



Large carnivores in cultural landscapes: challenges to human-wolf coexistence in Peneda-Gerês National Park, Portugal

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Abstract

Experiences with the Coexistence model, which argues that large carnivores can live in territories shared with people, have been mostly positive in Europe. The relative success does not, however, come without significant challenges. These are related to social conflicts driven by the economic costs to local populations and related practical challenges, which are often linked to deeper divisions between individuals and groups with contrasting interests and value orientations. Coexistence is based on tolerance, which depends on several factors beyond costs and benefits, such as social trust, ability to control the risks and emotive reactions to wildlife, but also broader socio-political and economic factors beyond direct human-wildlife relations. On the basis of a case study of conservation conflict in Peneda-Gerês National Park in Portugal, the article seeks to identify the main reasons behind the observed problems of coexistence in the park, and what can be done to improve tolerance for wolves among local communities? The findings highlight three issues: (1) improve the compensation system for the victims of wolf predation by making it more prompt and upgrading the cause of death verification process; (2) provide substantial support also to other livelihoods than tourism, such as agropastoralism, which is crucial for maintaining the cultural landscape; and (3) improve communication and collaboration with the residents who actually live inside the park and are subject to its restrictions.

Keywords Human-wildlife conflict · Wolves · Coexistence · Tolerance · Protected areas · Portugal

Introduction

The North American Wilderness model, which argues that large carnivores can persist only in highly managed protected areas (PAs) or in some remote and uninhabited wilderness areas, has long been the dominant model for the protection of large carnivores (Chapron et al. 2014). Whereas it has been adopted in many Asian, African, and neotropical countries, over the last two decades an alternative – the Coexistence model, which follows a landscape-scale conservation approach and argues that large carnivores can live in territories shared with people – has been relatively successful in Europe (Chapron et al. 2014; Kaczensky et al. 2024). One indication of the success is the overall increase in Europe's wolf population and expansion of its territory (Di Bernardi

et al. 2025), which led to change in the protection status of gray wolf (*Canis lupus*) in Europe from the Bern Convention's "strictly protected fauna species" to "protected fauna species" in 2025 (Council of Europe 2025).

To some extent the need for an alternative model was dictated by the specific socio-economic and institutional context of Europe, where most of the existing PAs are too small to host even a few large carnivore reproductive units (Chapron et al. 2014), contain substantial human populations and – instead of pristine wilderness – represent cultural landscapes formed in interaction with human activities (Pinto and Partidário 2012). The relative success of the Coexistence model in Europe does not, however, come without significant challenges. The most severe obstacles are related to social conflicts driven by the economic costs to local populations and related practical challenges, which are often linked to deeper divisions between individuals and groups with different interests and value orientations (Chapron et al. 2014; Stöhr and Coimbra 2013).

Coexistence requires that the local human population is willing to tolerate the additional costs of living with large

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carnivores (Kansky et al. 2016). Tolerance depends on several factors beyond direct costs and possible benefits, such as trust in authorities, ability to control the risks and even emotive reactions to wildlife (Bruskotter and Wilson 2014). If tolerance is low, coexistence may turn into acute conservation conflict. Recent studies have, however, shown that understanding such conflicts requires that we delve deeper into local historical context and consider broader socio-political and economic factors beyond direct human-wildlife relations (Stöhr and Coimbra 2013; Vitali 2014).

On the basis of a case study of conservation conflict – and human-wolf interactions in particular – in Peneda-Gerês National Park (PNPG) in Portugal, the article seeks to identify the main reasons – both direct and indirect – behind the observed problems of coexistence in the PA, and what can be done to reduce the conflict and improve tolerance for wolves among local communities in this area? It seeks to answer four main research questions: (i) What are the tangible costs and benefits of living in a protected landscape shared with wolves? (ii) What is the level of social trust between the local population and PA authorities; and what are the main issues of conflict? (iii) Does the local population perceive it can control the impact of wolves through its own means? and (iv) What is the role of the residents' emotive relations with wolf in the conservation conflict in PNPG?

Method and study area

Conceptual approach

Coexistence is understood here as a “dynamic but sustainable state in which humans and large carnivores co-adapt to living in shared landscapes where human interactions with carnivores are governed by effective institutions that ensure long-term carnivore population persistence, social legitimacy, and tolerable levels of risk” (Carter and Linnell 2016, p. 575). It includes both the impacts of direct interactions between humans and carnivores, and conflicts between humans over the way that human-carnivore relations are managed, including both social and governance dimensions (Redpath et al. 2013; Linnell et al. 2025). The second key concept is tolerance, which can be defined as “the ability and willingness of an individual to absorb the extra potential or actual costs of living with wildlife” (Kansky et al. 2016, p. 138).

Conservation conflict studies and policies are typically based on the hypothesis that the key driver of tolerance is the ratio between costs and benefits (e.g. Anuruddha et al. 2025; Nyhus et al. 2005), which is mainly a function of subjective perceptions (Inskip et al. 2016; Kansky et al. 2016). Bruskotter and Wilson (2014) highlight three subjective factors contributing to tolerance: firstly social trust, but also

perceived control and emotive relation with the species. If a person trusts the agency charged with managing wildlife, he/she is more likely to believe the information being provided and to follow instructions (Needham and Vaske 2008; Sjölander-Lindqvist et al. 2015). Greater trust in the agency tends to be reflected in lower perceived costs and higher perceived benefits associated with the species, which, in turn, lead to greater tolerance (Riley and Decker 2000). The second factor is self-efficacy, meaning the confidence in one's ability to avoid negative outcomes through one's actions. As the individual's perceived ability to control a situation increases, he/she is likely to be more tolerant (Kansky et al. 2016; Talbert et al. 2020). Finally, a person's instinctual and emotive response to a specific species can also have a direct effect on tolerance – in addition to its indirect effect mediated by perceived risks and benefits (Bruskotter and Wilson 2014; Slagle et al. 2012).

Over the last decade and half several studies have highlighted the importance of historical context and underlying old disputes on negative perceptions about wildlife even when people cite direct wildlife damage as the main reason for hostility (Dickman 2010; Madden & McGuinn 2014; Sands 2022). Social trust, which is crucial for tolerance, is affected by the compatibility of an individual's salient values with the values of the person or institution being assessed. Value conflict together with antipathy over perceived power and status asymmetries can be a key factor behind distrust (Johansson et al. 2012). Sometimes conflict with a certain species, such as wolf, is a symbolic manifestation of such deeper social conflicts, and the resources devoted to wildlife needs are perceived as a sign of disrespect for the needs of local community (Madden and McGuinn, 2014; Stöhr and Coimbra 2013). Therefore, consideration of a more complex set of social, political and cultural factors is needed to properly understand different perceptions, values and attitudes towards wildlife in general and wolf governance in particular (Stöhr and Coimbra 2013; Vitali 2014).

Study area

PNPG was established in 1971 and it is the only national park in Portugal. In 1997 it, together with the recently created Baixa Limia-Serra do Xurés Natural Park (PNX) on the Spanish side, were joined to constitute the Gerês-Xurés Transfrontier Park, which became part of the European Natura 2000 network (Paül and Santamaría 2019). PNPG occupies parts of five municipalities in the north of Portugal (approximately 42°N and 8°W) and is bounded in the north by the Spanish border (Fig. 1). It covers an area of 69,596 ha located in a mountainous region, with elevations generally above 700 m, reaching an altitude of 1,545 m at Nevosa Peak. The landscape consists mainly of heaths

