UiT The Arctic University of Norway

Faculty of Biosciences, Fisheries and Economics, Department of Arctic and Marine Biology

# Fear towards the four large carnivores in Norway; a geospatial survey from 2010 and 2019

Vilde Bech Sponberg

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Cover image: The four large carnivores: brown bear, lynx, wolf, and wolverine in Norway.

Photo (brown bear and lynx): Colourbox.com/ Volodymyr Burdiak.
Photo (wolf): Colourbox.com/ Gry Thunes.
Photo (wolverine): Colourbox.com/ Dennis Jacobsen.

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**Vilde Bech Sponberg**

Master of Science in Biology – Northern Populations and Ecosystem

**Supervisors:**

Jasmine Magali Nahrgang: The Arctic University of Norway

Kristin E. Mathiesen: Inland Norway University of Applied Sciences – Norwegian Institute for Nature Research (NINA)



Høgskolen i Innlandet

# Acknowledgement

Fear has always been an emotion that fascinate me, especially towards animals. I have grown up in rural areas among nature and wildlife and been taught to have respect towards wildlife and even keep distance from animals, considered dangerous. This has in some way created a level of fear in me, towards some species. However, instead of avoiding the concept I have become even more fascinated and intrigued. This project gave me a great opportunity to work and learn even more about fear and how much impact it can have on both humans and (in this case) large carnivores. Nevertheless, I have had great help, and in this acknowledgement, I would like to thank everyone who have helped and supported me through this year on my master thesis.

Firstly, I would like to thank my supervisor Kristin E. Mathiesen for not only giving me the opportunity with this thesis topic but also her support, guidance and help throughout the complete process in my master thesis. I would also like to thank my second supervisor Jasmine Magali Nahrgang-Berge for her instructions and assistance.

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# Abstract

Through the last centuries it has become high disturbances and interventions in natural areas, which has forced wildlife to interact with humans. This has led to human-wildlife conflicts (HWC), where animals have become a threat to peoples' safety or livelihood. These conflicts have often ended with species becoming endangered or extinct globally, including Norway. There are small populations of wolverine (*Gulo gulo*), wolf (*Canis lupus*), lynx (*Lynx lynx*), and brown bear (*Ursus arctos*) in Norway. Fear of carnivores is one of the many aspects in the human-large carnivore conflict. This could be fear of being injured or even killed in an encounter, especially those living in large carnivore areas, where the probability of encountering one is much higher.

Through two PhD-surveys executed in 2010 and 2019 I looked at peoples fear between years, spatial patterns of fear within and outside management areas for each large carnivore, and peoples' perception of the population size of each large carnivore in their living area (municipality). Both methods were performed the same way, where maximum 5 people per municipality had to go through the surveys of 30-40 questions in a phone survey by NORSTAT.

My results revealed a lower level of fear towards all four carnivores in 2019 compared to 2010, while fear in the spatial pattern varied between species; fear towards lynx and wolverine was higher outside their management areas, conversely fear towards wolf was higher within the management area than outside, and fear towards brown bear revealed no difference in areas. By including demographic variables, the only change that occurred in the spatial pattern was fear towards wolf, which no longer showed a difference between areas. Meanwhile, peoples' perception of the carnivore situation in their municipality revealed low level of fear in the perception of not enough carnivores, while perception of too many carnivores showed a high level of fear. This applies for fear towards brown bear, wolf, and lynx, while it only applies for wolverine in the category of too few wolverines in their own municipality. Lynx was the only carnivore who revealed a high level of fear in the perception of uncertainty. I further discuss causes behind peoples' fear and further measures should be studied to find ways to help people to manage their fear or even reduce fear to assist the reduce of large carnivore conflict in Norway.



**Key words**: fear, large carnivores, human-large carnivore conflict, municipality, management areas

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# 1. Introduction

## 1.1 General background

In the last centuries the human population has increased in high densities, which has led to an increase in disturbances and interventions in natural areas. These natural areas have originally been habitats for wildlife and wild species that now are forced to interact with humans and human activities. These interactions may develop into human-wildlife conflict (HWC) which occurs when animals pose a direct threat to the livelihood or people's safety (Linnell et al., 2005, p. 162). Conflicts between humans and large carnivores have resulted in endangered species and extinction all around the globe, and Norway is not an exception. In Norway, large carnivores got protected by law in the 1970's, and today the latest registration of the populations show 111-116 wolves (*Canis lupus*), 395 lynx (*Lynx lynx*), 386 wolverines (*Gulo gulo*) and 160 brown bears (*Ursus arctos*) (Gittleman et al., 2001; Rovdata, 2022a, 2021a, 2021b, 2022b).

Already in 1845, the conflict between humans and carnivores became such a huge problem, mostly due to predation of domestic sheep and cows, that the Norwegian Government came up with a strategy to terminate the carnivores (Søbye et al., 2000). Before Norway began their "war" against large carnivores the populations were immense (Statistics Norway, s.a.-a; Søbye et al., 2000). However, exactly how big the populations were are uncertain, but previous documentation suggest around 2500 – 3000 of each species (Richardsen, 2014, p. 3 & 7). Human – carnivore encounters was probably common due to higher numbers of carnivore. However, we assume that most encounters were not registered by people, as the carnivores probably just withdrew quietly, while the stories probably build on the most dramatic events (Besøkssenter rovdyr, 2020; Blekesaune & Rønningen, 2010, p. 185; Furseth, 2005; Røskaft et al., 2003, p. 193). Most common situation was loss of domestic animals like sheep and cattle, but cases of large carnivore attacks are rare in Norway (Linnell et al., 2021, p. 27; Penteriani et al., 2016, p. 1; Richardsen, 2014, p. 3). Besides, these types of encounters are mostly from brown bear and wolf, even though the last incidents happened a while ago (Blekesaune & Rønningen, 2010, p. 187; Furseth, 2005, p. 25 & 180; J. Linnell et al., 2002, p. 24), in comparison to lynx and wolverine is not known to attack people in Norway (Bevanger, 2012, p. 105 & 181).

From the mid of the 1800 century, human population increased drastically in Norway and people needed more space in the natural areas for domestic livestock (Richardsen, 2012, p. 31). This was one of the reasons making the Hunting Law in 1845, to remove these four carnivores

as well as the golden eagle (*Aquila chrysaetos*), white-tailed eagle (Haliaeetus albicilla), Eurasian eagle owl (*Bubo bubo*), and the northern goshawk (*Accipiter gentilis*) (Richardsen, 2014, p. 14; Søbye et al., 2000). People's view on nature and wildlife was quite different from today as anthropocentric attitudes were more in center (Richardsen, 2014, p. 19).

Anthropocentric value is part of the environmental value orientation (EVO) which is a theoretical concept describing how people may evaluate nature and their environment (Fransson & Gärling, 1999, p. 370; Gangaas et al., 2014, p. 1). The EVO are based on people's individual basic values, including both emotional and cognitive (knowledge) components (Fransson & Gärling, 1999; Gangaas et al., 2014, p. 1). An anthropocentric view typically puts man at the top of a hierarchically constructed world and humans dominate over all animals and all nature. At the other end of the value system, we find ecocentrism where humans are an equal part of nature and do not have any domination over plant or animals. Ecocentric values work for protecting the environment to maintain or enhance the quality of life for people (Thompson & Barton, 1994, p. 149). However, in the old days, people lived more connected with nature and depended on harvesting the resources that nature had to offer. This may have caused a more anthropocentric view on nature in the old days as they depended on "man dominating the nature resources". The large carnivores were looked upon as a burden and represented loss of resources every time they killed livestock or triggered people's fear when e.g. stories were told of wolves who were chasing horse sledding or sleigh rides (Furseth, 2005; Kvangraven, 2021, p. 209–210).

In this period (End of World War II to the 1970s) the numbers of free ranging sheep had increased greatly. Thus, by 1979-2001 the number of winter-fed sheep had increased by more than 120 000, to more than 980 000 (Blekesaune & Rønningen, 2010, p. 185). Eventually when the carnivores were nearly extinct, they became protected by law, one by one during the 1970s (Blekesaune & Rønningen, 2010, p. 185). After decades of protection, the populations started to increase and return to previous used areas, and as they started to return the conflict did as well (Røskaft et al., 2003, p. 185; Johansson et al., 2016, p. 262; Skogen, 2001, p. 203).

The human-carnivore conflict increased as the carnivore populations increased, and several discussions, documents and processes were carried out in the late 1990s. In 2004, the most comprehensive White Paper was delivered to the Parliament (St.meld.nr.15, 2003, p. 8), which most of today's management of the carnivores is based on, and where the international conventions are essential (Norwegian Environment Agency, 2013). The White Paper is based on an mutual agreement to protect and keep viable populations of the four large carnivores in

Norway (Andersen et al., 2003, p. 17; Regjeringen.no, 2003). Management areas are established for each carnivore (Figure 6a-d) where carnivores inside these management areas are prioritized over livestock (Norwegian Environment Agency, s.a.f). However, the management of these carnivores is based on politics to secure their survival in Norway, as well as keeping the conflict at a low level (Forskrift om tilskudd til forebyggende tiltak mot rovviltskader og konfliktdempende tiltak, 2013; Norwegian Environment Agency, s.a.f).

## 1.2 Carnivores' population structure from 2010-2019

During 9 years of changes and developments in Norway, the four large carnivore populations has altered in distribution and numbers. The populations of lynx, wolverine and brown bears has slightly decreased in numbers from 2010 and 2019, while the wolf populations have increased. The brown bear population is estimated through collection of DNA from e.g. scats, and these analyzes show a bear population of 166 bears (53 females and 113 males) in 2010, and 148 bears (57 females and 91 males) in 2019 (Tobiassen et al., 2011, p. 10; Fløystad et al., 2020, p. 17; Figure 1).

The wolverine population is documented by counts of litters each year (Norwegian Environment Agency, s.a.f). In 2010 it was registered 66 litters, while in 2019 the registrations revealed 62 litters (Brøseth, Tovmo, & Andersen, 2010, p. 14; Rovdata, 2020, p. 3).

The lynx population is registered through a systematic count of observations of family groups by tracking on snow (www.scandlynx.nina.no), and the lynx population is the one revealing the most drastic decrease over the years. In 2010 the registration came up with an estimation of 80 family groups, while in 2019 it was only 55 family groups (Brøseth, Tovmo, & Odden, 2010, p. 13; Tovmo et al., 2019, p. 15; Figure 3).

While the wolf population was the only carnivore who had a rather high increase during the last decade where only 33-39 individuals were registered, with 3 family groups (21-23 individuals) and 3 marking pairs in Norway and 33-37 individuals along the borders of Norway and Sweden in 2010 (Wabakken et al., 2010, p. 3). In 2019, there was 6 family groups and 5 marking pairs in total of 64-66 individuals documented in Norway, while 40-41 individuals was documented along the borders of Sweden and Norway in 6 family groups and five marking

pairs (Svensson et al., 2019, p. 7 & 15) . The distribution of the population is similar between these years, mostly within the management area inside region 4 and 5 (Figure 4).

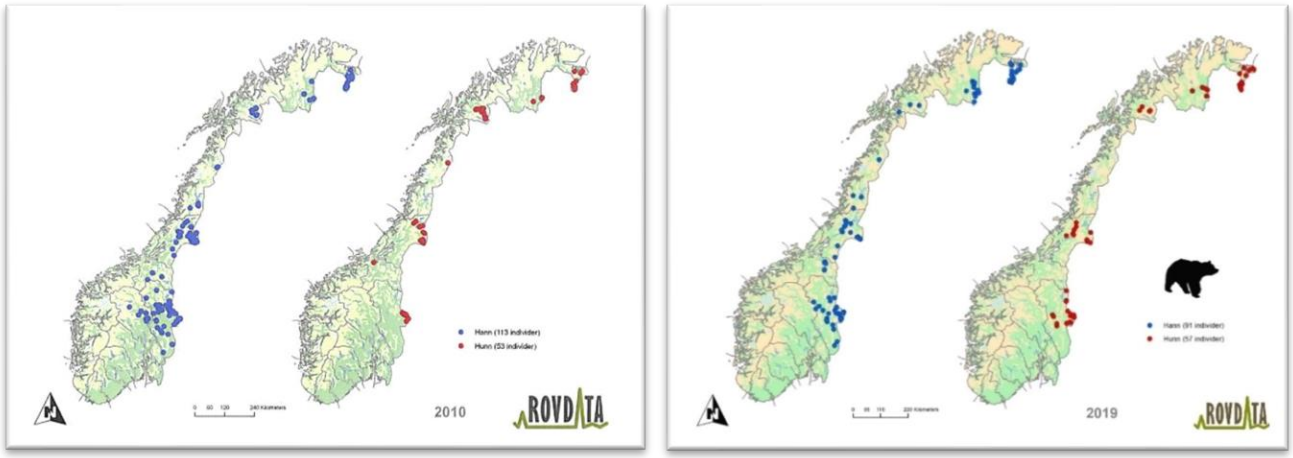


*Figure 1. The total numbers of registered and estimated individuals of brown bears in Norway in 2010 (left) and 2019 (right). Blue dots represents males while red dots are females (Tobiassen et al., 2011, p. 9; Fløystad et al., 2020, p. 16).*

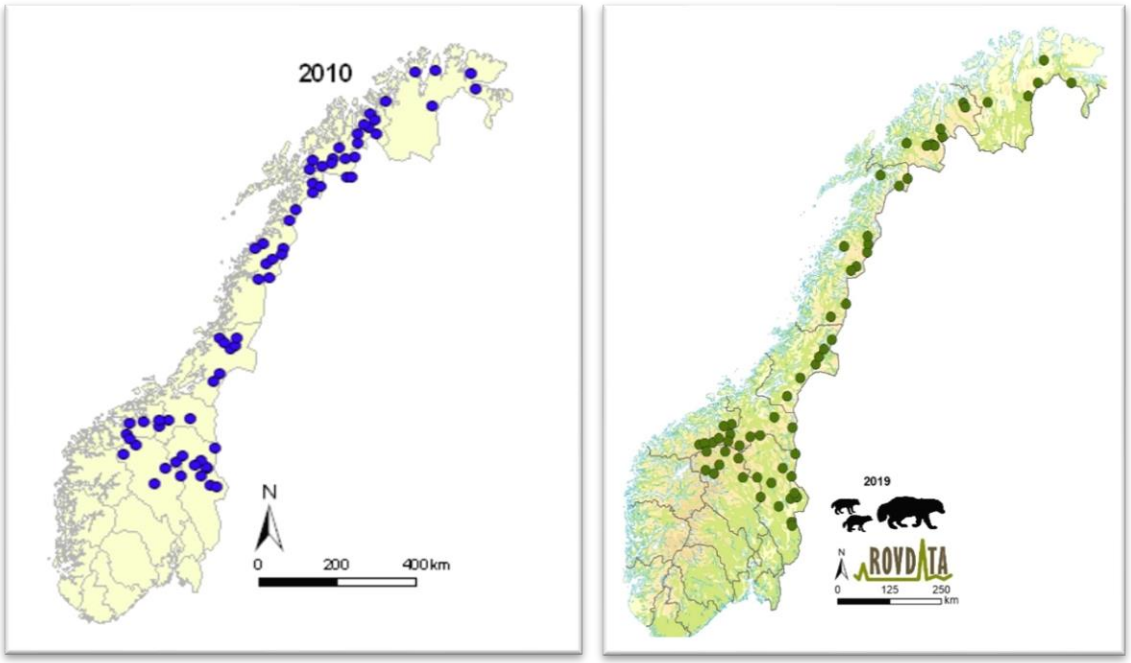


*Figure 2. Total numbers of registered and estimated reproductions of wolverines in 2010 (left) and 2019 (right) (Brøseth, Tovmo, & Andersen, 2010, p. 18; Rovdata, 2020, p.13).*

