

Environmentalities of Coexistence with Wolves in the Cantabrian Mountains of Spain

Running title: Environmentalities of wolf coexistence

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Abstract:

Coexistence between humans and large carnivores is mediated by diverse values and interactions. We focus on four sites in the Cantabrian Mountains of Spain with a history of continuous wolf presence to examine how perceptions of coexistence vary across contexts. We conducted semi-structured and informal interviews with livestock farmers (n = 271), hunters (n = 157), and local community members (n = 60) to collect quantitative and qualitative data on people's experiences of coexistence with wolves. We use an environmentality framework to analyse approaches to wolf governance across sites and explore how local resource users perceive, negotiate, and respond to different governance approaches. Our analysis is firstly structured around coexistence subjectivities associated with pastoralist and hunter cultures. These encompass ambivalent and multi-layered relations founded on notions of reciprocity with nature and on resource users' roles as producers and land stewards. Secondly, we explore encounters between local cultures, interests, and environmental regulations in the context of different site-based environmentalities. The framework we adopt enables coexistence to be conceived as a space of competing knowledges and practices, arising from everyday embodied interactions with wolves and the cultural politics through which local communities negotiate different ways of governing, knowing, and relating to nature.

Keywords: Large Carnivores, Wolves, *Canis lupus*, Environmentality, Coexistence, Human-wildlife Conflict.

Supplementary material: <https://bit.ly/3o8usti>

1. INTRODUCTION

Among a growing body of literature analysing ways in which nature is constructed and contested (Brosius 1999; Robbins 2012), there has been a recent upsurge in interest in the application of Michel Foucault's post-structural theory of governmentality (2007; 2008) to the governance of people's relations with nature (Fletcher and Cortes-Vasquez 2020). Seminal work by Luke (1999), Agrawal (2005), and Fletcher (2010) has laid the groundwork on which many other studies have explored the relationships between environmental governance, social change, and the creation of environmental subjects. The theory of green governmentality or 'environmentality' (Luke 1999; Agrawal 2005) has been used to investigate how people perceive, relate to, and care about their natural environment by focusing on encounters between different conservation regimes, local interests, and culture. To date, environmentality frameworks have primarily been applied to protected areas or ecotourism initiatives (Agrawal 2005; Erb 2012; Bluwstein 2017; Cortes-Vazquez and Ruiz-Ballesteros 2018). Here, instead, we apply the theory to the field of human-animal studies, focusing specifically on relations between people and wolves under different management regimes. Our analysis builds on Fletcher's (2017) framework of multiple environmentalities whereby local culture and interests, along with different systems of wolf management, contribute to shape local perceptions of coexistence with wolves.

Historically, in landscapes dedicated to livestock rearing, coexistence between people and wolves involved elaborate systems of livestock husbandry and wolf population control, usually carried out by local communities or professional hunters. State intervention was generally limited, although parts of Europe and North America used significant state-sanctioned bounties to promote wolf population control (Marvin 2012). This widespread persecution resulted in the eradication of wolves throughout most of their historical range (Chapron et al. 2014). However, a growing international awareness of global environmental destruction during the second half of the twentieth century gave birth to national, sub-, and supranational institutions that now govern relations between people and nature to various extents (Luke 1999). Thus, wolf management in some parts of the world has changed from being a largely de-centralised eradication regime to being an increasingly centralised conservation regime. Its

consolidation as an object of government by public institutions at different scales has been operationalised through a range of species and habitat conservation policies, damage compensation schemes, and incentivised changes to livestock herding (e.g. Chapron et al. 2014). Meanwhile, in Europe, agrarian structural changes have resulted in the gradual abandonment of many rural areas. As the material, cultural, and political influence of rural practices and lifestyles declined, many landscapes underwent a process of ecological transformation. Together, these changes have led to the recovery and expansion of wolves in many parts of Europe (Cimatti et al. 2021), where communities who have traditionally coexisted with wolves and communities where wolves have recently returned have had to negotiate new ways of relating to the predator under the growing influence of external and evolving interests.

Here, we apply the theory of environmentality to examine how perceptions of coexistence with wolves are influenced by current environmental regulations, local culture, and interests. Our study takes place in four sites in the Cantabrian Mountains of Spain, characterised by historical coexistence with wolves but different systems of environmental governance and wolf management. The study was carried out before the species was protected in all of Spain in 2021, when wolf management was diverse and decentralised. We begin by presenting the conceptual debates surrounding the theory of environmentality and its critiques. We then explore different constellations of environmentalities within existing formal wolf management systems across our four study sites. Next, we characterise an informal, culturally-rooted mode of environmentality related to local farmer and hunter relations with the natural environment and their roles as producers and stewards of the local landscape. Finally, we explore local coexistence subjectivities resulting from the encounter between culture, interests, and environmental regulations. In doing so, we aim to reveal the tensions and synergies that manifest as different environmentality approaches interact with each other and with communities on the ground. By couching resource user's expressions of care and control towards wolves in a broader set of livelihood practices, environmental relations, and political negotiations, we provide an understanding of local coexistence that is often tense and ambivalent, but that nonetheless exhibits elements of conviviality.