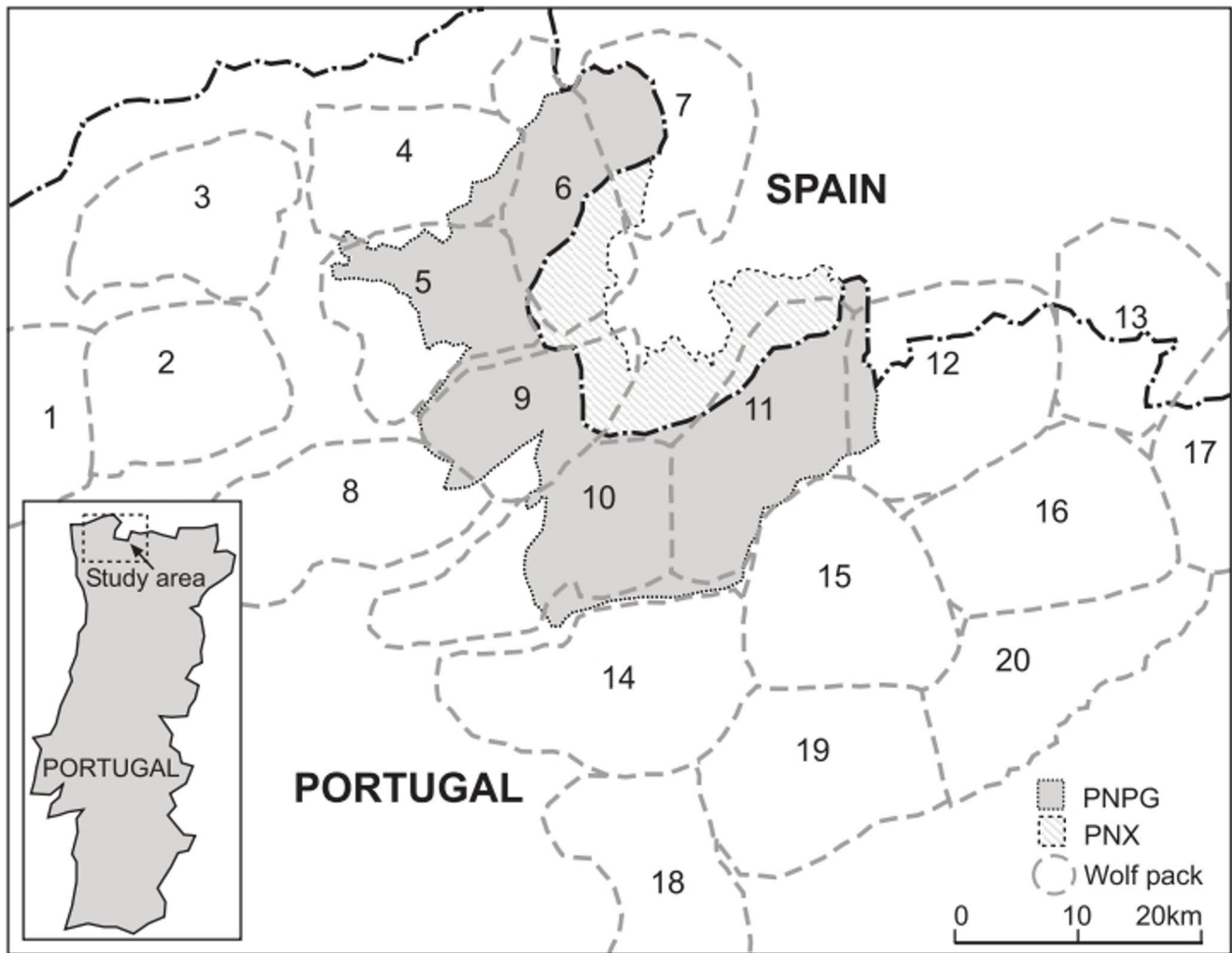


Fig. 1 Peneda-Gerês National Park (PNPG) and Baixa Limia-Serra do Xurés Natural Park (PNX) and wolf packs identified in the Peneda-Gerês populational nucleus during 1996–2005 (main map). Location of the study area in Portugal (inserted map). Source: Álvares 2011.

(45% of the territory), forests (30%), and areas of bare rock or otherwise sparse vegetation (18%). Two per cent of the territory is covered by water while the remaining part is a combination of agricultural areas, meadows and built environment (ICNF 2023b). The average annual temperature is approximately 13 °C (Cristóvão 2002) and annual rainfall is generally above 2000 mm, but there are different microclimates induced by the variations in altitude and the topographic characteristics (ICNF 2023b). The microclimates support a variety of botanic communities with species characteristic of Mediterranean, Euro-Siberian and Alpine areas (Cristóvão 2002). The high botanical diversity is combined with a rich fauna, including emblematic species such as the roe deer (*Capreolus capreolus*) and the Iberian wolf (*Canis lupus signatus*) (ICNF 2023b).

The park was inhabited by approximately 7,450 people in 2021 (ICNF 2023b). Similar to other mountain areas of Portugal, the population has declined by almost 60 per

cent since the 1960s when it reached the historical peak of 18,321 people. The greatest fall took place in the most isolated mountain parishes, such as Castro Laboreiro and Tourém (Cristóvão 2002). At the same time the population is aging rapidly, with a marked increase in the elderly population: the cohort 65 years or over made up 22 per cent of the resident population in 1991 (ICN 1995) but had increased to 41 per cent by 2021 (ICNF 2023b). In the mid-1990s the primary sector – mainly agropastoralism – still provided the main source of income for more than half of the population (ICN 1995), but since then low-intensity agriculture and extensive grazing have become economically unproductive leading to farmland abandonment. Over the last decade the supply of accommodation tourism has grown rapidly in PNPG, and currently tourism, forestry, small processing, civil construction and petty commerce are the main economic activities along with declining agropastoralism (ICNF 2023b).

In Portugal interest in nature conservation during the authoritarian *Estado Novo* regime (1933–1974) was restricted to academics who had contacts with environmental movements abroad and followed the international debates (Queirós 2012). When the first national legislation on protected areas, which enabled the establishment of PNPG, was enacted in 1970 it was largely the result of international pressure (Brandão 2015). By then two different views had emerged in the European conservation discourse: human activities should either be minimized in the PAs to protect pristine nature (the Wilderness model) or – alternatively – the PAs should aim to coexistence of people and wildlife in the cultural landscapes created through traditional human activities, such as agropastoralism (the Coexistence model) (Pinto and Partidário 2012). The differences between the models come to prominence in the context of large carnivore conservation, as the former model argues that large carnivores can persist only in exclusive PAs or other uninhabited wilderness areas, whereas the latter asserts that they can coexist with people (Chapron et al. 2014).

For PNPG, which was managed by the Forestry Services since its foundation until 1986, the Wilderness model was adopted. After the change to democratic regime in 1974 a new National Service was created for the management of PAs, but most PAs established before the regime change remained under the Forestry Services. In the mid-1980s the objective of species-oriented nature conservation gained more emphasis over cultural landscapes, and after Portugal joined the EU in 1986 more resources were made available through co-funding for PA management, which was now concentrated under the reformed National Service. Implementation of the Natura 2000, which started in Portugal in 2000, signaled a further change of emphasis from individual PAs to the broader objective of biodiversity conservation, which was accompanied by a new region-based management model (Pinto and Partidário 2012). The idea was to ensure better coordination between neighboring PAs and bring together national level and local authorities to stimulate local involvement (Queirós 2012). For PNPG, its classification as a PAN Park in 2007 reflects a return toward the original Wilderness model (Pinto and Partidário 2012).

For most of the local population the theoretical management models have little meaning aside from possible concrete benefits brought by the PA status, notably improved road network in the first years, and later EU funded agricultural subsidies and projects to maintain cultural landscapes and develop tourism (Luz 2018). More important than the PA-related support have been agricultural subsidies, especially those directed to livestock breeders, which constituted over half of the income from the sector. This is a common situation in the mountain areas of Portugal (Álvares et al. 2014; ICN 1995). The conservation status is more

concretely experienced through the externally imposed restrictions, which constrict the local inhabitants' economic activities and other aspects of everyday life (Figueiredo 2008; Queirós 2012). In PNPG the frustration and anger are typically expressed in the context of two controversial issues: use of communal lands (*baldios*) and wolves.

In Portugal close to six per cent of the lands (approximately 500,000 ha) consist of *baldios*, and some 85 per cent of these lands are currently under forest. More than half of the communal lands are situated in mountainous regions in the north of the country (Coelho 2003). They had a crucial role in traditional agro-pastoral livelihoods that supported the majority of the population in these regions, providing pastures for livestock, brush that served as bedding for the animals and subsequently as fertilizer for cultivated lands, firewood, timber, raw material for charcoal and pottery, as well as other NTFPs, such as honey and mushrooms (Brouwer 1995). In PNPG the *baldios* make up approximately 72 per cent of the territory, whereas 17.5 per cent is private land and only 7.5 per cent is public land (ICNF 2023b). The *baldios* remain important for the population of PNPG, but in the new socio-economic and legal context their relevance has changed from subsistence use to a source of income from livestock breeding, forestry and tourism. And different from the autonomous community-based management of the old days, the new market-oriented use of *baldios* is increasingly regulated by non-local (national and EU) laws and directives. The most recent bone of contention is the EU criteria from 2016 about livestock pastures eligible for subsidies, which would exclude approximately half of the *baldio* lands. As *baldios* continue to be crucial for most livestock breeders in PNPG, the new regulation threatens their livelihoods (Luz 2018).

Wolf, which has been under total protection in Portugal since 1988, has become the local emblem of conservation conflict in PNPG. Portugal's wolf population at the turn of the Millenium was estimated at 326 individuals in 63 packs but had declined to 58 packs by 2021. The decline in the number of packs was accompanied by even more drastic reduction in the area occupied by wolves, which contracted by 23 per cent, from 20.400 km² to 15.700 km². The population continues to be confined to the north and north-east of the country with more elevated densities close to the northern border with Spain (Pimenta et al. 2023), which provides an important source area for the Portuguese wolf population (Nakamura et al. 2021).

At the turn of this century, the Peneda-Gerês wolf population nucleus consisted of between 15 (2004) and 19 (1997) packs with a density of more than 50 wolves per 1,000 km² (Álvares 2011; Fig. 1). This is the highest figure in the Iberian Peninsula (ICNF 2023b), and among the highest wolf densities in the world (Álvares 2011; Fuller et al. 2003). Data from the latest wolf population census implies that the

density in the Peneda-Gerês nucleus has increased further as the number of packs increased by 50 per cent from 16 in 2002/2003 to 24 in 2019/2021, whereas the occupied area decreased by four per cent (Pimenta et al. 2023). PNPG also suffers the greatest losses of livestock due to predation by wolf in Portugal: during 1996–2005 approximately 80 to 90 per cent of the prey animals of wolf in PNPG consisted of cattle, equines, goats and sheep, whereas wild ungulates, namely wild boar (*Sus scrofa*) and roe deer made up only 7 to 12 per cent (Álvares 2011). In PNPG several wolf packs attacked more than 30 domestic animals (reimbursed by the state¹) per year in 2002–2003, and the attacks of some packs exceeded 150 per year (Pimenta et al. 2005), or more than 30 animals/wolf/year valued at more than €8,000. Such figures of livestock loss are very high even globally (Álvares 2011).

PAs in the context of contentious state-society relations

From a local community point of view, the key issue in PNPG is who has access to and control over natural resources ranging from forests and land to wildlife. Local communities have resisted in different ways the seizure of their lands and restrictions imposed on their use of natural resources, such as timber, fuelwood, pastures and wildlife by the crown or other state authorities in the form of forest and game reserves at least since the 13th century. Forest reserves were initially created to provide timber for the royal fleet and other needs of the royal family, whereas the hunting reserves (*coutadas* and *montarias*) served to guarantee amusement and exercise in martial arts for members of the royal family and other members of the elite (Rego 2001). Whereas people continued to live inside the reserved areas, they were banned from using most of the forest resources or killing the game animals declared privilege of the king, such as deer and wild boar, even when these destroyed cultivated fields (Melo 2015). As the reserved areas expanded during the following centuries local resistance in the form of poaching and intentionally set fires became widespread (Rego 2001). Similar to the Black Act in England (Thompson 1975), punishments meted out to infractors were harsh, including deportation to Africa and even capital punishment (Melo 2015).