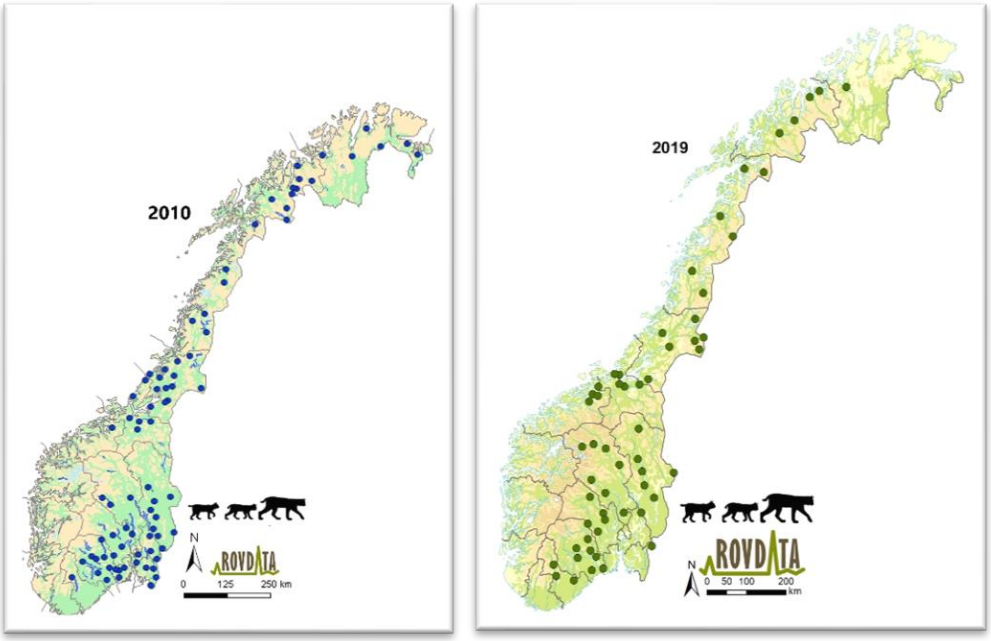


*Figure 3. Total numbers of registered an estimated family groups of lynx in 2010 (left) and 2019 (right) (Brøseth, Tovmo, & Odden, 2010, p. 14; Tovmo et al., 2019, p. 12).*

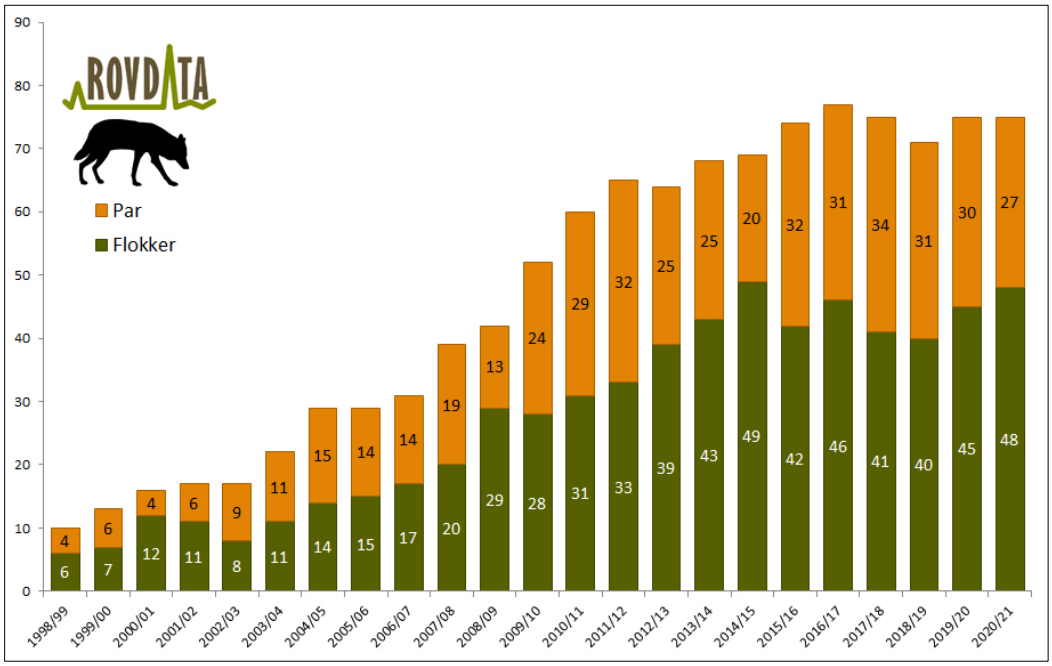


*Figure 4. The development of the grey wolf population in Scandinavia from 1998-2021, which shows an increasing alteration (Orange color is wolf pairs, while the green color represents number of family groups). (Rovdata, 2021)*

## 1.3 The concept of fear

The human-carnivore conflict in Norway has many aspects, and the most common factors is the financial loss for farmers and reindeer owners when the carnivores kill livestock. Other aspects are related to the competition between big-game hunters and wolves as wolves kill game species such as e.g., moose (*Alces alces*). Last, but not least is the fear of being hurt or even killed if encountering one of these carnivores (Linnell et al., 2005, p. 163; Røskaft et al., 2007, p. 182). Especially for people living in large carnivore areas there is an increased probability of encountering large carnivores (Johansson et al., 2017, p. 281; Røskaft et al., 2003, p. 195). Although the possibility of encountering these carnivores is relatively small, the fear that it may happen is real and influences people's attitudes towards having carnivores in their immediate areas (Zimmermann et al., 2001, p. 4; Johansson et al., 2017, p. 282).

To feel afraid is something everybody have somehow felt in their lives, however Ralph Adolphs (2013) states that there is no concept about fear in the scientific study (Adolphs, 2013, p. 1). From previous psychological theories a wide definition of fear was eventually approved, not only fear as an emotion, but also as a perception and attitude (Johansson et al., 2016, p. 261). There are many different types of fear, some of the most frequent types is fear towards animals, (which species people fear varies), fear of natural environment (e.g. fear of water), situational fears (e.g. claustrophobia) and fear of blood-injection-injuries (e.g. dental phobia) (Broeren et al., 2011, p. 50). There are also some species that are more common to fear than others, like spiders or snakes (Flykt et al., 2013, p. 417). However, previous studies indicate that fear towards large carnivores are frequently not as strong as the term "phobias" (more common towards snakes and spiders), and therefore should not be used for people fearing large carnivores (Johansson et al., 2016, p. 262, 2012, p. 59 & 60).

Fear towards large carnivores is a quite common concern which occurs globally, such as fear of lions (*Panhtera leo*) in Africa, wolves in Iran or the brown bear in Lithuania (Balčiauskas & Kazlauskas, 2012; Kushnir & Packer, 2019; Mohammadi et al., 2021). E.g. in Lithuania the brown bear was eradicated in 1883 (Balčiauskas & Kazlauskas, 2012, p. 168), but now when the bear is on a modest increase, 82.4 % of the people fear for their safety when the bears settled in the forest (Balčiauskas & Kazlauskas, 2012, p. 168).

Fear can root in many different emotions, whether it is to enter the forest by themselves, to let children walk alone to the school bus in areas where carnivore ay occur, or the experience of losing hunting dogs to the wolf (Bjerke et al., 2003, p. 317; Linnell et al., 2005, p. 163 & 164). In rural areas, fear of encountering large carnivores may in certain situations prevent

people from their outdoor recreational activities, such as hiking (especially with dogs), berry picking or hunting (Røskaft et al., 2003, p. 186 & 194; Skogen & Krange, 2003, p. 317). Nevertheless, a recent study uncovers the majority of respondents being positive to have our four large carnivores existing in Norway, however the results altered when the topic regarded to carnivores living close to people's home (Krange et al., 2012). The study also revealed that a majority was positive towards having large carnivores in Norway, as well as a majority accepted large carnivores in their living area (Krange et al., 2012, p. 20). This phenomenon called, Not-In-My-Back Yard (NIMBY) is also seen in studies related to establishment of e.g. prisons, landfills or power plants (Krange et al., 2012, p. 19). People accept power plants to increase the production of energy, but they do not want the power plants close to where they live. NIMBY describes a resistance to propositions people in a local community believe will lead to an adverse outcome (WEXLER, 1996, p. 92).

Documentation of humans being killed or hurt by carnivores in Norway goes back hundreds of years, with only one documented case of one person killed by wolf on 28th December in the 1800s, while there are some more documented cases of people killed by brown bear (Blekesaune & Rønningen, 2010, p. 186; Furseth, 2005, p. 170–173; J. Linnell et al., 2002, p. 24). In the period of 1800-1906, 15 people were reported killed by brown bears in Scandinavia, and 73% of them took place in Norway(Swenson et al., 1999, p. 4). Furthermore, the last person killed in Norway was a shepherd boy in 1906 who had gone too close to a bear with a sheep carcass by surprise and the boy died later of infection(Swenson et al., 1999, p. 4). These past stories showing that attacks actually may happen, may also support people's fear as they can argue that large carnivores actually may be dangerous (Linnell et al., 2002, p. 24; Swenson et al., 1999, p. 4; Zimmermann et al., 2001, p. 4). This may also play a part in arguing why a number of people want carnivores removed from areas close to their livelihoods, or further argue why large carnivores should not exist in Norway at all (Krange et al., 2012, p. 20).

## 1.4 What causes people fear of large carnivores?

There are numerous reasons behind people's fear towards large carnivores. Especially the largest species like lions, leopards (*Panthera pardus*), bears and wolves represent a greater proportion of fear as they are known be able to actually hurt or even kill people (Støen et al., 2018, s. 2; Nanni et al., 2020, p. 2; Bombieri et al., 2018; Kushnir & Packer, 2019; Odden et al., 2014, p. e112044). In Tanzania, statistics uncovers more than 1000 lion attacks between 1990-2007 (Kushnir & Packer, 2019, p. 1), and the overwhelming majority of these attacks were unprovoked and happened in human-dominated areas (Kushnir & Packer, 2019, p. 1).

Fear may also occur among people who associate presence of large carnivores with negative feelings like troublesome and stressful (Johansson et al., 2012, p. 58; Røskaft et al., 2003, p. 185), which further may lead to concerns about people's safety independent of the real risk (Johansson et al., 2016, p. 262). However, earlier research shows that 44 % of the Swedes are afraid of encountering brown bear in the forest, and 25 % are afraid of encounter wolves, while 57 % Norwegians responded "very much afraid" of bear and 48 % of wolf (Johansson et al., 2012, p. 58; Bjerke et al., 2003, p. 7).

Fear of large carnivores may also be a result from publications through media or social media (international and national news), showing carnivores killing livestock (Nanni et al., 2020, p. 2; Røskaft et al., 2007, p. 173; Zimmermann et al., 2001, p. 5), as well as from fairytales (Lenth et al., 2017, p. 91; Haaland, 2002, p. 74; Besøkssenter rovdyr, 2020). The most well-known fairytale is the Little Red Riding Hood with the "big bad wolf" which possibly has can have influenced for people in generations (Besøkssenter rovdyr, 2020). Fairytales is often told during childhood, a phase where fears and phobias are developed, however a majority of fears diminish impulsively while a subgroup of children will remain specific fears into their adulthood (Broeren et al., 2011, p. 50).

Environmental-based factors are another explanation of how children may develop fear and anxiety. According to Rachman (1977), there are three pathways to fear regarding environmental factors: aversive classical conditioning (direct route), modeling/vicarious learning (i.e., learning by observing others), and negative information transmission (King et al., 1998, p. 298 & 299). Values and attitudes develop from childhood, and impact on how people think and act towards large carnivores through their lives.

Fear is also influenced by what kind of knowledge people have regarding carnivores and the carnivores' behavior. If you know how to act in carnivores encounters, this may impact on a feeling of being more safe, compared to having no knowledge about these animals and situations (Norsk institutt for naturforskning (NINA), 2021, 18:20, 42:16; Støen et al., 2018, p. 2).

## 1.5 The concepts of values, attitudes, and behavior

Vaske and Manfredo et al. (Vaske et al., 2021, p. 1) developed a Cognitive hierarchy model that describes how people's attitudes and behavior depends on their individual characteristics such as emotions and cognitions. The human dimensions literature describes

how behavior can be predicted by peoples' values and attitudes, and that specific knowledge or cognition about an object (e.g. large carnivores) are better to predict a certain behavior compared to general knowledge or cognition (Figure 5; Vaske et al., 2021). Like Vaske & Manfredo mentioned in their chapter "*values are commonly defined as desirable individual end states, modes of conduct, or qualities of life that we were individually or collectively hold dear, such as freedom, equality, and honesty*" (Decker et al., 2012, p. 43). Values are fundamental for many attitudes, while attitudes are a person's evaluation of a person, object, action or concept, which can be positive or negative (Heberlein, 2012, p. 15). Additionally, attitude is an important notion as it predict behavior (Decker et al., 2012, p. 44). However, the important difference between value and attitude is that attitudes always have an object, which values do not have (Heberlein, 2012, p. 15).

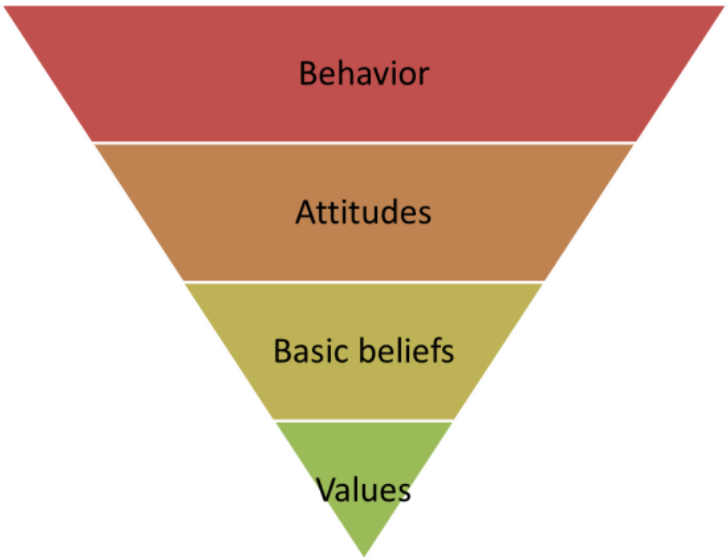


Figure 5: The cognitive hierarchy model adapted from Vaske and Donnelly (Vaske & Donnelly, 1999, p. 525) . The elements build on each other, and while "values" are few and very hard to change, "behavior" are plentiful and may be easy to change. Attitudes are not to be observed, but can be revealed by e.g., surveys, however, people's behavior are easy to observe.

Attitudes both have a cognitive and an emotional or evaluative part, and fear may develop if e.g., a person find the object (e.g., the wolf) as dangerous. Then fear will be part of the persons attitudes towards the wolf, and further may impact on the persons behavior (Vaske et al., 2021, p. 2; Heberlein, 2012).

## 1.6 Aim of study

To be able to deal with and fully understand what is driving the human – carnivore conflict, I think the understanding of fear is essential as one part of the conflict additional to other social, cultural and political factors. (Bjerke et al., 2003; Gangaas et al., 2014; Røskaft et al., 2003, p. 185; Tangeland et al., 2010).

Earlier studies have shown that negative attitudes at individual levels, may impact on peoples' behavior, and ultimately might lead to extremes such as willingness to commit e.g. poaching, a phenomenon frequently observed regarding conservation of large carnivores (Gangaas et al., 2013; Liberg et al., 2012).

In this study I expect to find patterns where peoples' fear of large carnivores associates with negative attitudes towards the carnivores. Further, I expect fear to impact on peoples' willingness of conservating these animals. Due to earlier studies showing how presence of carnivores' impact on people's attitudes, I hypothesize that fear among people towards large carnivores differ geographically depending on whether the respondents are living in areas close to the carnivore areas or not. I have looked at how fear varies in temporal and spatial patterns and therefore investigate how fear may associate with people's experience with carnivores in a decade over time: **Hypothesis 1**: I expect fear to differ between the four different large carnivore species. More people fear brown bears compared to the three other carnivores, due to its size and because this is the species that have injured or killed people in Scandinavia in "modern time" (Furseth, 2005; Haaland, 2002, p. 142–146); **Hypothesis 2:** Fear varies in time. I expect fear to decrease in the period 2010 to 2019 as I expect people to have gotten more used to having large carnivores; **Hypothesis 3:** Further I expect fear to differ in spatial pattern, as I expect fear to increase for people living inside areas where carnivores are present compared to areas outside e.g. the carnivore management areas; **Hypothesis 4:** Fear differs depending on peoples' perception to the carnivore situation in their municipality, those with the perception of "too many" carnivores shows more fear than those with the perception of not "enough" in their municipality, and those with the perception of "too few" carnivores show less fear than those with the perception of not "enough".

