

Conflicts surrounding the establishment of wild boar (*Sus scrofa*) in the Forest of Dean, UK.

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**Thesis submission for fulfilment of the requirements of the award
of Doctor of Philosophy by Oxford Brookes University in June 2024.**

Contents

1. Abstract.....	9
2. Introduction	10
2.1 Reintroduction, rewilding, and restoration	11
2.1.1 Issues with these concepts	13
2.1.2 Reintroduction in USA.....	14
2.1.3 Reintroduction in Europe.....	15
2.1.4 Reintroduction in the UK	17
2.1.5 Human-wildlife conflict and coexistence	19
2.1.6 Synopsis.....	21
2.2 Wild boar.....	22
2.2.1 Characteristics, ecology, and behaviour	22
2.2.2 History and range.....	24
2.2.3 Wild boar in the UK.....	25
2.2.4 Wild boar in the Forest of Dean.....	26
2.3 Wild boar research.....	31
2.3.1 Studies outside of Europe	31
2.3.2 European studies on wild boar	33
2.3.3 Wild boar studies in the UK	34
2.4 The Forest of Dean.....	36
2.4.1 Forest of Dean Geography	36
2.4.5 Synopsis.....	43
2.6 The researcher and the Forest of Dean	44
3. Methods.....	46
3.1 Ethical considerations	47
3.2 Questionnaire and interview design.....	48
3.4 Data analysis	50
3.5 Questionnaire response and interviewee profiles.....	52
3.6 Chapter creation	54
4. Human wild boar interactions	55
4.1 Perceived human wild boar interactions.	56
4.1.1 Influence of perceived interaction on opinions of management of wild boar.	57
4.1.2 Interactions and a sense of safety	58

4.2 The influence of connection to the Forest of Dean on perception of wild boar interactions	59
4.2.1 Forest of Dean value	59
4.2.2 The influence of time spent in the Forest of Dean and perception of interactions with wild boar.	60
4.2.3 Influence of recreation on perception of wild boar interactions.	61
4.3 Activities participated in when an interaction with a wild boar occurred.	62
4.3.1 Interactions whilst dog walking	63
4.3.2 Interactions whilst walking without dogs	74
4.3.3 Interactions whilst driving.....	79
4.3.4 Interactions with wild boar whilst at home.	82
4.3.5 Interactions with wild boar whilst horse riding	84
4.4 Comparison of study participants’ advice with official advice about interactions with wild boar.	85
4.4.1 Study participants’ advice	85
4.4.2 Official advice.....	87
4.5 Conclusions	88
5. Socioeconomic effects of the wild boar.....	91
5.1 Socioeconomic impact of the wild boar establishment.....	93
5.1.1 Damage to gardens and fencing.	95
5.1.2 Community damage.....	98
5.1.3 Road safety and vehicle damage.	108
5.1.4 Farm damage and concerns.....	112
5.2 Perception of the value of wild boar	115
5.3 Perceived safety in the Forest of Dean with wild boar present and changes of habits.	121
5.4 Conclusions	124
6. Historical consciousness, ownership, and conflict in the Forest of Dean.....	126
6.1.9 Protection from Privatisation.....	127
6.1.10 Hands Off Our Forest Campaign	130
6.3 Ownership of the wild boar in the Forest of Dean	132
6.3.1 conflicts over the wild boar	135
6.3.2 Synopsis.....	141
6.4 Chapter Conclusions	142
7. Classification and conceptualisation of the Forest of Dean wild boar	145
7.1 What is a wild boar?.....	146

7.1.1 Official classification of the Forest of Dean wild boar.	148
7.1.2 Different classifications of the Forest of Dean wild boar by interviewees.....	149
7.1.3 synopsis.....	156
7.2 Conceptualisation of the Forest of Dean wild boar.	157
7.2.1 Descriptors of wild boar.....	158
7.2.2 Emotional responses to the wild boar.....	160
7.2.3 synopsis.....	163
7.3 Chapter conclusions.....	164
8. Wild boar in the media	166
8.1 Local newspapers.....	168
8.1.2 Wild boar in the media	169
8.1.3 Synopsis.....	173
8.2 Wild boar in social media.....	174
8.2.1 The Boaring Truth	174
8.2.2 Boar Solutions	178
8.2.3 Forest of Dean Wild Boar Cull Saboteurs.....	179
8.2.4 synopsis.....	179
8.3 Conclusions	180
9. Wild boar management in the Forest of Dean	182
9.1 suggested management.....	183
9.1.1 Culling.....	185
9.1.2 Fencing.....	186
9.1.3 Contraceptives	189
9.1.4 Wolves and Lynx	190
9.1.5 Wild boar hunting rights	191
9.1.6 Extermination.....	193
9.1.7 Nematodes.....	193
9.2 Conclusions	194
10. Further research	197
11. Conclusions	199
12. Glossary of people and groups	202
12.1 Authorities	202
DEFRA:.....	202
Forest of Dean District Council:	202

