

Supporting Information

“They belong here”: Understanding the conditions of human-wolf coexistence in north-western Spain

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1. Table SI1. Key informants interviewed for the study.

Code	Date	Location	Interview venue	Interview type	Sex	Age	Occupation	Property
A1	27/01/2020	La Carballeda	Office	Formal	Male	45-60	Local authorities	Depopulation/Land abandonment
A2	28/01/2020	La Carballeda	Public space	Formal	Male	20-45	Business sector	Hospitality sector
A3	Various	La Carballeda	Public space	Informal	Male	60-85	Hunter	Hunting
A4	30/01/2020	La Carballeda	Public space	Formal	Male	45-60	Business sector	Nature tourism sector
A5	30/01/2020	La Carballeda	Home	Formal	Female	20-45	Local authorities	Depopulation/Land abandonment
A6	30/01/2020	Sanabria	Home	Formal	Male	45-60	Civil servant	Hunting
A7	02/02/2020	La Carballeda	Farm visit/participant herding	Formal	Male	45-60	Farmer, sheep	Traditional farming and agriculture
A8	03/02/2020	La Carballeda	Farm visit/participant herding	Formal	Male	60-85	Farmers, cattle	Traditional farming and agriculture
A9	04/02/2020	La Carballeda	Home	Formal	Female	60-85	Business sector	Hospitality sector
A10	04/02/2020	La Carballeda	Office	Formal	Male	45-60	Civil servant	Wildfire prevention
A11	06/02/2020	Sanabria	Farm visit/participant herding	Formal	Female	45-60	Farmer, sheep	Traditional farming and agriculture
A12a, b, c	06/02/2020	Sanabria	Farm visit/participant herding	Formal	Male, female	20-45	Farmers, sheep	Traditional farming and agriculture, Hunting
A13	07/02/2020	Sanabria	Public space	Formal	Male	60-85	Civil servant	Large carnivore conservation
A14	07/02/2020	Sanabria	Home	Formal	Female	20-45	NGO official	Traditional farming and agriculture
A15a, b, c	08/02/2020	Sanabria	Farm visit/participant herding	Formal	Male, female	20-45	Farmers, sheep	Traditional farming and agriculture
A16	11/03/2020	Sanabria	Farm visit/participant herding	Formal	Female	20-45	Farmer, cattle	Traditional farming and agriculture
A17	14/02/2020	La Carballeda	Farm visit/participant herding	Formal	Male	20-45	Farmer, cattle	Traditional farming and agriculture

A18	15/02/2020	Independent	Public space	Formal	Female	20-45	Farmer's union	Traditional farming and agriculture
A19	19/02/2020	La Carballeda	Office	Formal	Male	45-60	Civil servant	Hunting
A20	20/02/2020	La Carballeda	Home	Informal	Male	60-85	Civil servant	Hunting
A21	22/02/2020	La Carballeda	Public space	Informal	Male	60-85	Hunter	Hunting
A22	22/02/2020	Sanabria	Office	Formal	Male	60-85	Local authorities	Depopulation/Land abandonment
A23	27/02/2020	La Carballeda	Farm visit/participant herding	Formal	Male	45-60	Farmer, sheep	Traditional farming and agriculture
A24	02/03/2020	Sanabria	Office	Formal	Male	45-60	Local authorities	Depopulation/Land abandonment
A25	03/03/2020	Sanabria	Public space	Formal	Male	45-60	Local authorities	Countryside and landscape protection
A26	02/03/2020	Sanabria	Home	Formal	Male	20-45	Civil servant	Countryside and landscape protection
A27	03/03/2020	La Carballeda	Office	Formal	Male	20-45	Civil servant	Hunting
A28	18/03/2020	Sanabria	Online	Formal	Male	45-60	Civil servant	Protected area management
A29	09/04/2020	La Carballeda	Online	Formal	Male	45-60	Business sector	Nature tourism sector
R1	15/01/2020	Independent	Public space	Informal	Male	45-60	Research/academia	Large carnivore conservation
R2	11/02/2020	Independent	Online	Formal	Male	20-45	NGO official	Traditional farming and agriculture, Countryside and landscape protection
R3	27/02/2020	Independent	Public space	Informal	Male	45-60	NGO official	Depopulation/Land abandonment, Traditional farming and agriculture
R4	03/06/2020	Independent	Online	Formal	Male	45-60	Research/academia	Large carnivore conservation

2. Table SI2. Documentaries and programmes on human-carnivore interactions or rural areas in Spain, produced between 2015-2020, which together with media articles and academic publications contextualised primary data.

