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**Residents' Attributions, Attitudes, and Support for
Human-Wildlife Conflict Management**

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Abstract

This study aimed to gain knowledge about human-wildlife conflicts, with the ultimate goal of assisting in the effective management of these interactions. Its immediate purpose was to investigate, with respect to bears, cougars, and wolves, the values, attitudes, knowledge, and past experiences of residents who live near the Long Beach Unit of Pacific Rim National Park Reserve (PRNPR). It examined how residents' experiences and attitudes affect the attributions they make about the causes of their interactions. It also examined how environmental attitudes and knowledge about current management strategies predict residents' support for various solutions. 121 residents, from Tofino and Ucluelet, returned their surveys. Environmental attitudes, primarily ecocentrism, were mildly related to desired solutions. Resident behaviour was not strongly related to environmental attitudes and knowledge about currently used strategies. Most residents perceived their interaction with bears, cougars, and wolves as exciting and positive. Overall, residents attributed the main cause of wildlife problems to waste management practices and favour solutions that affect humans. Implementing these solutions may help decrease human-wildlife conflicts.

Residents' Attributions, Attitudes, and Support for Human-Wildlife Conflict Management

This study aims to gain knowledge about human-wildlife conflicts, with the ultimate goal of assisting in the effective management of these interactions. It investigates how residents' experiences with bears, cougars, and wolves affect the attributions they make about the causes of their interactions with these animals. This study also examines how environmental attitudes and knowledge about current management strategies predict residents' support for various human-wildlife conflict management strategies. The phrase 'human-wildlife conflict management' describes techniques and strategies used to manage negative interactions between humans and wildlife (Messmer, 2000). These negative interactions include sightings and close encounters with wildlife. Knowledge about these interactions is lacking, and an investigation into the social and ecological factors that influence human-wildlife conflicts is needed.

Human-wildlife Conflicts

Conflicts between humans and wildlife can be "real or perceived, economic or aesthetic, social or political" (Messmer, 2000, p. 100). These conflicts may arise when humans and wildlife, such as bears, cougars, and wolves, share the same physical space. The impact of human behaviour has become increasingly significant because the frequency of overlap between human and wildlife activities has increased. Wild animals are in danger of losing their 'wildness' when they interact with humans, particularly in town, but experience no negative consequences. These interactions can alter the animal's instinctual behaviours and cause them to habituate to humans. When humans feed wildlife or fail to frighten them off, they put themselves and the animals at risk. Some

park visitors' actions around wildlife suggest they do not understand the consequences of their actions. The future safety of humans and wildlife, such as bears, cougars, and wolves, depends on successful management strategies.

Human-wildlife Conflict Management

To decrease the frequency and severity of interactions between humans and wildlife requires strategies that prevent interactions and address conflicts appropriately. To create effective strategies, we need to understand how and why human-wildlife conflicts occur, the actual and perceived level of the problem, and which strategies should be implemented to address the interactions (Messmer, 2000). The solutions need to be situation-specific and driven by social and biological scientific data.

An increase in public awareness and appreciation of human-wildlife conflicts is necessary. This includes knowledge about factors such as their origin, dynamic nature, and ecology (Messmer, 2000). New strategies, that help protect humans and the environment, require public outreach and support for management tactics (Treves & Karanth, 2003). The involvement of local residents will result in "public ownership in the outcome, enhanced program credibility, and realization of long term wildlife conservation goals" (Hewitt and Messmer, 1997; Messmer et al., 1997, in Messmer, 2000, p. 100). Due to poor effectiveness of current strategies, we must search for new, publicly supported strategies.

Worldwide carnivore management research suggests that solutions to human-wildlife conflicts should use a mix of strategies that modify human and wildlife behaviours, and prevent the intersection of their activities (Treves & Karanth, 2003). These strategies include non-lethal modification of wildlife behaviour, changes in human

behaviour, prevention of interactions via spatial separation, and the use of lethal controls only when absolutely necessary (Treves & Karanth, 2003). To determine specific strategies, research is needed in the areas of human behaviour, animal behaviour, and the environment.

Previous Research

Little research has been conducted that integrates the social and ecological scientific investigation of human-wildlife interactions. Only a few social science studies have investigated issues that involve humans and wildlife. These studies focused on attitudes towards animal conservation programs, or human fear and attitudes towards large carnivores. Of particular interest is a study by Bjerke and Kaltenborn (1999) that addresses the attitudes of Norwegian farmers, wildlife managers, and research biologists, towards large carnivores. They posit that environmental attitudes are related to the amount of personal importance individuals place on large carnivores and their attitudes towards them (Bjerke & Kaltenborn, 1999).

Their central hypothesis was that attitudes towards carnivores can be accounted for by value structure and motivations for behaviour. A survey was used to measure attitudes towards large carnivores and the environmental attitudes of farmers, wildlife managers, and research biologists. To determine the attitudes towards carnivores they used six attitudinal scales defined by Kellert. These attitudes were ecologicistic, moralistic, naturalistic, utilitarian, negativistic, and dominionistic. To determine environmental attitudes they used Thompson and Barton's scales for ecocentrism, anthropocentrism, and environmental apathy, and the New Environmental Paradigm (NEP) scale developed by Dunlap et al. (1992).

They found that sheep managers scored lower on the ecocentric scale, while higher on the anthropocentric scale, as compared to wildlife managers and research biologists. These differences demonstrate that environmental attitudes are related to general values. Positive correlations were found between negative attitudes towards carnivores and anthropocentrism, and between positive attitudes and ecocentrism. Their results indicate that environmental attitudes mediate between general values and more specific attitudes towards carnivores. Thus, environmental attitudes help us understand attitudes towards wildlife and how to manage human-wildlife conflicts.

Environmental Attitudes

Environmental attitudes are motives for valuing nature, and can be measured using a scale developed by Thompson and Barton (1994). They define three dimensions of environmental attitudes: ecocentrism, anthropocentrism, and environmental apathy. Ecocentric individuals value nature for its intrinsic properties and consider this the primary reason to protect it (Thompson & Barton, 1994). Anthropocentric individuals value nature for its contribution to human welfare (Thompson & Barton, 1994). Though these two attitudes have different motives for protecting the environment, they both are based on concern for the environment. The third attitude measure is general apathy towards environmental issues. Individuals lack interest about environmental issues and believe that the problems are exaggerated (Thompson & Barton, 1994).

Environmental attitudes are important predictors of behaviours that support environmental conservation (Thompson & Barton, 1994). The value-based environmental attitudes affect general attitudes and attitudes towards situations. Human-centered values underlie anthropocentrism, whereas environment-centered values

underlie ecocentrism. Ecocentric individuals will attempt to protect the environment even if it sacrifices their material quality of life, but anthropocentrics will not (Thompson & Barton, 1994). The effects of environmental values and problem awareness are found to influence human behaviour (Nordlund & Garvill, 2002).

Proenvironmental behaviours are behaviours that favour the environment, chosen when individuals assess conflict between actions that will favour their own, immediate interest, or favour the long-term interest of the collective or environment (Nordlund & Garvill, 2002). To understand how to increase proenvironmental behaviour, we need to investigate the factors that contribute to residents' behaviours towards wildlife.

Proenvironmental behaviours are found to correlate positively with ecocentrism and negatively with anthropocentrism (Thompson & Barton, 1994). In conjunction with environmental attitudes, investigating attributions about the cause of interactions may help us understand attitudes towards management strategies.

Attributions

Attributions are made about a situation when people attempt to explain their own behaviour or that of others. Attributions affect how people perceive cause and effect and how they place responsibility for outcomes. People tend to take more credit for positive outcomes than for negative outcomes. This is known as the self-serving bias (Baron & Byrne, 1994). They also attribute positive experiences to internal causes, but negative ones to external causes. This is called the fundamental attribution error (Baron & Byrne, 1994). A motivational explanation for this form of attribution, suggests we attribute negative experiences to external factors to decrease any negative arousal. The stronger the arousal evoked, the stronger the tendency to demonstrate the self-serving bias (Brown

& Rogers, in Baron & Byrne, 1994). Descriptions of interactions with wildlife and attributions about the cause of the interaction may help distinguish between actual and perceived causes of interactions with wildlife. We may also learn which management solutions are supported, because when people are convinced that a specific factor contributes to a problem they will have a negative attitude towards it (Fransson & Gärling, 1999).

Predicting Support

Support for human-wildlife conflict management strategies will differ among individuals. Different basic values lead to different attitudes towards the presence of wildlife and how to deal with conflicts. These differences mean that decisions about wildlife-conflict management tend to be controversial (Messmer, 2000). Another major problem is the lack of data. Information on attitudes towards management strategies is needed to create effective solutions and make decisions.

The Present Study

The present study seeks to understand the factors that lead to human behaviours in the presence of wildlife and to ensure that humans act appropriately in these situations. Outcomes of interactions, whether positive or negative, depend on the behaviours of each party. To successfully predict human behaviours we must understand how people understand the situation as a whole (Ross & Nisbett, in Hine & Gifford, 1996). To understand the situation we use cognitive appraisal, which is mediated by our values, attitudes, knowledge and past experience. These factors, and resident support for management strategies, will be the focus of this study.

Values and attitudes. Studies on environmental attitudes and conservation behaviours find that ecocentrics and anthropocentrics have different motivations for their actions and behave differently (Thompson & Barton, 1994). I hypothesize that there will be positive correlations between anthropocentrism and human-centered management strategies, and between ecocentrism and environment-centered management strategies.

In this study, human-centered strategies produce positive results for humans or do not affect their material quality of life, regardless of the effects on the animals or the environment. An example of a human-centered strategy is to kill animals involved in negative interactions with humans. Environment-centered management strategies have net positive results for the environment, regardless of the effects on humans. An example of an environment-centered management strategy is to fine individuals caught leaving their garbage out. Ecocentrics tend to behave more proenvironmentally (Thompson & Barton, 1994). I hypothesize that individuals with high ecocentrism scores will behave as recommended in the presence of bear, cougars, and wolves.¹ Behaviours can also be mediated by knowledge of wildlife behaviours and how to act in their presence.

