



Managing Wolves is Managing Narratives: Views of Wolves and Nature Shape People's Proposals for Navigating Human-Wolf Relations

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Abstract

The resurgence of wolf populations in Germany is causing controversies regarding their management policies. Through 41 semi-structured interviews with stakeholders, we found that respondents favored the management directives predicated on the narratives they entertained, i.e., beliefs about wolves and nature more broadly. We identified 18 narratives that ranged from the extreme of “beings-focused, harmony-oriented, and wolf-favoring” extreme through “ecosystem-focused, conservation-oriented, and wolf-ambivalent” to another extreme of “human-centered, dominion-oriented, and wolf-critical” extreme. The 24 directives aim to allow, balance, and control wolf behavior. Narratives and directives correlate: participants and stakeholders holding beings-focused views tend to propose more allowing directives, those endorsing ecosystem-focused perspectives lean to choose balancing directives, and those inclined to human-focused stances prefer controlling directives. Thus, our research allows wildlife managers to understand better why people endorse or oppose specific management options and devise effective communication strategies by working with the underlying narratives.

Keywords Human dimensions · Wolves · Human-wolf relations · Wildlife management · Qualitative research · Germany

Introduction

Epitomes of natural resilience to be welcomed – or vermin to be kept in check? People's conceptions of wolves and wolf management differ starkly (Nie, 2001; Skogen, 2001; Lute et al., 2018; Breyne et al., 2021; Jürgens & Hackett, 2021). From practitioners managing stakeholder-wolf interactions on the micro-level in the short term to decision-makers navigating human-wolf relations on the macro-level in the long term (Manfredo & Dayer, 2004; König et al., 2020), it is essential to understand the roots of those opposing stances. In the big picture, polarized ideas of wolf management ultimately inform different scenarios for how to facilitate human-wolf coexistence and shape the biocultural evolution of wolf ecology, human ecology, and the socio-ecological spaces where the two intersect (Treves & Karanth, 2003; Plumwood, 2006; Nygren & Rikoon, 2008).

We aim to contribute to understanding people's reasons for dismissing and opposing or favoring and supporting specific management measures. To this end, we investigated how people's general worldviews and beliefs about wolves relate to the management strategies they favor.

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Wolves, Views of Wolves, and Wolf Management

The behavior of wolves interacts with human psychology to co-create the conceptions that people have of them (Lescureux & Linnell, 2010; Poerting & Marquardt, 2019; Schröder & Steiner, 2020; Jürgens, 2022). Likewise, the challenges in human-wolf coexistence, as well as the management solutions devised to respond to them, are shaped by multiple influences, such as wolf ecology, e.g., their predator nature; socio-economic and socio-cultural factors, e.g., established livestock herding practices; and human emotional dispositions and value orientations (Kansky & Knight, 2014; Bhatta et al., 2020; Breyne et al., 2021).

Therefore, our inquiry into a potential relation of views on wolves and preferred management strategies starts with investigating the existing knowledge on these aspects and their interrelation within the complex geography of human-wolf interactions. As our research projects focus on returning wolf populations in Germany, we begin by providing a brief outline of the current state of wolf recovery and German wolf management.

Wolves in Germany: (Not) Welcome

Wolves began to recolonize Germany over 20 years ago. At the moment, there are over 1000 individuals in 157 packs (DBBW 2021a). Most Germans approve of this development (WWF 2014; Arbieu et al., 2020; Forsa, 2021). Others fiercely oppose the further expansion of wolf populations (Fuhr, 2014; With & Kotzur, 2015; Bloch & Radinger, 2017; Pfannenstiel, 2017; Faß, 2018; Pates & Leser, 2021). While there have been no unprovoked attacks by wolves on people in Germany since their return (Linnell et al., 2002, 2020), some speculate that given rising wolf densities, the occurrence of attacks will just be a matter of time (Pfannenstiel, 2017; Geist, 2018). The stereotype of wolves as dangerous beasts is easily activated (Jürgens & Hackett, 2017). While it is not unusual for wolves to live close to humans and use their infrastructure, a conceptual separation of wolf areas from the human sphere exists in many people's minds (Bloch & Radinger, 2017; Boitani et al., 2018). Accordingly, whenever wolves are seen near human settlements, astonishment, helplessness and fear are among the first reactions (Focus Online 2019, 2021; Kreiszeitung, 2019; tz 2021).

Notably, human-wolf conflicts in Germany, as elsewhere, emerge when wolves prey on livestock (Fuhr, 2014; Bloch & Radinger, 2017; Faß, 2018; Bellin-Harder, 2019; Heurich 2019). Wolves have killed over 100,000 sheep, goats, cattle, and horses in Germany since 2000 (DBBW 2021b). While domestic animals make up only around 1% of their diet (Tiralla et al., 2021), these attacks impact the affected

animals, farmers' business practices, revenue, and emotional well-being. In retaliation, 66 wolves are documented to have been illegally killed despite strict legal protection (DBBW 2021c). Germany has clear guidelines on wolf management (DBBW). However, they are highly debated, and how to cope with the large predators is likely to change. Many affected livestock owners, hunters, and politicians demand a national cap on wolf numbers and more opportunities for lethal management.

Wolf Management in Germany and Beyond

The EU considers wolves endangered and strictly protected (Council of the European Communities 1992; Bundesministerium für Justiz und Verbraucherschutz 2021). This includes prohibiting killing wolves and interfering with their natural behavior. Wolf populations are closely monitored; a few wolves are equipped with a radio collar (Sächsisches Landesamt für Umwelt Landwirtschaft und Geologie 2021).

There are options for lethally removing "problem wolves," i.e., individuals that have repeatedly caused significant damage despite protection measures or shown other undesired behavior, such as approaching humans or pets. So far, the most effective measures for preventing depredation are the traditional practice of fencing, guardian dogs, and herding in combination with predator deterrents (Ogada et al., 2003; Weise et al., 2018; Bruns et al., 2020; Landry et al., 2021; Oliveira et al., 2021). Consequently, every federal state has issued a wolf management plan (DBBW), which provides recommendations and regulations for implementing these measures and acquiring public funds.

However, personnel and time resources rarely are covered by funding. In some locations, e.g., in alpine regions, fencing is unfeasible, and fences need to be maintained constantly, or wolves learn to overcome them (Faß, 2018). Subsequently, many affected people demand more extensive funding and harsher management strategies.

One proposition is legalizing the hunting of wolves and limiting their numbers or facilitating the targeted removal of problem wolves. While culling parts of or entire wolf packs can reduce depredation to a certain extent (Bradley et al., 2015), it is less effective than protective measures; prevention and protection are inevitable in any case (Harper et al., 2008; Krofel et al., 2011; Wielgus & Peebles, 2014; Stone et al., 2017; Bruns et al., 2020).

Another common demand is to relocate problematic wolves or to delimit wolf habitat, creating so-called "wolf-free zones" (Pates & Leser, 2021). However, wolves do not adhere to human-made boundaries: their territories can be as large as 200 km² in Europe, and young wolves travel long distances to find new territories and breeding partners (Mech & Boitani, 2003; Ramberg et al., 2006; Fechter &

Storch, 2014). Considering the shift in people's attitudes toward a more positive view of nature, some authors argue that a coexistence rather than a separation model is suitable for large carnivores in Europe (Chapron et al., 2014; Arbieu et al., 2020).

Various innovative and technical approaches for preventing and mitigating human-wolf conflicts have also been tested. With automatic deterrents like auditory, visual, or olfactory signals, habituation is the biggest problem (Ausband et al., 2013; Anhalt et al., 2014; Bloch & Radinger, 2017; Faß, 2018; Hackländer, 2019). Another possibility currently being tested in the alpine region is to collar livestock and monitor their behavior to ensure reaction in case of anomalies (Kronen Zeitung 2020; Scherrer 2021).

Ultimately, involving citizens in management has proven to be among the most effective efforts to mitigate human-wildlife conflict (Treves et al., 2006; Baruch-Mordo et al., 2009; DeMotts & Hoon, 2012; Hill et al., 2017; Weise et al., 2019). In this vein, many administrative areas in Germany are assigned so-called wolf advisors: trained, independent volunteers who counsel farmers on protection measures, fulfill an educative role, and document evidence in case of wolf attacks. Hands-on support for farmers for realizing protection measures is additionally offered by volunteers such as the organization *WikiWolves* (Soethe & Freiberg, 2021). Participation of relevant stakeholders, mainly in the European alpine region, is realized by the project *LIFE Wolfalps EU* which investigates human-wolf coexistence in their countries, informs about large carnivores, creates platforms for exchange, and supports livestock owners (LIFE Wolf Alps EU 2021; Oliveira et al., 2021). Citizen science and e-participation are promising methods to gather more information on wolves and attitudes toward them and generate publicly acceptable solutions, although it is virtually impossible to accommodate everyone's interests (Stevens et al., 2012; Salo et al., 2017; Ražen et al., 2020; Marino et al., 2021).