Code	Year	Location	Name/programme	Description	Initiative/production	URL
D1	2017	Ávila, Asturias, Zamora	Convivencia - Ganadería y Lobos?	Documentary produced on the initiative of a national farming syndicate to give voice to the various stakeholders impacted by the management of the wolf in Spain, asking the question of whether coexistence between wolves and farming is possible. Interviews with farmers, NGO staff, and other relevant stakeholders	UPA - Unión de Pequeños Agricultores y Ganaderos	http://ganaderiaylobos.es/
D2	2018	Zamora, Asturias The Pyrenees	Daños Cero	Interview with a shepherd in the Pyrenees who is using LGDs to defend himself from the wolf, with additional footage from Zamora and Asturias. Produced by one of the most prominent wolf protection NGOs in Spain.	Lobo Marley	https://www.youtube.com/watch?fbclid=IwAR3lu9OeS1xt07y8qQMpxHg1SI0quAF8DAHahkito9koy4QT-oGku0iOuDw&v=kR3L6-4wEsM&feature=youtu.be
D3	2018	Ávila, Asturias, Zamora	Pastando con Lobos	Episode about the coexistence with wolves on 'El Escarabejo Verde': a TV programme which has been working for more than 20 years in the dissemination of all kinds of environmental issues. Interviews of farmers, civil servants	Spanish TV 2	https://www.rtve.es/alacarta/videos/el-escarabajo-verde/escarabajo-verde-pastando-lobos/4866608/

				and business associated with or impacted by the wolf.		
D4	2016, 2018	Ávila, Asturias, Zamora	'Vivir con lobos'. And 'Coexistencia entre la ganadería extensiva y el lobo'	Interviews with farmers that are coexisting with wolves through preventative methods. Part of the campaign 'Living with Wolves' by a conservation NGO, which identified and coordinated around 60 farmers favourable to the coexistence with the wolf.	Foundation Ecologistas en Acción	https://www.ecologistasenaccion.org/110007/video-coexistencia-entre-la-ganaderia-extensiva-y-el-lobo/
D5	2019	National	Barabecho	Documentary about the impact of depopulation, the importance of small-scale family farms and the people who have decided to stay in the countryside, based on interviews and site visits. Produced by a national farming syndicate.	UPA - Unión de Pequeños Agricultores y Ganaderos	http://barbecho.es/
D6	2015, 2020	Zamora	El Arcón	Episodes about the influence of the wolf on the tourism sector from Sanabria (2015) and SdIC (2020) on El Arcón, a programme on TV CyL that interviews stakeholders associated to natural, cultural and gastronomical heritage and tourism within the Autonomous Community	Castilla Y León TV channel 7	https://www.cyltv.es/programa/el-arcon
D7	2020	Zamora and Asturias	Tierra de Todos	Episode from Spain, part of an audio-visual project of more than 30 testimonies from different sectors from 17 European countries, with the aim of showing	WWF and LIFE Euro Large Carnivores	https://www.wwf.es/nuestro_trabajo/especies_y_habitats/grandes_carnivoro

				that coexistence with large European carnivores is possible. Produced by WWF as a part of an EU life project on carnivore conservation.		s europeos /en tierra de todos/
D8	n/a	La Vera	El Lince en Botas	El Lince con Botas: a documentary series on Canal Sur Extremadura, with interviews of stakeholders about the cultural, environmental and human diversity of the Extremadura community, including episodes about the last shepherds, the impact of the growing hunting sector and Tuberculosis on the traditional farming sector.	El Lince con Botas on TV channel 'Sur Extremadura'	http://libreproducciones.es/?page_id=279

3. Table SI3. NVivo Code book. Node A-E provided initial analysis structure, the remaining nodes emerged from the interview and observation data or secondary sources.

