



Media's portrayal of large predators in Norway from the protection by law in the 1970's till today: an insight into local and national newspapers

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Accepted: 21 September 2022
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Abstract In the late century of 1800 till mid-1900s, large predators were eradicated worldwide, and bounties were commonly used to get rid of the predators. In the twentieth century the policy changed, and predators became protected by law. The “return” of the predators has resulted in negative human–wildlife interactions and an increase in social conflicts. Media plays a key role in most social conflicts, as positive portrayals can lead to an increased willingness to conserve the species, as opposed to negative portrayals. We have looked at how Norwegian newspapers portray the large predators from when they were protected by law in the 1970's till today. Our results show that wolves represent the most articles, and the positive mentioning of wolves has decreased, while for bears this has increased. Local newspapers contained more negative portrayals than national newspapers, and changes in wolf establishment, predator management or politics impact on the number of articles. As our findings indicate that negative experiences with predators, in particular in local areas, associate with negative articles in the local newspapers, we believe

this could contribute to negative attitudes towards predators among those who are readers of the local newspapers. This is yet to be studied in more detail and would be recommended to better understand the role of media in human–wildlife conflicts.

Keywords Human–carnivore conflicts · Media coverage · Predators and media · Human–wildlife interactions · Geo-spatial patterns · Attitudes towards predators · Large carnivores · Scandinavia

Introduction

Conflicts related to interactions between large predators and people are common worldwide (Frank, 2016; Karanth, 2012; Treves, 2009), and arise when predators and humans share the same areas (Athreya, 2013; Garcia Martin et al., 2017), or when stakeholders disagree in how predator populations can be maintained (Gangaas, 2013). The conflicts will often be perceived differently in a spatial geographical pattern depending on e.g., the presence of the predators. In areas where local farmers e.g., experience predators killing their sheep or cattle, the conflict may rise to its highest level. This often results in the predators being displaced or killed, which is a global challenge in predator conservation (Carter et al., 2017; Linnell, 2017; Treves, 2009).

A huge effort has been spent on trying to understand these conflicts, and research worldwide has

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focused on peoples' social acceptance of different management measures of large predators (Redpath et al., 2013; Young et al., 2016). Research has also dealt with people's attitudes and behavior towards the predators related to environmental values such as e.g., anthropocentric and ecocentric world views, or in relation to geo-spatial variables such as urban versus rural traditions (Dunlap, 2008; Gangaas et al. 2013; Kortenkamp & Moore, 2001). However, to conserve predators successfully, there is a need to broaden the understanding of what is creating or contributing to the conflict between humans and the large predators (Andreassen, 2018; Ericsson et al., 2008; Gangaas et al., 2015; Redpath et al., 2017; Treves et al., 2017). One important part is to understand how media plays a role on peoples' thoughts and attitudes (McCombs & Shaw, 1972), though, very few studies have looked at how media impact on this human—predator conflict (Athreya et al., 2015; Bombieri et al., 2018; Chandelier et al., 2018; Gore & Knuth, 2009; Jacobson et al., 2012; Wolch et al., 1997).

In this study, we have looked at how media, represented by a selection of Norwegian newspapers, discuss and portray the large predators in Norway with special emphasis on wolves (*Canis lupus*) and bears (*Ursus arctos*). We want to see whether the media's coverage of predators has changed in the period from 1970's when the large predators in Norway got protected by law, till 2014, and how this may differ in a geo-spatial perspective represented by local newspapers (districts) versus national newspapers (urban areas).

Media's role in the human-predator conflict

Media's coverage is crucial in contributing to people's understanding of issues important for the development of the society (Bombieri et al. 2018; Kamboh & Yousaf, 2019), and newspapers have played a unique role in distribution of important news long before the digital media took place. Newspapers also choose their content and approach to how they discuss, and present various issues based on how to attract readers in the battle to be the bestseller (Kamboh & Yousaf, 2019). This may lead to an editorial focus on discourses and conflicts, rather than a broader and more nuanced perspective that could benefit the readers and give a more nuanced and broader news dissemination (Kamboh & Yousaf, 2019).

Dealing with human–wildlife interactions, the way media in general and newspapers in particular, choose to facilitate and communicate large predator issues, may impact on public attitudes toward predators (Greenspan et al., 2021; Ostman, 2014). Positive media coverage can be an important component to conserve or protect animals, while negative coverage may contribute to a negative attitude (Jacobson et al., 2012; Ostman, 2014). Further, the portrayal of predators may vary between national and local scales as costs of having predators may be borne locally by stakeholders and farmers, while conservation seems more beneficial at national or international levels (Carter et al., 2012; Treves & Karanth, 2003).

The history of large predators in Norway

Norway has a long history with the four large predators, wolves, bears, wolverines (*Gulo gulo*) and lynx (*Lynx lynx*), and the wolf was already regulated by law in the first law implemented in Norway approximately 950–960 after Christ (Frostatingsloven; www.ssb.no). The wolf is also well known historically from the human cultures through stories, fairy tales, and myths (Lenth, 2017), and old stories like the "wolf battle", describing wolves attacking small, rural settlements or chasing people traveling by horses and sledges at the 1500 s to the 1800s. Interestingly, these stories are often quite similar and told in several countries and cultures (Skogen et al., 2008). The bear, on the other hand, does not have an equally strong negative reputation in the literature (Mykra, 2017).

In the last part of the 1800, both bears and wolves were almost extinct, and in 1932, the bounty was discontinued and the bear got protection by law during denning period (Fig. 3). For the other predator species, the bounty scheme was maintained (www.ssb.no). The decline of the predator populations continued, but in the 1970's wolves and bears got totally protected by law (Fig. 3; www.ssb.no).