So quite a few established and newly developing management measures for wolves exist. However, they do not seem to have a consistent classification scheme. For instance, Distefano (2005) technically distinguished mitigative and preventive strategies, while others categorized strategies into lethal and non-lethal (Roemer et al., 2011; Stone et al., 2017; Skogen & Kränge, 2020; Straka et al., 2020). In particular, we lack a classification grounded in stakeholders' assessment of those options. In most studies addressing people's preference for management options, participants were presented with a predefined list, requiring that they rate measures for their acceptability. There are only a few qualitative studies in which participants were asked to suggest solutions themselves (Salo et al., 2017).

Wildlife Value Orientations and Their Relation to Management

Attitudes toward wolves are multi-dimensional and dynamic. Situational variables, such as the perceived risk or damage from predators (Glikman et al., 2012; Sjölander-Lindqvist, 2015; Lute et al., 2018; Herzog, 2019; Nardi et al., 2020; Stauder et al., 2020) and sociodemographic variables, e.g., age, gender, education, urban or rural life-ways, or group membership (Naughton-Treves et al., 2003; Manfredo et al., 2009; Majic & Bath, 2010; Hamilton et al., 2020; Randler et al., 2020; van Eeden et al., 2021) associate with different perspectives on wolves.

People's attitudes toward wolves are rooted in their general worldviews (Jürgens & Hackett, 2021). For example, Bauer et al., (2009) propose four different types of human-nature relationships that also differ concerning their attitudes toward managing nature: "nature lovers," "nature sympathizers," "nature-connected users," and "nature controllers." These types combine aspects of anthropocentrism (seeing the human in the center of the world), ecocentrism (valuing the ecosystem as a whole), and biocentrism (focusing on individual human- and non-human beings) (Callicott, 2004; Dunlap, 2008; Wardropper et al., 2020), with the distinction of mutualism and domination (Teel & Manfredo, 2010; Carlson et al., 2020; Dietsch et al., 2017) define domination as prioritizing human interests over wildlife and mutualism as the importance of well-being and relationship with animals.

Relying on similar basic dimensions, Kellert (1980) identified ten types relating to wild animals. They range from a naturalistic stance, based on a personal involvement with individual animals, which provides context and meaning for active recreational interaction with outdoors; over an ecological perspective, aimed at a conceptual understanding of the interdependence of populations of wildlife with their ecosystem, to a dominionistic view, seeking mastery and control over animals thus rendering their inherent "wilderness" "submissive and orderly" (ibid., p. 34). Sevillano & Fiske (2019) argue that the behavior toward animals that people support or engage in may be determined by two dimensions of behavioral tendencies that are also relevant for human inter-group relations. An imaginary animal species perceived as friendly elicits active facilitation, e.g., caretaking, whereas if perceived as unfriendly, it attracts active harm, e.g., lethal control. If that species is rated as skillful, it may enjoy passive facilitation, e.g., tolerance for coexistence; if seen as unskillful, it triggers passive harm, e.g., withholding care. However, for natural animal species, the potential relation of people's stereotypes to favored management options was much less straightforward.

Scholars investigating real-world examples have observed that persons tending toward dominating nature consider restrictive management options for predators acceptable (Teel & Manfredo, 2010; Dietsch et al., 2016, 2017; Straka et al., 2020). Other authors traced negative attitudes toward wolves to the acceptance of hunting them (Bruskotter et al., 2009; Stauder et al., 2020). Conversely, the higher the perceived value of wolves for a person, the higher the acceptance of their protection (Grima et al., 2021; Breyne et al., 2021) have surveyed a wide range of socio-cultural values. They mainly found the value of biodiversity relating to a more positive view of wolves and less support for lethal control. Also, for non-lethal management options, it can be stated that the more negative people's attitude toward predators, the more restrictive the measures they favor (Roemer et al., 2011; Glikman et al., 2012; Lundmark & Matti, 2015; Dietsch et al., 2016; Lute et al., 2018; Herzog, 2019; Straka et al., 2020; Hamilton et al., 2020; Stauder et al., 2020; Breyne et al., 2021; van Eeden et al., 2021; Grima et al., 2021). Likewise, studies investigating the role of emotions in recommending different management strategies have found that people with more negative feelings toward a species tend to favor more restrictive management strategies (Straka et al., 2020). In sum, worldviews and perceptions of wildlife seem essential for forming people's perspectives on which management options are efficient and acceptable.

Previous research has not specifically addressed a potential relationship between attitudes and management preferences. However, the relation between worldviews and a preference for particular management strategies is difficult to quantify. This is due, first, to the fact that situational and other variables also play into the equation. Second, due to the absence of evidence on the management options toward which different people's preferences naturally gravitate, we lack a basis for assessing a potential connection of these preferences to worldviews. Moreover, studies that provided evidence of such a connection were based on surveys and thus driven by a top-down deductive paradigm that may reproduce predefined conceptions, e.g., the concepts of dominance and mutualism (Teel & Manfredo, 2010; Dietsch et al., 2016; Carlson et al., 2020; Straka et al., 2020), or anthropocentrism and ecocentrism (Wardropper et al., 2020), rather than probing into participants' genuine apperceptions.

Our study aims at filling these gaps in the knowledge base on human-wolf relations by zooming in on whether and how people's preference for management directives is predicated on their general views of nature and their beliefs about wolves – mental representations to which we refer as “narratives.” We propose to address that research question with a qualitative, bottom-up approach, not a priori confined

to the canonical classifications of wildlife orientations or a predefined set of management options. Instead, we seek to trace in detail how people's general outlooks may map onto their proposals of management strategies by following their natural lines of reasoning.

Methods

The data base for this study stems from two separate projects of the first and second authors, respectively. Since both projects were based on similar theoretical conceptions and practical approaches, illuminating the determining factors of human-wolf relations and potential solutions to human-wolf conflicts, aggregating the data from both research teams was deemed feasible.

We consider participants' worldviews and wolf-related beliefs “interpretation patterns.” Thus we follow Oeverman's (2001) definition of such patterns as systems of “knowledge, norms, values and interpretations” (ibid., p. 9; UJ's translation) by which people understand reality and determine how to react to the “objective challenges” they encounter (Oevermann, 2001, p. 21). Given how intensely individual stakeholders and the society at large are affected by the return of wolves to Central Europe, we expect that people's interpretation patterns are being called forth to make sense of this situation and devise directives for how to deal with this challenge. We designed our interviews to probe into the logical structure of nature- and wolf-related interpretation patterns and into the directions of action suggested by them.

Sampling

For a more extensive project investigating overarching dynamics in human dimensions of wildlife (Jürgens & Hackett, 2021), UJ conducted in-depth interviews (Lamnek, 2010) on participants' relations to wolves and other wildlife (see Jürgens 2022 for a detailed explanation of the choice of model cases). Seven participants were interviewed about wolves, and seven further participants interviewed about other wildlife spontaneously also mentioned their attitudes to wolves and wolf management. Therefore, the data of these additional seven participants were also included in this study's analysis, yielding a sample size of 14 of UJ's subjects.

MG and her group specifically investigated 27 stakeholders' attitudes on wolves and management solutions to human-wolf conflicts in their project.

In both projects, subjects were purposefully sampled according to a scheme of maximum variation sampling (Lamnek, 2010) suited to investigating phenomena

exhibiting “a great deal of variation” (Patton, 2002, p. 235). The two criteria for which a maximum variation was aspired were the valence of attitude to wolves (positive vs. negative, as assessed in a short recruiting conversation via phone or email) and subjects’ profession or vocation, e.g., scientist, shepherd, hunter, or environmentalist. We combined three sampling approaches to recruit subjects: critical cases were selected based on their particular engagement in human-wolf coexistence, e.g., as wolf advisors, and by contacting authors of expressive commentaries on wolf news in online media. Other subjects were then sampled by the snowball technique (Patton, 2002). Based on the pragmatic criterion for theoretical saturation proffered by Low (2019), further participants’ recruitment was discontinued as a saturation was observed concerning the concepts deemed relevant in the framework projects.

The overall sample comprises hunters, livestock farmers (affected and unaffected by wolf attacks), wolf advisors, pro-wolf activists, owners of wolfdogs (crossbreeds of dogs with wolves), scientists, politicians (MPs), and ordinary citizens living within or outside areas inhabited by wolves. Some subjects assumed several of these roles (see Appendix B).

For this study, participants are identified by codes of two letters and one number, e.g., “UJ1” or “MG22”. The letters refer to the research group that has conducted the respective interview, and the number refers to the order in which participants’ transcripts have been analyzed.

Interview Procedures

UJ interviewed participants in person between June 2016 and October 2020. Interviews lasted between one and three hours. The conversation started with participants recounting a meaningful experience (Kansky & Knight, 2014) they might have had with the respective animal. The interview was then semi-structured by a set of 15 open-ended questions (see Appendix C) whose themes were all discussed, but their order and phrasing were adapted to the conversation’s flow. Projective prompts complemented the verbal questions: Participants were also asked to express their thoughts by building configurations of little wooden figures. The projective technique may tap below subjects’ conscious filter (Hackett et al., 2016), eliciting deeper insight into their mental worlds. Participants were free not to use the figures. Of the 14 subjects whose interviews are included in this study, 11 did use them, and three chose not to use them.