Forestry Commission:	203
Parish councils:.....	203
Verderers:	203
12.2 Local people	204
Foresters:	204
Commoners & sheep badgers:.....	204
“Foreigners”:	205
Tourists:.....	205
12.3 Local groups	206
Boar Solutions:	206
Sab the wild boar cull:.....	206
13. References	207
14. Appendices.....	227
Appendix 1: Poster	227
Appendix 2: Informed consent information	228
Appendix 3: Informed consent form.....	230
Appendix 4: Questionnaire	231

List of Figures

Figure 1: Crossbred wild boar, who has a domestic pig body shape with wild boar fur, with young wild boar; two showing the stripped wild boar patterned coats, the other displaying a spotted pattern suggesting hybridisation (Christopher Jones/The Telegraph).	28
Figure 2: A woman approaching a wild boar with neither showing signs of fear (David Slater/Alamy).	29
Figure 3: Children following wild boar in the forest (interviewee photograph).....	29
Figure 4: wild boar rooting damage to a grass area in a village in the Forest of Dean (researcher photograph).	30
Figure 5: Forest of Dean district map with key (Forest of Dean District Council, 2011).	38
Figure 7: Diagram of the hierarchy of the Verderers and Forestry Commission in relation to the head of state.	40
Figure 8: numbers of positive, negative, and neutral interactions described by questionnaire respondents (N=171).	57
Figure 9: Number of respondents for each type of perceived interaction with wild boar and whether the respondent thought management of wild boar is necessary (N=171).....	58
Figure 10: Number of those who feel safe (Yes) or not safe (No) In the Forest of Dean with wild boar present given their perceived interaction with wild boar (N=171).	59
Figure 12: Number of respondents for each type of perceived interaction with wild boar given the category of what drew them to the area (N=171).....	60
Figure 13: Number of respondents categorised between how long that they have resided in the Forest of Dean and their perceived interaction with wild boar (N=171).	61
Figure 15: Type of recreational activity undertaken by respondents compared to perceived interactions with wild boar (N=171).	62
Figure 16: Activities of respondents when they interacted with wild boar and their perception of that interaction (N=164).	63
Figure 17: Count of respondents who gave each category of advice. The question was open ended and allowed for participants to give more than one area of advice (N=158).....	86
Figure 18: The number of people who have had expenditure due to wild boar in the Forest of Dean split by category. The total exceeds the number of those who had expenditures due to some respondents having more than one category of expenditure.	94
Figure 19: Top – wild boar wallow around a powerline pole where the pole is undermined and mud on the side of the road. Bottom – wild boar rooting in a village in the Forest of Dean, maintained verges have been rooted (own photographs).	100
Figure 20: Wild boar rooting of a picnic area next to speculation carpark in the Forest of Dean (own photograph).	105
Figure 21: Number of questionnaire respondents for whether they think wild boar are a draw to the area or not (N=171).	116
Figure 22: The percentage of whether people think wild boar generate income given whether they think wild boar are a draw to the area or not (N=171).	117
Figure 23: Total number of respondents for each category when asked if they think there is a net gain or loss from wild boar in the Forest of Dean (N=171).....	119
Figure 24: Percentage of opinions on wild boar generating income for the Forest of Dean given whether the respondent thinks wild boar is a net gain or loss for the area (N=171).	120