Knowledge. Knowledge is another mediator of cognitive appraisal that can affect behaviour. A lack of knowledge may result in weak correlations between environmental concern and environmentally responsible behaviour (Fransson & Gärling, 1999). I hypothesize that individuals with high knowledge scores will behave as recommended when in the presence of bears, cougars, and wolves. We may use the level of resident knowledge about currently used management to help us understand the residents' behaviours in the presence of wildlife. Another important factor that affects behaviour is past experiences with wildlife.

¹ Based on guidelines from the Pacific Rim National Park Reserve of Canada.

Experience. Experiences with bears, cougars, and/or wolves can affect the attributions that residents make about the cause of the problem and affect their future behaviours. Experiences are related to the attributions that individuals make about situations and their outlook on future outcomes. Negative experiences often result in attributions to external factors. I hypothesize that residents who perceive their experience as negative will attribute the cause of the sighting to external factors. External factors, in this study, are items that residents do not have control over, such as park management, waste management, and natural wildlife patterns.

Support for Solutions. Past experiences, knowledge, attitudes, and values are all related to cognitive appraisal of the situation. These factors should be related to support for management strategies because they affect behavioural intentions. For individuals to consider a solution effective they must believe it is a cause of the problem. I hypothesize there will be relations amongst the causes and solutions chosen by the residents. Attributions that residents make about the cause of animal sightings or aggressiveness will be reflected in their desirability of related solutions. An example of this is that residents who think feeding the animals is a problem will rate the solution of introducing fines for feeding as desirable. The factors that predict the desirability of solutions will help us choose management strategies that are favored by the public and are most effective.

Purpose. Human-wildlife conflict studies suggest that information about the circumstances and the humans involved in conflicts may help to predict, prevent, and mitigate future conflicts (Treves & Karanth, 2003). The immediate purpose is to investigate, with respect to bears, cougars, and wolves, the values, attitudes, knowledge,

and past experiences of residents. The residents to be studied are community members who reside near the Long Beach Unit of Pacific Rim National Park Reserve (PRNPR). Their support for various management strategies will be assessed. The ultimate goal is to learn about attitudes and experiences of community members, and the most-supported strategies for human-wildlife conflict management.

Method

Participants

The participants were one hundred and twenty-one residents who live in Tofino and Ucluelet, BC. Fifty-four were from Tofino, sixty-five from Ucluelet, and two did not indicate their area of residence (Table 1). They ranged from 19 to 76 years of age, $M = 46$ years, $s.d. = 14.66$ (Table 2). Seventy-four, 61.2%, of the participants were female and forty-six, 38.0%, were male (Table 1). Most residents live in the area year-round; the length of residence varied from a few months to 72 years, $M = 19$ years, $s.d. = 18.94$ (Table 2). The households were randomly selected throughout each community. The mean level of education was between some post-secondary and a college or technical school diploma (Table 2). One member of the household, 19 years of age or older, was asked to complete a survey. The response rate was 20.2 %.

Questionnaire

Residents received a six-page packet that included a survey on views about human-wildlife conflict management. To maximize the return rate, a self-addressed stamped envelope was included, as well as the opportunity to win one of three \$50 lottery prizes, that were later awarded, after a random draw. The first page was a consent form that described the nature of the research project, how they had been selected, and that

responses were confidential. The second page informed them about the lottery. The subsequent eight pages contained descriptive and analytic survey questions to investigate residents' values, attitudes, knowledge about management strategies and past experiences with bears, cougars, and wolves. See the Appendix A for the full survey.

The questions used Likert-type scales, forced-alternative, and open-ended answers. Most questions asked for individual responses about bears, cougars, and wolves. The first group of questions asked about residents' activities within the park, their location and frequency. An example of an activity question was, "How often do you use each of the following areas of the park?" The residents were asked to rate each item on a scale where 0 = never, 1 = occasionally, 2 = often. Some options were "beaches," "trails," and "campgrounds."

They were asked about their experiences with bears, cougars, and wolves, both in the park and their town. Questions were asked about the number and location of any sightings or negative close encounters, the behaviour of the resident and the animals, and the emotional response evoked. An example of an experience question was, "Have you ever seen a bear, cougar, and/or wolf within the Long Beach Unit?" They were asked to say "yes" or "no" for each animal.

Participants were asked whether they had reported the encounter, to whom they reported it, and whether they would report any future sightings. An example of this question was, "If you were to encounter a bear, cougar, and/or wolf, would you report it to park staff?" The possible answers they could choose from were "no," "unsure," "only if it were in town," "only if it were in the park," or "yes in either case."

To determine their level of problem awareness, the residents were asked to rate the extent of the problem in the park and their town. An example of this question was, “Do you think that there is a problem concerning bears, cougars, and/or wolves?” The possible answers were “no,” “unsure,” “only in my town,” “only in other communities,” “only in the park,” or “yes in many locations.”

The next two questions asked participants to attribute the frequency of animal sightings to a cause. They rated the item’s effect on sightings in the Long Beach Unit and the town. Two other questions asked them to rate the same items on their level of contribution to the aggressiveness of the encounters. An example of this was, “What do you think causes more wildlife sightings in the Long Beach Unit?” They were asked to rate each item on a scale where 0 = not influential, 1 = contributes, 2 = highly influential. A partial list of the items they had to rate was the “presence of residents,” “landscape development,” “forestry,” and “waste management.”

A question about current management strategies was used to determine the level of knowledge about management in the area. The question asked about bears, cougars, and wolves individually, for strategies in the Long Beach Unit and the town. An example of this was, “Which wildlife-management strategy/strategies is/are currently being used in the Long Beach Unit for bears, cougars, and wolves.” They were asked to mark all items that they thought applied. A partial list of the items to choose from were, “shooting animals,” “relocating animals,” and “restricting wildlife from human areas.”

To determine community support for various management strategies, residents were asked to rate the desirability of some offered solutions. This question asked, “How desirable are the following solutions to negative human-wildlife interactions?” They

were asked to rate each item on a scale where 0 = undesirable, 1 = desirable, 2 = very desirable. A partial list of the items was, “to shoot all animals,” “use non-lethal deterrents,” “fine any individual caught feeding the animals,” and “influence the mass media.”

Their knowledge-seeking behaviour was assessed. We asked about any reading done about bears, cougars, and wolves, both outside and inside the park. Residents were also asked where they received their information from. An example of this question was, “While in the Long Beach Unit, have you ever read notices about the behavior of bears, cougars, or wolves, and how to act in their presence?” They were to answer “yes” or “no” for each animal.

Residents were asked whether they felt they followed the recommended information during their animal sighting or encounter. If they answered “no,” they were asked why they chose to act differently. An example of this question was, “If ‘NO’, what motivated you to act differently than the information recommended?” They were to mark all items that applied. These included items stating that, “Interacting with wildlife is part of my connection to nature,” “I believe that my interaction would not hurt the animal,” and “I don’t like rules and being told how to act.”

A final knowledge question asked about the diets of bears, cougars, and wolves. This question asked to classify the diets of bears, cougars, and wolves as “carnivores”, “herbivores” or “omnivores.”

The Thompson and Barton scale for measuring environmental attitudes was included. It was 33 questions long and used a likert-type scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree. Twelve items on the ecocentric scale

“expressed appreciating nature for its own sake, positive affect and stress reduction associated with being out in nature, and seeing a connectedness between humans and animals” (Thompson & Barton, 1994, p. 151). An example is, “I can enjoy spending time in natural settings just for the sake of being out in nature.” Twelve items on the anthropocentric scale “reflected a concern with environmental issues primarily because of their effects on human quality of life and survival” (Thompson & Barton, 1994, p. 151). An example is, “One of the worst things about overpopulation is that many natural areas are getting destroyed for development.” Nine items addressed general apathy about the environment, “reflecting a lack of interest in environmental issues, and a general belief that problems in this area have been exaggerated” (Thompson & Barton, 1994, p. 151). An example is, “Environmental threats such as deforestation and ozone depletion have been exaggerated.”

The final questions concerned demographics, in order to aggregate the data. These included questions about gender, age, origin of birth, length of residence in the community, household income, and education.

Procedure

Participants were recruited from residential areas of Tofino and Ucluelet. Six hundred surveys were distributed, three hundred in each town. An envelope, containing the packet, was distributed into post-office boxes using Canada Post’s Unaddressed Admail service. Participants were informed that when they returned their survey they would imply consent to use their data. Participants were given the chance to enter a random lottery, with three prizes of \$50. All participants were asked to mail back the survey within seven days.

Results

Preliminary Considerations

Scales and new categories. Scores were created for each environmental attitude scale, giving each individual a total for ecocentrism, anthropocentrism, and environmental apathy. A single knowledge score was also created, separately for bears, cougars, and wolves, as well as a total wildlife knowledge score. Residents were given a knowledge point when they were correct about whether a management strategy is currently used. For bears, in the Long Beach Unit and town, the correct answers were: shoot, relocate, scare bears, and educate residents and visitors about bears. For the Long Beach Unit it was also correct to answer: restrict humans from bear areas and restrict bears from human areas. For cougars and wolves, in the Long Beach Unit and town, the correct answers were: shoot, and educate residents and visitors. For the Long Beach Unit it was also correct to answer that humans are restricted from cougar and wolf areas. The correct answers for the diet questions were that bears are omnivores, and cougars and wolves are carnivores.

Because of a high frequency of ‘other’ human behaviours reported for the encounters, some new response categories were added. For bears and cougars, the responses “continued on” and “watched out the window” were added, and for wolves “continued on” was added. Each animal had the response “ran away” added. Where individuals stated to whom they reported the encounter, new categories were created. These were “warden/parks,” “friends/spouse,” “RCMP,” and “conservation officer.”

