Understanding Romanian Hunters' Cognitive Components toward Large Carnivores in the Făgăraș Mountains, Romania

by

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ABSTRACT

In 2016, the Romanian government introduced a trophy hunting ban on large carnivores throughout Romania causing an uproar in the hunting community. Romanian hunters have been responsible for managing large carnivores and feel this responsibility has been taken from their hands. The overarching goal of this thesis is to understand the hunters' cognitive components (attitudes, beliefs, and emotions) and acceptable management approaches regarding large carnivores in Romania. A mixed method appoarch was utilized where quantitative questionnaires (n=512) were distributed to Romanian hunters , and qualitative interviews (n=11) occurred with presidents of hunting associations and directors of wildlife management in the Făgăraș Mountains area. Hunters' cognitive components and acceptability toward management approaches fluctuate depending on species and context. Human Dimensions of Wildlife research helped in understanding the relationship between human and large carnivores and has acted as a voice for Romanian hunters in the debate toward these species.

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Overview

This thesis consists of four chapters. Chapter *1. Introduction,* provides an overview of specific research in the field of Human Dimensions of Wildlife (HDW) regarding human cognitive components toward four large carnivore species: (1) gray wolves (*Canis lupus*), (2) brown bears (*Urus arctos*), (3) the Eurasian lynx (*Lynx lynx*), and (4) wildcats (*Felis silvestris*) residing in the Făgăraș Mountains, Romania. In addition, an overview of HDW and how HDW has been used studying hunter and large carnivore relationships in Europe, the relevance of this research, research objectives, the description of the study area, conceptual frameworks, and data collection. The following two chapters are scientific papers: Chapter *2. Are Large Carnivores Considered Equal Among Romanian Hunters,* and Chapter *3. Romanian Hunters Emotions toward Large Carnivores*. Chapter 2 is to be submitted to The European Journal of Wildlife, an internationally recognized journal focusing on wildlife in Europe. The latter of the chapters will be submitted to a journal solely focusing on human dimensions of wildlife management, Human Dimensions of Wildlife Journal. Chapter *4. Summary* focuses on key findings of the research, along with strengths and challenges of using a mixed method approach, and future direction of how the HDW field should approach mixed methods more frequently than currently. The two research instruments used are found in *Appendix 1* and *Appendix 2*.

Chapter 1. Introduction

Romania is a Central Eastern European (CEE) country rich in large carnivores (wolves, brown bears, Eurasian lynx, and wildcats), but recently a decision by the Minister of Environment banning all hunting of these species has angered hunters. Hunters have proudly managed large carnivores through trophy hunting and feel their successful management of those species to reduce game losses and livestock damage has now been taken away without their voices being heard. This research offers hunters in the Făgăraș Mountain region of Romania a voice in this debate by identifying their attitudes, beliefs, and behavioural intentions to support/oppose management options regarding large carnivores. In addition, this study employs innovative methodological tools to explore emotions of hunters. The mixed methods approach offers a unique addition to the Human Dimensions of Wildlife (HDW) resource management tool kit.

1.1 Human Dimensions of Wildlife

HDW is a social science research field which analyzes humans' psychological attributes when interacting with wildlife species or wildlife management (Decker et al., 2012). With the main focus revolving around the cognitive components of human behaviour, HDW researchers try to predict human value orientations, attitudes, and behavioural intentions in various wildlife issues (Bath, 1991; Decker et al., 2012; Decker et al., 2010; Engel et al., 2016; Manfredo, 2008; Whittaker et al., 2006). These predictions have the potential to allow wildlife managers to understand and modify human behaviour (Glikman et al., 2010; Jochum et al., 2014), thus improving decision-making (Berry et al., 2016) regarding conservation efforts and the potential reduction of human-wildlife conflicts.

In the early 1920's, Aldo Leopold, considered the founder of wildlife management, mentioned the underlining connection between humans and nature, and stressed the importance of

the social and political aspects of wildlife management (Bath, 1998; Flader, 1974; Manfredo et al., 2009). Leopold suggested studying human influences on wildlife and nature is as important as studying wildlife itself (Bath, 1998; Flader, 1974). However, it was not until the 1950s that studying human interactions with nature took form. The emergence of human dimensions studies was due to the increasing use of nature and natural resources for recreational, economic, and leisure purposes in the United States (Manfredo et al., 2009). Between the 1960s and 1970s, American government officials began to involve researchers with biology, ecology, economic, and social backgrounds who studied human-wildlife interactions in wildlife management planning (Manfredo et al., 2009). During this time, this type of interaction was mainly focused on the hunting and fishing industry (Bath, 1998), and it was not until the 1990s to early 2000s the HDW field expanded to include issues of governance, social justice, indigenous rights (Manfredo et al., 2009), climate change, habitat fragmentation, invasive species etc. (Vaske et al., 2006).

In 1973, Hendee and Schoenfeld, leading researchers in the unestablished field of HDW, introduced the term "Human Dimensions of Wildlife" at the North American Wildlife and Natural Resources Conference, discussing the need for a field that focused on the interactions between humans and wildlife (Brown, 2009; Gray, 1993) and conflicts between various users of wildlife (Ream, 1979). By the 1980s, the concept of examining human cognitive concepts, such as wildlife value orientations, attitudes, and beliefs, became the front runners to grasp the understanding of human-wildlife interactions, especially with human-wildlife conflicts (Bath, 1998). Many researchers who focus on human and wildlife interactions also focus on public involvement tools to improve the relationship between human and wildlife, such as ways to reduce conflicts (Decker et al., 2012; Rosen & Bath, 2009; Teel et al., 2005) leading towards tolerance and possible coexistence.

1.2. Human Dimensions of Wildlife: Relationship between Hunters and Large Carnivores in Europe

The interaction of humans and large carnivores have been recorded throughout human history (Chapron et al., 2014; Pennisi, 2002), from myths and legends to children's stories and modern movies. Throughout history, large carnivore species have been depicted as "evil", bloodthirsty creatures (Zeiler et al., 1999) which bring harm to human livelihood through consuming game species and killing livestock (Dorresteijn et al., 2016; Lopez, 1978; Breitmenmoser, 1998; Zeiler et al., 1999). Although it is true large carnivores can compete with humans for game species and kill livestock, these conflicts are the repercussions of increased human population, habitat destruction, and deforestation (Dorresteijn et al., 2016; Knorn et al., 2011; Ripple et al., 2014; Woodroffe, 2000) where humans and large carnivore encounters continuously occur. Due to this, large carnivores have been depicted negatively, resulting in many conflicts with humans (Chapron et al., 2014; Kaltenborn et al., 2013; Inskip & Zimmermann 2009; Karanth & Chellam, 2009; Kruuk, 2002; Treves & Naughton-Treves, 1999; Treves et al., 2009).

Like many places throughout the world, Europe is no stranger to the ongoing human and large carnivore conflicts. Throughout the continent's history, humans have driven the large carnivore population to the brink of extinction (Treves & Karanth, 2003) or extirpated (Mech, 1995; Nilsen et al., 2007). A massive impact on the large carnivore population occurred during the Second World War until the 1970s, and for many decades afterward, most of the large carnivore species have not existed in Central and Western Europe (Chapron et al., 2014). Due to conservation efforts, large carnivores are slowly making a comeback in Europe. With the increase of large carnivore dispersal especially into areas in which the species have not existed for many years, conflict has occurred once again. One of the many groups which these species remain in

constant conflict with are hunters. In many parts of Europe, hunters are involved with large carnivore management (Heberlein & Willebran, 1998; Kaltenborn et al., 2013; Salvatori et al., 2002; Treves & Karanth, 2003).

Hunters, who tend to have the most encounters with large carnivores on a daily basis are thought to have a negative perception about large carnivores. However, this is untrue. Hunters hold mixed preceptions about these species. For example, Polish hunters were more likely to have a positive attitude towards the Eurasian lynx (*Lynx lynx*) (Bath et al., 2008; Ericsson et al., 2004; Williams et al., 2002) than of wolves (*Canis lupus*) and brown bears (*Ursus arctos*) (Ercisson & Heberlien, 2002; Zeiler et al., 1999). However, in saying this, hunters in areas where there was no involvement of the interest group are more likely to have a negative attitude toward the species (Bath et al., 2008; Zeiler et al., 1999). Therefore, these perceptions are not only dependent on the country the hunters are from but also the experiences they have had with the species (direct or indirect), along with emotion such as fear (Bath et al., 2008; Jacobs et al., 2014). This can also be said about wolves and brown bears (Bath et al., 2008; Glikman et al., 2012; Linnell et al., 2002; Røskaft et al., 2003; Szinovatz, 1997; Zimmermann et al., 2001).

While research has explored hunter attitudes toward large carnivores in many parts of Europe, little research has been conducted in Romania, even more so regarding the Făgăraș Mountains. To reduce the knowledge gap of Romanian hunter cognitive concepts, examination and exploration were conducted to understand this group of individuals' attitudes, beliefs, acceptability toward invasive management options, and emotions toward the four large carnivore species located in Romania and the Făgăraș Mountains (wolves, brown bear, Eurasian lynx, and wildcat (*Felis silvestris*)).

1.3 Relevance of Research

For a long time, Romanian hunters were responsible for managing wildlife and the impacts wildlife caused towards residents (damages to livestock and crops, and attacks). When the Romanian government announced the ban on trophy hunting large carnivores, the Romanian hunters caused an uproar because they believed the responsibility of wildlife management was taken from their hands, especially in regards to large carnivores where the hunters face conflicts between the species and the Romanian residents. This trophy hunting ban caused controversy in the news and on social media where this change was presented in positive terms, especially by environmental and conservation news outlets. Also, this management decision was established around the time when a proposal was propositioned for the Făgăraș Mountains to be established as a national park.

My research project has theoretical and practical significance for understanding Romanian hunters' cognitive components and by giving this group a voice in the debate of large carnivore management. By using a mixed-method approach, which is rarely used in HDW and never used in Romania, the approach implemented here deeper understanding of how Romanian hunters think and feel about large carnivores.

1.4 Research Objectives

The overall objective of this project is to understand cognitive components of Romanian hunters and to give them a voice in the large carnivore debate. Two specific objectives emerge that collectively addresss this overarching goal:

(1) Understand hunters' attitudes, beliefs, and acceptability toward various management options.

(2) Understand how experiences and beliefs can potentially influence hunter emotions.

Objective 1 is addressed using a quantitative approach allowing for representative data of the hunter population in the Făgăraș Mountains. Specifically, the Potential for Conflict Index (PCI_2) is examined using this quantitative approach. Such quantitative data offers decision-makers a clear picture of support or opposition for management options. This being said, hunters want to express much more of their attitudes, beliefs, and behavioural intentions regarding large carnivores by discussing their experiences. Much can be learned by listening to these passionate and emotional voices which really offer a deeper understanding of issues. Objective 2 focuses on exploring these emotions. Collectively, both objectives contribute to documenting hunter's views about large carnivores in Romania. To accomplish both objectives requires a mixed-methods approach. Within HDW there has been an emphasis on quantitative studies. In these cases where a quantitative approach has not been taken, a solely qualitative approach has been used. A mixed-methods approach offers the opportunity to establish baseline data for monitoring attitude change based on the quantitative approach. Sharing these results with hunters and listening to them explain the findings provided an understanding of why hunters said what they said. As HDW researchers continue to work to predict behaviour, quantitative measures of attitudes and beliefs provide only a partial understanding of why people do what they do. Focusing on emotions may offer additional explanations of hunter's behaviour. Measuring emotions lends itself to a qualitative approach. Achieving both objectives through a mixed methods approach will help advance the HDW field by sharing an innovative way to explore multiple components of attitudes, beliefs and emotions toward large carnivores from the hunting community.

1.5 Study Area

Romania contains various landscapes ranging from mountains, hills, and plains (Dorresteijn et al., 2016; Rotar et al., 2012), providing habitats for numerous fauna and flora species. The most predominate landscape feature found in the country is the Carpathian Mountains (Linnell et al., 2016; Rotar et al., 2015). The Carpathian Mountains are approximately 1,500km in length, stretching through most of Central-Eastern Europe (CEE). Approximately 675km of the Carpathian Mountains mountain range can be found in Romania, where it enters in the northeastern part of the country and extends toward the southwestern borders. This mountain range, separates Transylvania (northwest) from the rest of Romania. As for the Făgăraș Mountains, this mountain range is located in the Southern Carpathian Mountains, 45.5833°N, and 24.7500°E, where it is approximately 70km long and 40km wide. It is in the Făgăraș Mountains where the highest peak, known as Moldoveanu Peak, reaches 2543m (Rotar et al., 2015). In this mountainous region, the Făgăraș Mountains is more than 72% covered in forest, 25% covered in alpine grasslands, scree, and bogs (Linnell et al., 2016). In various parts of this forested mountain range, it was discovered that the Făgăraș Mountains contains patches of virgin forest (Linnell et al., 2016), a well-established area for many of Romania's endemic, and Europe's endangered species. The Romanian Carpathian Mountains also includes large populations of large carnivores such as approximately 6,000 brown bears, 2,700 gray wolves, and 1,500 Eurasian lynx (EU, 2013). Even though Romania does not have the largest population of the wildcat in Europe, its numbers are estimated to be comparably high (Hillman, 2014; Velli et al.,, 2015). It is currently unknown how many of this species reside in Romania since there is no available quantitative

data, but it is believed that there are approximately 10,000 wildcats roaming the Romanian landscape (IUCN, 2019).

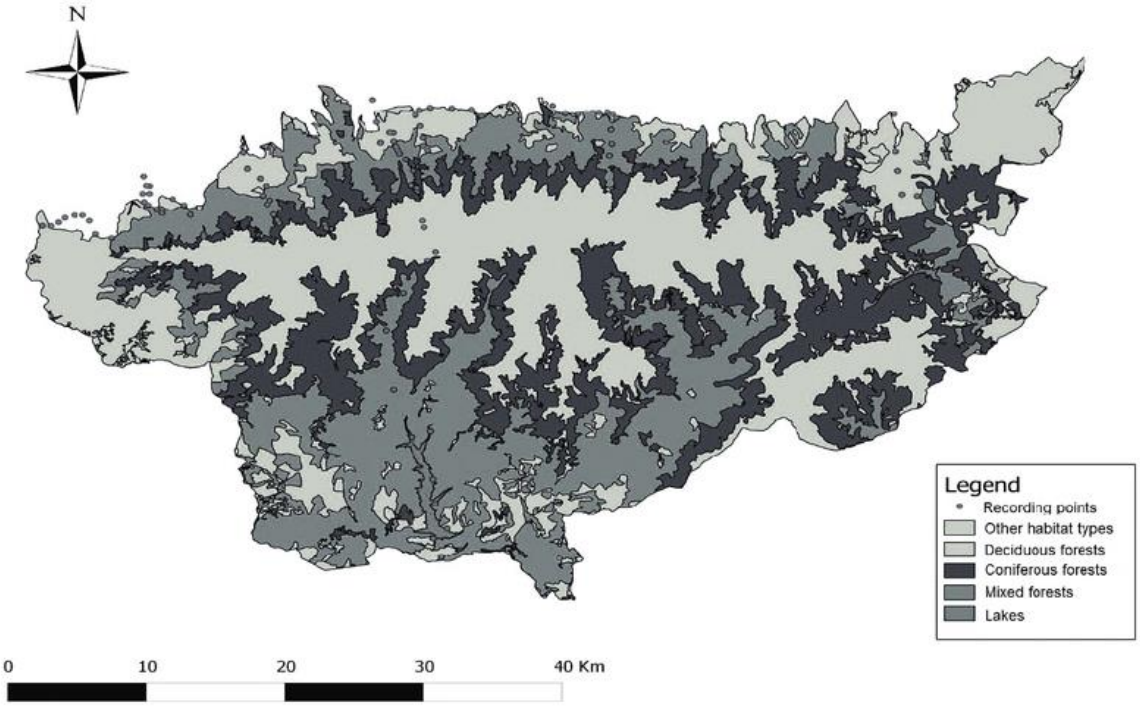


Figure 1.1. Habitat distribution map of the Făgăraș Mountains. Map design: Stoica Vasile-Alexandru and Laurian Gheorghe-SPOT Image 2007 provided by the Ministry of Environment and Forests.

Although parts of the Făgăraș Mountains mainly remain a natural landscape, the mountain range has been impacted by human activity throughout the centuries. These activities include cattle and sheep grazing, agriculture, hunting, and forestry. The Făgăraș Mountains is divided between four counties, Arges (approximately 612,431 residents), Brașov (approximately 549,217 residents), Sibiu (approximately 397,322 residents), and a small portion of Vâlcea (approximately 371,714 residents) (Citypopulation, 2011). These counties heavily rely on industries based on livestock, agriculture, hunting, and forestry; the latter remains as a prominent economic force in the region (Linnell et al., 2016). In recent years new economies have started to

gain momentum such as tourism and eco-tourism primarily in the Făgăraș Mountains (FCC, 2017; Linnell et al., 2016). Due to the interest in tourism and land use, as well as becoming a part of the European Union in 2007, the Romanian government established two large areas in the Făgăraș Mountains to be protected under Natura2000 (FCC, 2017; Linnell et al., 2016). In the northern parts of the Făgăraș Mountains is Piemontul Făgăraș (SPA), while Munti Făgăraș Site of Community Interest (SCI) covers the entire length and slopes of the mountain range, totaling approximately 244 ha of the protected area (Linnell et al., 2016).

1.6 Outline of Papers

Chapter 2 addresses objective 1. This paper, *Are Large Carnivores Considered Equal Among Romanian Hunters*, has been formatted and targeted for submission to the European Journal of Wildlife Research. The abstract for this paper is found below:

In 2016, the Romanian government announced a trophy hunting ban on all large carnivores residing in the country. This announcement caused uproar in the hunting community due to the responsibility of managing these species being taking from the hunters' hands. Our research is to understand Romanian hunters' attitudes, beliefs, and acceptability of certain management options toward the gray wolf (*Canis lupus*), brown bears (*Ursus arctos*), the Eurasian lynx (*Lynx lynx*), and wildcats (*Felis silvestris*). Quantitative questionnaires (n=512) were distributed to the hunting associations in the surrounding areas of the Făgăraș Mountains. Overall, hunters remained positive toward large carnivores with the exception large carnivore-livestock interactions where hunters responded with negative beliefs. Acceptable management approaches were those of hunting large carnivores to reduce livestock and game species loss, reducing attacks on people, and allowing trophy hunting to continue.

Chapter 3 addresses objective 2. This paper, *Romanian Hunters Emotions toward Large Carnivores*, has been formatted and targeted for submission to the Human Dimensions of Wildlife. The abstract for this paper is found below:

In 2016, the Romanian government introduced a trophy hunting ban on large carnivores which caused an uproar in the hunting community. The purpose of this paper is to understand how the presidents and directors of wildlife management feel about large carnivores and large carnivore management. We explored the emotions of worry about impacts caused by large carnivores, frustration toward people or organizations, and passion about environmental interest of values through the use of behavioural response of vocal tones (pitch, note, emphasis, etc.). Qualitative interviews were conduct with presidents and directors of wildlife management from (n=11) hunting association in the Făgăraș Mountain region. Results indicated three themes relating to our objectives: (1) large carnivore existence values represented by passion, (2) large carnivore and livestock interactions represent by worry, and (3) large carnivore management represented by frustration. Exploring emotion through qualitative methods is rare in the Human Dimensions of Wildlife field, especially through listening to vocal tones.

1.7 Conceptual Framework

While this project is primarily housed within the HDW umbrella, the integration of a qualitative approach is ultimately about suggesting ways to *broaden* the range of the HDW tool kit in order to better understand the complexities and nuances of emotion. That is, even though two different approaches (quantitative and qualitative) have been used for the two chapters, they should be read as complementary and both housed within the broader research orientation of HDW. This research is not carrying out two discrete analysis from totally different

methodological and epistemological standpoints. Rather, a mixed method approach is pursued in order to experiment with broadening the HDW tool kit in the interests of better capturing a part of human-wildlife interaction that is not well analyzed by the current HDW tool kit. In this research project, the quantitative approach was conduct before the qualitative approach. The quantitative approach was first used in order to direct how the qualitative approach was to take form; quantitative results dictated which questions were to be asked during the qualitative process. Although quantitative first took priority, the qualitative approach had equal influence toward this research project.

The theoretical background used for the quantitative approach is heavily utilized in HDW research (Bjerk and Kaltenborn, 1999; Decker et al., 2012; Fulton et al., 1996; Manfredo, 2008; Manfredo et al., 2009; Tarrant and Green, 1999; Teel et al., 2010; Vaske, 2008; Whittaker et al., 2006). Established by Vaske and Donnelly (1998), the cognitive hierarchy has been used to understand the relationship between people's values, attitudes, and behaviours. In this research project, the hierarchy was to understand hunters' attitudes, beliefs, and acceptable management approaches toward large carnivores. For the qualitative approach, the theoretical background is based on Inskip's et al. (2016) Theoretical Tolerance Model, which is in turn based on Kansky's (2015) Wildlife Tolerance Model. For this research project, the Theoretical Tolerance Model was modified to understand how experiences and beliefs can influence emotion instead of tolerance. Further details about the conceptual frameworks are described in the following chapters.

1.8 Data Collection

Due to the nature of this research project, quantitative research was conducted first followed by the qualitative phase of the project. Quantitative data collection occurred between

September and October 2017 by using a questionnaire containing closed-end questions. Although there were several sections included in questionnaire (see Appendix 1), to obtain the first objective of this research project, only the following sections were used in the analysis:

- attitudes toward gray wolves, Eurasian lynx, brown bears, and wildcats residing in the Făgăraș Mountains
- existence values
- beliefs about large carnivore-livestock interactions
- beliefs about large carnivore-game species interactions
- acceptability of relocation or killing large carnivores upon sightings, approaching, and attacking
- acceptability of hunting and trophy hunting large carnivores

The questionnaires were distributed through the presidents of various hunting associations in the surrounding areas of the Făgăraș Mountains, where hunters (> 18 years old) were given a questionnaire at the time of receiving their wild boar license. Further details about sampling and data analysis are presented in Chapter 2.

The qualitative approach, occurring between July 30th to August 3rd, 2018, was based on the unanswered 'why' questions from the quantitative approach; why did hunters answer the quantitative questionnaire the way they did? To answer this question, qualitative interviews were conducted with a semi-structured interview schedule containing open-ended items. The interview schedule was reviewed and revised several times to ensure consistency of vocabulary and length of the schedule. The interview schedule consisted of numerous questions about large carnivores in the Făgăraș Mountains (See Appendix 2), however, for the purpose of the second objective, the research focused on the following items:

- Can you tell me about the wildlife in the Făgăraș Mountains? For example, is there too much or too little of one or many species?
- How do you feel about large carnivores?
- Do you believe one species is more important than another?
- Have you noticed any increase or decrease of predation? If so, could you elaborate?
- What are some reasons why predation is occurring?
- Why do you think predation is occurring?
- Who is in charge of managing large carnivores?
- How is your relation with the government or NGOs?
- If you had one statement or question for the government or NGOs, what would it be?

The interviews were conducted with the presidents and directors of wildlife management from the various hunting associations in the surrounding areas of the mountain region. In total, 11 interviewees were conducted, an average of 60 minutes per interview (30 minutes being the shortest, and 130 minutes being the longest). Most interviews were conducted in Romanian; therefore, a translator was present. Further details about sampling and data analysis are located in Chapter 3.

Co-Authorship Statement

The author of this thesis has been the primary researcher of this study, including the literature review and design of the research proposal, practical aspects of data collection and analysis, and the manuscript preparation. The co-authors and committee members have contributed to the research project by providing critical insight through reading and feedback on writing for all stages of this project.

For the two manuscripts in this thesis, the author is the primary and corresponding author. Dr. Alistair Bath contributed to both manuscripts; however, Dr. Carly Sponarski contributed to the first manuscript, while Dr. Mark Stoddart contributed to the second manuscript. Each co-author provided critical feedback toward methods (data collection and analysis), interpreting data, and reviewing the manuscript they contributed to. The following paragraphs state the journal each manuscript will be submitted to and the order of the co-authors following the author of this thesis.

The first manuscript "*Are all large carnivores considered equal among Romanian hunters*," was a collaboration with Dr. Alistair Bath (MUN), Dr. Carly Sponarski (University of Maine), and Marie Louise Aastrup (MUN). This paper will be submitted to *European Journal of Wildlife Research*.

The second manuscript "*Romanian Hunters Emotions toward Large Carnivores*," was a collaboration with Dr. Alistair Bath (MUN), and Dr. Mark Stoddart (MUN). This paper will be submitted to *Human Dimensions of Wildlife*.

Chapter 2. Are Large Carnivores Considered Equal Among Romanian Hunters?

2.1 Background

Although large carnivores are known as charismatic animals, these species tend to have more intense conflicts with humans than other species (Gippoliti et al., 2017; Gittleman et al., 2001). Human-carnivore conflicts range from predation on livestock, competition with wild species consumption (Bisi et al, 2007; Fritts et al., 2003; Kellert et al., 1996; Salvatori et al., 2002; Thirgood et al., 2005) to encounters which can lead to attacks on people (Linnell et al., 1999; Sponarski et al., 2015). Many of these conflicts are due to the increasing human population, and encroachment on habitats (Bisi et al, 2007; Dorresteijn et al., 2016; Ripple et al., 2014; Sponarski et al., 2013; Woodroffe, 2000). Most European countries, such as Sweden, Germany, France, and Poland, have experienced conflicts with carnivores due to encroachment on habitat (Garshelis, 2002; Inskip and Zimmermann, 2009; Kaczensky et al., 2003; Ziółkowska et al., 2015) through deforestation for the expansion of human settlement (Lövenhaft et al., 2004; Rotar et al., 2012), and agriculture processes (Kleijn et al., 2009; Rotar et al., 2012; Tscharntke et al., 2005). While many countries within the European Union have developed large carnivore management plans, illegal activities such as poaching, poisoning, and baiting large carnivores continue (Creel and Rotella, 2010; Eeden et al., 2017; Karlsson and Sjöström, 2007; Mykrä et al., 2017; Pohja-Mykrä, 2016). To understand human perceptions of these conflicts, researchers must understand their cognitions toward the species and the conflict. In many areas, Europeans must re-learn about their connection to these carnivores, especially in areas where evidence has shown large carnivores are beginning to return, such as the Netherlands, Denmark, Germany and Austria

(Boitani and Linnell, 2015; Heel et al., 2017; Hermann et al., 2012; Jacob et al., 2014; Zeiler et al., 1999).

In the European setting, where human-carnivore conflicts have increased over the decades from human population increase and the increasing encroachment on wildlife habitats, understanding human cognitive concepts of attitudes, beliefs, and behavioural intention has been examined through the field of Human Dimension of Wildlife (HDW) (Bath et al., 2008; Bjerke et al., 1998; Eriksson et al., 2015; Glikman et al., 2012; Majić and Bath, 2010; Sijtsma et al., 2012; Skogen, 2001; Skogen and Krange, 2003; Treves and Karanth, 2003), especially regarding hunter cognitive orientations toward large carnivores (Dressel et al., 2014; Ericsson and Heberlin, 2003; Majić and Bath, 2010; Mykrä et al., 2017; Zeiler et al., 1999). Past research indicates that the attitudes and beliefs of hunters can alternate across species, countries, and context. For example, in Sweden (Karlsson and Sjöström, 2007), researchers found that Swedish hunters tend to possess negative attitudes toward wolves, especially in the context of livestock impacts. Similar negative attitudes were found by Lescureux and Linnell (2013) regarding hunter attitudes toward wolf impacts on livestock in Macedonia. In contrast, hunters in Poland tend to express positive attitudes toward the Eurasian lynx (Bath et al., 2008), however, the proposal to reintroduce the species to Scotland created controversy among various interest groups and landowners who believed the Eurasian lynx to be pests (Jørgensen, 2011).

Relationships with large carnivores have shifted since the Second World War (WWII) when many European countries witnessed a decrease in species populations. However, Romania observed an increase population of these species (Salvatori et al.,2002). Due to the continuous increase of large carnivores in Romania, hunting was the main tool used to manage large carnivore species (Kelemen and Șelaru, N.d.). Over time, the recreational activity of large carnivore trophy hunting became popular for both Romanians and foreign hunters. Trophy

hunting and hunting were believed to be effective in managing large carnivores and potential conflicts. In addition, trophy hunting provided a source of economic revenue (Enescu and Aureliu-Florin, 2017) for hunters through harvesting of trophies (Salvatori et al., 2002; Iordăchescu et al., 2016) who paid farmers for damages in compensation caused by large carnivores. During the communist regime (1947-1989), large carnivore population rates stayed consistently high due to the Romanian communist leader (Nicolae Ceaușescu), who declared himself or those with his permission as the only ones allowed to hunt; this included hunting ungulates, wild boar, and large carnivores (Tomiuc, 2004). Since the end of communist rule, carnivore populations have decreased (Enescu & Aureliu-Florin, 2017; Tomiuc, 2004) potentially due to the increasing number of people partaking in hunting activities than after the regime had fallen. Despite these declines in populations, Romania is considered to be the stronghold for the large carnivores such as brown bear (*Ursus arctos*), grey wolf (*Canis lupus*), and the Eurasian lynx (*Lynx lynx*) in Europe (EU, 2013).