Additionally, I will also expect fear to vary with demographic variables such as age, gender and education, hence I expect less fear among men, younger people and higher education in accordance with earlier studies and their results regarding attitudes towards large carnivores (Gangaas et al. 2013, Barmoen et al. 2021). Through this study I wanted to acquire more

knowledge about peoples fear towards these carnivores, thus may find new measures that benefits people and the management of large carnivores.

# 2. Materials and Method

The hypothesis are answered through analyzing two different surveys conducted in 2010 and 2019 respectively (Gangaas et al., 2014; Barmoen et al., 2021). Both surveys focus on attitudes towards large carnivores, and the one from 2010 has 2,500 respondents from Norway and Sweden, but I will only use the 1507 respondents from Norway. Whereas the second survey from 2019 has 2110 respondents from Norway. They were both conducted as phone surveys done by a professional survey company, NORSTAT (http://norstat.no). NORSTAT collects data through interviews from people in existing, publicly available registers. Each respondent must give a written agreement to the survey company NORSTAT to participate in these surveys, in addition, all participation was voluntarily.

## 2.1 Ethical statement

There is a strict protocol followed in the interviews, dictated by standard research ethics of the Norwegian Social Science Data Service (Barmoen et al., 2021, p. 10). The Inland Norway University of Applied Sciences (INN) and the data collection agency are not required to seek approval for this data collection from the Norwegian Social Science Data Service (Barmoen et al., 2021, p. 10). Moreover, the institution (NSD) is reviewing research proposals for collection of data, however an ethics permit and review are merely required in instances where researches and/or the collection of data agency maintain a register of respondents for purposes like following up surveys or reminders for instance. This does not apply for my study, and therefore I have no register or any other information that could have been used to link individuals to the data set.

## 2.2 Respondents and collection of data in a geographical stratified sampling

The surveys were done by using a geographically stratified sampling by surveying 3-4 respondents from each municipality in 2010 and 5 corresponding numbers in 2019. This because the aim of the surveys was to obtain responses that were evenly distributed throughout the country independent of human population density, but to cover all areas where large carnivores have allowed to establish. This method also ensured that all management areas for each carnivore are covered. This makes it possible to compare fear of carnivores between people living in areas with relatively high carnivore presence, to areas where there are none or very low carnivore numbers.

The numbers of municipalities in Norway from the survey done in 2010 (n = 430) differ to some extend from the survey in 2019 (n= 422). This is due to a “merging process” of

municipalities in the years between 2010 and 2019 (Appendix table 1). However, this merging of municipalities does not impact on the possibility of e.g., comparing peoples' attitudes inside and outside carnivore areas as the municipality affiliation is only linked to the possibility of linking people's place of residence to a geographical area. These geographical areas are further linked to site-dependent properties like having strong traditions of e.g., free ranging sheep or big game hunting. However, it also means that the sample represents a very small proportion of people living in high density areas, and it is not representative for the general opinion of people living in Norway, or for a particular county or municipality.

Both surveys have several equal questions which can be compare between the years. The survey in 2010 contained approximately 30 questions, while the survey from 2019 contained approximately 40 questions. Even though these surveys are already used in PhD-studies, their data dealing with fear has not been analyzed before now. For this purpose, I have a particular interest in doing scientific research about people's fear towards large carnivores to get a better understanding of how fear affects people's attitudes towards carnivores. Therefore, I did not use all the data from all the questions but chose those related to fear.

All respondents were asked the same questions about their attitudes and fear towards the four large carnivores. Additionally, we used data from the Norwegian large carnivore database (www.rovdata.no) to look at the size of each of the four carnivore populations and how the species were represented in different areas throughout Norway. This was relevant for analyzes where I looked at how fear associated with carnivore presence.

## 2.3 The study area in a perspective of the large carnivore management

Norway is divided in eight different predator regions, where the four carnivores are differently managed (Meld. St. 21 (2015-2016), p. 20–21), in addition to these regions, there are management zones for each carnivore (Miljødirektoratet, s.a.-a, s.a.b; Rovviltnemnda i region 3 Oppland, 2019, p. 8; Figure 6). The management zone for brown bear exists in several big areas, both in the southern- and northern parts of Norway. The management area is split into 7 areas where all are connected to the Swedish border. Wherefore, these areas are in the counties Innlandet (Region 5 – only Hedmark part), Trøndelag (Region 6 – North and south Trøndelag), Nordland (Region 7) and in Troms and Finnmark (Region 8) (Figure 6d). All the areas for the brown bear are connected to the Swedish boarder where the population is much higher in Sweden compared to Norway (Swenson et al., 1999, p. 6; Rovdata, s.a.-a; Norwegian Environment Agency, s.a.-a).

The wolverine has a large management zone represented in 5 of the 8 “carnivore regions”: Innlandet (only Hedmark part), Møre and Romsdal, Trøndelag, Nordland, Troms and Finnmark (Region 3, 5, 6, 7 and 8; Norwegian Environment Agency, s.a.-c; Figure 6b).

While the wolf’s management zone only covers below 5 % of land in Norway (Wabakken et al., 2018, p. 2), lynx have the largest management area of all four carnivores covering almost half of Norway’s areal. In fact, the lynx management area covers 7 of 8 regions in the counties Troms and Finnmark, Nordland, Trøndelag, Innlandet (Hedmark and Oppland), Vestfold and Telemark, Viken (Østfold, Akershus, Oslo and Buskerud) and Agder (Figure 6c; Norwegian Environment Agency, s.a.-b; Appendix table 1). Therefore, lynx can be expected to be found in all regions except for region 1 (Norwegian Environment Agency, s.a.-c).

Management zone for wolf is the smallest compared to the other carnivores. The area only covers a few municipalities inside the Hedmark county of Innlandet and Viken (Østfold, Oslo and Akershus) (Region 5 and 4; Norwegian Environment Agency, s.a.-e; Figure 6a). Because the wolf is the most controversial species among the four carnivores, size and placing of the management area was quite challenging and difficult to set, especially since the political parties had to come to an agreement (Lenth et al., 2017, p. 68).

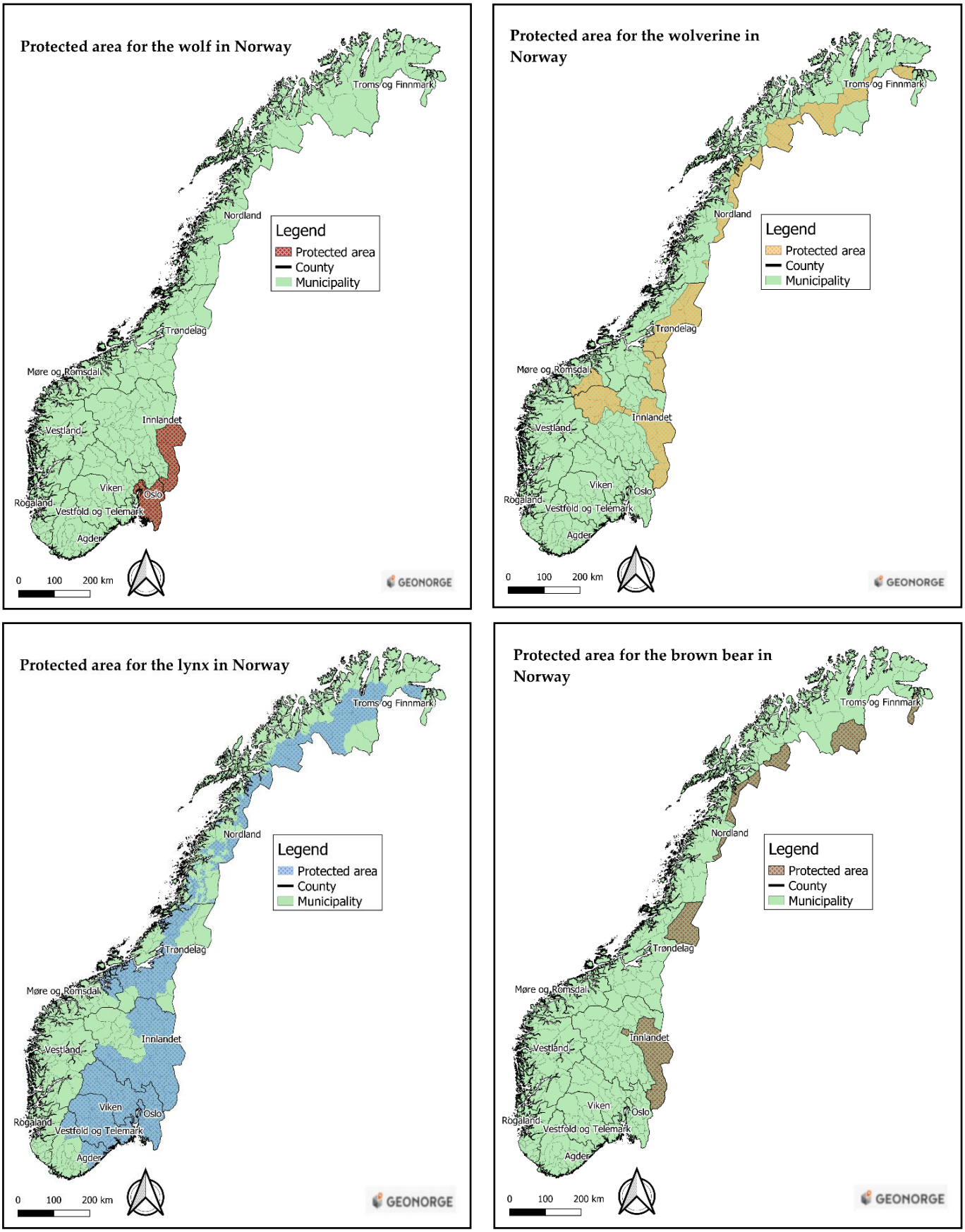


*Figure 6: The maps show the wolf zoning area in 6a (red markings), the management area for wolverine in 6b (orange markings), the management area for lynx in 6c (blue markings) and the management area for brown bear in 6d (brown markings) (Geonorge, 2021). The maps show "protected areas" which is the management area for the carnivores.*

## 2.4 Questionnaire

Both surveys were in Norwegian and contained demographic variables such as age, gender, home municipality, and final level of education. Furthermore, the respondents were asked how they experienced the large carnivore situation, and whether they had any self-experience of having these carnivores in their neighboring area. They were also asked about their values and attitudes in general related to nature, and towards carnivores and carnivore research among other questions (Appendix 1 & 2).

### 2.4.1 Geographical variations in fear

To find out if the respondents' fear of the large carnivores differed geographically, I looked at whether people's fear associated with the carnivore management areas. The carnivore management areas represented an expected presence of a certain number of carnivores. This made it possible for me to measure peoples' fear based on their municipality affiliation and compare this with the expected presence or absence of carnivores in the related management area.

The respondents were asked questions such as "How afraid are you to meet these species?", which they had to answer in a Likert scale from not afraid, little afraid, quite afraid, very much afraid and do not know (Appendix 1 & 2). Only the survey from 2010 added the last category (do not know) as an alternative. Further they also had to answer questions like "What do you think about the carnivore situation in Norway in your own municipality", which also were broken down to every particular species, but only in the survey for 2019; "I think there are "too many"/appropriate number/ "too few" wolves/bears/lynx/wolverines in Norway". For this question I only used data from 2019.

### 2.4.2 Social demographic data

The surveys also contained social data like the respondents age, gender, and education. These were included in the statistics as parameters that might impact on the level of fear. The different levels of education were divided a bit different between the surveys of 2010 and 2019, with higher education was divided into two groups in 2010 (higher education of three years and higher education of 4 years or more), while it was divided into three groups in 2019 (higher education: bachelor's degree, master's degree, and doctorate). To make the data equal between years, I changed data from 2019 in the similar division that was done in 2010. However, when I looked at fear towards each carnivore in demographic variables, it was not done between years, but all data was included in the analysis (n = 3617).

## 2.5 Statistical analyzes of data

I used QGIS Desktop 3.16.11 to manufacture the maps of the management areas for each predator to show the study areas (Figure 6a-d). Each management area is important to look at the people's fear outside and inside for each species and area.

To find out if the respondents fear or no fear of the large carnivores differed inside from outside each management area, I registered all municipalities that were partly or completely inside the management areas for each species.

All variables are categories, except for fear towards each of the species, which is binomial numeric data (0,1) no fear, fear. I divided their answers in two groups instead of five, those who showed any kind of fear were added in the category "fear" (1), while those with no fear were added in to "no fear" (0), lastly those who did not know were removed from the data. In addition, years are converted as categories instead of numeric data, this way I would compare peoples' fear between years.

I have mainly used the R program (http://cran.r-project.org/) to do my statistical analyzes, with a bit of support from Microsoft Excel (2016) in the fundamental work with the data. Most of the data is categorical with dependent variables being binomial (fear/no fear), therefore I made binomial logistic regression for all analysis. Furthermore, I altered the analysis to odds ratios (OR) to present the results with the probability of binomial outcome. Then I could uncover correlations between my dependent variable fear/no fear, and the independent variables.

This method presents strength of association between factors and outcomes (Smith, 2018), and through this study I used OR to look at the increase (OR > 1) or decrease (OR < 1) of fear towards each of the four large carnivores in different factors like inside and outside of management areas, years, gender, age groups and education. If some of the confidence interval of the results overlaps with the reference category (OR=1) it is not significant and therefore have no association with exposure and outcome (Smith, 2018).

# 3. Results

The survey from 2010 (n = 1507) contained 57 % women and 43 % men, and the age range from 15 to 94 years old (Mean = 53 yrs., SD =16 yrs.). The survey from 2019 (n = 2110) contained 57 % women and 43 % men with age 15-92 years (Mean = 46 yrs., SD = 18 yrs.). The majority of the respondents had the highest education level from high school (2010: 39 %; 2019: 43 %). Number of respondents showing fear towards the large carnivores, total in both years revealed less fear towards wolverine and lynx (n = 967, n =991) and the majority towards wolf and brown bear (n = 1 499, n = 1 936). Fear towards brown bear where the only large carnivore where the minority showed no fear (n = 1659). A high majority of the respondents showed no fear towards wolverine (n = 2 624), lynx (2 617) and wolf (n = 2 097).

I have divided the results in four main sections where I start with the data from Rovdata to show the changes of the populations (numbers and distribution) of each large carnivore in Norway in 2010 and 2019. Thereafter, the result from each hypothesis is presented in each section accordingly: peoples' fear between years, peoples' fear outside and within each management area, additionally with demographic factors, lastly, people's fear in relation to their perception of the carnivore situation in their own municipality.

## 3.1 Peoples fear differs between carnivore species between years

There was a significant reduction in peoples' fear in 2019 compared to 2010 towards all four carnivores, wolverine, wolf, lynx, and brown bear (Wolverine: OR = 0.70, 95 % CI [0.61, 0.81]; wolf: OR = 0.74, 95 % CI [0.64, 0.84]; lynx: OR = 0.60, 95 % CI [0.52, 0.70]; brown bear: OR = 0.51, 95 % CI [0.45, 0.59]; Figure 7; table 1). They all showed an indication of reduced fear from 2010 to 2019, with the strongest change of 49 % reduction of fear towards brown bear for 2019 compared to 2010. Fear towards lynx had a decrease of 40 % compared in 2019 compared to 2010, while fear towards wolverine had a decrease of 30 % in 2019 compared to 2010. Fear towards wolf had a weakest decline on 26 % in 2019 compared to 2010 (Figure 7).