2. THEORETICAL FRAMEWORK

Literature on the human dimensions of wildlife generally interrogates the efficacy of policies and management tools aimed at mitigating conflicts around carnivore presence by measuring their impact on local attitudes. Research within this field often adopts quantitative scales to differentiate between positive and negative attitudes (Treves et al. 2013; Browne-Nuñez et al. 2015) focusing on the psychological and cognitive structures that form a linear pathway from beliefs through to attitudes and behaviours (Zinn et al. 2000). Some of this research has attempted to make sense of nature value systems by placing them on an ecocentric-anthropocentric scale (Vaske and Donnely 1999) to describe whether nature has intrinsic value or whether its value depends on how it benefits humans, or a mutualistic-dominionistic scale (Dietsch et al. 2016) to discriminate between attitudes of care and affiliation and attitudes of control and domination of nature. On the other hand, anthropological approaches that interrogate the role of culture in defining relations with the environment problematise the application of prescriptive scales that originate outside of the system under study and tend to enforce a dualistic vision of human-nature relations (Peterson et al. 2010). Ethnographic approaches attempt to document human-nature relations from the point of view of local communities and on their own terms through the observation of everyday material and discursive practice. Research following this approach has facilitated an understanding of local relations with wildlife as multi-layered and situated within a wider set of cultural practices and belief systems concerning the nature and order of reality and humans' role within it (Goldman et al. 2010; Pooley 2021; Montes et al. 2020).

Building on such approaches, studies in political ecology have focused on exploring the conflicting knowledges, narratives, and meanings attributed to nature that underlie conservation conflicts (Adams 2015; Skogen et al. 2008). Within such approaches, the concept of governmentality (Foucault 2007, 2008) or environmentality, when applied to the environment (Robbins 2012), has been used to trace the effects of environmental regimes on local socio-ecological relations. In its initial conception, governmentality was understood as a form of disciplinary action intended to affect individuals, extending into people's intimate lives, subjectivities, and practices. However, in his later work, Foucault (2008) expanded this theory to include diverse modes of government. As elaborated by Fletcher (2010,

2017) these have been applied to define different ways of governing people's relations with the environment. The first approach, 'sovereign environmentality', is a top-down, fortress conservation or fences and fine approach (Brockington 2002). 'Disciplinary environmentality' aligns with the original conception of governmentality theory, referring to policies that compel subjects to internalise environmental values and ethics and to self-regulate, for example through awareness raising campaigns, or forms of participation in environmental management which infuse environmental consciousness into everyday practices (Agarwal 2005). They may include economic incentives if these are intended to change environmental values. 'Neoliberal, market, or incentive-driven environmentality' is understood as a system of external incentive structures that motivate human behaviour without changing people's views (Fletcher and Breitling 2012). It is based on a vision of humans as inherently self-interested and rational actors who behave to maximise their economic opportunities (Büscher et al. 2012) and refers to processes aimed at privatising or commodifying nature, such as ecotourism and trophy hunting, but also refers to welfare-based approaches such as agricultural or protected area subsidies. Finally, 'truth or culturally-rooted environmentality' is perhaps the least explored in current literature but has been associated with the cultural practices and belief systems uncovered by anthropological enquiries into people's spiritual, religious, and emotional attachment to nature, and into traditional ecological knowledge (Montes et al. 2020). A fifth approach, developed from critiques that the environmentality framework discounted agency (Cepek 2011; Fletcher and Cortes-Vasquez 2020), is akin to a 'community-driven environmentality' where local people have a participatory or self-mobilising role in environmental governance (Fletcher 2010). Multiple environmentalities may be at play within any given conservation initiative (Fletcher 2017). They may be in competition with each other, creating tensions on the ground, or they may be in synergy, enhancing one another.

Environmentality theory has been critiqued for giving too little scope to history and affective and material connections with the environment (Fletcher and Cortes-Vasquez 2020). Our research falls within the environmentality literature that focuses on the agency of local resource users and how they respond to conservation interventions (Cepek 2011). By understanding wolf coexistence subjectivities as both socially constructed and shaped by everyday material interactions with wolves and the local landscape, our approach extends beyond a purely post-structural one, and aligns with literature that

adopts a phenomenological perspective to understand socio-ecological relations (Ingold 2000; Cortes-Vasquez and Ruiz-Ballesteros 2018; Fry 2020). In this context, there has been a recent spurt in studies focused on affective labour and ecologies (Singh 2013, 2018), resonating with literature on convivial conservation that advocates for the cultivation of intimate connections and engagements with nature (Büscher and Fletcher 2020).

Our paper therefore attempts to bridge theories of environmentality and human-wildlife coexistence. It does so by contributing an understanding of coexistence as rooted in longstanding interactions between people and nature as well as negotiations between local resource users and wider conservation regulations. The framework enables coexistence to be conceived as an arena of competing knowledges and practices (Montes et al. 2020). It expands notions of “what counts as ‘political’” (Wang 2015, 323), by exploring wolf coexistence subjectivities through the constitutive role of knowledge generated by higher-level governance structures and institutions (i.e. ‘biopower from above’), and knowledge generated from embodied practices, local culture, and community governance arrangements (i.e. ‘biopower from below’).

3. MATERIALS AND METHODS

The Cantabrian Mountains, in northwest Spain, encompass deciduous forests, meadows, high pastures, and valleys. Whilst the largest towns in the mountain range have a history of coal mining, the majority of settlements are small and interspersed throughout the landscape. Our four study sites, the private hunting grounds (PHGs) of León, the Regional Hunting Reserve (RHR) of Riaño, Cangas del Narcea, and Somiedo, span across two Autonomous Regions (the former two in Castile and León and the latter two in Asturias; supplementary materials 1). Local communities historically relied on mixed subsistence farming of crops and livestock for both meat and dairy. This involved seasonal herding of livestock from valleys to higher pastures and, in some cases, seasonal herding across longer distances (Arango Fernández 2011). A transition into more specialised meat cattle production began in the mid-twentieth century and was consolidated after Spain joined the European Union in 1986. These changes resulted in

a significant reduction in the number of livestock farmers but an overall increase in cattle herd size, and the near disappearance of long-distance herding (Arango Fernández 2011).