Although Romania is considered a stronghold for three carnivore species in Europe, in 2016, the Minister of Environment introduced a ban on trophy hunting focused on all large carnivore species (Dale-Harris, 2016) including the wildcat (*Felis silvestris*). This change in policy was done without consulting hunters (wealthy individuals or people whose livelihoods depend on revenue from hunting). While hunter attitudes have been studied in various countries in Europe, little is known about the attitudes of hunters in Eastern-Europe (Bath et al., 2008), and even less is known about hunter's attitudes in Romania. With the trophy hunting ban in place for a little over two years, Romanian hunters have expressed a perceived increase of conflicts ranging from livestock predation and human-wildlife encounters, particularly with brown bears. Hunters are an important interest group in the large carnivore debate hence it is necessary to understand Romanian hunter attitudes and beliefs and give them a voice in this political resource

management decision-making process. Our research provides insight about these cognitive components of Romanian hunters toward the four large carnivore species residing in the Făgăraș Mountains. While many HDW research studies examine attitudes and beliefs toward one or two species, our research is across multiple species which is rare in HDW field. Also, conducting research in Eastern Europe where little HDW research has been completed allows researchers to understand how or if hunters from countries in Eastern Europe think and feel the same about wildlife as the rest of Europe.

2.1.1 Human Dimension of Wildlife and the Cognitions of Human Behaviour

Understanding the relationship between hunters and large carnivore species in Romania, especially with the trophy hunting ban in place, is of importance in understanding human-carnivore conflict. In order to understand these conflicts, HDW uses the cognitive hierarchy, a theoretical framework composed of the main cognitive concepts that influence a person's behaviour.

Ajzen and Fishbein (2000) stated that attitude is a component that is based on a person's response to favorable or unfavorable objects, people, situations, or ideals (Ajzen, 2001; Ajzen and Fishbein, 2000). Attitudes can be divided into three variables: cognition (i.e., beliefs), affective (i.e., positive or negative), and conation (behavioural intentions) (Ajzen, 2001; Glikman et al., 2012). In their separate forms of attitude, cognition attitudes or beliefs are influenced by thoughts or memories toward an object (Ajzen, 2001; Glikman et al., 2012). These beliefs can be abstract where actual information about the object may be inaccurate (Fishbein and Ajzen, 1975; Fulton et al., 1996; Glikman et al., 2012). However, affective attitudes consist of multitudinal layers of concepts, such as feelings, moods, and emotions (Ajzen, 2001; Eagly and Chaiken, 1993;

Glikman et al., 2012). During this time, positive, negative, and neutral responses toward an object can be acknowledged (Ajzen, 2001).

In this research project, the cognition of hunters' affective (labeled as attitudes) and cognition (labeled as beliefs) attitudes toward large carnivores in Romania were used to examine how hunters think and feel about large carnivores, and their acceptability of these species being present in the country. Regarding these cognitions, this research project will specifically examine hunters' positive and negative attitudes toward large carnivores, conflict beliefs, and management beliefs. Similar use of attitudes and beliefs toward large carnivores have been used in Poland (Bath et al., 2008), Croatia (Bath & Majic, 2000), and Alaska (Miller et al., 1998).

2.1.2 Research Questions

Considering the nature of this research project, where attitudes and beliefs of hunters have been examined across more than one species, it was important to understand if hunters' attitudes and beliefs change across the four large carnivore species and across topics. Therefore, three research questions were developed: (1) Are the attitudes toward the four large carnivores (gray wolves, Eurasian lynx, brown bears, and wildcats) similar among hunters? (2) How united are the beliefs of hunters toward these four large carnivore species?, and (3) What large carnivore management approaches are acceptable?

2.2 Methods

2.2.1 Study Area

Romania contains various landscapes ranging from mountains, hills, and plains (Dorresteijn et al., 2016; Rotar et al., 2012), providing habitats for numerous fauna and flora species. The most predominate landscape feature found in the country is the Carpathian Mountains (Linnell et al., 2016; Rotar et al., 2015). The Carpathian Mountains are approximately 1,500km in length, occurring through most of Central-Eastern Europe (CEE). Approximately 675km of the Carpathian Mountains mountain range can be found in Romania, where it enters in the northeastern part of the country and extends toward the southwestern borders. This mountain range, separates Transylvania (northwest) from Wallachia in the south. There is no 'physical border separating Transylvania and Moldova. As for the Făgăraș Mountains, this mountain range is located in the Southern Carpathian Mountains, 45.5833°N, and 24.7500°E, where it is approximately 70km long and 40km wide. The highest peak in Romania, Moldoveanu Peak, reaches 2543m and is found in the Făgăraș Mountains (Rotar et al., 2015). In this mountainous region, the Făgăraș Mountains is more than 72% covered in forest, 25% cover in alpine grasslands, scree, and bogs (Linnell et al., 2016). In various parts of this forested mountain range, it was discovered that the Făgăraș Mountains contains patches of virgin forest (Linnell et al., 2016), a well-established area for many of Romania's endemic, and Europe's endangered species. These species also include the high population of large carnivores. There are approximately 6,000 brown bears, 2,700 gray wolves, and 1,500 Eurasian lynx in the Romanian Carpathian Mountains (EU, 2013). Even though Romania does not have European wide the largest population of the wildcat, its population dimensions are estimated to be comparably high (Hillman, 2014; Velli, 2015). It is currently unknown how many of this species reside in Romania since there is no available quantitative data, but it is believed that there are approximately 10,000 wildcats

roaming the Romanian landscape (IUCN, 2019). However, this population estimate is up for debate since there is no genetic sampling for large carnivores in Romania.

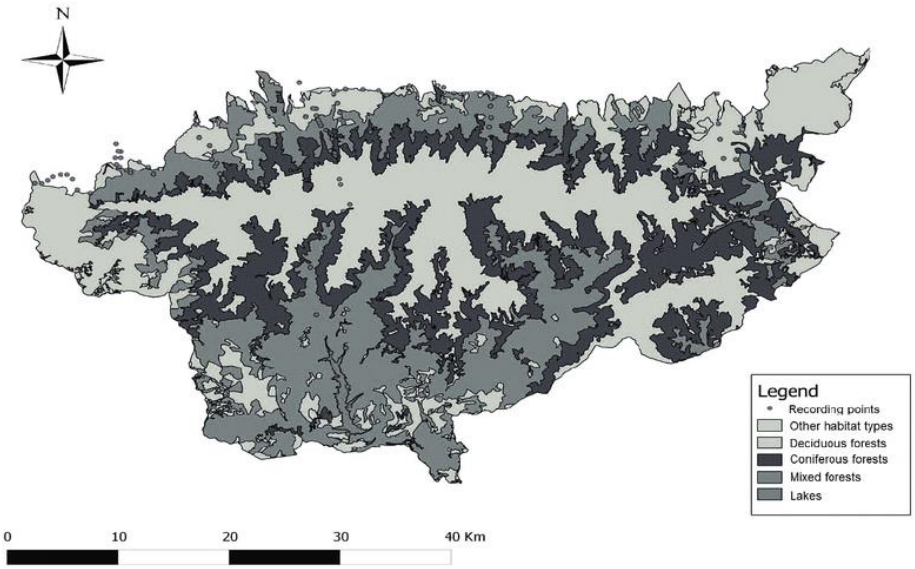


Figure 2.1. Habitat distribution map of the Făgăraș Mountains. Map design: Stoica Vasile-Alexandru and Laurian Gheorghe-SPOT Image 2007 provided by the Ministry of Environment and Forests.

Although parts of the Făgăraș Mountains mainly remain as a natural landscape, the mountain range has been impacted by human activity throughout the centuries. These activities include cattle and sheep grazing, agriculture, hunting, and forestry. In present time, the Făgăraș Mountains is divided between four counties, Arges (approximately 612,431 residents), Brașov (approximately 549,217 residents), Sibiu (approximately 397,322 residents), and a small portion of Vâlcea (approximately 371,714 residents) (Citypopulation, 2011). These counties heavily rely on livestock, agriculture, hunting, and forestry; the latter remains as a prominent economic industry (Linnell et al., 2016). In recent years new economies have started to gain momentum such as tourism and eco-tourism primarily in the Făgăraș Mountains (FCC, 2017; Linnell et al., 2016). Due to the interest in tourism and land use, as well as becoming a part of the European Union in 2007, the Romania government established two large areas in the Făgăraș Mountains to

be protected under Natura2000 (FCC, 2017; Linnell et al., 2016). In the northern parts of the Făgăraș Mountains is Piemontul Făgăraș which is a Special Protected Area (SPA), while Munti Făgăraș is a Site of Community Interest (SCI) covers the entire length and slopes of the mountain range, totaling approximately 244 ha of the protected area (Linnell et al., 2016).

2.2.2 Data Collection

Data collection occurred between September and October 2017. A quantitative questionnaire was distributed to the various hunting associations in the surrounding area of the Făgăraș Mountains. Due to the lack of trust for outsiders, the forty-one hunting associations were approached with assistance from a university professor, who is a highly regarded hunter and the president of the Brașov County hunting association. With their help, we distributed questionnaires (N=750) to the hunting population through the hunting associations. Potential participants received the questionnaire, including a cover letter explaining the purpose of the research, when applying for their wild boar (*Sus scrofa*) hunting license. By using a gatekeeper to assist in the distribution of questionnaires due to lack of trust hunters hold for outside, the potential for the gatekeeper effect could have caused bias results from the questionnaire distribution via the hunting associations for this research project. Questionnaires were completed either at their representative hunting lodges or taken home and returned to the hunting lodge at a later date. Once completed, questionnaires were returned to the hunting association in which the hunter received their license. In total, (n=512) questionnaires were collected, resulting in a 68% response rate from the (N=750) questionnaires distributed.

The questions included in the questionnaire were attitudinal and belief items. Positive attitudinal items included (1) *large carnivores have the right to exist*, (2) *large carnivores have*

the right to exist for future generations, (3) *large carnivores should be completely protected, and* (4) *it would be important to maintain the large carnivores in the Făgăraș Mountains*. Negative attitudinal items included: (1) *large carnivores are nuisance animals,* (2) *there is no benefit for having large carnivores in the Făgăraș Mountains,* (3) *large carnivores kill too many wild species, and* (4) *large carnivores kill too much livestock*. In order to analyze these responses, the 5-point Likert Scale was used ranging from strongly disagree (-2), with a neutral point neutral (0), to strongly agree (+2).

Questions relating to beliefs and acceptable management approaches were asked in various forms, such as, livestock-large carnivore relations; however, human-large carnivore interactions and hunting large carnivores questions were based only on acceptable management approaches items. Regarding livestock-large carnivore relations, three items were analyzed, two of which were based on beliefs: (1) *large carnivores cause potential damage to livestock,* (2) *large carnivores kill too much livestock,* and one based on management approach acceptability and (3) *if a large carnivore kills livestock, the large carnivore should be killed*. Four items based on acceptable management approach was asked when managing large carnivores regarding human-large carnivore interactions,*:* (1) *if a large carnivore crosses in front of a person, the large carnivore should be relocated,* (2) *if a large carnivore crosses in front of a person, the large carnivore should be killed,* (3) *if a large carnivore approaches a human, it should be killed, and* (4) *if a large carnivore attacks a human, it should be killed*. Five items related to the trophy hunting industry: (1) *hunting should be year-round,* (2) *trophy hunting should be allowed,* (3) *there should be a legal hunting season,* (4) *trophy hunting reduces game species loss, and* (5) *trophy hunting reduces livestock loss*. Similar to attitudes, the 5-point Likert Scale was used, where (-2) was strongly disagree, (-1) disagree, (0) neutral, (+1) agree, and (+2) strongly agree.

2.2.3 Potential for Conflict Index$_2$

Differences and similarities in attitudes and beliefs of hunters will be quantified and described using the Potential for Conflict Index$_2$ (PCI_2). PCI_2 is a graphic tool which illustrates descriptive statistics related to central tendency, dispersion, and form, while simultaneously measuring an accumulative amount of data (Vaske, 2008). Also, PCI_2 graphically represents the level of consensus, or potential for conflicts, among or between responses by displaying results through various bubble sizes (Engel et., 2017; Sponarski et al., 2015). PCI_2 ranges from 0 to 1, where 0 represents 100% of the responses in agreement and contains complete consensus (Engel et., 2017; Sponarski et al., 2015). If the bubble is small (PCI_2 value close to 0) then the level of consensus is high. However, if the bubble is large (PCI_2 value close to 1) then there is little consensus within the participating group(s) which represents more room for potential conflicts (Engel et al., 2017; Sponarski et al., 2015). However, a PCI_2 value of 1 represents two extreme cases when 50% is in total agreement, and 50% is in total disagreement; there is no consensus among the responses, leading to a high potential for conflict (Engel et al., 2017; Sponarski et al., 2015; Manfredo et al, 2003; Vaske et al., 2010). Once plotted on a graph, the responses in bubble form are measured along a vertical axis (Y-axis), where responses become increasingly positive further up the graph, and increasingly negative further down the graph. A horizontal line place (x-axis) in the middle of the graph represents neutral responses (Engel et al., 2017; Vaske et al., 2010).

Through this graphic approach, PCI_2 can address the potential for conflict and acceptability of various managerial issues (Engel et al., 2017; Sponarski et al., 2015; Vaske et al., 2010). To understand hunters' views about large carnivores in the Făgăraș Mountains, beliefs, and acceptable management approaches were measured, and examined through this graphic approach.

2.2.4 Data Analysis

By using the PCI_2, differences in responses were analyzed of the respondents' attitudes, beliefs, and acceptable management approaches (Vaske et al., 2010). The statistical difference (*d*) tests was used to explore differences among the PCI_2 results through a software program available on Vaske's PCI_2 website. One-way analysis of variance (ANOVA) was used to explore mean response differences between wolves, brown bears, Eurasian lynx, and wildcats across the 20 different questionnaire items. The use of effect size measured (i.e. η) compared the four species across hunters' attitudes, beliefs, and acceptable management approach towards the species. If variance could be assumed equal, Bonferroni Post-Hoc test was used, and if not assumed equal, Tamhane T2 Post-Hoc test was used.

2.3 Results

2.3.1 Sample

Ninety-nine percent of the responses were from male participants in this research project, while 1% were female participants. Since the female population in the response rate was small, both genders were combined for analysis. Hunters tend to be middle-aged or older with 33% of the sample between the ages of 35 to 44, 28% between 45 to 55, 22% between 55 to 64 years old. Only 1% of the sample included young hunters (17 to 24 years old) and less than 1% were over 75 years of age (0.6%). As this is the first quantitative Human Dimensions work done on hunters in Romania, we do not know hour our sample of hunters compares to the hunter population.

2.3.2 Attitudes toward Large Carnivores

2.3.2.1 Positive Attitudinal Items

Overall, respondents agreed with most of the variables (i.e. means above the neutral line, Figure 2.2) toward the existence of large carnivores in the Făgăraș Mountains. However, there was a change in attitudes regarding *complete protection* of these species (i.e. means below the neutral line, Figure 2.2) where respondents disagreed with this variable. Means were significantly different between the species for *existing for future generations* (p <.001), *complete protection of large carnivores* (p < .001), and *importance to maintain* these species in the mountain range (p =.021) (Table 2.1). While the means were significantly different, respondents remained mainly positive toward each species, especially toward brown bears. In other words, respondents were more positive toward brown bear existence in the Făgăraș Mountains than the other three species; however, significant differences indicated that respondents responded negativaly toward the complete protection of brown bears than other species.

Table 2.1. The results of the one-way ANOVA between the dependent variables of positive attitudes, and the independent variables, large carnivores. [a] [b]The letter superscripts denote significant differences between means based on the Bonferroni post hoc test.

Survey Item	Wolves (M)	Lynx (M)	Bears (M)	Wildcats (M)	F value	*p* value	Eta (ɳ)
Large carnivores…							
… should have the right to exist	1.73	1.79	1.76	1.79	.978	.402	0.039
…should exist for future generations	1.51[a]	1.67[a]	1.61[a]	1.07[b]	38.477	<.001	0.240
…should be completely protected	-.59[b]	-.79[b]	-1.39[b]	-.36[b]	61.675	<.001	0.297

… are important to maintain in the Făgăraș Mountains	1.47[a]	1.62[a]	1.52[a]	1.45[a]	3.260	.021	0.071

The level of consensus among respondents throughout the variable items remained strong (PCI_2 values closer to 0). For the measure that *large carnivores have the right to exist*, PCI_2 consensus was strong with values ranging from .06 to .14 (Figure 2.2) for all species. Attitudes toward Eurasian lynx and wildcats produced the strongest level of consensus in comparison to wolves and brown bears. Although respondents agreed that these species have *the right to exist for future generations*, only wolves, brown bears, and Eurasian lynx PCI_2 values indicated strong levels of consensus (PCI_2 = .07 to .12). Results relating to wildcats indicated little consensus among the hunters for having the *right to exist for future generations*. Although hunters disagreed with *completely protecting the large carnivores,* there was little consensus among the respondents regarding wolves, the Eurasian lynx, and wildcats. PCI_2 values of these species ranged from .31 to .42, portraying little consensus among the hunters. Much stronger consensus amongst hunters was found regarding brown bears (PCI_2 = .16). Indication of the *importance of maintaining large carnivores in the mountain range* resulted in agreement where PCI_2 values ranged from .14 to .19; wolves and Eurasian lynx PCI_2 values of .14, wildcats PCI_2 value of .15, and brown bears PCI_2 value of .19. Overall, respondents' attitudes indicated strong consensus regarding each

species towards each item. In comparison to the other three species, respondents held strong consensus toward brown bears regarding each item.

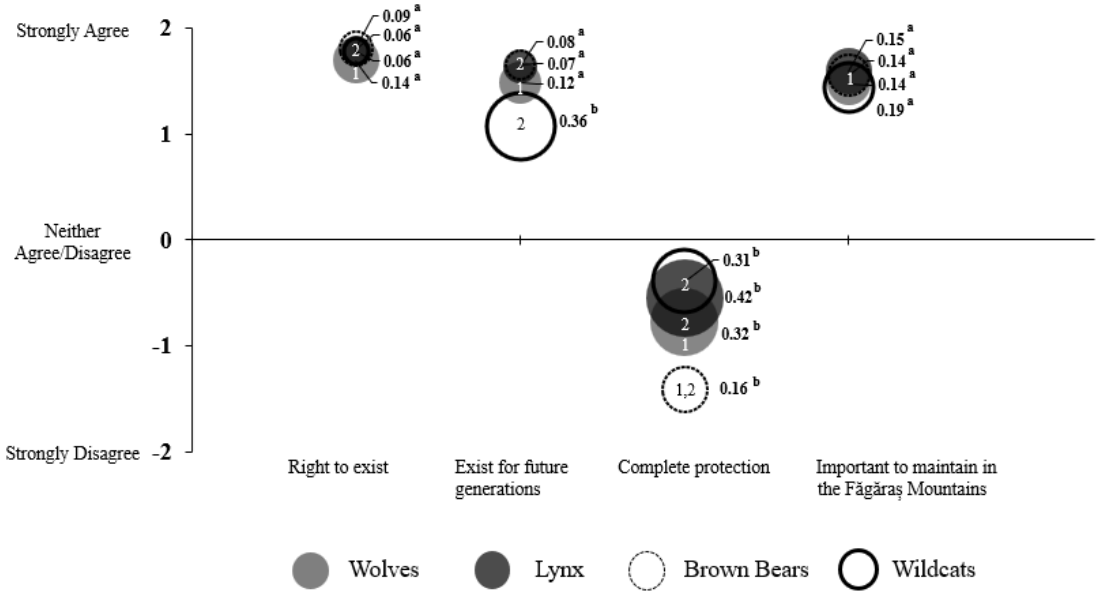


Figure 2.2. Potential for Conflict Index$_2$ (PCI$_2$) values of Romanian hunter overall responses related to positive attitudes. The superscript letters (a, b, c, d) on the PCI$_2$ represent whether there was significant difference between the means. The numbers in the bubbles (1, 2, 3) represent whether there was a significant difference in the PCI$_2$ for the four groups.

2.3.2.2. Negative Attitudinal Items

In comparison to the positive attitudinal items, overall respondents disagreed (means below the neutral line) or responded neutral (on the neutral line) to the negative attitudinal variables (Figure 3). Also, in contrast to positive attitudinal items, mean differences were significantly different (p <.001) for all four variables (Table 2.2). Three of the four variables were significantly different at p <.001, whereas large carnivores are *killing too many game species* resulted as p =.003. Although wildcats has the lowest of the means, it does not mean that the

respondents view these species more negatively than the other three species. Instead, the lower mean indicates that the respondents disagree to the items reflecting on the species. Therefore, brown bears which has the higher of the means than the other three species are viewed more negatively, except for *having no benefit in the Făgăraș Mountains*, where wolves are viewed more negatively by respondents. Due to these results, it seems that respondents have a stronger opinion about brown bears than the other three species.

Table 2.2. The results of the one-way ANOVA between the dependent variables of negative attitudes, and the independent variables, large carnivores. [a b c d]The letter superscripts denote significant differences between means based on the Bonferroni and Tamhane post hoc tests. All means except no benefit are based on the Bonferroni post hoc test.

Survey Item	Wolves (M)	Lynx (M)	Bears (M)	Wildcats (M)	F value	*p* value	Eta (ŋ)
Large carnivores are…							
… a nuisance animal	-.93^{b}	-.75^{b}	-.68^{c}	-1.19^{d}	15.782	<.001	.155
… no benefit to the Făgăraș Mountains	-1.02^{b}	-.89^{b}	-1.30^{c}	-1.18^{c}	13.831	<.001	.145
… killing too many game species	-.01^{a}	-.08^{a}	.01^{a}	-.29^{d}	4.553	.003	.084
…killing too much livestock	.01^{c}	-.50^{c}	.46^{c}	-1.24^{d}	137.101	<.001	.421

Three of the four variables indicated little PCI_2 consensus (Figure 2.3) regarding the negative attitudinal items. PCI_2 values for *large carnivores being a nuisance animals*, hunter responses toward wildcats consist of the strongest PCI_2 level of consensus (PCI_2 = .30), and responses toward wolves resulted with the weakest level of consensus (PCI_2 = .38), while the respondent results toward the Eurasian lynx indicated a PCI_2 value of .31 and brown bears at PCI_2 value of 0.37. Although responses toward wildcats held the strongest levels of PCI_2 consensus and wolves with the lowest, there were no PCI_2 significant differences between the

species. PCI_2 consensus of *killing too many wild species* ranged from values of .42 (wildcats) to .54 (brown bears); however, hunter responses toward wolves, Eurasian lynx, and brown bears resulted on the neutral line while wildcats indicate disagreement among the respondents toward this variable. Hunters disagreed that the Eurasian lynx (PCI_2 = .45) and wildcats (PCI_2 = .25) *killing too much livestock/poultry*; however, hunters responded neutral toward wolves (PCI_2 = .45) but agreed that brown bears are *killing too much livestock/poultry* (PCI_2 = .35). In contrast to the previous variables, PCI_2 values of consensus were relatively strong in disagreement that these species *have no benefits in the mountains*; respondents indicated that large carnivores do have benefits to the Făgăraș Mountains. The strongest level of PCI_2 consensus resided with the Eurasian lynx (PCI_2 = .11), whereas the weakest level of consensus resulted with the wolf (PCI_2 = .20). Overall, there was little consensus among the respondents' attitudes regarding the species and the items, except for large carnivores have no benefits in the Făgăraș Mountains where consensus were strong.

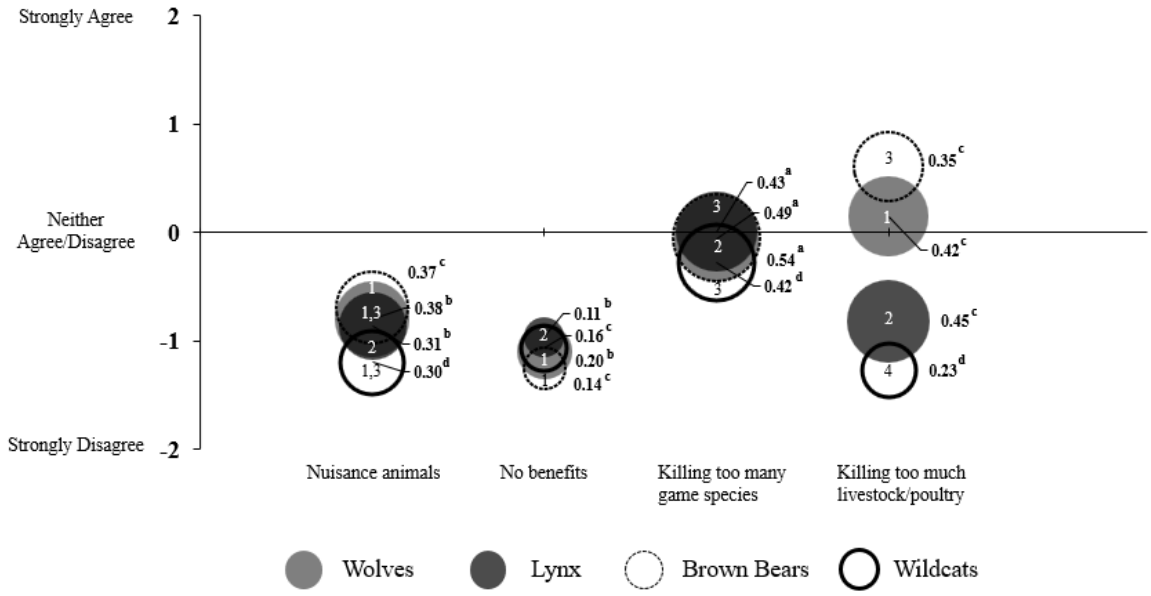


Figure 2.3. Potential for Conflict Index$_2$ (PCI$_2$) values of Romanian hunter overall responses related to negative attitudes. The superscript letters (a, b, c, d) on the PCI$_2$ represent whether there was significant difference between the means. The numbers in the bubbles (1, 2, 3) represent whether there was a significant difference in the PCI$_2$ for the four groups.

2.3.3 Beliefs and Acceptable Management Approaches

While the previous results were based on hunter attitudes, these next results are based on hunter beliefs and what management approaches hunters believe are acceptable. Three scenarios were created in order to understand hunter beliefs: 1) beliefs about livestock and large carnivore interactions, 2) human and large carnivore interactions, and 3) hunting and trophy hunting large carnivores.

2.3.3.1 Livestock and Large Carnivore Interactions

Respondent beliefs toward large carnivore-livestock interactions varied across the three variables (Figure 2.4). While beliefs about the Eurasian lynx and wildcats remained mainly in disagreement (means below the neutral line), hunter beliefs toward wolves stayed consistent along the neutral line until the final variable resulting in agreement. Responses toward brown bears remain in agreement (above the neutral line) for the three variables. Regarding mean differences, all variables indicated significant differences of $p < .001$ (Table 2.3). While significant differences were present for each of the items, respondents' responses toward their belief about large carnivore-livestock interaction fluctuated depending on the context of the item. However, similar to hunters' attitudes, respondents believe brown bear-livestock interactions are more of a problem than any other species interactions with livestock.

Table 2.3. The results of the one-way ANOVA between the dependent variables attitudes and beliefs, and the independent variables, large carnivores. [b c d]The letter superscripts denote significant differences between means based on the Bonferroni post hoc test.

Survey Item	Wolves (M)	Lynx (M)	Bears (M)	Wildcats (M)	F value	*p* value	Eta (η)
I believe large carnivores are…							
…causing potential damage to livestock	-.16[b]	-.37[c]	.30[b]	-.41[b]	20.794	<.001	.178
… killing too much livestock	.01[c]	-.50[c]	.46[c]	-1.4[d]	137.101	<.001	.421
…to be killed if the animal kills livestock	.53[d]	.21[c]	1.06[d]	.13[d]	56.544	<.001	.284

As shown in Figure 2.4, PCI_2 values varied in levels of PCI_2 consensus depending on the variable. Regarding large carnivores *causing potential damage to livestock*, PCI_2 values indicated

little consensus amongst hunter responses toward the species. The strongest of the consensus for this item was toward the Eurasian lynx ($PCI_2 = 0.49$) while the least amount of consensus was toward the wildcat ($PCI_2 = 0.62$); however, respondents indicated disagreement toward these two species. Responses toward wolves resulted with a PCI_2 value of 0.54 with hunters responding neutral toward the species, while hunters showed agreement for brown bears causing potential damage ($PCI_2 = 0.50$). Although there was little consensus, PCI_2 values for large carnivore *killing too much livestock* was much stronger than the results in the previous variable (PCI_2 values from .23 to .45). Similar to the previous item, the PCI_2 level of consensus for the Eurasian lynx ($PCI_2 = .45$) and wildcats ($PCI_2 = .23$) indicated disagreement among the respondents, while responses toward wolves ($PCI_2 = .42$) were neutral and agreement toward brown bears ($PCI_2 = .35$). In contrast, wolves, once again, the strongest level of PCI_2 values of 0.19, followed by brown bears ($PCI_2 = 0.20$) for the final variable of *if a large carnivore kills livestock, the animal should be killed*. Both species resulted in agreement among the hunters, while the Eurasian lynx and wildcat resulted on the neutral line with little consensus (PCI_2 values ranging from 0.45 for Eurasian lynx and 0.47 for wildcats). The overall level of consensus, as in which species held stronger or weaker consensus by the respondents fluctuated. The level of consensus for causing potential damage to livestock was the strongest toward the Eurasian lynx in comparison to the other species. Respondents held stronger consensus levels toward wildcats than wolves, the Eurasian lynx, and brown bears regarding killing too much livestock or poultry. Wolves resulted in the strongest level of PCI_2 consensus by the respondents regarding if the animal kills livestock of poultry, it should be killed.