Name	Description	Files	References
A. Pathway	The key (historical) events, conditions and factors that have formed the pathway to the current state of human-carnivore interactions (HCI).	0	0
<u>Farming system and landscape</u>	Past and current characteristics of the landscape and farming practices.	16	42
<u>Human-Carnivore Interactions</u>	Past and present perceptions, management, attitudes toward wildlife.	0	0
Attitudes	How people used to think about wolves.	8	12
Felix Rodriguez de la Fuente	The impacts of a famous Spanish naturalist.	6	10
Management	Relations to and impacts from administration from the local to the EU level (CAP etc.).	15	25
Stories and folklore	About Carnivores.	7	8
Wildlife populations	Historical population status of carnivores and ungulates in the area.	6	10
<u>Nature protection</u>	How and when protected/special management areas were declared and how they have developed.	0	0
Lago de Sanabria	Natural park.	9	32
Meseta Iberica Biosphere Reserve	Recently declared trans-frontier (Spain and Portugal) UNESCO heritage site, including Sanabria and Sierra de la Culebra.	3	7
Sierra de la Culebra	Regional hunting reserve.	14	40
<u>Population, village</u>	Population and village development through time.	19	31
Perceptions about the past	How do people perceive and remember the village and life in the villages of the past 50 years?	9	17
<u>Time-line</u>	Key dates/years to use for pathways visualization.	15	35
B. Coexistence conditions	Conditions within the SES that enable people to adapt to/ live with large carnivores (LCs). (Q: Why have carnivores survived in this location?)	0	0

<u>Ecological</u>	Ecological conditions.	27	57
Ecosystem services	Quotes relating to awareness of benefits of the wolf, such as suppressing ungulates and thus preventing zoonosis outbreaks.	14	18
Landscape	Habitat conditions, particularly topography, forest and scrub cover.	14	19
Wildlife populations	Presence of prey species, primarily ungulates.	13	20
<u>Economic</u>	Economic conditions.	0	0
Financial instruments	Support for mitigation etc.	8	15
Compensation	Support for loss and damage of livestock.	7	13
Ex-ante payments	Payment for residing in a wolf area.	1	2
<u>Hunting</u>	Income from hunting licenses.	13	33
<u>Tourism</u>	Tourism revenues.	19	68
Iberian Wolf Centre	Impacts of the centre.	5	17
<u>Governance</u>	How carnivores have been governed.	1	1
Hunting and control	Regulation (lethal) of wolf populations.	12	23
Legal frameworks	Laws and regulation protecting wolves.	3	4
<u>Social</u>	Social conditions.	0	0
Attitudes and perceptions	Fear, respect, perceptions of belonging.	30	102
Conflict mitigation	Initiatives aiming to decrease or mitigate conflicts.	6	22
Population density	Of people in the area.	6	10
Traditions and practices	Customs, traditional ecological knowledge, 'being used to' living with LCs etc.	25	63
<u>Z. Explicit solutions</u>	As elucidated by interviewees or that emerged from analysis and interpretation.	26	57
C. Issues	Conditions within the Social-ecological system that increase rural vulnerability and perpetuate negative HCIs.	0	0
<u>1. Depopulation</u>	Quotes relating to causes of and attitudes towards depopulation.	17	32
Attitudes; leave	Urban or rural views about reasons to leave rural areas (e.g. 'raising our kids to leave').	17	38