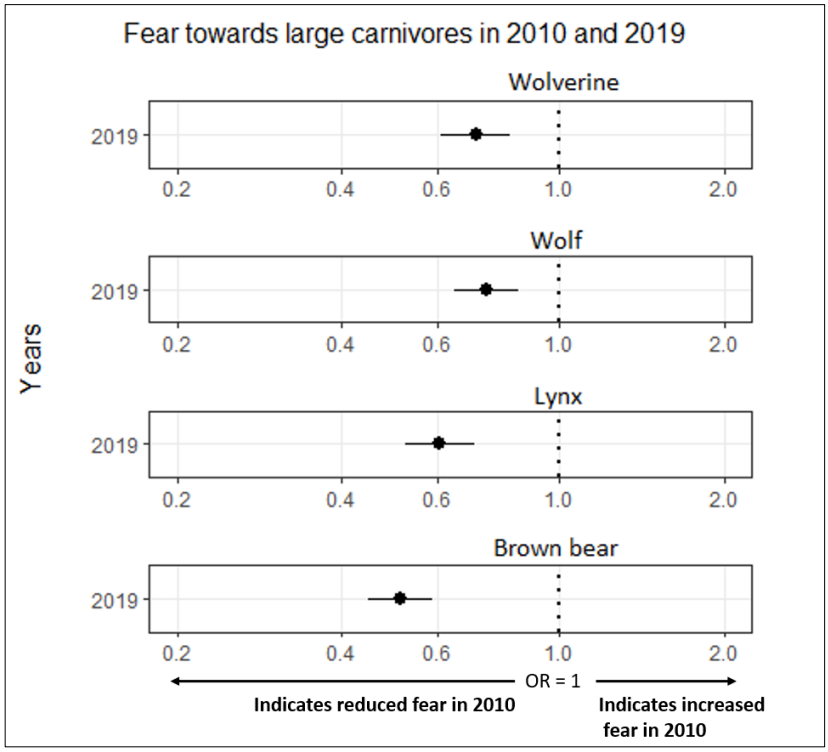


*Figure 7. Dashed vertical line (OR = 1: 2010, table 1) represents fear towards the large carnivores (f. above: wolverine, wolf, lynx and brown bear) comparing the years 2010 and 2019. Left side of vertical line indicates reduced fear in 2019 in relation to 2010, while right side of the vertical line indicates increased fear in 2019 in relation to 2010.*

*Table 1. Odds ratios of respondents' fear for large carnivores in years (2010 and 2019). Including confidence intervals, and those that are significant are denoted by *.*

| Carnivore species | Coefficients | OR | Lower CI | Upper CI |
|---|---|---|---|---|
| **Wolverine** | $Year_{2019}$ | 0.70 * | 0.61 | 0.81 |
| **Wolf** | $Year_{2019}$ | 0.74 * | 0.64 | 0.84 |
| **Lynx** | $Year_{2019}$ | 0.60 * | 0.52 | 0.70 |
| **Brown Bear** | $Year_{2019}$ | 0.51 * | 0.45 | 0.59 |

## 3.2 Fear towards the large carnivores differs in spatial pattern

There was a significant higher level of peoples' fear outside the management area compared to those living inside the management area for wolverine, wolf, and lynx ($OR_{wolverine}$ = 1.33, 95 % CI [1.06, 1.66]; $OR_{wolf}$ = 0.80, 95 % CI [0.64, 0.99]; $OR_{lynx}$ = 1.29, 95 % CI [1.11, 1.49]; Figure 8, table 2). The highest level of fear was towards wolverine with a 33 % for those living outside the management area compared to those living within, while fear towards lynx had a similar pattern with a strong level of fear of 29 % for those living outside the management area compared to those within. Conversely, fear towards wolf showed low level of fear by 20 % less in the areas outside the management area compared to those within. However, there were

no significant difference in fear between these areas for the brown bear ($OR_{bear}$ = 1.09, 95 % CI [0.84, 1.42].

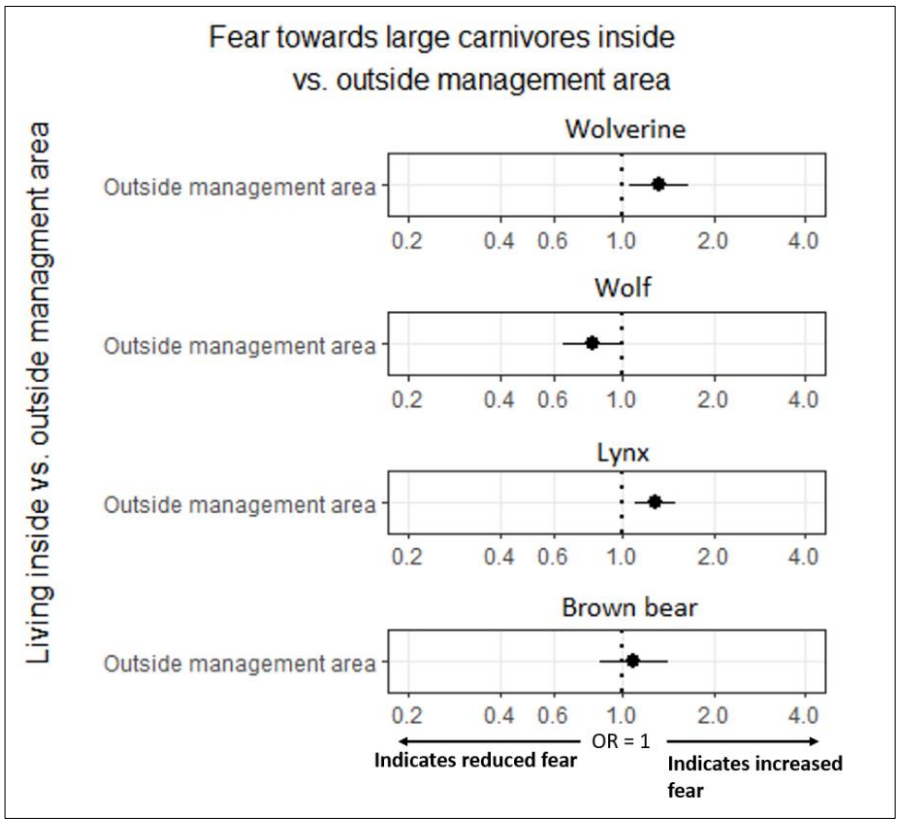


*Figure 8. Dashed vertical line (OR= 1; inside management area; table 2) represents fear towards large carnivores (f. above: wolverine, wolf, lynx, and brown bear) between areas inside and outside the management areas. Left side of vertical line indicates reduced fear outside of the management area compared to those within the management area, while right side of the vertical line indicates increased fear outside of the management area compared to those within the management area.*

*Table 2. Odds ratios in fear for large carnivores between respondents living areas (outside or within the management area for the specific large carnivore) with confidence intervals and those that are significant are denoted by *.*

| Carnivore species | Coefficients | OR | Lower CI | Upper CI |
|---|---|---|---|---|
| **Wolverine** | $Area_{Outside}$ | 1.33 * | 1.06 | 1.66 |
| **Wolf** | $Area_{Outside}$ | 0.80 * | 0.64 | 0.99 |
| **Lynx** | $Area_{Outside}$ | 1.29 * | 1.11 | 1.49 |
| **Brown bear** | $Area_{Outside}$ | 1.09 | 0.84 | 1.42 |

## 3.2.1 Fear differs with demographic variables

### 3.2.1.1 Gender

There was a significant difference in fear between men and women for all four carnivores: wolverine, wolf, lynx, and brown bear ($OR_{wolverine\ (men)}$ = 0.38, 95 % CI [0.33, 0.45];

$OR_{wolf(men)}$ = 0.46, 95 % CI [0.40, 0.53]; $OR_{lynx\ (men)}$ = 0.33, 95 % CI [0.28, 0.38]; $OR_{bear\ (men)}$ = 0.63, 95 % CI [0.55, 0.73]), as men showed an indication of less fear compared to women (Figure 9a-d, table 3). Men had an indication of 67 % lower level of fear towards lynx compared to women, which had the strongest difference. Thereafter, fear towards wolverine where men had 62 % lower fear than women, and fear towards wolf with 54 % lower fear among men compared to women. Lastly, I found the lowest difference in fear between men and women was related towards the brown bear where men revealed 37 % less fear compared to women.

#### 3.2.1.2 Age

Further, the respondents age was divided into five age groups (15-24 yrs., 25-34 yrs., 35-44 yrs., 45-54 yrs., and 65 yrs. and above). Three of the large carnivores had a similar pattern in the results: fear towards *wolverine* were significantly lower in the three age groups compared to those in the youngest age group of 15-24 years old ($OR_{25\text{-}34\ yrs.}$ = 0.63, 95 % CI [0.46, 0.88]; $OR_{35\text{-}44\ yrs.}$ = 0.66, 95 % CI [0.49, 0.89]; $OR_{45\text{-}54\ yrs.}$ = 0.61, 95 % CI [0.45, 0.82]; Figure 9a, table 3). There was a 37 % lower level of fear towards wolverine for the age group 25-34 years compared to the age group 15-24 years old, while the age group of 35-44 years had a 34 % lower level of fear compared to the age group 15-24 years old. Lastly, the age group of 45-54 years showed 39 % less fear compared to those in the age group 15-24 years. However, there was no significant difference in fear for the older age groups 55-64 and those over 65 years, compared to age group 15-24 yrs. ($OR_{55\text{-}64\ yrs.}$ = 0.91, 95 % CI [0.68, 1.22]; $OR_{+65\ yrs.}$ = 1.21, 95 % CI [0.93, 1.59]; Figure 9a, table 3).

Fear towards *wolf* were significantly lower for three age groups 25-34 yrs., 35-44 yrs. and 45-54 yrs. compared to age group 15-24 yrs. ($OR_{25\text{-}34\ yrs.}$ = 0.69, 95 % CI [0.51, 0.98]; $OR_{35\text{-}44\ yrs.}$ = 0.67, 95 % CI [0.51, 0.88]; $OR_{45\text{-}54\ yrs.}$ = 0.63, 95 % CI [0.48, 0.82]; Figure 9b, table 3). There was a 31 % lower fear for the age group 25-34 years compared to the age group 15-24 years old, while the age group of 35-44 years showed a 33 % lower fear compared to the age group 15-24 years old, lastly the age groups of 45-54 years showed a lower level of fear of 37 % compared to those in the age group 15-24 years. However, there was no significant difference in fear for age groups 55-64 and those over 65 years old compared to age group 15-24 ($OR_{55\text{-}64\ yrs.}$ = 0.89, 95 % CI [0.68, 1.16]; $OR_{+65\ yrs.}$ = 1.11, 95 % CI [0.86, 1.43]; Figure 9b, table 3).

Same pattern applies for fear towards lynx, with a significant lower fear in the age groups 25-34 years, 35-44 years, 45-54 years compared to the age group 15-24 years old ($OR_{25\text{-}34\ yrs.}$ = 0.71, 95 % CI [0.51, 0.98]; $OR_{35\text{-}44\ yrs.}$ = 0.59, 95 % CI [0.44, 0.80]; $OR_{45\text{-}54\ yrs.}$ = 0.56, 95 % CI [0.42, 0.76]; Figure 9c, table 3). There was a 29 % lower level of fear for the age group

25-34 years compared to the age group 15-24 years old, while the age group of 35-44 years had 41 % lower fear compared to the age group 15-24 years old, lastly the age groups of 45-54 years had 44 % lower level of fear compared to those in the age group 15-24 years. For the two older age groups 55-64 years and those above 65 years had was no significant difference in fear towards lynx ($OR_{55\text{-}64\ yrs.}$ = 0.87, 95 % CI [0.65, 1.16]; $OR_{+65\ yrs.}$ = 0.89, 95 % CI [0.68, 1.17]; Figure 9c, table 3)

Fear towards brown bear had a verry different result for the age groups, with only one age group (+65 yrs.) with a significant difference ($OR_{+65\ yrs.}$ = 1.33, 95 % CI [1.03, 1.71]; Figure 9d, table 3). The age groups for above 65 years showed an increase in fear of 33 % compared to those in the age group 15-24 years. While the other age groups (25-34, 35-44, 45-54, and 55-64) had no significant difference *(*$OR_{25\text{-}34\ yrs.}$ = 0.84, 95 % CI [0.63, 1.12]; $OR_{35\text{-}44\ yrs.}$ = 0.77, 95 % CI [0.59, 1.01]; $OR_{45\text{-}54\ yrs.}$ = 0.76, 95 % CI [0.59, 1.00]; $OR_{55\text{-}64\ yrs.}$ = 1.23, 95 % CI [0.95, 1.62]; Figure 9d, table 3).

#### 3.2.1.3 Education

I also looked at how fear might differ related to the respondents' highest fulfilled education level which was categorized into; primary school, high school, university level up to 3 years, or university level of 4 years or more. When looking at fear related to each carnivore species, I found that fear towards *wolverine* showed that the higher educated the lower level of fear were revealed ($OR_{Higher\ education\ (3\ years)}$ = 0.50, 95 % CI [0.39, 1.59]; $OR_{Higher\ education\ (+4\ years)}$ = 0.42, 95 % CI [0.31, 0.56]; $OR_{High\ school}$ =0.70, 95 % CI [0.56, 0.88]; Figure 9a, table 3). I even found that respondents with university education of 4 years or more, expressed an even lower fear with 58 % less indication of fear compared to those with education from primary school, while the university education of up to 3 years which showed 50 % less fear than those with the education level from primary school. For those who went to high school at most had 30 % less fear compared to those who had primary school as its highest fulfilled education (Figure 9a, table 3).

Fear towards *wolf* showed a significant lower level in all three levels compared to those educated merely through primary school ($OR_{Higher\ education\ (3\ years)}$ = 0.59, 95 % CI [0.47, 0.75]; $OR_{Higher\ education\ (+4\ years)}$ = 0.48, 95 % CI [0.37, 0.61]; $OR_{High\ school}$ = 0.73, 95 % CI [0.59, 0.91]; Figure 9b, table 3). The pattern here is similar to fear towards wolverine, where respondents with university education of 4 years or more, expressed an even lower level of fear of 52 % compared to compared to those educated merely through primary school. Those with university education level of 3 years showed low level of fear on 41 % compared to those who went to

primary school as the highest fulfilled education level. The education level of high school revealed the weakest level of fear on 27 % low compared to those who had primary school as the maximum fulfilled education level.

There was also a significant lower level of fear towards *lynx* on all three levels of educations ($OR_{\text{Higher education (3 years)}}$ = 0.45, 95 % CI [0.35, 0.58]; $OR_{\text{Higher education (+4 years)}}$ = 0.34, 95 % CI [0.26, 0.46]; $OR_{\text{High school}}$ = 0.64, 95 % CI [0.51, 0.80]; Figure 9c, table 3). My results shows that 66 % for those with the university education level (+ 4 years) revealed the lowest level of fear compared to those with primary school as their highest education, and those with a university education level (3 years) showed 55 % less fear compared to those with highest education level from primary school, and those with an education level from high school only showed 36 % less fear compared to those who had an education level from primary school.

Lastly, there was a also a significant lower fear towards brown bear on all three levels of educations ($OR_{\text{Higher education (3 years)}}$ = 0.58, 95 % CI [0.45, 0.73]; $OR_{\text{Higher education (+4 years)}}$ = 0.50, 95 % CI [0.39, 0.65]; $OR_{\text{High school}}$ = 0.67, 95 % CI [0.54, 0.84]; Figure 9d, table 3). The lowest level of fear was for those with a university education level (+ 4 years) with 50 % less fear compared to those who had the highest education level from primary school. Thereafter, the education level for those with a university education level (3 years) revealed a 42 % lower level of fear compared to those who had primary school as the highest education level, while respondents with high school as the highest fulfilled education level showed the weakest level of fear with only 33 % lower compared to those with the education level of primary school.

#### 3.2.1.4 Demographical variables and the spatial pattern

By adjusting the spatial analysis by including demographic variables age, gender, and education, I found that fear towards wolf between areas where no longer significantly different ($OR_{wolf}$ = 0.81, 95 % CI [0.65, 1.01]; Figure 8 & 9b; table 2 & 3). The demographic variables for the three other carnivores did not have a significant impact on fear ($OR_{wolverine}$ = 1.27, 95 % CI [1.01, 1.60]; $OR_{lynx}$ = 1.34, 95 % CI [1.15, 1.56]; $OR_{bear}$ = 1.10, 95 % CI [0.84, 1.43]; Figure 8 & 9; table 2 & 3).

