

# De- and re-peasantization through wolves: A more-than-human political ecology of agrarian change

Valerio Donfrancesco<sup>1</sup>

University of Cambridge, UK

## Abstract

While wolves are often described as 'ecological engineers', this article reframes the image of this predator as a *socioecological engineer*. Adopting a more-than-human political ecology perspective, I highlight the imbrication of wolf agency with the political economy of farming in co-shaping processes of agrarian change in Tuscany, Italy. A multispecies ethnography elucidates how wolves are simultaneously contributing to and undermining a modernization of sheep husbandry practices in the region. This entanglement of wolf agency in processes of de- and re-peasantization is politically relevant, affecting human-wolf relations and local levels of conflict. Through their return, wolves are necessitating shifts in farming practices and affecting the topology of agricultural landscapes, favoring either an intensification of husbandry regimes (i.e., more sheep raised indoors) or a greater competitiveness of family-led free-ranging farms with a high availability of family labor. Emphasizing this aspect is important to politicize current discussions surrounding coexistence, and supports the rise of practices that are considered to be most socially, culturally, and ecologically valuable. A focus on wolf agency in this case entails 'thinking with' wolves in co-designing alternative (co)existences, providing a more nuanced understanding of socioecological change and human-wolf relations. This article informs critical scholarship on the value of moving beyond dualist lenses while still maintaining a focus on structural processes. These are an important though not unidirectional force of change. Reframing wolves as socioecological engineers calls for further research exploring such entanglements of human and non-human agencies in the coproduction of agrarian change and human-wildlife relations.

**Key Words:** human-wildlife relations, more-than-human political ecology, agrarian change, wolf, coexistence, peasants, Tuscany

## Résumé

Alors que les loups sont souvent décrits comme des « ingénieurs écologiques », cet article recadre l'image de ce prédateur en tant qu'ingénieur socio-écologique. En adoptant une perspective d'écologie politique plus qu'humaine, je souligne l'imbrication de l'agence du loup avec l'économie politique de l'agriculture dans la co-construction des processus de changement agraire en Toscane, en Italie. Une ethnographie multi-espèces élucide la façon dont les loups contribuent et sapent simultanément la modernisation des pratiques d'élevage de moutons dans la région. Cet enchevêtrement de l'action des loups dans les processus de dé-paysanisation et de repaysanisation est politiquement pertinent, car il affecte les relations et les conflits entre l'homme et le loup au niveau local. Par leur retour dans le paysage, les loups nécessitent des changements dans les pratiques agricoles et affectent la topologie des paysages agricoles, favorisant soit une intensification des régimes d'élevage (c'est-à-dire plus d'élevage de moutons à l'intérieur), soit une plus grande compétitivité des fermes familiales en liberté avec une grande disponibilité de la main d'œuvre familiale. Il est important de mettre l'accent sur cet aspect pour politiser les discussions actuelles sur la coexistence, ce qui favorise l'essor des pratiques considérées comme les plus utiles sur le plan social, culturel et écologique. L'accent mis sur l'action des loups dans ce cas implique de « penser avec » les loups en concevant des (co)existences alternatives, ce qui permet une compréhension plus nuancée des changements socio-écologiques et des relations entre l'homme et le loup.

---

<sup>1</sup> Valerio Donfrancesco, Department of Geography, University of Cambridge, UK. Email: [donfrancesco.valerio@gmail.com](mailto:donfrancesco.valerio@gmail.com). Funding and acknowledgements: Churchill College, ESRC (ES/P000738/1), and two referees.

Cet article éclaire la recherche critique sur l'intérêt de dépasser les lentilles dualistes tout en continuant à mettre l'accent sur les processus structurels. Ceux-ci constituent une force de changement importante, même si elle n'est pas unidirectionnelle. Le recadrage des loups en tant qu'ingénieurs socio-écologiques appelle à des recherches plus approfondies sur l'enchevêtrement des agences humaines et non humaines dans la coproduction du changement agricole et des relations entre l'homme et la faune sauvage.

**Mots clés:** relations homme-faune, écologie politique plus qu'humaine, changement agricole, loup, coexistence, paysans, Toscane

## Riassunto

Mentre i lupi vengono spesso considerati come degli 'ingegneri ecologici', questo articolo propone una nuova immagine di questi predatori come ingegneri socioecologici. Attraverso un'ecologia politica più-che-umana, questo lavoro evidenzia come l'agentività del lupo sia intrecciata con l'economia politica dell'allevamento ovino, plasmando particolari processi di cambiamento agrario in Toscana, Italia. Un'etnografia multispecie mostra come i lupi stiano simultaneamente contribuendo e sovvertendo i processi di modernizzazione del settore ovino. L'influenza del lupo su queste dinamiche è politicamente rilevante, poiché condiziona le relazioni locali con questo predatore e i rispettivi livelli di conflitto. Il ritorno del lupo sta influenzando la disposizione e la topologia dei paesaggi agrari in Toscana, favorendo da un lato un'intensificazione delle pratiche di allevamento ovino (ad esempio, verso una stabulazione fissa) e dall'altro una maggiore competitività delle aziende agricole a conduzione familiare, che riescono meglio ad adattare l'allevamento semibrado alla presenza del lupo. Porre enfasi su questa dinamica è importante per politicizzare le discussioni attuali sulla coesistenza con il lupo, promuovendo pratiche di allevamento che abbiano valore dal punto di vista sociale, culturale ed ecologico. Concentrarsi sull'agentività del lupo come in questo caso può essere considerato un modo per 'pensare con' i lupi, ottenendo una comprensione più articolata del cambiamento socioecologico e dei rapporti fra umani e lupi, e quindi per co-progettare pratiche di coesistenza multispecie migliori. Questo articolo evidenzia il valore di andare oltre le logiche dualiste senza però perdere di vista il ruolo degli aspetti strutturali, che benché importanti non influiscono sulla produzione della società in modo unilaterale. La re-immaginazione del lupo come ingegnere socioecologico esplorata in questo articolo porta con sé un invito a condurre simili analisi in altri contesti di trasformazione agraria e di relazioni multispecie.

**Parole chiave:** relazioni multispecie; ecologia politica più-che-umana; cambiamento agrario; lupo; coesistenza; allevamento ovino, Toscana

## 1. Introduction

Wolf conservation projects can often allude to the idea of wolves playing important ecological functions, such as promoting 'ecosystem balance' (Zscheischler & Friedrich, 2022). Most notably, the reintroduction of wolves in the 1990s to Yellowstone National Park in the United States has been described as having triggered an ecological cascade that had positive impacts for local biodiversity (Ripple & Beschta, 2004). While some of these narratives about the ecological effects of wolves have since been subject to criticism and questioning (e.g., Mech, 2012; Marris, 2014), wolves are generally still considered to be 'ecological engineers', able to influence and alter ecosystem dynamics through their presence (Ausilio *et al.*, 2021; Ripple *et al.*, 2024), albeit in more complex ways.

These understandings are, at present, mostly being developed within the natural sciences, which can tend to reproduce a culture-nature dualism in their analyses, abstracting wolves from the social and political-economic context in which they are embedded (e.g., by associating them with notions of 'wilderness'; Cronon, 1996). While the critical social sciences are increasingly interested in exploring topics of human-wildlife relations (Pooley *et al.*, 2017; Fletcher & Toncheva, 2021), an aspect that has remained less explored is how the current understandings of wolves' ecological effects may change or be expanded, when humans and their activities are integrated into these considerations.

This study is focused on this aspect, articulating a reframing of wolves as *socioecological* engineers. By adopting a more-than-human political ecology perspective, it highlights how the return of wolves is affecting ongoing processes of agrarian change in Tuscany, Italy. Specifically, wolves, through the interventions that their

presence and impacts necessitate, are simultaneously contributing to and undermining a modernization of the ovine sector in the region, affecting local human-wolf relations in turn. Farming landscapes are different with the return of the wolves. The shifts that wolves are influencing are at the same time shaped by the political economy of farming. Advancing this kind of understanding can be valuable to gain a more nuanced view of agrarian change and of how human-wolf relations emerge, informing management strategies.