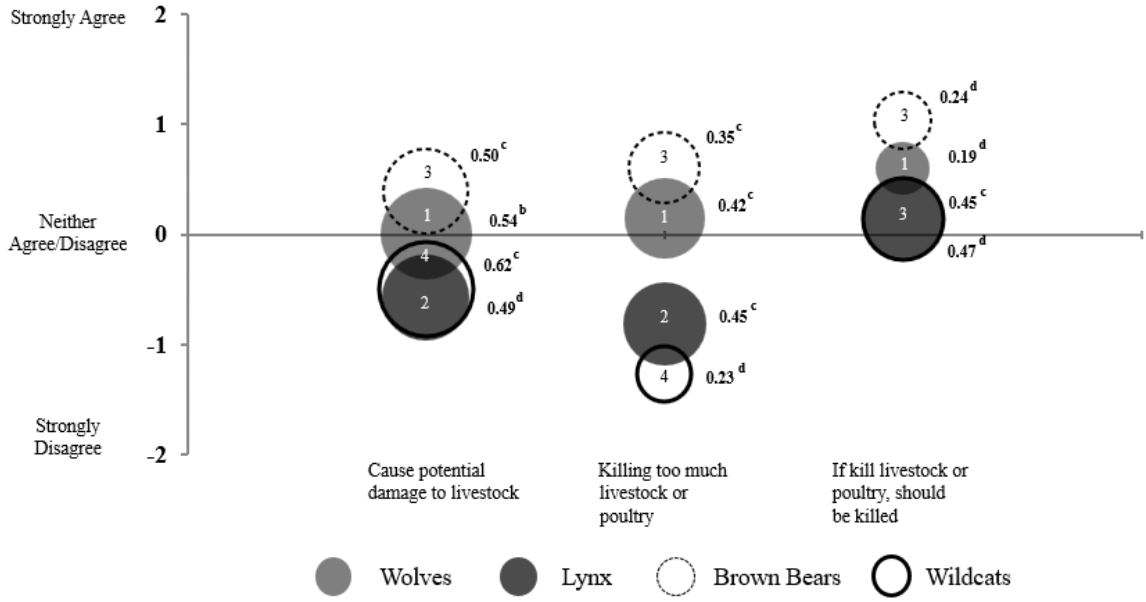


Figure 2.4. Potential for Conflict Index$_2$ (PCI_2) values of Romanian hunter overall responses related to attitudes and beliefs toward large carnivores-livestock interactions. The superscript letters (a, b, c, d) on the PCI_2 represent whether there was significant difference between the means. The numbers in the bubbles (1, 2, 3) represent whether there was a significant difference in the PCI_2 for the four groups.

2.3.3.2 Human and Large Carnivore Interactions

For this section, variables were only towards wolves, Eurasian lynx, and brown bears since these species can pose a direct threat toward humans. Respondents disagreed with the first three variables for all species, while the last variable indicated agreement. Regarding mean differences, it was not until the last variable, *if a large carnivore attacks a person, the animal should be killed*, that there was indication of significant difference where $p < .001$ (Table 2.4). Regarding which species is more on the respondents' radar, once again it is the brown bear where respondents believe this species should be killed if it attacks a person more so than wolves or the Eurasian lynx.

Table 2.4. Table The results of the one-way ANOVA between the dependent variables beliefs, and the independent variables, large carnivores. [b] [c]The letter superscripts denote significant differences between means based on the Bonferroni post hoc test.

Survey Item	Wolves (M)	Lynx (M)	Bears (M)	Wildcats (M)	F value	*p* value	Eta (η)
I believe if a large carnivores…							
… crosses in front of a person, it should be relocated	-1.40	-1.44	-1.42	N/A	.144	.866	.014
… crosses in front of a person, it should be killed	-1.44	-1.51	-1.47	N/A	.573	.564	.028
… approaches a person, it should be killed	-1.04	-1.19	-1.01	N/A	2.314	.099	.056
… attacks a person, it should be killed	1.24[b]	.92[c]	1.41[b]	N/A	17.074	<.001	.152

The level of PCI_2 consensus for the first two variables result in fairly strong consensus, while the following variables indicated little consensus among the respondents (Figure 2.5). In the first two variables, *if a large carnivore crosses in front of a person, the animal should be relocated or killed*, level of consensus remains fairly similar, where the Eurasian lynx PCI_2 values remain the strongest (relocate PCI_2 = .21; kill PCI_2 = .19). Hunter responses toward the belief of relocating wolves and brown bears resulted in PCI_2 values of .24 but resulted in a PCI_2 value of .22 toward wolves and .23 toward brown bears regarding the species to be killed. Levels of consensus became less for the variable of *killing a large carnivore if it approaches a person*, however, respondents stayed in disagreement. PCI_2 values indicated a stronger level of consensus for the Eurasian lynx (PCI_2 = 0.41) in comparison to wolves (PCI_2 = 0.48) and brown bears (PCI_2 = 0.43). In contrast, *if a large carnivore attacks a person, the animal should be killed* resulted in agreement for all species; however, this agreement resulted in a range of PCI_2 consensus levels.

Considering the Eurasian lynx consensus, PCI_2 value equaled to .48, indicating little consensus among the respondents. Wolves PCI_2 values as well indicated little consensus among the respondents (PCI_2 = .38), whereas responses toward brown bears were strong in levels of consensus (PCI_2 = .19). While the level of consensus toward the Eurasian lynx remains strong for the first three statements, the final statement indicates a strong level of PCI_2 consensus toward the brown bear whereas the Eurasian lynx consisted of the weakest level of consensus among the respondents.

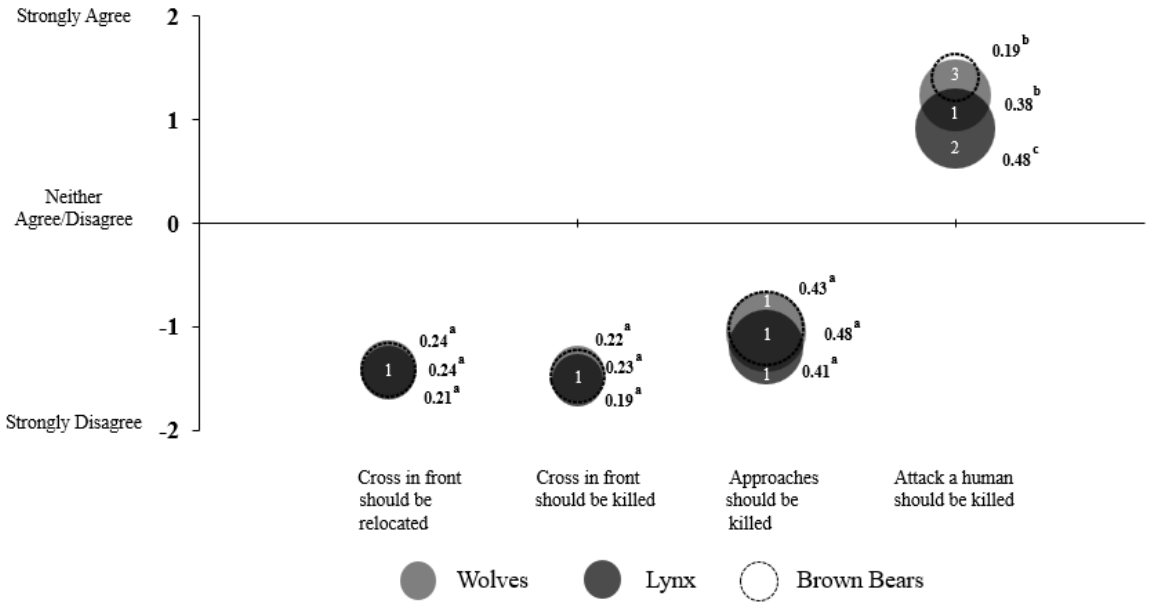


Figure 2.5. Potential for Conflict Index$_2$ (PCI_2) values of Romanian hunter overall responses related to beliefs toward human-large carnivore interactions. The superscript letters (a, b, c, d) on the PCI_2 represent whether there was significant difference between the means. The numbers in the bubbles (1, 2, 3) represent whether there was a significant difference in the PCI_2 for the three groups.

2.3.3.3 Hunting and Trophy Hunting Large Carnivores

In comparison to the previous items, respondents' agreement (above the neutral line) or disagreement (below the neutral line) fluctuated dramatically in response to this item depending

on the variable and the species. While respondents mainly agreed with each variable toward brown bears, wolves fluctuated from the neutral to agreement. Responses toward the Eurasian lynx and wildcats, however, ranged from disagreement to agreement. Mean differences of species indicated significant differences for the first three variables: (1) …*there should be hunting year-round*, (2)…*trophy hunting should be allowed*, and (3)…*there should be a legal hunting season*, all resulting in $p < .001$ (Table 2.5), whereas the latter two variables showed no significant differences. Overall, respondents responded all items positively toward the items regarding brown bears in comparison to the other three species. Respondents agreed that brown bears *should be hunted year-round, allowed to trophy hunt the species*, and *trophy hunting reduces game species and livestock losses* caused by brown bears.

Table 2.5. The results of the one-way ANOVA between the dependent variables beliefs, and the independent variables, large carnivores. [b c d]The letter superscripts denote significant differences between means based on the Bonferroni and Tamhane post hoc t tests. All variables except trophy hunting should be allowed are based on the Bonferroni post hoc test.

Survey Item	Wolves (M)	Lynx (M)	Bears (M)	Wildcats (M)	F value	*p* value	Eta (η)
I believe…							
… there should be hunting year-round	-.04[c]	-.52[d]	.25[d]	-.64[c]	39.694	<.001	.242
… trophy hunting should be allowed	1.09[b]	1.18[b]	1.31[b]	.89[d]	13.634	<.001	.144
… there should be a legal hunting season	1.60[d]	1.44[b]	1.69[c]	1.43[c]	8.946	<.001	.118
… trophy hunting reduces game species loss	.18	.24	.34	.22	.980	.401	.039
… trophy hunting reduces livestock loss	.66	.67	.69	.59	.311	.817	.025

PCI_2 levels of consensus also indicated fluctuation depending on the variables and species (Figure 2.6). Regarding the first variable of *hunting large carnivores year-round*, respondents disagreed with this variable toward the Eurasian lynx and wildcats, but with little consensus (Eurasian lynx $PCI_2 = .46$; wildcats $PCI_2 = .48$). Respondents also demonstrated a low level of PCI_2 consensus ($PCI_2 = .52$) toward brown bears, however, respondents agreed that this species should be hunted year-round. With low PCI_2 consensus ($PCI_2 = .36$), hunting year-round for wolves resulted on the neutral line; however, responses toward wolves contained a stronger level of consensus in comparison to the previous three species. When asked whether trophy hunting should be allowed and there should be a legal hunting season for large carnivores, respondents agreed to these variables for all four species. In both variables the responses toward Eurasian lynx resulted with the lowest PCI_2 values than the other three species (*trophy hunting should be allowed* $PCI_2 = .18$; *legal hunting season* $PCI_2 = .21$). In contrast, responses toward brown bears had the strongest PCI_2 level of consensus for the two variables where PCI_2 values equaled the same for both ($PCI_2 = .07$). Regarding wolves and wildcats, responses toward wolves resulted in a stronger PCI_2 value than wildcats for *trophy hunting should be allowed* (wolves $PCI_2 = .12$; wildcats $PCI_2 = .14$), whereas responses toward wildcats resulted in a stronger PCI_2 value for there *should be a legal hunting season* (wolves $PCI_2 = .19$; wildcats $PCI_2 = .14$). Regarding the item of *trophy hunting reduces game species loss*, there is very little PCI_2 level of consensus for all species. Also, the species either fall on the neutral line or hover above the line. Wolves, responses rest on the neutral line, resulted in little PCI_2 consensus with a value of .61. The responses toward Eurasian lynx and wildcats hover the line where both species are remarkably close in PCI_2 values (Eurasian lynx $PCI_2 = .53$; wildcats $PCI_2 = .52$). Also hovering above the neutral line, responses toward brown bears PCI_2 level of consensus was the strongest of the four species, but still consisted with little consensus ($PCI_2 = .43$). For the last variable that *trophy*

hunting reduces livestock loss, only wolves, the Eurasian lynx, and brown bears were examined. While responses toward wolves and the Eurasian lynx indicated little consensus (wolves PCI_2 = .47; Eurasian lynx PCI_2 = .51) among the respondents, the responses toward Eurasian lynx rests on the neutral line while results toward wolves show agreement among the respondents. Brown bears, however, show strong PCI_2 level of consensus (PCI_2 = .11) and agreement among the respondents. Although the level of consensus among the respondents did not continuously stayed strong toward brown bears, the consensus did indicate that brown bears held the strongest level consensus by the hunters for four or the five items.

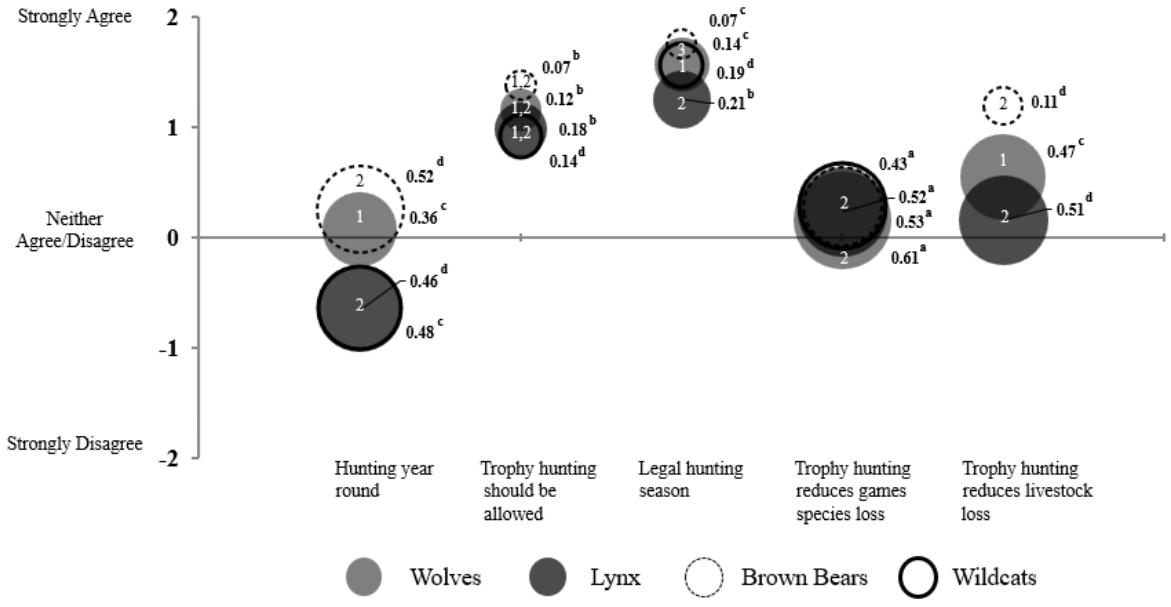


Figure 2.6. Potential for Conflict Index$_2$ (PCI_2) values of Romanian hunter overall responses related to hunting and trophy hunting beliefs. The superscript letters (a, b, c, d) on the PCI_2 represent whether there was significant difference between the means. The numbers in the bubbles (1, 2, 3) represent whether there was a significant difference in the PCI_2 for the four groups.

2.4 Discussion

The presence of large carnivores in Romania compared to the lack of large carnivores in many parts of Europe is partly attributed to the continuing positive attitudes of the hunting community toward large carnivores. Although the recent trophy hunting ban caused tension between hunter and large carnivores, these tensions are more specifically between hunters and environmental organizations and the Ministry of Environment. In comparison to other parts of Europe, where attitudes are mainly negative as rural residents struggle to adapt to the return of large carnivores to landscapes, we have found a supportive hunting population for all large carnivores.

Not all large carnivores are viewed the same by hunters. Hunters view brown bears negatively due to the increasing numbers of the species and causing potential damage toward livestock. This species was once valued highly where hunters gained economic income through the recreational sport of trophy hunting. When comparing the results of brown bears and wolves to the Eurasian lynx and wildcats, respondents were more positive towards the two latter species than of brown bears and wolves. This could be due to brown bear and wolf interactions with humans are more common than human interactions with the Eurasian lynx and wildcats. These interactions with brown bears and wolves are usually negative. Also, there is a lack of knowledge about the Eurasian lynx and wildcats among the Romanian hunters such as both feline bite marks, tracks, and overall interaction with livestock. This lack of knowledge could be a reason for such positive attitudes toward the species in comparison to brown bears and wolves. Similar positive attitudes toward lynx have been documented in Poland, another part of Eastern Europe (Bath et al., 2008). Such positive attitudes were linked to not living or interacting (livestock predation) with lynx on a daily basis like the farmers (Bath et al., 2008). Wolves, like in so many parts of the world, remain plagued by negative stereotypes of the serial killer damaging game species.

Consistent with numerous European studies (Bjerk et al., 2000; Ecrisson and Heberlein, 2003; Ericsson et al., 2008; Karlsson and Sjöström, 2007) attitudes toward wolves remain negative.

Romanian hunters' attitudes, beliefs, and acceptability of various management options toward large carnivores varied across context (existence value, livestock, human interaction, hunting, etc.). While hunters' attitudes remained mainly positive toward the existence of large carnivores in the Făgăraș Mountains, attitudes altered toward being more negative when variables were related towards the complete protection of the species, and the species interactions with game species and livestock. The reasoning for such change could be that hunters appreciate and understand that large carnivores are key to equilibrium in the mountainous region ecosystem. With the knowledge of the landscape that can aid wildlife managers in achieving conservation goals, throughout various parts of the world, hunters are thought as conservationists for wildlife (Paulson, 2012; U.S. Fish and Wildlife Service, 2018). Perhaps this is even more the case in Romania where, until recently, hunters played an active role in wildlife management. Hunters continue to feel responsible in Romania to manage large carnivores, especially when large carnivores are having impacts on other wildlife species and the livelihoods of the rural residents. Changes of attitudes mainly related to wolves and brown bears. Similar alterations of attitudes have been documented in Norway (Karlsson and Sjöström, 2007), where attitudes changed depending on direct and indirect experiences individuals had with wolves, as well as location. Heberlein and Ericsson (2005) suggested urban dwellers with no connection to rural areas tend to hold a negative attitude towards wolves, but those who do have rural experiences (from or have family members in a rural community) have more of a positive attitude toward wolves. In comparison to the North American setting, this seems quite reverse; in North America, rural dwellers tend to express negative attitudes toward wolves while urban dwellers express positive attitudes (Agarwala et al., 2010; Schanning, 2009). Reflecting on hunters' attitudes about the

existence of large carnivores in the Făgăraș Mountains, many hunters live in, are from, or have family members living in rural communities. In our study, hunters tend to have a connection to nature and wildlife which could be the possible reason for this group to hold positive attitudes toward all large carnivores in terms of believing all species have a right to exit in the Făgăraș Mountains.

Such existence values do not always exist amongst hunters nor the general public. For example, in Newfoundland and Labrador, Canada, attitudes toward coyotes, a smaller canid, are extremely negative where most believe that animal has no right to exist (Sutherland, 2010). In contrast, some European countries seem to be more willing to coexist with large carnivores demonstrated by holding strong existence values (Bisi et al., 2007).

Regarding Romanian hunters' beliefs in comparison to their attitudes, their beliefs on management seem to be context related; beliefs regarding managing livestock predation, acceptable invasive management, and hunting and trophy hunting varied. Romanian hunters have always been seen by the agriculture and livestock community as the managers of wildlife (Salvatori et al., 2002). Unsurprisingly, based on the historical role of hunters in Romanian society, the support to kill any of the four large carnivore species if these species were to kill livestock was present. That being said, not all large carnivores are seen equally by hunters. Hunters are more readily accepting of killing wolves and brown bears than the Eurasian lynx or wildcats. This could potentially be due to hunters' experiences with wolves and brown bears preying upon livestock more so than predation by Eurasian lynx and wildcats. There are few Eurasian lynx residing in the mountain range, which could translate into less conflicts. Wildcats are much smaller than the other three species, so it very unlikely the species would attack or kill cattle, sheep, and pigs. Chickens, however, is a possibility. Also, when livestock owners report about loss of livestock, they put blame on wolves or brown bears than the other two species (O.

Ionescu, personal communication, August 2, 2018) because of previous events and more knowledge about these two species than of the Eurasian lynx and wildcats. In the context of acceptable invasive management options, hunters believed the large carnivores should not be relocated or killed just because it is in sight or approaching a person. The results of Romanian hunters acceptability of large carnivores residing in the mountain region were similar to those found in rural areas of Brazil (Engel et al., 2017), where residents did not believe the large carnivores (jaguars and pumas) should be killed if the animal is in close proximity to residential areas. However, not all groups believe in such. In the Argentine Chaco, residents hold a negative attitude and fear jaguars (Altrichter et al., 2006), whereas in the Brazilian Pantanal value the existence of the species (Porfirio et al., 2016). If comparing our results of large carnivores in Romania to results in other countries, the change in attitudes and beliefs are based on context, species, and location. Humans may have positive attitudes toward certain large carnivores but may hold negative beliefs toward that species depending on the context (livestock, human interaction, policies, etc.) and location (local, regional, national, international).

The debate on trophy hunting continues worldwide with advocates pointing to parts of Africa that allow trophy hunting as having populations that are stable or increasing (e.g. Tanzania) (Nelson, 2009) compared to countries who continue to ban trophy hunting, but watch populations continue to decline (e.g. Kenya) (Hazzah et al., 2014). Whether allowing hunting promotes stronger tolerance to wildlife livestock damages and builds large carnivore acceptance remains a topic for further research (Inskip et al., 2016; Treves and Bruskotter, 2014). Economic arguments often are used with advocates stating large numbers while those against trophy hunting claim monies do not make it to local people where the need is greatest and the potential of poaching potentially could be higher. In Tanzania, this recreational sport generates approximately 30 million USD in national annual income (Barnett and Patterson, 2006; Nelson, 2009), using this

sport as a way to manage problematic animals (Lamarque et al., 2009). In contrast, this debate has not occurred in the discussion of hunting in Europe until the announcement of the Romanian government banning the trophy hunting of large carnivores in the country. Before the ban, similar uses of trophy hunting as a way to manage large carnivores established a multi-million euro industry in Romania (Dale-Harris, 2016). Since hunting large carnivores for food was not in demand, this management approach was purely for economic revenue (Enescu and Aureliu-Florin, 2017). Romanian hunters are concerned that the ban on trophy hunting may lead rural residents to take matters into their own hands to solve problems. With the strong views of wanting to see a return to trophy hunting, in Romania this activity may be a reason why attitudes to large carnivores remain generally positive but perhaps changing. Our study occurred two years after the ban, so may be documenting a shift to more negative views. Thus, we strongly encourage the longitudinal monitoring of these views through future research on hunters' attitudes and beliefs toward large carnivores.

The Făgăraș Mountains is going through change. A proposal to create the Făgăraș Mountains into a national park, for conservation and biological efforts, spearheaded by environmental NGOs (FCC, 2017) could further restrict hunting which could lead to creating increasing levels of negative attitudes within the hunting community. While a park could create an area to effectively raise more wildlife for hunters outside, it may take strong communication efforts for the hunting community to believe this will occur. Currently, there is little trust between the hunting community and NGOs for various of reasons. For example, the hunters blame the NGOs along with the Romanian government for banning large carnivore trophy hunting. With the role of responsibility for managing these species taken from their hands, hunters are under pressure for changing their approach of large carnivore management.

2.5 References

Agarwala, M., Kumar, S., Treves, A. & Naughton-Treves, L. (2010). Paying for wolves in Solapur, India and Wisconsin, USA: comparing compensation rules and practice to understand the goals and politics of wolf conservation. *Biological Conservation, 143*(2010), 2945-2955.

Ajzen, I. (2001). Nature and operation of attitudes. *Annual Reviews of Psychology, 53,* 27-58.

Ajzen, I. & Fishbein, M. (2000). Attitudes and the attitude-behavior relation: reasoned and automatic processes. In W. Stroebe & M. Hewstone (Eds) *European Review of Social Psychology*. Chichester, England: Wiley.

Altrichter, M., Boaglio, G. & Perovic, P. (2006). The decline of jaguars *Panthera once* in the Argentine Chaco. *Oryx, 40,* 302-309.

Barnett, R. & Patterson, C. (2006). *Sport hunting in the Southern African Development Community (SADC) region: An overview.* Johannesburg: TRAFFIC East/Southern Africa.

Bath, A., Olszanska, A., & Okarma, H. (2008). From a human dimensions perspective, the unknown large carnivore: Public attitudes towards Eurasian lynx in Poland. *Human Dimensions of Wildlife, 13(1),* 31-46.

Bath, A. J. & Majić, A. (2000). Human dimensions in wolf management in Savoie and Des Alpes Maritimes, France: Results targeted toward designing a more effective communication campaign and building better public awareness materials. *Report by Large Carnivore Initiative for Europe*, 1-142.

Bisi, J., Kurki, S., Svensberg, M. & Liukkonen, T. (2007). Human dimensions of wolf (*Canis lupus*) conflicts in Finland. *European Journal of Wildlife Research, 53*(4), 304-314.

Bjerke, T., Ødegådstuen, T. S. & Kaltenborn, B. P. (1998). Attitudes toward animals among Norwegian adolescents. *Anthrozoos, 11*(4), 227-235.

Bjerk, T., Vittersø J. & Kaltenborn, B. P. (2000). Locus of control and attitudes toward large carnivores. *Psychological Reports,* 86, 37-46.

Boitani, L. & Linnell, J. D. C. (2015). Bringing large mammals back: Large carnivores in Europe. In Perira, H. M. & Navarro, L. M. (Eds) *Rewilding European landscapes*. Springer, Cham, pp. 67-84.

Citypopulation, (2011). Romania. Retrieved from https://www.citypopulation.de/Romania.html

Creel and Rotella, (2010). Meta-analysis of relationships between human offtake, total mortality and population dynamics of gray wolves (*Canis lupus*). *PLos ONE, 5*(9), 1-7.

Dale-Harris, L. (2016). Romania bans trophy hunting of brown bears, wolves, lynx, and wild cats. *The Guardian*. Retrieved from https://www.theguardian.com/environment/2016/oct/05/romania-bans-trophy-hunting-of-brown-bears-wolves-lynx-and-wild-cats

Dorresteijn, I., Milcu, A. I., Leventon, J., Hanspach, J. & Fischer, J. (2016). Social factors mediating human-carnivore coexistence: Understanding thematic strand influencing coexistence in Central Romania. *Ambio, 45*(4), 490-500.

Dressel, S., Sandström., C. & Ericsson, G. (2014). A meta-analysis of studies on attitudes toward bears and wolves across Europe 1976-2012. *Conservation Biology, 29*(2), 565-574.

Eagly, A. H. & Chaiken, S. (1993). *The psychology of attitudes*. Orlando, Florida, USA: Harcourt Brace Jovanovich College Publishers.

Eeden, (2017). Managing conflict between large carnivores and livestock. *Conservation Biology, 32*(1), 26-34.

Enescu, C. M. & Aureliu-Florin, H. (2017). The economic contribution of hunting products to the turnover of the forestry units in Romania. *Agriculture & Forestry, 6*(3), 147-153.

Engel, M. T., Vaske, J. J., Bath, A. J. & Marchini, S. (2017). Attitudes toward jaguars and pumas and the acceptability of killing big bcats in the Brazilian Atlantic Forest: An application of the Potential for Conflict Index2. *Ambio, 46* (5), 604-612.

Ericsson, G. & Heberlin, T. (2003). Attitudes of hunters, locals, and the general public in Sweden now that the wolves are back. *Biological Conservation, 111*(2), 149-159.

Ericsson, G., Bostedt, G. & Kindberg, J. (2008). Wolves as a symbol for people's willingness to pay for large carnivore conservation. *Society and Natural Resources, 21*, 1-16.

Eriksson, M., Sandström, C. & Ericsson, G. (2015). Direct experience and attitude change toward bears and wolves. *Wildlife Biology, 21*, 131-137.

EU, (2013). Status, management and distribution of large carnivore-bear, lynx, wolf & wolverine – in Europe. Retrieved from http://www2.nina.no/lcie_new/pdf/635010989996563545_2013_03_25_Updated%20status%20of%20LC%20in%20Europe_Part1.pdf

FCC, (2017). VCA Proposal. *Carpathia European Wilderness Reserve*. Retrieved from http://www.earthmind.org/sites/default/files/2017-09-VCA-CarpathiaWildeerness-Proposal_0.pdf

Fishbein, M. & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.

Fritts, S., Stephenson, R., Hayes, R. & Boitani, L. (2003). *Wolves and humans*. In Mech D. & Boitani, L. (Eds) Wolves: behavior, ecology, and conservation. University of Chicago Press, Chicago.

Fulton, D. C., Manfredo, M. J., & Limpscomb, J. (1996). Wildlife value orientation: A conceptual and measurement approach. *Human Dimensions of Wildlife, 1(2),* 24-47.