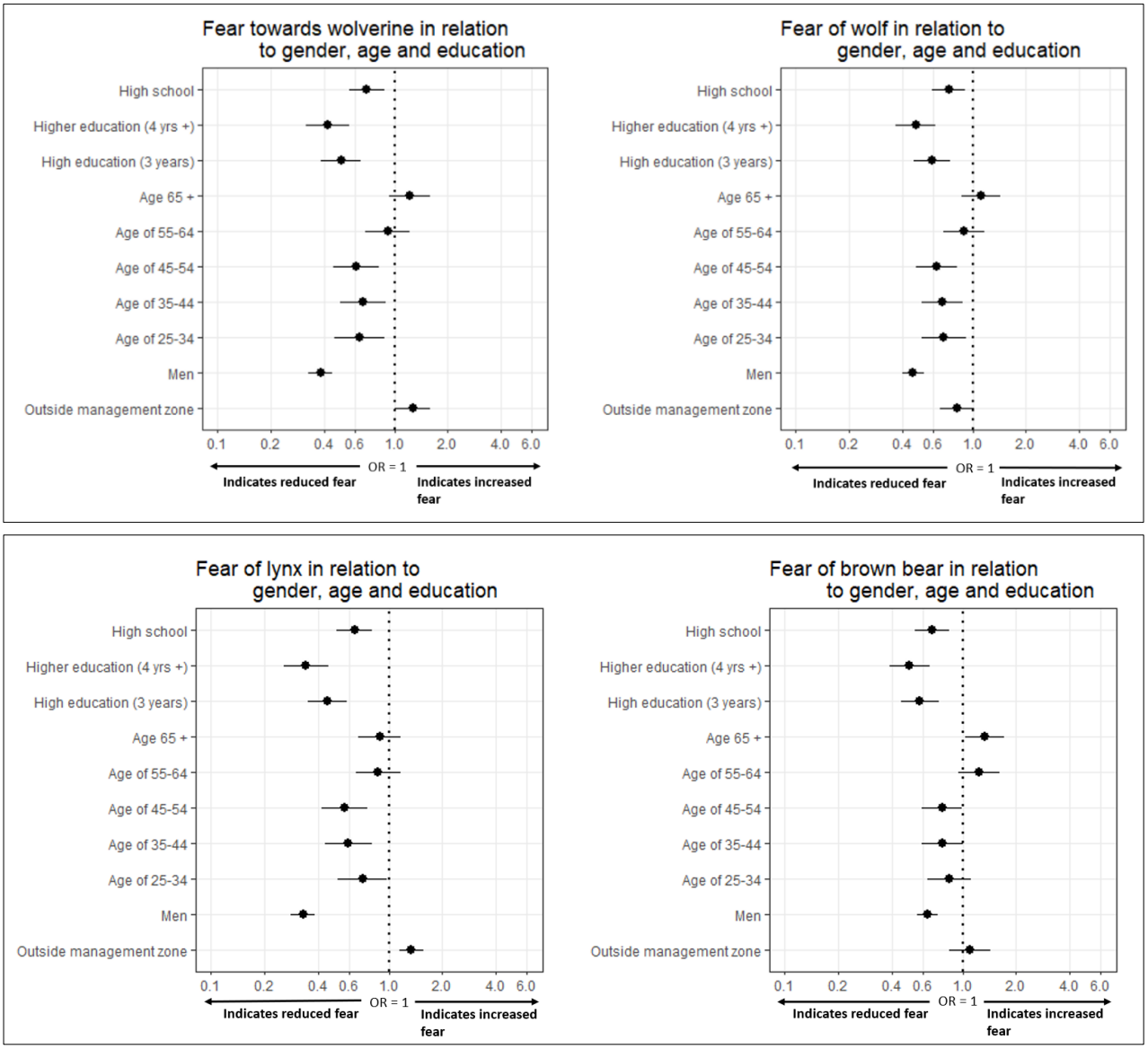


*Figure 9. Dashed vertical line (OR= 1: inside management area, women, 15-24 years old, primary school, table 3) represents the fear towards large carnivores (f. upper left: 9a. wolverine, 9b. wolf, 9c. lynx, and 9d. brown bear) between areas, gender, age-groups, and education. Left side of vertical line indicates reduced fear outside the management area/men/age groups (25-34, 35-44, 45-54, 55-64 and +65)/ education (high school, higher education of 3 yrs. and 4 years or more) in relation with inside the management area,/women/ age group 15-24/primary school, while right side of the vertical line indicates increased fear outside the management area/men/age groups (25-34, 35-44, 45-54, 55-64 and +65)/education (high school, higher education of 3 yrs. and 4 years or more) in relation with those living inside the management area/women/age group 15-24/primary school.*

*Table 3. Odds ratios of fear towards large carnivores in respondents living area (outside or inside management areas) and demographic factors as gender, age groups and education level. Also, with confidence intervals and those that are significant are denoted by *.*

| Carnivore species | Coefficients | OR | Lower CI | Upper CI |
|---|---|---|---|---|
| **Wolverine** | Outside management zone | 1.27 * | 1.01 | 1.60 |
| | Men | 0.38 * | 0.33 | 0.45 |
| | Age 25-34 | 0.63 * | 0.46 | 0.88 |
| | Age 35-44 | 0.66 * | 0.49 | 0.89 |
| | Age 45-54 | 0.61 * | 0.45 | 0.82 |
| | Age 55-64 | 0.91 | 0.68 | 1.22 |

| | | | | |
|---|---|---|---|---|
| | Age 65 + | 1.21 | 0.93 | 1.59 |
| | High education (3 yrs.) | 0.50 * | 0.39 | 0.64 |
| | High education (+4 yrs.) | 0.42 * | 0.31 | 0.56 |
| | High school | 0.70 * | 0.56 | 0.88 |
| **Wolf** | Outside management zone | 0.81 | 0.65 | 1.01 |
| | Men | 0.46 * | 0.40 | 0.53 |
| | Age 25-34 | 0.69 * | 0.51 | 0.92 |
| | Age 35-44 | 0.67 * | 0.51 | 0.88 |
| | Age 45-54 | 0.63 * | 0.48 | 0.82 |
| | Age 55-64 | 0.89 | 0.68 | 1.16 |
| | Age 65 + | 1.11 | 0.86 | 1.43 |
| | High education (3 yrs.) | 0.59 * | 0.47 | 0.75 |
| | High education (+4 yrs.) | 0.48 * | 0.37 | 0.61 |
| | High school | 0.73 * | 0.59 | 0.91 |
| **Lynx** | Outside management zone | 1.34 * | 1.15 | 1.56 |
| | Men | 0.33 * | 0.28 | 0.38 |
| | Age 25-34 | 0.71 * | 0.51 | 0.98 |
| | Age 35-44 | 0.59 * | 0.44 | 0.80 |
| | Age 45-54 | 0.56 * | 0.42 | 0.76 |
| | Age 55-64 | 0.87 | 0.65 | 1.16 |
| | Age 65 + | 0.89 | 0.68 | 1.17 |
| | High education (3 yrs.) | 0.45 * | 0.35 | 0.58 |
| | High education (+4 yrs.) | 0.34 * | 0.26 | 0.46 |
| | High school | 0.64 * | 0.51 | 0.80 |
| **Brown bear** | Outside management zone | 1.10 | 0.84 | 1.43 |
| | Men | 0.63 * | 0.55 | 0.73 |
| | Age 25-34 | 0.84 | 0.63 | 1.12 |
| | Age 35-44 | 0.77 | 0.59 | 1.01 |
| | Age 45-54 | 0.76 | 0.59 | 1.00 |
| | Age 55-64 | 1.23 | 0.95 | 1.62 |
| | Age 65 + | 1.33 * | 1.03 | 1.71 |
| | High education (3 yrs.) | 0.58 * | 0.45 | 0.73 |
| | High education (+4 yrs.) | 0.50 * | 0.39 | 0.65 |
| | High school | 0.67 * | 0.54 | 0.84 |

## 3.3 Fear related to peoples' perception of the large carnivore situation

I looked at how the respondents' expressed fear towards the large carnivores associated with their perception of the carnivore situation in their neighboring area (municipality), but only for 2019. The carnivore situation was categorized into four alternatives which the respondents could answer: Either they could choose that they found the carnivore situation "uncertain" (e.g., if they did not know whether there were carnivores in the area or not), insufficient number as "too few" carnivores, "too many" carnivores in their area, or the right amount as "enough" carnivores.

I found that fear towards wolverines associated with people who found the carnivore situations as "too few" wolverines in their own municipality ($OR_{too\ few}$ = 0.73, 95% CI [0.55,

0.97]), had a 27 % lower level of fear compared to those thinking it was “enough” wolverines in their municipality. I found no significant difference in fear of wolverine, in association with the two other categories “uncertain” and “too many”: ($OR_{uncertain}$ = 0.35, 95% CI [0.27, 0.44]; $OR_{too\ many}$ = 1.31, 95 % CI [0.95, 1.79]; Figure 10a, table 4).

The fear of wolves had a significant difference in the categories “too few” and “too many” with those thinking it was a right quantity of wolves (“enough”) in their municipalities ($OR_{too\ few}$ = 0.35, 95 % CI [0.28, 0.45]; $OR_{too\ many}$ = 1.32, 95 % CI [1.00, 1.74]; Figure 10b, table 4). Respondents who perceived the wolf situation as “too few” wolves in their municipality, indicated a 46 % less fear towards wolves compared to those who found the wolf situation as being “enough”. Respondents who reported “too many” wolves showed an 100 % increased fear compared to those thinking it was an adequate amount in their municipality. However, there was no significant difference in fear for those “uncertain” of the number of wolves in their own municipality in compared to those thinking it is “enough” in their municipality ($OR_{uncertain}$ = 0.71, 95 % CI [0.57, 0.90]; Figure 10b, table 4).

Fear towards lynx showed a similar pattern as to the wolverine but only here all three categories was significantly different. Those with the perception of “too few” lynx in their own municipality was significant less afraid by 29 % compared to those with the perception of thinking it was “enough” lynx in their own municipality ($OR_{too\ few}$ = 0.21, 95 % CI [0.16, 0.28; Figure 10c, table 4]. For the other two categories “uncertain” of the perception of the number of lynx and those thinking there was “too many” lynx in their own municipality showed an increase in reported fear where those thinking it was “too many” showed a 36 % higher level of fear towards lynx, while those who was “uncertain” showed a high level of fear on 28 % compared to those thinking it was the right amount of lynx in their own municipality ($OR_{uncertain}$ = 0.39, 95 % CI [0.30, 0.50]; $OR_{too\ many}$ = 0.41, 95 % CI [0.30, 0.56]).

Lastly, regarding the brown bear situation, respondents who found it to be “too few” bears in their neighborhood (municipality) also revealed a low level in expressed fear of 22 %, while I found the opposite for those who reported they found the bear situation as “too many” with a high level of 100 % compared to those with perception of being “enough” brown bears in their municipality ($OR_{too\ few}$ = 0.71, 95 % CI [0.58, 0.89]; $OR_{too\ many}$ = 1.90, 95 % CI [1.33, 2.73]; Figure 10d, table 4). For those who was “uncertain” of their perception of the numbers of brown bears in their municipality had no significant difference with those thinking it was

"enough" brown bears in their municipality ($OR_{uncertian}$ = 0.89, 95 % CI [0.72, 1.11]; Figure 10d, table 4).

*Table 4. Odds ratios for large carnivores with the perceptions "uncertain", "too few" and "too many" large carnivores in their own municipality. Including the confidence intervals, and those that are significant are denoted by *.*

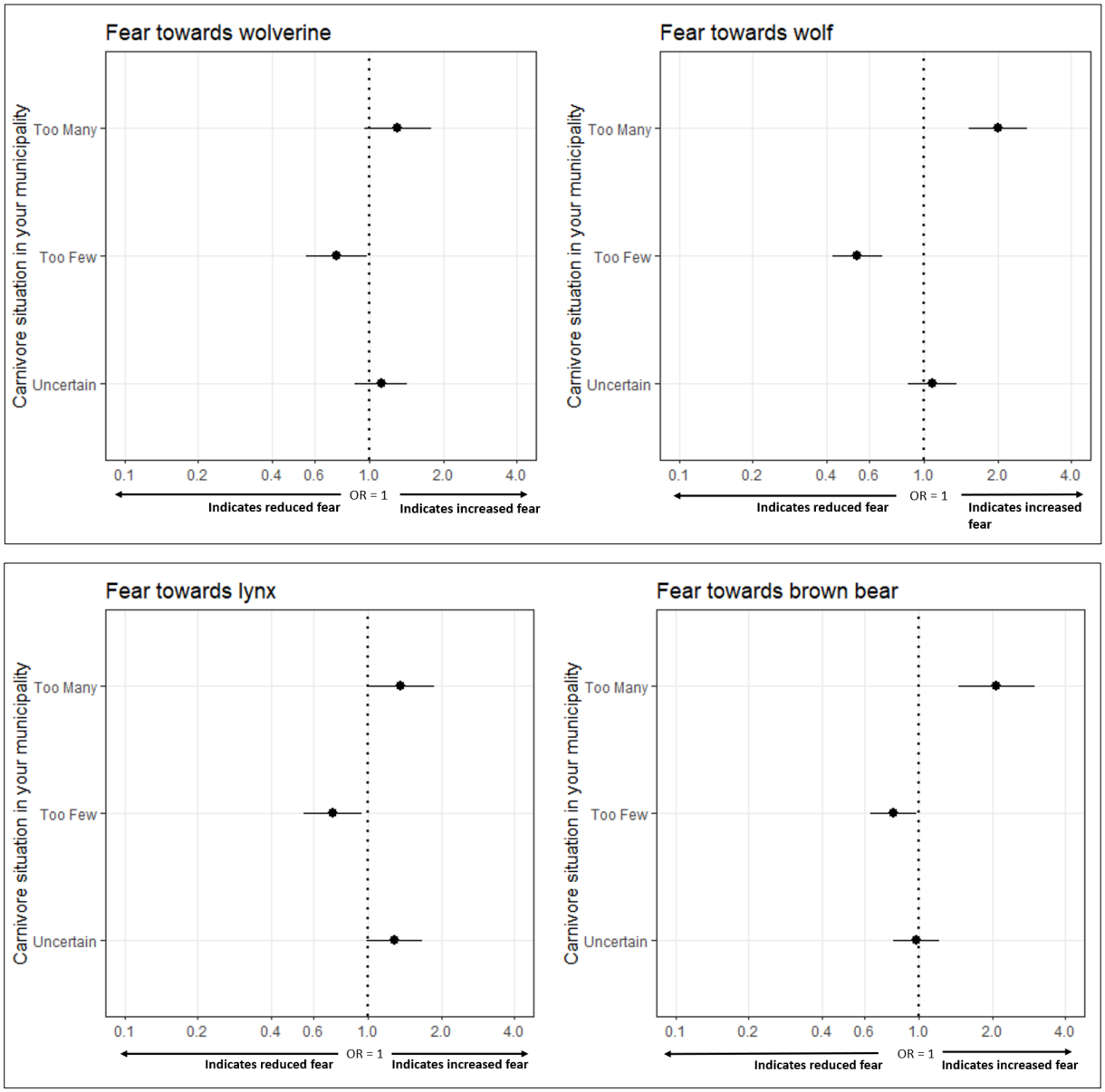


*Figure 10. Dashed vertical line (OR= 1; perception of those thinking it is "enough" carnivores in their own municipality, table 4) represents the fear towards large carnivores (f. upper left: 10a. wolverine, 10b. wolf, 10c. lynx, and 10d. brown bear) for people with the perception of "too many" carnivores, "too few" carnivores or "uncertain" of the number of carnivores in their own municipality compared to those thinking it is the right amount of carnivores in their own municipality (OR=1). Left side of vertical line indicates reduced fear with those with the perception of "too many", "too few" or "uncertain" with the number of carnivores in their own municipality in relation for those with the perception of being "enough" carnivores in their own municipality, while right side of the vertical line indicates increased fear for those with the perception of "too many", "too few" or "uncertain" with the number of carnivores in their own municipality in relation with those with the perception of being*

| Carnivore species | Coefficients | OR | Lower CI | Upper CI |
|---|---|---|---|---|
| **Wolverine** | Uncertain | 1.12 | 0.87 | 1.43 |
| | Too few | 0.73 * | 0.55 | 0.97 |
| | Too many | 1.31 | 0.95 | 1.79 |
| **Wolf** | Uncertain | 1.09 | 0.86 | 1.37 |
| | Too few | 0.54 * | 0.42 | 0.68 |
| | Too many | 2.01 * | 1.53 | 2.64 |
| **Lynx** | Uncertain | 1.28 * | 0.99 | 1.67 |
| | Too few | 0.71 * | 0.54 | 0.94 |
| | Too many | 1.36 * | 0.99 | 1.87 |
| **Brown bear** | Uncertain | 0.98 | 0.79 | 1.22 |
| | Too few | 0.78 * | 0.63 | 0.97 |
| | Too many | 2.09 * | 1.46 | 3.00 |

# 4. Discussion

## 4.1 Fear differs with carnivore species

The majority of respondents expressed fear of brown bear (n = 1936), followed by wolf (n = 1499), then lynx (n =991), and wolverine (n = 967) which were quite similar. Even a higher number of respondents expressed fear towards brown bear than those who expressed no fear (n =1659). Throughout the results there was often no change or only a small change (lower level) in fear towards brown bear in relation to the three other carnivores. However, the age group above 65 years showed higher level of fear compared to the age group 15-24 years, and men expressed 37 % less fear towards brown bear compared to level of fear expressed by women. Due to these results, my assumptions that more people express fear towards brown bear than the three other carnivores were strengthened. My finding that fear towards wolf also seem to be a little bit higher than fear towards lynx and wolverine may not be surprising, as the wolf gets a lot of negative publicity when it establishes itself in an area (Lenth et al., 2017). I also found that the respondents expressed fear between years, revealed the biggest change towards brown bear and least change towards wolf.