Human behaviours during animal encounters were analyzed and grouped to distinguish recommended and not recommended behaviours for the encounter.

Recommended behaviours included standing one's ground, backing away, continuing on, and attempting to scare the animal off. All other behaviours were deemed not recommended. To distinguish the individuals' experiences during the encounter, the responses were grouped into categories of "scary and negative," that included "worrisome," or "exciting and positive." The responses about problem perception were grouped into two categories: "no problem" and "problem."

A factor analysis was computed to conclude whether or not human-wildlife conflict solutions grouped naturally into human-centered and environment centered strategies. This was computed with a principal component analyses and varimax rotation. The desirability ratings for management solutions had four interpretable factors, with eigenvalues greater than 1, and loadings over 0.30. The first factor involves solutions that affect humans and includes educating visitors and residents, influencing the mass media, and creating by-laws, such as fines for feeding animals and leaving garbage out and developing domestic animal safety strategies. The second factor involves shooting the wildlife and includes all of them, wildlife that are part of negative interactions, and wildlife that enter communities. The third factor involves separating humans and wildlife in space, by either restricting humans from areas often used by wildlife and restricting wildlife from human use areas. The fourth factor deals with the wildlife once there is a problem and an attempt for prevention, such as shooting animals involved in negative encounters, relocating animals, and using non-lethal deterrents. These factors will be used in the analyses rather than the original groups of human-centered and environment-centered management strategies.

Reliabilities. Scale scores were created from some items. Internal consistency reliability was computed for the environmental attitudes and knowledge scores. The environmental attitude scales showed good homogeneity, with Cronbach's α -coefficients of $\underline{\alpha} = 0.81$ for the ecocentrism scale, $\underline{\alpha} = 0.70$ for anthropocentrism, and $\underline{\alpha} = 0.82$ for environmental apathy (Table 3).

The knowledge scale showed good homogeneity, with a Cronbach α -coefficient of $\underline{\alpha} = 0.87$ (Table 4).

Subscales were created for similar causes of human-wildlife interactions, grouping the same cause of sightings and close encounters in the Long Beach Unit and town. These subscales showed good homogeneity for attributing the cause to residents, $\underline{\alpha} = 0.76$, to feeding, $\underline{\alpha} = 0.89$, to land development, $\underline{\alpha} = 0.85$, to forestry, $\underline{\alpha} = 0.91$, to park management, $\underline{\alpha} = 0.75$, to waste management, $\underline{\alpha} = 0.81$, to poor education, $\underline{\alpha} = 0.74$, and to natural wildlife patterns, $\underline{\alpha} = 0.85$ (Table 5).

Based on the factor analysis, a scale was created for suggested solutions to human-wildlife conflicts that grouped them into strategies that affect humans, shoot wildlife, separate humans and wildlife, and deal with problems or prevent encounters. The solutions that affect humans showed good homogeneity, with a Cronbach α -coefficient of $\underline{\alpha} = 0.84$, but the homogeneity for the other strategies were low (Table 6). For strategies that shoot wildlife $\underline{\alpha} = 0.51$, strategies that separate humans and wildlife $\underline{\alpha} = 0.55$, strategies that deal with and prevent problems $\underline{\alpha} = 0.48$. Then, Pearson correlations and t -tests were computed to test some hypotheses. A factor analysis was run on the desired human-wildlife management solutions to identify commonalities between the strategies.

Descriptives. The residents surveyed live up to half an hour, driving distance, from the Long Beach Unit (Table 1). Residents say they enter the park from once a month to at least five days a week (Table 7). The majority use the beaches frequently, the trails occasionally, and rarely visit the campgrounds (Table 7). Hiking is the most popular activity in the park, and bird watching and nature studies are the next most common (Table 7). Other common activities are beachcombing, surfing, and walking.

Residents' scores for environmental attitudes were computed to give a total for each attitude and an average for the items in each scale. The total scores for ecocentrism and anthropocentrism were out of sixty, $\underline{M} = 47.37$, $s.d. = 9.92$ and $M = 31.23$, $s.d. = 2.60$, respectively, whereas environmental apathy was out of forty-five, $\underline{M} = 17.58$, $s.d. = 6.79$. All of the average item scores were out of five. The average item scores were as follows: for ecocentrism, $\underline{M} = 3.95$, $s.d. = .83$, anthropocentrism, $M = 2.60$, $s.d. = .60$, and environmental apathy, $M = 1.95$, $s.d. = .75$ (Table 3). These values are similar to the values found by Thompson and Barton (1994), which were as follows: for ecocentrism, $\underline{M} = 4.2$, $\underline{s.d.} = 0.5$, anthropocentrism, $\underline{M} = 2.8$, $\underline{s.d.} = 0.5$, and environmental apathy, $\underline{M} = 1.7$, $\underline{s.d.} = 0.5$.

Wildlife sightings in the Clayoquot Sound-Port Alberni-Port Renfrew area are quite common (Table 8). Almost every resident claimed to have seen a bear, a third has seen a cougar, and almost half have seen a wolf. Within the Long Beach Unit, almost all residents have seen a bear and a third have seen a wolf, but only a tenth have seen a cougar. Within Tofino, 87% of residents have seen a bear, 26% have seen a cougar and 8% have seen a wolf (Table 9). Within Ucluelet, 80% of residents have seen a bear, 26% have seen a cougar and 19% have seen a wolf. Other common areas for sighting wildlife

are along Highway 4, around Kennedy Lake and River, and at the junction between Tofino and Ucluelet. The most frequently indicated area for bear, cougar, and wolf sightings was the road (Table 10). Sightings from home or in residential areas were also indicated for about a fifth of the bear sightings.

The most common reactions reported during bear and wolf encounters were to slow the vehicle, followed by standing one's ground (Table 11). Only a few residents said they made noise and attempted to scare the bear off. During cougar encounters, the most common reactions were to slow their vehicle, followed by backing away. For all animals, many residents watched the animals from the safety of their home, and made no attempt to scare them off.

During the encounters, over half of the time, the residents reported that bears were aware of human presence but were not disturbed by the human presence (Table 12). Only a tenth of the residents stated that bears and cougars ran away. Half the time the cougars were said to be unaware of human presence, and a third of the time they were aware but not disturbed. About half the time, wolves were said to be aware but not disturbed by humans. They were also described as curious about humans, 16%, or they ran away, 18%.

The encounters with the wildlife were most often described as exciting and positive or neutral (Table 13). Only a few residents felt worried about a bear's presence or state of being. The majority of encounters and sightings were not reported to anyone, but when they were, it was most likely to park wardens, and less often to friends and spouses.

Half the residents say they would not report a bear if they saw one, a fifth would not report a cougar, and a quarter would not report a wolf (Table 14). Most residents stated they would report a cougar or wolf sighting, 44% and 32% respectively, no matter where it was seen. Others would only report wildlife sighted in town, around 20% for all animals.

Half the residents do not believe there is a problem with bears (Table 15). Another third believes there is a problem in many locations. Most residents, 60%, do not believe there is a problem with cougars or wolves, although some, 16% and 20% respectively, are unsure.

The factors that residents believe most affect the number of wildlife sightings and negative close encounters in the Long Beach Unit and town the most are waste management, feeding wildlife, natural wildlife patterns and land development, in that order (Table 16).

Among currently used wildlife-management strategies, most residents believe that residents and visitors are being educated about bears, cougars, and wolves (Table 17 and Table 18). The next-most common strategies are believed to be the relocation of bears or restricting humans from areas frequently used by wildlife. Residents also strongly believe that bears in the town are shot (Table 18). Most had little accuracy in their knowledge about currently used management strategies. The mean knowledge score was below 50% for all animals (Table 19). Most residents do know that bears are omnivores, and cougars and wolves are carnivores (Table 20). Interestingly, about a fifth of residents believe that bears are herbivores and wolves are omnivores.

Values and Attitudes

The hypothesis of a positive correlation between anthropocentrism and human-centered management strategies was not supported. Pearson correlations were computed between anthropocentrism and each of the suggested management strategies, because human-centered strategies were no longer a factor, and no significant results were found.

The hypothesis of a positive correlation between ecocentrism and environment-centered management strategies was supported. Pearson correlations were computed between ecocentrism and all suggested management strategies (Table 21). There was a moderate, positive correlation in several instances, which had been described as environment-centered management strategies, but renamed as strategies that affects humans. Higher ecocentrism scores correlated with support for the creation of domestic animal safety strategies² correlated with higher ecocentrism scores, $r = 0.37$, $p \leq 0.01$, community and visitor education programs, $r = 0.38$, $p \leq 0.01$ and $r = 0.45$, $p \leq 0.01$, respectively, and affecting the mass media, $r = 0.34$, $p \leq 0.01$.

The hypothesis that residents with high ecocentrism scores will behave as recommended in the presence of wildlife was not supported. An independent sample t-test was run on ecocentrism scores grouped by recommended and non-recommended behaviours in the presence of bears, cougars, and wolves individually (Table 22). No significant differences between the mean ecocentrism scores of residents who acted as recommended and those who did not were found for any of the animals. The ecocentrism scores for residents who acted as recommended for bears, $M = 47.03$, $s.d. = 9.6$, were not

² Domestic animal safety strategies include by-laws that require residents to keep their pets indoors at night and on-leash when walked.

significantly different that the scores for those who did not act as recommended, $M = 47.67$, $s.d. = 10.72$, $t(80) = -.33$, $p = .74$. Nor did the scores differ for recommended behaviour around cougars, $M = 44.13$, $s.d. = 11.43$, and not recommended behaviour, $M = 46.33$, $s.d. = 12.73$, $t(41) = -.61$, $p = 0.54$. Finally, there were no difference for ecocentrism scores during recommended behaviour around wolves, $M = 43.22$, $s.d. = 13.43$, and not recommended behaviour, $M = 48.95$, $s.d. = 7.47$, $t(50) = -1.97$, $p = 0.05$.