Garshelis, D. L. (2002). Misconceptions, ironies, and uncertainties regarding trends in bear populations: Invited paper. *Ursus, 13*(2002), 321-334.

Gippoliti, S., Brito, D., Cerfolli, F., Franco, D., Kryštufek, B. & Battisti, C. (2017). Europe as a model for large carnivores conservation: Is the glass half empty or half full? *Journal for Natural Conservation, 41,* 73-78.

Gittleman, J. I., Funk, S. M., Macdonald, D. & Wayne, R. K. (2001). *Carnivore Conservation*. Cambridge, UK: Cambridge University Press.

Glikman, J. A., Vaske, J. J., Bath, A. J., Ciucci, P. & Boitani, L. (2012). Residents' support for wolf and bear conservation: the moderating influence of knowledge. *European Journal of Wildlife Research, 58*(1), 295-302.

Hazzah, L., Dolrenry, S., Naughton, L….Frank, L. (2014). Efficacy of two lion conservation programs in Maasailand, Kenya. *Conservation Biology, 00*(0), 1-10.

Heberlein, T. A. & Ericsson, G. (2005). Ties to the countryside: Accounting for urbanites attitudes toward hunting, wolves, and wildlife. *Human Dimension of Wildlife: An International Journal, 10*(3), 213-227.

Heel, B. F. van, Boerboom, A. M., Fliervoet, J. M., Lenders, H. J. R. & Born, R. J. G. van den. (2017). Analysing stakeholders' perceptions of wolfe, lynx and fox in Dutch riverine area. *Biodiversity Conservation, 26,* 1723-1743.

Hermann, N., Voß, C. & Menzel, S. (2012). Wildlife value orientations as predicting factors in support of reintroducing bison and of wolves migrating to Germany. *Journal for Nature Conservation, 21,* 125-132

Hillman, V. (2014). Video: Wild Cats of the forest. *National Geographic*. Retrieved from https://blog.nationalgeographic.org/2014/01/27/video-wild-cats-of-the-forest/

Inskip, C. & Zimmermann, A. (2009). Cattle depredation by puma (*Puma concolor*) and jaguar (*Panthera onca)* in Central-Western Brazil. *Biological Conservation, 141,* 118-125.

Inskip, C., Carter, N., Riley, S., Roberts, T. & MacMillan, D. (2016). Toward human-carnivore coexistence: Understanding tolerance for tigers in Bangladesh. *PLoS ONE, 11*(1), 1-20.

Iordăchescu, G., Vasile, M., Barbu, R. & Promberger, C. (2016). The socio-economic context of the communities neighbouring the Făgăraș Mountains. *Synthetic Report,* 1-77.

IUCN. (2019). Wild Cat. *IUCN Red List*. Retrieved from https://www.iucnredlist.org/species/60354712/50652361

Jacobs, M. H., Vaske, J. J., Dubois, S. & Fehres, P. (2014). More than fear: Role of emotions in acceptability of lethal control of wolves. *European Journal of Wildlife Research, 60*(4), 589-598.

Jørgensen, D. (2011). What's history got to do with it? A response to Seddon's definition of reintroduction. *Restoration ecology, 19*(6), 705-708.

Kaczensky, P., Blazic, M. & Gossow, H. (2003). Public attitudes toward brown bears (*Ursus arctos*) in Slovenia. *Biological Conservation, 118*(2004), 661-674.

Karlsson, J. & Sjöström, M. (2007). Human attitudes towards wolves, a matter of distance. *Biological Conservation, 137*(4), 610-616.

Kelemen, A. & Șelaru N. (N. d.). The Evolulation and the Management of Large Carnivores from the Hunterțs Perspective in Romania. Retrieved from http://ec.europa.eu/environment/nature/conservation/species/carnivores/pdf/18_Kelemen_LC_Romania%20_Hunters_Perspective.pdf

Kellert, S. R., Black, M., Rush, C. R. & Bath. A. J. (1996). Human culture and large carnivore conservation in North America. *European Journal of Wildlife Research, 58*(1), 295-302.

Kleijn, D., Kohler, F., Báldi, A.,…Verhulst, J. (2009). On the relationship between farmland biodiversity and land-use intensity in Europe. *Proc Biol Sci, 276*(1658), 903-909.

Lamarque, F., Anderson, J., Fergusson, R., Lagrange, M., Osei-Owusu, Y. & Bakker, L. (2009). *Human-wildlife conflict in Africa: Causes, consequences and management strategies*. Rome, Italy: Food and Agriculture Organization of the United Nations.

Lescureux, N. & Linnell, J. D. C. (2013). The effect of rapid social changes during post-communist transition on perceptions of the human-wolf relationships in Macedonia and Kyrgyzstan. *Pastoralism: Research, Policy and Practice, 3*(4), 1-20.

Linnell, J. D. C., Odden, J., Smith, M. E., Aanes, R. & Swenson, J. E. (1999). Large carnivores that kill livestock: Do “Problem Individuals” really exist? *Wildlife Society Bulletin, 27*(3), 698-705.

Linnell, J. D. C., Kaltenborn, B., Bredin, Y. & Gjershaug, J. O. (2016). Biodiversity assessment of the Făgăraș Mountains, Romania. *NINA Report 1236*.

Lövenhaft, K., Runborg, S. & Sjögren-Gulve, P. (2004). Biotope patterns and amphibian distribution as assessment tolls in urban landscape planning. *Landscape and Urban Planning, 68,* 403-427.

Majić, A. & Bath, A. J. (2010). Changes in attitudes toward wolves in Croatia. *Biological Conservation, 143*(1), 255-260.

Manfredo, M., Tee, T. & Bright, A. (2003).Why are public values toward wildlife changing? *Human Dimensions of Wildlife, 8*(4), 287-306.

Miller, S. M., Miller, S. D. & McCollum, D. W. (1998) Attitudes toward and Relative Value of Alaskan Brown and Black Bears to Resident voters, Resident hunters, and Nonresident Hunters. *Ursus, 10,* 357-376.Kaltne

Mykrä, S., Pohja- Mykrä, M. & Vuorisalo, T. (2017). Hunters' attitudes matter: diverging bear and wolf population trajectories in Finland in the late nineteenth century and today. *European Journal of Wildlife Research, 63*(76), 1-13.

Nelson, F. (2009). Developing payments for ecosystems to carnivore conservation. *Human Dimensions of Wildlife, 14*(6), 381-392.

Paulson, N. (2012). The place of hunters in global conservation advocacy. *Conservation and Society, 10*(1), 53-62.

Pohja-Mykrä, M. (2016). Felony or act of justice?-Illegal killing of large carnivores as defiance of authorities. *Journal of Rural Studies, 44,* 46-54.

Porfirio, G., Sarmento, P., Leal, S. & Fonseca, C. (2016). How is the jaguar *Panthera onca* perceived by local communities along the Paraguai river in the Brazilian Pantanal? *Oryx, 50,* 163-168.

Ripple, W. J., Estes, J. A., Beschta, R. L.,…Wirsing, A. J.. (2014). Status and ecolocial effects of the world's largest carnivores. *Science, 343*(6167), 151-162.

Rotar, A., Simon, L., Urdea, P. & Mircea, V. (2012). A study of institutional stakeholders' views on biodiversity in Romania. *Carpathian Journal of Earth and Environmental Sciences, 7*(2), 219-230.

Salvatori, V., Okarma, H., Ionescu, O., Dovhanych, Y., Findo'o, S. & Boitani, L. (2002). Hunting legislation in the Carpathian Mountains: Implications for the conservation and management of large carnivores. *Wildlife Biology, 8*(1), 3-10.

Shanning, K. (2009). Human Dimension: public opinion research concerning wolves in the Great Lake States of Michian, Minnesota, and Wisconsin. In E. Heske, T. R. Deelan & A. R. Wydeven (Eds) *Recovery of gray wolves in the Great Lakes region of the United States* (pp 251-261). New York, NY: Springer.

Sijtsma, M. T. J., Vaske, J. J. & Jacobs, M. H. (2012). Acceptability of lethal control of wildlife that damage agriculture in the Netherlands. *Society and Natural Resources, 25*, 1308-1323.

Skogen, K. (2001). Who's afraid of the big bad wolf? Young people's responses to the conflicts over large carnivores in eastern Norway. *Rural Sociology, 66,* 203-226.

Skogen, K. & Krange, O. (2003). A wolf at the gate: The anti-carnivore alliance and the symbolic construction of community. *Sociologia Ruralis, 43,* 309-325.

Sponarski, C. C., Semeniuk, C., Glikman, J. A., Bath, A. J. & Musiani, M. (2013). Heterogeneity among rural resident attitudes toward wolves. *Human Dimensions of Wildlife, 18*(4), 239-248.

Sponarski, C. C., Vaske, J. J. & Bath, A. J. (2015). The role of cognitions and emotions in human-coyote interactions. *Humans Dimensions of Wildlife, 20*(3), 238-254.

Sutherland, M. B. (2010). Human dimensions of black bears, caribou and coyotes on the island portion of Newfoundland and Labrador (Unpublished master thesis). Memorial University of Newfoundland, Newfoundland, Canada.

Thirgood, S., Woodroffe, R. & Rabinowitz, A. (2005). The impact of human-wildlife conflict on human lives and livelihoods. In R. Woodroffe, S. Thirgood, and A. Rabinowitz (Eds) *People and wildlife, conflict or co-existence?* Cambridge: Cambridge University Press, 13-26.

Tomiuc, E. (2004). Eastern Europe: Hunting brown bears is big business, but at what cost? Retrieved from https://www.rferl.org/a/1051433.html

Treves, A. & Bruskotter, J. (2014). Tolerance for predatory wildlife. *Science, 344*, 476-477.

Treves, A. & Karanth, K. U. (2003). Human-Carnivore Conflict and Perspective on Carnivore Management Worldwide. *Conservation Biology, 17*(6), 1491-1499.

Tscharntke, T., Klein, A. M., Kruess, A., Stefan-Dewenter, I. &Thies, C. (2005). Landscape perspectives on agricultural intensification and biodiversity ecosystem service management. *Ecology Letters, 8*, 857-874.

U.S. Fish and Wildlife Society. (2018). Hunters as Conservationists. Retrieved from https://www.fws.gov/refuges/hunting/hunters-as-conservationists/

Vaske, J. J. (2008). Conceptualization and measurement. *Survey Research and analysis: Applications in parks, recreation, and human dimension.* 59-77.

Vaske, J. J., Beaman, J., Barreto, H. & Shelby, L. B. (2010). An extension and further validation of the potential for conflict index. *Leisure Sciences, 32*(3), 240-254.

Velli, E., Bologna, M. A. & Randi, E. (2015). The European Wildcat (*Felis silvestris silvestris*): study for a functional method of population research. 1-151.

Woodroffe, R. (2000). Predators and people: using human densities to interpret declines of large carnivores. *Animal Conservation, 3*, 165-173.

Zeiler, H., Zedrosser, A. & Bath, A. (1999). Attitudes of Austrian hunters and Vienna residents toward bear and lynx in Austria. *Ursus, 11*, 193-200.

Ziółkowska, E., Perzanowski, K., Bleyhl, B., Ostapowicz, K. & Kuemmerle, T. (2015). Understanding unexpected reintroduction outcomes: Why aren't European bison colonizing suitable habitat in the Carpathians? *Biological Conservation, 195*, 106-117.

Chapter 3. Romanian Hunters Emotions toward Large Carnivores

3.1 Introduction

While understanding the cognitive components (value orientations, attitudes, and beliefs) of a person's psychological composition are necessary to understand how people think and behave towards wildlife (Jacobs, Fehres, & Campbell, 2012b; Jacobs, Vaske, & Roemer, 2012a; Jacobs, Vaske, Teel, & Manfredo, 2012c), these concepts do not fully grasp the complexity and nuance of how people feel about wildlife. Therefore, the concept of emotion has become a valuable asset to understanding human-wildlife relationships (Jacobs, 2009; Jacobs, 2012; Jacobs, Fehres, & Campbell, 2012b; Vaske et al., 2013; Wilson, 2008; Wieczorek Hudenko, 2012). Regarding emotions research, the field of Human Dimensions of Wildlife (HDW) has primarily focused on the emotion of fear (Røskaft et al., 2003; Jacobs, Fehres, & Campbell, 2012b; Jacobs et al., 2014). This focus on fear is seen in research regarding large carnivores and their presence in an area (Davey et al., 1998; Jacobs et al., 2013; Sponarski, Vaske, & Bath, 2015), especially topics related to impacts and predation on livestock and game species (Lescureux et al., 2011). Although previous researchers have explored emotions beyond fear, (e.g., Jacobs, Vaske, Dubois, & Fehres, 2014), fear is still dominating HDW emotion research and limited work explores other emotions.

In studying various emotions a person can express, there are quantitative (e.g. survey questionnaires) and qualitative (e.g. interviews) methodologies that can be used to document the cognitive dynamics of human-wildlife interactions. Defining emotion has proven a challenge (Izard, 2007); researchers in various disciplines disagree on a formal definition (Fredrickson,

2001; O'Regan, 2003; Niedenthal et al., 2005; Scherer, 2005), however, there is agreement on the components of emotions. These are: (1) subjective experiences such as anger and joy, (2) physiological responses such as an increase of heart rate, and (3) behavioural responses such as body language (Buck, 1993; Fredrickson, 2001; Hanin, 2003; Scherer, 2005; Sponarski et al., 2015). As indicated, subjective experiences correspond with what people call feelings (disgust, fear, and sadness) (Buck, 1993; Dolan, 2001; Hanin, 2003). Such subjective experiences can be tied to situations, objects, people, places, and wildlife (Buck, 1993). Subjective experiences are based not only on basic feelings, but also relate to more complex feelings such as frustration, passion, and worry. Understanding the subjective experience of frustration is difficult due to the lack of agreement on a definition, however, researchers understand that frustration is a combination of emotion, tension, conflict and aggression (Britt and Janus, 1940; Maslow, 1943; Battigalli et al., 2015). The emotional aspect of frustration is related to the response of an individual toward a situation or obstacle (Britt and Janus, 1940; Battigalli et al., 2015). Passion is defined as a strong inclination or emotion toward something (Murnieks et al., 2012). Worry is the cognitive characteristic of anxiety, which influences negative thoughts and is connected with fear (Borkovec et al., 1983; Rijsoort et al., 2001). These emotions were explored due to the close relationship hunters have with large carnivores, and large carnivore encounters whether encounters are based on human, wildlife, or livestock. Also, the increasing lack of trust hunters have toward the government and NGOs.

In the context of behavioural responses, researchers have explored body language through various studies such as child psychology, understanding different cultures, and understanding animal behaviour among or between species. Many of these fields of study explore behavioural responses through vocal tones (pitch, note, emphasis, etc.) (Knower, 1941; Johnstone and Scherer, 2000; Stevens et al., 2001). However, in the field of HDW, little research has been

conducted regarding emotion and emotional expression through listening to vocal tones because the field has remained based heavily on questionnaire oriented methods. The use of vocal tones, mainly accompanied by facial expression, signals what is known as a push and pull effect (Johnstone and Scherer, 2000; Scherer et al., 1980). The push effect is the "…physiological processes such as respiration and muscle tone" while the pull effect is the cause of "…external factors such as social norms or listener expectations" regarding expressions, in this case, emotion (Johnstone and Scherer, 2000: 221; Scherer et al., 1980). The combination of vocal tones and the subjective experiences of emotions are driving forces toward the communication of emotion, which is critical for social interactions, relationships, and survival for humans and animals (Ekman, 1992; Juslin and Laukka, 2003).

Our study explores vocal tones and emotions beyond fear by identifying the main themes in the current hunter-large carnivore debate occurring in Romania, by documenting hunters' emotional expressions of frustration, worry, and passion towards (gray wolves (*Canis lupus*), the Eurasian lynx (*Lynx lynx*), brown bears (*Ursus arctos*), and wildcats (*Felis silvestris*). In 2016, the Romanian Minister of Environment introduced a trophy hunting ban on large carnivores, which caused an uproar in the hunting community (Dale-Harris, 2016). Wildlife management in Romania, in contrast to a North American model, is implemented at a local level by hunting associations. With the possibility of large carnivore populations increasing and a possible subsequent increase of livestock and game species predation, the need to involve hunters in the debate by understanding why hunters feel certain ways about large carnivores is of utmost importance.

By adopting a qualitative approach, we get a more nuanced understanding of the different emotions at play and see that different ecological and social contexts shape these for thinking about large carnivore interaction and management. In other words, the same species has the

potential to provoke different mixes of emotions among participants depending on the social-ecological context they are considering, whether it is nature "out there," their farmland, or spheres of governance and policymaking. Such a qualitative approach is a valuable addition to the HDW toolkit, as it affords a better sense of the complexity of why people feel certain emotions toward large carnivores. This approach provides insight into how the emotional resonance of humans to wildlife species can shift depending on the social-ecological context.

3.2 Theoretical Context

While emotions can have a great impact on human behaviour (Jacobs, 2012d), this cognitive concept has the potential to be influenced by a person's experience, beliefs, and perception of risk (Wieczorek Hudenko, 2012) toward wildlife. Inskip et al. (2016) suggest these concepts can be organized into a theoretical framework to understand human tolerance toward wildlife. The Theoretical Tolerance Framework was modified for my research to understand how experiences, beliefs, and perception of risk can interact with human emotion toward wildlife (Figure 3.1) with the main focus on hunter experiences, beliefs, and expressed emotions toward large carnivores.

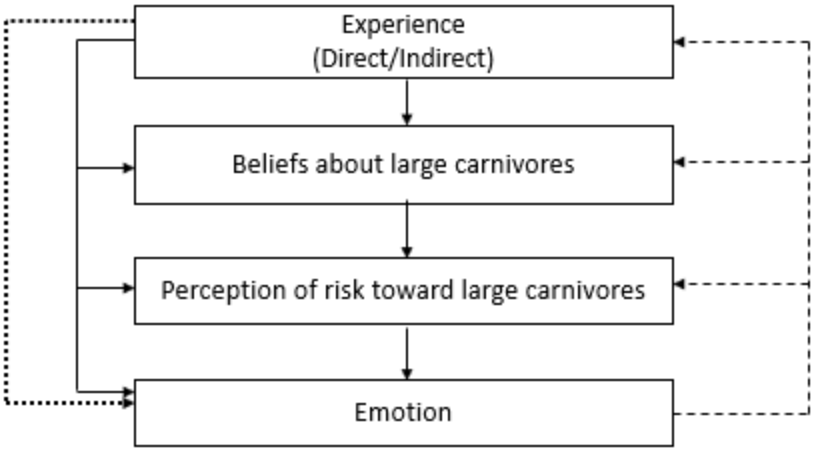


Figure 3.1. Modified Theoretical Tolerance Framework from Inskip et al., 2016, to understand the relation of experiences, beliefs, and perception of risk to emotion. Solid black arrows indicate direct relationship between experience, beliefs, perception of risk. Dotted black arrow indicates indirect relationship between experience and emotion, where experience does not influence beliefs and perception of risk. Dash black arrows indicates how emotion can later influence experience, beliefs, and perception of risk toward large carnivores.

An experience a person has with a wildlife species can be either positive or negative (Inskip et al., 2016; Wieczorek Hudenko, 2012), resulting in a certain type of emotion. For example, a person given a chance to experience interaction with a wolf through wildlife viewing tours may result in a positive emotion such as happiness or joy for the person (Farber and Hall, 2007; Wieczorek Hudenko, 2012). However, the same person may encounter a wolf in the forest where there are no boundaries or fences to separate the person and wolf, and this experience could result in a negative emotion such as fear or anxiety (Wieczorek Hudenko, 2012). Similar to experiencing the emotions of joy or fear, complex emotions like passion and frustration can be equally experienced. For example, the passion of possibly seeing a wolf in its natural habitat can create a positive experience, but not experiencing this phenomenon can cause frustration and lead to a negative experience. There are also various factors that influence a person's beliefs toward wildlife. Beliefs could be directly impacted by a person's experience with the wildlife species, or

indirectly impacted (Inskip et al., 2016) through various narratives such as stories, movies, or someone they know who had an experience with wildlife (Jacobs, 2012d; Wieczorek Hudenko, 2012). Beliefs can as well be positive or negative toward wildlife, influencing positive or negative emotions.

3.3 Methods

3.3.1 Study Area

Romania encompasses various landscapes ranging from mountains, hills, and plains (Dorresteijn et al., 2016; Rotar et al., 2012), which provide habitats for numerous fauna and flora species. The most predominate landscape feature is the Carpathian Mountains (Linnell et al., 2016; Rotar et al., 2015). The Carpathian Mountains are approximately 1,500km in length, crossing through most of Central Eastern Europe (CEE). Approximately 750km² of the Carpathian Mountains mountain range can be found in Romania, where it enters in the northern part of the country and travels toward the western borders separating Transylvania from the rest of Romania. The Făgăraș Mountains is located in the Southern Carpathian Mountains, 45.5833°N and 24.7500°E, where it is approximately 70km long and 40km wide. It is in the Făgăraș Mountains, where the highest peak, known as Moldoveanu Peak, reaches 2543m (Rotar et al., 2015). In this mountainous region, the Făgăraș Mountains is more than 72% covered in forest, with 25% characterized by alpine grasslands, scree, and bogs (Linnell et al., 2016). In various parts of this forested mountain range, it was discovered that the Făgăraș Mountains contain patches of old growth forest (Linnell et al., 2016), which provides habitat for many of Romania's endemic and Europe's endangered species. These species include healthy populations of large carnivores. Currently, there are approximately 6,000 brown bears, 2,700 gray wolves, and 1,500

Eurasian lynx in the Romanian Carpathian Mountains (EU, 2013). Even though Romania does not have the largest population of wildcat in Europe, the population is estimated to be comparably high (Hillman, 2014; Velli et al., 2015).

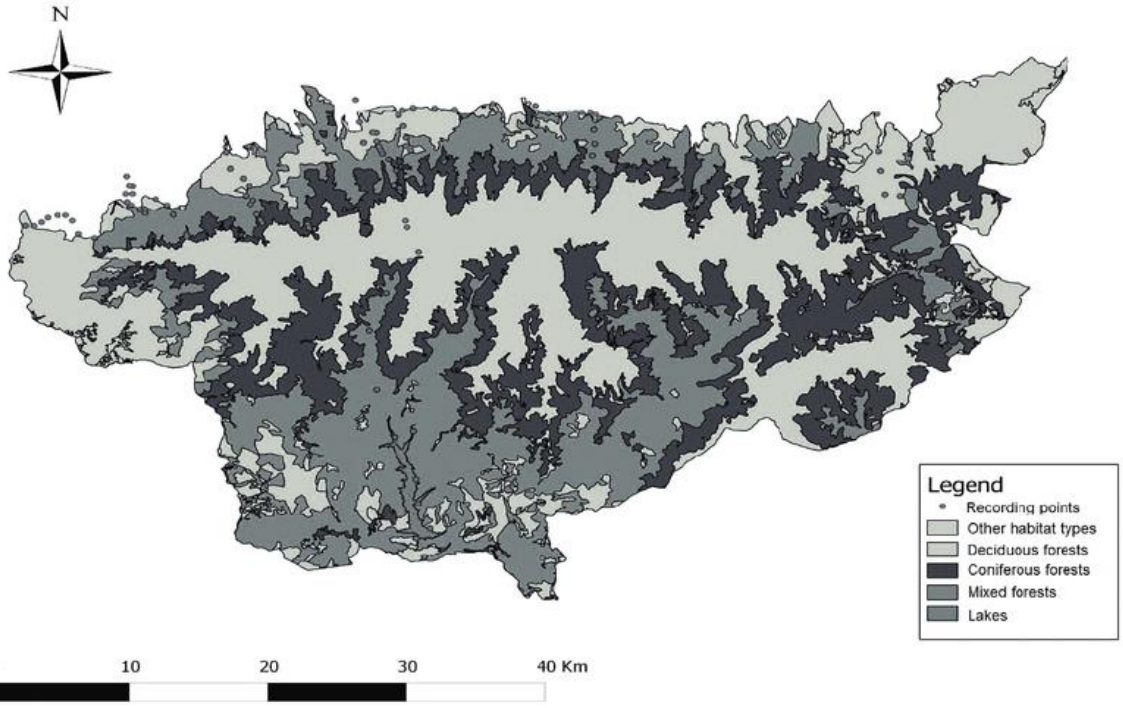


Figure 3.2. Habitat distribution map of the Făgăraș Mountains. Map design: Stoica Vasile-Alexandru and Laurian Gheorghe-SPOT Image 2007 provided by the Ministry of Environment and Forests.

Although many parts of the Făgăraș Mountains are a natural landscape, the mountain range has been impacted by human activity throughout the centuries. Although technology has changed, traditional economic activities, including livestock, agriculture, hunting, and forestry, remain prominent (Linnell et al., 2016). Tourism and eco-tourism have become a popular industry for the Făgăraș Mountains (Comănescu, Nedelea, & Dobre, 2011; Gratton et al., 2015; Linnell et al., 2016). Due to the country's interest in tourism and land use, as well as becoming part of the

European Union in 2007, the Romanian government established two large areas in the Făgăraș Mountains to be protected under Natura2000 (FCC, 2017; Linnell et al., 2016). In the northern part of the Făgăraș Mountains is Piemontul Făgăraș (SPA), while Munti Făgăraș Site of Community Interest (SCI) covers the entire length and slopes of the mountain range, totaling approximately 244 ha of the protected area (Linnell et al., 2016). The area of the Făgăraș Mountains is also being, considered as a national park, an initiative spearheaded by a Romanian non-government organization (NGO).

3.3.2.Data Collection

3.3.2.1 Sampling

A purposive sampling approach (Tongco, 2007) was used to collect detailed information about why hunters express certain emotions toward large carnivores. The presidents and directors of wildlife management from various hunting associations surrounding the Făgăraș Mountains were asked to participate. The hunting associations are either Asociația Generală a Vânătorilor și Pescarilor Sportivi (AVGPS) or privately owned. A semi-structured, qualitative interview schedule was used to collect data, and the interviewing process occurred between July 30th and August 3rd, 2018. In total, 11 interviews were conducted with the various presidents and directors. On average, each interview took approximately 60 minutes, with the shortest interview lasting 30 minutes and the longest being 130 minutes. Some interviews were conducted and recorded in English, however, the majority of the interviews were conducted in Romanian. Therefore, translation occurred onsite for later transcription and analysis, which occurred in English.

3.3.2.2 Research Questions

To understand respondents' experiences, beliefs, and emotions toward large carnivores, research questions were based on how the respondents feel about large carnivores and large carnivore management. The research questions were divided into various topics regarding the existence value of large carnivores in the Făgăraș Mountains, and large carnivore interactions with their surroundings, wildlife, livestock, and people. The following items formulated the basic general open-ended questions for the interview to help build a narrative of respondents responses.

- Can you tell me about the wildlife in the Făgăraș Mountains? For example, is there too much or too little of one or many species?
- How do you feel about large carnivores?
- Do you believe one species is more important than another?
- Have you noticed any increase or decrease of predation? If so, could you elaborate?
- What are some reasons why predation is occurring?
- Why do you think predation is occurring?
- Who is in charge of managing large carnivores?
- How is your relationship with the government or NGOs?
- If you had one statement or question for the government or NGOs, what would it be?

3.3.3 Analysis

The use of the software program NVivo (QSR International Pty ltd, 2012) for transcription, coding and analysis occurred in order to explore the expressed emotions further in depth (Dorresteijn et al., 2016; QSR International Pty ltd., 2012; Richards, 1999). The NVivo program allows the user to organize and identify common themes and patterns (QSR International

Pty ltd., 2012; Richards, 1999; Welsh, 2002) within interview responses. Similar to many qualitative research projects, like in James Jasper's book *The Emotions of Protest* (2018), script and schemas were used to analyze the data from the interviews. By importing the interviews into the NVivo program for coding, data were rearranged into nodes of coding based on experiences, species (game species versus large carnivores), emotions, livestock, and management (government and NGOs were separated). These coding nodes were later separated into themes and subthemes based on the information given by the respondents. Once categorizing the themes and subthemes concluded, the respondents' experience, beliefs, and views on management were categorized into further codes related to the emotions. These emotions were worry, frustration, and passion. For worry, we listened for what impacts caused by large carnivores had the respondents worried. Regarding frustration, we listened for people or organizations with whom the respondents were frustrated. With passion, we listened for when the respondents expressed their environmental interest or values in poetic, emphatic vocal tones, where the respondents shared stories about their experiences in nature, and how nature is part of their livelihood.

However, when it comes to analyzing emotions, Jasper (2018) explains that interpretation can become "fuzzy" and difficult to code even with the use of vocal tones. To determine the emotion expressed, we listened to the pauses and stresses of words, and the intensity of those words through the respondents' vocal tones (Jasper, 2018). Data often overlapped across multiple emotional themes and coding categories (e.g., Frustration-Passion). In other words, we recognize that more than one emotion can be expressed depending on the context that is at hand. Therefore, data was not coded to mutually exclusive categories but had the potential to be present in multiple categories of emotion.

3.4 Results

Our NVivo analysis revealed three dominant themes: (1) large carnivore existence values, (2) large carnivore and livestock interactions, and (3) large carnivore management. The first two themes indicate the respondents' opinions on large carnivores in the Făgăraș Mountains, while the latter theme illustrated respondents' opinions toward government officials and NGOs. Each theme contained four to five subthemes.