In Cangas del Narcea and the PHGs of León, livestock farming became a secondary activity during the coal mining boom but was revived in the 1990s as the mines were shut down, whilst in Somiedo and the RHR of Riaño, livestock farming was always the main livelihood activity, only recently being paralleled by the growth of the tourism sector. Somiedo is an established UNESCO Biosphere Reserve, renowned for brown bear tourism, while parts of Cangas and the RHR of Riaño exist within protected areas. A gradual and relentless process of depopulation at all four sites has resulted in an aging population and the abandonment of many small villages (Arango Fernández 2011). Local communities have always coexisted with wolves, and wolf packs are present across all four study sites (MAPAMA 2014).

Our study takes a mixed-method approach (Bernard 2011) to explore resource users' perceptions of coexistence with wolves across different environmental and wolf management regimes. We based our findings on data collected across these four study sites, consisting of: a survey of livestock owners (n = 271) and hunters (n = 157); semi- and unstructured interviews with administrators, hunters, farmers, and other community members (n = 70); happenstance conversations and participant observation. The latter was conducted by accompanying farmers as they herded and tended to livestock, grew, picked, slaughtered, prepared, and consumed food. It also involved participating in hunting social gatherings and other community celebrations and events. Each survey and interview lasted between 20 minutes and 1.5 hours. Fieldwork lasted a total of 15 months between 2015 and 2017. The surveyed livestock farmers were selected through a random and geographically stratified sample based on the public registry of the Common Agricultural Policy (supplementary materials 2). Hunters and other members of the community were selected through opportunistic snowball sampling.

The survey consisted of multiple choice and Likert scale responses as well as open-ended questions. The qualitative data collected in the survey and interviews and the research fieldnotes were analysed thematically (Braun and Clarke 2006). Owing to discrepancies in official data (Marino et al. 2018), we relied on farmers' assessments of livestock lost to wolves in the full two years before the interview for

our assessments of livestock depredations (supplementary materials 2). The following sections provide an analysis of, firstly, the different environmental approaches present in each study site based on information collected in policy documents and interviews; secondly, resource users' culturally-rooted relations with nature based on data collected in interviews and participant observation; and finally, common and place-specific wolf coexistence subjectivities based on the quantitative and qualitative data collected in the surveys and interviews.

4. RESULTS

4.1 Environmental Approaches Present in the Study Areas

Wolf management in Spain is regulated by regional management plans and national laws, as well as supranational regulations such as the Bern Convention (ratified by Spain in 1986) and the EU Habitats Directive (Directive 92/43/EEC), which require healthy wolf populations to be maintained. In 2021, following a ministerial decree, wolves became a protected species in all of Spain (TED/980/2021), but at the time of our field research (2015–2017), management was heavily decentralised, and wolves in our study sites could be either hunted or culled, provided the population remained within favourable conservation status (Trouwborst 2014). Spain's Autonomous Regions are responsible for developing wolf management plans, determining damage compensation, allocating damage prevention funds, and determining rule enforcement. At the time in which our study took place and specifically in the case of our field sites (Trouwborst 2014), Autonomous Regions were also responsible for deciding if wolves were a game species (northern Castilla y León) or were culled by rangers (Asturias), and setting hunting/culling quotas. Some aspects of wolf governance further vary within regional territories, between protected areas, and regional and private hunting reserves.

We used the environmental framework to identify differences in governance between the study sites, as well as areas of overlap and potential conflict between different approaches (Figure 1 and

supplementary materials 1). Elements of sovereign, disciplinary, market/incentive-driven, culturally-rooted, and community-driven environmentalities are present in each site but may be differentially prevalent. For example, the PHGs of León exhibit strong elements of market/incentive-driven environmentality, whereby damage compensation functions only through private insurance, licences to hunt wolves and other species used to be privately acquired, and there is limited government involvement in enforcing hunting rules. Somiedo, on the other hand, exhibits strong elements of disciplinary environmentality. There, a public damage compensation system, additional subsidies for farmers, and the protected area's promotion of ecotourism are intended to promote more tolerant perceptions of wildlife.

Types of environmental approaches	PHGs of León	RHR of Riaño	Cangas del Narcea	Somiedo
Sovereign Top-down conservation approaches that compel subjects to change their practices based on rule enforcement (e.g. fortress / fence and fine approaches)	Bern Convention, Habitats Directive and Wolf Management Plans of the Autonomous Regions that set wolf culling or hunting quotas			
			Wolves are not a game species, but a culling program is implemented by rangers	
	Presence of a PA*:			
		... in one part of the territory. - The RA** plays a large role in managing hunting	...in one part of the territory, where hunting is managed by the RA	...in the whole territory, where hunting is managed by the RA
	Prevalently public communal land tenure			Prevalently public communal land tenure
Disciplinary Top-down policies that compel subjects to internalise 'positive' environmental values and conservation friendly ethics, and to self-regulate	Public wolf damage compensation system			
	Wolves are a game species			Additional subsidies to farmers from the PA
	Wolf tourism		Wildlife tourism (bear focused)	Wildlife tourism (highly developed sector, bear focused)
(Neoliberal) Market or incentive driven Processes aimed at privatising and commodifying nature by providing economic incentives	Wolves are a game species			
	Damage compensation based on private insurance	Public wolf damage compensation system		
	Private hunting of wolves and other game, with limited hunting rule enforcement	Hunting licenses for wolves and other game sometimes sold in auctions	Limited hunting rule enforcement	Subsidies to farmers from the PA
	Wolf tourism		Wildlife tourism	Wildlife tourism (highly developed)
(Truth) Culturally rooted Traditional ecological knowledge encompassing cultural, emotional and everyday material relations with nature	Farmer and hunter relations with the natural environment and with wolves are linked to their roles oriented towards production, stewardship, custodian and pastoral care. These contribute to notions that human intervention is necessary and beneficial to the local ecosystem.			
Community driven Local communities have a participatory or self-mobilising role in environmental governance	Presence of communal land tenure (public and private, to different extents)			
	Neighbourhood associations benefit from, and directly manage, most hunting revenue and often also manage hunting itself	Neighbourhood associations benefit from hunting revenue but hunting itself and most hunting revenue is managed by RA	Wolf culling plans are presented to stakeholder groups and local administrators Communal land tenure is a highly contentious issue and is linked to opposition towards the PA	