The lynx and wolverines were included in the general protection provisions in 1981 (Fig. 3; www.ssb.no). This coincided with the time where research on predators gradually occurred worldwide, gaining important knowledge about the predator's biology and behavior, including social interactions between predators and people (Bjerke & Kaltenborn, 1999; Bright & Manfredo, 1996; Wabakken et al., 2001; Wilson, 1997). With the return of the predators

there was also an increased awareness of which role predators play in the ecosystem (William J. Ripple & Beschta, 2004), which again lead to disputes and discussion regarding the consequences of conserving the large predators (Ausilio et al., 2021; Chaille-Jammes et al., 2014; Tallian et al., 2021).

Norway has national and international laws and regulations they must comply with, such as the Bern Convention, intended to help conserve the four predators (Trouwborst et al., 2017). This obliges Norway to maintain all four species of predators, and all the four species are registered on the red list as critically endangered (Trouwborst et al., 2017). A larger majority of the public reveal positive attitudes towards maintaining the large predators, however, there are clear disagreements about where the predators should be allowed to establish themselves (Arbieu et al., 2019; Bjerke & Kaltenborn, 1999; Bjerke & Ost Dahl, 2004; Ericsson & Heberlein, 2003; Gangaas et al., 2013; Roskaft et al., 2007). From the period when predators were almost eradicated, Norway introduced a tradition of free ranging sheep and cattle in the wilderness (Evju et al., 2009; Mysterud & Austrheim, 2008), which today results in quite a high number of sheep being killed yearly by predators (Gangaas et al., 2015; Mabile, 2015; Odden, 2013).

There are two important situations where the media may influence on people's opinions about predators to a greater extent; the first is how the newspapers can be a driver of the conflict by presenting a case unilaterally, especially if journalists write about what they or the newspaper have a political interest in (van Dalen, 2012). The second is when the media write a lot about a political issue when there is already a lot of fuss and debate in politics, so an issue which is not necessarily big on a national or international scale seems to be oversized by all the media attention (van Dalen, 2012).

We believe that the awareness of predators has increased since the protection in the 1970's, being reflected in the amount of newspaper articles which are dealing with predator issues or the conflict in the same period. We also believe that major political changes, will impact on the amount of attention received in the media, and in particular be reflected in local newspapers as changes of national policies have a higher impact on local areas who actually are housing the predators. We hypothesize that (1) The

newspapers' coverage of large predators is generally more negative locally than nationally due to where the predators establish and who experiences the bearing of the cost of having predators, (2) Changes in the predators management system or in the policy regarding large predators affect the number of newspaper articles for predators as this is an issue of huge conflicts and disagreements, and (3) Newspaper articles dealing with wolves and bears will dominate compared to lynx and wolverine-articles, as these two species are to a higher extent associates with the conflict, people's fear and old myths. In addition, we also looked at how research on these predator species may be reflected by the increased predator population growth.

Methods

We have gained access to newspaper articles in a private archive based on a systematic collection of newspaper articles about predators and the predator conflict from the beginning of the twentieth century until 2018 (Knut Borg 2015, 2018 pers med). The collection was handed over and given as a gift to the Hedmark University College (merged to Inland Norway University of Applied Sciences in 2018) in 2015 and completed in 2018. The collection contains of articles from local newspapers including articles copied from the local library, but also from placed orders for various articles at the National Library in Mo in Rana (Borg 2020 pers. med). The newspaper articles are sorted chronologically over the years in various binders, and they are not being digitalized. The collection is in all probability a unique and the most complete collection of newspaper articles regarding large predators in Norway collected over these many years. Newspaper articles that are digitalized in Norway are mostly from the big national newspapers, while for the local newspapers from the districts the digitalization may be absent, or exists only from the latest years. Also, national newspapers lack digitalized articles from decades ago. The digitalization is a continuous and ongoing work, as in future there will probably be more newspaper articles available-also from the districts.

Study area

The data is based on collected newspaper articles from five newspapers in Norway; Østlendingen (www.ostlendingen.no), Hamar Arbeiderblad (www.h-a.no), Aftenposten (www.aftenposten.no), Verdens Gang (www.vg.no) and Nationen (www.nationen.no).



Fig. 1 The map of Norway, with the Inland County marked in red. Inland County is the county represented by the two local newspapers; Østlendingen and Hamar Arbeiderblad, and also represent the area in Norway with highest number of large carnivores including the wolf

(www.nationen.no). VG, Aftenposten and Nationen are nationwide newspapers and represent the whole country, while Østlendingen and HA are local newspapers that cover old Hedmark county (merged with Oppland county to Inland county in 2020; Fig. 1).

Hedmark (from here on called Inland County) represents the area in Norway with the highest predator pressure (Fig. 2) including the wolf zone, a management zoning area where wolves have advantages on behave of the sheep husbandry (Fig. 2).

HA and Østlendingen have a collaboration and cover many of the same Inland County areas. From what we have observed in the newspapers, it is especially in the 1970s and 1980s that both newspapers focused a lot on incidents with predators in the Inland County. Today, Østlendingen has its highest number of readers in the eastern part of the county, though writes about the large predators in most parts of the Inland County. HA on the other hand, has changed their profile by focusing more on other societal issues in the more urban areas of this county (www.h-a.no). Nationen is a national newspaper that has a greater focus within business and agriculture in all districts throughout Norway, and is also called the districts' business newspaper, while Aftenposten and VG are by far the largest and most read newspapers in Norway (www.medi norge.uib.no).