Human-wildlife coexistence is a pressing topic that is increasingly at the center of policy and research discussions (König *et al.*, 2020). In Europe, the last few decades have been characterized by the return of large carnivores such as bears, lynxes, and wolves (Chapron *et al.*, 2014). Presently, wolves are granted a protected status under the EU's Habitats Directive and the Bern Convention, but with the possibility of culling them depending on the specific circumstances of each member state. The return of wolves is posing new challenges for managing their growing presence and impacts in efficient, effective, and just ways (Marino *et al.*, 2022; Pettersson *et al.*, 2023; Donfrancesco, 2024). Wolves face particularly low levels of local acceptance, because of their significant impacts on activities such as sheep farming (Gervasi *et al.*, 2022). This conflictual situation is resulting in a growing number of calls for a possible downlisting of wolves of their European Union (EU) protected status (EC, 2023). Exploring how the return of wolves is entangled in ongoing dynamics of agrarian change could help further understand and plan for improved human-wolf relations.

The next section introduces the theoretical approach embraced by this study, reflecting that of a more-than-human political ecology. After describing the study site and methodology, I delve into wolf agency in processes of agrarian change in Tuscany. The last two sections bring together some final considerations on the reframing of the wolves as *socioecological engineers*, highlighting possible steps for the management of human-wildlife relations.

## 2. Theoretical framing

The article is situated within the growing literature of a more-than-human political ecology (Evans & Adams, 2018; Margulies & Karanth, 2018; de Silva & Srinivasan, 2019; Fry, 2023; Donfrancesco, 2024). This literature is particularly concerned with moving beyond (Western) dualist logics while maintaining an emphasis on the uneven power relations that characterize contemporary societies. Specific emphasis is placed on decentering the human from current analyses and discourses, highlighting the role of non-human agencies in co-shaping socioecological change (Jepson *et al.*, 2011). Dualist logics, separating culture and nature, can overlook and oversimplify the complex more-than-human entanglements that characterize society (Whatmore, 2006; Hobson, 2007; Buller, 2014; Hovorka, 2018).

Greater recognition of non-human agency can provide insights into the production of uneven geographies, shedding light on dynamics that might otherwise be missed (Margulies & Karanth, 2018). In this case, agency can simply be defined as the capacity of an actor or 'actant' to influence the course of events (Jepson *et al.*, 2011), rather than defining it by alluding to more elusive notions such as 'intentionality' (c.f., Komi & Nygren, 2023). This approach can provide a finer grain of analysis compared to 'master narratives', such as those of the more structural or Marxist readings, which tend to present socioecological change as the unidirectional product of political economies (Lorimer, 2022).

This does not mean that the radical insights of political economy need to be discarded. A criticism of more-than human perspectives is that they can be ahistorical and decontextualized (Arboleda, 2017; Büscher, 2022). A more-than-human political ecology could seek to marry or strike a balance between these different theoretical positionings. This could be addressed by focusing on how non-humans influence the course of events in undisciplined ways through their responsive, adaptive, and agentive capacities, beyond a totalizing human control, while recognizing that this dynamic is not entirely contingent but co-shaped by political-economic processes.

In contexts of wolf conservation, for instance, recent historical work highlighted how wolves actively 'resisted' or responded to shifts in land use and farming practices, partly linked to the onset of capitalism in Italy, by developing more problematic behaviors in terms of attacking people and livestock with greater frequency, exacerbating conflict and leading to wolf removal policies (Donfrancesco, 2024; also see Knight 1997). This highlights the inherent 'co-becoming' (Haraway, 2016) of humans and wolves, wherein coexistence

outcomes emerge and take shape through the imbrication of wolf agency with structural processes (Donfrancesco, 2024). A growing number of studies are adopting these critical lenses, emphasizing similar dynamics across different contexts and regions, and providing novel insights into current understandings of human-wildlife relations and socioecological change. For example, tigers and elephants in India have both been shown to inadvertently respond to and affect dynamics of uneven development, exacerbating human-wildlife conflict while reproducing existing inequities (Margulies & Karanth, 2018; de Silva & Srinivasan, 2019).

This investigation seeks to take these analyses further, by exploring the influence of the return of wolves not only on shaping conflict but also on influencing the very composition of farming landscapes and broader processes of agrarian change. Barua (2023), for instance, recently highlighted the agency of an invasive plant brought to India during colonial times, in reconfiguring wider forest landscapes in ways that resulted in an escalation of human-elephant conflict and greater land grabs by local authorities.

I focus on how the comeback of wolves is affecting agrarian change in Tuscany, central Italy. For this, it is important to understand the broader agrarian context within which wolves are returning. The gradual expansion of wolf populations in Europe since the closing decades of the previous century is situated within processes of agrarian change that favored farmland abandonment, reforestation, and an increase in wild ungulate populations (Falcucci *et al.*, 2007; Cimatti *et al.*, 2021). While these socioecological dynamics might have aided the comeback of wolves (Falcucci *et al.*, 2007; Cimatti *et al.*, 2021), it is less clear how they are entangled with the growing presence of wolves.

Farmland abandonment is a trend documented internationally, both in the Global North and South, referring to the closing down of especially the smallest and most socioeconomically marginalized farms, with the concentration of farm businesses towards ever fewer and bigger farms (Shiva, 2006; Eastwood *et al.*, 2010; Altieri & Toledo, 2011; van der Ploeg *et al.*, 2015). These trends have become accentuated in the latter half of the 20<sup>th</sup> century, with the liberalization of markets and the pursuit of modernization, rationalizing farming practices to increase efficiency, productivity, and profitability, often through promoting technological solutions and economies of scale (Galt, 2013; Isakson, 2014).

In Europe, the modernization of farming is also associated with a 'depeasantization' of agricultural landscapes (van der Ploeg, 2018). It was envisaged in policy documents, scientific studies, parliamentary sessions and other such contexts in the 1950s and 1960s. These considered peasant styles of agriculture (e.g., low market-dependency, low technological innovation, reliance on family labor) as backward and destined to be phased out and replaced by a more entrepreneurial mode of farming (e.g., more market-dependent) (van der Ploeg, 2018). Classification schemes at the time distinguished between three groups of farmers: "'stayers' (those likely to stay in farming and able to 'move' into the future), 'leavers' (whose destiny was to stop farming) and 'the ones in between' who just tagged along: they had either to follow the road taken by the 'stayers' or share the fate of the 'leavers'" (van der Ploeg, 2018, p. 238).

The idea of 'modernizing' farming still infuses some policy documents today, such the latest EU Common Agricultural Policy (CAP) reform and Farm to Fork strategy, promoting farm business models that are more technologically advanced, ready to make financial investments to further farm innovation, and better integrated into a highly competitive market (EC, 2020; also see Alberdi *et al.*, 2020). While there is a greater recognition of the value and contribution to sustainable food production of smaller and family-led farms, policies are ultimately still permeated by ideals of modernization, such as encouraging a digitalization and automatization of farming and financial investments by farming entrepreneurs, and are also contradicted in practice: the CAP measures have an inherent bias towards favoring the largest farm businesses (Scown *et al.*, 2020; Pe'er & Lakner, 2020).

At the same time, while visions of modernizing farming in Europe unfold, some farms among 'the ones in between' are also developing their practices in alternative directions, possibly showing greater potential for food production, rural prosperity, and improved ecological outcomes (van der Ploeg, 2009, 2018; van der Ploeg *et al.*, 2019). In particular, they are adopting approaches that are more aligned with a peasant-like or 'agroecological' style of farming, embracing greater farm autonomy and reliance on family labor rather than being grounded in forms of entrepreneurship or economies of scale (van der Ploeg, 2009, 2018). This approach

tends to contrast with the conventional farming model envisioned by the modernization project and has been described as an ongoing process of 're-peasantization' (van der Ploeg, 2018).

Despite coexistence research exploring how different forms of human-wildlife relations are produced, there has been little engagement with how these broader trends in the farming sector may interplay with the expansion and return of wildlife, including large carnivores in Europe. This study conceptualizes the return of wolves into contexts of de- and re-peasantization, exploring how wolves are entangled in these processes.

### 3. Tracing wolf agency in processes of agrarian change in Tuscany

Wolves have been returning across Italy in the recent decades, following their persecution in previous centuries (La Morgia *et al.*, 2022). Wolves have been a protected species in the country since the 1970s, and their killing continues to remain strictly prohibited. Despite this, illegal wolf killings still occur and are thought to be a significant cause of wolf mortality in Italy (Galaverni *et al.*, 2016). This is one aspect of a broader, rather conflictual picture of human-wolf relations in the country, where the ongoing expansion of this predator in the peninsula is associated with growing levels of impact on livestock farming, especially sheep farms (Gervasi *et al.*, 2022).