Figure 26: Comparative word clouds created in NVivo 12 Pro giving a representation of the proportions of positive emotions (top) and negative emotions (bottom) from questionnaire respondents when interacting with wild boar.....	162
Figure 27: Graph showing the readership of each newspaper and consumption of other news media of questionnaire respondents (N=171).....	169
Figure 28: Pie chart of percentages for each type of media message seen to be given by the media according to questionnaire respondents (N=171).....	170
Figure 29: Percentage perceived category of media message about wild boar per news outlet.	171
Figure 30: Graph depicting the proportion of perception of safety given each category of media message (N=171).	172
Figure 31: Pie chart showing percentage of study participants' responses to whether wild boar should be managed in the Forest of Dean.....	184
Figure 32: Suggested management strategies and their frequencies from questionnaire data (N=171).	185
Figure 33: Wild boar rooting restricted by a fence protecting football grounds (own photograph).	187

List of tables

Table 1: Interviewee code and information about the residence and nativity to the Forest of Dean.	53
Table 2: Number of times each category of wild boar income was mentioned by questionnaire respondents (N=176).	117
Table 3: Descriptors of wild boar ordered from most used to least used and grouped using the type of experience; negative, neutral, or positive.	158
Table 4: List of emotions and feelings from questionnaire respondents when they had neutral interactions with wild boar.	160
Table 5: Binary logistic regression results for media message category and perception of safety....	172

1. Abstract

In the Forest of Dean, forty to sixty wild boars were released in 1997 and 2004, these wild boar populations converged and grew into a population of nearly two thousand by 2015 after a six-hundred-year absence. Human-wild boar conflict started to occur in both wild areas and human areas due to negative interactions and property damage. Human-human conflict surrounding wild boar escalated between the people of the Forest of Dean and Forestry Commission. Data were collected from one hundred and seventy-one questionnaire respondents and twenty-five interviewees. Data were analysed through an explorative thematic analysis and mixed method approach.

Human-wild boar interactions were varied with negative interactions having the biggest effect on people. Negative interactions created social costs through a loss of a sense of place in the Forest of Dean and economic costs through property damage. Dog walkers in the Forest of Dean were the biggest group who had negative interactions with wild boar. There was conflict over the ownership of the wild boar and contention about the ownership of the Forest of Dean. Historical consciousness of the Forest of Dean is needed to fully understand these social conflicts in the Forest of Dean. Media outlets were viewed as biased with non-local outlets being in favour of the wild boar creating a divide between local and non-local opinions. The culling of wild boar was seen as ineffective due not controlling the increase of wild boar, however management methods suggested by study participants were not ecologically or economically feasible.

There was contention over the classification of wild boar, however the most accurate classification is an illegally reintroduced invasive native species. To reduce conflicts with wild boar and other reintroduced species conscientious conservation should be used; equal weighting of social impact is given in decision making as biological and ecological impacts.

2. Introduction

A wild boar population has established within the Forest of Dean from two unofficial releases in one in 1997 and the other in the early 2000s (Goulding and Smith, 1998, Wilson, 2005). The population has increased from approximately 30 wild boar in each release to an estimated 1500 wild boar in 2019 and a current estimated 658 (confidence interval 398-1051) wild boar (Gill and Waeber, 2019, Gill, 2023). The nature of the release, increase in numbers of wild boar, and subsequent management of the wild boar has created differences in opinion over whether this establishment of wild boar is a reintroduction, introduction, or invasion of the species (Goulding, 2009, Wilson, 2005). Through the time since release there has been an increase in human wild boar interactions, both positive and negative, due to the initial rapid increase in wild boar population. This is creating social tensions within communities and raising questions over the ownership of the wild boar and liability for damage caused by them. This study aims to explore these human wild boar interactions and subsequent socioeconomic effects of the wild boar establishment, reviewing five areas:

- How/whether types of interactions experienced between humans and wild boar impacts on people's attitudes toward wild boar.
- The effects of the wild boar population increase on media reports about the wild boar and whether these reports influence people's views about the wild boar.
- The relationships, if any, between wild boar range and reported behaviour, and the socioeconomic impacts on people living in or using the Forest of Dean.
- The effects and impacts of wild boar range and reported behaviour on people's land use decisions within the Forest of Dean and surrounding areas.
- The debate over the classification of this population of wild boar in the Forest of Dean; reintroduction, introduction, or invasion?

To explore these aims an understanding of three key areas is needed: the Forest of Dean geography and social history, wild boar behaviour and ecology, and what constitutes a species reintroduction, introduction, or invasion.