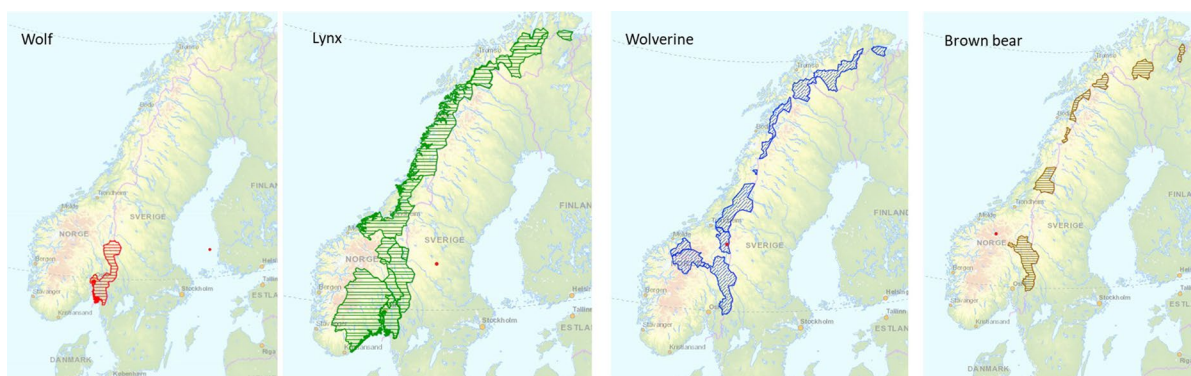


Fig. 2 Color-shaded fields in the maps showing the core management areas for all the four large predators in Norway, and how all four species have at least parts or their management

areas within the Inland County shown in Fig. 1 (The Norwegian Environment Agency 2022)

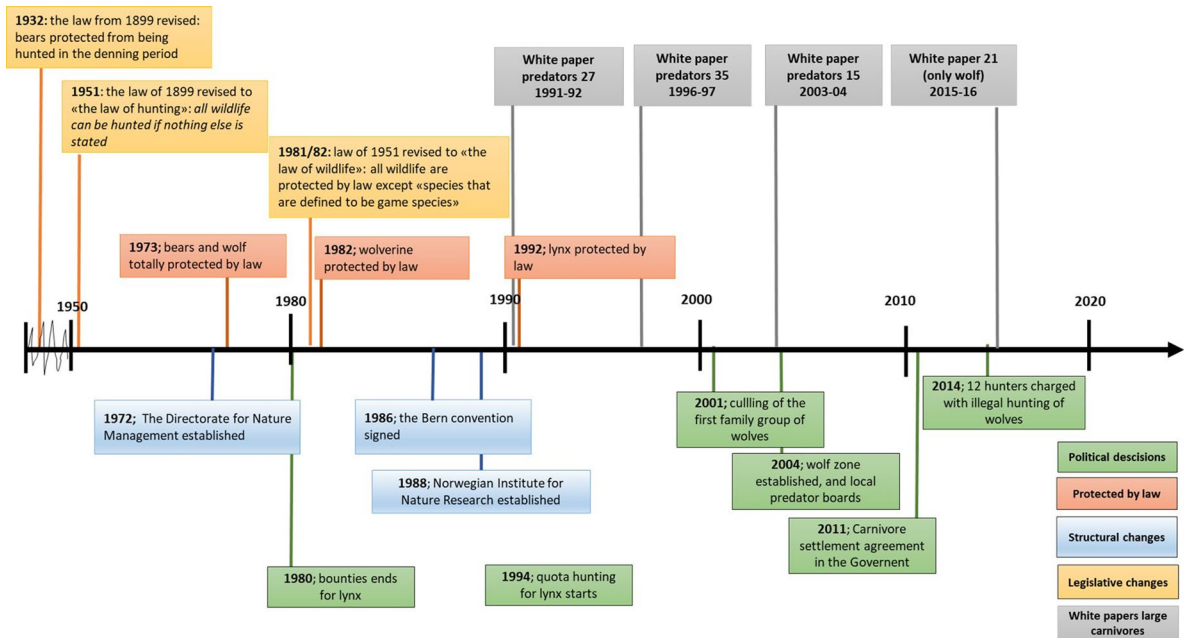


Fig. 3 Timeline showing some of the most important events throughout the history of large predators in Norway from 1900 to 2018. The political decisions, legislative changes, and happenings may be reflected in numbers of newspaper articles

both nationally and locally, and may contribute to an easier understanding of the connection with current events around the predator conflict and policy

Newspaper articles

To limit the amount of data, we have selected a few specific years to represent the period from the predators were protected by law, up till today (Fig. 3). From the earliest periods, very few newspaper articles were written about predators, and we have therefore chosen to include all the years from the 1970s (the years 1970–1979). The other years are 1982, 1987, 2004 and 2014. To supplement the newspaper archive, we have used ATEKST (www.retrievergroup.com) to find several national newspaper articles from *Aftenposten* and *VG*. ATEKST is a digital archive of newspaper articles that is available to universities and colleges for analyzes and research (ATEKST, 2019). As the number of newspaper articles archived in ATEKST turned out to be very extensive, we chose two years with articles from *VG* and *Aftenposten*; the years 1987 and 2014. However, parts of the ATEKST were closed for a longer period before we know if we managed to extract the total number of relevant articles, which means we unfortunately may lack some newspaper

articles from both 1987 and 2014. This has most likely affected the results somewhat.

When conducted a search on ATEKST, we entered «01.01.year–31.12.year». We chose "national press" in the second search field to get the newspapers *Aftenposten* and *VG*. The keywords used were "ulv" (W. J. Ripple et al.), "gråbein" (common word used for wolf), "brunbjørn" (bear), "bjørn" (bear), "slagbjørn" (commonly used for brown bears killing sheep) and "rovdyr" (predator). In this way we could read every single newspaper article in the same way as from the analogue paper collection. In cases where the newspaper articles appear on the front page of the newspaper, only the article within the newspaper was collected. This is done to avoid collecting the content from the newspaper twice. In some cases, different incidents are written about the predators on the same day in the same newspaper. We distribute these in the collection according to what the articles contain and how different content they have. Some of the articles are about the same event but divided into different headings and placed as one article, while in other cases the articles may be about different events

or topics on the same page in the newspaper, but they are divided into more than one article.

