, pamphlets, etc.)

Methodology: Personal interviews by an aboriginal is the best procedure here. It will be expensive and time-consuming to obtain this information territorial-wide. Unstructured interviews by a trained interviewer will work best. It is also recommended that such research be completed after land settlements have been completed.

Costs: This phase of the study will be the most expensive and the most difficult to complete.

Benefits: Although phases I and II will include some aboriginal peoples in the sample it will be a small number. Forming an important percentage of the Yukon population, it is recommended that a phase of the study be devoted strictly to the aboriginal peoples. Personal interviews are the only way to obtain some data on this segment of the Yukon population.

Importance to Fish and Wildlife Branch:

As more land is returned to the aboriginal peoples, more resources will be in their hands. This makes it essential to managers to understand the attitudes and knowledge of these individuals especially to implement programs regarding their

lands. It is also hypothesized that attitudes and knowledge levels may be considerably different between aboriginal peoples and other residents of the Yukon. Although prioritized third, this phase is very important.

PHASE IV: EFFECTIVENESS OF EDUCATIONAL PROGRAMS IN CHANGING ATTITUDES TOWARD BEARS

Purpose: To assess the effectiveness of an educational program upon changing attitudes toward bears and increasing knowledge levels about bears.

Objectives: To identify a specific population and monitor attitude change and knowledge before and after exposure to an educational program.

Methodology:

- 1) It is suggested to use the population of Faro to conduct this study. Education efforts have been tried in Faro but with little success. Information of Faro resident attitudes toward bears and knowledge about bears may help focus further educational efforts.
- 2) Upon randomly assigning Faro residents to two groups, a mail-out survey could assess their attitudes and knowledge about bears.
- 3) An educational package will then be sent to one group approximately a month later.
- 4) After another period of time, the identical survey will be sent to both groups and changes monitored.
- 5) Differences between the two groups can be used to assess the effectiveness of the program.
- 6) Items identified through analysis which correlate with attitude could be emphasized in future programs.

Costs: Printing of educational material, postage (if mail-out technique used) and analysis could make this study not too expensive.

Benefits: In obtaining initial attitudes of Faro residents, solutions may be found to the current garbage bear viewing and related problems in the area. At the same time, the effectiveness of an educational program is being evaluated, thus allowing modification to be made and a more effective program in the future.

Importance to Fish and Wildlife Branch:
Education is an important goal for the Yukon Department of Renewable Resources. Increased

knowledge and understanding of bears does lead to more positive attitudes toward the animal. Before spending a lot of money upon educational programs, it is important to understand those aspects of knowledge about bears which are particularly related to attitude. In addition, testing the effectiveness of an existing program may indicate necessary modification and improvements. Although suggested as phase IV due to the importance of collecting some baseline information, it is strongly recommended that if further monies are to be spent on educational programs, this phase be conducted prior to this expenditure.

PHASE V: CHILDREN'S ATTITUDES TOWARD BEARS AND KNOWLEDGE OF BEARS

Purpose: To identify and document children's attitudes toward bears and their knowledge levels of bears.

Objectives:

- 1) To identify and document any differences between attitudes and knowledge levels between aboriginal children and others.
- 2) To identify and document knowledge levels about bears
- 3) To identify and document particular weaknesses in knowledge that are related to attitude
- 4) To identify by what means do children learn and would like to learn more about bears (i.e talks, films, TV etc.)
- 5) To identify and document differences between sexes and age groups along knowledge and attitudinal items.

Methodology: Cooperation with each school in the Yukon could be explored to allow a teacher to hand-out the survey to each student and collect them when they are done. Surveys could then be mailed to the place of analysis.

Costs: This could be an inexpensive study as the data collection phase costs are minimal. Analysis and report writing would be the only significant costs.

Benefits: A high response rate is guaranteed. The surveys also are 100% correctly given to the target group. A large sample size could be relatively easy to obtain which would be representative of children's attitudes Yukon-wide.

Importance to Fish and Wildlife Branch:

If money is to be spent on educational materials and programs for children it would prove useful to conduct this phase. As attitudes toward many issues are formed at childhood, the Fish and Wildlife Branch may wish to implement this phase simultaneously with earlier phases. The inexpensive nature of this phase should prove particularly attractive.