Knowledge

The hypothesis that individuals with high knowledge scores will behave as recommended when in the presence of bears, cougars, and wolves was not supported. An independent sample t -test was run on knowledge scores grouped by recommended and non-recommended behaviours (Table 23). No significant differences between mean knowledge levels for each animal and behaviour in their presence were found. The knowledge scores for residents who acted as recommended around bears, $M = 5.88$, $s.d. = 3.09$, did not differ significantly from scores of residents who did not, $M = 5.88$, $s.d. = 2.86$, $t(93) = -.01$, $p = 1.0$. Knowledge scores for recommended behaviour in the presence of cougars, $M = 3.71$, $s.d. = 2.31$, were not different from knowledge for not recommended behaviours, $M = 3.71$, $s.d. = 2.35$, $t(42) = -.01$, $p = 0.99$. Knowledge scores for residents who acted as recommended in the presence of wolves, $M = 3.44$, $s.d. = 2.14$, were not significantly different than scores for those who did not act as recommended, $M = 3.30$, $s.d. = 1.92$, $t(44) = .24$, $p = .81$.

Descriptives were tabulated to yield a total knowledge score for each animal and total wildlife knowledge score (Table 19). To calculate these scores, the total number of correct answers to questions about the current management strategies used for each

animal, in the park and Long Beach Unit, and the dietary classifications were added. Bear knowledge, $\underline{M} = 5.91$, $\underline{s.d.} = 2.98$, was out of 13. Cougar knowledge, $\underline{M} = 3.31$, $\underline{s.d.} = 2.27$, and wolf knowledge, $\underline{M} = 2.89$, $\underline{s.d.} = 2.16$, were out of 8.

Experience

The hypothesis that residents who perceive their experience as negative will attribute the cause of the sighting to external factors could not be tested. The frequency of perceiving the interaction with animals as negative was too low (Table 13).

Causes and Solutions

The hypothesis of relations amongst the causes and solutions chosen by the residents was supported. Pearson correlations were computed between the attributed causes of human-wildlife interactions and the desirability of solutions to human-wildlife conflicts (Table 24). They revealed positive correlations between feeding and the following solutions: using non-lethal deterrents, $\underline{r} = 0.33$, $\underline{p} \leq 0.01$, fines for individuals caught leaving garbage, $\underline{r} = 0.32$, $\underline{p} \leq 0.01$, developing domestic animal safety strategies, $\underline{r} = 0.31$, $\underline{p} \leq 0.01$, visitor education, $\underline{r} = 0.33$, $\underline{p} \leq 0.01$, and influencing the mass media, $\underline{r} = 0.31$, $\underline{p} \leq 0.01$. Waste management was positively correlated with solutions of non-lethal deterrents, $\underline{r} = 0.35$, $\underline{p} \leq 0.01$, developing domestic animal safety strategies, $\underline{r} = 0.31$, $\underline{p} \leq 0.01$, developing a community education program, $\underline{r} = 0.37$, $\underline{p} \leq 0.01$, and influencing the mass media, $\underline{r} = 0.35$, $\underline{p} \leq 0.01$. Positive correlations were also found between attributing the cause of the problem to residents and the solution of restricting humans from areas frequently used by wildlife, $\underline{r} = 0.30$, $\underline{p} \leq 0.01$. Land development was positively correlated with influencing the mass media, $\underline{r} = 0.37$, $\underline{p} \leq 0.01$, as was forestry, $\underline{r} = 0.33$, $\underline{p} \leq 0.01$.

Demographics

Correlations were computed between demographic variables and other variables in the study, but revealed no significant relations with environmental attitudes, problem perception, willingness to report encounters, or human behaviour. More education correlated with greater cougar knowledge, $r = 0.32$, $p \leq .01$, wolf knowledge, $r = 0.32$, $p \leq .01$, and total wildlife knowledge, $r = 0.35$, $p \leq .01$ (Table 25). More education also correlated with support for fining individuals caught leaving garbage out, $r = 0.35$, $p \leq .01$ (Table 26).

Unanticipated Results

Pearson correlations were computed between environmental attitudes and desired solutions to human-wildlife conflicts (Table 24). A negative correlation was found between environmental apathy and support for developing community education programs, $r = -0.47$, $p \leq 0.01$.

An independent sample t -test was run on knowledge scores grouped by whether residents have or have not read about the animals while in the park. Significant differences between mean knowledge levels for each animal and reading behaviours in the Long Beach Unit were found. Bear knowledge scores were significantly different when residents had not read about bears when in the Long Beach Unit, $M = 4.77$, $s.d. = 3.39$, and when they had, $M = 6.24$, $s.d. = 2.84$, $t(116) = -2.11$, $p = .04$. For cougar knowledge there were differences between not reading about cougars, $M = 2.24$, $s.d. = 2.05$, and when they did read, $M = 3.81$, $s.d. = 2.21$, $t(116) = -3.58$, $p < .01$. There were significant differences in knowledge scores when residents had not read about wolves, $M = 1.84$, $s.d. = 1.90$, and when they did read, $M = 3.46$, $s.d. = 2.09$, $t(116) = -4.20$, $p <$

.01. Therefore, knowledge about the management of bears, cougars, and wolves, was higher when residents had read about bears, cougars, and wolves, respectively.

Discussion

This study revealed support for solutions that may help decrease human-wildlife conflicts. There are many factors that affect resident support for human-wildlife conflict management strategies, which makes it a complex task. In sum, environmental attitudes are only mildly related to desired solutions. Residents' behaviours appear to be unrelated to their environmental attitudes and knowledge about currently used management strategies. Most residents perceived their interaction with bears, cougars, and wolves as exciting and positive. Residents' knowledge about local wildlife management strategies is weak.

Overall, the residents attribute the main cause of wildlife problems to poor waste management. Other main attributions include feeding wildlife, natural wildlife patterns and land development. Most of these factors are amenable to change, and changes may help decrease human-wildlife conflicts.

The most favoured solutions to human-wildlife conflicts are strategies that affect humans. These strategies require humans to modify their behaviour, rather than animal behaviours and lives. Specifically, introducing fines, creating education programs, using non-lethal deterrents, influencing the mass media and creating domestic-animal safety strategies were most favoured, in that order. An important stage in the development of effective conflict management strategies is to involve residents in decisions about the prevention of intersections between humans and wildlife. We have learned some

interesting things about residents' values, attitudes, knowledge and past experiences with bears, cougars, and wolves; the details will follow.

I expected a positive correlation between anthropocentrism and human-centered management strategies, but this hypothesis was not supported. Because human-centered strategies were no longer a factor, anthropocentrism was correlated with individual strategies. No statistically significant results were found. A possible reason for the lack of correlation is that there was only moderate reliability for the anthropocentric scale. Moderate reliability indicates that the average inter-item correlation is not high and the scale may have a multidimensional structure. This suggests that our subscale of anthropocentrism may measure additional attitudes that are not related to the management strategies. Attitudes may be associated with multiple or contradictory values (Easly & Chaiken, in Schultz, 2001). To study other values, some questions about residents' spiritual connection to the environment, and views on animal rights should be included because they may also affect attitudes towards wildlife and management of human-wildlife conflicts.

A positive correlation between ecocentrism and environment-centered management strategies was expected and supported, though under the new group of strategies that affect humans. A relation was found between ecocentrism and creating domestic-animal safety strategies, community and visitor education programs, and influencing the mass media. A domestic-animal safety strategy, such as keeping pets indoors at night or on a leash when being walked, requires individuals act in the interest of the environment while they sacrifice their convenience or routine. This relation between ecocentrism and proenvironmental behaviour was found in the study by

Thompson and Barton (1994). Education and influencing the mass media are methods that can be used to promote proenvironmental behaviours, and require collaboration amongst residents, visitors, researchers, and management. The other solutions may not have correlated with ecocentrism because residents may have prior experiences with certain management strategies or attitudes towards them that mask the relation between solutions and environmental attitudes.

Ecocentrism was expected to correlate positively with recommended behaviour in the presence of wildlife, but this was not supported. It has been widely reported that weak links exist between environmental attitudes and behaviour (e.g. Fransson & Gärling, 1999). Social norms may explain why environmental concern is not significantly correlated to behaviour, because they prevent individuals from acting in accordance with their attitudes (Newhouse, in Fransson & Gärling, 1999; Nordlund & Garvill, 2002). Residents may have followed the behaviours of others around them or behaved differently because of the presence of others. Unfortunately, this study did not investigate the number of people present during the wildlife encounter, and so we cannot test for social effects.

The expectation that knowledge scores would modify resident behaviour in the presence of wildlife was not supported. No significant differences were found between the mean knowledge scores of residents behaving as recommended versus as not recommended. This lack of support likely resulted because the knowledge questions were related to management strategies rather than recommended behaviours during wildlife encounters. The variables were unrelated and we should have investigated more specific knowledge about recommended behaviours.

The hypothesis that residents who perceive a negative experience with an animal will attribute the cause of the sighting to external factors could not be tested. Most residents perceived their interaction as exciting and positive rather than scary and negative. This is interesting because it demonstrates human fascination with wild animals. Kruuk (2002) suggests that we have come to love and admire wild animals because we evolved in their presence and had to compete with them and defend ourselves. This explains why humans are so attracted to and curious about large wildlife, such as bears, cougars, and wolves. But it is surprising that so few reported being frightened. We are unsure whether these descriptions are true, or if residents were acting in a socially desirable, or brave, way. It is possible that residents may have described their encounters as positive because they thought that if they indicated they were scared it would be more likely the animals will be shot. Therefore the opinions could be biased. The descriptions of encounters with wildlife are also limited because of the wording used in the questionnaire. The options were grouped into “scary and negative,” “neutral”, and “exciting and positive.” Residents may have had a scary and positive or scary and exciting experience. In future studies, these descriptions should not be grouped to ensure a more accurate response.