Tuscany (Figure 1) is a hotspot of human-wolf interactions on the Italian peninsula, with the local farming communities affected by hundreds of sheep depredations by wolves every year (Gervasi *et al.*, 2022). Current institutional measures to address this include the use of wolf-proof fences and/or livestock guard dogs. Adopting at least one of these measures is an eligibility requirement for the local farmers to claim compensation following wolf attacks. The extent to which they are effective at mitigating depredations, however, is still subject to ongoing research (Kuijper *et al.*, 2019). In the meantime, local tolerance for wolves generally remains low (Salvatori *et al.*, 2021).

To better understand local human-wolf relations, it is important to consider the context within which wolves are returning, and which they are also shaping. Tuscan landscapes, like other regions in Italy and Europe, have been going through significant processes of agrarian change in recent decades. As explored earlier, this entails an ongoing abandonment of farmland, and the concomitant rise of fewer and bigger farms (ISTAT, 2022). The number of sheep farms in Tuscany has more than halved in the last two decades, with small farms being the most affected (Pasqual, 2012; BDN, 2022; ISTAT, 2022). Small businesses with no more than a hundred or so sheep are the majority, while the bigger farms with more than five hundred or even over a thousand sheep are fewer, although growing in numbers (BDN, 2022; ISTAT, 2022).

Among the farms closing down are those in the more marginal areas, which can struggle to remain competitive, leading the younger family members to seek jobs in other areas and sectors of the economy with better and more stable incomes. Considering that most farms in the region and country have traditionally been family-led and highly reliant on the availability of family labor, a low generational turnover underpins farmland abandonment (IRPET, 2023).

To investigate how the growing wolf presence may be interacting with and influencing these agrarian dynamics, this study involved a twelve-month multispecies ethnography. Multispecies ethnography, as an extension of traditional human-centered ethnography, broadens the scope of inquiry to consider in greater detail the intricate relations between humans and non-humans, as situated within particular contexts that they are shaping at the same time (Kirksey & Helmreich, 2010). Ogden *et al.* (2013, p.7) described multispecies ethnography as a research approach that conceives the human as "untethered from its fixed isolation from other beings and things", where humans and human practices are seen as "a register of difference that emerges through shifting, often asymmetrical, relations with other agentive beings."

Multispecies ethnography is a fluid methodology and focused on shedding light on the entanglement of human and non-human life, seeking to disrupt dualist concepts by highlighting co-becomings and more-than-human agencies (Kirksey & Helmreich, 2010). In this study, analysis was mainly based on working closely with local farmers, making use of their traditional knowledge and understanding of the local wolves to gain insights. I documented aspects of wolf adaptive capacities, including shifts in their behaviors and in their interactions with the farmers and the sheep. This is not a novel approach, as it has been used before to elucidate non-human agency (e.g., Toncheva & Fletcher, 2022; Fry, 2023). Alongside this, I also spent time with the

sheep and guard dogs to observe their behaviors in contexts of wolf presence, visited farm sites where depredations had just happened to get a better sense of the dynamics of the attack, and tracked wolves non-invasively by walking transects and making opportunistic use of two camera traps, to monitor their presence.<sup>2</sup>

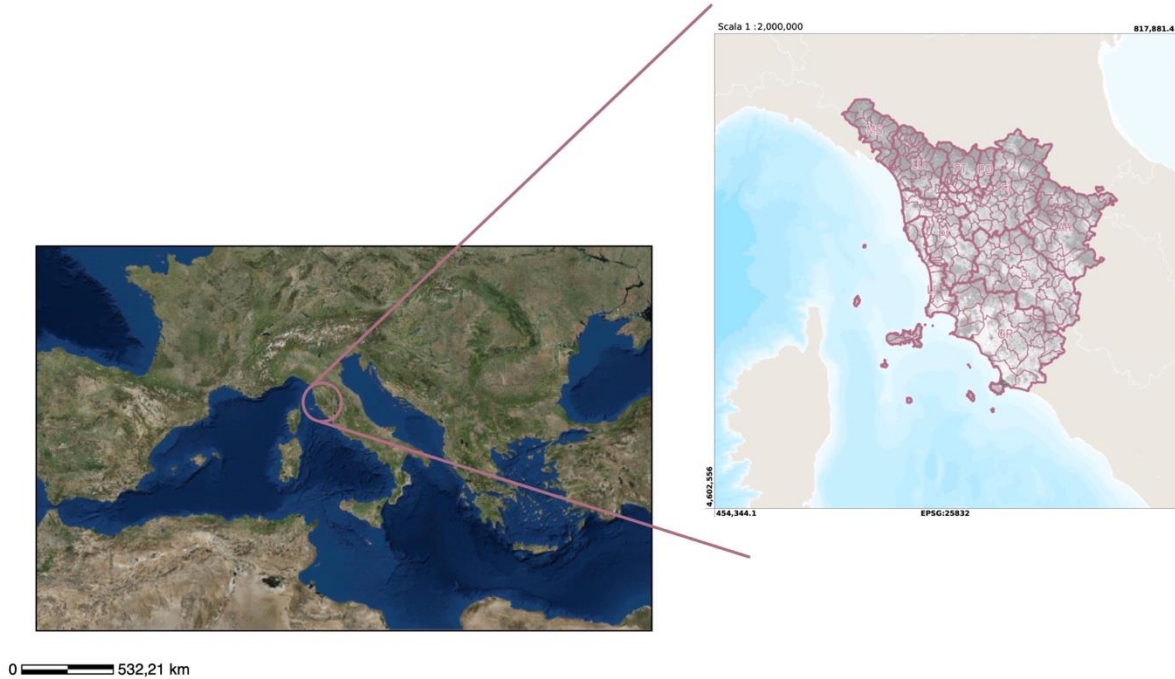


Figure 1: Illustration of the study area in Tuscany, Italy. The administrative border of the province of Grosseto (southern Tuscany) is illustrated in the image on the right under the initials GR. Human-wolf interactions in the study area occurred in lands owned by the local farmers (i.e., private property). Sources: Ministero Ambiente – Geoportale Nazionale; Regione Toscana – SITA: Cartoteca

In support of the multispecies ethnography, I also engaged in participant observation, which entails to "obtain a close and intimate familiarity with a given group of individuals and their practices through intensive involvement with people in their environment, usually over an extended period" (Moser & Korstjens, 2018, p.12). In my case, this involved shadowing and following farmer routines, including herding, feeding, and milking the sheep. By direct engagement, I got a better sense of the labor that goes into these activities, how they are structured, and whether they are conducive to coexistence with wolves. I also led informal semi-structured interviews that were audiotaped, based on permission from farmers. The semi-structured interviews were conducted in a very informal and conversational manner to offer participants the chance to explore the issues they felt were most important to them, rather than being structured beforehand (Longhurst, 2003).

I was introduced to farmers by local people I met during fieldwork, as well as by attending local fairs, markets, and farmer protests. Overall, I worked with about forty sheep farmers, including young adults and retired farmers, who managed farms of different sizes ranging from less than a hundred to thousands of sheep. Verbal informed consent was obtained from the farmers before any of these activities were conducted.

To acknowledge my positionality in conducting this research, I was living locally in a house owned by my grandparents, which they in turn inherited from their parents. My grandparents usually only spent summers

<sup>2</sup> See Sandbrook *et al.* (2018) for the ethics of using camera traps as in this study.

at this house, which is also when I used to visit the village. I did not have any close relation with the people living at the village before conducting this research. I developed and established local connections during fieldwork, by spending time in and with the local community. I was always genuine in my interactions with the farmers and made very clear my intents from the start, which I believe is what helped the most in building relationships, more so than having some family roots. That said, my background and familiarity with the local customs and dialect possibly helped me gain a better understanding of local human-wolf relations.

As described earlier, for this research I adopted a theoretical positioning at the interface between a structuralist and new materialist stance (Moon & Blackman, 2014). This means that I might have missed insights that could have been gathered using other perspectives, such as from adopting more feminist angles. My gender (male) might have shaped my experience and interpretation of this research in ways that I may not be aware of. I wish to emphasize that this study is not meant to provide an exhaustive or definite take on this topic, but to rather highlight one particular perspective on how the return of wolves may be influencing socioecological change. Further research could explore these aspects with a different theoretical positioning, to contribute to the development of a more holistic understanding of human-wolf relations and agrarian change.