All articles were collected and registered by year, type of newspaper, predator species, topic, sub topic, review, headline, senders/communicator of the newspaper content, occupation of sender and a comment with the main content for each newspaper article. In this way, we got good information from each newspaper article.

To find out about the issues discussed, main topic, and sub-topic in the articles, we have followed specific rules for how to interpret the content to be able to categorize the information we looked for. We set up special conditions and rules to follow to be able to decide the three points mention, theme and sub-theme. These rules of how the predators are portrayed is set as positive, negative, neutral or other;

- Positive review: Newspaper articles that write in favor of wolves or the other three species
- Negative review: Newspaper articles that write about the predators (one or more species) in a disadvantage's way for the species
- Neutral: an information that gives neither advantage nor disadvantage to the predators

Other review: Articles not able to categorize in any of the above categories. These have usually been articles with a lot of discussion perceived as complicated.

Our definitions of “positive”, “negative” and “neutral” could have been defined differently by others. For instance, “positive” articles could mean articles which do not contribute to the conflict, but had a positive and respectful content, while “negative” articles could have been defined as articles with high degree of conflict. However, the definitions we chose to use were the most suitable for us, and our interest in how this has affected the predator species.

The themes that the predators are being portrayed within differ, and we have divided these themes into nine different categories; economy including bounties, hunting and license to kill, research and research projects, conflicts, zoo's and predators in sanctuaries, exciting happenings, fear, old histories and myths, and facts. Each theme has its definition (Appendix Table 3).

Rare cases: hit by car, use of hunting dogs, the topic is focusing on Sweden instead of Norway
Sub-theme: Under the specific theme «conflict», we

have divided the articles into a separate grouping with «sub-theme» for which conflict is expressed in the article (Appendix Table 4). Nevertheless, some newspaper articles can be linked to several topics and sub-topics. For both topics and sub-topics, we have chosen the main content of the article and registered the article based on this.

We also found some of the articles more demanding to interpret than others, and these could not be interpreted as neither positive nor negative or neutral, but were placed in a category “other”. These “other” counted a number of 75 out of the total 712 newspaper articles. Some of these «other» newspaper articles were very debating between two or more counterparties or factual information that could be too demanding to register as negative or positive. A large proportion came from the local newspapers, where 10 of the newspaper articles were about all four large predators, while 61 of the articles were only about wolves and only one newspaper article was about bears. We chose not to include these further in our analyses or discussion as they do not help to shed light on our main issue in this study.

Research articles

We used the search browser Web of Science to look at the development of the number of published research articles written for both wolves and bears in the period 1945–2019 (Web of Science). We searched for «ursus arctos*» and “bear*” and got the total number of publications internationally published on the Web of Science. Then we did the same search, but added «Scandinavia*», and received publications about brown bears and Scandinavia that had been published in the Web of Science. We repeated the same search for wolves by searching “canis lupus*” and “Scandinavia*”, and also “wolf*” and “Scandinavia*”.

Data analyzes

During the data collection, we wanted to get an overview of the number of items for each predator. For example, an article that dealt with both bears and wolves will count as one mention for wolves and one mention for bears. An article relating to all four predators resulted in four copies of the article representing one for each predator. In this way, we made

an overview of all newspaper articles where the four large predators were mentioned, and how many newspaper articles there are for each of the species. As a result, some newspaper articles became repetitive. We had a total of 712 newspaper articles and posts in the data collection, but due to the copies, the number increased to 961 mentions in total.

Sources of error

During this investigation, several sources of error have emerged that must be taken into account that may influence the results. One is the actual data collection of newspaper articles, where it proved difficult to obtain all the newspaper articles for the years and the newspapers chosen. To know whether or not we have managed to collect all the newspaper articles dealing with predators for the years is extensive and demanding to find out. This applies to the articles from the binders, but also those that are retrieved in ATEKST. Some of the articles are recurring and appear in several newspapers, and rarely does the same newspaper article appear in the same newspaper on another day. This can also have an effect on the result, but the fact that they have been repeated is still collected because this is part of the media's presentation. There is also a challenge that our archive with articles were not digitalized, but needed to be read manually. Digitalized articles can for instance be analysed with statistical content analyses with a computer modeling program (Chandelier et al., 2018). We still believe that we have managed to capture the general trends in how the media have portrayed predators and the predator conflict in the chosen periods and in the selected newspapers.

Result analyzes

International research publications

In the period 1945 to 2019, we found a total of 3344 and 2012 international research publications on wolves and bears respectively (Web of science 2019; Fig. 4), and the corresponding numbers for publications in Scandinavia were 119 publications for wolves and 110 publications for bears. From 1945 to 1990, the number of international research publications is low for both wolves and bears (an average of 2.3 articles per year for wolves and 1 article per year

for bears), with none in Scandinavia (Fig. 4). From 1991 until 2019, the number of publications increases steadily for both species, and peaked in 2019 for wolves, and in 2017 for the bears (Fig. 4). In Scandinavia the first wolf publication came in 1991 discussing inbreeding challenges among wolves in Scandinavian zoos (Laikre & Ryman, 1991), while the first bear publication discussed hair differences between brown bears in North America and Scandinavia (Elgmork & Riiser, 1991).

Newspaper articles related to the predator species

In total, we found 712 newspaper articles and 961 mentioning that dealt with one or more predator species in the 5 different newspapers. Wolves are clearly dominant in number of mentions (627 wolf mentions out of the 712 newspaper articles), with bears next (160 bear articles) followed by wolverines and lynx (95 and 79 articles respectively; Table 1).