In the area of the current PNPG early royal reserves included the hunting reserve of Soajo (Baeta-Neves 1980) and the forest reserve of Albergaria. In 1888 the latter was extended to 10,000 hectares to encompass large part of the *baldios* used traditionally by local communities (Paül and

Santamaría 2019). The stated objective of the new enclosure was nature protection though (re-)forestation, mostly with Maritime pine (Sousa 1909), but the imposed forest regime resulted in constant conflicts with local communities, who resorted to setting fire and uprooting planted tree seedlings (Paül and Santamaría 2019). Plans were made to reforest an additional 60,000 hectares along the national border, but a revolt by the population thwarted the implementation (Radich 2000). During the *Estado Novo* regime appropriation of *baldios* under a new reforestation programme reached new dimensions as Forest Services acquired control over some 500,000 hectares of *baldios* and a revision of the civil code abolished communal property (Lopes et al. 2013). In the area of the actual PNPG the state took over almost all the communal lands and restricted traditional uses, albeit only a part of the lands were actually reforested. Again local population contested the appropriations by different means ranging from obstruction of workers and destruction of newly planted areas to legal processes (Luz 2018).

Communal institutions have traditionally been pivotal for the mountain communities of northern Portugal. In the area of the current PNPG they included such diverse institutions as watermills and bakeries, as well as institutions for the maintenance of public facilities (e.g. water channels and shepherds' shelters) and communal herding organizations (Campos 2020; Sousa 1909). Although each with its particularities, the agro-pastoral communities were relatively homogeneous and autarkic (despite regular cattle sales, see Fontes 2013) with their own social institutions and rule systems (Polanah 1981). Imposition of the Forest Services authority over the *baldios*, which annulled access to key elements of the livelihood system and obviated related community institutions, contributed to the drastic socio-economic changes of the period, such as increasing (mainly illegal) male emigration, subsequent decline of agropastoral production, and weakening of social cohesion. Whereas the transition to democracy in 1975 was accompanied by return of the *baldios* to local management at the national level, in PNPG the prominence of the Forest Services, which was set to administer the recently created PA, was even strengthened (Luz 2018).

Whereas the historically coercive role of the forestry staff was reflected in the contentious relations that developed between PNPG staff and local population, the legacy left by the gamekeepers was more complicated. The latter had earlier a double role as enforcer of the Royal privileges, but also as the organizer of official wolf hunts prescribed by law, which enjoyed the support of local populations especially in the northern mountain areas, where wolves were perceived as a major threat to the agropastoral livelihood (Melo 2015). Traditionally control of the wolf population was maintained by construction and maintenance of communal wolf traps called *fojos*, elaborate stone constructions used in large-scale

¹ Livestock losses proven to be caused by wolves have been compensated by the state in PNPG since the early 1970s, and since 1990 throughout the wolf range in Portugal (Álvares 2011). From 2017 onwards only half of the established market value is paid if the animals are not protected adequately (Freitas and Álvares 2021).

wolf drives where the whole community, or even several communities participated (Álvares et al. 2000; Sousa 1927). The method was last used in the Peneda-Gerês region in the 1970s (Caetano 2006). During the two-and-half decades up to 1957 more than 100 wolves were killed in the region (Flower 1971). Creation of the PA turned the relationship between gamekeepers and local population on its head as the park rangers were now expected to enforce preservation of wolf instead of organizing wolf hunts. Nonetheless, illegal killings are common: of the 123 wolf carcasses² inspected in 1996–2005 in Portugal almost one half were killed on purpose by snare traps, firearms or poison (Lobo Iberico 2024). In the study area the percentage of illegal killings in the same period was even higher, estimated at 70 per cent (Álvares 2011; cf. Nakamura et al. 2021).

Data collection

The primary data comprise three sets of semi-structured interviews conducted in PNPG or its immediate surroundings in February–March in the years 2020, 2023 and 2024. In addition, one interview with a representative of ICNF was conducted in Braga in February 2020 and another with a representative of an NGO was conducted in Porto in February 2023. Three interviews with representatives of ICNF and one NGO were conducted via internet (Teams) in March–April 2023. The interviews were conducted in Portuguese by the author, who explained the objective of the study to the respondents and asked their permission to conduct the interview before beginning. The author took quick notes during the interviews and wrote down any characteristic expressions; the notes were transcribed each day after the interviews. The encounters took place in the interviewee's place of work (sometimes a pasture), in a bar/café, or a few times on the street. In three cases two persons were interviewed together. Instead of formal interviews with fixed questions, these encounters took the form of open conversations for sharing thoughts about issues related to the four research questions. Some interviews were as brief as ten minutes, whereas others lasted for more than an hour. In order to maintain the anonymity of the interviewees, reference to interviews is made by indicating the place, month and year. The field notes are in the author's private archives.

Altogether, 36 persons (21 men and 15 women) were interviewed, representing residents of different sections of the PA as well as relevant authorities (ICNF and parish councils) and four NGOs based or active in PNPG. In all, 30 interviewees lived in PNPG or close to it whereas six

interviewees – representatives of ICNF and NGOs, as well as one parish council chair – lived elsewhere. Among the locals, most were born in PNPG or their parents were from there, although the majority had worked for a substantial period elsewhere, typically abroad. Five interviewees were immigrants without consanguineal kin in PNPG. Local inhabitants included both livestock breeders and people working with tourism, but also people in transport and construction business (including some already retired). The ages of the interviewees ranged from approximately 30 to 80 years.

Data collection was started during the author's stay as a visiting researcher at the University of Coimbra in the spring of 2020, but it was interrupted due to the COVID-19 pandemic. While this delayed the work considerably, it also had a positive outcome as it was necessary to return to the study area some years later to complete the data collection. By chance this was a period with marked changes in the livelihood situation within PNPG, which gave the study a diachronic twist.

The analysis is based on the conceptual approach, using the four research questions to identify relevant issues in the data sets and relating them to the broader context of the study area, and finally reflecting the findings against wider research literature about conservation conflicts. The data on historical context, including land use management, is based on systematic review of original documents and extensive research literature on the subject, started at the library of the University of Coimbra and continued via internet.

Results

Peneda-Gerês has since time immemorial been a landscape shared by humans and wolves where the latter have been able to persist while becoming extinct in most other regions of the country (Álvares 2011). What has changed over the last five decades are the institutional framework and – to some extent – the social legitimacy of wolves and perceptions of a tolerable level of risk. Several older interviewees (Pitões das Júnias 2/2020a; Castro Laboreiro 2/2023a & b) lamented the deterioration of previously strong communal institutions and traditions of mutual aid. Until the 1960s, for example monetary compensation among community members was considered inappropriate, and even in the current situation of rapid depopulation, the few newcomers – mostly holiday home owners – are received with suspicion (Interviews, Gerês 2/2020; Castro Laboreiro 2/2023b; Pitões das Júnias 2/2020b & c). At the same time previously strong communal autonomy has crumbled under the pressure of rules and regulations imposed from above by the EU

² Carcasses for which it was possible to conduct necropsy. The numbers do not reflect the total mortality rates as many remains are never found (Álvares 2011; Treves et al. 2017).

and state authorities (Interviews, Pitões das Júnias 2/2020c; Fafião 2/2024b).

As noted by a representative of ICNF, the oppressive legacy of the *Estado Novo* regime's policies, such as enclosure of the commons and heavy restrictions on human mobility provided a toxic starting point for relations between the local population and the newly created National Park in the 1970s. Whereas the democratic regime established in 1974 abolished strict state controls and revoked the anti-communal land policies, in Peneda-Gerês the institutional regime actually became more restrictive due to the NP status. The fact that enforcement of the new regulations was initially entrusted to Forestry Services – the same institution that had policed the contentious reforestation scheme in the *baldios* – did not make the relations any better (Interview, Braga 2/2020). A representative of a local NGO even spoke about a “war” between Forestry Services (later ICNF) and cattle breeders during 1978–1990 (Interview, Fafião 2/2024a), and the legacy can still be detected behind the distrust and negative attitude towards park – and more broadly government – authorities expressed by many local interviewees ranging from cattle breeders to lorry drivers (Interviews, Ermida 2/2020; Rouças 3/2023a; Fafião 2/2024b). Two interviewees actually alleged that some of the recent forest fires were started intentionally as a protest against the most recent state interference in the use of *baldios* as pastures (Lamas de Mouro 3/2023; Fafião 2/2024a).

Costs and benefits

The interviewed local representatives of parish councils and rangers highlighted wolves and restrictions on construction inside PNPG as the main areas of conflict between the local population and park authorities, (Interviews, Vilar de Veiga 2/2020; Lamas de Mouro 3/2020; Pitões das Júnias 2/2020). With regard to wolves, the new institutional framework implied the end of hunting, which was reinforced by the declaration of nationwide total protection 17 years later. According to some older interviewees these restrictions led to increase of wolf population and corollary predation of livestock, especially small stock (Interviews, Pitões das Júnias 2/2020a; Castro Laboreiro 2/2023b). The indignation was condensed by one interviewee as “now wolf prevails over man, if you kill a wolf in self-defense, you go to prison” (Vilar de Veiga 2/2020). However, according to several interviewees wolf poaching still continues and is quietly tolerated (Pitões das Júnias 2/2020c; Entre Ambos os Rios 2/2023; Fafião 2/2024c).