This study into the effects on humans of the establishment of wild boar in the Forest of Dean is important as there are current projects and proposed plans to (re)introduce other species to the Forest of Dean and other areas in the UK to restore these areas changed by human activity. These are through an increased social ecological consciousness in the human population creating pressure to restore natural habitats and landscapes throughout the world (Uhl, 2003, Ahmad et al., 2012) following successes such as the reintroduction of wolves (*Canis lupis*) in Yellowstone national park, USA (Nogues-Bravo et al., 2016) and red kite (*Milvus milvus*) in the UK (Stevens et al., 2020). Despite this, there is relatively little known about the social impacts of species' introductions. This research aims to make a significant contribution to the understanding of social effects when species become established after (re)introduction.

2.1 Reintroduction, rewilding, and restoration

There is a consensus that the current epoch is the Anthropocene, where human activities are the major driving force of global environmental changes (Corlett, 2015). Despite this consensus, there is debate as to when the Anthropocene started with arguments for the start of the Anthropocene in the late 18th century, coinciding with the industrial revolution (Crutzen and Stoermer, 2000), and arguments aligning the start of the Anthropocene with the evolution of the first modern humans ten thousand years ago (Braje and Erlandson, 2014). Notwithstanding this debate, the realisation of the Anthropocene has led to the idea that humans are planetary stewards (Kellert, 1997, Liordos et al., 2017), therefore human activities should affect global processes positively and not negatively. To understand these human impacts on biota there has been an increase in the monitoring of species at a global level. This has been recorded since 1996 through the IUCN Red List¹ which has currently assessed the status of over 157000 species, with 44000 of these classified as threatened with extinction (IUCN, 2023). This is linked to the Anthropocene being called the sixth mass extinction event with vertebrate species loss in the last century up to one hundred times higher than the background rate of extinction (Cebellos et al., 2015) with a sentiment of loss and grievance (Hobbs, 2013). Linked to this, extinction and endangerment of species have

¹ The IUCN (International Union for Conservation of Nature) Red List has compiled data on the conservation status of species using scientific expertise and research.

become global news stories, such as “Lonesome George” the Pinta Island tortoise (*Chelonoidis abingdoni*) who died in 2012 or more recently the death of the last male northern white rhinoceros (*Ceratotherium sumatranense*). Both stories were reported by international news networks (BBC News, 2012, Berlinger, 2018).

The culmination of such news and findings has led to a global movement of ecosystem restoration; the act of restoring an ecosystem, whole or in part, back to a previous state in response to historic and on-going transformation and destruction through human activity (Hobbs and Harris, 2001). Ecosystem restoration can be conducted through three routes; reintroduction, inserting a removed organism back into a landscape (Armstrong and Seddon, 2008); rewilding, returning to a self-sustaining ecosystem which has minimal human intervention (Nogues-Bravo et al., 2016); and restoration reinstating an ecological system to a previous state (Corlett, 2015). However, issues arise as there is not a consensus over what constitutes reintroduction, rewilding or restoration, with many definitions overlapping or differing in certain aspects (Nogues-Bravo et al., 2016). For example, rewilding has transatlantic differences in connotations; in North America there is an emphasis on reintroduction of large predators through top-down trophic control of the ecosystem (Donlan et al., 2006), such as the “landscape of fear” management of elk species through the reintroduction of wolves (*Canis lupus*) in Yellowstone National Park (Hernandez and Laundre, 2005). In Europe the emphasis is on grazers to restore landscapes (Vera, 2000), such as European Bison rewilding projects to restore ecosystems (Lord et al., 2020, Kuemmerle et al., 2010).

There is debate on the extent of the historical human caused ecosystem damage that restoration, reintroduction, or rewilding should strive to reverse (Corlett, 2013). This debate reflects that of the debate on when the start of the Anthropocene occurred, the debate on when human interference with the environment became detrimental to global and local ecosystems. Therefore, when do conservationists need to look for species to reintroduce, or what historical wild habitats need to be restored to repair the damage caused by human interferences? Due to this there are four main concepts for rewilding and restoration: rewilding, Pleistocene rewilding, passive rewilding and translocation rewilding. Rewilding is the act of restoring wilderness using large carnivores as ecosystem regulators (Soule and Noss, 1998). Pleistocene rewilding focuses on restoring the evolutionary and