There is a general pattern that local newspapers contribute with a much higher number of predator articles than the national ones (Table 1). Of the local newspapers, Østlendingen has the most articles followed by HA. Nationen is the nationwide newspaper with the highest numbers of newspaper articles (Table 1).

Although there is general trend that local newspapers have the highest numbers of articles, the year 1987 stands out differently (Table 1). For wolves there are 22 articles in the national newspapers this year compared to only 2 in the local newspapers (Table 1). For bears, the year of 1987 stands out as the year where the number of national newspaper articles equals the number of local newspaper articles (Table 1), and also when bears exceed the local attention of the wolf.

The years 2004 and 2014 represent the highest numbers of newspaper articles for both bears and wolves additional to contain a higher number categorized as "neutral" or "other".

Positive and negative portrayal of the predators

In general, a negative portrayal of the predators dominates both in the national and the local newspapers. In 1987 this pattern differs regarding wolf as 71% of the total numbers of articles (73% of the national articles) had a positive portrayal. For bears

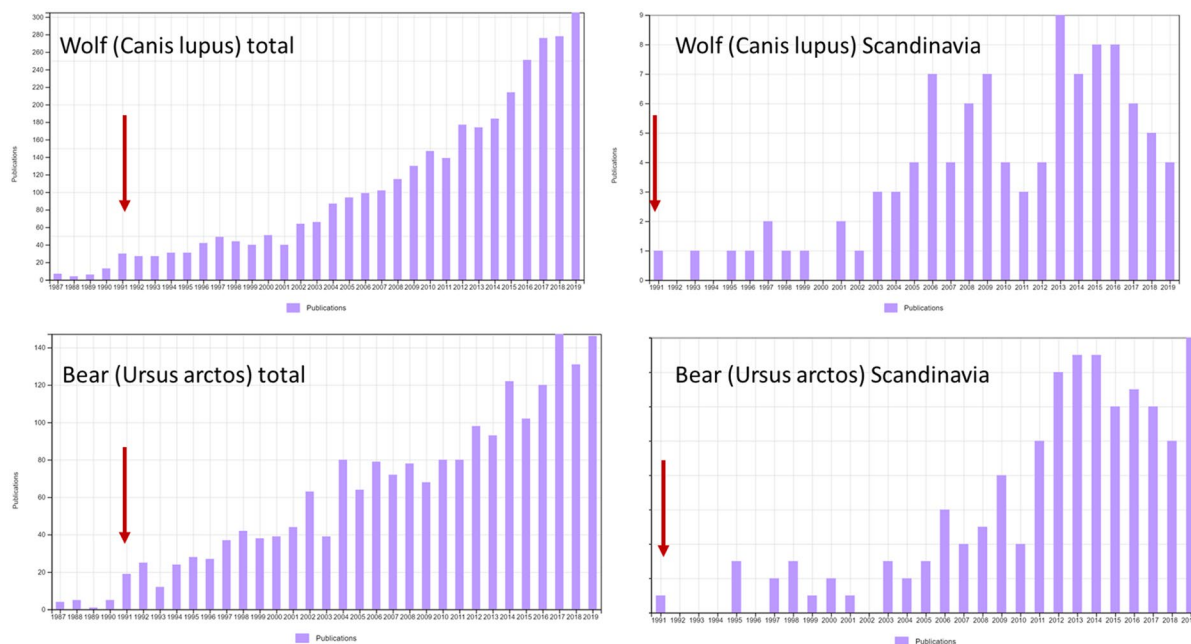


Fig. 4 Numbers of international publications registered at Web of Science on wolves (n=3344; upper left panel) and bears (n=2012; lower left panel) in total from 1945 to 2019, and number of publications from Scandinavia on wolves (n=119; upper right panel) and bears (N=110; lower right

panel) in the same period. The first international publication was registered in the late 1980's for both species (left panels). The year of 1991 is marked with a red arrow in all figures (Elgmork & Riiser, 1991; Laikre & Ryman, 1991)

Table 1 The number of newspaper articles for each of the predator species per year and divided into local (upper panels) and national newspaper (lower panels)

Year	Wolf	Bear	Wolverine	Lynx	Sum
<i>Numbers of newspaper articles in local newspapers</i>					
1970–1979	15	11	4	0	30
1982	23	11	0	0	34
1987	2	14	1	1	18
2004	243	48	44	42	377
2014	147	25	14	13	199
Totalt	430	109	62	56	657
<i>Numbers of newspaper articles in national newspapers</i>					
1970–1979	1	1	0	0	2
1982	0	0	0	0	0
1987	22	14	6	3	45
2004	89	22	13	11	135
2014	85	14	14	9	122
Totalt	197	51	33	23	304

the exception came in 1982, where 64% of the local newspaper articles were positive (though there were only 11 newspaper articles in total in 1982; Fig. 5).

For wolves, the years 2004 and 2014 stands out as the years with most negative reviews (Fig. 5). A similar pattern also occurs for bears in these two years where 44% and 49% of the articles were negative in 2004 and 2014 respectively (Fig. 5).

In 1987, we found that 5 out of the 22 national articles (22, 7%) and one of the two local articles were negative in how they portrayed the wolf while in 2014 68 out of a total of 147 (46,3%) local wolf articles had a negative portrayal, and 15 out of a total of 25 (60%) local bear articles were negative (Table 2).

Discussion

Our findings show that there were some few research publications internationally very early on, and no publications related to Norway or Scandinavia from Web of Science between 1945 and 1990.