Globally, studies show it is more common to fear brown bear and wolf (Linnell et al., 2005), studies have shown that people have expressed more fear of the brown bear (Bjerke et al., 2003; Røskaft et al., 2003). Fear may be linked towards that particular species that people has experienced to have an unpleasant encounter, in worst case be a danger to a persons' safety (Johansson et al., 2012; Krange et al., 2017; Røskaft et al., 2007; Skogen et al., 2018, p. 34). However, over the years it has been more attention of fear towards carnivores like brown bear and wolf, hence educate more people about the carnivores and how to interact when encounters happens (Norsk institutt for naturforskning (NINA), 2021, 18:20, 42:16). This could have worked for fear of brown bear, while the topic of wolf is more controversial and a much bigger conflict (Krange & Skogen, 2018, p. 7; Lenth et al., 2017), especially through media which may have an impact on the small changes in fear between the years (Nanni et al., 2020). This can for instance be seen from 2014, when 12 people were arrested for illegal hunting on wolves in Norway, which created a massive case in the social media (Lenth et al., 2017; Sponberg, 2020). Moreover, a study from Johansson et al (2012) describes how fear of wolf is more related to the managing authorities of wolves in relation to mitigation on predation of pets and livestock, meanwhile the fear of brown bear is more about the encounters and the expectations related to these human – bear encounters (Johansson et al., 2012). Wherefore, if there are different reasons

to why people fear the large carnivores, it might need different solutions in both interpret fear, and how to handle this.

Less respondents were afraid of lynx and wolverine. These carnivores are not as common in media and additionally there are very few accounts of people attacked by lynx, while wolverine is not known to attack (Bevanger, 2012, p. 105 & 181). Those who do express fear may have limited knowledge about the carnivores, especially since they are much less mentioned in not only media, but also in stories and fairytales (Haaland, 2002, p. 74; Sponberg, 2020). Both carnivores are rare to encounter and can therefore seem more mysterious (Bevanger, 2012, p. 105 & 182), I guess this also could have created more uncertainty, thus also a higher level of fear towards these species, but that was not the case, and not what I expected either.

### 4.2 Fear of carnivores between years

My results showed a significant decrease in fear in 2019 compared to 2010 for all four large carnivores. It shows an indication of less fear towards the large carnivores in time. In fact, the highest decrease of 49 % in 2019 compared to 2010 was fear towards brown bear, next was fear towards lynx with a decrease of 40 % in 2019 compared to 2010, thereafter fear towards wolverine with a decrease of 30 %, and lastly fear towards wolf had only decreased by 26 % in 2019 from 2010. It can be several reasons for people to be less afraid of these carnivores, but some of the assumptions is the changes in the carnivore populations, increased knowledge about each carnivore, globalization, urbanizing, or changes in generations. Earlier studies have discussed how people living in urban areas or are more globally oriented also may be higher educated and thereby have an increased ecocentric value orientation (Gangaas et al., 2014), but this is not something I can claim from my results as I have not looked at this in this study. However, changes in the carnivore situation are highly relevant in explaining differences in peoples fear, and I would also expect a correlation between media coverage and how people perceive the carnivore situation including level of fear. This could be an interesting way to go for future research.

The carnivore populations have altered differently, where the populations of wolverine, lynx and brown bear have all declined in numbers between the years of 2010 and 2019, even though the population of wolverine had only a slight decline from 66 litters to 62 litters from 2010 to 2019 (Brøseth, Tovmo, & Andersen, 2010, p. 14; Rovdata, 2020, p. 3). This could also impact on peoples' fear, though we cannot confirm this as a certain cause in my study.

Meanwhile, the population of lynx had the greatest decline from 80 family groups till 55 family groups from 2010 to 2019 (Brøseth, Tovmo, & Odden, 2010, p. 13; Tovmo et al., 2019, p. 15). Thereafter, the population of brown bear with 166 individuals in 2010 down to 148 individuals in 2019 (Tobiassen et al., 2011, p. 10; Fløystad et al., 2020, p. 17). The only large carnivore with an increase of the population during 2010 to 2019 was wolf with 33-39 individuals (33-37 individuals along the border to Sweden) in 2010 and 64-66 individuals (40-41 individuals along the border to Sweden) in 2019 (Wabakken et al., 2010, p. 3; Svensson et al., 2019, p. 7 & 15). As the populations of lynx and brown bear where the only species with a great decline, while there was a decline in fear towards all carnivores, it must be other explanations for why less people were afraid in 2019 than 2010. This is only assumptions since I did not look further into this in my research.  them.

A lot of changes occur through 9 years; thus, it is complex to come with specific answer behind it. The reduction of fear may be a result of either being used to having carnivores where the respondents themself live, or it could be a response to actually having fewer carnivores in the management areas. I would guess that even with smaller declines of the carnivore numbers, it could mean that there was less writing in media, lower numbers of killed livestock and less observations of the carnivores by people in the neighborhood. This could further give a "false" expression of a much higher decline in the carnivore situation compared to what it actually has been in real numbers. The respondents have expressed how they themselves "experience" the carnivore situation, and not stated what they think about the exact number of the population sizes. Another assumption could be that increased knowledge about large carnivores' biology and behavior could contribute towards the level of fear and including knowledge about what action to take when encountering these animals could result in reduced fear. "Visitor center carnivore" were created in 2013 and authorized by The Norwegian Environment Agency (Besøkssenter rovdyr, s.a.; Brønnøysundregistrene, s.a.). These centers are open for the public in general, to teach and give information to everyone that are interested, as well as classes from primary school, about the large carnivores. We do not know how these centers play a role in peoples' awareness of the large carnivores, but this could also be interesting to include in future research. Thirdly, I also think there might have been a kind of adjustment to living close to large carnivores since their return after the protection by law in the 1970s, even though it took some time before the carnivore populations increased. Last but not least, it might have been a change of a less anthropocentric view and more ecocentric view during the time, where people with ecocentric values have a higher acceptance of having carnivores than people with

anthropocentric value (Gangaas et al., 2014). This is also an interesting discussion related to my findings that people who expressed that they found the carnivore situation as "too few", also where those that revealed lower fear compared to those who found the carnivore situation as "too many". I will come back to this later in this discussion.

### 4.3 Fear in spatial pattern with demographical variables.

My results showed a significant difference of fear between outside and inside the management areas for wolverine, wolf, and lynx. There was more fear among those living outside the management area for *wolverine* with 33 % and *lynx* with 29 % higher level than within the management areas. Conversely, those respondents living outside the management area of wolves showed 20 % less fear towards wolf than those living within the management area. There was no difference of fear towards brown bear between areas inside an outside management area. I got a similar pattern in the results when including demographic variables such as gender, age, and education. However, fear towards wolf was no longer significant between areas, while fear towards wolverine, lynx and brown bear showed a small change, thus these demographic variables had not a significant impact on fear towards these three carnivores, wolverine, lynx and brown bear.

The differences in fear in the spatial pattern of lynx and wolverine might be that people inside the management areas have more knowledge or experience with the two carnivores from those living outside. Second, lynx and wolverines might be less known to people compared to wolf and brown bear, because they are less mentioned in media, stories, and fairytales (Sponberg, 2020; Haaland, 2002, p. 74). Less knowledge can create uncertainty and fear (Røskaft et al., 2003, p. 194). Furthermore, there are more studies done about fear and attitudes between rural and urban areas, where there tend to be more negative attitudes, but less fear in rural areas than urban areas (Krange et al., 2017; Røskaft et al., 2007; Skogen, 2001). I would also question whether the management area of wolves is far more well known to people compared to the other management areas. The management area for wolves has been called "the wolf zone" and are heavily debated in media and in local societies (Norwegian Environment Agency, s.a.-e; Lenth et al., 2017, p. 68). This could also impact on the respondents' awareness of living inside or outside the different management areas.

My findings where men in general had a lower level of fear compared to women are also found in other studies (Røskaft et al., 2003), addition previous studies have shown that men express more positive attitudes towards large carnivores than women (Røskaft et al., 2007). This may be explained by the possibility of the different roles between genders in the past

(Røskaft et al., 2003, p. 195). In a time where the men went out to hunt while women kept in close proximity to the home (Røskaft et al., 2003, p. 195). It has become more common for women to hunt, but the majority of hunters are still men (Statistics Norway, 2021b).

I mainly found that the age group of 45-54 years old had the lowest level of fear, but only towards wolverine, wolf, and lynx. These three carnivores had similar pattern in the results revealing less fear in three of the age groups 25-34 years, 35-44 years, and 45-54 years compared to the youngest age group of 15-24 years, while fear towards brown bear only showed a significant difference in the most elderly age group above 65 years with a higher level of fear compared to the youngest age group of 15-24 years old. Previous studies had shown that age differences can have both different attitudes and varied level of fear towards large carnivores (Røskaft et al., 2003, 2007). Most common results shows that older people have more negative attitudes towards large carnivores than young people (Røskaft et al., 2003, 2007). There was less fear in the younger groups from 25-54 years, but only towards wolverine, wolf, and lynx. Fear of brown bear had in general a higher level of fear independent of age compared to the three other carnivore species. It is more common to have less fears at a younger age, good body condition and less vulnerability, furthermore elderly people is likely to be more cautious, which can relate to fear of carnivores (Røskaft et al., 2003, p. 193). Another assumption is the differences in type of living where there is more likely that elderly people has grown up in rural areas, often with livestock which can create more negative attitudes (Røskaft et al., 2007, p. 183). Simultaneously, many of the elderly people have lived in a time with almost none of the large carnivores left and a time where agriculture was the main source of income, food and livelihood, while today there are less farmers, especially in areas where three of four of the carnivore management areas overlap (Røskaft et al., 2007, p. 183; Austrheim et al., 2008, p. 3; Strand et al., 2019, p. 542). Today, I guess people are trying to adjust to the return of the large carnivores, thus younger people may have more positive attitudes and feel more excitement than fear in an encounter with the carnivores.

Fear of the large carnivores regarding the respondents' educational levels showed a similar pattern for all four species. There was least fear towards the carnivores for the respondents with a university degree of four years or more, thereafter the university degree of three years compared to those who merely had primary school as the highest education level. There was still less fear towards carnivores for those with an educational level from high school compared to those with highest education level form primary school. However, the low level was not as strong as those with a higher educational level. Other studies have revealed similar

results where those with higher education level express more positive attitudes (Røskaft et al., 2007) as well as less fear in the higher educational levels (Røskaft et al., 2003). Røskaft et al (2007) stated that a higher level of education can have an association with more knowledge about the environmental value (Røskaft et al., 2007, p. 183; Kellert & Berry, 1987). The biophilia theory revealed that primary knowledge about a threat would decrease fear towards the object. Knowledge of carnivores behavior and biology, as well as the danger they can represent, and experience of carnivores in the wild can be relevant knowledge to reduce fear towards them (Røskaft et al., 2003).

## 4.4 Fear and perception of large carnivore numbers

There was a pattern in fear towards large carnivores where respondents who expressed that they found the carnivore situation as "too many" carnivores in their municipality showed an indication of a higher level of fear compared to those with the perception of "enough" carnivores. Respondents who found the situation as "too few" revealed a lower degree of fear towards the carnivores compared to those with the perception of "enough". Those being "uncertain" about their perception had no difference to those with the perception of "enough" carnivores. Especially fear towards wolf and brown bear showed a clear pattern of this, where those thinking it was "too many" wolves or "too many" brown bears in their own municipality showed a 100 % higher level of fear compared to those thinking it was the right amount of these in their own municipality. Conversely, those with the perception of "too few" wolves showed reduced fear at 46 %, while same category in fear towards brown bear showed only a decrease of 22 % compared to those thinking it is "enough". Fear of wolverine had only one category that was significant different, which was those with the perception of being "too few" wolverines in their own municipality with decrease of 27 % fear compared to those thinking it was "enough". Meanwhile, fear towards lynx revealed all three categories were significant different from the perception "enough"; there was a higher level of fear in the categories with perception of "too many" lynx in their municipality and those "uncertain" of the number of lynx in their municipality compared to perception "enough", while there was a low level of fear in the perception of "too few" lynx in their municipality compared to perception "enough".

This shows that there is an association with attitudes towards carnivores and the level of fear. This is also consistent with Gangaas et al. (2014) showing how the categories "too few", "too many" and "suitable" number of carnivores associated with ecocentric values (Gangaas et al., 2014). These findings may contribute to show that fear is an important part of the human - carnivore conflict. As fear is more expressed among people who find the carnivore situation as

"too many", while those expressing less fear also report that there are "too few" carnivores are an important contribution to better understand how people experience having large carnivores.

People in Norway have different perception to each large carnivore and have some idea or feeling of how many there is in their living area, a majority of people overestimate the populations (Zimmermann et al., 2001, p. 8). Previous study also showed that higher perceived estimate of wolf numbers, more people wanted the population reduced or removed and vice versa (Zimmermann et al., 2001, p. 8). Attitudes are driven by emotions, and fear being a negative emotion tend to create negative attitudes towards an object (carnivores) (Heberlein, 2012, p. 16; Røskaft et al., 2007, p. 172). Nevertheless, attitudes often tends towards consistency, even though it is not always consistent (Heberlein, 2012, p. 24). Therefore, people can still be afraid of carnivores but have a positive attitude towards them or show no fear of them but still have negative attitudes of them (Zimmermann et al., 2001).

## 4.5 Measures and valuations of fear towards large carnivores in Norway

In the last decades there have been done a lot of studies about carnivores' biology and behavior, which has brought important knowledge to help people to a better understanding about the species. To know how to behave in an encounter and how to read the carnivores behavior may help people feel safer outdoors, especially in areas where carnivores are present. Some studies suggests interventions like education to avoid human – carnivore conflicts, thus reduce fear (Glikman et al., 2012; Johansson et al., 2016, p. 265; Røskaft et al., 2007). To fear animals is not necessarily rational and realistic in these present times where many of us do not live as close to nature as in our earlier history. Fear is a natural instinct towards animals is an adaptation value from our evolutionary past (Røskaft et al., 2003, p. 185). Nevertheless, whether fear towards big carnivores is rational or not, feelings cannot be overlooked in the management of the carnivores (Johansson et al., 2012, p. 59).