#### 4. Wolf agency in processes of de-peasantization

Since the local eradication of wolves, farmers had been able to keep their sheep ranging freely on pastures, without much need to supervise them. The return of the wolves has necessitated immediate changes. Despite the wider availability of wild prey in Tuscany, wolves find wild ungulates harder to hunt than unguarded sheep (Meriggi *et al.*, 2011). From the very moment the wolves returned, they started preying on sheep that were left unguarded on pastures, especially at night when there is generally less human activity. This soon meant local farmers adjusted their practices and confined their sheep indoors in the evening, letting them out only during daytime. To the surprise of farmers, wolves quickly adapted by shifting to diurnal activity patterns, attacking the unguarded sheep in broad daylight.

I built night enclosures for the sheep, and now he [the wolf] comes during the day, even at midday [in the middle of summer], with this heat! This seems quite incredible really.

These adaptations by wolves mean that farmers can't rely on night enclosures to protect their sheep. They need to ensure greater supervision of their flocks on the pastures, which is a task particularly suitable for guard dogs. Guard dogs, however, can require significant attention, care, training, and maintenance costs (e.g., veterinary and upkeep). The use of dogs can also entail new responsibilities and ethical burdens for farmers, especially in highly touristy landscapes such as those of Tuscany, where guard dogs can harass and cause problems with passers-by, hikers, cyclists, neighbors, etc. To be effective at protecting flocks, these dogs need to work in groups of at least three or four, especially in contexts of highly organized wolf packs consisting of several individuals, easily outnumbering a few dogs (Figure 2).

Smaller farms managed by older farmers, or the 'leavers' (van der Ploeg, 2018), may not be able to afford these extra costs. Getting guard dogs could mean losing any additional income supporting low pension payments that the sheep can provide. These dogs can also live 10-15 years, which means they could potentially outlive the farms that are on their way out. This can become a further problem, in terms of "what happens to the dogs once the farm closes? They get sent to kennels?" These are all aspects that mean the 'leavers' don't use dogs, and so they are more exposed to and affected by wolf attacks. This dynamic can eventually bring them to prematurely cease their sheep farming activities, finishing earlier than they would have otherwise done.

The return of the wolves accelerates and consolidates this process of farmland abandonment, directly affecting local livelihoods by 'enforcing' an early termination of sheep farming. Emphasizing wolf agency in the early closure of farms is not a trivial detail but provides an important nuance to local human-wolf relations. The way wolves can hasten the closure of farm activities has political ramifications, engendering lower tolerance for this predator and contributing to the rise of populist politics in rural areas. Wolf management can become inserted and mobilized in local political manifestos and electoral campaigns:



Figure 2: Frames of camera trap footage showing the passage of a pack of at least six wolves in the study area. There is one wolf in the top-left frame, two wolves in the top-right, one wolf in the bottom-left, one centrally, and one in the bottom-right. Footage recorded in February 2022 while conducting this research. Source: author

I got to the point that I have fifty sheep left. At the next depredation I will sell them all off, because you can't live with that constant anxiety: where are the sheep; are they okay; are they agitated... so you end up having to get rid of them to live a better life yourself. Life is [already hard], and with this issue of the sheep it's no longer a livable life, no longer a livable life... I told you, I would have kept going with the sheep for a few more years, because it's not like they are a burden, but my health is important, and so it's better to get rid of the sheep, for those who can.

The 'leavers' are not the only farmers affected by wolves. The biggest farms with several thousand sheep are also impacted. These 'stayers' (van der Ploeg, 2018), have become highly adapted to a neoliberal economy and highly competitive in recent decades. Their large size and economies of scale enable them to efficiently produce large quantities of milk, which give their farmers a strong bargaining hand in negotiations with cheese manufacturers. To manage large flocks, they employ waged labor, in charge of taking the sheep to pastures and bringing them back indoors at the end of the day. While the sheep are left grazing, workers carry out other work at the farm, such as cleaning and restocking the pens.

As wolves return, they are increasingly undermining highly competitive farm businesses. Effective protection by guard dogs can be particularly difficult when there are separate flocks on different pastures, including those rented from others and distant from the farm. The oversight and coordination of dogs can be especially challenging in these circumstances: dogs left alone may roam, providing wolves with greater opportunities to prey on sheep. Some farmers have also observed that on more distant pastures the dogs can be



less territorial, and sometimes struggle to fend off wolves. Certainly, scattered sheep are harder to defend effectively. A local farmer, who kept over 2,500 sheep guarded by 40 dogs, suffered losses for these reasons. He lost hundreds of sheep every year to wolves, while also bearing the extra costs of the guard dogs:

The issue with the use of dogs is very simple, it's not like you need a degree to understand why using dogs is difficult, because, first of all it's the cost, as dogs cost us an eye. Dog food costs about 24, 25 euros per bag, and you need a bag a day [for about 40 dogs]. And yet even by using dogs we have not solved the problem [of depredation]. Then there is the problem of tourists, of commuters who cycle or walk or anything else. No one safeguards me, if my dog bites a person, it would cost me my business. No one safeguards me. It's easy to say get livestock guarding dogs. You don't solve the problem of the wolf and it's false when someone says you do, it's false.

Wolves learn to return to pastures where their hunting was successful, making them a real threat to farmers. Some find that their sheep, under these circumstances, can become more stressed and less productive. The landscape of fear that wolves generate and its related indirect impacts on production can undermine the very competitiveness upon which the business model of these largest farms is premised.

It's not the impact of the animal that is depredated, but the indirect impact that is destroying us. I personally do not know how much I can resist unless something different is done. Because after all, ultimately, we have to draw conclusions, we are entrepreneurs and when you get to a point that the business is no longer sustainable, you have to make some calculations [to see whether it's worth continuing]. Because at that point there are also other problems that come up that are even bigger, which are about seeing what you have been working on for 30 years being destroyed, because that's what is being done to us. Like, what has been happening now in these last few years, and the work we have been doing for the last 30 years to become competitive, to stay in the market, to create a supply chain. With this issue of the wolf, we... like, I don't want anyone to come up and say that the problem is the price of milk per liter, that's not true, for me the problem of the price of milk per liter does not exist, I make my own price of milk per liter. I am good at selling, I earn. I am not good at selling, I close the business.

The return of wolves, by affecting the financial sustainability of these largest farms, is also leading to indoor-based husbandry. This is the ultimate 'modernization compromise': coexisting with wolves while further intensifying farming practices and rationalizing production, at the expense of more traditional and free-ranging husbandry. The presence of wolves is also becoming associated locally with the politics of restructuring and modernization of the ovine sector, exacerbating levels of conflict:

We [farmers] are forced into extinction. The wolf will keep going if there won't be any containments [of wolf populations]. Where are we heading to? We are heading to coexistence with wolves through a destruction of livestock farming or through the creation of a different world where all livestock farms must be based on indoor feeding systems [*stabilizzazione fissa*], because the world is heading in that direction and because maybe someone made a deal with environmentalists and would like us to become like other countries, where indoor-based husbandry practices have taken off. Who knows? We don't. We know that indoor-based practices will become the only husbandry option if we keep going like this.

This is a shift that is already ongoing among other types of farms, which are neither as large as the 'stayers' nor as marginalized as the 'leavers' ('the ones in between'; von der Ploeg, 2018). These are generally younger farmers, or older with kids working on the farm, who want to continue raising sheep and do not plan to close any time soon. The return of the wolf is influencing the decision by some to replace the local sheep

breed (i.e., the Sardinian breed) with the French lacaune breed, which is a bigger type of sheep that is significantly more productive when raised indoors. This change in practices can facilitate coexistence by reducing the time sheep spend on pastures, decreasing their vulnerability to attacks. In this way, these farmers can also avoid the broader costs and burdens of using guard dogs. Nevertheless, some farms may not be able to adopt more indoor-based regimes:

[For me, a switch to Lacaune breed would mean] no longer having a farm business. I don't have a farm suited for the French breed because my zone is a bit awkward, like a lot of zones in [local name removed], where it is good if the sheep go and sort themselves out with finding food. These are inaccessible zones that would otherwise be left abandoned ... With the French breed, instead, you have to harvest feed, bring them to the pen and give it to the sheep, even though it's not like these sheep don't go out at all [...]. So, swapping the Sardinian for the French breed is not something all farms can do. Particularly, the breeds better suited for free-ranging practices can make use of any territory available, that's their service: to go, make the most of what's out there, possibly on lands that are difficult to work on tractor and so on. If you get the French breed, they want hay indoors... like, not all farms can have the French breed.