MG and her group interviewed participants in person, via phone, or via video calls between July 2020 and August 2021. They pursued a semi-structured interview technique (Glaser & Strauss, 1967) about participants’ beliefs about wolves, their perception of current wolf management, and

suggestions to improve the situation. They adapted the framing of questions to the participants’ unique perspectives. The complete set of their guiding questions is in Appendix D.

In both approaches, participants freely determined the contents and the flow of the interview by what they decided to share. Both interviewers’ open-ended ways of exploring participants’ ideas for resolving human-wildlife conflicts were essentially the same. All interviews were conducted in German. Citations in this text are translated from the original quotes by UJ.

Analysis

Qualitative Steps of Analysis

UJ’s video-taped interviews were transcribed verbatim. The parts of MG’s interviews relevant to the research questions were transcribed as literally as possible, and particularly striking statements were recorded verbatim.

In the first step of thematic analysis (Clarke & Braun, 2017), the transcript of each participant was analyzed for statements reflecting the subject’s worldviews, beliefs about wolves, and ideas for resolving human-wolf conflicts. These statements were collected across all participants to form the core codes. For each code, we noted the participants from whose statements it was derived. Also, the participant-specific contingencies between statements reflecting nature-related values, beliefs about wolves, and ideas for management solutions were recorded. The yield of this first step of the analysis was a set of “motives,” i.e., thematically distinct codes tabulated for contingencies between them. In the following, motives are printed in italics.

In the second step, the motives were grouped by similarities in content. Thus, the “narratives” and “directives” were established. “Narratives” are constituted by thematically matching motives pertaining to worldviews and wolf-related beliefs. Similarly, “directives” are groups of similar motives pertaining to participants’ proposals for management solutions.

During this grouping of motives (“n-motives” for short) into narratives and “d-motives” into directives, respectively, care was taken to retain the contingencies between the n-motives and d-motives. Thus, we obtained an overall mapping between narratives and directives. In some cases, the contingencies reflect an immediate causal connection. For example, the narrative *Humans need to control wildlife populations that otherwise propagate boundlessly* and its joint belief that *Wolves have an exceptionally high reproduction rate* immediately map onto the directive *Regulate wolf populations through hunting*. In other cases, the causal connection between narratives and directives is mediated by a logical proposition. For example, belief that *Spreading*

[...] knowledge [...] is pivotal, indirectly maps onto the directive *Adhere to the Kantian Categorical Imperative as a code of conduct when dealing with animals* via the proposition that once people have gained insight into the functioning of natural processes, they may decide to apply the golden rule to the non-human world.

In the third stage of analysis, narratives were arranged into a continuum (called the “n-continuum” for short) with three adjacent topical sections (“categories”); and directives were arranged into another continuum (“d-continuum”) with three categories.

In the fourth and final step, a table was created that listed all narratives ordered and numbered by the positions they assumed concerning the n-continuum. For each narrative, directives are listed, which participants had mapped onto. Directives are arranged and numbered by order of their appearance on the d-continuum. For all n- and d-motives, the participants who mentioned them are listed. This table is the data base for all further analyses. It is displayed in Appendix A.

Quantitative Analyses

The qualitative analyses established the motives and meaningful relations between them. In order to additionally derive a quantitative assessment of potential connections between narratives and directives, we based quantitative analyses on the data table in Appendix A.

First, we counted how many participants jointly mentioned both for every pair of categories on the n-continuum and the d-continuum. We counted joint mentions between categories of the same continuum and between categories of the two different continuums. These joint mentions constitute a core measure for potential dependencies between thematic categories.

Second, we counted how often each participant mentioned the motives of a given category. This count was divided by the total number of motives mentioned by that particular participant, normalizing possible distortions due to differences in communicativeness. These measures constitute the relative frequencies of how often each participant mentioned motives pertaining to a given category. These relative frequencies, displayed in Appendix B, were taken as the basis for determining correlations between the categories of the two continuums.

Third, these participant-specific relative frequencies were also used for determining whether a specific group of participants exhibited a particular preference for a specific thematic category of n- or d-motives, respectively. For five professional groups of participants with four or more members – hunters, livestock farmers, wolf advisors, animal- and nature’s rights activists, and wolfdog owners – we averaged

the respective members’ relative frequencies. We did the same for six demographic groups: women, men, participants above and equal to or below the median age, and participants with and without personal experiences with wolves (such as having encountered or lost livestock to wolves). By Chi-square tests, we determined whether the distribution of these groups’ mentions of the different n- and d-motives differed from the mean distribution of motive mentions (i.e., relative frequencies of motive mentions averaged across all participants).

These results must be interpreted carefully. Sub-sample sizes are relatively small, and due to the maximum-variation rationale of choosing participants for this study, members of the sub-samples are not representative of that respective demographic group in the general population. Also, significant results of the Chi-Square tests exhibit a divergence of a group’s motive mentions from the total average. Thus, we cannot conclude that a particular category of narratives has been mentioned significantly more often than another category of narratives. Comparisons between groups are not feasible for the same reasons. Moreover, some professional groups are not disjoint, e.g., some hunters are also livestock farmers. Therefore, the group-related results reflect just an indication of potential patterns.

Fourth, we calculated correlation coefficients on the group level: As for individual participants, we correlated for the 11 sub-samples the relative frequencies of mentions of n- and d-motives between the nine pairs of categories on the n-continuum and d-continuum. Again, as the groups are not disjoint, these group-related results must be interpreted cautiously.

Finally, we assigned a set of rank numbers to narratives that reflect their position concerning the n-continuum and another set of rank numbers to directives reflecting their position on the d-continuum. We then correlated the rank numbers of narratives with the average of their mapped directives’ rank numbers. We interpret this measure as an indicator of the relationship between these two continuums as wholes.

Results

We found 55 n-motives, 19 of which are general worldview-related beliefs, and 36 represent beliefs about wolves. By establishing thematic correspondences, we identified a total of 18 narratives. On the part of directives, we found 46 d-motives. Because of similarities in their content, we aggregated them into 24 directives.

Only one motive about narratives and eight motives on directives were mentioned by a single participant each and thus constituted somewhat idiosyncratic ideas. Two or more

Table 1 Compiled results of the correlative analyses on the individual and group levels

		Allowing vs. controlling directives			
		$r_i = -0,69^{***}$ Overlap: 13/23 = 57%			
	Allowing directives mentioned by 23/41 participants	$r_i = -0,39^{**}$ Overlap: 17/23 = 73,9%	Balancing directives mentioned by 30/41 participants	$r_i = -0,45^{**}$ Overlap: 22/28 = 78,6%	Controlling directives mentioned by 28/41 participants
Beings-focused, harmony-oriented, wolf-favoring narratives	Being-focused, harmony-oriented, wolf-favoring narratives mentioned by 31/41 participants	$r_i = 0,75^{***}$ Overlap: 19/23 = 83% $r_g = 0,97^{***}$	$r_i = -0,11$ (n.s.) Overlap: 24/30 = 80% $r_g = 0,26$ (n.s.)	$r_i = -0,64^{***}$ Overlap: 21/28 = 75% $r_g = -0,81^{**}$	
Vs. human-focused, dominion-oriented, wolf-critical narratives	ecosystem-focused, conservation-oriented, wolf-ambivalent narratives mentioned by 37/41 participants	$r_i = -0,32^*$ Overlap: 18/23 = 78% $r_g = -0,3$ (n.s.)	$r_i = 0,68^{***}$ Overlap: 27/30 = 90% $r_g = 0,74^{**}$	$R_i = -0,25$ (n.s.) Overlap: 23/28 = 82% $r_g = -0,18$ (n.s.)	
$r_i = -0,61^{***}$ Overlap: 20/28 = 71%	human-focused, dominion-oriented, wolf-critical narratives mentioned by 28/41 participants	$r_i = -0,45^{**}$ Overlap: 11/23 = 48% $r_g = -0,89^{***}$	$r_i = -0,48^{***}$ Overlap: 20/28 = 71% $r_g = -0,69^{**}$	$r_i = 0,83^{***}$ Overlap: 25/28 = 89% $r_g = 0,98^{***}$	

* $p < .05$, ** $p < .01$, *** $p < .001$

correlation coefficients on the individual participants' level are labeled r_i and tested for significance employing a t-distribution with $n-2 = 39$ degrees of freedom; correlation coefficients on the groups level are labeled r_g and tested for significance employing a t-distribution with $n-2 = 9$ degrees of freedom.

Overlap between categories is established by determining the ratio of actual joint mentions and the potential maximum number of joint mentions.

participants mentioned most motives; a vast majority of motives were concurrently named by participants of both UJ's and MG's samples. This evidences a striking congruence of ideas among participants or groups of participants (see below) about worldviews and beliefs about wolves.