Relations were expected, and found, between the attributions that residents make about the cause of animal sightings or aggressiveness and their desirability of related solutions. This makes sense because when people are convinced that a factor contributes to the problem they will consider finding a related solution. Influencing the mass media was the solution that correlated with the most causes. This is likely because residents believe it can influence many people and many problems. Residents who suggested that

their presence is a cause of the problem chose restricting humans from wildlife areas as a solution. This indicates they understand residents local encroach on native wildlife areas and must attempt to separate themselves from the animals spatially to avoid human-wildlife conflicts. Fining residents who leave garbage out is related to attributing the cause to feeding. This suggests that residents understand that garbage leads to food-conditioned animals. Interestingly, support for community education programs was related to waste management, whereas support for visitor education programs was related to feeding. This suggests that residents believe the community contributes to the food conditioning of animals because of waste management problems, but visitors more directly food-condition animals by feeding them. The relations found between the causes of, and solutions to, human-wildlife conflicts are rational and suggest that residents will support solutions when they believe they will be effective. Thus, education about the causes of human-wildlife conflicts and the consequences of human actions should foster support for the appropriate management solutions.

There were some unanticipated results in this study. These include a positive correlation between more education and more knowledge about local wildlife management techniques and between more education and support for fines for leaving garbage out. These findings can be explained by the social-class hypothesis, according to which education and income are positively associated with environmental concern (Fransson & Gärling, 1999). Environmental concern has consequences for the environment and this encompasses both local wildlife knowledge and fining individuals who leave garbage out. A negative correlation was found between environmental apathy and developing community education programs. This demonstrates that an attitude that

lacks environmental concern will not favour management strategies that affect humans. Residents with less environmental concern may believe that the problem is exaggerated, and believe that their time and effort would not make a difference. Knowledge about currently used management strategies was higher when residents had read about bears, cougars, and wolves when in the Long Beach Unit. Although we found that knowledge is not related to behaviour, it is related to reading about the animals. Therefore the signs in the park increase resident knowledge about the animals and management strategies used, but they do not appear to influence resident behaviour.

Limitations

This study revealed some interesting findings that will contribute to our investigation of the nature of human-wildlife conflicts, but these findings have some limitations. This study was exploratory and aimed to investigate many factors. The length of the questionnaire may have led to some careless responses. Some questions were asked repeatedly with small changes, such as asking the same question for the Long Beach Unit and town, and sightings or close encounters. Participants may have answered the related questions without making a conscious distinction between them. This would mean that the data are not as accurate as they could be. In future studies the questionnaire should have a narrower, more straightforward focus.

A factor we had no control over was the accuracy of the residents' memories. The responses about previous encounters may not be accurate because of inaccurate memories of the experience or the social-desirability of behaving appropriately. A question about the recency of the sighting should have been included.

The wording used in questions about human behaviour may have lead to inaccurate frequencies for correct and incorrect behaviours. Residents chose from given answers to describe their behaviour in the presence of wildlife. Most residents saw animals from their vehicle, but there was only one given answer that included a vehicle; this answer was “slowed vehicle” and was considered an incorrect behaviour. Although some residents did indicate that they continued on, in the “other” category, others may have checked the box that was the most appropriate. Therefore, the frequencies for incorrect behaviours may be higher than they should be.

Future Direction

Human behaviour in the presence of wildlife may be more related to emotions than to knowledge or attitudes. In the future, emotional and spiritual connections to nature and wildlife should be taken into account because they may override knowledge about how to act when in the presence of wildlife. How residents perceive the effect of their actions on the integrity of the environment and the lives of wildlife is also important. For example, we could ask, "If I feed a bear its chances of being shot increases, stays the same, or decreases." If we measure resident awareness of environmental consequences we may predict willingness to take pro-environmental action (Stern et al., in Fransson & Gärling, 1999).

Conclusion

Our findings have implications for the creation of effective management strategies. We found that many residents see and interact with bears, cougars, and wolves in the Long Beach Unit, Tofino, and Ucluelet. Environmental attitudes had little connection with desired solutions for human-wildlife conflicts or behaviours during

interactions. To ensure the safety of humans and wildlife, we need to instil some fear towards these animals in local residents. Education about the effects of their actions may be more important than education about management strategies. To create effective solutions, residents must be convinced that the solution will influence a major cause of the problem. "To increase environmentally responsible behaviour . . . the most effective strategies . . . [combine] knowledge about environmental problems, discussion about alternative solutions to such problems, development of problem analysis and problem-solving ability, value discussion, and skill training" (Fransson & Gärling, 1999, p. 379). We need to continue with multidisciplinary research that engages policy makers and fosters local community collaborations to monitor conflicts and test new solutions to human-wildlife conflicts.

References

- Bjerke, R., & Kaltenborn, B. P. (1999). The relationship of ecocentric and anthropocentric motives to attitudes toward large carnivores. *Journal of Environmental Psychology, 19*, 415-421.
- Dunlap, R. E., Van Liere, K. D., Mertig, A. D., Catton, W. R. Jr. & Howell, R. E. (1992). *Measuring Endorsement of an Ecological Worldview: A revised NEP scale*. Paper presented at the 1992 Meeting of the Rural Sociological Society, State College, Pennsylvania.
- Fransson, N., & Gärling, T. (1999). Environmental concern: Conceptual definitions, measurement methods, and research findings. *Journal of Environmental Psychology, 19*(1), 369-382.
- Hartig, T., Kaiser, F. G., Bowler, P. A. (2001). Psychological restoration in nature as a positive motivation for ecological behavior. *Environment and Behavior, 33*, 590-607.
- Hine, D. W., & Gifford, R. (1996). Attributions about self and others in commons dilemmas. *European Journal of Social Psychology, 26*, 429-445.
- Kortenkamp, K. V. & Moore, C. F. (2001). Ecocentrism and anthropocentrism: Moral reasoning about ecological commons dilemmas. *Journal of Environmental Psychology, 21*, 261-272.
- Kruuk, H. (2002). *Hunter and hunted: Relationships between carnivores and people*. Cambridge: Cambridge University Press.

- Messmer, T. A. (2000). The emergence of human-wildlife conflict management: Turning challenges into opportunities. *International Biodeterioration & Biodegradation*, 45, 97-102.
- Nordlund, A. M., & Garvill, J. (2002). Value structures behind proenvironmental behavior. *Environment and behavior*, 34, 6, 740-756.
- Rauwald, K. S., & Moore, C. E. (2002). Environmental attitudes as predictors of policy support across three countries. *Environment and behavior*, 34, 709-739.
- Røskoft, E., Bjerke, T., Kaltenborn, B., Linnell, J. D.C., & Andersen, R. (2003). Patterns of self-reported fear towards large carnivores among the Norwegian public. *Evolution and Human Behavior*, 24, 184-198.
- Shultz, P. W. (2001). The structure of environmental concern: Concern for self, other people, and the biosphere. *Journal of Environmental Psychology*, 21, 327-339.
- Schultz, P. W. & Zelezny, L. (1999). Values as predictors of environmental attitudes: Evidence for consistency across 14 countries. *Journal of Environmental Psychology*, 19, 255-265.
- Thompson, S. C. G. & Barton, M. A. (1994). Ecocentric and anthropocentric attitudes toward the environment. *Journal of Environmental Psychology*, 14, 149-157.
- Treves, A., & Karanth, K. U. (2003). Human-carnivore conflict and perspectives on carnivore management worldwide. *Conservation Biology*, 17, 1491-1499.

Table 1.
Frequencies of Demographic Data in Percentages (n = 121)

		N	%
Area of residence	Tofino	54	44.6
	Ucluelet	65	53.7
Gender	Male	74	61.2
	Female	46	38.0

Table 2.
Descriptives of Demographic Data Including Means, and Standard Deviations

	N	M	SD
Driving distance to Long Beach Unit (minutes)	121	11.83	5.735
Year of birth	119	1959	14.66
Length of residence in the community (years)	119	18.58	18.94
Length of residence during the year	120	3.94 ³	.27
Gross household income, before taxes	85	\$51 517.81	\$34 008.10
Highest level of education achieved	114	4.53 ⁴	1.45

³Note. 1=0-3 months, 2 = 3-6 months, 3 = 6-12 months, 4 = Year round

⁴Note. 1 = Grade 8, 2 = Some high school , 3= High school diploma, 4 = Some post-secondary school, 5 = College or Technical school diploma, 6 = University degree, 7 = Post-Graduate degree, 8 = Other

Table 3.
Means, Standard Deviations, and Internal Consistency Reliability for Environmental Attitudes Subscales

Subscale	N	M ⁵	SD	M ⁶	SD	N	Cronbach's α	\bar{n}
		total		average				items
		score		item				
Ecocentrism	121	47.37	9.92	3.95	.83	111	.81	12
Anthropocentrism	119	31.23	7.24	2.60	.60	110	.70	12
Environmental Apathy	119	17.58	6.79	1.95	.75	111	.82	9

⁵ Note. Maximum score was 60 for ecocentrism and anthropocentrism, and 45 for environmental apathy.

⁶ Note. 1=strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree

Table 4.

Internal Consistency Reliability for Knowledge Scores

N	Cronbach's α	<u>n</u> items
98	.87	29

Table 5.
Internal Consistency Reliability for Grouping Causes of Wildlife Sightings and Encounters in the Long Beach Unit and Town

Cause	N	Cronbach's α	<u>n</u> items
Residents	113	.76	4
Feeding	112	.89	4
Land Development	113	.85	4
Forestry	112	.91	4
Park Management	113	.75	3
Waste Management	112	.81	4
Poor Education	112	.74	3
Natural Wildlife Patterns	111	.85	4

Note. The following items were removed to increase the alpha level: park management as a cause of wildlife sightings in town, and poor education as a cause of negative close encounters in the Long Beach Unit.