Figure 1 Summary of wolf environmental approaches present in each study site in 2015–2017.

Darker greys represent a stronger prevalence of the respective approaches.

**PA: Protected Area; **RA: Regional Administration*

4.2 Culturally-Rooted Environmentalities

In line with other scholarship, we understand ‘truth’ or culturally-rooted environmentalities as encompassing forms of traditional ecological knowledge and broader systems of beliefs and cultural practice regarding the order of nature and humans’ place within it (Erb 2012; Montes et al. 2020). Resource users from across our study sites viewed their landscape as a bountiful environment, moulded and made productive by centuries of human activity and labour. Livestock farming was considered a defining element of the local ecology, giving the landscape shape, meaning, and purpose. Human engagements with the environment encompassed relations of care, production, extraction, and control, performed through everyday sensorial and embodied practices of pastoral labour and stewardship.

The daily tasks of care carried out by farmers towards their livestock included herding and checking on them in high pastures, feeding and sheltering livestock in the winter, nurturing the young and sick, and delivering births through long hours in the night-time. Farmers also fertilised soils to grow cattle feed and cultivated vegetable gardens, fruit trees, and beehives. Alongside these acts of care, there exist also practices that restrain, control, inflict pain, and kill livestock. Farmers separated calves from the herd and constrained their movement for priming, and they transported livestock to faraway places through arduous journeys or slaughtered and consumed them at home. Although resource users often differentiated between wild and domestic spaces, and lamented when wildlife transgressed barriers, acts of pastoral care and control extended beyond domestic livestock to also encompass wildlife and landscape management. Hunting, tree felling, and shrub burning were mostly seen as ecologically beneficial interventions. Fire was often understood to have regenerative qualities, and managed forests to be healthier than those untouched by humans. On some occasions, hunters were known to provide supplementary feeding to game during harsh winters, and overall viewed hunting as a necessary form of population control for many species. Hunting was believed by some to protect vulnerable game from carnivores, control disease, reduce consanguinity, and prevent undesirable behaviours such as infanticide: “Before, nature used to control itself. But from the

moment man became sedentary and put his hands on nature, species no longer control themselves. Nature must be managed now.” (hunter in Cangas).

Humans were, for the most part, understood as the most important actors in the local environment but in no way viewed themselves as separate from it. Rather, they engaged in daily reciprocal relations with nature. Pastures and forests should not be left to waste: “one must take advantage of (*aprovechar*) the pastures” (farmer in RHR of Riaño); while at the same time, livestock carcasses were believed to have been an important food source for large carnivores in the past, used as a way of “taming” wolves (farmer in PHGs of León) and enabling a more peaceful coexistence.

Social memories of past hardships, scarcity, and perseverance were reflected in farmers’ accounts of the current crisis of the livestock breeding sector. Declining agricultural subsidies and stalling sale prices were considered primary threats to viable livelihoods for small-scale farmers. In the context of structural disadvantage and an aging and dwindling local population, resource users saw themselves as inhabiting a space of historical and contemporary marginality. Land abandonment and depopulation dominated resource users’ perceptions of their surroundings and were seen to negatively affect the social and environmental quality of the landscape.

4.3 Common Coexistence Subjectivities

Resource users’ views about coexistence with wolves in many ways reflected how they viewed their place in the landscape. Across all study sites, farmers overwhelmingly believed that wolves belong to the nature of their area (Figure 2c) but were divided over the importance of conserving them (Figure 2a). Overall, farmers who did not believe it is important to conserve wolves were in a slight majority (Figure 2a), as were those who felt that wolves do not help maintain nature’s equilibrium (Figure 2d). Hunters’ attitudes towards wolf conservation were instead predominantly positive: most either agreed or were neutral regarding the importance of conserving wolves (Figure 1a in supplementary materials 4) and felt that wolves enriched

their experience of nature (Figure 1b in supplementary materials 4). Positive attitudes toward wolves were sometimes expressed in terms of the joy experienced in seeing and knowing they exist but, more often, informants referred to their longstanding coexistence with wolves as evidence of their tolerance.

Habituation to wolves meant that their presence was not viewed as extraordinary, but rather, informants who showed tolerance towards wolves saw them as just another animal: “It’s not important to have wolves, but they have always existed” (farmer in Somiedo); “I can hear wolves howling at night (Do you enjoy it?) I don’t hate it” (hunter in PHGs of León). Some also expressed tolerance for a certain level of damage, claiming that “(wolves) too must eat” (farmer in Somiedo). Farmers’ habituation to wolf presence was often reflected in their livestock herding practices and damage prevention measures. Although farmers have abandoned traditional systems of collectivised livestock shepherding (Arango Fernández 2011), most protected their livestock during the birthing season by keeping the young in nearby fields, and around one-quarter of them owned livestock guarding dogs (supplementary materials 5).