By conducting studies like this one where we collect information about peoples' attitudes and emotions, can give us intel to find new measures and solutions to protect large carnivores as well as reduce large carnivore conflicts, both between humans and large carnivores, and between humans who disagree about having these carnivores. An idea might be to do qualitative or quantitative surveys in Norway about peoples' thoughts of why they fear each carnivore, thereby try different measures that might reduce peoples fear. A similar study has been achieved in Sweden with different exposure interventions towards brown bear to reduce peoples' fear (Johansson et al., 2019).

# 5. Conclusion

This study shows that fear towards large carnivores in Norway has decreased from 2010 to 2019, which confirms my hypothesis. Explanations for this might be the increase of knowledge about the carnivores, or less attention from media, a decrease in the carnivore populations or the changes of peoples' views where more people might have a more ecocentric view. This is only assumptions; thus, we need more research of what the factors for this change might be. Secondly, fear of large carnivores in the spatial pattern differed with species, but wolf was the only carnivore which creates more fear inside the management area than outside. This difference was not valid when including demographic variables. Meanwhile, fear towards lynx and wolverine were higher outside the management areas than within. Furthermore, there was no difference in fear towards brown bear between areas. The hypothesis is only confirmed in fear towards wolf, while for the rest of the carnivores the hypothesis is diminished. Thirdly, I revealed more expressed fear among people with the perception of the carnivore situation as being "too many" carnivores in their municipality, and an expressed lower fear among people who found the carnivore situation as "too few". This was valid for all species except the wolverine. This confirms my hypothesis that attitudes towards carnivores associate with fear.

As expected, I also revealed less fear towards the carnivore species among men compared to women, and among higher educated people. However, looking at difference in age groups revealed less fear towards wolverine, wolf and lynx in the younger age groups 25-34 year, 35-44 years, and 45-54 years, while fear towards brown bear showed a higher level of fear in the age group above 65 years old. I expected more fear towards brown bear and wolf than lynx and wolverine, and this was revealed in my study. The strongest reduction of fear occurred between years towards brown bear compared to the reduction of fear of the other carnivores. Even though the changes were stronger towards brown bear, the majority of respondent expressed more fear towards the brown bear.

In the last decades there have been done a lot of studies about carnivores' biology and behavior, which has brought important knowledge to help people acquire a better understanding about the species, thus less fear (Røskaft et al., 2003, p. 194). Fear has an impact on peoples' health and behavior, which makes some people avoid their outdoor activities and interests, especially in areas where carnivores are present (Gore et al., 2009). Even though there are done several studies about fear towards large carnivores, more studies should be done in Norway, but also studies that look at different measures that might help reduce peoples' fear and try reducing the large carnivore conflict, especially towards brown bear and wolf.

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# Appendix

Appendix table 1. The change is due to a reorganization of the municipalities in Norway between 2010 and 2019 where several municipalities got merged.

| | |
|---|---|
| Municipalities 2010 (Previous municipalities) | Andebu, Bjarkøy, Hof, Lardal, Leksvik, Rissa, Nøtterøy, Tjøme, Stokke, Leksvik |
| Municipalities 2019 (New municipalities) | Færder and Indre Fosen |

Appendix 1. Survey from 2010 (in Norwegian) (Gangaas, 2013)

*Spørreskjema kartlegging av toleranse for rovvilt*

Kjønn

Alder

Bosted / postnr

Utdanning

Yrke

Politisk tilhørighet (parti du stemte på ved siste valg)

*Hvilke erfaringer og opplevelse har du med rovvilt?*

I. Hvordan synes du den generelle rovviltsituasjonen i Norge er (sett kryss for det som passer)
- ☐ For lite rovvilt
- ☐ Passe antall rovvilt
- ☐ For mye rovvilt

II. Hvordan synes du rovviltsituasjonen er i din kommune (sett kryss for det som passer)
- ☐ For lite rovvilt
- ☐ Passe antall rovvilt
- ☐ For mye rovvilt
- ☐ Tror ikke det er store rovvilt her

III.

a) Har du selv opplevd eller sett disse artene i naturen, eventuelt spor/sportegn fra noen av disse?
☐ Nei ☐ Jerv ☐ Ulv ☐ Gaupe ☐ Bjørn

Hvis ja:

b) Har du selv sett noen av disse artene *i din kommune*?
☐ Nei ☐ Jerv ☐ Ulv ☐ Gaupe ☐ Bjørn

c) Har du selv opplevd skader fra noen av disse artene?
☐ Nei ☐ Jerv ☐ Ulv ☐ Gaupe ☐ Bjørn

☐ Ja, i jobbsammenheng som rovviltkontakt (eller tilsvarende)

Hvis ja – hvilke typer skader:

Privat:
- ☐ Tap av sau/bufe/storfe
- ☐ Tap av hund
- ☐ Tap av bikuber

Som rovviltkontakt (eller tilsvarende):
- ☐ Tap av sau/bufe/storfe
- ☐ Tap av hund
- ☐ Tap av bikuber

☐ Annet ..... ☐ Annet .....

Når skjedde dette:

Privat:

☐ Mer enn 5 år siden ☐ 1 – 5 år siden ☐ Siste året

Som rovviltkontakt (eller tilsvarende):

☐ Mer enn 5 år siden ☐ 1 – 5 år siden ☐ Siste året

d) På en skala fra 1 til 4 hvor 1= ikke redd i det hele tatt, 2 = litt redd, 3 = ganske redd, 4 = veldig redd:

Hvor redd er du for å møte disse artene:

| | Ikke redd | Litt redd | Ganske redd | Veldig redd |
|---|---|---|---|---|
| Jerv | ☐ | ☐ | ☐ | ☐ |
| Ulv | ☐ | ☐ | ☐ | ☐ |
| Gaupe | ☐ | ☐ | ☐ | ☐ |
| Bjørn | ☐ | ☐ | ☐ | ☐ |

## *Hvilke synspunkter har du til å ha rovvilt i Norge eller til å ha rovvilt der du bor?*

Du vil nå få 4 ulike valg hvor du kan plassere deg selv når det gjelder holdninger til rovvilt generelt. Hvilket av disse utsagnene mener du passer best for deg.

Du kan kun velge ett av alternativene A til D:

A) Jeg kan absolutt ikke akseptere rovvilt i Norge ☐
B) Jeg kan akseptere rovvilt i Norge under gitte forutsetninger (for eks. drive rovviltjakt, kompensasjon for tap av bufe, kompensasjon for tap av hund osv) ☐
C) Jeg mener rovvilt bør kunne etablere seg hvor de vil i Norge ☐
D) Jeg mener rovvilt kan etablere seg hvor de vil i Norge under gitte forutsetninger (for eks. drive rovviltjakt, kompensasjon for tap av bufe, kompensasjon for tap av hund osv) ☐

Ut fra de svarene du har gitt ovenfor vil vi nå stille deg mer spesifikke spørsmål for hver rovviltart:

Du kan svare på en skala fra "helt uenig", "uenig", "verken uenig eller enig", "enig" og "helt enig".

| Fra spørsmål: | | | JA | NEI |
|---|---|---|---|---|
| A | Gjelder dette alle arter? | Ulv | | |
| | | Jerv | | |
| | | Bjørn | | |
| | | Gaupe | | |

| Fra spørsmål: | Påstand: | | Helt enig | Enig | Verken enig eller uenig | Uenig | Helt uenig |
|---|---|---|---|---|---|---|---|
| B | Jeg mener denne arten kan etablere seg i Norge, men ikke i min kommune | Ulv | | | | | |
| | | Jerv | | | | | |
| | | Bjørn | | | | | |
| | | Gaupe | | | | | |
| B/D | Jeg kan akseptere denne arten i min kommune under visse forutsetninger (rovviltjakt, kompensasjon osv) | Ulv | | | | | |
| | | Jerv | | | | | |
| | | Bjørn | | | | | |
| | | Gaupe | | | | | |
| C | Denne arten bør kunne etablere seg hvor som helst i Norge | Ulv | | | | | |
| | | Jerv | | | | | |
| | | Bjørn | | | | | |
| | | Gaupe | | | | | |

På de videre spørsmålene kan du svare på en skala fra "helt uenig", "uenig", "verken uenig eller enig", "enig" og "helt enig".

### *A - Ønsker ikke fri rovviltetablering i Norge:*

1) Den/de artene du ikke vil ha i Norge eller i din kommune – er dette fordi:
   a) De er for stor belastning for landbruket som driver med sau/bufe/tamrein
   b) De medfører reduserte jaktkvoter på elg/rådyr
   c) Du ikke kan slippe hund i ulveområder
   d) De skaper frykt og gjør at folk ikke kan bruke naturen

2) Hva er du villig til å gjøre for å hindre etablering av disse artene der du bor?
   a) Jeg er villig til å skyte bjørn ulovlig
   b) Jeg er villig til å skyte ulv ulovlig
   c) Jeg er villig til å skyte jerv ulovlig
   d) Jeg er villig til å skyte gaupe ulovlig
   e) Jeg vil støtte opp om andre som vil skyte ulv/bjørn/gaupe/jerv ulovlig, men vil ikke skyte selv
   f) Jeg er ikke villig til å gjøre noe som helst
   g) Jeg vil jobbe politisk for å hindre rovviltetablering
   h) Annet

### *B og D - Rovvilt kan etablere seg under gitte forutsetninger:*

3) Jeg kan akseptere de aktuelle rovviltartene i Norge hvis:
   a) tap av sau/bufe/tamrein kompenseres
   b) de ikke tar bikkjer
   c) tap av bikkjer kompenseres
   d) de kan jaktes på
   e) tapte jaktrettigheter kompenseres
   f) de fredes innenfor noen få områder med strengt vern
      i. Jeg kan ikke selv akseptere å bo innenfor en rovviltsone
      ii. Jeg kan akseptere å bo innenfor en rovviltsone for ulv
      iii. Jeg kan akseptere å bo innenfor en rovviltsone for bjørn
      iv. Jeg kan akseptere å bo innenfor en rovviltsone for gaupe
      v. Jeg kan akseptere å bo innenfor en rovviltsone for jerv
      vi. Jeg kan akseptere å bo innenfor en rovviltsone om det gis økonomisk kompensasjon til kommunen/innbyggerne
      vii. Jeg kan akseptere å bo innenfor en rovviltsone om sonen oppheves og flyttes til et annet område etter et gitt antall år

   g) Annet _____

### *C - Rovvilt kan etablere seg geografisk fritt:*

4) a) Jeg mener rovvilt skal kunne etablere seg hvor som helst i Norge fordi
      i. Dette gir lik belastningen fordelt på alle
      ii. Rovviltet må kunne etablere seg i de leveområdene som er naturlig for dem
      iii. Rovvilt bør være en berikelse for alle å oppleve
      iv. Rovvilt er en naturlig del av vår natur
      v. Rovvilt har en viktig økologisk funksjon i naturen
      vi. Annet.....

   b) Jeg mener det likevel må gis kompensasjon i de områdene rovviltet velger å etablere seg?

| | Ja | Nei |
|---|---|---|
| For bufe/tamrein/storfe | ☐ | ☐ |
| For hund | ☐ | ☐ |
| For bikuber | ☐ | ☐ |

c) Er du selv villig til å bo innenfor et område med

i. Ulv ja ☐ nei ☐

ii. Bjørn ja ☐ nei ☐

iii. Gaupe ja ☐ nei ☐

iv. Jerv ja ☐ nei ☐

### *A, B, C, D - Noen generelle utsagn rundt rovvilt og rovviltkonflikten*

Her er noen generelle utsagn du kan være helt enig til helt uenig i:

| Utsagn | Helt uenig | Uenig | Verken/eller | Enig | Helt enig |
|---|---|---|---|---|---|
| Kompensasjon bør kun gis om det er gjennomført forebyggende tiltak | | | | | |
| All ulempe med rovvilt bør kompenseres | | | | | |
| Det er landbruket sitt ansvar å tilpasse seg rovviltsituasjonen | | | | | |
| Frykt er god nok grunn for å fjerne rovviltet | | | | | |
| Det er sterke tradisjoner for storviltjakt her jeg bor | | | | | |
| Ulovlig jakt på bjørn er akseptabelt | | | | | |
| Ulovlig jakt på ulv er akseptabelt | | | | | |
| Ulovlig jakt på jerv er akseptabelt | | | | | |
| Ulovlig jakt på gaupe er akseptabelt | | | | | |
| Rovvilt må forvaltes på lik linje med andre ville arter | | | | | |
| Rovvilt er en berikelse for min naturopplevelse | | | | | |
| Rovvilt begrenser min bruk av naturen | | | | | |
| Å se spor og sportegn øker min livskvalitet | | | | | |
| Rovvilt bør utnyttes i større grad i turistsammenheng | | | | | |
| Å få oppleve rovvilt i vår natur er et privilegium | | | | | |
| Norge er et rikt land som bør ta ansvar for store rovvilt | | | | | |

**Til slutt vil vi stille deg noen generelle utsagn om miljø og miljøsituasjonen de siste årene. Er du enig eller uenig i det som sies her?**

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Utsagn | Helt uenig | Uenig | Nøytral | Enig | Helt enig | Vet ikke |
| Balansen i naturen er svært ømfintlig og lett å forstyrre | | | | | | |
| Mennesket misbruker naturen i et omfang som er svært alvorlig | | | | | | |
| Alt snakk om den såkalte "økologiske krisa" er betydelig overdrevet | | | | | | |
| Dyr og planter har like stor rett til å leve på jorda som mennesker | | | | | | |
| Balansen i naturen er stabil nok til å tåle påvirkningene fra et moderne industrisamfunn | | | | | | |
| Hvis vi fortsetter på samme kurs som nå, vil vi snart oppleve en økologisk katastrofe | | | | | | |
| Menneskenes oppfinnsomhet vil sikre at det ikke blir ulevelig på jorda | | | | | | |

Appendix 2. Survey from 2019 (in Norwegian) (Barmoen, 2022).