Table 6.

Internal Consistency Reliability for Solutions to Human-Wildlife Conflicts Grouped
Based on the Factor Analysis

Solutions	N	Cronbach's α	<u>n</u> items
Affect Humans	117	.84	8
Shoot Wildlife	116	.84	6
Separate Humans and Wildlife	112	.55	2
Deal with Problems or Prevention	117	.48	3

Note. The solutions included in the scale of strategies that affect humans were: fine individuals caught leaving garbage out and feeding animals, develop a domestic animal safety strategy, develop community and visitor education programs, and influence the mass media. The solutions that included in the scale of strategies that shoot wildlife were: shooting all animals, animals that enter communities, and animals that are involved in negative interactions. The solutions included in the scale of strategies that separate humans and wildlife were: restrict humans from areas frequently used by wildlife and restrict wildlife from human areas. The solutions included in strategies that deal with problems and prevent problems were: relocate wildlife, use non-lethal deterrents, and shoot wildlife involved in negative encounters.

Table 7.

Descriptives of Residents' Activities in the Long Beach Unit

How often (use area/activity) in Long Beach Unit?	N	M ⁷	SD
Enter	120	2.33 ⁸	1.06
Beaches	121	1.5	.58
Trails	121	1.12	.69
Campgrounds	121	.14	.39
Other	121	.08	.33
Hike	121	1.22	.72
Bike	121	.21	.46
Bird-watch	121	.50	.70
Nature-study	121	.57	.68
Surf	11	1.55	.52
Other	121	.40	.68

⁷ Note. 0 = never, 1 = occasionally, 2 = often

⁸ Note. Exception to ⁶Note: 1 = 5+ days/week, 2 = 2-4 days/week, 3 = biweekly, 4 = once per month or less

Table 8.

Percentage of Residents That Have Seen Animals and the Location of Sightings (n = 121)

Area	Animal	N	%
Clayoquot Sound-Port Alberni-Port Renfrew	Bear	4	96.7
	Cougar	41	33.9
	Wolf	55	45.5
Long Beach Unit	Bear	110	90.9
	Cougar	14	11.5
	Wolf	41	33.9
Town	Bear	101	83.5
	Cougar	32	26.4
	Wolf	17	14.0

Table 9.
 Descriptives of Animal Sightings Including Number of Sightings and Distance From
 Animal

Number or Distance	Location	Animal	N	M	SD	
How many	Long Beach Unit	Bears	115	17.66	39.36	
		Cougars	113	.68	4.75	
		Wolves	114	.85	2.14	
How many	Town	Tofino	Bears	53	5.02	9.49
		Ucluelet		61	7.26	11.17
		Tofino	Cougars	52	.33	.62
		Ucluelet		60	.50	.95
		Tofino	Wolves	52	.06	.24
		Ucluelet		61	.33	.83
How far, in meters		Bear	115	22.87	35.62	
		Cougar	42	60.14	96.29	
		Wolf	44	45.18	58.26	

Table 10.

Frequency of Location for Most Recent Animal Sightings

Animal seen (most recent)	N	Location	%
Most recent sighting (any animal)	117	LBU	37.6
		town	39.3
		other	23.1
Bear	118	beach	1.7
		trail	7.6
		road	50.0
		at home	16.9
		residential	16.9
		other	6.8
Cougar	44	beach	2.3
		trail	9.1
		lake	2.3
		road	52.3
		at home	11.4
		residential	13.6
Wolf	49	other	9.1
		beach	12.2
		trail	8.2
		lake	2.0
		road	53.1
		at home	6.1
		residential	4.1
		other	14.3

Table 11.

Frequency of Human Behaviours During the Sighting

Animal Encountered	N	Human Reaction	%
Bear	118	slowed vehicle	50.8
		stood my ground	18.6
		backed away	9.3
		ran away	.8
		continued on	5.1
		watched out from house	6.8
		other	8.5
Cougar	45	slowed vehicle	40.0
		stood my ground	13.3
		backed away	22.2
		ran away	2.2
		continued on	6.7
		watched out from house	11.1
		other	4.4
Wolf	52	slowed vehicle	50.0
		stood my ground	23.1
		backed away	1.9
		continued on	9.6
		other	15.4

Table 12.

Frequency of Reported Animal Behaviours During the Sighting

Animal Encountered	N	Animal Reaction	%
Bear	117	Unaware of human	25.6
		presence	57.3
		Aware, but undisturbed	1.7
		Curious about human	12.0
		Ran away	3.4
		Other	
Cougar	43	Unaware of human	46.5
		presence	30.2
		Aware, but undisturbed	4.7
		Curious about human	16.3
		Ran away	2.3
		Other	
Wolf	51	Unaware of human	23.5
		presence	41.2
		Aware, but undisturbed	15.7
		Curious about human	17.6
		Ran away	2.0
		Aggressive	

Table 13.
Frequency of Descriptions of the Animal Sighting

Animal Seen	N	Description	%
Bear	118	Scary and negative	1.7
		Neutral	52.5
		Exciting and Positive	42.4
		Other	3.4
Cougar	44	Scary and negative	9.1
		Neutral	31.8
		Exciting and Positive	54.5
		Other	4.5
Wolf	49	Scary and negative	4.1
		Neutral	42.9
		Exciting and Positive	53.1

Table 14.

Frequency of Reporting Behaviours of Animal Sightings

Time of Encounter	Animal	N	Reporting Behaviour	%
Previous	Bear	117	No	81.2
			Yes	18.8
	Cougar	45	No	71.1
			Yes	28.9
	Wolf	51	No	80.4
			Yes	19.6
Future	Bear	119	No	43.7
			Unsure	10.9
			Only in town	18.5
			Only in park	13.4
			Yes in either case	13.4
	Cougar	110	No	17.3
			Unsure	9.1
			Only in town	20.9
			Only in park	9.1
	Wolf	109	Yes in either case	43.6
			No	24.8
			Unsure	11.9
			Only in town	22.0
			Only in park	9.2
			Yes in either case	32.1

Table 15.

Frequency of Perceived Problems with Wildlife

Animal	N	Perceived Problem	%
Bear	119	No	45.4
		Unsure	6.7
		Only in my town	14.3
		Only in other communities	1.7
		Only in the park	0
		Yes, in many location	31.9
Cougar	111	No	61.3
		Unsure	16.2
		Only in my town	7.2
		Only in other communities	.9
		Only in the park	.9
		Yes, in many location	13.5
Wolf	112	No	59.8
		Unsure	19.6
		Only in my town	6.3
		Only in other communities	.9
		Only in the park	3.6
		Yes, in many location	9.8

Table 16.
Descriptives of Grouped Attributions of Causes of Human-Wildlife Interactions

Cause	N	M ⁹	SD
Residents	121	.68	.57
Feeding	120	1.13	.70
Land Development	120	.86	.69
Forestry	121	.55	.63
Park Management	119	.24	.40
Waste Management	121	1.3	.63
Poor Education	120	.61	.59
Natural Wildlife Patterns	121	.97	.65

⁹Note. 0 = not influential, 1 = contributes, 2 = highly influential

Table 17.

Frequency of Statements that Specific Management Strategies Are Currently Used in the Long Beach Unit

Strategy	Animal	%
I don't know	Bears	20.7
	Cougars	37.2
	Wolves	38.0
Shooting animals	Bears	26.4
	Cougars	14.0
	Wolves	8.3
Relocating animals	Bears	36.4
	Cougars	6.6
	Wolves	5.0
Scaring animals away	Bears	22.3
	Cougars	11.6
	Wolves	12.4
Restrict humans from areas frequently used by wildlife	Bears	36.4
	Cougars	26.4
	Wolves	28.1
Restrict wildlife from areas frequently used by humans	Bears	8.3
	Cougars	4.1
	Wolves	5.0
Educating residents	Bears	68.6
	Cougars	47.9
	Wolves	47.1
Educating visitors	Bears	71.9
	Cougars	53.7
	Wolves	52.1

Table 18.

Frequency of Statements that Specific Management Strategies Are Currently Used in Town (n = 121)

Strategy	Animal	%
I don't know	Bears	15.7
	Cougars	33.1
	Wolves	38.0
Shooting animals	Bears	43.8
	Cougars	17.4
	Wolves	7.4
Relocating animals	Bears	43.8
	Cougars	11.6
	Wolves	6.6
Scaring animals away	Bears	28.9
	Cougars	14.0
	Wolves	11.6
Restrict humans from areas frequently used by wildlife	Bears	10.7
	Cougars	9.9
	Wolves	6.6
Restrict wildlife from areas frequently used by humans	Bears	7.4
	Cougars	3.3
	Wolves	3.3
Educating residents	Bears	76.9
	Cougars	53.7
	Wolves	45.5
Educating visitors	Bears	61.2
	Cougars	43.0
	Wolves	36.4

Table 19
Descriptives of Knowledge Scores For Each Animal Individually and Collectively

Animal	N	M ¹⁰	SD
Bears	121	5.91	3.98
Cougars	121	3.31	2.27
Wolfs	121	2.89	2.16
Wildlife	121	12.12	6.40

¹⁰ Note. Maximum score for bears = 13, cougars = 8, wolves = 8, and wildlife = 29.

Table 20.