Farmers across all sites overwhelmingly believed that the wolf population would keep increasing unless it was controlled (Figure 2l), and most felt that there were too many wolves in their area (Figure 2k). Most farmers and hunters spoke of “conservation through control”, referring to their acceptance that wolves belonged to the landscape but required management. The wolf’s contribution to maintaining an ecological balance in the landscape was not necessarily denied (Figure 2d) but was considered secondary to the role played by humans. “Here wild animals don’t maintain the natural balance because humans control wild animals.... (but later says) wolves do us a favour because they keep disease in check” (farmer in RHR of Riaño). ‘Conservation through control’ generally referred to maintaining the damages caused by wolves at acceptable levels, but some informants alluded to a level of control that would most likely reduce the population to unsustainable levels. Some mentioned that wolves should be conserved in enclosures or that they should be completely eradicated.

Reasons behind negative attitudes toward wolves were primarily associated with damages to livestock. Wolves were perceived as a threat to livestock by the majority of farmers in most field sites and by a slight minority in the PHGs of León (Figure 2e). Wolf depredations varied considerably across the study sites: 71% of farmers claimed to have suffered damages over the past two years in Somiedo, 66% in the RHR of Riaño, 51% in Cangas, and 38% in the PHGs of León (supplementary materials 2). On average, in 2015, farmers claimed to have lost between 0.31–1.89 livestock heads and between 0.13–1.53 meat cattle heads at each site. Farmers spoke of the economic impacts of wolves and the burden that wolves placed on their herding practices.

Farmers also spoke of the emotional effect of losing or witnessing injury to livestock and lamented the government's and urban environmentalists' reluctance to take responsibility for depredations by compensating damages fairly or through wolf population control (Figures 2m and 2n). Finally, wolves were portrayed both as a cause and as a symbol of depopulation owing to their perceived threat to local farming practices. The perceived increase in wolf numbers (Figure 2j) was reported as causing some farmers to abandon livestock keeping. But even more powerful was the metaphor of wild wolves taking over once populated and productive landscapes. Despite these narratives, the field sites exhibit cautious evidence of a type of coexistence laden with conflict yet not entirely defined by it. The majority believed that wolves had a place in the landscape and that their presence could be tolerated if their management were made compatible with the local vision of an ordered and productive landscape (Figure 2f).

4.4 Place-based Coexistence Subjectivities

Despite many common aspects to resource users' views across all sites, there are also important differences. Perceptions of carnivores are known to vary even at small scales (Piédallu et al. 2016), and although our results show that wolf depredations were significant predictors of certain attitudes towards wolves, damages did not alone explain the variation in attitudes between study sites (supplementary materials 2). In the

following sections, we trace the interplay between the coexistence subjectivities described above and the multiple and overlaying environmentality approaches present in each site.

4.4.1 PHGS of León (*Castilla y León*)

The PHGs of León had the most decentralised system of wildlife governance of all four sites (Figure 1 and supplementary materials 1). Wolves were listed as a game species, wolf and other hunting permits were acquired privately, and hunting management was devolved to license holders. Privately employed rangers accompany hunters, and the damage compensation system functions through private insurance (Marino et al. 2018). Alongside a strongly market-driven hunting system, there are elements of a community-driven environmentality approach as local democratically elected Neighbourhood Associations are holders and beneficiaries of hunting rights on public lands.

Upon first glance, the privatised and community-managed hunting systems of the PHGs of León appeared to support each other, as the hunting of wolves and other species generated significant revenue for local Neighbourhood Associations and also allowed hunters a high level of autonomy over wildlife management. However, deeper enquiry revealed tensions between the two approaches, as some hunters reported that the market-driven hunting system, based on concessions sold to the highest bidder, excluded local hunters: “hunting is for the rich” (hunter). Stronger decentralisation and weaker rule enforcement in the PHGs of León resulted in an interesting combination of attitudes towards wolves. This site showed the lowest level of declared (supplementary materials 2) and perceived (Figure 2e) damages to livestock, and the most open and relaxed attitudes towards wolf poaching (supplementary materials 6), sometimes justified by the lack of damage compensation. Despite having a less advantageous compensation system from the regional administration, farmers in the PHGs of León were less likely to claim their tolerance would increase with improved compensation (Figure 2m), suggesting they appreciated the decentralised system in place. Finally, hunters (supplementary materials 4) and farmers were significantly more likely to claim that wolves

enrich their experience of nature (Figure 2b) and to be more tolerant of the size of wolf population (Figure 2k). The apparent open and relaxed attitudes towards the illegal killing of wolves and positive emotional attachment to wolves are seemingly in contrast with each other but could be explained by the high value local resource users placed on their autonomy and their role in maintaining their vision of a natural balance: “Wolves carry out a good selection of wild prey, they take out the sick ones. I like to see them and I also hunt them. It would be better if the regional government did not do anything, we can control them perfectly.” (hunter).