Attitudes; stay	Urban or rural views about reasons to stay in rural areas (why rural areas are important).	17	46
Infrastructure	Internet, roads etc.	7	16
Job opportunities	Perceptions regarding the availability of rural jobs.	19	61
No opportunities	People claiming that there are no jobs.	13	26
Lack of initiative	People claiming that the problem is not a lack of opportunities but a lack of (private) initiative.	6	14
Outsourcing	The tendency of local and regional administration to outsource services to private companies, often residing outside of the area.	9	18
Loss of community cohesion	Individualisation and deterioration of social bonds.	2	3
Seasonality	The tendency of tourism and visits being concentrated and limited to certain times (summer, holidays).	16	32
Social services	Faltering access to health care, education etc.	15	29
Taxes and financial incentives	Tendency to tax urban and rural areas equally/lack of tax incentives for living and producing in rural areas.	7	16
Unused potential	E.g. mushrooms, deer meat, forestry.	19	41
<u>2. Farming viability</u>	Main issues highlighted by farmers and shepherds.	0	0
Attitudes and perceptions	Urban and rural attitudes towards the countryside, farming and farmers.	22	50
Bureaucracy and administration	Burden and complexity of paperwork.	10	15
Diseases	Afflicting livestock, transmitted from wildlife.	5	8
Distribution of products	Butchers, regulation, farmers markets, middlemen, promotion, awareness.	9	27
Distrust and disunity	Amongst farmers.	8	20
Education levels	Of farmers.	4	7
Financial instruments	Current funding infrastructure and its impacts on farmers.	0	0
CAP	Issues relating to the Common Agricultural Policy.	14	64
Incentives and start-up support	Issues relating to the means needed to start up a farming operation.	11	23

Services to nature	Recognition of farmers' maintenance of public goods.	5	11
Spanish 'piquaresca'	From a typical expression describing how people cheat and exploit the system.	12	16
Guardian dogs	Costs, legal issues, interactions with domestic dogs.	12	23
Profitability and costs	Price of outputs (meat and milk), costs of inputs (feed etc).	16	38
Wolf damages	Killed and injured livestock.	23	63
Compensation	Support for of loss and/or damage to livestock.	14	27
Insurance	For potential wolf damages.	16	27
Statistics	Current figures and the degree to which they represent the reality.	1	2
<u>3. Governance and institutions</u>	Current relationships with the administration and politicians.	0	0
Information, transparency	Of the system that governs HCI.	6	13
Legislation	Laws governing wolves and rural areas.	15	34
North vs. South of Duero	Disparities in wolf management to the northern and southern part of Spain.	13	35
Participation	Degree of participatory decision-making.	15	27
Support	Whether or not farmers feel supported by the administration.	23	49
Trust and efficiency	Perceptions of the administration's responsiveness, responsibility and degree of corruption.	23	53
<u>4. Stereotypes, beliefs</u>	Node gathering perceptions about 'the other' that are replicated throughout different groups and which may contribute to polarisation.	2	2
About farmers	Their traditions, practices, and characteristics.	18	34
About politicians, conservationists and members of the public	For instance farmers' views about tourists.	17	31
About wolves	Rumours, beliefs, stories, and fake news.	26	45
<u>5. Hunting</u>	General info about hunting in the area + perceptions regarding whether hunting is beneficial or not for the maintenance of good HCI.	12	39
Against	Views against (continued) hunting.	12	21
Control	Views advocating for lethal control of wolves, but performed by the administration.	19	33

For	Views that endorse (continued) hunting.	12	30
Friction with tourism	The impacts of hunting on wolf-observation opportunities in areas where the two activities coincide.	6	13
Poaching	The degree to which hunting affect poaching tendencies.	1	3
Prices of game	Price trends on hunting auctions.	8	21
Wolf impact on game	The number of ungulates and the quality of their 'trophies' (antlers etc).	4	4
Zoning	Views and proposals for different management areas for wolves.	10	18
D. Trends	Tendencies within the social-ecological system that may impact future HCI.	0	0
<u>T1. Landscape use</u>	Changing views, purposes and uses of landscapes (from production to recreation?)	28	93
Nature protection and restoration	Rewilding, fauna reintroduction and land abandonment.	15	27
Nature tourism demand	Demand on nature-based experiences and tendencies of nature commodification. Effects caused by the mixing of urban and rural people.	20	42
Friction with locals	The increasing number of (urban) tourists and their impact on local infrastructure and nature.	12	25
Privatisation and commons	Loss of public grazing, communal forests etc.	1	1
<u>T2. Land abandonment impacts</u>		7	10
Biodiversity	Impacts on species associated with the (previous) traditional landscape.	12	22
Population and culture	Preservation of traditional knowledge, practices and culture.	10	14
Scrub, forest	Natural succession of forest communities and associated impacts.	18	33
Wildfires	Wildfire tendencies.	15	24
<u>T3. Livestock preferences and management systems</u>	Management preferences, impacts of livestock subsidies, product demand.	11	24
<u>T4. Wildlife populations</u>	Negative impacts from wildlife populations, associated perceptions and beliefs about wildlife populations.	0	0
Bear		5	11