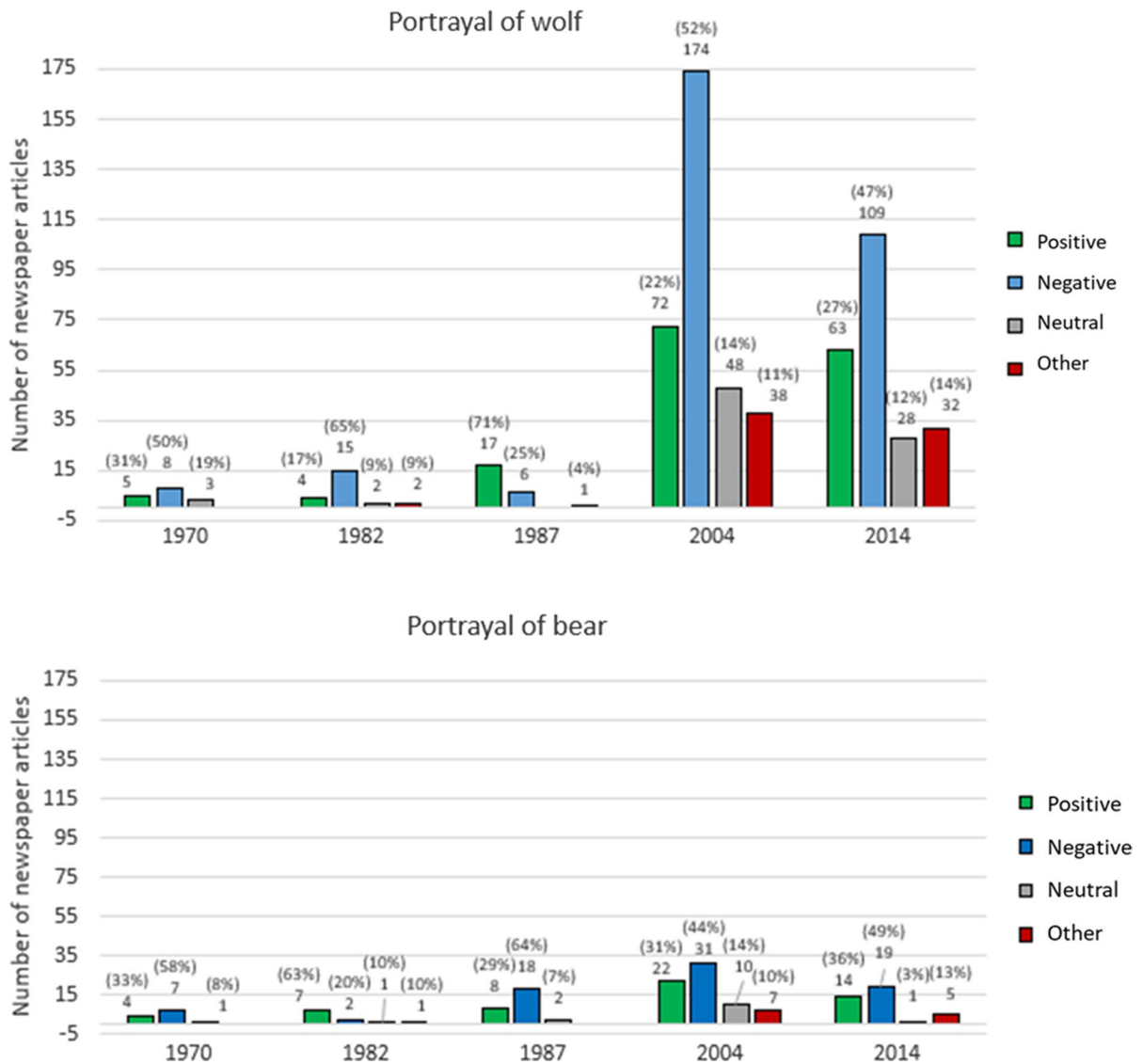


Fig. 5 The number of newspaper articles each surveyed year and how they portray wolves (upper figure) and bears (lower figure) in a positive (green bars) and negative (blue bars) way.

The grey bars show the number of articles interpreted to be neutral, while the red bars are articles considered as other

By this time, the populations of bears and wolves had been greatly reduced and almost extinct, and it was not until the 1990s that research on wolves and bears gained momentum both internationally and in Scandinavia. This coincides with the period when the bear and wolf populations began to increase (Breitenmoser, 1998; Trouwborst, 2010). In the late 1980's and the beginning of the 1990's, research as a field was also to separate from the nature management in Norway, and the Norwegian Institute for

Natural Research (NINA) was established as the first independent nature research institute in 1988.

Newspaper articles

Wolves and bears have received the most attention in the newspapers, while lynx and wolverines have avoided much attention. Bears and wolves may get more attention due to their size, and may also represent fear to a greater extent. Attacks and damages to

Table 2 The proportions of newspaper articles with a positive portrayal of the predator species in the different years (panel a). The proportions are shown as part of the total number of newspaper articles, as part of the number of local newspaper articles (panel b), and as part of the number of national newspaper articles (panel c)

Year	Wolf	Bear	Wolverine	Lynx
<i>(a) Percentage of total number of articles with a positive portrayal (%)</i>				
1970–1979	31,2	33,3	50	0
1982	17,4	63,6	0	0
1987	71	28,6	43	25
2004	22	31,4	24,6	24,5
2014	27,1	36	36	45,4
<i>(b) Percentage of local newspapers articles with a positive portrayal (%)</i>				
1970–1979	33,3	36,4	50	0
1982	17,4	63,6	0	0
1987	50	7,1	0	0
2004	21	23	20,5	21,4
2014	24,5	32	43	46,2
<i>(c) Percentage of national newspapers articles with a positive portrayal (%)</i>				
1970–1979	0	0	0	0
1982	0	0	0	0
1987	73	50	50	33,3
2004	23,6	50	38,5	36,4
2014	32	43	28,6	44,4

domestic animals may be more common additional to be more mentioned in stories and myths (Frank et al., 2015; Skogen et al., 2008). In some cases, humans may be injured or, in the worst case, killed in encounters with bears, although this is extremely rare in Norway and Scandinavia (Linnell, 2017).