## 1. Socio-demography

1. Registrer kjønn
    a. Mann
    b. Kvinne
2. Hva er din alder? [15-99]
3. Bosted/postnr. Kommune

## 2. Experience with carnivores

1. Har du selv opplevd noen av disse artene i naturen, eventuelt spor/sportegn fra noen av disse? MULTI a-d - RANDOMIZE a-d
    a. Jerv
    b. Ulv
    c. Gaupe
    d. Bjørn
    e. Ingen av disse

    If a-d in q2_1
2. Har du selv sett noen av disse artene *i din kommune*? MULTI a-d - RANDOMIZE a-d
    a. Jerv
    b. Ulv
    c. Gaupe
    d. Bjørn
    e. Ingen av disse
3. Finnes disse artene i din kommune?
    a. Jerv
    b. Ulv
    c. Gaupe
    d. Bjørn
    e. Ingen av disse
4. Har du beitedyr
    a. Ja
    b. Nei

    If b in q2_4
5. Har du hatt beitedyr tidligere?
    a. Ja
    b. Nei
6. Har du selv opplevd skader fra noen av disse artene? - MULTI a-d - RANDOMIZE a-d
    a. Jerv
    b. Ulv
    c. Gaupe
    d. Bjørn
    e. Ingen av disse
7. Har du venner eller slekt som har opplevd skader fra noen av disse artene? MULTI a-d - RANDOMIZE a-d
    a. Jerv
    b. Ulv
    c. Gaupe
    d. Bjørn
    e. Nei

8. if (a-d in q2_6) or (a-d in q2_7)
   Hvilke typer skader har du eller venner/slekt opplevd?
   a. Tap av sau/bufe/storfe
   b. Tap av hund
   c. Tap av bikuber
   d. Annet → Noter

9. Hvor redd er du for å møte disse artene, først ….{insert a-d}, er du …LES OPP SKALA.

a. Jerv
b. Ulv
c. Gaupe
d. Bjørn

   1) Ikke redd
   2) Litt redd
   3) Ganske redd
   4) Veldig redd

10. Hvor uenig eller enig er du i følgende utsagn: «Det er sterke tradisjoner for storviltjakt her jeg bor»

a) Helt uenig
b) Uenig
c) Hverken eller
d) Enig
e) Helt enig

11. Hvilket forhold har du til jakt? Er (har) du … LES OPP MULTI

a) Storviltjeger
b) Småviltjeger
c) …. familiemedlemmer/venner som driver med storviltjakt
d) …. familiemedlemmer/venner som driver med småviltjakt
e) ….ingen tilknytning til jakt.
f) ….motstander av jakt

If a or b in q11

12. Jakter du med hund?
    a. Ja
    b. Nei

## 3. Attitude toward carnivores

1. Hvordan synes du den generelle rovviltsituasjonen i Norge er. Er det …LES OPP SKALA
   a. Bjørn
   b. Ulv
   c. Gaupe
   d. Jerv

For lite

Passe antall

For mye

2. Hvordan synes du rovviltsituasjonen er i din kommune? Er det …LES OPP SKALA
   a. Bjørn
   b. Ulv
   c. Gaupe

d. Jerv

For lite

Passe antall

For mye

På en skala fra 1 til 5 hvor 1 = Helt uenig og 5 = Helt enig, hvor uenig eller enig er du i følgende:

| | **Utsagn** | **1 Helt uenig** | **Uenig** | **Verken/eller** | **Enig** | **5 Helt enig** |
|---|---|---|---|---|---|---|
| 3 | Store rovdyr begrenser bruken min av naturen. | | | | | |
| 4 | For meg er det en berikelse å vite at det finnes store rovdyr i norsk natur. | | | | | |
| 5 | Det er viktig for meg at vi tar vare på de store rovdyrene for fremtidige generasjoner. | | | | | |
| 6 | Norge har et internasjonalt ansvar til å ta vare på levedyktige bestander med store rovdyr | | | | | |
| 7 | Bestemmelsene rundt felling på store rovdyr er for rigide og lite tilpasset praktiske løsninger. | | | | | |
| 8 | Jeg er villig til å bidra økonomisk for å kompensere for skader resultert av store rovdyr. | | | | | |

9. Hvor engasjert er du i spørsmål om store rovdyr og rovdyrforvaltning?

a. Svært engasjert
b. Nokså engasjert
c. Noe engasjert
d. Ikke engasjert
e. Vet ikke

## 4 Trust in science

* Betyr at dersom man på spørsmålet svarer «Helt uenig» eller «Uenig», så får man spørsmål 13. Dette gjelder for spørsmål 4, 5, 11og 12.

| | **Utsagn** | **1 Helt uenig** | **Uenig** | **Verken/eller** | **Enig** | **5 Helt enig** |
|---|---|---|---|---|---|---|
| 1 | Jeg synes at forskning generelt er viktig i dagens samfunn | | | | | |
| 2 | Det er alvorlig om allmennheten mister troen på forskning | | | | | |
| 3 | Jeg har tillit til forskning generelt* | * | * | | | |
| 4 | Jeg har tillit til medisinsk forskning | * | * | | | |
| 5 | Jeg har tillit til klimaforskning | | | | | |
| 6 | Jeg synes forskere generelt virker å ha høy ekspertise | | | | | |
| 7 | Jeg synes at forskere generelt virker å ha høy troverdighet | | | | | |
| 8 | Jeg synes rovviltforskerne virker å ha høy ekspertise | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 9 | Jeg synes rovviltforskerne virker å ha høy troverdighet | | | | | |
| 10 | Jeg har tillit til rovviltforskningen i Norge | * | * | | | |
| 11 | Jeg har tillitt til at rovviltforskerne, på lik linje med andre forskere, legger fram objektive resultater | * | * | | | |
| 12 | *IF 1-2 IN Q4_3/4/10/11): Jeg mener mistillit til forskning skyldes: LES OPP<br>Forskere er kun teoretikere og mangler praktisk forståelse<br>Forskning er bestillingsverk fra bestemte interesseorganisasjoner/næringer<br>Forskerne tar ikke hensyn til lokalkunnskap<br>Forskerne driver etter egeninteresse<br>Andre årsaker? (skriv ned)<br>IKKE LES OPP Vet ikke | | | | | |

13. Fra hvilke kilder har du mest tillitt til at du får kunnskapsinformasjon fra, generelt sett? Nevn de 3 viktigste
    Forsker/forskerinstitusjon/vitenskapelige artikler
    Internett
    Venner/familie
    Lokale politikere
    Populærvitenskap
    Sosiale medier (facebook og lignende)
    Lokale aviser (både nett- og papirformat)
    Riksaviser
    Ikke interessert i forskning
    Annet: Noter
    Vet ikke

    På en skala fra 1 til 5 hvor 1 = Helt uenig og 5 = Helt enig, hvor uenig eller enig er du i følgende:

## *5. Worldviews* and other parts of *value orientation*

| | **Utsagn** | **Helt uenig** | **Uenig** | **Verken/eller** | **Enig** | **Helt enig** |
|---|---|---|---|---|---|---|
| 1 | Fake news er et økende problem i dagens samfunn | | | | | |
| 2 | Det finnes ikke "fake news" | | | | | |
| 3 | Rovvilt, miljøspørsmål og klimatiltak må besluttes lokalt da lokalbefolkning er de som har mest kunnskaper om dette. | | | | | |
| 4 | Likestillingen har gått for langt i Norge i dag | | | | | |
| 5 | Norge må ta sitt ansvar i å ta imot flyktninger | | | | | |
| 6 | Norge tar imot for få flyktninger i dag | | | | | |
| 7 | Global oppvarming vil føre til at vi får en strøm av klimaflyktninger i løpet av noen få år | | | | | |
| 8 | Diskriminering av minoriteter er fortsatt et stort problem i Norge i dag (spør Norstat om hva som ligger i «minoritet». Hva tolker folk her? | | | | | |
| 9 | Jeg hadde svart det samme på denne spørreundersøkelsen selv om jeg ikke var anonym | | | | | |

## 6. NEP-spørsmål

| | Utsagn (NEP) | Helt uenig | Uenig | Nøytral | Enig | Helt enig | Vet ikke |
|---|---|---|---|---|---|---|---|
| 1 | Balansen i naturen er svært ømfintlig og lett å forstyrre | | | | | | |
| 2 | Mennesket misbruker naturen i et omfang som er svært alvorlig | | | | | | |
| 3 | Alt snakk om den såkalte "økologiske krisa" er betydelig overdrevet | | | | | | |
| 4 | Dyr og planter har like stor rett til å leve på jorda som mennesker | | | | | | |
| 5 | Balansen i naturen er stabil nok til å tåle påvirkningene fra et moderne industrisamfunn | | | | | | |
| 6 | Hvis vi fortsetter på samme kurs som nå, vil vi snart oppleve en økologisk katastrofe | | | | | | |
| 7 | Menneskenes oppfinnsomhet vil sikre at det ikke blir ulevelig på jorda | | | | | | |

## 7. Utsagn

Nå skal jeg lese opp noen få utsagn og vi lurer på hvordan du oppfatter utsagnet som enten Forskningsresultat, Politisk argument, Manipulering, Gjetning eller noe annet.

1. a) Hvordan oppfatter du utsagnet: «Ulven i Skandinavia har mest sannsynlig finsk-russisk opprinnelse». Er det som …LES OPP

a) Forskningsresultat
b) Politisk argument
c) Manipulering
d) Gjetning
e) Annet→ Noter

b) Hvis du får vite at utsagnet («Ulven i Skandinavia har mest sannsynlig finsk-russisk opprinnelse») kommer fra en rovviltforsker. Hva oppfatter du utsagnet som da?

a) Forskningsresultat
b) Politisk argument
c) Manipulering
d) Gjetning
e) Annet→ Noter

c) Hvis du får vite at utsagnet («Ulven i Skandinavia har mest sannsynlig finsk-russisk opprinnelse») kommer fra NJFF (Norges Jeger- og Fiskeforbund). Hva oppfatter du utsagnet som da?

a) Forskningsresultat
b) Politisk argument
c) Manipulering
d) Gjetning
e) Annet→ Noter

d) Hvis du får vite at utsagnet («Ulven i Skandinavia har mest sannsynlig finsk-russisk opprinnelse») kommer fra en interesseorganisasjon for bønder (F.eks. Norges bondelag, småbrukerlaget). Hva oppfatter du utsagnet som da?

A. Forskningsresultat
B. Politisk argument

C. Manipulering
D. Gjetning
E. Annet→ Noter

2. a) Nytt utsagn: Hvordan oppfatter du utsagnet: «Ulven i Skandinavia har kapasitet til å vandre fra Finland/Russland ned til Sør-Skandinavia». Er det som …LES OPP

A. Forskningsresultat
B. Politisk argument
C. Manipulering
D. Gjetning
E. Annet→ Noter

b) Hvis du får vite at utsagnet («Ulven i Skandinavia har kapasitet til å vandre fra Finland/Russland ned til Sør-Skandinavia») kommer fra en rovviltforsker. Hva oppfatter du utsagnet som da?

A. Forskningsresultat
B. Politisk argument
C. Manipulering
D. Gjetning
E. Annet→ Noter

c) Hvis du får vite at utsagnet («Ulven i Skandinavia har kapasitet til å vandre fra Finland/Russland ned til Sør-Skandinavia») kommer fra en interesseorganisasjon for bønder (F.eks. Norges bondelag, småbrukerlaget). Hva oppfatter du utsagnet som da?

A. Forskningsresultat
B. Politisk argument
C. Manipulering
D. Gjetning
E. Annet→ Noter

d) Hvis du får vite at utsagnet («Ulven i Skandinavia har kapasitet til å vandre fra Finland/Russland ned til Sør-Skandinavia») kommer fra NJFF (Norges Jeger- og Fiskeforbund). Hva oppfatter du utsagnet som da?

a) Forskningsresultat
b) Politisk argument
c) Manipulering
d) Gjetning
e) Annet→ Noter

3. a) Nytt utsagn: Hvordan oppfatter du utsagnet: «95 % av dietten til skandinavisk ulv består av elg». Er det som …LES OPP

A. Forskningsresultat
B. Politisk argument
C. Manipulering
D. Gjetning
E. Annet→ Noter

b) Hvis du får vite at utsagnet («95 % av dietten til skandinavisk ulv består av elg») kommer fra en interesseorganisasjon for bønder (F.eks. Norges bondelag, småbrukerlaget). Hva oppfatter du utsagnet som da?

A. Forskningsresultat
B. Politisk argument
C. Manipulering
D. Gjetning
E. Annet→ Noter

c) Hvis du får vite at utsagnet («95 % av dietten til skandinavisk ulv består av elg») kommer fra en rovviltforsker. Hva oppfatter du utsagnet som da?

A. Forskningsresultat
B. Politisk argument
C. Manipulering
D. Gjetning
E. Annet→ Noter

d) Hvis du får vite at utsagnet («95 % av dietten til skandinavisk ulv består av elg ») kommer fra NJFF (Norges Jeger- og Fiskeforbund). Hva oppfatter du utsagnet som da?

a) Forskningsresultat
b) Politisk argument
c) Manipulering
d) Gjetning
e) Annet→ Noter

4. a) Nest siste utsagn: Hvordan oppfatter du utsagnet: «I alt 5 svenske vandringsulver er identifisert i og utenfor ulvesonen i år (2018)». Er det som …LES OPP

a) Forskningsresultat
b) Politisk argument
c) Manipulering
d) Gjetning
e) Annet→ Noter

b) Hvis du får vite at utsagnet («I alt 5 svenske vandringsulver er identifisert i og utenfor ulvesonen i år (2018)») kommer fra en rovviltforsker. Hva oppfatter du utsagnet som da?

A. Forskningsresultat
B. Politisk argument
C. Manipulering
D. Gjetning
E. Annet→ Noter

c) Hvis du får vite at utsagnet («I alt 5 svenske vandringsulver er identifisert i og utenfor ulvesonen i år (2018)») kommer fra interesseorganisasjon for bønder (F.eks. Norges bondelag, småbrukerlaget). Hva oppfatter du utsagnet som da?

a) Forskningsresultat
b) Politisk argument
c) Manipulering
d) Gjetning
e) Annet→ Noter

d) Hvis du får vite at utsagnet («I alt 5 svenske vandringsulver er identifisert i og utenfor ulvesonen i år (2018)») kommer fra NJFF (Norges Jeger- og Fiskeforbund).. Hva oppfatter du utsagnet som da?

A. Forskningsresultat
B. Politisk argument
C. Manipulering
D. Gjetning
E. Annet→ Noter

5. a) Siste utsagn, Hvordan oppfatter du utsagnet: «Rovdyrene har gjerne leveområder på flere hundre eller flere tusen kvadratkilometer.»

a) Forskningsresultat

b) Politisk argument
c) Manipulering
d) Gjetning
e) Annet→ Noter

b) Hvis du får vite at utsagnet («Rovdyrene har gjerne leveområder på flere hundre eller flere tusen kvadratkilometer») kommer fra NJFF (Norges Jeger- og Fiskeforbund).. Hva oppfatter du utsagnet som da?

F. Forskningsresultat
G. Politisk argument
H. Manipulering
I. Gjetning
J. Annet→ Noter

c) Hvis du får vite at utsagnet («Rovdyrene har gjerne leveområder på flere hundre eller flere tusen kvadratkilometer») kommer fra interesseorganisasjon for bønder (F.eks. Norges bondelag, småbrukerlaget). Hva oppfatter du utsagnet som da?

f) Forskningsresultat
g) Politisk argument
h) Manipulering
i) Gjetning
j) Annet→ Noter

d) Hvis du får vite at utsagnet («Rovdyrene har gjerne leveområder på flere hundre eller flere tusen kvadratkilometer») kommer fra en fra rovviltforsker. Hva oppfatter du utsagnet som da?

F. Forskningsresultat
G. Politisk argument
H. Manipulering
I. Gjetning
J. Annet→ Noter

1. Utdanning
*Hva er den høyeste graden av utdanning du har gjennomført? Les opp om nødvendig*

1 = Grunnskoleutdanning
2 = Videregående utdannelse
3 = universitet/høgskole m lavere grad (bachelorgrad)
4 = universitet/høgskole med høyere grad (mastergrad)
5 = doktorgrad

2. Hva er ditt arbeidsområde?

| Value | Label |
|---|---|
| 1 | Student |
| 2 | Offentlig – undervisnings-/forskningssektor |
| 3 | Offentlig – øvrig |
| 4 | Privat - Primærnæring (jord, skog, fiske) |
| 5 | Privat – Øvrig |
| 6 | Hjemmeværende/trygdet/pensjonist |
| 7 | Arbeidssøker |
| 98 | Annet |

3. Hva er husstandens samlede brutto årsinntekt?

1 Under 100.000 kr

2 100-200.000 kr

3 201-300.000 kr

4 301-400.000 kr

5 401-500.000 kr

6 501-600.000 kr

7 601-700.000 kr

8 701-800.000 kr

9 801-900.000 kr

10 901-1.000.000 kr

11 1.001-1.100.000 kr

12 1.101-1.200.000 kr

13 1.201-1.300.000 kr

14 1.301-1.400.000 kr

15 1.401-1.500.000 kr

16 Mer enn 1.500.000 kr

98 Ønsker ikke å svare

99 Vet ikke

4. Dersom det var Stortingsvalg i morgen, hvilke parti ville du stemme på?

1 Ap (Arbeiderpartiet)
2 Frp (Fremskrittspartiet)
3 H (Høyre)
4 Krf (Kristelig Folkeparti)
5 Rødt
6 SP (Senterpartiet)
7 SV (Sosialistisk Venstreparti)
8 V (Venstre)
9 PP (Pensjonistpartiet)
10 MDG (Miljøpartiet De Grønne)
20 Andre partier
21 Vil ikke stemme/vet ikke