The picture emerging from this section is that the wolves are active agents in the coproduction of agrarian change, influencing the arrangement and configuration of local farming landscapes as they return to and expand into rural areas. In particular, wolves influence aspects of farmland abandonment while contributing to a modernization of sheep husbandry in Tuscany, co-shaping ongoing processes of de-peasantization.

## 5. Wolf agency in processes of re-peasantization

When a shift to indoor-based practices is not a feasible option, some farms still continue. Some of 'the ones in between' adopt a business model that seems particularly well placed to accommodate coexistence with wolves while still maintaining free-ranging practices. These farms have sufficient availability of family labor around which their business model is built. Specifically, the sizes of their flocks are tied to labor availability. Reliance on family labor is part of a wider business strategy to enhance farm resilience in the face of environmental stochasticity and market volatility:

One of the perks of relying on family labor is that when there is the need to reduce your income, whether because of poor weather, low milk prices, or for whatever reason, then all of you [family members] can take the hit and bear the costs until things get better. But with the workers, you can't really do that... maybe you could do that for a month, but then after that you need to pay them their full salary as per the contract they signed.

Relying on family labor means that these farms do not become very large, although they can still reach around 500 or 600 sheep for families that have three or four members working at the farm. On the one hand, generational renewal allows these farms to better afford and invest in long-term measures such as the use of guard dogs, compared to the 'leavers.' On the other hand, the relatively smaller number of sheep they keep means that guard dogs can be deployed more effectively compared to the 'stayers.' With fewer sheep, pastures can be used closer to the main farm, making oversight of the flocks and the dogs easier. This also allows the dogs to develop more territorial instincts and to become more effective at guarding (Figure 3). While some deaths do still happen even in these cases, these tend to be more sporadic than frequent, facilitating possibilities of coexistence.



Figure 3: Two Maremmano-Abruzzese sheepdogs (the local breed of guard dogs) at a local farm in Tuscany. Source: author

In the same way that wolves can learn to regularly predate on vulnerable farms, they can also learn to avoid farms that are patrolled effectively. Guard dogs can kill wolves if they catch them, making attacking sheep a high-risk activity. Wolves redirect their attacks onto the more vulnerable farms without dogs. Guarded farms could have some competitive advantage.

Improved sheep protection can help farmers better manage breeding programs to enhance the productivity of their flocks, instead of having to constantly buy new animals because of regular losses. The sheep themselves may also be less stressed and more productive at farms that are less impacted by wolf attacks. By being able to retain wide ranging sheep husbandry despite the presence of wolves, family-led farms with a high availability of labor have an advantage, and this may increase in future. Certainly, the return of wolves has shifted shifting production dynamics. The most productive and competitive farms are no longer the large-scale businesses of the 'stayers', but the relatively smaller and family-led farms. While some farms may shift to more indoor-based regimes and persist, this can come with different socioecological costs and may also affect the very quality of the products of these farms. For instance, farmers generally found that milk quality is becoming poorer with the rise of more intensive practices.

Milk quality is certainly no longer as good as back then, and it will become increasingly worse with alimentary regimes that are always the same, because outdoors it [the alimentary regime of sheep] varies, from field to field, depending on grass type, but if you keep the sheep indoor and you manage them inside like dairy cows, the milk produced comes out always the same, in summer and winter.

Farmers with greater availability of family labor can exploit the market for fresh milk via some direct sales, selling outside the often-exploitative dynamics of supply chains (Galt, 2013; Isakson, 2014):

We don't employ workers, we have about 500 sheep and do all the work ourselves, from herding them, to transforming the milk, and selling the products. We never rest, we wake up every morning at 4am and go to sleep at midnight... it's a big sacrifice, but with the help of our kids we manage to just get by ... our daughter enjoys doing especially the direct sales bit, while our son is more into the farm work. [...] There is still some competition with other direct sellers, especially those who buy their products wholesale and are able to sell them at lower prices... but our products are fresher and tastier because they are made daily, so we are still able to maintain a good customer base. Cheese factories collect milk from farms every three days, so the milk is less fresh and they probably have to put something in it to preserve it.

These family-led farms still face limitations in trying to co-adapt to and coexist with wolves. Farms particularly close to road junctions or villages can still find it significantly problematic to use guard dogs. This is also the case for farms that complement their income by through (agri)tourism and homestays. Direct sales rely on price differentiation and premium products, which could diminish if 'everyone' starts selling this way. Considering these aspects, it is unlikely that these family farms are gaining direct benefits from the presence of wolves. Rather, the wolves are functioning as a 'selective force' that is disadvantaging other types of farms, thus better enabling the persistence of these family-led businesses.

The growing presence of wolves is necessitating and shaping the emergence of a different kind agrarian change, long linked to fewer and bigger businesses (ISTAT, 2022). The presence of wolves favors a process of re-peasantization by making the relatively smaller and family-led farms the most competitive and resilient business model for free-ranging sheep husbandry.

## 6. Discussion

I have shown how wolves in Tuscany are deeply entangled in these processes of agrarian change, channeling it in particular directions. Tuscan farming landscapes are being altered by the presence or absence of wolves. While mainstream ecological and conservation narratives present wolves as 'ecological engineers' (see Lorimer, 2017), this study reframes them as *socioecological* engineers. Representations of non-humans as passively laying in the background of human actors, which can characterize the more structural political ecology accounts (Hovorka, 2018), do not accord with wolves seen as highly adaptive and agentive beings, capable of altering socioecological dynamics in politically relevant ways.

Agrarian change is not the result of unidirectional or top-down structural processes, as dictated by supranational agricultural policies. Rather, it is influenced 'sideways' by other agents, including the agency of wolves. The return of wolves in Tuscany is accelerating the closure of the most marginalized farms while undermining the business model of the most competitive sheep farms. This is leading to a modernization of the ovine sector, towards indoor husbandry, and the greater competitiveness of family farms with adequate labor able to maintain extensive herding. As wolves return, they are affecting the very composition and arrangement of local farming landscapes, shaping processes of de- and re-peasantization.

Agency is inherently relational, emerging through a network or assemblage of forces rather than being the sole result of individual actors or structural processes (Bawaka Country *et al.*, 2016). This conceptualization of agency does not attribute wolves responsibility for their impacts (cf., Komi and Nygren, 2023). Rather, it enables a greater focus on how farming practices are changing respective to the imbrication of wolf agency with the political economy of farming. The way wolves influence the course of events is not predetermined or fixed but contingent on these aspects. This reflects the constant co-becoming (Haraway 2016) of humans and wolves, problematizing dualist conceptions of a 'nature out there' and a 'society over here.'

The article has also shown how farming practices can remain compatible with the presence of wolves. They are a 'selective force' influencing the very topology of farming landscapes, beyond totalizing human control (Barua and Sinha, 2019). This understanding sheds light on the effects or 'ripples' of wolf agency at a wider, landscape level, beyond what happens on individual farms (Ojalampi and Blomley, 2015). Research has revealed how wolves operate as socioecological engineers, and how they elicit and reproduce change. In the region, wolves' contribution to an intensification of farming practices is an aspect that has remained largely

unexplored by the scientific and conservation community. It may be desirable to avoid some effects of their reintroduction, given the broader ecological and cultural values that can be associated with free-range herding practices in Europe (Pe'er *et al.*, 2017). The return of wolves provides a radical opportunity for a change in practices.

Wolves seem to be necessitating a re-peasantization of rural landscapes if an intensification of husbandry regimes is to be avoided. This challenges economies of scale and competitiveness, through bigger and more intensive farms. For sure, greater intergenerational renewal with farm autonomy and food sovereignty could be assisted by significant restructuring and overhauling of international agricultural and trade policies (de Molina *et al.*, 2019; van der Ploeg *et al.*, 2019; La Via Campesina, 2021; McGreevy *et al.*, 2022), but wolf presence also necessitate some coexistence with free-ranging sheep husbandry.