In the 1970s, when wolves and bears were totally protected by law, there were still very few newspaper articles writing about this. This indicates that predators have gained more attraction in the latest years and that media coverage increase with an increasing predator population.

Regarding the two years, 1982 and 1987, that stood out markedly in our results, this may be related to local incidents with the large predators. In 1982, the wolf killed a lot of sheep in Trysil (Inland county), which got presented as a major problem for sheep farmers. The incidents were only mentioned in the local newspapers, and not in the national ones. For bears, we found very few articles, probably because

there was very few conflicts, and those portrayals found were mostly positive.

In 1987, the bear had the most negative portrayals while the wolf had the most positive portrayals. The cause of this is probably a lack of negative interactions with wolves this year, and the newspapers focused more on general issues like wolf biology, and less on conflicting issues. For bears, on the other hand, there were several incidents with "slaughter bears" that had attacked and killed sheep which became the big news locally. "Slaughter bears" was commonly used among people for bears that killed sheep, and in particular killing sheep which they did not necessarily eat. People had a perception that some bears were "kind" and did only eat berries and grass, while other had gotten the taste for meat, becoming incurable slaughter bears. This was especially marked by the local newspapers, and several slaughter bears ended up being culled this year.

There was a bias in the preference of the media to focus on the wolf to make big headlines with more suspense and drama (Delibes-Mateos, 2020). This is also known from media's coverage of other conflicting and controversial predators in other countries (Fernandez-Gil et al., 2016; Sabatier & Huveneers, 2018). In Spain, Fernandez-Gil et al. (2016) found that complaints of predations of sheep by bears and wolves associated with the predators' abundance and the media coverage. This further led to compensations for wolf got higher than for bears, and correlated positively to number of wolves being culled. However, media's coverage of wolf damages was thirty times higher than for damages by bears (Fernandez-Gil et al., 2016), and management decisions might partly be influenced by the media's coverage of wolf complains (Fernandez-Gil et al., 2016). The media's attraction towards the most charismatic or sensational predator species such as the wolf, is also in accordance with studies dealing with sharks or cougars (Arbieu et al., 2021; Bombieri et al., 2018; Bornatowski et al., 2019).

The highest number of negative articles being represented by local newspapers, may relate to the geographical aspect. Local newspapers' readers live in the same areas as where the predators have established. Hence, the presence of predators and the consequences of having them close, affect the local newspapers' readers' everyday life. Local newspapers may also have a smaller area of interest and less cases to

write about, while national newspapers have a broader scale and a more diverse readership. Cases like “Bear killed 5 sheep in Trysil” will probably not attract readers in urban areas outside Trysil. At the same time, such headlines locally could contribute to build negative attitudes towards predators among those living in these predator areas experiencing such negative consequences. In those cases when the national newspapers write about predators, they usually choose to write in a more general angle that focuses on conservation, knowledge and predator policy. This is consistent with other studies looking at media coverage and large predators (Jacobson et al., 2012; Sakurai et al., 2013).

Another effect on the number of articles could be due to variations in the predator populations in Norway, but in the selected years, the number of predators was quite modest in Norway (Pedersen et al., 2005; Swenson et al., 2015). The wolf population was estimated to vary between 0 and 5 individuals in the 1980’s, and increased to 3 reproductive family groups (approximately 30 individuals in Norway in total) in both 2004 and 2014 (www.rovdata.no). The numbers of bears in Norway were not known when they got protected by law in the 1970’s, but has been estimated to be somewhere between 96 and 123 in 1983 to 136 individuals in 2014, of which 26 to 43 individuals in Southern parts of Norway (Swenson et al., 2003). We think that these numbers are too low to actually represent an increase in encounters or a true experience that should impact on people’s awareness of having predators close to where they themselves live, and thereby be reflected in the focus in the newspapers. This is supported by our findings of the peak of articles in both local and national articles in 2004. This coincides with The White Paper process in 2003–2004 which resulted in a more detailed predator management policy. Population targets got set for each of the four predator species, and eight geographical management regions were established to maintain the large predator populations (minimum 65 annual litters of lynx, 42 annual litters of wolverines, 20 annual litters of bears, some annual litters of wolves within its management zone; Royal Ministry of Nature & Environment, 2004). The eight geographical predator regions were assigned different management goals for the four different predator species, but they should all contribute to achieve the national population goals. During the process of the White paper, there were major discussions between politicians, especially about the

number of litters of wolves in addition to the size and location of establishing a wolf zone (Andersen, 2003). The process also resulted in new management measures where the large predators should be governed by regional committees consisting of local politicians (www.miljodirektoratet.no). The process created a lot of controversy and a lot of engagement which we assume are reflected in the high number of newspaper articles in this year of 2004.