Among the 18 narratives, a straightforward continuum with three categories could be established that reflected the concepts discussed in the literature. Likewise, the 24 directives align along a three-category continuum. Moreover, these two continuums correlate because directives map systematically onto the narratives. Results are compiled in Table 1 and detailed in the text. Figure 1 presents an overview of the results.

Narratives

The 18 narratives align along a continuum according to whether they reflect more or less biocentric, ecocentric, or anthropocentric orientations (Callicott, 2004); according to the emphasis on human uniqueness and dominion (Teel & Manfredo, 2010); and according to the degree of connectedness versus distinctiveness of humans and nature implied by them (Chapron et al., 2014; Linnell et al. 2015; Jürgens

& Hackett 2021). This continuum exhibits three thematic categories:

1. the beings-focused, harmony-oriented, wolf-favoring category (BHF for short): a pole defined by a biocentric focus on the equal worth and welfare of individual human and non-human beings by which a harmonious union of man and nature is aspired, where wolves are favored not only as fellow-creatures but as epitomes of that quasi-paradisical utopia;
2. the ecosystem-focused, conservation-oriented, wolf-ambivalent category (ECA for short): an intermediate category defined by an ecocentric focus on the ecosystem as a whole, where the protection of nature and all its parts is the prominent goal of humans viewing themselves as endowed with unique capabilities and, hence, responsibilities, and where wolves are regarded both as particularly challenging and worthwhile cases for conservation efforts;
3. the human-focused, dominion-oriented, wolf-critical stance (HDC for short): a pole defined by an anthropocentric focus on humankind as being prescinded from nature and animals and as being eligible to master,

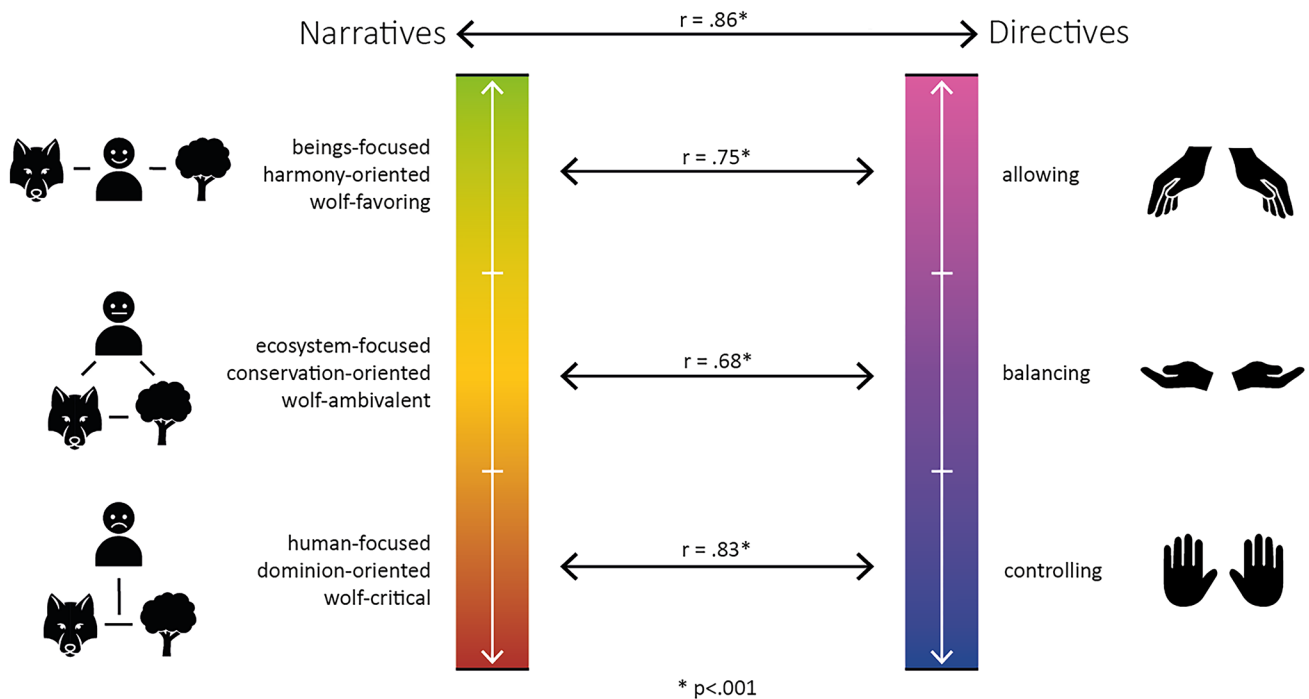


Fig. 1 Graphical representation of the correlation between narratives and directives mentioned by participants

manage, and use them as a resource, where the attitudes to wolves are defined by the conflictual and challenging facets of wolf presence.

Despite the topical differences between these categories, the thematic emphases of the 18 narratives gradually progress from the BHF pole over the intermediate ECA stance to the HDC pole. We found five beings-focused, harmony-oriented, wolf-favoring narratives mentioned by 31 of the 41 participants; eight ecosystem-focused, conservation-oriented, wolf-ambivalent narratives mentioned by 37 of the 41 participants; and five human-focused, dominion-oriented, wolf-critical narratives mentioned by 28 of the 41 participants. Considered across the whole sample, participants mentioned the n-motives with relative frequencies of 27% for BHF motives, 43% for ECA motives, and 30% for HDC motives.

Tables 2 and 3, and 4 present the worldview- and wolf-related motives of the 18 narratives, listed in the sequence and numbered by the rank order they assume regarding the n-continuum. The adjunct letters (e.g., BHF) indicate the category into which this narrative has been classified. When motives are joined based on shared content, title themes of these narratives are given in bold; the motives themselves are given in plain font. The participants who mentioned the individual motives are listed in the table in Appendix A.

The continual nature of the structure formed by the narratives is reflected in the fact that most participants mentioned motives from all three categories, producing a high number

of joint mentions between categories: Pairs of categories share between 70% (BHF and HDC) to about 90% (BHF and ECA; ECA and HDC) of participants, i.e., the adjacent categories exhibit more joint mentions than the categories constituting the two extremes. Also, with regard to how often the individual participants mention motives pertaining to each category, the categories significantly intercorrelate: $r(39) = -0.41$, $p < .01$ for BHF and ECA; $r(39) = -0.47$, $p < .001$ for ECA and HDC; and $r(39) = -0.61$, $p < .001$ for BHF and HDC (see the leftmost columns of Table 1). The categories are not distinct, but interdependencies are expressed in a linear relation captured in these correlations. Again, this pattern is most obvious for the most distant categories, BHF and HDC, underscoring the idea that motives for these categories lie at opposing poles of a continuum. The overlap of categories indicates that participants' views of wolves represent not a little cluster but a spectrum of attitudinal elements.

The category-like patterning of the structure formed by the narratives is reflected in the fact that those intercorrelations are negative. A negative correlation indicates that if participants mention more motives pertaining to any category, they mention fewer motives pertaining to the other two categories. In this way, virtually all participants predominantly mention motives about one of the three categories (see also Appendix B), and thus, the categories contain motives of systematically different contents.

Table 2 Beings-focused, harmony-oriented, wolf-favoring narratives

No.	<i>Worldview-related beliefs contained in the narrative</i>	<i>Wolf-related beliefs contained in the narrative</i>
1-BHF	Like humans, animals are individuals with inherent worth, a perspective of their own, and inalienable rights. Humans, therefore, are part of a community of natural persons.	<p>Wolves are to be seen and appreciated as agents, i.e., they have an agenda of their own, and their behavior comes from a deliberate internal locus of control.</p> <p>Wolves are non-human persons competently navigating their behavior; they are intelligent, adaptive, and deliberate.</p> <p>Wolves are social beings; they care for and form intimate familial bonds with their kin.</p>
2-BHF	Humankind is inherently malignant and intrusive concerning animals and nature. Humans as a species systematically encroach upon and exploit natural resources.	<p>People entertain incorrect, partly outright irrational prejudices toward wolves</p> <p>Among the adversaries of wolves, targeted deprecatory propaganda lacks any factual base. Also, conspiracy theories are endorsed, e.g., about the return of wolves not being a natural phenomenon but an intentional reintroduction, i.a., the release of wolf hybrids. Also, stillborn livestock and game killed by traffic are claimed to be wolf kills.</p> <p>The Big Bad Wolf stereotype, as present in fairytales, still is tainting people's image of wolves.</p>
3-BHF	<p>Nature knows her ways best – humans should intervene as little as possible.</p> <p>(Ill-informed) attempts to regulate nature are ineffective or outright detrimental to natural and human systems.</p> <p>Nature is endowed with the ability to self-regulate; humans should appreciate that.</p>	
4-BHF	Nature and non-human animals have a right to exist regardless of whether their existence is of any use or value to humankind.	Having been a part of the ecosystem in Central Europe in the past, wolves have a right to exist in the area today.
5-BHF	<p>Humans are a part of the natural community, yet responsibly forming that system.</p> <p>Segregation of the human sphere and nature is impossible; there is a continuum between humans and nature. On the one hand, humans are part of nature as they succumb to the same natural laws of being; on the other hand, humans' unique capabilities endow them with a special status.</p> <p>Owing to their special status, humans have a responsibility (akin to a "sacred mission," UJ11) toward nature and animals. Specifically, they have a responsibility to care for creation and mold it for all beings' good.</p>	Wolves are Janus-faced beings: They are "fellow creatures" endowed with a right to exist, yet "troublemakers" (UJ7). Managing them needs to account for both aspects.