Teasing out the influence of wolf agency on agrarian processes is a way to 'think with' wolves in management strategies (Nassar & Barbour, 2023). Wolves have some capacity to affect socioecological change in 'undisciplined' and 'inadvertent' ways. Managing existing inequities and conflicts should not exclude consideration of these effects.

Non-human agency can be mobilized towards particular political ends, including the reproduction and reinforcement of the status quo (Evans & Adams, 2018; Barua, 2023). In human-wolf relations in Italy, the actions that wolves necessitate through their presence and impacts have been historically mobilized for the promotion of (inequitable) ecotourism activities, and even enrolled into populist agendas that seek the removal of these predators (Donfrancesco, 2024). But it is the actions taken by the farmers themselves, as necessitated by the wolves and as constrained by their different socioeconomic circumstances, that play into a reproduction of dominant practices like the intensification of husbandry regimes.

Non-humans may provide opportunities for alternative practices, which are sometimes windows of opportunities for the pursuit of alternative (co)existences (e.g., Leap, 2014; Argüelles & March, 2022). Focusing on these dynamics can help uncover different strategies to improve human-wildlife relations (Pooley *et al.*, 2017). Developing more just and effective approaches for a mutual flourishing of human and non-human life can often be overlooked by more mainstream accounts (de Silva and Srinivasan, 2019; Chao *et al.*, 2022; Celermajer *et al.*, 2021).

## 7. Conclusion

I have called for a more nuanced understanding of the presence of wolves in socioecological systems, treating them as *socioecological* engineers rather than as bringers of 'ecological balance' (see Zscheischler & Friedrich, 2022). Wolves and humans are engaged in a constant process of co-becoming (Haraway, 2016), wherein both entities influence and shape each other's existence.

This interaction is not unidirectional or static. Wolves become more or less problematic to humans depending on specific contexts, and their adaptive behaviors can affect and undermine these contexts. By emphasizing this imbrication of non-human agency with particular political economies, it becomes possible to emphasize possibilities for radical change. A more-than-human political ecology offers a re-politicization of current discourses of socioecological change and a recognition of relationality, with greater concern and care for vulnerable non-human others (Hinchliffe, 2008; Choi, 2016; de Silva & Srinivasan, 2019). As Haraway (2016, p.12) stressed:

[i]t matters what matters we use to think other matters with; it matters what stories we tell to tell other stories with; it matters what knots knot knots, what thoughts think thoughts, what descriptions describe descriptions, what ties tie ties. It matters what stories make worlds, what worlds make stories.

We need to take such analyses further, across different regions and contexts, contributing to a growing scholarship of a more-than-human political ecology that goes beyond dualist frames and without losing a critical focus on the political economy of agrarian change.

## References

- Alberdi, G., Begiristain Zubillaga, M., Brent, Z., Choplin, G. Claeys, P., Conti, M., Corrado, A., Duncan, J., Ferrando, T. McKeon, N. de Marinis, P., Milgroom, J., Moeller, N., Nicol, P., Onorati, A., Plank, C. van der Ploeg, J.D., Rivera-Ferre, M.G., ... Van Dyck, B. (2020). [A collective response from food sovereignty scholars on the EU's 763 Farm to Fork Strategy](https://doi.org/10.13140/RG.2.2.19433.11365). Wageningen University. <https://doi.org/10.13140/RG.2.2.19433.11365>
- Altieri, M. A., & Toledo, V. M. (2011). The agroecological revolution in Latin America: Rescuing nature, ensuring food sovereignty and empowering peasants. *Journal of Peasant Studies*, 38(3), 587-612. <https://doi.org/10.1080/03066150.2011.582947>
- Arboleda, M. (2017). Revitalizing science and technology studies: A Marxian critique of more-than-human geographies. *Environment and Planning D: Society and Space*, 35(2), 360–378. <https://doi.org/10.1177/0263775816664099>
- Argüelles, L., & March, H. (2022). Weeds in action: Vegetal political ecology of unwanted plants. *Progress in Human Geography*, 46(1), 44–66. <https://doi.org/10.1177/03091325211054966>
- Ausilio, G., Sand, H., Månsson, J., Mathisen, K. M., & Wikenros, C. (2021). Ecological effects of wolves in anthropogenic landscapes: The potential for trophic cascades is context-dependent. *Frontiers in Ecology and Evolution*, 8, 577963. <https://doi.org/10.3389/fevo.2020.577963>
- Barua, M. (2023). Plantationocene: A vegetal geography. *Annals of the American Association of Geographers*, 113(1), 13–29. <https://doi.org/10.1080/24694452.2022.2094326>
- Barua, M., & Sinha, A. (2019). Animating the urban: An ethological and geographical conversation. *Social & Cultural Geography*, 20(8), 1160–1180. <https://doi.org/10.1080/14649365.2017.1409908>
- Bawaka Country, Wright, S., Suchet-Pearson, S., Lloyd, K., Burarrwanga, L., Ganambarr, R., Ganambarr-Stubbs, M., Ganambarr, B., Maymuru, D., & Sweeney, J. (2016). Co-becoming Bawaka: Towards a relational understanding of place/space. *Progress in Human Geography*, 40(4), 455–475. <https://doi.org/10.1177/0309132515589437>
- BDN (2022). Consistenza allevamenti per classe di consistenza. [https://www.vetinfo.it/j6\\_statistiche/#/report-pbi/29](https://www.vetinfo.it/j6_statistiche/#/report-pbi/29)
- Buller, H. (2014). Animal geographies I. *Progress in Human Geography*, 38(2), 308–318. <https://doi.org/10.1177/0309132513479295>
- Büscher, B. (2022). The nonhuman turn: Critical reflections on alienation, entanglement and nature under capitalism. *Dialogues in Human Geography*, 12(1), 54–73. <https://doi.org/10.1177/20438206211026200>
- Celermajer, D., Schlosberg, D., Rickards, L., Stewart-Harawira, M., Thaler, M., Tschakert, P., Verlie, B., & Winter, C. (2021). Multispecies justice: Theories, challenges, and a research agenda for environmental politics. *Environmental Politics*, 30(1–2), 119–140. <https://doi.org/10.1080/09644016.2020.1827608>
- Chao, S., Bolender, K. & Kirksey, E. (Eds.) (2022). *The promise of multispecies justice*. Duke University Press.
- Chapron, G., Kaczensky, P., Linnell, J. D. C., von Arx, M., Huber, D., Andrén, H., López-Bao, J. V., Adamec, M., Álvares, F., Anders, O., Balčiauskas, L., Balys, V., Bedó, P., Bego, F., Blanco, J. C., Breitenmoser, U., Brøseth, H., Bufka, L., Bunikyte, R., ... Boitani, L. (2014). Recovery of large carnivores in Europe's modern human-dominated landscapes. *Science*, 346(6216), 1517–1519. <https://doi.org/10.1126/science.1257553>
- Choi, M. A. (2016). [More-than-human geographies of nature: Toward a careful political ecology](https://doi.org/10.1177/0309132516664099). *Journal of the Korean Geographical Society*, 51(5), 613–632.
- Cimatti, M., Ranc, N., Benítez-López, A., Maiorano, L., Boitani, L., Cagnacci, F., Čengić, M., Ciucci, P., Huijbregts, M. A. J., Krofel, M., López-Bao, J. V., Selva, N., Andren, H., Bautista, C., Ćirović, D., Hemmingmoore, H., Reinhardt, I., Marenče, M., Mertzanis, Y., ... Santini, L. (2021). Large carnivore expansion in Europe is associated with human population density and land cover changes. *Diversity and Distributions*, 27(4), 602–617. <https://doi.org/10.1111/ddi.13219>