The reason for why the White Paper process started in this period, may find its explanation by looking back to 1997 when a wolf family group established and reproduced in the Inland of Norway, Koppang. Additionally, another family group of wolves established in the same area straight north of the Koppang wolves, called the Atndals pack. These wolf establishments should turn out to represent a new era in Norwegian predator history (Storaas et al., 2008). In spite of the fact that wolves occasionally had bred close to the national border since 1983 (Wabakken et al., 2001), the Koppang wolves were described as the first reproductive family group in Norway in recent times (Gundersen et al., 1997; Wabakken, 2002). The wolves established in an area where people experienced the wolves up close to their homes, tracks were seen in the ski slopes and moose (*Alces alces*) was attacked all the way down to people’s gardens. This resulted in fear and uncertainty, and the discussions and controversies over whether or not to have wolves in Norway escalated. Local politicians argued that there was no place for these predators, while urban people argued that these charismatic species belonged to the Norwegian wilderness (Skogen, 2017). The Atndals pack were culled by the state in 2000–2001, with huge attention also in international newspapers (The New York Times., 2001). This abrupt increase in wolf reproductions led to a political demand for a new predator policy in Norway, and thus most certainly was a significant contributing factor of the White paper in 2003–04 (Royal Ministry of Nature & Environment, 2004). These years from 1997 to 2001 are probably the forerunner of the leap in numbers of newspaper articles we registered in 2004. Ideally, we should have covered the years from 1997 to 2001 in our study to capture any major change in newspapers’ attentions during this period. We would expect an increase in the numbers of newspaper articles especially locally in these years, but also nationally.

The differences between national and local media in their portrayal of the predators were as expected. Urban people may get to know the predators only through the media, while higher percentage of the readers of the local newspapers will most likely acquire a direct experience of living in the predator areas, and experience negative consequences of having predators in their neighborhood (Eriksson et al., 2015; Karlsson & Sjoström, 2007, 2008). People in rural areas have a great interest in hunting and fishing, they carry on with strong traditions like harvesting and big game hunting (Gangaas et al., 2013; Karlsson & Sjoström, 2008). On the same time, living in the predators' proximity may result in encounters with some of the predators which trigger fear and anxiety that further impact on the willingness to conserve the predator species (Johansson et al., 2012; Roskaft et al., 2003). This may in particular be valid for the readers of the local newspaper Østlendingen as they live in the core areas of many of the predator species, and explain why Østlendingen has written by far the most cases about the predators. The local newspapers may also write in a more personal way that arise emotions, and focus on individual stories.

The media may take advantage of personal stories, and their coverage may impact on both management decisions, and contribute to changing the overall policies (Fernandez-Gil et al., 2016; Fryberg et al., 2012). This was also shown in our study represented by an incident from 1992. A man in his 20's shot 3 lynxes on a short-day hunting trip. The hunter posed proudly with his three killed lynx that was exposed on the front page of several large newspapers nationwide. Many people reacted with disgust and anger and could not understand that it was still legal to hunt lynx, while in local newspapers, the hunter was seen as a hero for his great achievement. Nevertheless, there were strong reactions from nature conservationists and the lynx got totally protected in Norway the same year. A monitoring program of the lynx population started, which resulted in limited hunting of lynx being approved from 1994 (Fig. 3; Andersen et al., 2003).

Conclusion

In recent years, it has become easier for people to express their opinions through the newspapers, where

both journalists and other everyday people can submit their texts. The predators have become a topic in the newspapers that create drama and have a sensational character that makes the predator cases interesting to read (Bombieri et al., 2018). Politicians in particular also get to say their words about the predators, and may influence the media coverage to be more sensational compared to if the same message had been expressed by researchers, wildlife managers or conservation authorities (Darimont et al., 2021; Muter, 2013).

We need to gain a better understanding of the newspapers' portrayal of such controversial species and how this impact on people's attitudes. We believe that an increased understanding of the role of media, and how journalists' and the media's portrayal of the predators' impact on the management of conflicting species like the predators, are crucial in conserving these species for the future (Shaw et al., 1999).

Author contributions VBS has contributed with the main idea, written and analyzed the data. KEM has supervised, and contributed with discussions according to analyzes, and done smaller parts of the writing. Both authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by VBS. The first draft of the manuscript was written by VBS and both authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Funding Open access funding provided by Norwegian institute for nature research. This study was funded by The Inland Norway University of Applied Sciences.

Data availability The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Conflict of interest The authors have no relevant financial or non-financial interests to disclose.

Ethical approval We confirm by this that this paper is written in accordance with ethical responsibility. The results are done by us and are done according to good scientific practice. It is not submitted to other journals for simultaneous consideration. The submitted work is original and are not published elsewhere. No data or text are plagiarism. Our research do not pose a threat to public health or national security. All authors agree with the content and the submission for publication. All authors' names appear on the submission.

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Appendix

See Tables 3, 4

Table 3 The news paper articles were divided into 9 different topics describing the content of the specific article

Topic	Kode	Definition
Economy	1	Money, compensation (for loss of domestic sheep), bounty
Management	2	Hunting, quota or license hunting, measurements
Research	3	Research projects, reports, researcher comments
Conflict	4	Conflicts, following a certain sub theme (see appendix 4)
Tourism	5	Zoos, carnivore tourism, activities marketed in relation to carnivore
Other	6	Car accidents killing carnivores, special dog breeds for carnivore used in Sweden and not in Norway, rare cases
Excitement	7	People reporting excitement in carnivore encounters, people expressing excitement in having carnivores
Fear	8	Fear towards carnivores
Facts	9	Facts with no politics involved, population size, new settlements of carnivores etc.
Histories	10	Myths, old stories, transmissions from generations

Table 4 Articles categorized as “conflict” in Table 3, identify 7 different sub-themes presented in Table 4 (below)

Sub theme "conflicts"	Kode	Definition
Domestic animals	1	Sheep, cows, horses being killed or attacked. Farmers with livestock conflicts
Wildlife	2	Reductions of hunting quotas on moose, deer, reindeer
Hunting dogs	3	Dogs being attacked, or killed
Politics	4	Carnivore politics, discussions and disagreements
Common people's engagement	5	Chronicles, people's experience and negative attitudes
Illegal hunting	6	Illegal hunting or killing of carnivores
Accidents	7	Human—carnivore accidents where both are hurt or being killed, car crash

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