Table 3 Ecosystem-centered, conservation-oriented, wolf-ambivalent narratives

No.	<i>Worldview-related beliefs contained in the narrative</i>	<i>Wolf-related beliefs contained in the narrative</i>
6-ECA		Wolves are beautiful, aesthetic beings; they radiate a fascinating, awe-inspiring presence.
7-ECA		Wolves evade direct encounters with people and keep away from human spaces. They exhibit a natural shyness.
8-ECA		Wolves are generally not dangerous to humans. Exceptions may occur, e.g., when wolves feel stalemated, yet are very unlikely.
9-ECA	Spreading and deepening knowledge about natural processes and their interrelation is pivotal for leveraging environmental protection. People are naturally inclined to protect nature when they gain the necessary information and develop essential insights.	
10-ECA		<p>Wolves represent nature</p> <p>Ecologically, wolves are indicators of healthy ecosystems.</p> <p>Wolves and their behavior are natural parts among other parts of the environment; they complete the endemic ecosystem.</p> <p>As predators, wolves assume a pivotal regulating function in ecosystems.</p> <p>As predators, wolves exhibit the “unkind” (UJ11) face of nature; they demonstrate that nature can be “insanely brutal” (MG10).</p> <p>Wolves are symbols of plain nature; they are associated with wilderness. Symbolically, wolves are epitomes of untouched and untamed wilderness. The return of wolves is the epitome of nature’s resilience.</p> <p>As classical dwellers of the wilderness, wolves have a right to exist in areas not used by humans.</p>
11-ECA		<p>Wolves are opportunists who capitalize on opportunities opening up to them.</p> <p>Wolves go for the most easily accessible food supplies. This is why they come close to human settlements. Due to their opportunist nature, they will specialize in preying on livestock if not impeded.</p> <p>When not hunted, wolves lose their natural shyness toward humans.</p>

Table 3 (continued)

No.	Worldview-related beliefs contained in the narrative	Wolf-related beliefs contained in the narrative
12-ECA	<p>Ecological values have lost their meaning in contemporary society</p> <p>Economic gain and pursuing ideologies trump ecological values and the common good in politics and economics. Vocations oriented toward collective welfare (i.a., pasture management of livestock and sustainable farming) are not appreciated and thus are not sufficiently remunerated.</p> <p>People have lost touch with nature, sustainable farming, and food production.</p>	<p>Wolf management is charged emotionally by factually unrelated issues. “The wolf” is a political and societal debate topic and thus is an indicator of general societal conflict and a catalyst of discourse about values and political premises.</p> <p>The issue of wolf management exemplifies how the government dominates the general people; how politics fails to exhibit informed leadership; and how policies and directives are imposed without consulting with the people affected. In particular, farmers and hunters are scapegoated and must pay for ill-advised wolf policies. The publicly endorsed resurgence of wolf populations thus is an epitome of a collective lack of appreciation for these professions.</p> <p>Wolves and wolf management raise general deep-going questions about what it means to be human and how to deal with nature, particularly regarding the significance of livestock farming and the conservation of biodiversity. In this way, wolves challenge humans to step into their responsibility of managing or caring for nature. “The wolf” as a political issue is thus also a political football of the different camps and a scapegoat for failing political processes.</p> <p>Conflicts between different social and stakeholder groups (e.g., conflicts along a rural-urban divide) significantly exacerbate the practical issues of wolf management on the inter-individual and societal scale.</p>
13-ECA	The relevant unit of moral concern is the animal species and the whole of the ecosystem.	Wolves are being mystified and favored to the disadvantage of other wildlife species and significant environmental protection issues.

Directives

Like the narratives, the 24 directives found in this study neatly align along a continuum that exhibits three different thematic categories. This continuum is defined by a rationale of allowing versus restricting wolf behavior on the individual (e.g., preying on livestock) or on the species level (e.g., expanding their range to areas in the cultural landscape used by humans). This continuum runs from:

1. allowing directives (A for short): the pole of permitting unrestricted wolf behavior while ceding human claims of resources;
2. to balancing directives (B for short): an intermediate category characterized by reconciling the respective interests of humans and wolves in management;
3. to controlling directives (C for short): the pole of strictly constraining wolves’ behavior to what is acceptable within limits defined by humans’ interests that are given absolute priority.

We found seven allowing directives, proposed by 23 of the 41 participants; 10 balancing directives, proposed by 30 of the 41 participants; and seven controlling directives, proposed by 28 of the 41 participants. Of all motives mentioned,

the different categories on the d-continuum were mentioned with relative frequencies of 27% in the category of allowing directives, 37% in the category of balancing directives, and 36% in the category of controlling directives.

In Tables 5, 6 and 7 the directives are listed in the sequence and numbered by the rank order they assume concerning the d-continuum. When several motives are subsumed thematically to a directive that directive is given a heading in bold. The participants who mentioned a single motive are listed in the table in Appendix A.

There was a huge number of joint mentions between the three categories of directives (74% for A and B; 79% for B and C; 57% for A and C), as well as significant intercorrelations: $r(39) = -0.39$, $p < .01$ for A and B; $r(39) = -0.45$, $p < .01$ for B and C; and $r(39) = -0.69$, $p < .001$ for A and C (see the upper rows in Table 1). This underscores the adequacy of structuring the directives as a continuum.

However, participants exhibited a clear tendency to favor one category of directives (see Appendix B), and all intercorrelations between categories of directives are negative. This indicates that the continuum formed by the directives exhibits distinguishable thematic emphases represented by the three categories.

Table 4 Human-centered, dominion-oriented, wolf-critical narratives

No.	<i>Worldview-related beliefs contained in the narrative</i>	<i>Wolf-related beliefs contained in the narrative</i>
14- HDC		<p>Wolves constitute a threat to the physical wellbeing of humans.</p> <p>Wolves are potentially dangerous for humans, particularly when rabid or when wolf numbers rise, so they are forced to come close to settlements in search of food.</p>
15-HDC	<p>Anthropocentric premises for assessing the value of nature</p> <p>Allowing the establishment of wolf populations should be predicated on a net benefit for humankind.</p> <p>Measures for nature conservation need to evidence a benefit for humankind.</p>	<p>Wolves are subtly associated with threat; they emanate an eerie omnipresence.</p> <p>Detrimental effects of wolf presence</p> <p>Wolves do not fit into the cultural landscape</p> <p>Wolf presence brings no benefit yet causes significant damage and nuisance. For example:</p> <p>Given the regulating effect of hunting, wolves serve no ecological function in the human-dominated landscape.</p> <p>Wolves compete for game yield with human hunters and counteract their attempts to neatly regulate game populations and forest management by altering their prey species' behavior.</p> <p>The economic viability and the traditional lifeways of livestock farmers, particularly those engaging in pasture management of their herds, are challenged by wolves.</p> <p>Wolves kill unselectively; they attack prey animals of all ages and health conditions; therefore, they will eventually cause game populations to degrade.</p> <p>Wolves are insatiable beasts who regularly engage in surplus kills.</p> <p>Wolves kill their prey in a ferocious manner.</p>
16-HDC		<p>Wolf counts are incorrect or even intentionally whitewashed; important information (e.g., incidents of wolf attacks on humans) is kept secret.</p>
17-HDC	<p>Humans need to control wildlife populations that otherwise propagate boundlessly</p> <p>Generally, all animal species propagate without natural limits when not regulated by hunting.</p> <p>The number of wildlife is pivotal to the acceptance of any species.</p>	<p>Wolves have an exceptionally high reproduction rate and will proliferate boundlessly if humans do not take action, e.g., through hunting. Unregulated wolf numbers will overstrain the carrying capacity of the endemic ecosystems and densities tolerable to human land use interests. The fact that wolves live in packs adds to the challenge.</p>

Table 4 (continued)