“*Lobo não faz falta*” (wolf is not needed) was the response of an almost 80 years old woman who still herds livestock, when asked about wolves in PNPG (Cainheiras 2/2023). Together with other comments, such as “Wolf is

incompatible with human population” (Interview, Vilar de Veiga 2/2020), and “There is nothing good about wolves” (Interview, Ermida 2/2020), it reflects the opinion of many local interviewees of this study. Those hostile toward wolves were mostly stock breeders, but included also other livelihoods and retired persons without livestock.

Most of those who said wolves belong to PNPG and must be protected worked in the tourism industry (Interviews, Gerês 2/2020; Castro Laboreiro 3/2023) or for environmental NGOs (Interview, Aldofreire 2/2023), but a few pensioners (Interviews, Pitões das Júnias 2/2020; Castro Laboreiro 2/2023b; Gavieira 3/2023) and even one younger stock breeder (Interview, São Bento de Canda 3/2024) expressed the same opinion – albeit usually with a rider that the damages should remain tolerable and compensations should be adequate and promptly paid (Interviews, Castro Laboreiro 3/2023; Pitões das Júnias 2/2024a). Wolf is a theme animal for two local tourism operators, one focusing on foreign clientele and the other also on local population (Interviews, Aldofreire 2/2023; Fafião 2/2024a). A new Iberian Wolf Interpretation Center was opened recently in Pitões das Júnias (Interview, Pitões das Júnias 2/2024a). These were the only local activities through which existence of wolves in the park was conceived as a benefit.

Several interviewees had problems in understanding (or accepting) also some other activities to protect biodiversity, including the ban on cutting certain tree species, such as cork oak (*Quercus suber*) (Interview, Fafião 2/2024b), or eradicating alien species, such as mimosa (*Acacia dealbata*) (Interview, Ermida 2/2020), for example. Whereas conservation of cultural landscapes was admitted as a valid goal (Interviews, Gerês 2/2020; Pitões das Júnias 2/2020a; Rouças 3/2023b), the restrictions imposed on construction were widely considered as too strict and in disregard of local realities (Interviews, Vilar de Veiga 2/2020; Gerês 2/2020; São Bento de Canda 3/2023) – even by some members of the park administration (Interviews, Braga 2/2020; Lamas de Mouro 3/2020). At the same time some interviewees complained about the complexity and increasingly deficient supervision of existing regulations (Vilar de Veiga 2/2020; Castro Laboreiro 2/2023b; Lamas de Mouro 3/2023).

It should be noted that the interviewees were not unanimous about the negative aspects. Whereas the view that “the park does not bring anything good” (Interview, Ermida 2/2020) was shared by a few other interviewees (Rouças 3/2023a; Fafião 2/2024b), and some were indifferent (Cainheiras 2/2023; Gavieira 3/2023; Fafião 2/2024c), most interviewees felt that the park was good but had some problems. One even considered the *Estado Novo* reforestation project as positive as it provided some jobs (interview, Ermida 2/2020; cf. Cunha and Azevedo 2021). The key benefits identified were attraction of tourists (Interviews,

Gerês 2/2020; Pitões das Júnias 2/2020a; Castro Laboreiro 3/2023; Pitões das Júnias 2/2024a) and improvement of the road network especially in the early years (Castro Laboreiro 2/2023b; Aldofreire 2/2023; Fafião 2/2024d). Other benefits mentioned included resources for reforestation and to prevent and fight forest fires (Interviews, Vilar de Veiga 2/2020; Pitões das Júnias 2/2020a; Rouças 3/2023b), as well as external funding for various projects (Interviews, Gerês 2/2020; Castro Laboreiro 2/2023a). Some of the latter, such as projects to maintain mountain paths and structures originally created for shepherds but now used mainly by tourists, were also criticized for inefficient implementation (Interviews, Lamas de Mouro 3/2023; Fafião 2/2024a). Only half a dozen local interviewees specifically mentioned protection of nature or the cultural landscape as benefits, and half of those who did were immigrants.

One benefit that is not directly related to the protected status of the area is the substantial level of subsidies distributed by the central government (but coming from EU funds) that farmers with autochthonous cattle breeds continue to receive, which was highlighted by some representatives of ICNF and a parish council (Interviews, Braga 2/2020; Lamas de Mouro 3/2023; Pitões das Júnias 2/2020c). On the other hand the interviewees also pointed out that the communities receive few benefits from the state: most local schools and other social services have closed down (Castro Laboreiro 2/2023a; Pitões das Júnias 2/2024a), pension transfers come predominantly from abroad, and most of the improved houses and even Castro Laboreiro's electrical network were paid by returning emigrants from their own savings (Castro Laboreiro 2/2023b; Cainheiras 2/2023).

Trust in authorities

Whereas a few interviewees expressed outright hatred of wolves as noted above, in most cases negative attitudes were linked to difficulties in getting adequate redress for livestock lost to wolves (Interviews, Gavieira 3/2023a; Rouças 3/2023a; São Bento de Canda 3/2023; Fafião 2/2024c). One interviewee (Fafião 2/2024e) even stated that “in fact, they [stock breeders] are not angry at wolves, but rather at the state, which does not comply with its obligations”. Complaints were mostly about inadequate or delayed payment of compensation (Interviews, Gerês 2/2020; Gavieira 3/2023a; Fafião 2/2024b) and difficulties to prove that wolves were the culprits, especially in case of newborn calves and small stock when few if any parts of the carcass may remain (Interviews, Rouças 3/2023b; Gavieira 3/2023b; Fafião 2/2024a). Such problems had a negative impact on trust, and representatives of ICNF recognized the problem explaining that delays were due to inadequate annual budget and maintained that the situation had been redressed in 2023. One of them also

noted that as the compensations have been paid via bank by the institution responsible for all agricultural subsidies since 2018, some clients may have confused the bank transfer with other subsidies (Teams interviews, ICNF 3/2023; 4/2023). Representatives of different concerned parties also pointed out that verification is necessary because unscrupulous individuals try to abuse the system (Interviews, Pitões das Júnias 2/2020c; Lamas de Mouro 3/2020; Aldofreire 2/2023).

Mistrust in authorities was manifested in a narrative repeated by several interviewees, who claimed that at least some of the wolves currently encountered in Peneda-Gerês were bred in captivity – some being mixtures of dog and wolf – that were transplanted by ICNF. As proof they volunteered that they look different from the wolves of their childhood and are more docile (Interviews, Castro Laboreiro 2/2023b; Fafião 2/2024d). One older female interviewee explained that “when I encountered wolves in the old days I felt a shiver, but now with the current wolves I do not – they are not purebred” (Lamas de Mouro 3/2023). Although it is strictly denied by relevant authorities that any wolves were ever transplanted in Portugal (Álvares et al. 2011), such narratives were accepted as true by many older inhabitants (Interview, Castro Laboreiro 2/2023a).

Due to the conflictual role of the Forest Services in the pre-park era, relations with the park authorities and the local population were initially problematic. However, as the park initiated new projects that improved infrastructure and created some employment for the locals, and administrative staff worked mostly within the park compounds, several interviewees said they established good personal relations with some staff members, including the park's director (Pitões das Júnias 2/2020a; Castro Laboreiro 2/2023a; Fafião 2/2024e). Most interviewees stated that relations with the park authorities turned worse after the 2007 reform of the PA administrative system (Decreto-Lei No. 136/2007 (2007)), which created regional level units and abolished PA-level administration including the post of park director and the system of council delegates. With fewer ICNF implemented projects and less presence of ICNF staff in PNPG – except for forest guards and rangers – park authorities have become a distant entity tucked away in Braga, which is perceived as out-of-touch with local realities. The drawback was also recognized by ICNF staff members with more field contact (Interviews, Braga 2/2020; Lamas de Mouro 3/2020). Lack of personal contact reflects directly on trust: several interviewees who represent stock breeders stated that among ICNF staff they only trust one or two local rangers with whom they have established a personal relationship (Rouças 3/2023b & c; São Bento de Canda 3/2023).

A second administrative reform, which was initiated in 2019 and started implementation two years later, increased the power of the five municipalities in PNPG administration

through a new system of co-management (ICNF 2023a). The reform was, however, criticized already before the implementation started by some ICNF staff members and representatives of parish councils, who felt that the needs of local population actually living within PNPG would not be heard as the interests of the urban population of the municipalities would predominate (Interviews, Braga 2/2020; Pitões das Júnias 2/2020c; Lamas de Mouro 3/2020). Concerns were also voiced about lack of intersectoral coordination and increasing corruption at municipal level (Interviews, Pitões das Júnias 2/2020c; Aldofreire 2/2023; Fafião 2/2024b). Subsequent interviews in 2023 and 2024 show that the concerns were well-founded and PNPG inhabitants are suspicious of the new institutions, which tend to assemble outside of the park and ignore local voices (Castro Laboreiro 2/2023a; São Bento de Canda 3/2023; Fafião 2/2024a & e; Pitões das Júnias 2/2024a).

The administrative changes seem to have contributed to a more general problem, namely deficient communication between the park administration and local population. This was named as a major shortcoming even by many interviewees who were positive about the park. Several interviewees complained that consultation of local population remains tokenistic, while communication from the authorities does not reach the locals (Pitões das Júnias 2/2020a & b; Fafião 2/2024a). This view was supported by the finding that most interviewees were unaware of the events whereby local population were to be consulted about the new co-management plan in 2022, and the few that had heard about them had not been able to participate due to tardy communication or inconvenient location (Lamas de Mouro 3/2023; Pitões das Júnias 2/2024a).