- Cronon, W. (1996). The trouble with wilderness: Or, getting back to the wrong nature. *Environmental History*, 1(1), 7–28. <https://doi.org/10.2307/3985059>
- De Molina, M.G., Petersen, P.F., Peña, F.G. & Caporal, F.R. (2019). *Political agroecology: Advancing the transition to sustainable food systems*. CRC Press.
- de Silva, S., & Srinivasan, K. (2019). Revisiting social natures: People-elephant conflict and coexistence in Sri Lanka. *Geoforum*, 102, 182–190. <https://doi.org/10.1016/j.geoforum.2019.04.004>
- Donfrancesco, V. (2024). (Co)producing landscapes of coexistence: A historical political ecology of human-wolf relations in Italy. *Geoforum*, 149, 103958. <https://doi.org/10.1016/j.geoforum.2024.103958>
- EC (2020). Farm to Fork strategy: For a fair, healthy and environmentally-friendly food system. European Commission. [https://food.ec.europa.eu/system/files/2020-05/f2f\\_action-plan\\_2020\\_strategy-info\\_en.pdf](https://food.ec.europa.eu/system/files/2020-05/f2f_action-plan_2020_strategy-info_en.pdf)
- EC (2023). Commission proposes to change international status of wolves from 'strictly protected' to 'protected' based on new data on increased populations and impacts. [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_23\\_6752](https://ec.europa.eu/commission/presscorner/detail/en/ip_23_6752)
- Eastwood, R., Lipton, M., & Newell, A. (2010). Farm size. In Pingali, P. & Evenson, R. (Eds.). *Handbook of Agricultural Economics* (Vol. 4, pp. 3323–3397). Elsevier. [https://doi.org/10.1016/S1574-0072\(09\)04065-1](https://doi.org/10.1016/S1574-0072(09)04065-1)
- Evans, L. A., & Adams, W. M. (2018). Elephants as actors in the political ecology of human–elephant conflict. *Transactions of the Institute of British Geographers*, 43(4), 630–645. <https://doi.org/10.1111/tran.12242>
- Falcucci, A., Maiorano, L., & Boitani, L. (2007). Changes in land-use/land-cover patterns in Italy and their implications for biodiversity conservation. *Landscape Ecology*, 22(4), 617–631. <https://doi.org/10.1007/s10980-006-9056-4>
- Fletcher, R., & Toncheva, S. (2021). The political economy of human-wildlife conflict and coexistence. *Biological Conservation*, 260, 109216. <https://doi.org/10.1016/j.biocon.2021.109216>
- Fry, T. (2023). 'They're part of what we are': Interspecies belonging, animal life and farming practice on the Isle of Skye. *Environment and Planning E: Nature and Space*, 251484862311518. <https://doi.org/10.1177/25148486231151809>
- Galaverni, M., Caniglia, R., Fabbri, E., Milanese, P., & Randi, E. (2016). One, no one, or one hundred thousand: How many wolves are there currently in Italy? *Mammal Research*, 61(1), 13–24. <https://doi.org/10.1007/s13364-015-0247-8>
- Galt, R. E. (2013). Placing food systems in first world political ecology: A review and research agenda. *Geography Compass*, 7(9), 637–658. <https://doi.org/10.1111/gec3.12070>
- Gervasi, V., Zingaro M., Aragno P., Genovesi P. & Salvatori V. (2022). Stima dell'impatto del lupo sulle attività zootecniche in Italia. Analisi del periodo 2015-2019. Relazione tecnica realizzata nell'ambito della convenzione ISPRA-Ministero della Transizione Ecologica per "Attività di monitoraggio nazionale nell'ambito del Piano di Azione del lupo". [https://www.isprambiente.gov.it/public\\_files/StimaImpattoLupoAattivitazootecniche.pdf](https://www.isprambiente.gov.it/public_files/StimaImpattoLupoAattivitazootecniche.pdf)
- Haraway, D. J. (2016). *Staying with the trouble: Making kin in the Chthulucene*. Duke University Press.
- Hinchliffe, S. (2008). Reconstituting nature conservation: Towards a careful political ecology. *Geoforum*, 39(1), 88–97. <https://doi.org/10.1016/j.geoforum.2006.09.007>
- Hobson, K. (2007). Political animals? On animals as subjects in an enlarged political geography. *Political Geography*, 26(3), 250–267. <https://doi.org/10.1016/j.polgeo.2006.10.010>
- Hovorka, A. J. (2018). Animal geographies II: Hybridizing. *Progress in Human Geography*, 42(3), 453–462. <https://doi.org/10.1177/0309132517699924>
- IRPET (2023). L'agricoltura Toscana oggi: Le tendenze tra i due censimenti ISTAT. [https://www.irpet.it/wp-content/uploads/2023/07/agricoltura-toscana-oggi\\_tra-2-cens\\_istat-06-2023.pdf](https://www.irpet.it/wp-content/uploads/2023/07/agricoltura-toscana-oggi_tra-2-cens_istat-06-2023.pdf)
- Isakson, S. R. (2014). Food and finance: The financial transformation of agro-food supply chains. *The Journal of Peasant Studies*, 41(5), 749–775. <https://doi.org/10.1080/03066150.2013.874340>

- ISTAT (2022). Meno aziende agricole (ma più grandi) e nuove forme di gestione dei terreni. [https://www.istat.it/it/files//2022/06/REPORT-CENSIAGRI\\_2021-def.pdf](https://www.istat.it/it/files//2022/06/REPORT-CENSIAGRI_2021-def.pdf)
- Jepson, P., Buckingham, K., & Barua, M. (2011). What is a conservation actor? *Conservation and Society*, 9(3), 229. <https://doi.org/10.4103/0972-4923.86993>
- Kirksey, S. E., & Helmreich, S. (2010). The emergence of multispecies ethnography. *Cultural Anthropology*, 25(4), 545–576. <https://doi.org/10.1111/j.1548-1360.2010.01069.x>
- Knight, J. (1997). On the extinction of the Japanese wolf. *Asian Folklore Studies*, 56, 129–159. <https://doi.org/10.2307/1178791>
- Komi, S., & Nygren, A. (2023). Bad Wolves? Political ecology of responsibility and more-than-human perspectives in human–wildlife interactions. *Society & Natural Resources*, 36(10), 1–19. <https://doi.org/10.1080/08941920.2023.2209789>
- König, H. J., Kiffner, C., Kramer-Schadt, S., Fürst, C., Keuling, O., & Ford, A. T. (2020). Human–wildlife coexistence in a changing world. *Conservation Biology*, 34(4), 786–794. <https://doi.org/10.1111/cobi.13513>
- Kuijper, D. P. J., Churski, M., Trouwborst, A., Heurich, M., Smit, C., Kerley, G. I. H., & Cromsigt, J. P. G. M. (2019). Keep the wolf from the door: How to conserve wolves in Europe's human-dominated landscapes? *Biological Conservation*, 235, 102–111. <https://doi.org/10.1016/j.biocon.2019.04.004>
- La Morgia, V. Marucco F., Aragno P., Salvatori V., Gervasi V., De Angelis D., Fabbri E., Caniglia R., Velli E., Avanzinelli E., Boiani M.V. & Genovesi P. (2022). Stima della distribuzione e consistenza del lupo a scala nazionale 2020/2021. Relazione tecnica realizzata nell'ambito della convenzione ISPRA-Ministero della Transizione Ecologica "Attività di monitoraggio nazionale nell'ambito del Piano di Azione del lupo". [https://www.isprambiente.gov.it/it/attivita/biodiversita/monitoraggio-nazionale-del-lupo/file-monitoraggio/report-nazionale-lupo-20\\_21.pdf](https://www.isprambiente.gov.it/it/attivita/biodiversita/monitoraggio-nazionale-del-lupo/file-monitoraggio/report-nazionale-lupo-20_21.pdf)
- La Via Campesina. (2021). *Food Sovereignty, a manifesto for the future of our planet*. La Via Campesina. <https://viacampesina.org/en/food-sovereignty-a-manifesto-for-the-future-of-our-planet-la-via-campesina/>
- Leap, B. (2014). Collective troubles: Transforming neoliberalism through interactions with nonhumans. *Geoforum*, 56, 182–191. <https://doi.org/10.1016/j.geoforum.2014.07.007>
- Longhurst, R. (2003). Semi-structured interviews and focus groups. In Clifford, N., Cope, M., Gillespie, T., & French, T. (Eds.). *Key methods in geography*. (pp.143-156.). Sage.
- Lorimer, J. (2017). Probiotic environmentalities: Rewilding with wolves and worms. *Theory, Culture & Society*, 34(4), pp.27-48. <https://doi.org/10.1177/0263276417695866>
- Lorimer, J. (2022). Is this the humanism we have been looking for? *Dialogues in Human Geography*, 12(1), 74–78. <https://doi.org/10.1177/20438206221080568>
- Margulies, J. D., & Karanth, K. K. (2018). The production of human-wildlife conflict: A political animal geography of encounter. *Geoforum*, 95, 153–164. <https://doi.org/10.1016/j.geoforum.2018.06.011>
- Marino, A., Blanco, J., Cortes-Vazquez, J., López-Bao, J., Bosch, A., & Durant, S. (2022). Environmentalities of coexistence with wolves in the Cantabrian Mountains of Spain. *Conservation and Society*, 20(4), 345. [https://doi.org/10.4103/cs.cs\\_66\\_21](https://doi.org/10.4103/cs.cs_66_21)
- Marris, E. (2014). Rethinking predators: Legend of the wolf. *Nature*, 507(7491), 158–160. <https://doi.org/10.1038/507158a>
- McGreevy, S. R., Rupprecht, C. D. D., Niles, D., Wiek, A., Carolan, M., Kallis, G., Kantamaturapoj, K., Mangnus, A., Jehlička, P., Taherzadeh, O., Sahakian, M., Chabay, I., Colby, A., Vivero-Pol, J.-L., Chaudhuri, R., Spiegelberg, M., Kobayashi, M., Balázs, B., Tsuchiya, K., ... Tachikawa, M. (2022). Sustainable agrifood systems for a post-growth world. *Nature Sustainability*, 5(12), 1011–1017. <https://doi.org/10.1038/s41893-022-00933-5>
- Mech, D. L. (2012). Is science in danger of sanctifying the wolf? *Biological Conservation*, 150(1), 143–149. <https://doi.org/10.1016/j.biocon.2012.03.003>