No.	Worldview-related beliefs contained in the narrative	Wolf-related beliefs contained in the narrative
18-HDC	<p>Humans are prescinded sovereigns, wise users, and managers of nature; hunters are their prototypical representatives.</p> <p>Humans are entitled to and responsible for using their prescinded status vis-à-vis other beings to organize and manage nature as sovereigns providently.</p> <p>To date, there is virtually no landscape untouched and unmanaged by humankind.</p> <p>A hunter responsible for fostering and harvesting the game is like a microcosm for the role humans ought to take on nature in general. In this way, hunters are at the forefront of humankind concerning the non-human environment.</p> <p>The concept of fairness is essential when hunting: game animals must be given a fair chance in the chase.</p>	<p>Wolves as agents perturb the cultural landscape's human-made order and challenge humankind's dominion over nature.</p> <p>Wolves are considered indomitable beings whose behavior is described in morally charged terms that, besides describing wolves' actions in an anthropomorphizing manner, allege that wolves possess a contrary intention toward the human reign over nature.</p> <p>Wolves cannot be domesticated or controlled behaviorally.</p> <p>Local hunters fear that the presence of resident wolves and the necessity of regulating their population may cause politicians to decide that professional hunters will be put in charge of this job who then intrude into and perturb their previously sovereignly managed hunting grounds. In a similar vein, wolves' hunting is considered and repudiated as an illegal encroachment upon the rights of the licensed game warden.</p> <p>Wolves' behavior leaves no room for romantic utopia; instead, it demands unambiguous courses of action.</p>

Group-specific Differences in Mentions of Motives

Chi-square tests reveal that the frequency distribution regarding n- and d-motive mentions of most of the five different professional groups and the six demographic groups significantly deviate from the average frequency distribution in the sample as a whole (see Table 8): Hunters, livestock farmers, wolf advisors, animal and nature's rights activists, wolfdog owners, men, and participants who had personal experience with wolves mentioned specific n- and d-motives in a pattern differing from the overall sample ($p < .001$, and $p < .01$, respectively). For women, only the distribution of d-motive frequencies diverges from the average ($p < .05$). Bearing the caveats in mind (see above), we may cautiously state that those groups exhibited particular preferences for certain thematic kinds of motives compared to the overall sample. For example, hunters' and livestock farmers' frequency distribution is tilted more toward favoring HDC narratives and controlling directives while dismissing BHF narratives and allowing directives. In contrast, the reverse is true of animal and nature's rights activists and wolfdog owners. The four wolf advisors, in contrast, exhibit a peak in mentions of ECA narratives and balancing directives.

Contrary to what might have been expected, our male subjects disproportionately often mentioned beings-focused,

harmony-oriented, wolf-favoring n-motives and assumed few human-focused, human-focused, dominion-oriented, wolf-critical stances, while at the same time proposing many more allowing- and balancing directives than the average of the sample. Female participants, on the other hand, exhibit a penchant for controlling directives, potentially due to women being more fearful and inclined to negative attitudes towards predators, despite showing a general lower tendency to support aggression towards animals (Blekesaune & Rønningen, 2010; Amiot & Bastian, 2015; van Eeden et al., 2021). The motive mentions of people having had personal experience with wolves are likewise tilted toward the HDC and controlling ends of the respective continuums, which is likely due to the predominance of negative experiences like livestock depredation in our sample, concordant with previous research (Arbieu et al., 2020).

How Narratives and Directives Relate

As we have seen, narratives and directives align along thematic continuums. Also, narratives relate to directives systematically.

First, joint mentions between narrative and directive categories exhibit a pattern. BHF narratives overlap with allowing directives, ECA narratives with balancing directives, and HDC narratives with controlling directives.

Table 5 Allowing directives

No.	Directive
1-A	Exclude lethal measures
2-A	Give free reign to nature Evaluate and accept wolves' assaults on livestock as a natural phenomenon.
3-A	Leave nature be and trust in her power to self-regulate. Adhere to the Kantian Categorical Imperative as a code of conduct when dealing with animals.
4-A	Protect wolves by land use planning: Segregate the human sphere and wolves' range because coexisting with humans would harm wolves, who need a protected space.
5-A	Abide by the human responsibility to considerately take care of the non-human world.
6-A	Humans need to self-restrict Humans need to consciously limit their consumption and use of natural resources to make room for animals' development and allow for coexistence. Humans must adjust their lifeways to coexist with wolves in areas where wolf populations exist. Humans must accept that 100% protection from conflict with wolves is unfeasible.
7-A	Create ecological awareness paving human-wolf coexistence Disseminate knowledge and spread information, e.g., about wolf ecology, particularly regarding favorable facts about wolves and protective measures, proper conduct in wolf areas, and ecological values to foster acceptance for human-wolf coexistence. Foster a close connection of people, particularly children, to animals and nature, laying the ground for understanding and appreciation for natural processes.

However, as examined by a Chi-square test, this pattern is far from significant because the overlap between categories is generally high.

However, when we consider the number of individual motives that a given participant has mentioned for each of the three categories of narratives and directives, the same systematic relation is evident: correlating the number of mentioned BHF motives with the number of proposed allowing directives, yields a high and significant correlation of $r(39)=0.75$, $p<.001$. The number of mentioned BHF motives is not significantly correlated with the number of proposed balancing directives. In contrast, it exhibits a negative correlation with the number of proposed controlling directives: $r(39)=-0.64$, $p<.001$. This means that participants inclined to beings-focused, harmony-oriented, wolf-favoring motives also tend to propose many allowing directives, particularly few controlling ones. Conversely, participants favoring ecosystem-focused, conservation-oriented,

wolf-ambivalent narratives tend rather to propose balancing directives, as evidenced by a correlation of $r(39)=0.68$, $p<.001$ between the mentions of ECA motives and balancing directives, whereas participant's mentions of ECA narratives correlate weakly with their proposals of allowing directives ($r(39)=-0.32$, $p<.05$), and exhibit no significant correlation with controlling directives. Finally, participants who mention many human-focused, dominion-oriented, wolf-critical motives also propose many controlling directives ($r=.83$, $p<.001$), but tend to propose less allowing or balancing directives ($r(39)=-0.45$, $p<.01$; $r(39)=-0.48$, $p<.001$; respectively).

So, there is a clear mapping pattern between the narratives favored by participants and their proposed directives. The same pattern also holds on the level of groups (see Table 1). The more frequently a group mentions BHF motives, the more it tends to mention allowing directives ($r(9)=0.97$, $p<.001$) and the less often controlling directives are mentioned ($r(9)=-0.81$, $p<.01$). Groups favoring ECA motives also favor balancing directives ($r(9)=0.74$, $p<.01$). Conversely, groups bringing up a lot of HDC motives propose many controlling directives ($r(9)=0.98$, $p<.001$), and particularly few balancing or even allowing directives ($r(9)=-0.68$, $p<.01$; $r(9)=-0.89$, $p<.001$, respectively).

Another analysis corroborates the systematic relation between narratives and directives. Based on the participant-generated mappings of narratives and directives (see Appendix A), we calculated Spearman's rank correlation between the continuum rank number of any given narrative and the average of the continuum rank numbers of the mapped directives. In this way, we can directly investigate a potential logical relation between the continuums of narratives and directives.

This analysis yields a high and significant correlation of $r(16)=0.86$, $p<.001$. This means that the more a narrative tends toward the beings-focused, harmony-oriented, wolf-favoring end of the continuum, the more directives map onto it, which tend toward the allowing pole. Correspondingly, the more a narrative ranges at the human-focused, dominion-oriented, wolf-critical end of the spectrum, the more directives of a controlling nature tend to map onto it.

These results support the idea that people's narratives about general views of nature and regarding wolves systematically relate to the managing options they favor.

Discussion

The empirical results provide a clear answer to our research question: People's preferences for management strategies in human-wolf coexistence are predicated on their general views of nature and their beliefs about wolves. We found

Table 6 Balancing directives

<i>No.</i>	<i>Directive</i>
8-B	Devise a label for agricultural produce stemming from wolf areas to use wolf presence for marketing and thus cover the extra expenses for livestock protection measures.
9-B	Steer the socially shared values toward appreciating nature in general and pasture management of livestock in particular. Politics needs to socially engineer the behavior of the human population based on scientific facts toward sustainability and ecological awareness. Base political and individual decisions on values and idealism (instead of profitableness). In particular, sustainable livestock farming must be appreciated and supported as a matter of common welfare (specifically concerning compensating challenges by the societally endorsed recovery of wolf populations). Create a closer connection between society and nature through urban design and sustainable architecture.
10-B	Launch joint research projects, including scientists and practitioners investigating the merit of ecological shepherding practices, human-predator coexistence, and protection measures.
11-B	Ensure a neutral-, fact-based, and balancing approach to wolf issues in politics and the media.
12-B	Establish a consensus within society Found a consultative board of stakeholders that coordinates wolf monitoring and management. These data then serve as a base for discussing management strategies that balance the board members' differing interests. In particular, the members should agree upon and implement a reliable method for monitoring population density. Enable a dialogue between urban and rural citizens and between livestock farmers and wolf proponents to facilitate mutual understanding and appreciation of the opposing viewpoints and lifeways. Also, politics ought to consult with these stakeholders before making decisions that affect them.
13-B	Prevent livestock pastures and human settlements from becoming attractive to wolves as regular food supply, e.g., by avoiding feeding wolves and eliminating easily accessible food sources.
14-B	Contract an insurance covering wolf attacks.
15-B	Ensure and support the implementation of effective and feasible protection measures for livestock. Provide professional advice and logistic and practical support for livestock protection for all sizes and economic models of farms. Provide a solid financial base and unbureaucratic support for the general work of livestock farmers who serve the common good through their vocation. Additionally, their expenses for the materials and for the workforce for implementing preventive protection measures should be fully covered by public funds. In case of wolf attacks, offer quick and extensive compensation. Farmers should not be required to provide documentation or proof of wolf attacks; instead, there should be impartial and licensed referees for examining assaults by wolves. There should be specialized contact persons, transparent chains of command, and explicit authorizations on the part of the public agencies. Allow the implementation of protection measures for livestock not to be obligatory for farmers because they are already overburdened by work. Obligate farmers to protect their livestock since voluntary schemes are not sufficiently pursued.
16-B	Implement effective protection measures for livestock Use non-lethal, painful antagonizing measures and varying deterrents to scare off wolves. In particular, innovative technical solutions should be developed and established, for example: chipping or radio-collaring for GPS tracking either wolves or sheep; collars administering electric shocks, alerts, or aversive odors when wolves approach sheep; drones for monitoring. Effectively engage Livestock Guardian Dogs: reputable breeders belonging to a certified association; careful choice of suitable individual dogs; rigorous and professional training.
17-B	Wolf proponents should actively engage in facilitating human-wolf coexistence. Proponents of human-problem animal coexistence should take legal and financial responsibility for "their" wildlife, just like shepherds need to take legal and financial responsibility for the behavior of their livestock. Alternatively, wolf proponents should actively partake in the practical protection of livestock and not request that farmers carry all of the financial and work-load. Wolf proponents volunteer to support livestock farmers by establishing and maintaining protection measures against wolf attacks, e.g., building fences, holding night watches, and driving away approaching wolves.