4.4.2 RHR of Riaño (*Castilla y León*)

Compared to the PHGs of León, the RHR of Riaño shows a stronger influence of disciplinary and sovereign environmentalities (Figure 1 and supplementary materials 1). Hunting revenue is reinvested in the local community but most is managed by the Regional Administration, hunters are always accompanied by Regional Administration rangers, and wolf damages are fully compensated by the Regional Government. Out of the four sites, the RHR of Riaño is the best-known destination for wolf tourism. Our results show that although resource users from Riaño had a more positive view of wolf tourism than resource users elsewhere (Figures 2h and 2i), they did not have noticeably more positive views of wolves (Figures 2a–2e). In this respect, some informants from the RHR of Riaño claimed that wolf tourism promoted a romanticised vision of wilderness and misrepresented the reality of coexistence. Such claims do not mean that wolf tourism is incompatible with local aspirations and activities. However, they indicate the potential for tensions between the intended disciplinary effect of wildlife tourism initiatives and resource users’ culturally-rooted relations with nature. Additionally, some informants also wanted revenue from wolf tourism to be distributed differently, by contributing payments to Neighbourhood Associations. Finally, our analysis of the RHR of Riaño reveals that the dependence of local communities on hunting revenue at times fuelled hostility towards wolves. Some informants claimed that the wolf’s trophy value was limited compared to the value of its prey, and through discursive expressions that linked domestic and wild animals, exhibited a strong sense of ownership over wild game: “if wolves don’t cause damages to domestic

livestock, they cause them to wild livestock” (hunter)... “(the regional administration) should compensate wolf damages to wild game too because they take money away from the town” (hunter)... “in the end, breeding wolves is more expensive than (the revenue) tourism brings in” (farmer). In this case, ‘market-driven’ perceptions of wildlife as a commodity that is owned and traded may have been strengthened by a regional development policy marked by austerity measures, which according to some informants had increased rural towns’ financial dependency on hunting.

4.4.3 *Cangas del Narcea and Somiedo (Asturias)*

Cangas del Narcea and Somiedo’s wolf management strategies tend towards sovereign and disciplinary environmentalities (Figure 1). Neither treated wolves as a game species; instead, wolf culling was carried out by rangers and wolf damages were fully compensated by the Regional Administration. However, the two sites have different land tenure systems and histories. In Cangas del Narcea, conflicts between private landowners, community land tenure arrangements, and the protected area created by the Regional Administration have resulted in legal challenges (Marino 2019), reflecting fundamental tensions between neoliberal, community, and sovereign environmentality approaches. In Somiedo, on the other hand, most land is public, the protected area is well-established and viewed relatively positively by local residents (Marino 2019). The Somiedo Natural Park coincided with, and resulted in, important investments in the area (Arango Fernández 2011), and successfully established a narrative that emphasises the biocultural uniqueness of the site.

Even though reported livestock depredations from wolves in Somiedo were higher than in Cangas del Narcea (supplementary materials 2), we did not observe any major differences in local attitudes and beliefs about wolves between the two sites (Figure 2). Furthermore, wolf poaching was reportedly less frequent in Somiedo than in all the other sites (only 6% of farmers claimed that wolves were killed illegally in the area, compared to 61% in the PHGs of León, 17% in the RHR of Riaño, and 13% in Cangas del Narcea;

supplementary materials 6). Greater law enforcement, compared with that in the PHGs of León and Cangas del Narcea, might explain lower levels of reported wolf poaching in Somiedo, influencing either the occurrence of illegal behaviour or people's willingness to discuss it. Informants in Somiedo almost always referred to the patrolling activities of rangers and the consequences of being caught as the main reason why wolves were not poached "people don't (poach) out of fear of the consequences (...) before people did it all the time, but now there are laws" (farmer). However, resource users also claimed that the higher levels of rule compliance were an outcome of internalised norms: "people are aware that it is not allowed, they have internalised it, that's what the regional administration is for (to control the wolf population)" (farmer). These accounts suggest that in Somiedo, the disciplinary effects of law enforcement and productive alliances with park authorities worked to constrain local practices. Yet these arrangements did not directly affect local subjectivities, as informants in Somiedo openly criticised the regional administration's management of wolves and shared similar views on wolf conservation as informants from the other sites (Figure 2a). Coexistence in Somiedo, therefore, appears to be sustained through a system in which livestock and hunting practices are valued elements of the natural environment, and the economy of the area is supported by public investment and tourism.



Figure 2 Descriptive plots of the items measuring farmers' attitudes towards wolves on a 3-point Likert scale. Significance (* = $P < 0.05$; ** = $P < 0.01$; *** = $P < 0.001$) is indicated: a) below each plot using Kruskal–Wallis tests across all study sites; and b) above each plot using Wilcoxon post hoc tests to examine differences between individual sites. All tests used Bonferroni adjustments (supplementary materials 3). $N = 69$ in PHGs of León; 59 in RHR of Riaño; 76 in Cangas; 67 in Somiedo

5. DISCUSSION

The Cantabrian Mountains' diverse wolf management systems and long history of coexistence offer fertile grounds to explore the wider cultural and political contexts in which relations with wolves are situated. The field sites we examined all encompass varying approaches that govern local relations with wolves: culturally-rooted environmentalities based on worldviews and practices that define the role of humans in nature; community-based arrangements through which local institutions play an active role in managing coexistence; subsidy or market-based mechanisms intended to offset the costs of coexisting with wolves; disciplinary conservation approaches intended to promote positive attitudes and behaviours towards wolves; and sovereign approaches intended to regulate and enforce the protection of wolves and land. Our study reveals the ways in which multiple environmentalities are at play within any given wolf governance system, showing how they are sometimes aligned, and other times in tension with each other.