PHASE VI: ATTITUDES OF VARIOUS INTEREST GROUPS TOWARD BEARS AND THEIR MANAGEMENT

Purpose: To identify and document attitudes of significant interest groups in the Yukon toward bears and their management.

Objectives:

- 1) To identify and document the spectrums of the issue and areas of possible compromise.
- 2) To identify and document differences in attitude and knowledge about bears between groups
- 3) To identify and document particular weaknesses in knowledge that are related to attitude
- 4) To identify the best media to disperse bear information (i.e. talks, films, pamphlets, etc.)
- 5) To compare differences in attitude toward bears and knowledge about bears between Whitehorse residents and the rest of the Yukon.

Methodology: With cooperation from the selected interest groups, membership lists and addresses could be obtained. A random sample of the group or the entire list (if sample size is small) could be mailed a survey. The mail-out survey technique has been shown to be very successful with special interest groups. In a study of Defenders of Wildlife attitudes toward wolves, Bath (1987a) received over an 80% response rate.

Costs: Data collection costs would be inexpensive and each interest group may even cover mail-out costs to their membership.

Benefits: This phase can be inexpensive. Although data collected is not representative of the Yukon general public, such information can allow the resource manager to define the issue spectrum and areas of compromise.

Importance to Fish and Wildlife Branch:

Interest groups usually have a loud voice and can effectively lobby support. Although the opinions of the loud few should not alter decisions supported by the

silent majority, management agencies can reduce problems of program and policy implementation with prior knowledge of interest group attitudes, knowledge levels about the issue, and their willingness to compromise.

APPENDIX 3: Brief research proposal to strengthen this report and provide necessary information to move forward into future phases (I through VI)

PURPOSE: To interview bear experts to obtain insights on future directions of bear management in the Yukon.

- OBJECTIVES:**
- 1) To define research priorities and in terms of the phases suggested in this report, identify the prioritization of such phases by bear experts and human dimensions in wildlife resources researchers.
 - 2) To identify a list of knowledge items about bears that seem to be important information for the public to understand.
 - 3) To identify possible attitudinal items to include in a research instrument.
 - 4) To identify bear management strategies and form these into attitudinal items for the research instrument.
 - 5) To identify other items which should be included in the research instrument.

- METHODS:**
- 1) A written letter will be sent to each bear expert identified below informing him/her of the project and requesting responses to the above items.
 - 2) A telephone interview with each expert will occur two weeks later, thus allowing some time to think about the issues.
 - 3) Additional names of experts will be solicited at the time of the telephone interview who will then be contacted in the same manner.

Initial List: Barney Smith (403) 667-5177
 Steve Herrero (403) 220-7436
 Kathy Jope (315) 597-5372
 Chris Servheen (406) 329-3223
 Ian Stirling (403) 435-7349
 Fred Bunnell (604) 228-5724
 Dennis Knight and Bear Management
 Team members, Yellowstone National
 Park (307) 344-7381
 Stephen Kellert (203)432-5114
 Daniel Decker, Cornell University
 Stephen McCool
 Other experts as determined through
 initial conversations

COSTS: Telephone costs (estimated)..... \$300.00
 Interviewer time..... \$200.00
 Secretarial help \$300.00
 Report Writing..... \$500.00
 TOTAL.....\$1300.00

TIME SCHEDULE: This project could be completed within two months.

FINISHED PRODUCT TO INCLUDE:

- 1) A set of questions identified by the bear experts as important and the frequency that each question was mentioned.
- 2) Questions will be sorted into attitudinal items about bears, knowledge items about bears, attitudinal items about bear management strategies, and suggested socio-demographic questions.
- 3) The final report will include:
 - a) a rough outline of possible items to include in a research instrument
 - b) an identification of research priorities for the Yukon bear management program
 - c) a prioritization by bear experts and by human dimensions in wildlife resources researchers of the phases suggested in the report: "Public attitudes toward bears - implications to the management of black and grizzly bears in the Yukon".