Within the theme of large carnivore existence values, the subtheme related to respondents' experiences with increasing numbers of large carnivores in the Făgăraș Mountains. These experiences ranged from discussions about all large carnivores increasing or were focused toward specific large carnivores, usually bears. Regarding the subtheme of beliefs, here the importance of having large carnivores in the mountain range, as well as the right these species have to exist in the mountains surfaced. Hunters also discussed possible reasons why the increase has been occurring , how large carnivores impact game species through predation, and decreases in certain game species . Within the second theme of large carnivore and livestock interactions, the subtheme of experiences involved with livestock predation (if all species were equally to blame for the predation or only certain species), and potential illegal killings such as poaching and poisoning surfaced. Beliefs focused on possible reasons why livestock predation is occurring and if the predation is increasing. Additionally, respondents discussed the nature of increasing livestock predation and growing risk to livestock and the livelihoods of farmers, due to their perception of all large carnivores increasing.

The third theme, large carnivore management, was based on the respondents' overall experiences, and beliefs toward those involved with large carnivore management. Therefore, this theme focused on those involved with management (government officials, NGOs, and hunters)

rather than the species. This theme illustrated human-human conflicts within large carnivore management more so than issues focused toward the species.

Using the concepts of emotion, along with interpretation (Jasper 2018) by listening to the respondents' vocal tones and watching body language especially facial expressions, we determined that the three main emotions, worry, frustration, and passion, were expressed within a situational context. For example, the emotion of worry reflected on respondents' views about attacks on people, property damage, big game and livestock predation, decline in hunting opportunities, perception of hunters by the livestock community. The respondents expressed frustration on topics about environmentalist views, government trophy hunting ban, and possible EU pressure. Finally, passion was expressed when respondents talked about the environment, the importance of equilibrium in the ecosystem and nature, and the overall conceptual way of thinking that the environment is larger than one's self. In order to verify our interpretation of the expressed emotions, exploration of the learnings and definitions from various psychology and sociology studies occurred (Britt and Janus, 1940; Maslow, 1943; Borkovec et al., 1983; Rijsoort et al., 2001; Murnieks et al., 2012,Battigalli et al., 2015; Jasper, 2018).

3.4.1 Large Carnivore Existence

Regarding the existence of large carnivores residing in the Făgăraș Mountains, worry and passion were the most common emotions expressed by the respondents. Here, the ever-growing populations of the large carnivores generated worry among the respondents, especially towards brown bears and wolves. Before the trophy hunting ban, these population numbers were normally controlled by the hunters (this included some of the respondents) to ensure minimal damage caused by the "problem large carnivore". Numerous respondents stated that the brown bear

population has increased “ten times more than normal” (Respondent 6) over the last two years, where “female brown bears are no longer having one to two cubs, but three to five possibly due to the species feeding in the cornfields” (Respondent 1, 6, and 7) and “… garbage.” Not only did the respondents state that the population growth of the large carnivores was worrisome when it came to the increase of feeding on ‘unnatural’ food sources, but they perceived an increase of interactions between people and large carnivores, especially bears. These interactions are perceived to have increased since the trophy hunting ban, where large carnivores, especially brown bears, demeanor had changed. Respondents perceived bears as becoming bolder and wandering into villages and cities daily. Due to the increase of encounters, there has been an increasing number of reports regarding attacks. “Last year, we had three attacks in our town…”, “We were out hunting…”, “a young lady was attacked…”, were similar beginnings of stories which were told by the respondents when discussing the impact of the increasing brown bear population (Respondents 1, 2, 3, 4, 5, 6, 7, 9, 10, and 11). Although the topic of brown bears dominated the discussion, the increasing wolf population also exposed worry in the respondents. One respondent expressed his concern this way: “everyone is complaining about brown bears because they interact with them a lot in the field, but we also have an increase in the wolf population” (Respondent 9).

Although the respondents expressed worry about the increase of large carnivore populations in the mountain region, they do believe these species have the right to exist, and their existence value is of importance. Overall, the respondents’ vocal tones and body jesters demonstrated their passion and love for the animals. Many respondents stated all large carnivores are important, that each species has an important role to play to bring or continue equilibrium within the ecosystem (Respondents 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, and 11). Respondents believe that large carnivores are a keystone species. Understanding this role and vividly describing the beauty

of seeing large carnivores, especially near the mountains illustrate the emotion of passion. Some may say the respondents stated this due to their interest of hunting, which could be true, however, with the ongoing ban on trophy hunting, their beliefs have not shifted regarding the species importance and right to exist. While all hunters expressed that the species are "important to the ecosystem" (Respondents 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, and 11), some indicated they wish for "the species to be kept at a minimal" (Respondents 6 and 9), especially brown bears and wolves. Not surprising, the respondents stated that brown bears and wolves should be kept at a minimal due to their experiences with these species (Respondents 6 and 9). Considering large carnivores as a posing threat toward game species, the respondents indicated brown bears and wolves cause more damages than the Eurasian lynx and wildcats. While respondent 5 acknowledged that brown bears are "guilty of the red deer population not increasing a lot," as well as other game species, wolves were described as "serial killers" (Respondent 9). One respondent stated that wolves would kill anything from "a bear cub to red deer, roe deer, wild boar, anything it can reach" (Respondent 9). In other words, brown bears are perceived to kill game species, but not in the numbers like wolves. While explaining how these species are potential risk factors, the respondents expressed worry. While worry was mainly directed towards brown bears regarding certain game species, this emotion was expressed about the impacts wolves are causing on the vast majority of game species.

3.4.2 Large Carnivores and Livestock

In the theme of large carnivore and livestock interactions, frustration and worry were the most frequent emotions expressed by the respondents. When respondents acknowledged their experiences of this type of interaction, especially livestock predation, worry was expressed more often than the other explored emotions. Similar to large carnivore existence and existence value,

the respondents claimed that brown bears and wolves were the most notorious for livestock predation than the Eurasian lynx and wildcat. While brown bears were compared to a bulldozer, “going through everything” where “they eat goats, they eat chickens, they eat everything” (Respondent 9), some respondents acknowledged the intelligence of wolves (Respondents 6 and 9). Indicated by one of the respondents, wolves are known as “a very intelligent and opportunistic species" where they prey upon “livestock that is easily caught” (Respondents 6 and 9). This comment is similar to how the respondents compared the wolf as a serial killer regarding game species. One respondent expressed his worries about the species from one of the many events of livestock predation where a wolf pack “killed twelve goats” but did not eat all of them; “the wolf pack killed for pure enjoyment” (Respondent 6). Due to livestock predation and the ban on trophy hunting, the respondents expressed worry that they could not help farmers suffering from livestock losses as they could not shoot bears. The perceptions which the farmers hold toward the hunting associations now have the potential to injure the association's reputation; the hunting associations are respected in the eyes of those impacted by large carnivore damages, and if the relationship between these groups becomes negative, the associations will no longer be trusted. Therefore, the trust built between the groups is important, especially when it comes to the ability to “solve” large carnivore-livestock predation problems.

Similar to large carnivore and game species interactions, the Eurasian lynx and wildcats were rarely mentioned in the context of livestock predation. However, respondent 1 indicated that the Eurasian lynx has the potential to kill livestock, but it is rare. One respondent commented on the rarity of this species killing livestock, but then he indicated that this type of interaction happens more often than people believe. He stated that “even if the Eurasian lynx was to kill livestock, usually the wolves are going after the kill, and one of the guys (individual who finds the carcass) will say, “Oh, the wolf killed it!”” (Respondent 1). In other words, the Eurasian lynx

killed the livestock animal but “a wolf pack or bear will discover the kill and finish it off” (Respondent 1). Therefore, the blame is placed on the wrong species resulting in “seldom reports of lynx attacks on livestock” (Respondent 1). Incidences of potential illegal killing caused by shepherds, cattle owners, or licensed hunters were mentioned, but it was not as frequent a subtheme in comparison to livestock predation (Respondents 1 and 9). Frustration and worry about these sorts of ‘management’ options were expressed. Indicated by one of the interviews, people who are partaking in these sorts of ‘management,’ do not use snares but instead use vehicle anti-freeze (Respondents 1 and 9). “Illegal killing has increased in the last two years,” stated respondent 1. These illegal killings could be on the rise as shepherds take management into their own hands to solve their problems.

Frustration was also expressed in regards to the beliefs toward potential reasons why livestock predation is occurring, however, respondents had very little or nothing to say for this subtheme. Those who did express frustration toward the subtheme focused their frustration towards brown bears causing property damage. Similar responses were given about “the dominant males pushing out” the other bears; “dominant males are pushing out younger males from the areas,” as well as “older males are pushing out females with cubs” (Respondent 5). Pushing out the younger males and females with cubs was interpreted as a reason for livestock predation, where these individuals within the brown bear population are unable to feed off game species resulting in the animal killing livestock. With the increasing numbers of younger male bears and females with cubs approaching areas of human civilization to feed on livestock, frustration by hunters about the inability to shoot the problem animals occurs. In addition, this lack of action by the hunters in their minds leads to a decrease of trust from the locals; while there is frustration among the hunters there is also frustration among local residents who are directly

impacted by large carnivore damages. As mentioned previously, illegal killings are increasing and could be due to locals' frustration on lack of action partaking by the hunters.

Frustration was the only emotion expressed by respondents toward the subtheme of increasing livestock predation when considering the perception of risk. Respondents mainly expressed their frustration toward brown bears and the damage the species is causing to livestock. Those who spoke of increasing livestock predation stated brown bears are coming "…into areas which they are not supposed to," areas which are "…heavily populated by humans" (Respondents 1, 2, 4, and 9) and livestock. Wolf impacts were intertwined with brown bears where respondent 11 stated brown bears and wolves are preying on cows, as well as "attacking stalls with piglets." The Eurasian lynx, however, was only mentioned when brought up by the interviewer. One respondent stated that the lynx could cause more damage to livestock than wildcats, but not nearly as much damage as wolves and brown bears (Respondent 6).

3.4.3 Large Carnivore Management

In contrast to large carnivore existence and the species interactions with livestock, respondents targeted their frustration to the Romanian government and NGOs when discussing about large carnivore management. Although all three emotions were present for every subtheme, frustration was the most predominant emotion expressed regarding management. Each respondent had many comments about the government and the actions Parliament is taking concerning large carnivore management. According to numerous respondents, the government once relied on science, but now rely on emotion when deciding on management approaches regarding large carnivores and other wildlife species. These respondents expressed that the government once again need to "…trust the voice of science" that the specialists provide (Respondents 3, 6, and 9)

and "…not their emotion" (Respondent 2). Respondents expressed frustration and worry that the government is relying on their 'heart' and not their 'head.' Regarding the 'voice of science' which the respondents were commenting, this could have been concerning those with field and wildlife experiences since currently there is no rigorous scientific data existing regarding large carnivore numbers. Also, when science was mentioned, a few respondents acknowledged, while expressing frustration, the type of research that was being conducted for this research project and stated: "they (the government) have to monitor people's attitude, not the attitudes of people in Bucharest, but where it counts" (Respondents 1, 3, and 4). In other words, the government or researchers should monitor those who are being impacted daily by large carnivores such as shepherds, farmers, hunters, and residents of rural villages, and not of those that rarely encounter these species. The respondents stated if this type of research was to be completed in smaller villages and areas greatly impacted by large carnivores or with ongoing encounters, the local attitudes would vary quite differently than those in cities like Bucharest; locals would have a negative attitude towards large carnivores in contrast to city residents' positive attitude.

While frustration and worry were the common emotions expressed toward government, all three emotions were present when the subtheme of NGOs was brought up. "In the past, NGOs and hunters used to meet to discuss wildlife and wildlife management," stated respondents 1 and 7 while expressing frustration, "However, they no longer come to the meetings." Within was clear there was hostility towards NGOs because of this lack of communication. Although many respondents understood NGOs are trying to ensure the balance and health of the ecosystem, the respondents also believed that some NGOs are protectionist and that these organizations have a negative impact on large carnivores and large carnivore populations by trying to protect these species completely.Respondents started expressing worry due to the belief that if large carnivores were to be completely protected, the population of these species will eventually decrease

(Respondents 1, 3, and 5) due to people taking management into their own hands. In addition, the lack of natural food source in the forest causing the species to rely on domestic livestock or crops would lead to increasing encounters and potential illegal killings, therefore, resulting in a decrease of large carnivores. As stated by one respondent, "whenever some guy (protectionist NGOs) starts to be more involved with management, the bear numbers decrease" (Respondent 1). Among the emotions of frustration and worry, there was passion in the respondents' vocal tones when discussing their experiences and beliefs about NGOs, where passion was mixed with the other two emotions creating the emotions of frustration-passion and worry-passion. Unlike results from the previous themes and subthemes, there was no clear line separating one emotion (frustration and worry) from passion.

Respondents expressed frustration about the Romanian government and NGOs who believe have no respect for hunters knowledge and experiences in the field (Respondents 1 and 5). Many respondents stated that the specialist (directors of wildlife management) need to be "left alone" (Respondents 1, 2, 5, and 10) to ensure there is an equilibrium in the ecosystem. Not just from what the specialists learned from their studies, "but mainly from the field by working in the field" (Respondent 2). In the case of managing large carnivores, the respondents stated that they understand that "you do not shoot without rule," but rather "you shoot based on a level of intervention" (Respondents 11 and 2). In other words, if an individual is "…hunting for damages, you hunt for a special individual; you only hunt the animal that has caused a great amount of damage to the livelihood of people and wildlife" (Respondent 1, 2, and 11). The frustration expressed by the respondents indicated that the respect and collaboration the hunting associations once had with the government is now gone, and they feel belittled for their responsibility on wildlife management being taken from their hands.

3.5 Discussion

Quantitative methodologies have been the predominant approach to understanding human emotions toward wildlife and wildlife issues in the field of HDW (Engel et a., 2016; Jacobs, 2009; Jacobs et al., 2014; Jochum et al., 2014; Sponarski et al., 2015). The quantitative approach of understanding this cognitive concept is based on questionnaires that use scale based ranking systems (e.g. Likert Scale) to explain how much an individual likes or dislikes a wildlife species (Bright et al., 2002; Grob, 1995; Jacobs et al., 2014). While this methodological approach is useful in many ways, the quantitative approach does not answer the question of why an individual expresses or feels certain emotions over others in relation to various species.

In addition, a quantitative approach establishes pre-set limits on the questions for discussion, leaving little to no flexibility to explore ideas mentioned by respondents that could provide valuable insights. By utilizing a qualitative approach, the question of how can be more readily answered through exploring the depths of this cognitive concept (Given, 2008; Jasper, 2018). Through qualitative interviews, participants are able to offer narratives based on their emotions tied to experiences and beliefs regarding an event, object, people, and situation (Bruner, 1985; Polkinghorne, 1995) rather than fitting their emotions and experiences into categories that are pre-determined by the researcher. Using these narratives allows the researcher to interpret the information gathered from the participants and understand the depths of the emotional occurrence (Hanin, 2003). This can be further enhanced by considering vocal tones (pitch, note, emphasis, etc.) (Raingruber, 2003; Fraser, 2004). In other words, exploring emotions and vocal tones through a qualitative approach allows researchers to grasp the understanding of emotions expressed toward what individuals value, as well as acknowledging the relationships between those expressed emotions, individuals, and the ‘item’ of value (Jasper, 2018). In regards to human and wildlife interactions, the qualitative approach allows researchers to explore the unanswered

question of why people express certain emotions toward certain species, and why these emotions can change over different contexts.

One of our main findings was documenting the shift between emotions directed at large carnivores when discussing existence values or large carnivore-livestock interaction versus how large carnivores enter into the political sphere of policy-making and environmental governance. While the emotions of frustration, worry, and passion were present across all themes, each context (species, species and location, and politics and governance about species had a different mix of emotions expressed by the respondents. On the context of species, respondents were passionate about the existence and the importance of having large carnivores in the Făgăraș Mountains ecosystem. Although there is an ongoing conflict between hunters and large carnivores, the respondents stated that they and the hunters within their hunting associations have an unwavering love for large carnivores. There could be various reasons of why passion was expressed, one being that the respondents love animals and knowing that these species residing in their area brings them great pleasure. In contrast, some individuals may say that the respondents 'unwavering love' for these species could be due to the fact that they are hunters, wishing to hunt large carnivores for trophies and income. While there may be truth to this statement, there was noticeable emotional expression through behavioural responses of vocal tones, body jesters, and facial expressions that suggest otherwise. Stereotyping of hunters being 'blood thirsty' is unjustified and is as incorrect as stereotyping all environmentalists as animal activists, who hate hunting of any animal. Effectively listening to the hunting community reveals much about the culture of Romanian hunters. Romanian hunters view themselves as conservationists, who have a connection with the forest and its wildlife in various forms; the hunters view the forest as their 'brother' (Respondent 1), and they are responsible to take care of it and its wildlife (Respondent 5).

The expression of worry is common regarding large carnivores and the proximity of these species, predominantly regarding the topic of livestock (Naughton-Treves, Grossberg and Treves, 2003; Carter, Riley and Liu 2012). In many rural areas throughout the world, livestock is a source of livelihood for residents (shepherds, farmers, and cattle owners) (Vittersø, Kaltenborn and Bjerke, 1998; Naughton-Treves, Grossberg and Treves, 2003; Carter, Riley, and Liu, 2012; Engel et al., 2017). Therefore, many residents are unwelcoming to the thought or knowledge of large carnivores being in the area (Røskaft et al., 2007). In the case of Romania, the hunting associations were established for numerous reasons, one being responsible for managing large carnivores to minimize the impact these species have on livestock. Considering the ban on trophy hunting, worry has increased throughout the hunting associations. Being that their hands are tied, hunters are concerned about the relationships the associations have built over the years with rural communities. Rural communities have sought relief from predators through working with for many years. The trophy ban challenges the role hunters have historically played worrying hunters about how they will be perceived (e.g. as doing nothing) by the livestock community.

In light of the ban on trophy hunting large carnivores, and the decision of changing the methods of managing these species, one hears frustrated tones from respondents. Due to the feeling that the responsibility of managing large carnivores have been taken from their hands, frustration is expressed through respondents' vocal tones where the hostility the group holds toward the Romanian government and the NGOs is evident. The expression of frustration between groups is common (Hocking, 2006; Baur et al., 2010; Liu et al., 2010). In the development of any management plan, a variety of interest groups are usually involved. Although these groups may seek for a common outcome, each group tend to have their own objectives of how to achieve said outcome (Hocking, 2006; Baur et al., 2010; Berry et al., 2016). As group work together, such frustration can be reduced but this requires active participatory processes. To

date, hunters have largely been left out of the carnivore debate. In the case of managing large carnivores in the Făgăraș Mountains, hunters and NGOs have expressed the need for large carnivore existence to continue, however, NGOs seek to completely protect these species, while hunters wish to continue to manage large carnivore like in the previous decades through trophy hunting, an activity not supported by environmental groups. Although hunters and NGOs share a similar vision of large carnivores existing on the landscape and creating minimal impact, defining "minimal impact" remains a challenge. It also does not help in resolving conflicts that IUNC stated that hunting remains one of the major threats to mammals in Romania (IUCN, 2013). Frustration by hunters could also be attributed to the governance and policy-making processes and the lack of income or revenue obtained by the hunting association now that trophy hunting has been banned. Trophy hunting was a multi-million euro industry; therefore, it is understandable why the respondents expressed frustration since their associations are losing an extreme amount of income. Increased frustration may influence behaviour toward the animals such as the likelihood of increased poaching.

Expanding the methodological toolkit of the HDW field to integrate qualitative approaches is particularly useful when exploring emotions and analyzing vocal tones offers more understanding of why individuals express different emotions toward species across different contexts. While quantitative approaches ask participants to fit their emotions and experiences into pre-determined analytical categories, qualitative approaches can add depth and nuance, better-capturing uncertainties or unanswered questions that are created by quantitative measurements. We are not suggesting that HDW researchers abandon quantitative research, but we encourage further studies to use vocal tones and qualitative approaches to gain new insights to understanding wildlife-human relationships. As HDW researchers we continue to struggle to predict human behaviour. We envision such qualitative approaches may help. We are also fully aware that much

of the qualitative approach is based on interpretation and subjective measurements. Exploring emotions and vocal tones are highly complex and exhibit the ‘messy parts’ in the human cognitive composition (Scherer, 1986; Fraser, 2004; Jasper, 2018). Reading emotions through more than a scale ranking system is difficult, especially since reading these emotions are often through display (Jasper, 2018). Therefore, further research needs to be conducted in order to establish an understanding of the definitions of the emotions expressed, and the nature of vocal tones, specifically how to classify tone and how they are used to distinguish the emotions on display.

3.6 References

Battigalli, P., Dufwenberg, M. & Smith, A. (2015).Frustration and Anger in Games. *CESIfo, 5258,* 1-52.

Baur, V. E., van Elteren, A. H.G., Nierse, C. J., & Abma, T. A. (2010). Dealing with distrust and power dynamics: Asymmetric relations among stakeholders in responsive evaluation. *Evaluation, 16*(3), 233-248.

Berry, P. M., Fabók, V., Blicharska, M., Bredin, Y. K., Llorente, M.G., Kovács, E., … Harrison, P. A. (2016). Why conserve biodiversity? A multi-national exploration of stakeholders' views on the arguments for biodiversity conservation. *Biodiversity Conservation, 27,* 1741-1762.

Borkovec, T. D., Robinson, E., Pruzinsky, T. & DePree, J. A. (1983). Preliminary exploration of worry: some characteristics and processes. *Behav. Res. Ther. 1(21), 9-16.*

Bright, A. D., Barro, S. C. & Burtz, R. T. (2002). Public attitudes toward exological restoration in the Chicago Metropolitan Region. *Society and Natural Resources, 15*(9), 763-785.

Britt, S. H., and Janus, S. Q. (1940). Criteria of Frustration. *Psychological Review, 47*(5), 451-470.

Bruner, E. M. (1985). Ethnography as narrative. In V.W. Turner & E.M. Bruner (Eds), *The anthropology of experience,* (pp. 139-155). Urbana: University of Illinois Press.

Buck, R. (1993). What is this thing called subjective experience? Reflections on the neuropsychology of Qualia. *Neuropsychology, 7*(4), 490-499.

Carter, N. H., Riley, S. J., & Liu, J. (2012). Utility of a psychological framework for carnivore conservation. *Oryx, 46*(4), 525-535.

Comănescu, L., Nedelea, A. & Robert, D., (2011). Evaluation of geomorphosites in Vistea Valley (Făgăraș Mountains-Carpathians, Romania). *International Journal of Physical Sciences, 6*(5), 1161-1168.

Dale-Harris, L. (2016). Romania bans trophy hunting of brown bears, wolves, lynx, and wild cats. *The Guardian*. Retrieved from https://www.theguardian.com/environment/2016/oct/05/romania-bans-trophy-hunting-of-brown-bears-wolves-lynx-and-wild-cats

Davey, D. C., McDonald, A. S., Hirisave, U., Prabhu, G. G., Iwawaki, S., Jim, C. I., Merckelbach, H., De Jong, P. J., Leung, P. W., Reimann, B. C. (1998). A cross-cultural study of animal fears. *Behav Res Ther, 36,* 735-750.

Dolan, R. J. (2001). Emotion, cognition, and behavior. *Science, 298,* 1191-1194.

Dorresteijn, I., Milcu, A. I., Leventon, J., Hanspach, J. & Fischer, J. (2016). Social factors mediating human-carnivore coexistence: Understanding thematic strand influencing coexistence in Central Romania. *Ambio, 45*(4), 490-500.

Ekman, P. (1992). An argument of basic emotions. *Cognition & Emotion, 6*(3-4), 169-200.

Engel, M., T., Vaske, J. J., Bath, A. J. & Marchini, S. (2016). Predicting acceptability of jaguars and pumas in the Atlantic forest, Brazil. *Human Dimensions of Wildlife, 21*(5), 427-444.

Engel, M. T., Vaske, J. J., Bath, A. J. & Marchini, S. (2017). Attitudes toward jaguars and pumas and the acceptability of killing big bcats in the Brazilian Atlantic Forest: An application of the Potential for Conflict Index$_2$. *Ambio, 46* (5), 604-612.

EU, (2013). Status, management and distribution of large carnivore-bear, lynx, wolf & wolverine – in Europe. Retrieved from

http://www2.nina.no/lcie_new/pdf/635010989996563545_2013_03_25_Updated%20status%20of%20LC%20in%20Europe_Part1.pdf

Farber, M. E. & Hall, T. E. (2007). Emotion and environment: Visitor's extraordinary experiences along the Dalton Highway in Alaska. *Journal of Leisure Research, 39*(2), 248-270.

FCC, (2017). VCA Proposal. *Carpathia European Wilderness Reserve*. Retrieved from http://www.earthmind.org/sites/default/files/2017-09-VCA-CarpathiaWildeerness-Proposal_0.pdf

Fraser, H. (2004). Doing narrative research: Analysing personal stories line by line. *Qualitative Social Work, 3*(2), 179-201.

Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-an-build theory of positive emotions. *American Psychologist, 56*(3), 218-226.

Given, L. M. (2008). Emotions as research tools. In *The SAGE Encyclopedia of Qualitative Research Methods, Vol. 2*, 250-252. Thousand Oaks, California: SAGE Publications, Inc.

Gratton, M, Morin, S, Germain, D, Voiculescu, M. & Ianas, A. (2015). Tourism and natural hazards in Bâlea Glacial are valley, Făgăraș massif, Romanian Carpathians. *Carpathian Journal of Earth and Environmental Science, 10,* 19-32.

Grob, A. (1995). A structural model of environmental attitudes and behaviour. *Journal of Psychology, 15*(3), 209-220.

Hanin, Y. L. (2003). Performance related emotional states in sport: A qualitative analysis. *Forum: Qualitative Social Research, 4*(1), 1-32.

Hillman, V. (2014). Video: Wild Cats of the forest. *National Geographic*. Retrieved from https://blog.nationalgeographic.org/2014/01/27/video-wild-cats-of-the-forest/

Hocking, B. (2006). Multistakeholder diplomacy: forms, functions, and frustrations. In J. Kurbalija & V. Katrandjiev (Eds), *Multistakeholder Diplomacy: Challenges and Opportunities* (pp 13 – 29). Malta: DiploFoundation.

Inskip, C., Carter, N., Riley, S., Roberts, T. & MacMillan, D. (2016). Toward human-carnivore coexistence: Understanding tolerance for tigers in Bangladesh. *PLoS ONE, 11*(1), 1-20.

IUCN. (2013). Romania's biodiversity at risk: A call for action. Retrieved from https://cmsdata.iucn.org/downloads/romania_s_biodiversity_at_risk_fact_sheet_may_2013.pdf?fbclid=IwAR1r8LJ-AxBLde1J8ZvGlbgfYm-tHTfEhYZIU0qaKKcqv7URlxIMUwiJ5tQ

Izard, C. E. (2007). Basic emotions, natural kinds, emotion schemas, and a new paradigm. *Perspectives on Psychological Science, 2,* 260-280.

Jacobs, M. H. (2009). Why do we like or dislike animals? *Human Dimensions of Wildlife, 14*(1), 1-11.

Jacobs, M. H., Vaske, J. J. & Roemer, J. M. (2012a). Toward mental systems approach to human relationships with wildlife: The role of emotional dispositions. *Human Dimensions of Wildlife, 17(*1), 4-15.

Jacobs, M., Fehres, P. & Campbell, M. (2012b). Measuring emotions toward wildlife: A review of generic methods and instruments. *Human Dimensions of Wildlife, 1*(4), 233-247.

Jacobs, M. H., Vaske, J. J., Teel, T. L. & Manfredo, M. J. (2012c). Human dimensions of wildlife. In L. Steg, A. E. van den Berg & J. I. M. de Groot (Eds.), *Environmental psychology: An introduction* (pp. 77-86). London, UK: Wiley-Blackwell.

Jacobs, M. H., Vaske, J. J., Dubois, S. & Fehres, P. (2014). More than fear: Role of emotions in acceptability of lethal control of wolves. *European Journal of Wildlife Research, 60*(4), 589-598.

Jacobs, M. H. (2012). Human emotions toward wildlife. *Huma Dimensions of Wildlife, 17*(1), 1-3.

Jasper, (2018). The emotions of protest. Chicago, Illinois: The University of Chicago Press.

Jochum et al., (2014). Integrating complexity in the management of human-wildlife encounters. *Global Environmental Change, 26*(1), 73-86.

Johnstone, T. & Scherer, K. R. (2000). Vocal Communication of Emotion. In M. Lewis, & J. Haviland (Eds), *The Handbook of Emotion* (pp. 220-235). New York: Guilford.

Juslin, P. N. & Laukka, P. (2003). Communication of emotions in vocal expression and music performance: Different channels, same code? *Psychological Bulletin, 129*(5), 770-814.

Knower, F. H. (1941). Analysis of some experimental variations of simulated vocal expressions of the emotions. *The Journal of Social Psychology, 14*(2), 369-372.

Lescureux, N. & Linnell, J. D. C. (2010). Knowledge and perceptions of Macedonian hunters and herders: The influence of species specific ecology of bears, wolves, and lynx. *Human Ecology, 38,* 389-399.