Stock breeders were also critical about the central government's agricultural policies, in particular the new interpretation of the 2016 EU regulation about the use of *baldios* for pasture. Those farmers who raise indigenous cattle breeds (*Cachena* and *Barrosã*) organically receive substantial subsidies from EU. However, the new interpretation of the regulation, which was put into effect in 2023 drastically reduces the area of *baldio* pastures that are eligible for the subsidy. Several stock breeders interviewed in 2023 were furious about the new decision, explaining that they would have to cull a substantial part of their herd as they did not have access to alternative pastures, and thus their business would become unviable. They accused the government authorities for being partial to southern farmers and not understanding the realities of indigenous cattle and mountain pastures (Rouças 3/2023a & b; São Bento de Canda 3/2023). The issue was still unresolved in 2024 (Interview, Fafião 2/2024a).

Confidence in own ability to reduce risks

As noted above, wolves have always been present in Peneda-Gerês, and local population has developed various ways to

combat predation by them, ranging from devices to reduce wolf population, such as *fojos*, to various means for protecting domestic stock. Most of these were based on communal institutions, such as rotation of shepherds under the *vezeira* system. After the killing of wolves was forbidden inside the park in 1971, protective measures became the only legal option available. Older interviewees highlighted two major means to protect the animals from wolves, constant vigilance by one or two shepherds and the use of livestock guarding dogs (LGDs) (Pitões das Júnias 2/2020a; Ermida 2/2020; Castro Laboreiro 2/2023b; Lamas de Mouro 3/2023).

During the cold winter months domestic animals were traditionally kept close to homesteads and each family guarded its own animals on the meadows close to settlements, but the risks increased when the animals were taken to distant pastures on the high mountains from spring to autumn. In most communities cattle and small stock were pastured separately under a communal rotative system called *vezeira*, in which each family was responsible for providing a shepherd for a set number of days depending on the number of animals they had (Interviews, Pitões das Júnias 2/2020b; Fafião 2/2024a). In Castro Laboreiro, however, families moved their entire home from a seasonal winter settlement (*inverneira*) in a protected valley to a summer settlement (*branda*), which was adjacent to the highland pastures (Interview, Castro Laboreiro 2/2023a). In 2023 there was only one family who still moved annually between the settlements (Interview, Cainheiras 2/2023).

Traditionally two types of dogs were used: smaller agile dogs helped the shepherd guide the flock, while robust intrepid dogs (LGDs) protected it from wolves. In Peneda-Gerês region an old local breed, the Castro Laboreiro dog, was generally used for the latter purpose. Most families had at least one LGD, which accompanied the shepherds when they took livestock to pastures. But although the use of dogs reduced the risk caused by wolves, it did not prevent it totally (Interviews, Pitões das Júnias 2/2020a; Ermida 2/2020; Castro Laboreiro 2/2023b).

Both of these protective means suffered major changes as a result of increasing emigration, which caused profound upheavals in local livelihoods. Whereas Peneda-Gerês has by tradition been a migration loss area, the volume of migration increased drastically in the 1960s while the traditional pattern of permanent move to Brazil changed to more temporary stays in western Europe. As the migrants were mainly working-age men, stock rearing and other agricultural tasks fell on women, children and elders (Interviews, Pitões das Júnias 2/2020a; Castro Laboreiro 2/2023b; Cainheiras 2/2023; Fafião 2/2024a; Pitões das Júnias 2/2024b). This led to gradual decline of traditional communal institutions as well as degeneration of the native dog breeds, which were replaced by dogs brought by returning migrants and

subsequent mixed breed dogs (Interviews, Castro Laboreiro 2/2023c; Gaviêira 3/2023a). The situation has, however, improved over the last two decades as more LGDs of the traditional breeds are currently used. This is mainly due to more active breeding and exchange between stock breeders (Cainheiras 2/2023; Rouças 3/2023a), albeit there is also small-scale support by an NGO and a subsidy by ICNF (Interview, Porto 2/2024; Teams interview ICNF 3/2023). In addition to Castro Laboreiro dogs, also Spanish Mastiffs are now common among stock breeders. Most of the interviewees who had LGDs considered them valuable, but observed that alone they do not resolve the problem (Castro Laboreiro 2/2023b; Lamas de Mouro 3/2023; Cortegada 3/2023; Rouças 3/2023b; São Bento de Canda 3/2023).

One of the older interviewees narrated how he tended small stock in his family's *vezeira* turn when he was still a child. He noted with nostalgia that earlier there were some 4000 goats in his village, whereas in 2020 there were only 250, but the *vezeira* was still operational (Ermida 2/2020). In the neighboring Fafião there were 3000 goats in the 1970s. They were taken to pastures at 800 m altitude some 15 to 20 km from the village (Interview, Fafião 2/2024a). Since then the number of goats has diminished rapidly, as old people find them difficult to herd and they easily fall prey to wolves (Interview, Fafião 2/2024c). In 2016 there were only 66 goats left in Fafião, and a local association started a project (subsidized by the government) to continue the 500-year old tradition of *vezeira* for small stock. They bought 200 goats and hired a shepherd to herd them, and later two families also joined (Interview, Fafião 2/2024a).

In Fafião the cattle *vezeira* still functions: the herd of local *Barrosã* cattle is taken to highland pastures in May and return at the end of September. There are corrals for cattle and shepherds stay with cattle overnight. In 2024 there were 20 families participating (Interviews, Fafião 2/2024a & d). A second group of farmers also takes cattle to highland pastures, but they follow what the locals call the 'Swiss' model, visiting the cattle only once per week. This is because the owners have other business and young people are generally not interested in herding (Interviews, Fafião 2/2024a & e). Some farmers in Peneda-Gerês also breed autochthonous *Garrano* ponies, which are left alone in highland pastures in semi-wild conditions from late April to October (Interview, Gaviêira 3/2023b).

In Pitões das Júnias some 400 heads of small stock were still herded communally in the highlands in 2020, but it was ending as young people were not interested. *Vezeira* for cattle had ended already in the 1970s (Interview, Pitões das Júnias 2/2020a). Currently most farmers in the region have mixed breed cattle (*Barrosã* mixed with French breeds), which is fattened for six months for meat production. They still use *baldios*, but as the cattle are not autochthonous, they are not entitled to subsidies and therefore the

EU restrictions do not apply. As the animals are less hardy than autochthonous breeds the farmers must have large cowsheds to protect the cattle in cold periods; during summer in the highland pastures some newborn calves are lost to wolves as the herds are only checked weekly (Interview, Pitões das Júnias 2/2024b).

In PNPG the 'Swiss' model became common after generous subsidies offered by the EU for farmers in 1986–1990 allegedly enticed them to buy more autochthonous cattle even if they were not able to care for the animals as before. This incentive continued up to 2000, after which the regulations about proper care have become more strict (Interviews, Pitões das Júnias 2/2020c; Lamas de Mouro 3/2020). The 'Swiss' model continues, however, as dominant in most of PNPG, and according to a representative of ICNF it is the main cause for the high intensity of predation by wolves (Teams interview, 3/2023).

Emotive relation with wolf

As noted by a representative of ICNF, opinions about wolves tend to be polarized (Interview, Braga 2/2020). Most of the interviewees disliked wolves and a few hated them, but the reasons were mainly related to forfeiture of domestic animals, not fear of wolves as such (Vilar de Veiga 2/2020; Ermida 2/2020; Cortegada 3/2023; Fafião 2/2024d). Several older interviewees related events in which they had confronted wolves when herding cattle or even inside the settlement when they were children, and a few affirmed they had chased the beast away (Castro Laboreiro 2/2023a & b; Cainheiras 2/2023; Lamas de Mouro 3/2023). However, as noted by one older interviewee with only a few heads of cattle, for him a calf killed by wolves is not only a financial loss but also an emotional loss (Gaviêira 3/2023a). On the other hand, many interviewees – mostly but not only those working with tourism – viewed wolves positively as important parts of the ecosystem, or even emblems of true wilderness (Aldofreire 2/2023; Castro Laboreiro 3/2023; São Bento de Canda 3/2023; Pitões das Júnias 2/2024c). Either way, "stories about wolves always electrify the audience in this region", as one of the interviewees remarked (Castro Laboreiro 2/2023a).

Discussion

As pointed out by Álvares and associates (2014), the idea of coexistence between wolves and livestock breeders is a modern concept. Wolves have caused economic losses to farmers since time immemorial, but before wolf protection started in Portugal in the 1970s, the society was unanimous about how to address the problem: by eradicating wolves.

There were no compensation payments or subsidies to livestock, but the government paid bounties for killing wolves. All sectors worked in the same direction: against wolves and on behalf of livestock. This changed when wolf protection was issued in the 1970s and 1980s under international pressure, and now the society is spread between the extremes of pro-wolf and anti-wolf.

Balancing costs and benefits – or seeking justice?

The results of a meta-analysis about the variables driving human attitudes toward damage causing wildlife indicate that attitudes are more strongly associated with tangible costs than tangible benefits (Kansky and Knight 2014). On the level of tangible costs, in PNPG the damage caused by wolves concerns almost exclusively livestock breeders who suffer financial losses due to depredation by wolves. Inadequate and delayed payment of compensation, as well as difficulties in proving that the losses were caused by wolves were highlighted as important causes of discontent, mirroring other studies from Portugal (Cortés et al. 2020; Milheiras and Hodge 2011) and other European countries (Álvarez 2013; Bisi et al. 2007; Paniagua 2018). Critical assessments of compensation payments have, however, suggested that they do not necessarily improve tolerance of affected stock owners toward wolves, and may even have a negative impact on conservation (Dickman et al. 2011; Marino et al. 2016; Naughton-Treves et al. 2003).