Lynx		0	0
Ungulates		23	46
Wolf		25	69
<u>T5. Value orientations</u>	Shifts in values regarding the countryside, nature, and wildlife.	0	0
Dietary changes	Food preferences and demand.	3	5
Farmers and farming	Of the profession and its role for sustainable development.	4	6
Pride of coexistence farmers	Locals' perceptions about local/traditional knowledge and capacities of local farmers with regards to the wolf.	15	24
Hunting values	Interest in hunting, perceptions about hunters, generational turnover of hunters.	24	59
Knowledge	Divergent types of knowledge and associated disconnection between different social groups (e.g. urban and rural).	14	18
Stories and emotions	People's encounters with wolves and nature and associated feelings.	18	32
Wildlife	Wildlife value orientations (mutualistic, utilitarian etc).	25	56
<u>T6. Infrastructure</u>	Internet, distribution chains, transport.	4	6
<u>T7. COVID 19</u>	Impacts of the ongoing COVID crisis (beginning March 2020).	6	10
E. Future	What are the key trends, aspirations and drivers within the SES that may affect the pathway(s) towards rural sustainability and resilient human-carnivore coexistence?	0	0
<u>1. Aspirations</u>	What people want/what do they think is needed to improve HCI and the conditions for small-scale farming?	0	0
Economic	The shape and function of future support mechanisms.	0	0
CAP	Changes to the EU agricultural policy.	10	26
Compensation	Changes to the carnivore damage compensation policy.	6	8
Mitigation	Ex-ante payments and programmes to support preventative measures.	16	33
Services to nature, greening	Policies to support and incentivise production in marginalised and challenging areas, e.g. due to the presence of LCs.	8	15
Taxes and incentives	To counter loss of small-scale agriculture and depopulation.	16	30
Environmental	How do people imagine this area in the future, which are their hopes and aspirations?	1	1

Landscapes	Hopes and outlooks for the traditional landscape, shifting baseline syndrome.	8	12
Wildlife populations and management	How do people want wildlife populations to be managed? Where do they want them? In what densities? (Control, hunting and zoning).	21	45
Governance	Aspirations regarding how carnivores should be governed.	13	19
Mediation	How to address and solve conflicts in the future.	11	22
Infrastructure	Needs and aspirations for infrastructure development.	3	3
Distribution	Of rural products: producer-consumer chains, new market places, certification, and advertising.	6	18
Opportunities	Aspects highlighted as promising for future development.	8	12
Social	Aspirations regarding social elements.	0	0
(Re)connection with nature	Environmental and cultural awareness and education.	15	22
Acknowledgement	Desired attitude changes.	16	46
Cooperation and commons	Communal/public ownership and management of natural resources and livestock.	1	2
Professional development	For farmers and rural inhabitants.	5	8
Social services	The ones needed for the persistence of rural areas.	11	17
<u>2. Beliefs about the future</u>	Respondents' answers to the question 'what do you think about the future of this area/where will you and/or your family be in 20-30 years?'	27	39
<u>3. Preparing for LCs</u>	Respondents' views on how areas should act BEFORE the return of LCs in order to mitigate or avoid negative impacts and civil unrest, and the difficulties associated with this preparation.	14	21