Table 7 Controlling directives

<i>No.</i>	<i>Directive</i>
18-C	<p>Establish stringent policies for rule-based regulation and management of wolves.</p> <p>Apply “the full range” (UJ7) existing laws and policies on wildlife about wolves. Wolves should not enjoy special treatment.</p> <p>Politics must provide clear guidance and adhere to that trajectory; people will then adapt to and accept this status quo of wolf policies over time.</p>
19-C	<p>Politics needs to take action - just educating the public does not work.</p> <p>Educate the public about wolves and the perils of wolf presence and hunting, thus furthering acceptance for classifying wolves as a huntable species under game law and regulating their populations through hunting.</p>
20-C	<p>Targeted lethal removal</p> <p>Hunt wolves in a focused manner, as this is the only way of locally repelling wolves and keeping wolves shy.</p>
21-C	<p>Selectively remove problematic wolf individuals (“problem wolves”).</p> <p>Regulate wolf populations through hunting</p> <p>Under game law, suspend the legal protection of wolves and classify them as huntable species. Manage wolf population densities through hunting quotas or contraceptive measures, as these are the only means of controlling wolf numbers and establishing acceptance of wolf presence within the larger society.</p> <p>Define a cap on wolf numbers.</p> <p>Establish and monitor wolves’ exemplary conservation internationally on the European level, not (just) on the national level.</p>
22-C	<p>Non-lethal livestock protection measures are either undesirable (e.g., restricting pasture management of livestock and keeping animals in stables or securely fencing pastures, thus impeding wildlife crossings); ineffective (e.g., electric fences); too expensive (e.g., livestock guardian dogs), unfeasible (maintaining fences without additional funding); and/or wolves habituate and outsmart measures (e.g., monotonous visual or auditory deterrents)</p> <p>Entrust hunters have more direct responsibility for managing their hunting grounds, specifically regarding wolf management, as the local wardens are the most knowledgeable and competent managers of local wolf populations.</p>
23-C	<p>Protect humans and their belongings by land use planning: Segregate the human sphere and wolves’ range to protect humans and livestock from encroachment by wolves.</p> <p>Keep wolves away from civilization and the cultural landscape.</p> <p>Prohibit hunting in designated and approved wolf habitats to maintain a game density sufficient for wolves’ food supply, thus minimizing attacks on livestock.</p> <p>Maintain wolf-free zones near areas where pasture management of livestock is practiced. Specifically, dike areas need to be strictly wolf-free.</p>
24-C	<p>Catch and keep all wolves in fenced game reserves.</p> <p>Prohibit the reestablishing of wolf populations and exterminate existing wolf populations in Central Europe.</p>

strong correlations between the thematic categories participants mentioned – beings-centered, harmony-oriented, wolf-favoring; ecosystem-focused, conservation-oriented, wolf-ambivalent; or human-focused, dominion-oriented, wolf-critical –, and the thematic categories of the directives – allowing, balancing, or controlling – which they propose. This connection is even more pronounced on the

level of participant groups. The correlations can be identified as causal relations by the qualitative information provided in the context of interviewees’ statements. Thus, it can be asserted that participants favor directives of a particular valence *because* of what they believe to be true about nature in general and wolves in particular.

Table 8 Frequency distributions of motive mentions (in percentages) for 11 sub-samples representing five professional and six demographic groups.

Participant Group	Narratives			Directives		
	BHF	ECA	HDC	A	B	C
Hunters **, ***	14	43	43	11	28	61
Livestock Farmers **, ***	12	51	37	11	40	49
Wolf Advisors ***, ***	23	64	13	26	59	15
Animal and Nature Rights Activists ***, ***	69	31	0	54	39	7
Wolfdog Owners ***, ***	43	53	4	38	55	7
Men ***, ***	41	48	11	40	52	8
Women (n.s.), *	21	41	38	22	29	49
Participants older than 47 years (n.s.), (n.s.)	21	41	38	23	32	45
Participants of 47 years or younger (n.s.), (n.s.)	34	45	21	31	41	28
Participants without personal experiences with wolves (n.s.), (n.s.)	35	41	24	36	34	30
Participants having had personal experiences with wolves **, **	14	47	39	12	42	46
Average (= expected relative frequencies if groups exhibited no preference for motives of a certain category)	27	43	30	27	37	36

* $p < .05$, ** $p < .01$, *** $p < .001$, significances refer to Chi-Square Tests investigating whether a group's responses diverge from the average frequencies; separate tests being performed for narratives and directives, respectively

Specifically, participants and groups inclined toward a beings-focused, harmony-oriented, wolf-favoring outlook view wolves as “belonging to life, as individuals, devoid of any utilitarian value to humankind [...]; they have a right to exist as a part of mother nature” (UJ1). Given this conviction, any management option that somehow limits or restricts the liberty of wolves to pursue their ways of life would be intolerable. Accordingly, they propose to “live and let live” (UJ12). In contrast, participants and groups holding human-focused, dominion-oriented, wolf-critical views naturally go with more controlling directives for wolf management. As expressed by UJ7, mankind has a God-given right to reign over the earth and the “duty of making the best of that”. At the same time, MG13 paints a dire picture of the detrimental effects of resurging wolf populations: “in regions with high wolf densities, people do not dare leave their homes – because they will be devoured as well!” Therefore, the only option for human inhabitants of wolf areas is to leave one's house “armed with a gat.” Finally, participants and groups favoring an ecosystem-focused, conservation-oriented, wolf-ambivalent perspective are in touch with both perspectives and tend to support balancing directives, finding “a middle ground between complete protection and entire disfranchisement” (MG14) of wolves. Notably, some people subscribing to these positions are willing to engage in facilitating these directives. For example, MG16 says she does not just aspire to be a “hero on the keyboard” and therefore engages as a volunteer in supporting affected livestock owners.

Corroborating and Complementing Extant Knowledge

Parts of our results concur with existing knowledge on the human dimension of wildlife, and others bridge previous gaps in research. Many of the individual n-motives pick up concepts that have been discussed as relevant, e.g., questions of the belonging of a returning species to an endemic ecosystem (Ghosal et al., 2015; Sjölander-Lindqvist, 2015; Hiedanpää & Pellikka, 2017; von Essen & Allen, 2020) or the allegation that wolves attack livestock not for hunger, but are motivated by a genuine lust for killing (Bath, 2000; Lescureux & Linnell, 2010). Moreover, the continuum of narratives in its entirety corroborates the canonical concepts in the field and thus further underscores the power of the anthropocentrism-ecocentrism-biocentrism distinction (Callicott, 2004); the poles of mutualism and domination (Teel & Manfredi, 2010); and the contrasting ideas of separation- versus coexistence paradigms for gauging people's value orientations concerning nature and wildlife (Chapron et al., 2014).

On the part of directives, our identified continuum of allowing, balancing, and controlling types of management constitutes a new conception in the field. Previous research has profusely addressed the controlling directives of lethal control or constraining wolf habitat (Roemer et al., 2011; Lute et al., 2018; Stauder et al., 2020; Breyne et al., 2021); has discussed balancing measures such as financial support, compensation for damages or livestock protection (Naughton-Treves et al., 2003; Houston et al., 2010; Roemer et al., 2011; Lundmark & Matti, 2015; Herzog, 2019; Hamilton et al., 2020; Stauder et al., 2020; Breyne et al., 2021; Grima et al., 2021; van Eeden et al., 2021); and has occasionally considered the allowing directives of

education and doing nothing or legally protecting and monitoring wolves (Roemer et al., 2011; Glikman et al., 2012; Lundmark & Matti, 2015; Straka et al., 2020). However, to our knowledge, our study is the first to establish a systematic classification of management strategies. Notably, the allowing-balancing-controlling continuum is structured by a logic inherent to the strategies and their interrelation, as apperceived by stakeholders. In this way, this classification is as practical and strategic use as it is of conceptual value.