Frequency of Classification for Wildlife Diets as Carnivores, Herbivores, and Omnivores

Animal	N	Diet	%
Bear	100	Carnivore	6.0
		Herbivore	14.0
		Omnivore	80.0
Cougar	99	Carnivore	91.9
		Herbivore	0
		Omnivore	8.1
Wolf	99	Carnivore	78.8
		Herbivore	0
		Omnivore	21.2

Table 21.
Pearson Correlations between Environmental Attitude Subscales and Desired Solutions to
Negative Human-Wildlife Interactions (n = 121)

Desired Solution	Environmental Attitude Subscale		
	Ecocentrism	Environmental Apathy	Anthropocentrism
Shoot all animals	-.09	-.03	.05
Shoot animals involved in negative interactions	.09	.11	.14
Shoot animals that enter communities	-.06	-.02	.01
Relocate animals	.14	.20*	.07
Use non-lethal deterrents	.24**	.01	-.23*
Restrict humans from areas frequently used by wildlife	.27**	-.17	-.25**
Restrict wildlife from areas frequently used by humans	.11	.04	-.04
Fine individuals caught feeding animals	.22*	.11	-.07
Fine individuals caught leaving garbage out	.27**	-.09	-.14
Develop domestic animal safety strategy	.37**	.07	-.24**
Develop community education program	.38**	-.04	-.47**
Develop visitor education program	.45**	.02	-.28**
Influence the mass media	.34**	.03	-.24**
Other	.01	-.05	.17

*p < 0.05 **p < 0.01

Table 22.

Independent-Samples t-test for Ecocentrism Grouped by Recommended and Non-recommended Behaviour in the Presence of Each Animal

Animal	Behaviour	N	M ¹¹	sd	t	df	Sig. (2-tailed)	se
Bears	Recommended	75	47.03	9.60	-.33	80.0	.74	1.97
	Not recommended	43	47.67	10.72				
Cougars	Recommended	24	44.13	11.43	-.61	40.61	.54	.3.60
	Not recommended	21	46.33	12.73				
Wolves	Recommended	32	43.22	13.43	-1.97	49.50	.05	2.90
	Not recommended	20	48.95	7.47				

¹¹ Note. Maximum score for ecocentrism was 60.

Table 23.

Independent-Samples *t*-test for Knowledge Scores For Each Animal Grouped by Recommended and Non-recommended Behaviour in the Presence of the Animal

Animal	Behaviour	N	M ¹²	sd	t	df	Sig	se
							(2-tailed)	
Bears	Recommended	75	5.88	3.09	-.01	93.40	1.0	.56
	Not-recommended	43	5.88	2.86				
Cougars	Recommended	24	3.71	2.31	-.01	42.03	.99	.70
	Not-recommended	21	3.71	2.35				
Wolves	Recommended	32	3.44	2.14	.24	43.74	.81	.57
	Not-recommended	20	3.30	1.92				

¹² Note. Maximum score for bears = 13, cougars = 8, wolves = 8, and wildlife = 29.

Table 24.

Pearson Correlations between Grouped Attributed Causes of Wildlife Interactions and Desired Solutions to Negative Human-Wildlife Interactions (111 < n < 118)

Desired Solution	Causes of Wildlife Interactions							
	Residents		Land		Park		Poor	
	Development		Management		Education		Wildlife	
	Feeding		Forestry		Waste Management		Wildlife Patterns	
Shoot all animal	-.15	-.07	-.13	-.01	-.01	-.26**	-.08	-.16
Shoot animals involved in negative interactions	.14	.13	.08	.02	.15	.18	.04	.14
Shoot animals that enter communities	-.01	-.05	-.03	.11	.08	-.11	-.03	-.06
Relocate animals	.05	.15	.03	.01	.02	.12	-.02	.09
Use non-lethal deterrents	.27**	.33**	.22*	.23*	.11	.35**	.24**	.28**
Restrict humans from areas frequently used by wildlife	.30**	.16	.24**	.19*	-.02	.14	.25**	.01
Restrict wildlife from areas frequently used by humans	.25**	.00	.08	.15	-.03	.08	.17	.03
Fine individuals caught feeding animals	.11	.28**	.03	.06	-.08	.22*	.12	.06
Fine individuals caught leaving garbage out	.25**	.32**	.15	.12	.05	.28**	.28**	.20*
Develop domestic animal safety strategy	.25**	.31**	.25**	.23*	.06	.31**	.26**	.12
Develop community education program	.24**	.26**	.25**	.25**	.05	.37**	.28**	.16
Develop visitor education program	.25**	.33**	.26**	.22*	.04	.28**	.26**	.25**
Influence the mass media	.27**	.31**	.37**	.33**	.16	.35**	.24**	.21*
Other	.04	.05	-.01	-.12	-.06	-.00	.09	.04

*p < 0.05 **p < 0.01

Table 25.

Pearson Correlations between Level of Education and Knowledge About Currently Used Management Strategies for Bears, Cougars, Wolves, and Wildlife in General

Animal Knowledge Score	Education Level
Bears	.27**
Cougars	.32**
Wolves	.32**
Wildlife	.35**

Note * $p < 0.05$ ** $p < 0.01$

Table 26.

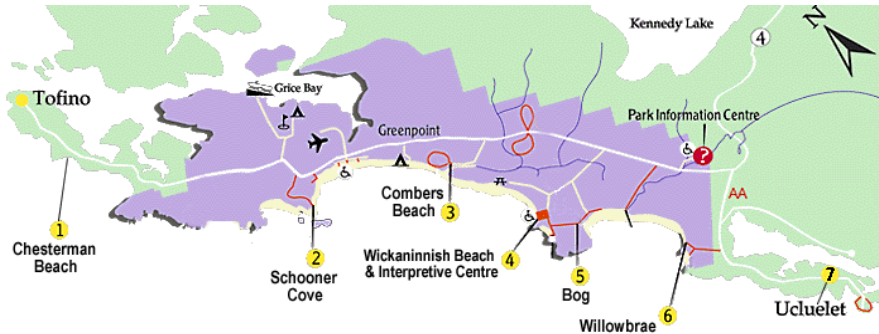
Pearson Correlations between Desired Solutions to Human-Wildlife Conflict Management Strategies and Education

Desired Solution	Education
Shoot all animal	-.25**
Shoot animals involved in negative interactions	-.09
Shoot animals that enter communities	-.25**
Relocate animals	-.11
Use non-lethal deterrents	.14
Restrict humans from areas frequently used by wildlife	.14
Restrict wildlife from areas frequently used by humans	.01
Fine individuals caught feeding animals	.21*
Fine individuals caught leaving garbage out	.35**
Develop domestic animal safety strategy	.27**
Develop community education program	.12
Develop visitor education program	.24
Influence the mass media	.24
Other	-.00

* $p < 0.05$ ** $p < 0.01$

Appendix

Residents' Views on Bear, Cougar, and Wolf Management in the Long Beach Unit of Pacific Rim National Park Reserve



This study is being conducted by an Honours student from the University of Victoria. My interest is the views of Tofino and Ucluelet residents regarding wild animal management in the Long Beach Unit. The results may help to improve human-wildlife interactions and wildlife management in your area.

Please have a member of the household, who is 19 years of age or older, take 20 minutes to fill out this anonymous survey. Do not include your name, address, or any means of identification, unless you would like a copy of the research upon completion, or plan on entering the lottery.

All levels of knowledge and experience are helpful and appreciated. Let us know your opinions!

Thank you for your time.

Please ensure you answer questions on BOTH sides of the page.

Please put an 'X' on the appropriate line, or rate the item according to the given scale.

1. Area of Residence: Tofino_____ Ucluelet_____
2. Driving distance, **in minutes**, from your residence to the Long Beach Unit park boundary: _____minutes
3. How **often** do you enter the Long Beach Unit of the park?
 5+ 2-4 biweekly_____ Once per month, or
 week_____ days/week_____ less_____

4. How often do you use **each** of the following **areas** of the park? Please rate each item.

(0=never, 1=occasionally, 2=often)

Beaches___ Trails_____ Campgrounds_____ Other
 _____ (specify)_____

5. How often do you engage in **each** of the following **activities** in the Long Beach Unit?

Please rate each item. (0=never, 1=occasionally, 2=often)

Hiking Biking Bird- Nature Other None (no park
 _____ _____ watching__ Study (specify)__ activities)
 _____ _____ _____

6. Have you ever seen a bear, cougar, and/or wolf within the **boundaries of Clayoquot Sound – Port Alberni – Port Renfrew?**

Bear Yes_____ No_____
 Cougar Yes_____ No_____
 Wolf Yes_____ No_____

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7. Have you ever seen a bear, cougar, and/or wolf within the **Long Beach Unit?**

Bear Yes_____ No_____
 Cougar Yes_____ No_____
 Wolf Yes_____ No_____

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8. Have you ever seen a bear, cougar, and/or wolf within your **town?**

Bear Yes_____ No_____
 Cougar Yes_____ No_____
 Wolf Yes_____ No_____

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If you answered “NO” to questions 6 to 8, please skip to question 18.

If you answered “YES”, please respond to questions 9-17 about the most recent encounter you had. (In case you’ve had more than one encounter.)