ecological potential that was lost at the start of the Anthropocene, either through reintroduction of lost species or functional equivalents in extant taxa (Donlan et al., 2006). Passive rewilding is an inactive process which allows landscapes and ecosystems to return to natural processes through reduction of human control of that landscape (Gillson et al., 2011). Translocation rewilding is what is commonly thought of as reintroduction where ecological processes are restored by species reintroduction (Seddon et al., 2014). There have been several successful reintroductions, rewildings and restorations globally (Seddon et al., 2007). For example, in North America the successful reintroduction of California condors (*Gymnogyps californianus*) into California (Toone and Wallace, 1994). In the Arabian Peninsula Arabian Oryx (*Oryx leucoryx*) have successfully been reintroduced (Marshall and Spalton, 2000). Burrowing bettong (*Bettongia lesueur*) have been successfully reintroduced to mainland Australia (Short and Turner, 2000).

2.1.1 Issues with these concepts

The lack of clarity of the definitions of both the Anthropocene and what constitutes reintroduction, rewilding, and restoration allows for flexibility of understanding and interpretation. What can be considered a reintroduction to one party may not be to another, for example this could be due to the length of time that a species has been absent in an area. This increases conflict and division over what species are eligible for reintroduction.

The use of the Anthropocene as a geological concept creates a negative attitude towards the needs of the human population given that fulfilling those needs has created ecological issues conservationists are now trying to resolve. This puts an emphasis on the use of reintroduction, rewilding and restoration whilst reducing the weight of the argument of those people who are going to suffer negatives due to changes through conservation. Through this argument, social issues and human-wildlife conflict created through reintroduction have been understudied. Wilson (2004) noted that reintroduction causes negative social effects to those who are local to the reintroduction site when discussing the feasibility of introducing large carnivores in the UK. This is linked to the theory of wildlife stakeholder acceptance capacity where there is a social carrying capacity for the number of individuals of a species within or adjacent to human spaces (Carpenter et al., 2000). This

theory should inform reintroduction practices, but for the most part has not. Redpath et al. (2013) found that focusing on biological aspects of reintroduction and wildlife management led to persistent human-wildlife conflict and human-human conflict.

2.1.2 Reintroduction in USA

The most famous reintroduction, and conservation success, in the last century is that of wolves to Yellowstone National Park (Wilson, 1997). The reintroduction was hailed a success due to the positive ecological impacts on the ecosystem of the national park through reduction of deer browsing in riparian habitats, allowing these habitats to recover from over browse, through wolf presence (Beschta and Ripple, 2016). The reintroduction of wolves led to conflict between those people local to the park, park authorities, and people residing outside of the area. Wilson (1997) investigated the social impacts of the charismatic wolves finding that the wolves were symbolic to those in the study. Wolf symbolism changed between demographic groups: to those people local to the park the wolf symbolised the end of their use of Yellowstone and a loss of local identity; to those outside of the local area wolves were a symbol of “social good” that humans have rebalanced the ecosystem. The wolf reintroduction was a socially transitional event, in which the view of the local people was a detrimental transition (Scarce, 1998, Wilson, 1997). Although it has been seen as a conservation success globally, locally the wolf reintroduction created social tensions. More recent research into the landscape scale reintroduction of cougars (*Puma concolor*) in north-eastern USA acknowledges the human dimensions of reintroduction of large predators into the region (Laundre, 2013). The maximum number of cougars that could be reintroduced into the area with minimal human impacts was reviewed, however there is a lack of discussion of what those impacts could be.

There have been several studies in the USA into social aspects of human-wildlife interactions where reintroduction was not the focus or reason for research. Taylor and Knight (2003) used a questionnaire survey to study visitor perception of deer in Utah. They found that education of people on wildlife issues reduced the human impact on wildlife. Similarly, Ferrato et al. (2016) found that education and public relations were needed for support of the golden-cheeked warbler (*Setophaga chrysoparia*) in Texas. Skupien et al. (2016) found that education reduced conflict and increased acceptance for the American

alligator (*Alligator mississippiensis*) through increased understanding of the species and its role in the ecosystem and avoidance of areas where the species are to be expected. Despite reviewing human-wildlife conflict these studies focus on changing human aspects of the conflict rather than compromise or reviewing wildlife management tactics. In the USA when reintroducing animals into an environment human-wildlife conflict is understudied. However, when human dimensions are studied the focus is on re-education or reframing conflict to change human opinion rather than exploring drivers of conflict and reviewing management and ecological practices.