The mappings we found between narratives and directives conform with but also transcend previous conclusions of research in the field of human dimensions. For example, part of our results echoes the bottom line of Dietsch et al.'s review of studies on wildlife orientations and their connection to management: "The stronger a person's domination orientation, the more likely he or she is to justify the treatment of wildlife in utilitarian terms and to be accepting of actions resulting in the death of or harm to wildlife" (Dietsch et al., 2017, p. 177). Also, our mapping of narratives and directives is akin to Bauer et al., (2009) typology: For example, the BHF-allowing mapping resembles their types of "nature lovers" or "nature sympathizers," whereas the ECA-balancing association is also found in their type "nature-connected users," and the HDC-controlling correlation mirrors the essence of their type "nature controllers."

Bell (2015) analyzed farmers' and hunters' commentaries on wolf issues in online fora and framed her results even more concordant to ours. She finds two opposing discourses about wolves: One of them views "'man' as the top predator in an environment that is inherently hierarchical. The notion of hierarchy [...] evokes the Christian concept of dominion." (p.287). According to this view, wolves who are "portrayed as 'not respecting' [...] the supremacy of man" "must learn their subordinate place in nature" by being lethally controlled by human hunters (p. 288–289). The opposing discourse views humans as being "part of a web" while offering "solutions that involve humans altering their behaviors" and letting "nature take its course" (p. 295). Our results, moreover, are congruent with research on human-wolf interactions in other Central European countries such as France (Breyne et al., 2021), the Netherlands (Strake et al. 2020), Italy (Glikman et al. 2011), and Portugal (Torres et al. 2020). These studies focus on research questions different from ours, but facets of their findings underscore that socio-cultural values and views of wolves significantly shape people's ideas about wolf management. The convergence of others' and our findings indicates that despite recruiting a purely German-speaking sample, our results do not seem biased or solely applicable to German-speaking countries and highlight the overarching importance of the conceptions proposed here for understanding the human dimensions of

wildlife. Our findings thus encourage research specifically targeting cross-nation comparisons.

Our results enrich the existing knowledge by spelling out the causal nature of the mapping between narratives and directives. The in-depth one-on-one interviews with our participants enabled us to trace their lines of thought from narratives as premises to directives as logically connected conclusions.

As in the interviews, participants did not need to narrow down their spontaneous responses to fit the researcher's preconceived ideas, as when checking off Likert scales in a questionnaire, the narratives, and directives, and the systematicity of their mapping relations found in this study are empirically grounded concepts and thus ecologically valid (cf. Lamnek, 2010). The confidence in the ecological validity of our findings is moreover corroborated by the fact that the motives stated by participants were essentially the same under both UJ's and MG's research procedures: When the issue of human-wolf relations is brought up, their 'ensemble' of communicable interpretative schemes" (Oevermann, 2001, p. 5) gets activated and pours out into the interpersonal space of the interview, regardless of the exact phrasing of a question or prompt.

Implications and Applications for Wolf Management

The ecological validity of our findings also renders the concrete ideas proposed by participants particularly relevant and helpful for practical wolf management. They endorsed many pertinent management options, like financially facilitating and implementing livestock protection measures, targeted lethal removal, or managing wolf populations through hunting. However, participants also develop fresh ideas for leveraging human-wolf-coexistence, like establishing a brand and marketing produce from wolf regions. They suggest options that are, at best, on the offside of the current debate but may indeed be effective in mitigating conflict: e.g., launching joint research projects that include practitioners or recruiting wolf-enthusiastic lay people for helping with the strenuous implementation of livestock protection measures, monitoring, or deterring wolves. These strategies merit being further developed in practical management and targeted by research.

This proposal responds to the view that human-wolf relations are fraught with issues that have nothing to do with wolves in the first place, so that a proper mutual understanding may foster a common ground concerning wolf management (Johansson et al., 2012, p. 71). Notably, participants from all groups stress the importance of establishing a constructive dialogue between stakeholders, decision-makers, and those affected, and within the broader society. The aim

is to establish a consensus on wolf policy embedded within fact-bound media coverage, despite diverging values.

Can a mutual understanding be reached and social trust be built between positions as incompatible as those situated at the opposing poles of the continuums presented in this paper? Even though human-wolf coexistence is extremely controversial, a particular aspect of our findings may spawn politicians' and managers' confidence: While people exhibit clear preferences for certain management options, even individuals and groups taking seemingly opposing stances exhibit a notable overlap in their scope of ideas. 71% of participants hold beliefs of a beings-focused, harmony-oriented, wolf-favoring quality but also mention human-focused, dominion-oriented, wolf-critical narratives. Likewise, more than half of our sample (57%) envision directives about the allowing pole but also propose directives of a controlling kind. This means that respondents' views of wolves and nature comprise a broad spectrum of elements rather than being focused and monolithic. The pattern of solid correlations we found in our study is as much a sign of individual people's and groups' well-defined preferences as it is – qua nature of correlations – a reflection of the *graded* nature of that relationship on the societal level. This suggests that even persons adamant in their stance are capable of taking other(s') perspectives.

In particular, many balancing directives enjoy ample support from vastly different individuals and stakeholder groups. They may be found to be acceptable by many people, even if they do not champion them. The conciliatory potential of ECA stances and balancing directives is not only paving the way for the dialogue aspired by stakeholders of all groups and a focal point for building social trust between them. It is a toe-hold for environmental agencies to improve their relations with groups on both extremes of the spectrum. For stakeholders inclined to HDC-like attitudes, it has been shown that trust in authorities and institutions – which ex officio represent an ecosystem-focused, conservation-oriented, and wildlife-ambivalent stance and a balancing approach to management– is low (Blekesaune & Rønningen, 2010; Johansson et al., 2012; Arbieu et al., 2019). We may assume that the same is true for advocates of radical HDC values and directives. However, it seems that balancing directives framed by ECA arguments can establish a common ground for all parties. As trust in institutions has, in turn, been proposed to improve people's attitudes toward wolves, radical positions of both extremes can potentially be mollified when agencies successfully implement more balanced measures (Johansson et al., 2012; Kinsky & Knight, 2014). We, therefore, recommend the set of balancing directives for wide use in practical management. When either allowing or controlling strategies are to be pursued, we advise flanking their implementation by a suitable

measure from the balancing category. Future research on these matters is strongly encouraged.

Moreover, the evidence of a causal connection between narratives and directives may be employed for skilfully “managing” narratives to foster support for management options deemed desirable in societal deliberation. For example, resistance against management measures rooted in narratives that, in turn, are based on ecologically inappropriate assumptions may be carefully dismantled by drawing on more balancing narratives that accord with local cosmologies (Bhatia et al., 2020; Nair et al., 2021; Pooley et al., 2021). Likewise, responsibly appealing to and feeding narratives conducive to chosen management options can foster support for them. As research indicates a top-down approach to imparting scientifically adequate facts to persons who rather rely on local sources to be ineffective or counterproductive, lay knowledge, as expressed in the narratives we found, may be a potential reservoir of non-academic frames for conveying the intended information (Blekesaune & Rønningen, 2010; Skogen & Krange, 2020).

Conclusion and Outlook

Human and wolf ecology form a complex overlay in the German cultural landscape. In making sense of and dealing with the challenges of human-wolf coexistence, people adhere to narratives, i.e., interpretative schemes concerning wolves and nature, more broadly. These narratives inform the directives for wolf management that they endorse. Through our qualitative procedure, we tapped into our participant's precise lines of reasoning and carved out a clear-cut causal connection between narratives and directives. The narratives we discovered corroborate an extant understanding of the human dimensions of wildlife. Our participants' proposals for management directives and the classification scheme we established for them confirm that the spectrum of possible interventions is challengingly diverse but also encouragingly rich. These results provide a firm basis for researchers and practitioners to leverage wolf management. Our findings are one more piece of evidence that in the socio-ecological systems which humans and wildlife co-create, managing wildlife significantly translates into managing the human dimension, including people's narratives.

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Data Availability Copies of interview transcripts (in German) can be made available upon request.

Declarations

Competing Interest The authors, therefore, declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Ethics Approval Prior to conducting the research, UJ presented her paradigm to the ETH ethics committee and was granted consent for pursuing this plan by the responsible agent without a need to apply for formal approval by either the ETH ethics committee or the cantonal ethics committee in Zürich. Likewise, MG’s research did not require formal approval by state or institutional law. Informed consent was gathered from all participants prior to the individual interviews.

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