Yet, the same meta-analysis found that intangible – not tangible – costs are the main driver of attitudes, whereas benefits, either tangible or intangible have only a marginal role (Kansky and Knight 2014). In PNPG most interviewees – not only livestock breeders who suffer the tangible losses – expressed the view that as wolves are now protected by the state, the authorities should provide timely and adequate compensation for the animals lost to wolves (cf. Marino et al. 2016; Vitali 2014), but currently they fail to do so. Whereas the current compensation scheme may not improve tolerance of affected individual stock owners, a fair, transparent and quick compensation system is needed in PNPG for general sense of justice.

Wolf as a symbol of perceived exclusion and mistrust

Another controversial aspect of the conservation regime in PNPG is the feeling of loss of control over local natural resources and own lives by the population, which is caused by the transfer of decision-making power to conservation authorities and the EU (Luz 2018). This is a broader problem in Portuguese conservation administration, as most PAs have been implemented on land whose owner is not

the state. Through expropriations the authorities have created the atmosphere of mistrust and conflict that prevails even today (Frazão-Moreira and Martins 2023). Plans and management decisions are typically made and implemented by external actors while local communities are marginalized (Luz 2018; Queiros 2012). In PNPG the historically problematic relationship is further impaired by inefficient communication by conservation authorities and their detachment from local actors (cf. Barros et al. 2008). Again this appears to be a more general problem in the country, where lack of presence, involvement and visibility of state authorities have been identified as the most obvious reasons for misunderstandings and distrust (Queirós 2012). Arguably the administrative reforms of 2007 and 2019, which decentralized power over the PAs to regional/municipal level have undermined the role of the populations living inside conservation areas even further. This is not surprising as studies from different parts of the world show that decentralization to municipal level is likely to increase the power of non-local actors while weakening existing community-level governance structures and local livelihoods (Virtanen 2003; Wittman and Geisler 2005).

The above findings support the argument – familiar from several studies from Europe and North America – that wolves (or wolf depredation) are not the main cause of conflict, but they have become surrogates for a central government that is perceived to care more for a wild species than about local inhabitants' welfare (e.g. Pohja-Mykrä 2016; Scarce 2005; Vitali 2014). Whereas in the old days wolf hunting was a shared village responsibility supported by state authorities, the abrupt change of its legal status from pest to protected species seems perverted for many local inhabitants, as the former villain now became victim and the former victim became suspect (Stöhr and Coimbra 2013). The frustration is voiced through several symbolic means, including the stories about release of captured or bred wolves to the wild by either park authorities or environmental NGOs. Similar to stories spread elsewhere in Europe, they are bolstered by arguments that current wolves look different and are less fierce than the wolves of earlier times, and do not cause the 'shiver' they used to cause (Campion-Vincent 2005; Pohja-Mykrä 2016; Skogen et al. 2008).

Declining relevance of own means in the changing socio-economic context

Several studies have concluded that wolf-related conflicts tend to become particularly intense in areas where the return of wolves is a recent phenomenon, and where traditional husbandry practices, such as means to protect vulnerable livestock from predators have been lost (Breitenmoser 1998; Dura-Alemañ et al. 2024; Marino et al. 2016; Skogen

et al. 2008). However, whereas wolf-related conflicts are particularly intense in the study area, husbandry practices have changed even if wolves never disappeared. Reasons for the change of practices can be traced to transformation of the economic and social basis of agropastoral production since the 1960s. Previously each family owned just a few heads of livestock, which were too valuable to be left unprotected. Labor force (including children) was abundant and livestock was guarded meticulously by shepherds and LGDs employing communal institutions, while vulnerable animals were kept in shelters at night (Álvares et al. 2014; Cunha and Azevedo 2021). Nowadays, the population is rapidly aging whereas children attend distant schools and therefore the workforce is scarce. There are fewer breeders but the number of livestock per breeder has increased thanks to EU subsidies, and most of the owners are busy with other jobs. In PNPG they usually breed beef cattle under extensive grazing, whereby the owner visits the cattle (or in some cases *Garrano* ponies) in the highlands once or twice a week. The system leaves especially pregnant animals and newly born calves vulnerable to wolf attacks (Álvares et al. 2014; Pimenta et al. 2017).

Whereas there is abundant evidence that effective preventive measures, such as keeping (especially vulnerable) livestock in enclosures or guarding them constantly by shepherds or LGDs, are crucial in the context of extensive grazing (Dura-Alemañ et al. 2024; Eklund et al. 2017; Linnell et al. 2025; Ribeiro and Pertucci-Fonseca 2005; Smith et al. 2000), most livestock owners in the study area prefer to take the risk of suffering losses instead of investing more time and money in preventive measures. Apparently this has been economically viable due to generous subsidies (at least until recently), and arguably it has enabled the large wolf population to thrive.

Emotive relationship with wolf: fear, anger or admiration?

In most of Europe, wolf is an emotional keystone species (Breitenmoser 1998), and its cultural legacy is particularly strong in Iberian rural communities (Álvares et al. 2011). The legacy is, however, deeply divided as wolf may either be admired as an authentic symbol of wilderness or detested as a degenerate predator that should be exterminated (Costa 2020).

For many farmers and peasant hunters in Europe wolf was traditionally the most feared and hated large predator, “a travesty in nature” (Breitenmoser 1998, p. 281). In northern Spain a study among livestock breeders found out that more than half of the interviewees thought that all wolves encountered should be killed, and approximately a quarter condoned the use of illegal means, such as

poison and snare traps (Álvarez 2013). Wolves are often believed to pose an actual threat to human lives, and studies from the Nordic countries indicate that illegal killings are driven by strong primary emotions, such as anger and fear. Especially in areas where wolves are not present or have re-appeared only recently the danger for children is perceived as real (Bisi et al. 2007; Pohja-Mykrä and Kurki 2014). Similar results concerning fear were also recorded in Portugal in areas where wolves are absent or rare (Espírito-Santo 2014).

The results of this study show, however, that in PNPG – where wolves have always been present – the relationship is different, reflecting anger but not fear as the narratives about wolf encounters told by several interviewees make clear (cf. Cunha and Azevedo 2021). Other studies confirm that in the study area livestock breeders were angry for losing animals but did not fear for personal security of themselves or their families (Espírito-Santo 2014). Findings from Finland also indicate that in areas where people have long-term first-hand experience of wolves, local people did not express fear of wolves (Bisi et al. 2007). However, both fear and anger tend to be associated with frustration towards authorities and their inaction (Johansson et al. 2012), and together they constitute driving forces for the ultimate protest – illegal killing of wolves, which is often silently condoned by a substantial part of local inhabitants (Pohja-Mykrä and Kurki 2014; Pohja-Mykrä 2016; Vitali 2014).

Conclusions

Most of the concrete problems of coexistence with wolves in PNPG are linked to economic (and sometimes emotive) losses due to predation of livestock, notably inadequate monetary compensation. On the other hand wolves bring only few indirect benefits and only for those working in tourism business. At the same time stock breeders have limited own means to deal with predation as wolves are strictly protected and the changed husbandry practices have made traditional protective measures – such as constant guarding by shepherds and LGDs – more difficult to apply. The main change factors are linked to the rapid aging of the population, unavailability of children and youth to participate in herding activities, and diversification of livelihood opportunities, so that stock breeders often have also other jobs whereas individual herd sizes have grown.

Behind the concrete problems of coexistence is, however, the more general problem of low social trust between the local population and PA authorities. Conscious of the historical legacy of seizure of locally important common lands by the state, a large part of the local population continues to feel neglected and powerless in the face of a

conservation regime imposed on them by authorities they perceive as more interested in wild beasts than local people. According to the interviewees, the alienation of the PA authorities has increased during the last two decades due to administrative reforms, which have drastically reduced the presence of PA staff in PNPG and brought new urban actors from outside of the PA into the management system. Most interviewees complained about deficient communication and lack of authentic dialogue with the authorities, which reflects negatively on social trust. The low level of trust is also manifested in persistent illegal killing of wolves and the widely circulating accusatory tales about transplanted wolves.

Unlike in some other European countries, fear of wolves is not an important factor of human-wolf interactions in PNPG. Whereas many people are angry at wolves because of the economic (and in some cases emotive) losses caused by them, wolves are not perceived as dangerous to humans, and many interviewees expressed a positive attitude to wolves as important parts of wild nature.

Recommendations

Arguably, the reason for the exceptionally high population density of wolves in PNPG is the availability of relatively easy sustenance in the form of newborn and young calves and foals ranging free in the highland pastures from spring to autumn. The dominant husbandry practice, whereby cattle and ponies are left unattended in the pastures for several days or even weeks is a consequence of two main factors: the generous funding made available by the EU (via the national government) earlier for purchasing autochthonous cattle breeds and the current significant subsidies for specialized livestock farming (autochthonous breeds and/or organic farming), and the changed socio-economic situation whereby most stockbreeders have also other occupations and do not see organizing full-time guarding as a viable alternative. Changing the husbandry practice so that pregnant and young animals would be kept in cowsheds or wolf-proof enclosures – as was done earlier – would probably reduce the losses but is apparently not economically viable for individual owners. The number of small stock (goats in particular) – which was previously the main prey of wolves – has declined rapidly and is likely to remain insignificant despite its potential importance for maintaining the cultural landscape. Strengthening collaboration with different parties and reviving selected cooperative practices (e.g. for guarding pregnant and young animals) may offer some solutions.

Based on the issues highlighted by the interviewees, it is possible to identify two interventions that can be done to improve tolerance for wolves especially among stock

breeders. The first is to improve the compensation system for the victims of wolf predation by making it more prompt and upgrading the cause of death verification process. This is important not only for appeasing the stock breeders but also for general sense of justice. The second is to ensure that the EU regulations concerning type of livestock pastures that are eligible for the subsidy schemes are interpreted by the national government to include the type of *baldios* traditionally used in the northern mountain areas for that purpose. Whereas the second measure does not target wolves directly, it would probably improve the attitude of local population toward government (and PA) authorities.