9. In total, **how many** bear, cougar, and/or wolf sightings have you had in the **Long Beach Unit?**

Bear _____ Cougar _____ Wolf _____

10. In total, **how many** bear, cougar, and/or wolf sightings have you had in your **town?**

Bear _____ Cougar _____ Wolf _____

11. What was the location of your **most recent** sighting?
 In Long Beach Unit _____ In your town _____ Other location (state where) _____

12. During your **most recent** sighting of **each** animal, **where** were you when you saw the animal?

Bear encounter:

N/A Beach Trail Lake Road At Home Residential Area Other (specify)

Cougar encounter:

N/A Beach Trail Lake Road At Home Residential Area Other (specify)

Wolf encounter:

N/A Beach Trail Lake Road At Home Residential Area Other (specify)

13. Approximately, in meters/yards, **how far** were you from the animal?
Bear _____ **Cougar** _____ **Wolf** _____
 meters/yards meters/yards meters/yards

14. What was **your** reaction? Please check one for each encounter.

During the **bear** encounter, I...:

Slowed Stood my Backed Ran Other (specify)
 vehicle_____ ground_____ away_____ away_____ _____

During the **cougar** encounter, I...:

Slowed Stood my Backed Ran Other (specify)
 vehicle_____ ground_____ away_____ away_____ _____

During the **wolf** encounter, I...:

Slowed Stood my Backed Ran Other (specify)
 vehicle_____ ground_____ away_____ away_____ _____

15. What was the **animal's** reaction?

The **bear** was...:

Unaware Aware of Curious Calmly Aggressive Other (specify)
 of me me, but about Calmly Aggressive Other (specify)
 _____ me, but about Calmly Aggressive Other (specify)
 _____ undisturbed me me _____ _____ _____

The **cougar** was...:
 Unaware of me _____ Aware of me, but undisturbed _____ Curious about me _____ Calmly approached me _____ Aggressive towards me _____ Other (specify) _____

The **wolf** was...:
 Unaware of me _____ Aware of me, but undisturbed _____ Curious about me _____ Calmly approached me _____ Aggressive towards me _____ Other (specify) _____

16. How would you describe your encounter?

With the bear:
 Scary and negative _____ Neutral _____ Exciting and positive _____ Other (specify) _____

With the cougar:
 Scary and negative _____ Neutral _____ Exciting and positive _____ Other (specify) _____

With the wolf:
 Scary and negative _____ Neutral _____ Exciting and positive _____ Other (specify) _____

17. Did you report the encounter?

Bear Yes _____ to whom-? _____ No _____

Cougar Yes _____ to whom-? _____ No _____

Wolf Yes _____ to whom-? _____ No _____

18. If you were to encounter a bear, cougar, and/or wolf, **would you report it to park staff?**

19. **If I encountered a bear:**
 No _____ Unsure _____ Only if it were in town _____ Only if it were in the park _____ Yes, in either case _____

If I encountered a cougar:
 No _____ Unsure _____ Only if it were in town _____ Only if it were in the park _____ Yes, in either case _____

If I encountered a wolf:
 No _____ Unsure _____ Only if it were in town _____ Only if it were in the park _____ Yes, in either case _____

24. What do you think **causes negative close encounters** with wildlife your **town**? Please rate each item. (0=not influential, 1=contributes, 2=highly influential)

Presence of visitors	Presence of residents	Feeding by humans	Landscape development	Forestry	Park management	Waste management	Poor education programs	Natural wildlife patterns
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- 24-25. Which wildlife-management strategy/strategies is/are **currently** being used in the **Long Beach Unit** for bears, cougars, and wolves. Please mark 'X' for all that apply.

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	Bears	Cougars	Wolves
Don't know			
Shooting animals			
Relocating animals			
Scaring animals away			
Restricting humans from areas frequently used by wildlife			
Restricting wildlife from human areas			
Educating residents			
Educating visitors			

26. Which wildlife-management strategy/strategies is/are **currently** being used in your **town** for bears, cougars, and wolves. Please mark 'X' for all that apply.

	Bears	Cougars	Wolves
Don't know			
Shooting animals			
Relocating animals			
Scaring animals away			
Restricting humans from areas frequently used by wildlife			
Restricting wildlife from human areas			
Educating residents			
Educating visitors			

- 29-27. How **desirable** are the following **solutions** to negative human-wildlife interactions.

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Please rate each item. (0=undesirable, 1=desirable, 2= very desirable)

Shoot all animals	
Shoot animals involved in negative human interactions	
Shoot animals that enter communities	
Relocate animals	

Use non-lethal deterrents (stimuli that create negative smells, tastes, sights, sounds, or feelings)	
Restrict humans from areas frequently used by wildlife	
Restrict wildlife from human use areas	
Fine any individual caught feeding the animals	
Fine any individual leaving garbage out	
Develop domestic animal (cats, dogs, llama) safety strategy (e.g. Keeping animals indoors at night) Improve livestock holding facilities	
Develop community education programs	
Develop visitor education programs	
Influence the mass media	
Other (specify)	

30-28. Have you ever **sought** information, from outside the Long Beach Unit, about the behavior of bears, cougars, or wolves, and how to act in their presence?

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Bears Yes _____ No _____
Cougars Yes _____ No _____
Wolves Yes _____ No _____

If you answered “NO” to question 27, please skip to question 29.

If you answered “YES” to any options in question 27, please respond to questions 28.

31-29. If “YES”, where did you seek this information from?

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	Bears	Cougars	Wolves
From Pacific Rim National Park			
From the province			
From community members			
From books			
From the internet			
From other sources (please list)			

32-30. While in the **Long Beach Unit**, have you ever **read** notices about the behavior of bears, cougars, or wolves, and how to act in their presence?

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Bear Yes _____ No _____
Cougar Yes _____ No _____
Wolf Yes _____ No _____

If you answered “NO” to questions 6 to 8, i.e. you have not seen a bear, cougar, or wolf, skip to question 32.

If you answered “YES” to questions 6 to 8, i.e. you have seen a bear, cougar, or wolf, and answered “YES” to question 27 or 29, i.e. you have read information

about these animals, please respond to questions 30 about the most recent encounter you had.

33-31. If you have seen an animal and read information, did you **follow** the information when you encountered the animal?
 Yes _____ No _____

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If you answered "NO" to question 30, please respond to question 31.

If you answered "YES", please skip to question 32.

34-32. If "NO", what **motivated** you to act differently than the information recommended?
 Please mark 'X' for all that apply.

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	Bears	Cougars	Wolves
Interacting with wildlife is part of my connection to nature			
I believe that my interaction would not hurt the animal			
I don't like rules and being told how to act			
The animal seemed to be enjoying the interaction with me			
Other people were ignoring the direction, so I did as well			
Other (please explain)			

35-33. Please **classify** the diets of bears, cougars, and wolves. Choose one for each animal

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Bears Carnivore _____ Herbivore _____ Omnivore _____
Cougars Carnivore _____ Herbivore _____ Omnivore _____
Wolves Carnivore _____ Herbivore _____ Omnivore _____

Please respond to the following questions (33-65) about your **opinions** on the **environment**.

(1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree)

36-34. _____ One of the worst things about overpopulation is that many natural areas are getting destroyed for development.

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37-35. _____ I can enjoy spending time in natural settings just for the sake of being out in nature.

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- ~~38-36.~~ ____ Environmental threats such as deforestation and ozone depletion have been exaggerated.
- ~~39-37.~~ ____ The worst thing about the loss of the rain forest is that it will restrict the development of new medicines.
- ~~40-38.~~ ____ Sometimes it makes me sad to see forests cleared for agriculture.
39. ____ It seems to me that most conservationists are pessimistic and somewhat paranoid.
40. ____ I prefer wildlife reserves to zoos.
- ~~43-41.~~ ____ The best thing about camping is that it is a cheap vacation.
- ~~44-42.~~ ____ I do not think the problem of depletion of natural resources is as bad as many people make it out to be.
- ~~45-43.~~ ____ I find it hard to get too concerned about environmental issues.
- ~~46-44.~~ ____ It bothers me that humans are running out of their supply of oil
- ~~47-45.~~ ____ I need time in nature to be happy.
- ~~48-46.~~ ____ Science and technology will eventually solve our problems with pollution, overpopulation, and diminishing resources.
- ~~49-47.~~ ____ The thing that concerns me most about deforestation is that there will not be enough lumber for future generations.
- ~~50-48.~~ ____ I do not feel that humans are dependent on nature to survive.
- ~~51-49.~~ ____ Sometimes when I am unhappy I find comfort in nature.
- ~~52-50.~~ ____ Most environmental problems will solve themselves given enough time.
- ~~53-51.~~ ____ I don't care about environmental problems.
52. ____ One of the most important reasons to keep lakes and rivers clean is so that people have a place to enjoy water sports.
- ~~55-53.~~ ____ I'm opposed to programs to preserve wilderness, reduce pollution and conserve resources.
- ~~56-54.~~ ____ It makes me sad to see natural environments destroyed.
- ~~57-55.~~ ____ The most important reason for conservation is human survival.
- ~~58-56.~~ ____ One of the best things about recycling is that it saves money.
- ~~59-57.~~ ____ Nature is important because of what it can contribute to the pleasure and welfare of humans.
- ~~60-58.~~ ____ Too much emphasis has been placed on conservation.
- ~~61-59.~~ ____ Nature is valuable for its own sake.
- ~~62-60.~~ ____ We need to preserve resources to maintain a high quality of life.
- ~~63-61.~~ ____ Being out in nature is a great stress reducer for me.
- ~~64-62.~~ ____ One of the most important reasons to conserve is to ensure a continued high standard of living.
- ~~65-63.~~ ____ One of the most important reasons to conserve is to preserve wild areas.
- ~~66-64.~~ ____ Continued land development is a good idea as long as a high quality of life can be preserved.
- ~~67-65.~~ ____ Sometimes animals seem almost human to me.
66. ____ Humans are as much a part of the ecosystem as other animals.

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The following information will assist in correlating data. In adherence with my ethical review, by the University of Victoria, please be assured that any of the information provided will remain anonymous, and none will be reported on an individual basis.

69-67 . Gender: M _____ F _____ Other _____	← Formatted: Bullets and Numbering
70-68 . Year of birth: _____	← Formatted: Bullets and Numbering
71-69 . Place of birth: City _____ Country _____	← Formatted: Bullets and Numbering
72-70 . How long have you resided in this community? Years _____ Months _____	← Formatted: Bullets and Numbering
73-71 . How long do you reside in this area during the year? 0-3 months _____ 3-6 months _____ 6-12 months _____ Year round _____	← Formatted: Bullets and Numbering
74-72 . Gross household yearly income, before taxes: _____	← Formatted: Bullets and Numbering
75-73 . Highest level of education achieved: Grade 8 Some high school High school diploma Some post-secondary school College or Technical school diploma University degree Post-Graduate degree Other (specify) _____ _____ _____ _____ _____ _____ _____ _____	← Formatted: Bullets and Numbering

Thank you for your time.

I would greatly appreciate it if you could please return this questionnaire, in the provided self-addressed, stamped envelope, within 7 days.