5.1 Synergies Between Environmentalities

Data from across our field sites show that social relations with wolves are embedded within a broader set of human-environment relations (see also Montes et al. 2020). Habituation to wolves and longstanding coexistence produced some degree of tolerance, suggesting that resource users' relations with wolves are shaped not just by a socially constructed reality influenced by top-down approaches, but also by embodied, everyday experiences of material and intimate interactions with nature (Singh 2013, 2018). In our sites, culturally-rooted environmentalities encompass relations with the landscape as a whole, through livelihood practices and lived experiences, and with wolves in particular, through habituation and repeated interactions that include livestock depredations and forms of wolf population control. Local resource users viewed their activities and familiar engagements with nature as central in promoting and maintaining a natural balance (see also Kaltenborn et al. 2013). Although informants appeared to hold separate notions of wild and domestic spaces and entities, the boundaries between the two were permeable, suggesting that concepts of care, control, and sometimes ownership extended beyond farmers' relations with livestock to encompass

wildlife in similar ways. This supports other research which has shown that familiarity and everyday interactions with nature can pre-empt or blur conceptual dichotomies between nature and culture and between wilderness and domesticity (Bobbé 1993; Ingold 2000; Descola 2013).

Many local farmers are not opposed to wolf conservation, and instead favour an approach that might be summarised as ‘conservation through control’. This is a view of coexistence in which population control and reciprocity are prevalent features, and where people play a central role in maintaining a productive landscape (Bobbé 1993; Lescureux and Linnell 2010). Grounding such views in wider notions that local resource users hold about the landscape and their place within it, can help explain the origin and symbolic importance attributed to wolf control. It has important implications for resource users’ sense of autonomy and place, and is also embedded within husbandry and production-oriented subjectivities tied to farmers’ self-concepts as producers (Wilson 2001; Burton 2004). Through this lens, wolves become enrolled in struggles over the legitimacy, sustainability, and persistence of pastoral livelihoods and practices (Krange and Skogen 2007). By extension, they also become entangled in wider narratives of depopulation that link to the disappearance of inhabited and productive landscapes and of the livelihoods and practices that sustain them (Rippa 2021). Our analysis suggests that culturally-rooted and community-based environmental approaches are closely linked, they mutually constitute and reinforce each other, and in this sense, neither can really be understood without the other. The pastoral traditions of husbandry and stewardship evoked by farmers are rooted in history and culture, but they are also strategic political articulations (Li 2000; Escobar 2001). Appeals to the sustainability of their livelihoods and environmental practices were instrumental in resource users’ claims of autonomy and self-determination.

5.2 Tensions Between Environmentalities

Our case studies furthermore contribute to a growing body of literature documenting a misalignment between top-down policy and local subjectivity, and highlighting how people may resist, reinterpret, and navigate environmental and development initiatives (Wilson 2001; Heatherington 2010; Homewood 2010;

Cepek 2011). In our case, the more developed wolf tourism sector in the RHR of Riaño did not result in higher tolerance for wolves when compared with the other sites. The creation of a protected area in Cangas met resistance from local resource users and has coincided with extensive illegal fires (Marino 2019). Wildlife tourism, park subsidies, and narratives of sustainable development in Somiedo did not result in more positive perceptions of wolves compared to other sites. These are examples where policy interventions have not produced the expected change in coexistence subjectivities. Other research has doubted the extent to which subjects' worldviews can be colonised and has shown how individuals exposed to interventions may mould their practices to comply with new requirements and regulations, while still retaining their own views and beliefs (Scott 1985; Manfredo et al. 2017; Cortes-Vazquez and Ruiz-Ballesteros 2018). In the case of Somiedo, compliance with rules did not result from a disciplinary approach that changed how local communities viewed wolves but may have emerged from a productive alliance between park authorities and local resource users (see also Forsyth and Walker 2014).

Our results also exemplify contexts in which incentive- or market-based mechanisms conflict with community and culturally-rooted environmentalities and raise questions regarding the extent to which conservation approaches that rely solely on economic incentives may result in positive conservation and social outcomes. Our data show that economic incentives alone, particularly ones that are insensitive to community governance structures and antagonise culturally-rooted relations with nature, may fail to enhance coexistence with wolves. In the PHGs of León, the privatised hunting system provided revenue to local communities, but limited local hunters' access. In the RHR of Riaño, support for using wolves to attract tourism was higher than elsewhere, but tourism existed uneasily alongside local conceptions of nature, and disagreements persisted over how tourism revenue should be distributed. This draws attention to the significance of tourism as a "loaded moral territory" (Mostafanezhad and Hannam 2014) in which encounters between different worldviews unfold (Erb 2012; Martínez Álvarez et al. 2020).

Overall, informants were doubtful about claims that wolf hunting and tourism could offset the economic costs of coexistence. This was exacerbated where reported reductions in public funding from the regional

administration seemed to have increased the dependency of local communities on income generated by ungulate hunting. Whilst revenue generated from wolf hunting was meant to promote support for wolves, the much greater revenue generated by ungulate hunting served to intensify competition between hunters and wolves over wild prey. Moreover, sites with better compensation for wolf damages were not associated with higher tolerance for wolves. Our analysis illustrates the limits of neoliberal approaches to conservation (Büscher and Fletcher 2020; Apostolopoulou and Adams 2015), and the strengths of culturally-rooted approaches that recognise the importance of engaging with pastoral traditions and local visions of landscape and nature (Heatherington 2010; Peterson et al. 2010).