Communication was highlighted as a main problem in the relations between local inhabitants and the PA administration by most local interviewees. In order to overcome the historical legacy of conflictual state-community relations, it is crucial that the residents who actually live inside the PA (or its immediate surroundings) are given preference over external (urban) actors. They must be genuinely heard and incorporated in the decision-making process. Personal relations are crucial for establishing social trust, and regular presence of PA staff – including high-level functionaries – in PNPG while pursuing active dialogue with the local communities would be an important step forward. As Peneda-Gerês is the only National Park in mainland Portugal, it might even be possible to recreate the post of Park Director with a small local staff who would be based inside the PA – at least as a pilot-project.

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Data availability The field notes are in the author's private archives.

Declarations

Competing interests The authors declare no competing interests.

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References

- Álvares F (2011) Ecologia e conservação do lobo (*Canis lupus*, L.) no Noroeste de Portugal. Dissertation, University of Lisbon
- Álvares F, Alonso P, Sierra P, Petrucci-Fonseca F (2000) Os fojos dos lobos na Península Ibérica. Sua inventariação, caracterização e conservação. *Galemys* 12:57–77
- Álvares F, Domingues J, Sierra P, Primavera P (2011) Cultural dimension of wolves in the Iberian Peninsula: Implications of ethnozoology in conservation biology. *Innov – Eur J Soc Sci Res* 24:313–331. <https://doi.org/10.1080/13511610.2011.592049>
- Álvares F, Blanco J, Salvatori V et al (2014) Exploring traditional husbandry methods to reduce wolf predation on free-ranging cattle in Portugal and Spain. Final report to the European Commission. https://environment.ec.europa.eu/publications/final-report-exploring-traditional-husbandry-methods-reduce-wolf-predation-free-ranging-cattle_en?prefLang=bg. Accessed 20 March 2022
- Álvarez E (2013) Prejuízos e conflituosidade social do urso-pardo e do lobo na Península Ibérica. Dissertation, University of Lisbon
- Anuruddha M, Morimoto T, Gamage S, Marikar F (2025) Assessing the economic and ecological costs of human-wildlife conflict in Nuwara Eliya. *Ecologies* 6(1):6. <https://doi.org/10.3390/ecologi6010006>
- Baeta-Neves CML (1980) A montaria de Soajo, primórdio histórico do Parque Nacional da Peneda-Gerês- Gereziana V: 163–176
- Barros F, Vicente L, Pereira H (2008) Parques e populações: É possível conciliar? A experiência de um parque nacional europeu. IV Encontro do Associação Nacional de Pós Graduação e Pesquisa em Ambiente e Sociedade, 4–6 junho de 2008, Brasília, DF, Brasil
- Bisi J, Kurki S, Svensberg M, Liukkonen T (2007) Human dimensions of wolf (*Canis lupus*) conflicts in Finland. *Eur J Wildl Res* 53:304–314. <https://doi.org/10.1007/s10344-007-0092-4>
- Brandão T (2015) Origens da Comissão Nacional do Ambiente na emergência da política ambiental em Portugal. *Ler Hist* 68:129–167. <https://doi.org/10.4000/lerhistoria.1754>
- Breitenmoser U (1998) Large predators in the alps: the fall and rise of man's competitors. *Biol Conserv* 83:279–289
- Brouwer R (1995) Common goods and private profits: Traditional and modern communal land management in Portugal. *Hum Organ* 54:283–294
- Bruskotter J, Wilson R (2014) Determining where the wild things will be: Using psychological theory to find tolerance for large carnivores. *Conserv Lett* 7:158–165. <https://doi.org/10.1111/conl.12072>
- Caetano P (2006) Lobos em Portugal. Má-criação, Lisbon
- Campion-Vincent V (2005) The restoration of wolves in France: Story, conflicts and uses of rumor. In: Herda-Repp A, Goedeke T (eds) *Mad about Wildlife: Looking at Social Conflict over Wildlife*. Brill, Leiden, pp 99–122
- Campos J (2020) Valores contemporâneos do património: a paisagem cultural das Terras do Barroso. *Cad Geogr* 42:43–57. https://doi.org/10.14195/0871-1623_42_3
- Carter N, Linnell J (2016) Co-adaptation is key to coexisting with large carnivores. *Trends Ecol Evol* 31:575–578. <https://doi.org/10.1016/j.tree.2016.05.006>
- Chapron G, Kaczensky P, Linnell J et al (2014) Recovery of large carnivores in Europe's modern human-dominated landscapes. *Sci* 346:1517–1519. <https://doi.org/10.1126/science.1257553>
- Coelho I (2003) Propriedade da terra e política florestal em Portugal. *Silva Lusit* 11:185–199
- Cortés Y, Ribeiro S, Petrucci-Fonseca F, Blanco J (2020) A decade of use of damage prevention measures in Spain and Portugal. *Carniv Damage Prev News* 20:32–47
- Costa F (2020) One feels a shiver – wolf perceptions and representations in Portugal. In: Fenske M, Tschofen B (eds) *Managing the return of the wild: human encounters with wolves in Europe*. Routledge, London, pp 62–74
- Council of Europe (2025) Modification of wolf protection under the Bern Convention enters into force. Strasbourg. <https://www.coe.int/en/web/portal/-/modification-of-wolf-protection-under-the-bern-convention-enters-into-force>. Accessed 15 May 2025
- Cristóvão A (2002) Rural development initiatives and institutional arrangements in the national park of Peneda Gerês, Portugal. Dissertation, University of Trás-os-Montes and Alto Douro
- Cunha C, Azevedo P (2021) Vidas e lugares com história. Efeitos Graficos, Porto
- Decreto-Lei No. 136/2007 (2007) Diário da República. 1 série 82:2671–2675
- Di Bernardi C, Chapron G, Kaczensky P et al (2025) Continuing recovery of wolves in Europe. *PLOS Sustain Transform* 4(2):e0000158. <https://doi.org/10.1371/journal.pstr.0000158>
- Dickman A (2010) Complexities of conflict: The importance of considering social factors for effectively resolving human-wildlife conflict. *Anim Conserv* 13:458–466. <https://doi.org/10.1111/j.1469-1795.2010.00368.x>
- Dickman A, Macdonald E, Macdonald D (2011) A review of financial instruments to pay for predator conservation and encourage human-carnivore coexistence. *PNAS* 108:13937–13944. <https://doi.org/10.1073/pnas.1012972108>
- Dura-Alemañ J, Almarcha F, Sánchez-Zapata J, Pérez-Ibarra I, Morales-Reyes Z (2024) Land of wolves, school of shepherds: the importance of pastoral knowledge on co-existence with large carnivores. *Ecosyst People* 20(1):2422910. <https://doi.org/10.1080/026395916.2024.2422910>
- Eklund A, López-Bao J, Tourani M, Chapron G, Frank J (2017) Limited evidence on the effectiveness of interventions to reduce livestock predation by large carnivores. *Sci Rep* 7. <https://doi.org/10.1038/s41598-017-02323-w>
- Espírito-Santo C (2014) Atitudes públicas para com o lobo. Relatório final para Direcção-Geral do Território, 28 p
- Figueiredo E (2008) Imagine there's no rural: The transformation of rural spaces into places of nature conservation in Portugal. *Eur Urban Reg Stud* 15:159–171.
- Flower E (1971) Lobos em Portugal – Wolves in Portugal. Direcção Geral dos Serviços Florestais e Aquícolas, Lisboa
- Fontes L (2013) Arqueologia da paisagem nas montanhas do Noroeste de Portugal: O caso do Parque Nacional da Peneda Gerês. *Oppidum* 7:11–36
- Frazão-Moreira A, Martins H (2023) National and Natural Parks in Portugal: a brief history to understand the appropriation by the state of humanized territories. *J Region Res* 55:93–111. <https://doi.org/10.38191/iirr-jorr.23.006>
- Freitas J, Álvares F (2021) Economic impact of wolf predation on free-ranging horses in Portugal. *Carniv Damage Prev News* 23:37–47
- Fuller T, Mech LD, Cochrane J (2003) Wolf Population Dynamics. In: Mech T, Boitani L (eds) *Wolves: behavior, ecology, and conservation*. The University of Chicago Press, Chicago, pp 161–191
- Inskip C, Carter N, Riley S, Roberts T, MacMillan D (2016) Toward human-carnivore coexistence: Understanding tolerance for tigers in Bangladesh. *PLoS ONE*. <https://doi.org/10.1371/journal.pone.0145913>