Linnell, J. D. C., Kaltenborn, B., Bredin, Y. & Gjershaug, J. O. (2016). Biodiversity assessment of the Făgăraș Mountains, Romania. *NINA Report 1236.*

Liu, J. Y.C., Chen. H. G., Chen, C. C., & Sheu, T. S. (2010). Relationships among interpersonal conflict, requirements uncertainty, and software project performance. *International Journal of Project Management, 29,* 547-556.

Maslow, A. H. (1943). Conflict, Frustration, and the Theory of Threat. *The Journal of Abnormal and Social Psychology, 38(1),* 81-86.

Murnieks, C. Y., Mosakowski, E. & Cardon, M. S. (2012). Pathways of passion: Identity centrality, passion, and behavior among entrepreneurs. *Journal of Management, 40*(6), 1583-1606.

Naughton-Treves, L. Grossberg, R. & Treves, A. (2003). Paying for tolerance: Rural citizen's attitudes toward wolf depredation and compensation. *Conservation Biology, 17*(6), 1500-1511.

Niedenthal, P. M., Barsalou, L., Winkielman, P., Krauth-Gruber, S. & Ric, F. (2005). Embodiment in attitudes, Social perception and emotion. *Personality and Social Psychology Review, 9*(3), 184-211.

O'Regan, K. (2003). Emotion and e-learning. *JALN, 3*(2), 78-92.

Polkinghorne, D. E. (1995). Narrative configuration in qualitative analysis. *International Journal of Qualitative Studies in Education, 8*(1), 5-23.

QSR International Pty ltd., (2012). What is NVivo? Retrieved from https://www.qsrinternational.com/nvivo/what-is-nvivo

Raingruber, B. (2003). Video-cued narrative reflection: A research approach for articulating tacit, relational, and embodied understandings. *Qualitative Health Research, 13*(8), 1155-1169.

Richards, (1999). *Using NVivo in Qualitative Research.* London: SAGE Publications.

Rijsoort, S. van, Emmelkamp, P. & Vervaeke, G. (2001). Assessment of worry and OCD: how are they related? *Personality and Differences,* 31(2), 247-258.

Røskaft, E., Bjerke, T., Kalthenborn, 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.

Røskaft, E., Händel, B., Bjerke, T., & Kaltenborn, B. P. (2007). Human attitudes towards large carnivores in Norway. *Wildlife Biology, 13*(2), 172-185.

Rotar, A., Simon, L., Urdea, P. & Mircea, V. (2012). A study of institutional stakeholders' views on biodiversity in Romania. *Carpathian Journal of Earth and Environmental Sciences, 7*(2), 219-230.

Scherer, K. R. (1986). Vocal affect expression: A review and a model for future research. *Psychological Bulletin, 99*(2), 143-165.

Scherer, K. R. (2005). What are emotions? And how can they be measured? *Social Science Information, 44*(4), 695-729.

Scherer, U., Helfrich, H., & Scherer, K. R. (1980). Internal push or external pull? Deteminants of paralinguistic behavior. In H. Giles, P. Robinson, & P. Smith (Eds.), *Language: Social psychological perspectives* (pp. 279-282). Oxford, England: Pergamon Press.

Sponarski, C. C., Vaske, J. J. & Bath, A. J. (2015). The role of cognitions and emotions in human-coyote interactions. *Humans Dimensions of Wildlife, 20*(3), 238-254.

Stevens, D., Charman, T. & Blaire, R. J. R. (2001). Recognition of emotion in facial expressions and vocal tones in children with psychopathic tendencies. *The Journal of Genetic Psychology, 162*(2), 201-211.

Tongco, M. (2007). Purposive sampling as a tool for informant selection. *Ethnobotany Research and Applications,5*, 147-158.

Vaske, J. J., Roemer, J. M. & Taylor, J. G. (2013). Situational and emotional influences on the acceptability of wolf management actions in the Greater Yellowstone ecosystem. *Wildlife Society Bulletin, 37*(1), 122-128.

Velli, E.. (2015). The European Wildcat (*Felis silvestris silvestris*): study for a functional method of population research (Unpublished doctoral dissertation). Roma Tre University, Rome, Italy.

Vittersø, J., Kaltenborn, B. P., and Bjerke, T. (1998). Attachment to livestock and attitudes towards large carnivores among sheep farmers in Norway. *Anthrozoös, 11*(4), 210-217.

Welsh, (2002). Dealing with Data: Using NVivo in the Qualitative Data Analysis Process. *Forum Qualitative Sozialforschung/ Forum: Qualitative Social Research, 3*(2), Art. 26.

Wieczorek Hudenko, H. (2012). Exploring the influence of emotion on human decision making in human-wildlife conflict. *Human Dimensions of Wildlife, 17*(1), 16-28.

Wilson, R. S. (2008). Balancing emotion and cognition: A case for decision-aiding in conservation efforts. *Conservation Biology, 22*(6), 1452-1460.

Chapter 4. Summary

4.1 Discussion

Despite Human Dimensions of Wildlife (HDW) research being conducted in many European countries, little research has been carried out in Eastern European countries like Romania. Although there are clear political and historical differences between Western and Eastern Europe, much to do with the influence of communist leaders, Romanian hunters share similar cognitions about large carnivores with other European hunters. Hunters are often hypothesized to hold negative attitudes toward large carnivores; however, this is not always the case (Bath et al., 2008; Ericsson et al., 2004; Williams et al., 2002). Overall, Romanian hunters' attitudes remained positive toward large carnivores existing in the Făgăraș Mountains. These positive attitudes are mainly based on understanding the importance of large carnivores for the equilibrium of the ecosystem. The hunters expressed their attachment for nature and wildlife: their belief that the forest is 'their brother,' and a sense of duty to ensure a balance is met. Huber et al., 2008 indicated similar findings on Croatia where hunters expressed positive attitudes toward brown bears. Huber et al. (2008) acknowledged that this positive attitude toward brown bears was due to hunters wanting to foster bigger trophies. By killing males which did not meet their standards of a 'good trophy', and protecting females with cubs, ensured hunters had better trophies in the future (Huber et al., 2008). Similar thoughts were expressed from Romanian hunters. For many years, foreign hunters from other parts of Europe would flock to Romania to trophy hunt due to the large number of large carnivores residing in the country in comparison to the rest of Europe. Positive attitudes toward large carnivores were also found in Austria (Zeiler et al., 1999), where the authors suggested "*…hunters who have had some historical tradition or connection with bears and lynx tend to be more positive*" (Zeiler et al., 1999: pp 198). Since

hunting has been a tradition passed down from generation to generation, the relationship between hunters and large carnivores is substantially different compared to general public attitudes toward wildlife.

Although Romanian hunters' attitudes were positive, their beliefs regarding large carnivore damage to livestock were not. Throughout many countries, hunters express negative beliefs about the interaction between large carnivores and livestock. Similar findings indicated that this type of interaction is due to the damages and threat the species cause to livestock (Bath et al., 2008; Linnell et al., 1996; Majić et al., 2011; Nilsen et al., 2007; Petra, 2010; Zeiler et al., 1999). Similar to many studies about livestock predation, Romanian hunters had more of a negative attitude toward brown bears and wolves when it came to livestock-carnivore conflict. Since wolves and brown bears have had continuous conflicts with hunters, the Romanian hunters tend to have a stronger opinion about these species in comparison to the Eurasian lynx and wildcats. These two feline species are rarely studied in the HDW field (Bath et al., 2008; Hetherington et al., 2006; Olszńaska, 2012; Zeiler et al., 1999). In Romania, livestock losses are usually compensated, hunters are more so worried about how the species impact on livestock will impact hunters relationship with rural residents (shepherds, farmers, cattle owners). Since hunters in Romania are responsible for managing large carnivores to help the rural areas raising livestock, the ban on trophy hunting has significantly impacted their reputation. Hunters feel their hands are tired and with every day the ban remains in effect, they lose greater respect from all the residents.

While there are many similarities among Romanian hunters and hunters from other parts of the world, there are some differences. The biggest difference is how Romanian hunters are responsible for managing wildlife (Salvatori et al., 2002) while in North America wildlife is the responsibility of province or state wildlife agencies (e.g. Department of Fish and Wildlife Resources, and Department of Environment and Conservation). In a North American context,

wildlife are managed at the spatial scale of the province or state or hunting area (Peek et al., 2012). Large carnivores are managed in Romania at a local level, where hunting associations of each county are given responsibility and a set quota for harvested species. When looking at the North American Model (NAM) of Wildlife Conservation, this management approach is based on the "*…success of wildlife management and conservation…rather than recreational hunting*" (Lukasik, 2018: pp 3) and is accepted by many North American wildlife biologists (Lukasik, 2018). Also, this model is considered as a way to identify the key properties of establishing conservation (Organ et al., 2012). NAM has been adapted into various policies developed by the Association of Fish and Wildlife, The Wildlife Society, and integrated into Recreational Hunting and Wildlife Conservation Planning (Organ et al., 2012). Although the model is implemented in many management plans, it has been suggested that there is a lack of scientific evidence used when creating wildlife management plans in North America (Artelle et al., 2018; Lukasik, 2018), and instead these sorts of plans are more so implemented for human benefit than for nature.

The idea of a lack of scientific evidence is used when creating wildlife management plans in North America, this idea was also brought to our attention when discussing management of large carnivores in the Făgăraș Mountains with the Romanian presidents of the hunting associations and directors of wildlife management. These respondents indicated that the government once listened to the 'voice of science' but no longer. Genetic research is currently being conducted to track and 'name' the large carnivores roaming through the mountain range. While genetic research is considered as the 'voice of science' to researchers, it is not considered as such by the hunting association; the hunting association believe their methods of measuring wildlife through experience and observation in the field is better than genetic research. Also, managing wildlife (including large carnivores) under the jurisdiction of national or federal government means these management plans are at a large spatial scale. A management plan for

large carnivores at a federal level may show usefulness in Romania due to the large spatial scale of these species home ranges; however, this plan may also require more localized human-large carnivore conflict plans to fit the needs of the different human communities since each location may have different wildlife value orientations, attitudes, and beliefs toward large carnivores. For example, location can influence differences of attitudes, such as urban residents may differ from those of rural backgrounds (Skogen and Thrane, 2008; Vaske et al., 2011). Also, tolerance levels from one physical landscape to another may change. For example, in Newfoundland the new arrival of a coyotes, resulted in the most negative attitudes toward a carnivore seen in North America (Sutherland, 2010). In contrast, coyotes are tolerated in areas of Vancouver, a large city (Frank, 2016). In the case of Romania, many of the residents are willing to tolerate and have positive attitudes toward the existence of large carnivores. This could be possibly due to the relationship the locals and hunters have with each other and with large carnivores who have had a long history of being on the landscape. Since each hunting association in Romania is in charge of managing wildlife in their area, hunters continuously interact with the locals and try to understand their problems regarding wildlife impacts, increasing the trust between the groups. This type of public involvement is lacking in management plans in higher levels; very few national or federal government wildlife management plans include local cognitions about wildlife issues and impacts. As mentioned previously, Romanian hunters are responsible for wildlife management and are given a set quota that they must hunt during the hunting season. Through this quota, the hunters use this to their advantage to trophy hunt, bringing in income for the hunting associations and the country; however, in a North American context, especially in the USA, managing wildlife is unprofitable and mainly conducted through aggressive lethal management (Bruskotter et al., 2014).

4.2 Strengths and Challenges

By using a mixed method approach for this research, we were able to establish a deeper understanding of how and why hunters think certain ways. While a quantitative approach developed a foundation of what hunters' views and opinions are, a qualitative approach filled in the missing gaps of the absent 'why' question through a narrative of hunters' experiences and beliefs about large carnivores in the Făgăraș Mountains. For example, integrating the results from the PCI_2 results from the quantitative portion into the interview process allowed respondents to see a visual representation of how answers and the level of consensus among the hunters varied. By integrating these results into the qualitative methods it allowed the respondents to explain why hunters answered the way they did through stories of experiences with large carnivores and large carnivore management. By being there with the respondents, we were able to interpret their behavioural responses (body language, facial expression, and vocal tones), to the best of our abilities, when expressing the various studied emotions. Also, using this visual in the qualitative portion of the research project helped further validate our understanding of human cognitions and the cognitive hierarchy by having the respondents agree with the PCI_2 results. At a time when research in wildlife management can be quite removed from people, our work engaged hunters in the research process. By integrating hunters' views and opinions about large carnivores and the ban on trophy hunting, it has become a source of public involvement, which is a rare phenomenon in Romania due to residents feeling they are still living in the Communist regime. Also, involving hunters allows us to build relationships through sharing and discussing knowledge about large carnivores and large carnivore management, being that it is an integral part of the research process.

In saying this, conducting a mixed method study comes with its challenges: (1) sample size, and (2) lack of literature in the HDW field. When looking at sample size, N=512

quantitative questionnaires to N=11 qualitative interviews, there were difficulties in selecting participants for the interviewing process. While the presidents of the hunting associations and directors of wildlife management were valid participants for an overview of why hunters think and feel certain ways, they do not represent each hunter individually. Similarly, quantitative questionnaires may give a valid overview of hunters, but this method does not give the in-depth and personal narrative of the individuals as does qualitative methods. With a lack of resources using a mixed methods approach in HDW, there were difficulties on how to approach this type of method properly. Therefore, expansion into other fields, such as Sociology and Psychology, allowed us to interpret how mixed method approaches can add to the complexity of understanding human cognitions toward wildlife, in particular large carnivores. By incorporating mixed methods more frequently into the HDW field and exploring other fields for insight and different perspectives about the methodology, will broaden this field of study in other forms in how to approach human cognition toward wildlife. By integrating the mixed method approach into the HDW tool kit, it adds value to the research allowing us to understand human-wildlife interactions better. Currently, HDW expansion outside of current methods or exploring what other disciplines are researching is rare; however, other disciplines (e.g. Conservation Psychology) are embracing human-wildlife interactions or understanding human-nature relationship while bringing in their ideas. In regards to Conservation Psychology, this discipline incorporates similar research topics as HDW, for example, understanding the role of humans in nature, and environmental attitudes, perception, and cognition (APA, N. d.).

Other challenges in this research project emerged through the qualitative component: (1) cultural differences, (2) language difficulties,(3) vocal tones, and (4) definitions of frustration, worry, and passion. Understanding body language across cultures is a difficult process where (e.g.) waving of arms and loudly hitting a surface, such as a table, may indicate an emotional

breakdown in one culture but also indicate a funny story in another (Sielski, 1979). The movement of the body having different meanings could also be said for vocal tones when trying to understand the expressed emotion. Just because an individual becomes loud does not mean the individual is angry. This could be also said for spoken languages where certain phrases or words could hold different meanings between the (e.g.) Romanian and English language. Therefore, reading further behavioural responses such as body language and facial expression can help with understanding what emotion is being expressed. Due to disagreement and a lack of consensus for a concrete definition for frustration, worry, and passion among the various fields which studies emotion, it was a challenge to define these emotions. To understand what emotion was being expressed, we followed how psychologists define frustration, worry, and passion, and integrate these definitions as frustration 'with' people, worry about impacts caused by large carnivores, and passion toward nature and the existence of wildlife. By following psychologist based definitions of these emotions, we were able to submerse ourselves into a deeper understanding of human behavioural responses. By following along with one field's definition of these emotions, it 'put blinders' on us where we have to follow one direct path when listening to the vocal tones and emotions. To overcome these challenges, pursuing qualitative work alongside quantitative work will decrease the knowledge gap about qualitative methods and mixed methods in the HDW field. Also, expanding outwards into other fields of study, as other disciplines have done, will improve our knowledge about the environment and how humans interact with their surroundings. In cases as this research, expanding our collaboration niche with the local researchers helped improve our understanding of the Romanian culture, and getting a firsthand experience of how hunters think and feel about the environment and wildlife species.

4.3 Future Direction

Romanian hunters are unique because historically they are responsible for wildlife management where in many other countries wildlife management is overseen by government officials. With the introduction of the trophy hunting ban for large carnivores, the Romanian model of managing the species is now being challenged. In the perspectives of the hunters, all wildlife needs to be controlled. They believe that without hunters, wildlife would not be able to control their population and species will go extinct by animals eating themselves out of home. Hunters believe they are the experts in the field and their way of management is the correct way, but such statements bid the question if they really are the experts and hunting or trophy hunting large carnivores is the correct way of management of wildlife. Also, is buying tolerance through trophy hunting an effective way to manage large carnivores, and is trophy hunting an effective way to control the increasing population? These are but a few questions in the debate of large carnivore trophy hunting.

As HDW researchers, the continuation of monitoring the Romanian hunters' cognition must occur to see if changes of the studied cognitions arise with the continued ban on trophy hunting. Based on our research, we hypothesize the situation may become worse with hunters who potentially will become more upset with the government and NGOs the longer the ban continues. In addition, the rates of illegal killing, damage to livestock and potential threats to human lie, particularly in the base of brown bears, could create major obstacles to effective large carnivore management in Romania. On the other hand, the trophy ban will benefit the large males, in terms of brown bears, which may create stability in bear populations. Killing large males, who often have been the fathers of new cubs of the year, can result in new males killing the cubs (McLellan, 1994; Noyce and Garshelis, 1994; Swenson et al., 2008) so to breed with the females. A protection period for large carnivores may create more wildlife viewing opportunities

and in turn more hunting opportunities if and when the trophy hunting ban is lifted. If Romanian society embraces protection of large carnivores, then wildlife managers will need to explore ways of dealing with "problem" or "nuisance" individuals; this could be through brown bear emergency teams that could remove bears that enter villages or other large carnivores that cause considerable livestock damage. This will require a considerable dialogue and changes in legislation. Currently, firearms cannot be discharged within residential areas, a bone of contention of hunters that would like to help local residents in such emergency situations.

The understanding of attitudes and beliefs are well-established in HDW research. However, understanding emotions through qualitative approaches, especially listening to emotions through vocal tones, is rare. Therefore, we should further our understanding of such cognitions and behaviour responses by expanding our resources and knowledge. To do so, integrating the mixed method approach can provide useful insights that quantitative methods and qualitative methods cannot do standing alone; by using the mixed method approach, it helps close the gap between quantitative and qualitative paradigms (Vargas-Amezcua, 2015). As Vargas-Amezcua (2015) suggests, separating the world into quantitative and qualitative measurements is more artificial than reality, but combining the two approaches initiates complex "…thinking and acting on the objects of research, the problematic fields, the collection of information, the tools and analysis" (pp 101) by producing more complex and multi-faceted research accounts. To understand Australian clinical learning environments, Salamonson et al., (2014) used mixed methods involving nursing students from four different Australian universities by studying their experiences (positive and negative) in the workplace. Similar use of methods can be found on various topics such as teacher education (MacMath and Salingré, 2017), personal computer usage in public high school (Foster, 2017), ethnographic data (LeCompte & Schensul, 2013), and food insecurity and foodbanks in U.K. (Garratt and Purdam, 2018). By utilizing mixed methods

approaches in Romania, managers will have a more realistic idea of how hunters think and feel about wildlife management, in particularly large carnivores. While quantitative methods indicate what hunters' cognitions are, qualitative methods acknowledge why hunters may have these cognitions. With the mixture of both approaches, managers can have a better idea of how to properly approach future decision-making regarding wildlife management.

In light of the trophy hunting ban and the species potentially being completely protected, new models of wildlife management need to be integrated into the Romanian system. In the current state, Romania may adopt the NAM of wildlife conservation if the country progresses more towards protection of wildlife and landscapes. As mentioned previously, NAM has its advantages and disadvantages, and adapting this model into wildlife management in Romania may provide some challenges, especially regarding hunters and their negative views toward government. If the government does lean towards increasing conservation and protection of wildlife, hunters attitudes may become increasingly negative due to possible increases of conflict, which is currently being seen. In saying this, hunters need to adapt their way of thinking, where they will need to become more open-minded to possible new management approaches.

As society becomes more involved or interested in wildlife, wildlife value orientations can change to where people are willing to spend money to see or interact with wildlife (Cunningham et al., 2012; Manfredo, 2008). Between the early 1990s to 2006 tourism and ecotourism worldwide has doubled, generating trillions of US dollars annually, however since the beginning of the twenty-first century ecotourism has passed the growth rate of the rest of the industry (Manfredo, 2008). Similar patterns have been seen in Romania today where there is an increasing number of tourists interested in outdoor recreation and wildlife viewing, especially seeing large carnivores in their natural habitat. Not only is Romania seeing a change in wildlife value orientations through tourism, but also through the government and media. The Romanian

government and media are suggesting more regulations and laws toward protecting wildlife are needed. While understanding hunter attitudes and beliefs toward wildlife is important, exploring other interest groups or groups impacted by wildlife damages are equally as important. For a long time wildlife agencies have focused solely on hunters, recruitment of hunters, and retainment of hunters. Studying hunters' cognition has been the traditional tool of management in North America and worldwide. Nevertheless, due to changing of societal values toward concerns for the environment, biodiversity, the concept of "letting nature take its course," new players need to be part of wildlife management. This especially goes for Romania where hunters have been the sole group responsible for wildlife management for many years. Though hunters need to be listened to in the debate of wildlife management, they are one voice or segment of society that is now valuing wildlife and ecosystems differently.

References

APA. (N. d.). Society for environmental, population and conservation psychology. Retrieved from https://www.apa.org/about/division/div34

Artelle, K. A., Reynolds, J. D., Treves, A., Walsh, J. C., Paquet, P. C. & Darimont, C. T. (2018). Hallmarks of science missing from North American wildlife management, *Science Advance, 4*(eaao0167), 1-6.

Bath, A. (1991). Public attitudes in Wyoming, Montana and Idaho Toward Wolf Restoration in Yellowstone National Park. *Transactions of North American Wildlife and Natural Resources Conference, 56,* 91-95.

Bath, A. J. (1998). The Role of Human Dimensions in Wildlife Research in Wildlife Management. *Ursus,10*(September 1995), 349-355.

Bath, A., Olszanska, A., & Okarma, H. (2008). From a human dimensions perspective, the unknown large carnivore: Public attitudes towards Eurasian lynx in Poland. *Human Dimensions of Wildlife, 13(1),* 31-46.

Berry, P. M., Fabók, V., Blicharska, M., Bredin, Y. K., Llorente, M.G., Kovács, E., … Harrison, P. A. (2016). Why conserve biodiversity? A multi-national exploration of stakeholders' views on the arguments for biodiversity conservation. *Biodiversity Conservation, 27,* 1741-1762.

Bjerk, T. & Kaltenborn, B. P. (1999). The relationship of ecocentric and anthropocentric motives to attitudes toward large carnivores.

Breitmenmoser, U. (1998). Large predators in the Alps: The fall and rise of man's competitors. *Biological Conservation, 83*(3), 279-289.

Brown, P. (2009). Introduction: Perspectives on the Past and Future of Human Dimensions of Fish and Wildlife. In *Wildlife and Society: The Science of Human Dimensions* (pp. 1-13). Washington, DC: Island Press

Bruskotter, J. T., Treves, A. & Way, J. G. (2014). Carnivore management. In B. S. Steel (Ed.), *Science and Politics: An A-To-Z Guide to Issues and Controversies*. Thousand Oaks, CA, USA: CQ Press.

Cunningham, P. A., Huijbens, E. H. & Wearing, S. L. (2012). From whaling to whale watching: Examining sustainability and cultural rhetoric. *Journal of Sustainable Tourism, 20*(1), 143-161.

Chapron, G., Kaczensky, P., Linnell, J. D .C.,…Boitani, L. (2014). Recovery of large carnivores in Europe's modern human-dominated landscapes. *Science, 346*(6216), 1517-1519.

Citypopulation, (2011). Romania. Retrieved from https://www.citypopulation.de/Romania.html

Decker, S. E., Bath, A. J., Simms, A., Linder, U., & Reisimger, E. (2010). The return of the king or bringing snails to the garden? The human dimensions of a proposed restoration of European bison (*Bison bonasus*) in Germany. *Restoration Ecology, 18(1),* 41-51.

Decker, D. J., Riley, S. J., & Siemer, W. F. (2012). *Human Dimensions of Wildlife Management*. Baltimore, Maryland: The Johns Hopkins University Press.

Dorresteijn, I., Milcu, A. I., Leventon, J., Hanspach, J. & Fischer, J. (2016). Social factors mediating human-carnivore coexistence: Understanding thematic strand influencing coexistence in Central Romania. *Ambio, 45*(4), 490-500.

Engel, M., T., Vaske, J. J., Bath, A. J. & Marchini, S. (2016). Predicting acceptability of jaguars and pumas in the Atlantic forest, Brazil. *Human Dimensions of Wildlife, 21*(5), 427-444.

Ericsson, G. & Heberlin, T. (2003). Attitudes of hunters, locals, and the general public in Sweden now that the wolves are back. *Biological Conservation, 111*(2), 149-159.

Ericsson, G., Heberlein, T., Karlsson, J., Bjärvall, A. & Lundvall, A. (2004). Support for hunting as a means of wolf population control in Sweden. *Wildlife Biology, 10,* 269-276.

EU, (2013). Status, management and distribution of large carnivore-bear, lynx, wolf & wolverine – in Europe. Retrieved from http://www2.nina.no/lcie_new/pdf/635010989996563545_2013_03_25_Updated%20status%20of%20LC%20in%20Europe_Part1.pdf

FCC, (2017). VCA Proposal. *Carpathia European Wilderness Reserve*. Retrieved from http://www.earthmind.org/sites/default/files/2017-09-VCA-CarpathiaWildeerness-Proposal_0.pdf

Flader, S. L. (1974). Thinking like a mountain. University of Missouri Press, Columbia

Foster, W. T. (2017). *Diffusion of the personal computer innovation in public high schools: A mixed methods approach*. London, England: SAGE Publications Ltd.

Frank, B. (2016). Human-wildlife conflicts and the need to include tolerance and coexistence: An introductory comment. *Society & Natural Resources, 29*(6), 738-743.

Fulton, D. C., Manfredo, M. J., & Limpscomb, J. (1996). Wildlife value orientation: A conceptual and measurement approach. *Human Dimensions of Wildlife, 1(2),* 24-47.

Garratt and Purdam, (2018). *Researching U.K. food insecurity and foodbank use using a mixed-method approach*. London, England: SAGE Publications Ltd.

Glikman, J.A., Bath, A. J. & Vaske, J. J. (2010). Segmenting normative beliegs regarding wolf management in Central Italy. *Human Dimensions of Wildlife, 15*(5), 347-358.

Glikman, J. A., Vaske, J. J., Bath, A. J., Ciucci, P. & Boitani, L., (2012). Residents' support for wolf and bear conservation: The moderating influence of knowledge. *European Journal of Wildlife Research, 58*(1), 295-302.

Gray, G. (1993). *Wildlife and people: The human dimensions of wildlife ecology*. Urbana, IL: University of Illinois Press.

Heberlein, T. & Willebran, T. (1998). Attitudes toward hunting across time and continents: The United States and Sweden. *Gibier faune sauvage, 15*(1), 1071-1080.

Hetherington, D. A., Lord, T. C. & Jacobi, R. M. (2006). New evidence for the occurrence of Eurasian lynx (Lynx lynx) in medieval Britain. *Journal of Quaternary Science, 21*¸ 3-8.

Hillman, V. (2014). Video: Wild Cats of the forest. *National Geographic*. Retrieved from https://blog.nationalgeographic.org/2014/01/27/video-wild-cats-of-the-forest/

Huber, D., Kusak, J., Majić-Skrbinšek, A., Majnarić, D. & Sindičić, M. (2008). A multidimensional approach to managing the European brown bear in Croatia. *Ursus*, *19*(1), 22-32.

Inskip, C., Carter, N., Riley, S., Roberts, T. & MacMillan, D. (2016). Toward human-carnivore coexistence: Understanding tolerance for tigers in Bangladesh. *PLoS ONE, 11*(1), 1-20.

Inskip, C. & Zimmermann, A. (2009). Cattle depredation by puma (*Puma concolor*) and jaguar (*Panthera onca)* in Central-Western Brazil. *Biological Conservation, 141*, 118-125.

IUCN. (2019). Wild Cat. *IUCN Red List*. Retrieved from https://www.iucnredlist.org/species/60354712/50652361

Jacobs, M. H., Vaske, J. J., Dubois, S. & Fehres, P. (2014). More than fear: Role of emotions in acceptability of lethal control of wolves. *European Journal of Wildlife Research, 60*(4), 589-598.

Jochum et al., (2014). Integrating complexity in the management of human-wildlife encounters. *Global Environmental Change, 26*(1), 73-86.

Kaltenborn, B. P., Andersen, O. & Linnell, J. D. C. (2013). Is hunting large carnivores different from hunting ungulates? Some judgements made by Norwegian hunters. *Journal for Nature Conservation, 21*(5), 326-333.

Kansky, R. (2015). Towards Understanding Tolerance to Damage Causing Mammalian Wildlife. Retrieved from PhD Dissertation. University of Stellenbosch, South Africa. Retrieved from http://scholar.sun.ac.za/browse?value=Kansky%2C+Ruth&type=author.

Karanth, K. U. & Chellam, R. (2009). Carnivore conservation at the crossroads. *Oryx, 43*(1), 1-2.

Knorn, J., Kuemmerla, T., Radeloff, V. C., Szabo, A., … Hostert, P. (2011). Forest restitution and protected area effectiveness in post-socialist Romania. *Biological Conservation, 146(2012)*, 204-212

Kruuk, H. (2002). *Hunter and hunted relationships between carnivores and people.* Cambridge, UK: Cambridge University Press.