- Meriggi, A., Brangi, A., Schenone, L., Signorelli, D., & Milanesi, P. (2011). Changes of wolf (*Canis lupus*) diet in Italy in relation to the increase of wild ungulate abundance. *Ethology Ecology & Evolution*, 23(3), 195–210. <https://doi.org/10.1080/03949370.2011.577814>
- Moon, K., & Blackman, D. (2014). A guide to understanding social science research for natural scientists. *Conservation Biology*, 28(5), 1167–1177. <https://doi.org/10.1111/cobi.12326>
- Moser, A., & Korstjens, I. (2018). Series: Practical guidance to qualitative research. Part 3: Sampling, data collection and analysis. *European Journal of General Practice*, 24(1), 9–18. <https://doi.org/10.1080/13814788.2017.1375091>
- Nassar, D., & Barbour, M. (2023). Tree stories. *Cultural Politics*, 19(1), 128–147. <https://doi.org/10.1215/17432197-10232530>
- Ogden, L.A., Hall, B. & Tanita, K. (2013). Animals, plants, people, and things: A review of multispecies ethnography. *Environment and Society*, 4(1), 5–24. <https://doi.org/10.3167/ares.2013.040102>
- Ojalamm, S., & Blomley, N. (2015). Dancing with wolves: Making legal territory in a more-than-human world. *Geoforum*, 62, 51–60. <https://doi.org/10.1016/j.geoforum.2015.03.022>
- Pasqual, S. (2012). La Toscana al 6° censimento generale dell'agricoltura. <http://www.regione.toscana.it/censimentoagricoltura2010>
- Pe'er, G., & Lakner, S. (2020). The EU's Common Agricultural Policy could be spent much more efficiently to address challenges for farmers, climate, and biodiversity. *One Earth*, 3(2), 173–175. <https://doi.org/10.1016/j.oneear.2020.08.004>
- Pe'er, G., Lakner, S., Müller, R., Passoni, G., Bontzorlos, V., Clough, D., Moreira, F., Azam, C., Berger, J., Bezak, P., Bonn, A., Hansjürgens, B., Kleemann, J., Lomba, A., Sahrbacher, A., Schindler, S., Schmidt, J., Schüller, S....Zinngrebe, Y. (2017). [Is the CAP fit for purpose? An evidence-based fitness-check assessment](https://doi.org/10.1016/j.geoforum.2015.03.022). German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig.
- Pettersson, H. L., Holmes, G., Quinn, C. H., Sait, S. M., & Blanco, J. C. (2023). Who must adapt to whom? Contested discourses on human–wolf coexistence and their impact on policy in Spain. *People and Nature*, pan3.10543. <https://doi.org/10.1002/pan3.10543>
- Pooley, S., Barua, M., Beinart, W., Dickman, A., Holmes, G., Lorimer, J., Loveridge, A. J., Macdonald, D. W., Marvin, G., Redpath, S., Sillero-Zubiri, C., Zimmermann, A., & Milner-Gulland, E. J. (2017). An interdisciplinary review of current and future approaches to improving human-predator relations. *Conservation Biology*, 31(3), 513–523. <https://doi.org/10.1111/cobi.12859>
- Ripple, W. J., & Beschta, R. L. (2004). Wolves and the ecology of fear: Can predation risk structure ecosystems? *BioScience*, 54(8), 755–766. [https://doi.org/10.1641/0006-3568\(2004\)054\[0755:WATEOF\]2.0.CO;2](https://doi.org/10.1641/0006-3568(2004)054[0755:WATEOF]2.0.CO;2)
- Ripple, W. J., Wolf, C., Beschta, R. L., Craig, A. D., Curcija, Z. S., Lundgren, E. J., ... & Wirsing, A. J. (2024). A shifting ecological baseline after wolf extirpation. *BioScience*, biae034. <https://doi.org/10.1093/biosci/biae034>
- Salvatori, V., Balian, E., Blanco, J. C., Carbonell, X., Ciucci, P., Demeter, L., Marino, A., Panzavolta, A., Solyom, A., von Korff, Y., & Young, J. C. (2021). Are large carnivores the real issue? Solutions for improving conflict management through stakeholder participation. *Sustainability*, 13(8), 4482. <https://doi.org/10.3390/su13084482>
- Sandbrook, C., Luque-Lora, R., & Adams, W. M. (2018). Human bycatch: Conservation surveillance and the social implications of camera traps. *Conservation and Society*, 16(4), 493–504. <https://doi.org/10.4103/cs.cs.17.165>
- Scown, M. W., Brady, M. V., & Nicholas, K. A. (2020). Billions in misspent EU agricultural subsidies could support the Sustainable Development Goals. *One Earth*, 3(2), 237–250. <https://doi.org/10.1016/j.oneear.2020.07.011>
- Shiva, V (2006). WTO and agrarian crisis in India. *Indian Foreign Affairs Journal*, 1(4), 8–18.

- Toncheva, S., & Fletcher, R. (2022). Knowing bears: An ethnographic study of knowledge and agency in human–bear cohabitation. *Environment and Planning E: Nature and Space*, 5(2), 901–923. <https://doi.org/10.1177/25148486211015037>
- Van der Ploeg, J. D. (2009). *The new peasantries: Struggles for autonomy and sustainability in an era of empire and globalization*. Routledge.
- van der Ploeg, J. D. (2018). From de-to repeasantization: The modernization of agriculture revisited. *Journal of Rural Studies*, 61, 236–243. <https://doi.org/10.1016/j.jrurstud.2017.12.016>
- van der Ploeg, J. D., Franco, J. C., & Borras, S. M. (2015). Land concentration and land grabbing in Europe: A preliminary analysis. *Canadian Journal of Development Studies / Revue Canadienne d'études Du Développement*, 36(2), 147–162. <https://doi.org/10.1080/02255189.2015.1027673>
- van der Ploeg, J. D., Barjolle, D., Bruil, J., Brunori, G., Costa Madureira, L. M., Dessein, J., Drag, Z., Fink-Kessler, A., Gasselin, P., Gonzalez de Molina, M., Gorchach, K., Jürgens, K., Kinsella, J., Kirwan, J., Knickel, K., Lucas, V., Marsden, T., Maye, D., Migliorini, P., ... Wezel, A. (2019). The economic potential of agroecology: Empirical evidence from Europe. *Journal of Rural Studies*, 71, 46–61. <https://doi.org/10.1016/j.jrurstud.2019.09.003>
- Whatmore, S. (2006). Materialist returns: Practising cultural geography in and for a more-than-human world. *Cultural Geographies*, 13(4), 600–609. <https://doi.org/10.1191/1474474006cgj377oa>
- Zscheischler, J., & Friedrich, J. (2022). The wolf (canis lupus) as a symbol of an urban–rural divide? Results from a media discourse analysis on the human–wolf conflict in Germany. *Environmental Management*, 70(6), 1051–1065. <https://doi.org/10.1007/s00267-022-01719-3>