- Instituto da Conservação da Natureza e Florestas (ICNF) (2023a) Plano de coexistência do Parque Nacional da Peneda-Gerês: Documento síntese. <https://www.icnf.pt/api/file/doc/f9b9c79d68c1ff4d>. Accessed 18 Jan 2024
- Instituto da Conservação da Natureza (ICN) (1995) Plano de ordenamento do Parque Nacional da Peneda-Gerês: Relatório de síntese. ICN, Braga
- Instituto da Conservação da Natureza e Florestas (ICNF) (2023b) Plano de coexistência do Parque Nacional da Peneda-Gerês: documento complementar I, caracterização da área protegida. Accessed 18 Jan 2024. <https://www.icnf.pt/api/file/doc/553dfe36195936ce>
- Johansson M, Karlsson J, Pedersen E, Flykt A (2012) Factors governing human fear of brown bear and wolf. *Hum Dimens Wildl* 17:58–74. <https://doi.org/10.1080/10871209.2012.619001>
- Kaczynsky P, Ranc N, Hatlauf J et al (2024) Large carnivore distribution maps and population updates 2017–2022/23. IUCN/SSC Large Carnivore Initiative for Europe (LCIE); Istituto di Ecologia Applicata (IEA). fhal–05111247
- Kansky R, Knight A (2014) Key factors driving attitudes towards large mammals in conflict with humans. *Biol Conserv* 179:93–105. <https://doi.org/10.1016/j.biocon.2014.09.008>
- Kansky R, Kidd M, Knight A (2016) A wildlife tolerance model and case study for understanding human wildlife conflicts. *Biol Conserv* 201:137–145. <https://doi.org/10.1016/j.biocon.2016.07.002>
- Linnell J, Boitani L, Blanco J et al (2025) Conceptualising coexistence with large carnivores in Europe. Report to the European Commission under contract N° 09.0201/2023/907799/SER/ENV.D.3 Support for Coexistence with Large Carnivores. IUCN/SSC Large Carnivore Initiative for Europe (LCIE) and Istituto di Ecologia Applicata (IEA)
- Lobo Iberico (2024) Mortalidade. <https://www.loboiberico.pt/lobo-ibero/mortalidade/>. Accessed 16.4.2025/PV
- Lopes L, Bento J, Cristóvão A, Baptista F (2013) Institutionalization of common property in Portugal: Tragic trends between commons and anticommmons. *Land Use Policy* 35:85–94. <https://doi.org/10.1016/j.landusepol.2013.05.007>
- Luz A (2018) *Compartes, estado e autarquias: que futuro para as terras comunitárias? O caso dos baldios do Parque Nacional da Peneda-Gerês*. Dissertation, NOVA University Lisbon
- Madden F, McQuinn B (2014) Conservation's blind spot: The case for conflict transformation in wildlife conservation. *Biol Conserv* 178:97–106. <https://doi.org/10.1016/j.biocon.2014.07.015>
- Marino A, Braschi C, Ricci S, Salvatori V, Ciucci P (2016) Ex post and insurance-based compensation fail to increase tolerance for wolves in semi-agricultural landscapes of central Italy. *Eur J Wildl Res* 62:227–240. <https://doi.org/10.1007/s10344-016-1001-5>
- Melo C (2015) An analysis of the royal preserves in Portugal: issues of privilege, power, management, and conflict. Wildtrack Publishing, Heeley
- Milheiras S, Hodge I (2011) Attitudes towards compensation for wolf damage to livestock in Viana do Castelo, north of Portugal. *Innov* 24:333–351. <https://doi.org/10.1080/13511610.2011.592071>
- Nakamura M, Rio-Maior H, Godinho R, Petrucci-Fonseca F, Álvares F (2021) Source-sink dynamics promote wolf persistence in human-modified landscapes: insights from long-term monitoring. *Biol Conserv* 256:109075. <https://doi.org/10.1016/j.biocon.2021.109075>
- Naughton-Treves L, Grossberg R, Treves A (2003) Paying for Tolerance: Rural Citizens' Attitudes Toward Wolf Depredation and Compensation. *Conserv Biol* 17:1500–1511. <https://doi.org/10.1111/j.1523-1739.2003.00060.x>
- Needham M, Vaske J (2008) Hunter perceptions of similarity and trust in wildlife agencies and personal risk associated with chronic wasting disease. *Soc Nat Res* 21:197–214. <https://doi.org/10.1080/08941920701816336>
- Nyhus P, Osofsky S, Ferraro P, Madden F, Fischer H (2005) Bearing the costs of human-wildlife conflict: the challenges of compensation schemes. In: Woodroffe R, Thirgood S, Rabinowitz A (eds) *People and wildlife, conflict or coexistence?* Cambridge University Press, Cambridge, pp 107–121. <https://doi.org/10.1017/CBO9780511614774.008>
- Paniagua A (2018) Local people unprotected by protected (depopulated) natural areas: The case of Sierra Norte Guadalupe, Spain. *GeoJ* 83:993–1004. <https://doi.org/10.1007/s10708-017-9813-8>
- Paul V, Santamaría J (2019) Hacia una geografía histórica del Gerês/Xurés: La conformación de una región transfronteriza. *Rev de Historiogr* 30:119–155. <https://doi.org/10.20318/rvhisto.2019.4746>
- Pimenta V, Barroso I, Álvares F, Correia J, Costa G, Moreira L, Nascimento J, Petrucci-Fonseca F, Roque S, Santos E (2005) Situação populacional do lobo em Portugal, resultados do Censo Nacional 2002/2003. ICN/Grupo Lobo, Lisboa
- Pimenta V, Barroso I, Boitani L, Beja P (2017) Wolf predation on cattle in Portugal: assessing the effects of husbandry systems. *Biol Conserv* 207:17–26. <https://doi.org/10.1016/j.biocon.2017.01.008>
- Pimenta V, Barroso I, Álvares F et al (2023) Situação populacional do Lobo em Portugal: Resultados do Censo Nacional de 2019/2021. ICNF, Lisboa
- Pinto B, Partidário M (2012) The history of the establishment and management philosophies of the Portuguese protected areas: Combining written records and oral history. *Environ Manag* 49:788–801. <https://doi.org/10.1007/s00267-012-9820-y>
- Pohja-Mykrä M (2016) Felony or act of justice? - Illegal killing of large carnivores as defiance of authorities. *J Rural Stud* 44:46–54. <https://doi.org/10.1016/j.jrurstud.2016.01.003>
- Pohja-Mykrä M, Kurki S (2014) Strong community support for illegal killing challenges wolf management. *Eur J Wildl Res* 60:759–770. <https://doi.org/10.1007/s10344-014-0845-9>
- Polanah L (1981) *Comunidades camponesas no Parque Nacional da Peneda-Gerês*. Serviço Nacional de Parques, Reservas e Património Paisagístico, Lisboa
- Queirós M (2012) Natural parks in Portugal: a way to become more ecologically responsible? *Env Hist* 18:585–611. <https://doi.org/10.3197/096734012X13466893037189>
- Radich M (2000) A Floresta no Portugal oitocentista. In: Silva A, Leitão T (eds) *Dois séculos da floresta em Portugal*. CELPA, Lisboa, pp 7–108
- Redpath S, Young J, Evelyn A, Adams W, Sutherland W, Whitehouse A, Amar A, Lambert R, Linnell J, Watt A, Gutiérrez R (2013) Understanding and managing conservation conflicts. *Trends Ecol Evol* 28:100–109. <https://doi.org/10.1016/j.tree.2012.08.021>
- Rego F (2001) *Florestas públicas*. Direcção Geral das Florestas, Lisboa
- Ribeiro S, Petrucci-Fonseca F (2005) The use of livestock guarding dogs in Portugal. *Carniv Damage Prev News* 9:27–33
- Riley S, Decker D (2000) Risk perception as a factor in wildlife stakeholder acceptance capacity for cougars in Montana. *Hum Dimens Wildl* 5:50–62
- Sands D (2022) Dewilding 'wolf-land': exploring the historical dimensions of human-wildlife conflict and coexistence in Ireland. *Conserv Soc* 20:257–267

- Scarce R (2005) More than mere wolves at the door: reconstructing community amidst a wildlife controversy. In: Herda-Rapp A, Giedeke T (eds) *Mad about wildlife – looking at social conflict over wildlife*. Brill, Leiden, pp 123–146
- Sjölander-Lindqvist A, Johansson M, Sandström C (2015) Individual and collective responses to large carnivore management: the roles of trust, representation, knowledge spheres, communication and leadership. *Wildl Biol* 21:175–185. <https://doi.org/10.2981/wlb.00065>
- Skogen K, Mauz I, Krangle O (2008) Cry wolf! Narratives of wolf recovery in France and Norway. *Rural Sociol* 73:105–133. <https://doi.org/10.1526/003601108783575916>
- Slagle K, Bruskotter J, Wilson R (2012) The role of affect in public support and opposition to wolf management. *Hum Dimens Wildl* 17:44–57. <https://doi.org/10.1080/10871209.2012.633237>
- Smith M, Linnell J, Odden J, Swenson J (2000) Review of methods to reduce livestock depredation: I. guardian animals. *Acta Agric Scand Sect Anim Sci* 50:279–290
- Sousa T (1909) *Serra do Gerez: Estudos – aspectos – paisagens*. Livraria Chardron, Porto
- Sousa T (1927) *Gerez: notas etnográficas, arqueológicas e históricas*. Imprensa da Universidade, Coimbra
- Stöhr C, Coimbra E (2013) The governance of the wolf-human relationship in Europe. *Rev Eur Stud* 5:1–18. <https://doi.org/10.5539/res.v5n4p1>
- Talbert L, Leslie S, Black S (2020) Use of predator controls to address human wildlife conflict. *Int J Avian Wildl Biol* 5:9–13. <https://doi.org/10.15406/ijawb.2020.05.00167>
- Thompson EP (1975) *Whigs & hunters: the origin of the Black Act*. Allen Lane, London
- Treves A, Artelle K, Darimont C, Parsons D (2017) Mismeasured mortality: correcting estimates of wolf poaching in the United States. *J Mammal* 98:1256–1264. <https://doi.org/10.1093/jmammal/gyx052>
- Virtanen P (2003) Local management of global values: community-based wildlife management in Zimbabwe and Zambia. *Soc Nat Res* 16:179–190. <https://doi.org/10.1080/08941920390178766>
- Vitali C (2014) A frame-analytical perspective on conflict between people and expanding wolf *Canis lupus* population in central Italy. *Oryx* 48:575–583. <https://doi.org/10.1017/S0030605313000276>
- Wittman H, Geisler C (2005) Negotiating Locality: Decentralization and Communal Forest Management in the Guatemalan Highlands. *Hum Organ* 64:62–74. <https://doi.org/10.17730/humo.64.1.yx8tpel6be6ghpne>

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