LeCompte, M. D. & Schensul, J. J. (2013). *Analysis and interpretation of ethnographic data: A mixed methods approach*. Lanham, Md.; Toronto: AltaMira Press c2013

Linnell, J. D. C., Smith, M. E., Odden, J., Kaczensky, P. & Swenson, J. E. (1996). Strategies for the reduction of carnivore-livestock conflicts: A review. *NINA Oppdragsmelding, 443*, 1-118.Linnell, J. D. C., Løe, J, Okarma, H.,…Breitenmoser, U. (2002). The fear of wolves: A review of wolf attacks on humans. *NINA Oppdragsmelding, 731*, 1-65.

Linnell, J. D. C., Kaltenborn, B., Bredin, Y. & Gjershaug, J. O. (2016). Biodiversity assessment of the Făgăraș Mountains, Romania. *NINA Report 1236*.

Lopez, B. H. (1978). *Of wolves and men*. New York: Charles Scribner's and Sons.

Lukasik, V. (2018). Lethal control, tradition, and politics: Anthropocentric large carnivore management in Western Canada (Unpublished doctoral dissertation). University of Calgary, Calgary, Canada.

MacMath, S. & Salingré, B. (2017). A study of intake variables in teacher education: Analyzing a mixed-methods approach. *SaGE Research Methods Cases.*

Majić, A., Taussig de Bodonia, A. M., Huber, D. & Bunnefeld, N. (2011). Dynamics of public attitudes toward bears and the role of bear hunting in Croatia. *Biological Conservation, 144*(12), 3018-3027.

Manfredo, M. (2008). *Who cares about wildlife? Social science concepts for exploring human-wildlife relationship and conservation issues*. Colorado, USA: Springer.

Manfredo, M. J., Vaske, J. J., Brown, P. J. & Decker, D. J. (2009). *Wildlife and Society: The Science of Human Dimensions*. Washington, DC: Island Press.

McLellan, B. (1994). Density-dependent population regulation of brown bears. *Density dpendent population regulation in black, brown, and polar* bears. M. Taylor (eds) *Int. Conf. Bear Res. And Manage. Monogr*. Series No. 3, 15-24.

Mech, L. D. (1995). The challenge and opportunity of recovering wolf populations. *Conservation Biology, 9*, 270-278.

Nilsen, E. B., Milner-Gulland, E. J., Schofield, L., Senseth, N. C. & Coulson, T. (2007). Wolf reintroduction to Scotland: Public attitudes and consequences for red deer management. *Proceedings of the Royal Society Biological Science, 274*(1612), 995-1003.

Noyce, K. V. & Garshelis, D. L. (1994). Body size and blood characteristics as indicators of condition and reproductive performance in black bears. *Ursus, 9*(1), 481-496

Olszńaska, A. (2012). Comparison of attitudes of the key interest groups toward the wolf (*Canis lupus*) and the Eurasian lynx (*Lynx lynx*) conservation in Poland (Unpublished doctoral thesis). Memorial University of Newfoundland, Newfoundland, Canada.

Organ, J. F., Mahony, S. P., Williams, S…Decker, D. J. (2012). The North American Model of Wildlife Conservation. The Wildlife Society, *Technical Review 12-04* (). Bethesda Maryland, USA: The Wildlife Society.

Peek, J., Mahoney, S., Dale, B., Miller, C.,…Soulliere, C. (2012). Management of large mammalian carnivores in North America. The Wildlife Society, *Technical Review 12-01* (1-76). Bethesda, Maryland, USA: The Wildlife Society. Pennisi, E. (2002). A shaggy dog history. *Science, 298,* 1540-1542.

Petra, M. (2010). Large carnivore depredation on livestock in Europe. *Ursus, 11*(1998), 59-71.Ream, (1979). Human-Wildlife Conflicts in Backcountry: Possible Solutions. *Recreational Impact on Wildlands: Conference Proceedings.* University of Minnesota

Ripple, W. J., Estes, J. A., Beschta, R. L.,…Wirsing, A. J. (2014). Status and ecolocial effects of the world's largest carnivores. *Science, 343*(6167), 151-162.

Rosen, T. & Bath, A. (2009). Transboundary management of large carnivores in Europe: from incident to opportunity. *Conservation Letters, 2,* 109-114.

Røskaft, E., Bjerke, T., Kalthenborn, 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.

Rotar, A., Simon, L., Urdea, P. & Mircea, V. (2012). A study of institutional stakeholders' views on biodiversity in Romania. *Carpathian Journal of Earth and Environmental Sciences, 7*(2), 219-230.

Salamonson, Y., Everett, B., Halcomb, E.,… Weaver, R. (2014). Unravelling the complexities of nursing studnets' feedback on the clinical learning environment: A mixed methods approach. *Nurse Education Today, 35,* 206-211

Salvatori, V., Okarma, H., Ionescu, O., Dovhanych, Y., Findo'o, S. & Boitani, L. (2002). Hunting legislation in the Carpathian Mountains: Implications for the conservation and management of large carnivores. *Wildlife Biology, 8*(1), 3-10.

Sielski, L. M. (1979). Understanding body language. *Journal of Counseling & Development, 57*(5), 238-242.

Skogen, K. & Thrane, C. (2008). Wolves in context: Using survey data to situate attitudes within a wider cultural framework. *Society and Natural Resources, 21*(1), 17-33/

Sutherland, M. B. (2010). Human dimensions of black bears, caribou and coyotes on the island portion of Newfoundland and Labrador (Unpublished master thesis). Memorial University of Newfoundland, Newfoundland, Canada.

Swenson, J. E., Dahle, B. & Sandegren, F. (2008). Intraspecific predation in Scandinavian brown bears older than cubs-of-the-year. *Ursus, 12*(2001), 81-91.

Szinovatz, V. (1997). Attitudes of the Norwegian public toward bear and lynx (Unpublished diploma thesis). Institute of Wildlife Biology and Gamen Management, University of Agricultural Sicences, Vienna, Austira.

Tarrant, M. A. & Green, G. T. (1999). Outdoor Recreation and the Predictive Validity of Environmental Attitudes. *Leisure Science, 21*(1), 17-30.

Teel, T., Dayer, A., Manfredo, M., & Bright, A. (2005). Regional results from the research project entitled "Wildlife values in the West." *Project Report for the Western Association of Fish and Wildlife Agencies (Project Report No. 58),* (September). https://doi.org/10.13140/RG.2.1.1484.0406

Teel, T. L., Manfredo, M. J., Jensen, F. S., Buijs, A. E., Fischer, A., Riepe, C., Arlinghaus, R. & Jacobs, M. H. (2010). Understanding the cognitive basis for human-wildlife relationships as a key to successful protected-area management. *International Journal of Sociology, 40*(3), 194-123.

Treves, A., Jurewicz, R. L., Naughton-Treves, L. & Wilcove, D. S. (2009). The price of tolerance: wolf damage payments after recovery. *Biodiversity Conservation, 18*(4), 4003-4021.

Treves, A. & Karanth, K. U. (2003). Human-Carnivore Conflict and Perspective on Carnivore Management Worldwide. *Conservation Biology, 17*(6), 1491-1499.

Treves, A. & Naughton-Treves, L. (1999). Risk and opportunity for humans coexisting with large carnivores. *Journal of Human Evolution, 36,* 275-282.

Vargas-Amezcua, E. (2015). Mixed-Methods Studies. In: García-Peña, C., Gutiérrez-Robledo, L., Pérez-Zepeda, M. (eds) *Aging Research-Methodological Issues*. Springer, Cham.

Vaske, J. J. & Donnelly, M. P. (1998). A Value-Attitude-Behavior Model Predicting Wildland Preservation Voting Intentions. *Society & Natural Resources, 12(6),* 523-537.

Vaske, J. J., Shelby, L. B., & Manfredo, M. J. (2006) Bibliometric Reflections on the First Decade of Human Dimensions of Wildlife. *Human Dimensions of Wildlife, 11(2),* 79-87.

Vaske, J. J. (2008). Conceptualization and measurement. *Survey Research and analysis: Applications in parks, recreation, and human dimension.* 59-77.

Vaske, J. J., Jacobs, M. H. & Sijtsma, M. T. J. (2011). Wildlife value orientations and demographics in The Netherlands. *European Journal of Wildlife Research, 57*(6), 1179-1187.

Velli, E., Bologna, M. A. & Randi, E. (2015). The European Wildcat (*Felis silvestris silvestris*): study for a functional method of population research. 1-151.

Whittaker, D., Vaske, J. J., & Manfredo, M. J. (2006). Specificity and the cognitive hierarchy: Value orientations and the acceptability of urban wildlife management actions. *Society and Natural Resources, 19(6),* 515-530.

Williams, C. K., Ericsson, G. & Heberlein, T. A. (2002). A quantitative summary of attitudes toward wolves and their reintroduction (1972-2000). *Wildlife Society Bulletin, 30*(2), 575-584.

Woodroffe, R. (2000). Predators and people: using human densities to interpret declines of large carnivores. *Animal Conservation, 3*, 165-173.

Zeiler, H., Zedrosser, A. & Bath, A. (1999). Attitudes of Austrian hunters and Vienna residents toward bear and lynx in Austria. *Ursus, 11,* 193-200.

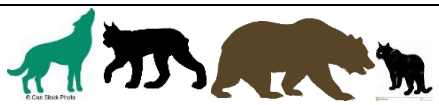
Zimmermann, B., Wabakken, P. & Dötterer, M. (2001). Human-carniovre interactions in Norway: How does the re-appearance of large carnivores affect people's attitudes and levels of fear? *Forest Snow and Landscape Research, 76*(1/2), 137-153.

Appendix 1

Appendix 1.1 English Questionnaire

Universitatea Transilvania

Large carnivores in Făgăraș Mountains, România



Dear hunter,

I invite you to participate in this research project. Memorial University of Newfoundland, Canada, in cooperation with Transylvania University and a variety of organizations within the Făgăraș Mountains are interested in learning more about the attitudes and opinions of hunters regarding large carnivores. We send this questionnaire to a selected number of hunters, so your participation is very important. Your participation is voluntary. Your answers will not be reported to local, county or government officials. It will be used as a part of my PhD dissertation at Memorial University of Newfoundland in Canada.

You are free to respond positively, negatively, or neutral to each question and you can skip any questions that you do not wish to answer. You also have the right to withdraw from the study at any time between the moment of contact and the time of collection the answers, according to your wish. Your answers will be grouped with those of other respondents, and your individual questionnaire will be kept anonymous and strictly confidential.

Thank you for your time and for expressing your views on this matter. If you have any questions about the project or would like to schedule a face-to-face interview, please do not hesitate to contact me by phone at 001-709-894-4733 or by e-mail at abath@mun.ca (Alistair Bath) or Mr. Ovidiu Ionescu, by phone + 40-744-362-458 or by email at o.ionescu#unitbv.ro..

Section A refers to your opinion on wildlife in general. Section B is specific to wolf wolves (*Canis lupus*). Section C is specific for lynx (*Lynx lynx*). Section D is specific for brown bears (*Ursus arctos*), section E is about European wildcats (*Felis silvestris silvestris)* and section F addresses some general questions.

Respectfully yours,

Dr. Alistair J. Bath
Memorial University of Newfoundland
Email: abath@mun.ca

Dr. Ovidiu Ionescu
Universitatea Transilvania
Email: o.ionescu@unitbv.ro

The proposal for this research has been approved by the Interdisciplinary Committee on Ethics in Human Research at Memorial University. If you have ethical concerns about the research (such as the way you have been treated or your rights as a participant), you may contact the Chairperson of the ICEHR at icehr@mun.ca or by telephone at (709) 864-2561**.**

Section A: These questions refer on how you feel about wildlife in general

A1. To what extent do you agree or disagree with the following statements? (For each statement, circle the number that best represents your opinion.)

	Strongly Disagree	Moderately Disagree	Neutral	Moderately Agree	Strongly Agree
Humans should manage wildlife populations in the humans' benefit.	1	2	3	4	5
Animals should have rights similar to the rights of humans.	1	2	3	4	5
We should strive for a world where there is an abundance of wildlife for hunting and fishing.	1	2	3	4	5
I care about animals as much as I care about people.	1	2	3	4	5
Hunting does not respect the life of animals.	1	2	3	4	5
I feel a strong emotional connection with the animals.	1	2	3	4	5
The needs of humans should have priority over wildlife protection.	1	2	3	4	5
I consider all living things as part of one big family.	1	2	3	4	5
Wildlife exists on earth primarily for people to use it.	1	2	3	4	5
Hunting is cruel and inhumane.	1	2	3	4	5
We should strive for a world where humans and wildlife can live together without fear.	1	2	3	4	5
I appreciate the feeling of companionship I receive from animals.	1	2	3	4	5
Wildlife are like my family and I want to protect them.	1	2	3	4	5
People who want to hunt should have the possibility to do this.	1	2	3	4	5

Section B: These questions refer on how you feel about wolves (*Canis lupus*)

B1. Do you agree or disagree with each of the following statements? (For each statement, circle the number that best represents your opinion.)

	Strongly Disagree	Moderately Disagree	Neutral	Moderately Agree	Strongly Agree
Wolves have the right to exist in Făgăraș Mountains	1	2	3	4	5
Wolves are nuisance animals in Făgăraș Mountains	1	2	3	4	5
Wolves prevent me from spending time outdoors in Făgăraș Mountains	1	2	3	4	5
It is important for **wolves** to exist in Făgăraș Mountains for future generations	1	2	3	4	5
There are no advantages in having **wolves** in Făgăraș Mountains	1	2	3	4	5
Wolves should be completely protected in Făgăraș Mountains	1	2	3	4	5
Hunting **wolves** should be allowed all the year in Făgăraș Mountains	1	2	3	4	5
The presence of **wolves** in the forest attracts tourists	1	2	3	4	5
Wolves are killing too many wild ungulates (wild boar, red deer, roe deer)	1	2	3	4	5
It is important to maintain **wolves** in Făgăraș Mountains	1	2	3	4	5
Wolves kill too many livestock	1	2	3	4	5

B2. In general, do you think that **wolves** are: *(For each statement, circle the number that best represents your response.)*

	Extremely	Moderately	Neither	Moderately	Extremely	
Bad	1	2	3	4	5	Good
Harmful	1	2	3	4	5	Beneficial
Negative	1	2	3	4	5	Positive

B3. Because **wolves** are present in the Făgăraș Mountains, how do you feel about the following?

	Strongly Disagree	Moderately Disagree	Neutral	Moderately Agree	Strongly Agree
I am worried about my own health and safety	1	2	3	4	5

I am worried for the health and safety of my children	1	2	3	4	5
I am worried for the health and safety of the livestock	1	2	3	4	5
I worry about the diseases the wolves spread	1	2	3	4	5
I worry about the potential damage to my livestock made by **wolves**	1	2	3	4	5

B4. Do you agree or disagree with each of the following statements? (For each statement, circle the number that best represents your opinion.)

I believe that…	Strongly Disagree	Moderately Disagree	Neutral	Moderately Agree	Strongly Agree
.. **wolves** that kill livestock should be killed	1	2	3	4	5
.. a **wolf** that crosses a trail in front of a person in Făgăraș Mountains should be relocated	1	2	3	4	5
.. a **wolf** that crosses a trail in front of a person in Făgăraș Mountains should be killed	1	2	3	4	5
.. a **wolf** that approaches a person in Făgăraș Mountains should be killed	1	2	3	4	5
.. **wolves'** trophy hunting reduces losses of other game species that are killed by wolves	1	2	3	4	5
.. a **wolf** that has attacked a person in Făgăraș Mountains should be killed	1	2	3	4	5
.. there are too many **wolves** in Făgăraș Mountains	1	2	3	4	5
.. there should be a legal hunting season for **wolves** in Făgăraș Mountains	1	2	3	4	5
.. **wolves'** trophy hunting should be allowed	1	2	3	4	5
.. we should continue to coexist with the **wolves**	1	2	3	4	5
.. **wolves'** trophy hunting reduces losses of livestock that are killed by wolves	1	2	3	4	5

B5. How many **wolves** do you think there are in the Făgăraș Mountains? _____number of **wolves.**

B6. Do you believe the population of **wolves** in the Făgăraș Mountains is (*Please tick one version*):

☐ Decreasing ☐ The same ☐ Increasing

B7. **Wolves** generally avoid contact with humans (*Please tick one version*):

☐ True ☐ False ☐ I am not sure

Section C: These questions refer on how you feel about lynx (*Lynx lynx*)

C1. Do you agree or disagree with each of the following statements? (For each statement, circle the number that best represents your opinion.)

	Strongly Disagree	Moderately Disagree	Neutral	Moderately Agree	Strongly Agree
Lynx have a right to exist in the Făgăraș Mountains	1	2	3	4	5
Lynx are nuisance animals in the Făgăraș Mountains	1	2	3	4	5
Lynx prevent me from spending time outdoors in Făgăraș Mountains	1	2	3	4	5
It is important for **Lynx** to exist in Făgăraș Mountains for future generations	1	2	3	4	5
There are no advantages in having **Lynx** in Făgăraș Mountains	1	2	3	4	5
Lynx should be completed protected in Făgăraș Mountains	1	2	3	4	5
Hunting **Lynx** should be allowed all the year in Făgăraș Mountains	1	2	3	4	5
The presence of **Lynx** in the forest attracts tourists	1	2	3	4	5
Lynx are killing too many wild ungulates (wild boar, red deer, roe deer)	1	2	3	4	5
It is important to maintain **Lynx** in Făgăraș Mountains	1	2	3	4	5
Lynx kill too many livestock	1	2	3	4	5

C2. In general, do you think that **lynx** are: *(For each statement, circle the number that best represents your response.)*

	Extremely	Moderately	Neither	Moderately	Extremely	
Bad	1	2	3	4	5	Good
Harmful	1	2	3	4	5	Beneficial
Negative	1	2	3	4	5	Positive

C3. Because **lynx** is present in the Făgăraș Mountains, how do you feel about the following?

	Strongly Disagree	Moderately Disagree	Neutral	Moderately Agree	Strongly Agree
I am worried about my health and safety	1	2	3	4	5
I am worried for the health and safety of my children	1	2	3	4	5

I am worried for the health and safety of the livestock	1	2	3	4	5
I worry about the diseases the **lynx** spread	1	2	3	4	5
I worry about the potential damage to my livestock made by **lynx**	1	2	3	4	5

C4. Do you agree or disagree with each of the following statements? (For each statement, circle the number that best represents your opinion.)

I believe that..	Strongly Disagree	Moderately Disagree	Neutral	Moderately Agree	Strongly Agree
.. **lynx** that kill livestock should be killed	1	2	3	4	5
.. a **lynx** that crosses a trail in front of a person in Făgăraș Mountains should be relocated	1	2	3	4	5
.. a **lynx** that crosses a trail in front of a person in Făgăraș Mountains should be killed	1	2	3	4	5
.. a **lynx** that approaches a person in Făgăraș Mountains should be killed	1	2	3	4	5
.. **lynx** trophy hunting reduces losses of other game species that are killed by wolves	1	2	3	4	5
.. a **lynx** that has attacked a person in Făgăraș Mountains should be killed	1	2	3	4	5
.. there are too many **lynx** in Făgăraș Mountains	1	2	3	4	5
.. there should be a legal hunting season for **lynx** in Făgăraș Mountains	1	2	3	4	5
.. **lynx** trophy hunting should be allowed	1	2	3	4	5
.. we should continue to coexist with the **w lynx**	1	2	3	4	5
.. **lynx** trophy hunting reduces losses of livestock that are killed by wolves	1	2	3	4	5

C5. How many **lynx** do you think there are in the Făgăraș Mountains? _____number of **lynx.**

C6. Do you believe the population of **lynx** in the Făgăraș Mountains is (*Please tick one version*):

☐ Decreasing ☐ The same ☐ Increasing

C7. **Lynx** generally avoid contact with humans (*Please tick one version*):

☐ True ☐ False ☐ I am not sure

Section D: These questions refer on how you feel about brown bear (*Ursus arctos*)

D1. Do you agree or disagree with each of the following statements? (For each statement, circle the number that best represents your opinion.)

	Strongly Disagree	Moderately Disagree	Neutral	Moderately Agree	Strongly Agree
Bears have a right to exist in the Făgăraș Mountains	1	2	3	4	5
Bears are nuisance animals in the Făgăraș Mountains	1	2	3	4	5
Bears prevent me from spending time outdoors in Făgăraș Mountains	1	2	3	4	5
It is important for **Bears** to exist in Făgăraș Mountains for future generations	1	2	3	4	5
There are no advantages in having **Bears** in Făgăraș Mountains	1	2	3	4	5
Bears should be fully protected in Făgăraș Mountains	1	2	3	4	5
Hunting **Bears** should be allowed all the year in Făgăraș Mountains	1	2	3	4	5
The presence of **Bears** in the forest attracts tourists	1	2	3	4	5
Bears are killing too many wild ungulates (wild boar, red deer, roe deer)	1	2	3	4	5
It is important to maintain **Bears** in Făgăraș Mountains	1	2	3	4	5
Bears kill too many livestock	1	2	3	4	5

D2. In general, do you think that **bears** are: *(For each statement, circle the number that best represents your response.)*

	Extremely	Moderately	Neither	Moderately	Extremely	
Bad	1	2	3	4	5	Good
Harmful	1	2	3	4	5	Beneficial
Negative	1	2	3	4	5	Positive

D3. Because **bears are** present in the Făgăraș Mountains, how do you feel about the following?

	Strongly Disagree	Moderately Disagree	Neutral	Moderately Agree	Strongly Agree
I am worried about my health and safety	1	2	3	4	5
I am worried for the health and safety of my children	1	2	3	4	5
I am worried for the health and safety of the livestock	1	2	3	4	5
I worry about the diseases the **bears** spread	1	2	3	4	5

I worry about the potential damage to my livestock made by **bears**	1	2	3	4	5

D4. Do you agree or disagree with each of the following statements? (For each statement, circle the number that best represents your opinion.)

I think..	Strongly Disagree	Moderately Disagree	Neutral	Moderately Agree	Strongly Agree
.. **bears** that kill livestock should be killed	1	2	3	4	5
.. a **bear** that crosses a trail in front of a person in Făgăraș Mountains should be relocated	1	2	3	4	5
.. a **bear** that crosses a trail in front of a person in Făgăraș Mountains should be killed	1	2	3	4	5
.. a **lynx** that approaches a person in Făgăraș Mountains should be killed	1	2	3	4	5
.. **bears** trophy hunting reduces losses of other game species that are killed by bears	1	2	3	4	5
.. a **bear** that has attacked a person in Făgăraș Mountains should be killed	1	2	3	4	5
.. there are too many **bears** in Făgăraș Mountains	1	2	3	4	5
.. there should be a legal hunting season for **bears** in Făgăraș Mountains	1	2	3	4	5
.. **bears** trophy hunting should be allowed	1	2	3	4	5
.. we should continue to coexist with the **bears**	1	2	3	4	5
.. **bears** trophy hunting reduces losses of livestock that are killed by wolves	1	2	3	4	5

D5. How many **bears** do you think there are in the Făgăraș Mountains? _____number of **bears.**

D6. Do you believe the population of **bears** in the Făgăraș Mountains is (*Please tick one version*):

☐ Decreasing ☐ The same ☐ Increasing

D7. **Lynx** generally avoid contact with humans (*Please tick one version*):

☐ True ☐ False ☐ I am not sure

D8. Why are bears seen in and around communities?

	Strongly Disagree	Moderately Disagree	Neutral	Moderately Agree	Strongly Agree
Disturbance of the habitats caused by forestry industries drives bears from the forest towards communities	1	2	3	4	5
Disturbance of habitats caused by recreational activities (motocross, mountain biking, hiking, ATV, etc.) drives bears from the forest towards communities	1	2	3	4	5
Bears are attracted to communities due to easy access to food waste (garbage)	1	2	3	4	5
Bears are attracted to communities because of their easy access to livestock	1	2	3	4	5
Bears are attracted to communities due to easy access to crops and orchards	1	2	3	4	5
Habitats are overpopulated by bears so some wander into communities	1	2	3	4	5
Disturbance of habitats caused by collection of fruit and mushrooms drives bears from the forest towards communities	1	2	3	4	5
Diminution of food sources caused by the collection of fruits and mushrooms drives bears from the forest towards communities	1	2	3	4	5

Section E: These questions refer on how you feel about European wild cat (*Felis silvestris*)

E1. Do you agree or disagree with each of the following statements? (For each statement, circle the number that best represents your opinion.)

	Strongly Disagree	Moderately Disagree	Neutral	Moderately Agree	Strongly Agree
Wildcats have a right to exist in the Făgăraș Mountains	1	2	3	4	5
Wildcats are nuisance animals in the Făgăraș Mountains	1	2	3	4	5
Wildcats prevent me from spending time outdoors in Făgăraș Mountains	~~1~~	~~2~~	~~3~~	~~4~~	~~5~~
It is important for **Wildcats** to exist in Făgăraș Mountains for future generations	1	2	3	4	5
There are no advantages in having **Wildcats** in Făgăraș Mountains	1	2	3	4	5
Wildcats should be completed protected in Făgăraș Mountains	1	2	3	4	5
Hunting **Wildcats** should be allowed all the year in Făgăraș Mountains	1	2	3	4	5
The presence of **Wildcats** in the forest attracts tourists	1	2	3	4	5
Wildcats are killing too many wild birds	1	2	3	4	5
It is important to maintain **Wildcats** in Făgăraș Mountains	1	2	3	4	5
Wildcats kill too many livestock (chickens)	1	2	3	4	5

E2. In general, do you think that **wildcats** are: *(For each statement, circle the number that best represents your response.)*

	Extremely	Moderately	Neither	Moderately	Extremely	
Bad	1	2	3	4	5	Good
Harmful	1	2	3	4	5	Beneficial
Negative	1	2	3	4	5	Positive

E3. Do you agree or disagree with each of the following statements?

I believe that..	Strongly Disagree	Moderately Disagree	Neutral	Moderately Agree	Strongly Agree
.. **wildcats** that kill chickens must be killed	1	2	3	4	5

.. **wildcats** trophy hunting reduces losses of other game species that are killed by wildcats (pheasants, birds)	1	2	3	4	5
.. we should continue to coexist with the **wildcats**	1	2	3	4	5
.. there are too many **wildcats** in Făgăraș Mountains	1	2	3	4	5
.. there should be a legal hunting season for **wildcats** in Făgăraș Mountains	1	2	3	4	5
.. **wildcats** trophy hunting should be allowed	1	2	3	4	5

E4. How many **wildcats** do you think there are in the Făgăraș Mountains? _____number of **wildcats.**

E5. Do you believe the population of **wildcats** in the Făgăraș Mountains is (*Please tick one version*):

☐ Decreasing ☐ The same ☐ Increasing

E6. **Wildcats** generally avoid contact with humans (*Please tick one version*):

☐ True ☐ False ☐ I am not sure

Section F: A few general questions

F1. In general, what is your interest, if any, in large carnivores?

☐ Not interested ☐ Somewhat interested ☐ Neutral ☐ Moderately interested ☐ Strongly interested

F2. In general, what is your interest, if any, in wildlife watching?

☐ Not interested ☐ Somewhat interested ☐ Neutral ☐ Moderately interested ☐ Strongly interested

F3. If hunting would be restricted in certain areas, would you participate in wildlife watching in these areas instead of hunting?

☐ Not interested ☐ Somewhat interested ☐ Neutral ☐ Moderately interested ☐ Strongly interested

F4. How did you receive information about large carnivores in the past? Tick the boxes that apply.

☐ Books
☐ Radio
☐ Video (DVD/VHS/YouTube)
☐ Government agency
☐ Forest service
☐ Friends & family
☐ National Geographic
☐ Magazines/Newspapers
☐ Television
☐ Internet website
☐ Environmental groups
☐ Social media (Facebook, Twitter etc.)
☐ Hunting Association
☐ Other (specify):_____

F5. Would I participate on wildlife monitoring?

☐ Strongly disagree ☐ Disagree ☐Don't know ☐ Agree ☐Strongly agree

F6. Would I participate on nature volunteering programs?

☐ Strongly disagree ☐ Disagree ☐Don't know ☐ Agree ☐Strongly agree

F7. For how long have you been hunting in Făgăraș Mountains? _____years

F8. Which hunting association are you affiliated with? _____

F9. How close do you live from your hunting area? I live about _____km from the area where I usually hunt.

F10. How interested or useful would you find each type of information about large carnivores?

I would find useful information about..	Strongly Disagree	Moderately Disagree	Neutral	Moderately Agree	Strongly Agree
.. what to do if you are attacked by a large carnivore	1	2	3	4	5
.. habitat and behavior of large carnivores	1	2	3	4	5
..the importance of large carnivores for the environment	1	2	3	4	5
.. how to protect children and pets when you meet large carnivores	1	2	3	4	5
.. how humans and large carnivores can share the same living space	1	2	3	4	5
.. prevention techniques of livestock	1	2	3	4	5

F11. You are:

☐Man ☐ Woman ☐ Identify as other

F12. What is your age? _____years

F13. Which county do you live in? I live in_____

F14. What is the highest level of schooling you have completed?