5.3 Multi-layered and Ambivalent Coexistence Subjectivities and Practices

Our results have implications for how coexistence is managed and highlight the usefulness of place-based accounts that complicate our understanding of coexistence and conviviality in productive ways. They show that without rule enforcement, the legal hunting of wolves does not necessarily result in lower levels of poaching (see also Louchouart et al. 2021), and that public compensation programs are not necessarily associated with higher levels of tolerance of damages (see also Agarwala et al. 2010). Management tools and policies are not experienced in isolation, but rather they depend on and interact with each other and with realities on the ground. Our case studies exemplify some of the difficulties of balancing the level of autonomy granted in wolf management with social and conservation goals. On the one hand, a centralised wolf governance system in Somiedo, strongly influenced by sovereign and disciplinary approaches, was associated with high damages and negative attitudes towards wolves but limited reported poaching; on the other, a decentralised governance system in the PHGs of León, strongly influenced by neoliberal and community-driven approaches, was associated with low damages, positive attitudes towards wolves, and yet high levels of reported poaching. In our cases, greater autonomy in wolf management was linked to more positive attitudes but not necessarily to more conservation friendly practices. Although this inference relies on informants' openness to discuss poaching and conclusions drawn from it should be tentative, it does point to the importance of examining not just how people perceive wildlife but also how they interact

with it. It brings to the forefront the practices with which people establish relations with wildlife and on which they build their own understanding of what it means to coexist.

The inconsistency between coexistence subjectivities and practices we identify in this study has important implications for how coexistence is understood. Our results contrast with behavioural science theories (Ajzen 1991) often adopted in traditional human dimensions studies, which posit a universal and one-way relationship between attitudes and behaviours. Rather, and in line with other environmentality research, our case studies emphasise the role of environmental practices in shaping subjectivities, and the ways in which both subjectivities and practices result from situated and complex negotiations between individuals and governmentality approaches (Cepek 2011; Singh 2013; Cortes-Vazquez and Ruiz-Ballesteros 2018). In the case of Somiedo, such negotiations can result in communities upholding conservation behaviours, whilst still maintaining their fundamental views.

As a whole, our approach highlights the importance of exploring the processes of cultural politics resulting in what Heatherington refers to as “identit(ies) fraught with layers of hybridity and ambivalence” (2010, 8). Our data on resource users’ perceptions of wolves depict a reality of coexistence that is never free of conflict but where, nonetheless, locals overwhelmingly believe that wolves belong to the local landscape and show more positive attitudes towards wolves than those reported on average in Europe (Dressel et al. 2015). Underlying these results is a simultaneous capacity for tolerance of wolves alongside a desire to control their behaviours and populations, sometimes to potentially unsustainable levels. In this context, categorisations that see conflict and coexistence as opposites (Frank et al. 2019) and dominionistic and mutualistic values as unreconcilable (Manfredo et al. 2016) may be inappropriate. Instead, the notion of reciprocity on which local relations with wolves are built, encompasses acts of control as well as stewardship (Goldman et al. 2010; Lescureux and Linnell 2010; Fry 2022). In our case studies, perceptions of wolves and other wildlife appear to be closely linked to farmers’ roles as producers and to the relations of dominance and care that they extend to domestic livestock. In this way, proximity, habituation, and close engagement with nature and animals may result in a type of coexistence that, if altogether different from

mainstream and predominantly dualistic conceptualisations (Sandbrook 2015), still exhibits elements of moderate tolerance and conviviality. This is a view of conviviality that values non-idealised, everyday environmentalisms built on intimate engagements with nature and carried out in lived, biocultural landscapes where traditional knowledge and local practices are acknowledged components of the local ecology (Büscher and Fletcher 2020; Toncheva et al. 2022).

6. CONCLUSION

In this paper, we analyse the cultural contexts and political negotiations through which coexistence with wolves is shaped. Our analysis reveals a complex and at times ambivalent experience of coexistence by local resource users, which is mediated by everyday engagements with nature as well as conservation and management regimes. Resource users' perceptions of wolves emerged as embedded within wider human-environment relations, and closely linked to stewardship and production-oriented pastoralist traditions. As such, they are largely founded on notions of reciprocity spanning both relations of care and control. Whilst we argue that these relations must be understood as rooted in history, culture, daily labour, and practice, they are also means through which resource users articulate their identity and negotiate autonomy with top-down management regimes. The expressions of convivial relations that we report in this study offer a vision of coexistence that is far from idealised. Instead, they are fraught with everyday conflicts and contradictions. These contradictions are exemplified by the fact that many resource users expressed both tolerance and acrimony towards wolves, but they also manifest through the multiple inconsistencies we reported between the intended effects of conservation approaches and the responses of those who are exposed to them. Our framework facilitates an understanding of how different ways of knowing and governing human-nature relations encounter each other, coningle, or collide, thereby shaping individual experiences of coexistence and resulting in unexpected combinations of subjectivities and practices. The prominent role that labour and material expressions of care and control play in shaping coexistence subjectivities in our analysis brings environmentality theories beyond a purely post-structural approach,

and aligns with theoretical currents that emphasise practice-based engagements with nature (Ingold 2000; Singh 2013; Cortes-Vazquez and Ruiz-Ballesteros 2018; Martínez-Reyes 2016). By applying environmental theories to the field of human-animal studies, we expose coexistence as an arena of competing knowledges and practices, but also as a space of possible synergies and productive alliances. Overall, our study reveals the potential for conservation approaches to improve collaborations with existing coexistence mechanisms and local notions of stewardship. Such an effort depends on a cultural and political understanding of how local resource users negotiate their own life and place-making projects in the context of wider conservation policy.

Author contribution statement:

AM conceived the study, collected and analysed the data, and drafted the manuscript; SMD contributed to the first draft; APC contributed to the data collection; JCB, JACV, JVLB, and SMD contributed critical revisions of the manuscript.

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Data Availability: Our data cannot be made available to third parties as we do not have permission from our informants to do so. Furthermore, we wish to be careful in this respect as our research addresses sensitive topics, and we want to avoid our data being used out of context. Moreover, our qualitative dataset is extensive and contains some sensitive and confidential information.

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