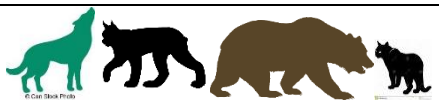
- ☐ Primary school
- ☐ High school
- ☐ University degree
- ☐ Other (please specify):_____

Before handing back the questionnaire, please make sure you have answered all the questions. If you have more comments about the large carnivores from the Făgăraș Mountains or about this questionnaire, please write below your feedback.
Thank you for participating: it is very important and highly appreciated.

Appendix 1.2 Romanian Translated Questionnaire

Universitatea Transilvania

Carnivore mari în Munții Făgăraș, România



Stimate Vânător,

Vă invit să participați la acest proiect de cercetare. Universitatea Memorial din Newfoundland, Canada, în colaborare cu Universitatea Transilvania și o serie de organizații din jurul Munților Făgăraș sunt interesați să afle mai multe despre atitudinile și opiniile vânătorilor cu privire la carnivorele mari. Trimitem acest chestionar unui număr selecționat de vânători, astfel că participarea dvs. este foarte importantă. Participarea dvs. este voluntară. Acceptul și răspunsurile dvs. nu vor fi folosite sub nicio formă în raport cu oficialitățile locale, județene sau guvernamentale.

Sunteți liber să răspundeți pozitiv, negativ sau neutru fiecărei întrebări și puteți sări peste orice întrebare la care nu doriți să răspundeți. De asemenea, aveți dreptul să vă retrageți din studiu în orice moment între momentul contactării și momentul colectării răspunsurilor, în funcție de dorința dvs. Răspunsurile dvs. vor fi grupate cu cele ale altor respondenți, iar chestionarul dvs. individual va fi păstrat anonim și strict confidențial.

Vă mulțumim pentru timpul acordat și pentru exprimarea opiniilor dvs. cu privire la această chestiune. Dacă aveți întrebări legate de proiect sau doriți să stabilim un interviu față în față, nu ezitați să mă contactați telefonic la +1-709-864-4733 sau prin e-mail la abath@mun.ca (Alistair Bath) sau pe dl. Ovidiu Ionescu, la telefon +40-744-362-458 sau prin e-mail la o.ionescu@unitbv.ro

Secțiunea A se referă la opinia dumneavoastra cu privire la fauna în general. Secțiunea B este specifică lupului (Canis lupus). Secțiunea C este specifică pentru râs (Lynx lynx). Secțiunea D este specifică ursului brun (Ursus arctos), secțiunea E este axată pe pisicile sălbatice (Felis silvestris silvestris), iar secțiunea F adresează câteva întrebări generale.

Cu respect,

Dr. Alistair J. Bath
Universitatea Memorial din Newfoundland
Email: abath@mun.ca

Dr. Ovidiu Ionescu
Universitatea Transilvania
Email: o.ionescu@unitbv.ro

Propunerea pentru această cercetare a fost aprobată de către Comitetul Interdisciplinar pentru Etică în Cercetarea Umană de la Universitatea Memorial. Dacă aveți îngrijorări etice privind cercetarea (cum ar fi modul în care ați fost tratat sau drepturile dvs. în calitate de participant), puteți contacta președintele ICEHR la icehr@mun.ca sau telefonic la (709) 864-2561.

Secțiunea A: Aceste întrebări se referă la ce simțiți cu privire la viața sălbatică în general

A1. În ce măsură sunteți de acord sau în dezacord cu afirmațiile de mai jos? (Pentru fiecare afirmație, încercuiți numărul care reprezintă cel mai bine opinia dvs.)

	Dezacord total	Dezacord moderat	Neutru	Acord Moderat	Acord Total
Oamenii ar trebui să gestioneze populațiile de animale sălbatice în beneficiul oamenilor.	1	2	3	4	5
Animalele ar trebui să aibă drepturi similare cu drepturile omului.	1	2	3	4	5
Ar trebui să facem eforturi pentru o lume în care există o abundență a faunei pentru vânătoare și pescuit.	1	2	3	4	5
Îmi pasă de animale la fel de mult cum îmi pasă de oameni.	1	2	3	4	5
Vânătoarea nu respectă viața animalelor.	1	2	3	4	5
Simt o puternică legătură emoțională cu animalele.	1	2	3	4	5
Nevoile oamenilor ar trebui să aibă prioritate în fața protecției faunei sălbatice.	1	2	3	4	5
Văd toate lucrurile vii ca parte a unei mari familii.	1	2	3	4	5
Fauna este pe pământ în primul rând pentru ca oamenii să o folosească.	1	2	3	4	5
Vânătoarea faunei sălbatice este crudă și inumană.	1	2	3	4	5
Ar trebui să facem eforturi pentru o lume în care oamenii și fauna să trăiască împreună fără frică.	1	2	3	4	5
Apreciez sentimentul de companie pe care o primesc de la animale.	1	2	3	4	5
Animalele sălbatice sunt ca familia mea și vreau să le protejez.	1	2	3	4	5
Oamenii care doresc să vâneze ar trebui să aibă posibilitatea să facă acest lucru.	1	2	3	4	5

Secțiunea B: Aceste întrebări reflecta opinia dvs. despre lupi (*Canis lupus*)

B1. În ce măsură sunteți de acord sau în dezacord cu afirmațiile de mai jos? (Pentru fiecare afirmație, încercuiți numărul care reprezintă cel mai bine opinia dvs.)

	Dezacord total	Dezacord moderat	Neutru	Acord Moderat	Acord Total
Lupii au dreptul să existe în Munții Făgăraș.	1	2	3	4	5
Lupii sunt animale dăunătoare în Munții Făgăraș	1	2	3	4	5
Lupii mă împiedică să petrec timpul în aer liber în Munții Făgăraș	1	2	3	4	5
Este important ca **lupii** să existe în munții Făgăraș pentru generațiile viitoare	1	2	3	4	5
Nu există avantaje pentru a avea **lupi** în Munții Făgăraș	1	2	3	4	5
Lupii ar trebui să fie complet protejați în Munții Făgăraș	1	2	3	4	5
Ar trebui să fie permis ca **lupii** să poată fi vânați pe tot parcursul anului în Munții Făgăraș	1	2	3	4	5
Prezența **lupilor** în pădure atrage turiștii	1	2	3	4	5
Lupii ucid prea multe ungulate sălbatice (mistreți, cerbi, căpriori)	1	2	3	4	5
Este important să menținem **lupii** în Munții Făgăraș	1	2	3	4	5
Lupii ucid prea multe animale domestice	1	2	3	4	5

B2. În general, credeți despre lupi că sunt: *(*Pentru fiecare afirmație, încercuiți numărul care reprezintă cel mai bine opinia dvs.)

	Extrem	Moderat	Nici	Moderat	Extrem	
Răi	1	2	3	4	5	Buni
Malefici	1	2	3	4	5	Benefici
Negativi	1	2	3	4	5	Pozitivi

B3. Deoarece **lupii** sunt prezenți în Munții Făgăraș, cum vă simțiți în legătură cu următoarele?

	Dezacord total	Dezacord moderat	Neutru	Acord Moderat	Acord Total
Mă tem pentru propria mea sănătate și siguranță	1	2	3	4	5
Mă tem pentru sănătatea și siguranța copiilor	1	2	3	4	5
Mă tem pentru sănătatea și siguranța animalelor de companie	1	2	3	4	5

Mă tem de bolile răspândite de **lupi**	1	2	3	4	5
Mă tem de posibilele pagube provocate de **lupi** animalelor mele domestice	1	2	3	4	5

B4. În ce măsură sunteți de acord sau în dezacord cu fiecare dintre următoarele? (Pentru fiecare afirmație, încercuiți numărul care reprezintă cel mai bine opinia dvs.)

Cred că...	Dezacord total	Dezacord moderat	Neutru	Acord Moderat	Acord Total
.. **Lupii** care ucid animalele domestice ar trebui uciși	1	2	3	4	5
.. **un lup** care traversează o potecă în fața mea în Munții Făgăraș ar trebui să fie relocat	1	2	3	4	5
.. **un lup** care traversează o potecă în fața mea în Munții Făgăraș ar trebui să fie ucis	1	2	3	4	5
.. **un lup** care se apropie de tine în Munții Făgăraș ar trebui ucis	1	2	3	4	5
.. Vânătoarea de trofee de **lupi** ajută la reducerea pierderilor de specii de vânat cauzate de **lupi**	1	2	3	4	5
.. **un lup** care a atacat un om în Munții Făgăraș ar trebui ucis	1	2	3	4	5
.. sunt prea mulți **lupi** în Munții Făgăraș	1	2	3	4	5
.. Ar trebui să existe un sezon legal de vânătoare pentru **lupii** din Munții Făgăraș	1	2	3	4	5
.. ar trebui să fie permisă vânătoarea **lupilor** pentru trofee	1	2	3	4	5
.. ar trebui să continuăm să coexistăm cu **lupii**	1	2	3	4	5
.. vânătoarea de trofee a lupilor ajută la reducerea pierderilor de animale domestice cauzate de **lupi**	1	2	3	4	5

B5. Câți **lupi** credeți că există în Munții Făgăraș? _____număr de **lupi.**

B6. Considerați că populația de **lupi** din Munții Făgărașului este (*Vă rugăm bifați o singură variantă*):

☐ În descreștere ☐ Rămâne la fel ☐ În creștere

B7. **Lupii** evită în general contactul cu oamenii (*Vă rugăm bifați o singură variantă*):

☐ Adevărat ☐ Fals ☐ Nu sunt sigur

Section C: Aceste întrebări reflecta opinia dvs. despre râs (*Lynx lynx*)

C1. În ce măsură sunteți de acord sau în dezacord cu afirmațiile de mai jos? (Pentru fiecare afirmație, încercuiți numărul care reprezintă cel mai bine opinia dvs.)

	Dezacord total	Dezacord moderat	Neutru	Acord Moderat	Acord Total
Râșii au dreptul să existe în Munții Făgăraș.	1	2	3	4	5
Râșii sunt animale dăunătoare în Munții Făgăraș	1	2	3	4	5
Râșii mă împiedică să petrec timpul în aer liber în Munții Făgăraș	1	2	3	4	5
Este important ca **râșii** să existe în munții Făgăraș pentru generațiile viitoare	1	2	3	4	5
Nu există avantaje pentru a avea **râs** în Munții Făgăraș	1	2	3	4	5
Râsul ar trebui să fie complet protejat în Munții Făgăraș	1	2	3	4	5
Ar trebui să fie permis ca **râșii** să poată fi vânați pe tot parcursul anului în Munții Făgăraș	1	2	3	4	5
Prezența **râsului** în pădure atrage turiștii	1	2	3	4	5
Râșii ucid prea multe ungulate sălbatice (mistreți, cerbi, căpriori)	1	2	3	4	5
Este important să menținem **râsul** în Munții Făgăraș	1	2	3	4	5
Râșii ucid prea multe animale domestice	1	2	3	4	5

C2. În general, credeți despre **râși** că sunt: *(*Pentru fiecare afirmație, încercuiți numărul care reprezintă cel mai bine opinia dvs.)

	Extrem	Moderat	Nici	Moderat	Extrem	
Răi	1	2	3	4	5	Buni
Malefici	1	2	3	4	5	Benefici
Negativi	1	2	3	4	5	Pozitivi

C3. Deoarece **râșii** sunt prezenți în Munții Făgăraș, cum vă simțiți în legătură cu următoarele?

	Dezacord total	Dezacord moderat	Neutru	Acord Moderat	Acord Total
Mă tem pentru propria mea sănătate și siguranță	1	2	3	4	5
Mă tem pentru sănătatea și siguranța copiilor	1	2	3	4	5

Mă tem pentru sănătatea și siguranța animalelor de companie	1	2	3	4	5
Mă tem de bolile răspândite de **râși**	1	2	3	4	5
Mă tem de posibilele pagube provocate de **râși** animalelor mele domestice	1	2	3	4	5

C4. În ce măsură sunteți de acord sau în dezacord cu afirmațiile de mai jos? (Pentru fiecare afirmație, încercuiți numărul care reprezintă cel mai bine opinia dvs.)

Cred că…	Dezacord total	Dezacord moderat	Neutru	Acord Moderat	Acord Total
.. **Râșii** care ucid animalele domestice ar trebui uciși	1	2	3	4	5
.. **un râs** care traversează o potecă în fața mea în Munții Făgăraș ar trebui să fie relocat	1	2	3	4	5
.. **un râs** care traversează o potecă în fața mea în Munții Făgăraș ar trebui să fie ucis	1	2	3	4	5
.. **un râs** care se apropie de tine în Munții Făgăraș ar trebui ucis	1	2	3	4	5
.. Vânătoarea de trofee de **râși** ajută la reducerea pierderilor de specii de vânat cauzate de **râși**	1	2	3	4	5
.. **un râs** care a atacat un om în Munții Făgăraș ar trebui ucis	1	2	3	4	5
.. sunt prea mulți **râși** în Munții Făgăraș	1	2	3	4	5
.. Ar trebui să existe un sezon legal de vânătoare pentru **râșii** din Munții Făgăraș	1	2	3	4	5
.. ar trebui să fie permisă vânătoarea **râșilor** pentru trofee	1	2	3	4	5
.. ar trebui să continuăm să coexistăm cu **râșii**	1	2	3	4	5
.. vânătoarea de trofee a **râșilor** ajută la reducerea pierderilor de animale domestice cauzate de **râși**	1	2	3	4	5

C5. Câți **râși** credeți că există în Munții Făgăraș? _____număr de **râși.**

C6. Considerați că populația de **râși** din Munții Făgărașului este (*Vă rugăm bifați o singură variantă*):

☐ În descreștere ☐ Rămâne la fel ☐ În creștere

C7. **Râșii** evită în general contactul cu oamenii (*Vă rugăm bifați o singură variantă*):

☐ Adevărat ☐ Fals ☐ Nu sunt sigur

Section D: Aceste întrebări reflecta opinia dvs. despre ursul brun (*Ursus arctos*)

D1. În ce măsură sunteți de acord sau în dezacord cu afirmațiile de mai jos? (Pentru fiecare afirmație, încercuiți numărul care reprezintă cel mai bine opinia dvs.)

	Dezacord total	Dezacord moderat	Neutru	Acord Moderat	Acord Total
Urșii au dreptul să existe în Munții Făgăraș.	1	2	3	4	5
Urșii sunt animale dăunătoare în Munții Făgăraș	1	2	3	4	5
Urșii mă împiedică să petrec timpul în aer liber în Munții Făgăraș	1	2	3	4	5
Este important ca **urșii** să existe în Munții Făgăraș pentru generațiile viitoare	1	2	3	4	5
Nu există avantaje pentru a avea **urși** în Munții Făgăraș	1	2	3	4	5
Ursul ar trebui să fie complet protejat în Munții Făgăraș	1	2	3	4	5
Ar trebui să fie permis ca **urșii** să poată fi vânați pe tot parcursul anului în Munții Făgăraș	1	2	3	4	5
Prezența **urșilor** în pădure atrage turiștii	1	2	3	4	5
Urșii ucid prea multe ungulate sălbatice (mistreți, cerbi, căpriori)	1	2	3	4	5
Este important să menținem **urșii** în Munții Făgăraș	1	2	3	4	5
Urșii ucid prea multe animale domestice	1	2	3	4	5

D2. În general, credeți despre **urși** că sunt: *(*Pentru fiecare afirmație, încercuiți numărul care reprezintă cel mai bine opinia dvs.)

	Extrem	Moderat	Nici	Moderat	Extrem	
Răi	1	2	3	4	5	Buni
Malefici	1	2	3	4	5	Benefici
Negativi	1	2	3	4	5	Pozitivi

D3. Deoarece u**rșii** sunt prezenți în Munții Făgăraș, cum vă simțiți în legătură cu următoarele?

	Dezacord total	Dezacord moderat	Neutru	Acord Moderat	Acord Total
Mă tem pentru propria mea sănătate și siguranță	1	2	3	4	5
Mă tem pentru sănătatea și siguranța copiilor	1	2	3	4	5
Mă tem pentru sănătatea și siguranța animalelor de companie	1	2	3	4	5
Mă tem de bolile răspândite de **urși**	1	2	3	4	5

Mă tem de posibilele pagube provocate de **urși** animalelor mele domestice	1	2	3	4	5

D4. În ce măsură sunteți de acord sau în dezacord cu afirmațiile de mai jos? (Pentru fiecare afirmație, încercuiți numărul care reprezintă cel mai bine opinia dvs.)

Cred că...	Dezacord Total	Dezacord moderat	Neutru	Acord Moderat	Acord Total
.. **urșii** care ucid animalele domestice ar trebui uciși	1	2	3	4	5
.. **un urs** care traversează o potecă în fața mea în Munții Făgăraș ar trebui să fie relocat	1	2	3	4	5
.. **un urs** care traversează o potecă în fața mea în Munții Făgăraș ar trebui să fie ucis	1	2	3	4	5
.. **un urs** care se apropie de tine în Munții Făgăraș ar trebui ucis	1	2	3	4	5
.. Vânătoarea de trofee de **urs** ajută la reducerea pierderilor de specii de vânat cauzate de **urși**	1	2	3	4	5
.. **un urs** care a atacat un om în Munții Făgăraș ar trebui ucis	1	2	3	4	5
.. sunt prea mulți **urși** în Munții Făgăraș	1	2	3	4	5
.. Ar trebui să existe un sezon legal de vânătoare pentru **urșii** din Munții Făgăraș	1	2	3	4	5
.. ar trebui să fie permisă vânătoarea **urșilor** pentru trofee	1	2	3	4	5
.. ar trebui să continuăm să coexistăm cu **urșii**	1	2	3	4	5
.. vânătoarea de trofee a **urșilor** ajută la reducerea pierderilor de animale domestice cauzate de **urși**	1	2	3	4	5

D5. Câți **urși** credeți că există în Munții Făgăraș? _____număr de **urși.**

D6. Considerați că populația de **urși** din Munții Făgărașului este (*Vă rugăm bifați o singură variantă*):

☐ În descreștere ☐ Rămâne la fel ☐ În creștere

D7. **Urșii** evită în general contactul cu oamenii (*Vă rugăm bifați o singură variantă*):

☐ Adevărat ☐ Fals ☐ Nu sunt sigur

D8. De ce sunt vazuti ursii in comunitati si pe langa comunitati?

	Dezacord total	Dezacord moderat	Neutru	Acord Moderat	Acord Total
Deranjarea habitatelor cauzat de lucrarile forestiere imping **urșii** din padure spre comunitati	1	2	3	4	5
Deranjarea habitatelor cauzate activitatile recreative (motocross, mountain biking, hiking, ATV etc) imping **urșii** din padure spre comunitati.	1	2	3	4	5
Urșii sunt atrasi in comunitati datorita accesului usor la resturi de mancare (gunoi).	1	2	3	4	5
Urșii sunt atrasi in comunitati datorita accesului usor la animale domestice.	1	2	3	4	5
Urșii sunt atrasi in comunitati datorita accesului usor recolte si livezi.	1	2	3	4	5
Habitatele sunt supra populate de **ursi** asa ca o parte din ei sunt nevoiti sa isi caute alte zone.	1	2	3	4	5
Deranjarea habitatelor cauzate de culegerea fructelor si a ciupercilor imping **urșii** din padure spre comunitati.	1	2	3	4	5
Diminuarea surselor de hrana cauzate de culegerea fructelor si a ciupercilor imping **urșii** din padure spre comunitati.	1	2	3	4	5

Section E: Aceste întrebări reflecta opinia dvs. despre pisica sălbatică (*Felis silvestris silvestris*)

E1. În ce măsură sunteți de acord sau în dezacord cu afirmațiile de mai jos? (Pentru fiecare afirmație, încercuiți numărul care reprezintă cel mai bine opinia dvs.)

	Dezacord total	Dezacord moderat	Neutru	Acord Moderat	Acord Total
Pisicile sălbatice au dreptul să existe în Munții Făgăraș.	1	2	3	4	5
Pisicile sălbatice sunt animale dăunătoare în Munții Făgăraș	1	2	3	4	5
Pisicile sălbatice omoară prea multe găini	1	2	3	4	5
Este important ca **pisicile sălbatice** să existe în munții Făgăraș pentru generațiile viitoare	1	2	3	4	5
Nu există avantaje pentru a avea **pisici sălbatice** în Munții Făgăraș	1	2	3	4	5
Pisicile sălbatice ar trebui să fie complet protejate în Munții Făgăraș	1	2	3	4	5
Ar trebui să fie permis ca **pisicile sălbatice** să poată fi vânate pe tot parcursul anului în Munții Făgăraș	1	2	3	4	5
Prezența **pisicilor sălbatice** în pădure atrage turiștii	1	2	3	4	5
Pisicile sălbatice omoară prea multe specii de păsări sălbatice	1	2	3	4	5
Este important să menținem **pisica sălbatică** în Munții Făgăraș	1	2	3	4	5
Mă tem pentru eventuale pagube produse la animalele domestice din gospodăria mea (găini etc.) produse de pisicile sălbatice	1	2	3	4	5

E2. În general, credeți despre **pisicile sălbatice** că sunt: *(*Pentru fiecare afirmație, încercuiți numărul care reprezintă cel mai bine opinia dvs.)

	Extrem	Moderat	Nici	Moderat	Extrem	
Rele	1	2	3	4	5	Bune
Malefice	1	2	3	4	5	Benefice
Negative	1	2	3	4	5	Pozitive

E3. În ce măsură sunteți de acord sau în dezacord cu fiecare dintre următoarele?

Cred că…	Dezacord total	Dezacord moderat	Neutru	Acord Moderat	Acord Total

.. **pisicile sălbatice** care ucid găini trebuie ucise	1	2	3	4	5
.. vânătoarea de trofee a **pisicilor sălbatice** ajută la reducerea pierderilor de animale sălbatice cauzate de **pisicile sălbatice** (fazani, păsări)	1	2	3	4	5
.. ar trebui să continuăm să coexistăm cu **pisicile sălbatice**	1	2	3	4	5
.. sunt prea multe **pisici sălbatice** în Munții Făgăraș	1	2	3	4	5
.. Ar trebui să existe un sezon legal de vânătoare a **pisicilor sălbatice** în Munții Făgăraș	1	2	3	4	5
.. ar trebui să fie permisă vânătoarea **pisicilor sălbatice** pentru trofee	1	2	3	4	5

E4. Câte **pisici sălbatice** credeți că există în Munții Făgăraș? _____număr de **pisici sălbatice.**

E5. Considerați că populația de **pisici sălbatice** din Munții Făgărașului este (*Vă rugăm bifați o singură variantă*):

☐ În descreștere ☐ Rămâne la fel ☐ În creștere

E6. **Pisicile sălbatice** evită în general contactul cu oamenii (*Vă rugăm bifați o singură variantă*):

☐ Adevărat ☐ Fals ☐ Nu sunt sigur

Section F: Câteva întrebări generale

F1. În general, care este interesul dumneavoastră, dacă este cazul, față de carnivorele mari?

☐ Nu sunt interest ☐ Destul de interesat ☐ Neutru ☐ Moderat interesat ☐ Foarte Interest

F2. În general, care este interesul dvs., dacă este cazul, în observarea/contemplarea vieții sălbatice?

☐ Nu sunt interest ☐ Destul de interesat ☐ Neutru ☐ Moderat interesat ☐ Foarte Interest

F3. Dacă va fi restricționată vânătoarea în anumite zone, ați participa la observarea faunei sălbatice în aceste zone, în loc de vânătoare?

☐ Nu sunt interest ☐ Destul de interesat ☐ Neutru ☐ Moderat interesat ☐ Foarte interesat

F4. Cum ați primit informații despre carnivore mari în trecut? Bifați toate variantele care se aplică.

☐ Cărți
☐ Radio
☐ Video (DVD/VHS/YouTube)
☐ Agenții guvernamentale
☐ Servicii forestiere
☐ Prieteni & familie
☐ National Geographic
☐ Reviste/Ziare
☐ Televiziune
☐Site Internet
☐ Grupuri de protecția mediului
☐ Social media (Facebook, Twitter etc.)
☐ Asociații de Vănătoare
☐ Altele(specificați): _____

F5. Aș participa la activități de monitorizare a vieții sălbatice?

☐ Dezacord total ☐ Dezacord ☐Nu știu ☐ Acord ☐Acord total

F6. Aș participa la programele de voluntariat pentru natură?

☐ Dezacord total ☐ Dezacord ☐Nu știu ☐ Acord ☐Acord total

F7. De cât timp vânați în munții Făgăraș? _____years

F8. La ce asociație de vânători sunteți afiliat? _____

F9. Cât de aproape locuiți de zona dvs. de vânătoare? Locuiesc la aproape _____km de zona în care vânez.

F10. Cât de interesante sau utile ați găsi fiecare dintre următoarele tipuri de informații despre carnivorele mari?

Aș considera utile informațiile despre…	Dezacord Total	Dezacord moderat	Neutru	Acord Moderat	Acord Total
.. ce să faci dacă ești atacat de un carnivor mare	1	2	3	4	5
.. habitatul și comportamentul carnivorelor mari	1	2	3	4	5
…importanța carnivorelor mari pentru mediul înconjurător	1	2	3	4	5
.. cum să protejezi copiii și animalele de companie de întâlniri cu carnivorele mari	1	2	3	4	5
.. modul în care oamenii și carnivorele mari pot împărți același areal.	1	2	3	4	5
…tehnici de reducere a pierderilor de animale domestice	1	2	3	4	5

F11. Sunteți:

☐ Bărbat ☐ Femeie

F12. Care este vârsta dvs? _____years

F13. În ce județ locuiți? Locuiesc în_____

F14. Care este ultimul nivel de studii finalizat?

- ☐ Școală primară
- ☐ Liceu
- ☐ Diplomă universitară
- ☐ Altele (vă rugăm specificați): _____

Înainte de a înapoia chestionarul, vă rugăm să vă asigurați că ați răspuns la toate întrebările. Dacă aveți comentarii suplimentare despre carnivorele mari din munții Făgăraș sau despre sondajul în sine, vă rugăm sa ne oferiți feedbackul dvs. în spațiul de mai jos. Vă mulțumim pentru participare. Participarea dvs. este foarte importantă și foarte apreciată.

Appendix 2

Interview Schedule

Understanding Hunter Experiences, Perceptions, and Acceptance (Tolerance) Levels Toward Large Carnivores in the Făgăraș Mountains, Romania

Interview #:
Respondent's gender:
Interview conducted by:
Translator:
Date interview conducted:
Place interview conducted:
Time of interview:
Participant's written response for consent:

Introduction for Interview

Good day. My name is Jacqueline Butler and I am a master's student of the Department of Geography in Memorial University of Newfoundland, Canada. I invite you to partake in a collaborative research project among Memorial University, Transylvania University, and various organizations in the Făgăraș Mountains. This project involves learning about hunters and Transylvania University students' opinions regarding large carnivores in the Făgăraș Mountains region.

I will ask a variety of questions about your background, wildlife, large carnivores, fear towards large carnivores, and acceptability and coexistence with large carnivores. You can also withdraw at any point during the interview; your participation is voluntary.

Your answers will be used for my Master thesis. Your name will not be used in reporting research results. Your name and answers will also not be reported to local, county or government officials. By giving your consent, you are allowing this interview session to be recorded and used for research purposes. Dr. Alistair Bath will supervise this research project. If you have any questions, please contact Dr. Bath via email, abath@mun.ca.

The proposal for this research has been approved by the Interdisciplinary Committee on Ethics in Human Research at Memorial University. If you have ethical concerns about the research (such as the way you have been treated or your rights as a participant), you may contact the Chairperson of the ICEHR at icehr@mun.ca or by telephone at (709) 864-2561.

Section 1: Background Information

(1) What made you start hunting?

(2) Are you from the area?

(3) Why did you join this hunting assoication?

Prompt: How long have you been part of this association?

Prompt: How long have you been the president of this association?

(4) When first starting, how did you feel about hunting?

Prompt: Do you feel the same?

(5) How important is hunting to your family and how does hunting experiences influence your family dynamic?

(6) During your time as a hunter, have you noticed an increase or a decrease in game populations, such as deer, boar, fowl?

Prompt: Can you tell me more about this?

Section 2: General Wildlife Questions

(1) How do you feel about wildlife?

Follow up: Do you feel there are some species that are more important to the region than others? Why? What is important to him?

Follow up: How do you think wildlife should be managed?

Follow up: How is this related to hunting?

Section 3: Acceptance and Tolerance/ Experience/ Risk

(1) Can you tell me about WL in FM?

Prompts: too little, too much, why/why not; (*if say numbers), how did you get them

Prompt: How does it compared to RO and EU?

(2) I've heard FM referred to as the last strong hold of large carnivores… What do you think about this notion? [Prompts: (i) livestock (increased/decreased, why?], (ii) fear (personal, general – attacks/encounters/trends), (iii) cultural components (forest is big in RO culture), (iv) what would a coexistence model look like to you?]

(3) Personal experiences [prompts: negative/positive, changed you views/how]

Section 4: Using images from the PCI results

What you are seeing here are results from the questionnaires that were passed out last September to October. The smaller the bubble is the more consensuses there is within the group, and the bigger the bubble the less consensuses.

Any prompts for graphs

What do you think? What's your take on this?

Section 5: Management

Do you have any suggestions for policy makers like the government or NGOs?

Section 6: Conclusion

Is there anything I have not asked you about that you think I should take away from our conversation?

This completes the interview. Thank you for your time and participation. When this research has been completed, would you be interested in a copy of the summary report?