2.1.3 Reintroduction in Europe

Johansson et al. (2016) noted that human dimensions in wildlife is not an established concept or recognised as a formal research field in Europe, however the field is becoming more prominent. They go further to say that there is need for multidisciplinary research on human dimensions in wildlife. Despite this, there have been studies describing a variety of human wildlife interactions across Europe from this time such as farmers and white-tailed sea eagles (*Haliaeetus albicilla*) in Ireland (O'Rourke, 2014), rural populations and brown bears (*Ursus arctos arctos*) in the Alps (Tosi et al., 2015) and Pyrenees (Piédallu et al., 2016), wolves in Italy (Vitali, 2014), brown bears and canids in Turkey (Ambarli et al., 2016), European bison in the Carpathian Mountains (Ziółkowska et al., 2016), beaver (*Castor fiber*) in Poland (Kloskowski, 2010), and issues with poisoning of reintroduced species in north west Spain (Mateo-Tomas et al., 2012).

Studies on brown bears in Europe revealed that there were different aspects of human bear interactions. In the Alps the bears were accepted by local people and considered a conservation success, but as the population of bears increased opinion shifted from acceptance to annoyance. Tosi et al. (2015) reviewed the social consequence of this and found that media and political attention of the bears affected public opinion and that a focus on problem animals rather than the population was a cause for conflict. In the Pyrenees human proximity and location to brown bear populations in respect to opinion on brown bears was studied. It was shown that location had no bearing on views on brown bear and that there was no clear for/against divide (Piédallu et al., 2016). Both these studies review human-wildlife conflict, but neither reviewed in depth the drivers to the conflicts in

their respective areas and mitigation of the conflicts. In Turkey brown bears were seen to cause conflict through crop foraging, human death after harassment of the bears and development in bear habitat (Ambarli et al., 2016).

Human-canid conflict studied by Ambarli et al. (2016) focussed on ecological drivers of the conflict such as the reduction of wild ungulates through extirpation and dispersal. In Italy human-wildlife conflict has been created through an expanding wolf population through effective population management strategies of reintroducing wolves into new areas (Vitali, 2014). The study interviewed people to the area local to the reintroduced wolves, finding that the wolf was seen to be state owned due to their protected status and the political agenda surrounding wolves making broadcasting negative views towards the wolves difficult (Vitali, 2014). Authorities were therefore indifferent to conflicts over the wolves moving from a compensation scheme to insurance to cover any economic losses due to conflicts.

The research on white-tailed sea eagle conflict reflects on human-human conflicts surrounding the reintroduction of the eagle, with critique of those who committed the reintroduction (O'Rourke, 2014). This contrasts with the previous European papers and includes the scientists and researchers as part of the conflict. There were conflicting messages around eagle predation of livestock which reduced local support for the project. O'Rourke (2014) suggests that stakeholder engagement with reintroduction from the offset is key for success.

Non-predatory species, such as bison and beaver, reintroductions showed similar causes of conflict to those of predatory species through habitat fragmentation (Ziółkowska et al., 2016) or interference with food production (Kloskowski, 2010). Solutions involved were similar to those for predatory species; compensation, culling, and wildlife corridors to reduce damage. Issues around protection of the species were mentioned and socio-political conflict around viewpoints about, and adherence to, these protections. The lack of adherence to protection is further highlighted in Mateo-Tomas et al. (2012) where incidence of illegal poisoning of species, including reintroduced species, is reviewed in northwestern Spain. In contradiction to the other papers their study suggest that socioeconomics had limited correlation to poisonings. However, this paper uses second hand data on species and

the human population in the area to find correlation but does not consider the individual poisoner. Therefore, these findings by Mateo-Tomas et al. (2012) are likely restricted in the accuracy.

These papers show that there is a depth of research in Europe around conflict with reintroduced species. Several methods have been utilised from spatial modelling (Mateo-Tomas et al., 2012, Ambarli et al., 2016, Ziółkowska et al., 2016) to interview and reviewing of medial and legislation (Tosi et al., 2015, Piédallu et al., 2016, Vitali, 2014) with the latter methods providing more depth of insight.

2.1.4 Reintroduction in the UK

The UK has a mixed history concerning its wildlife. Despite many people considering themselves animal lovers in the UK, the UK is one of the most nature depleted countries in Europe (Wyatt, 2024). Historically, there have been several successful eradication, extirpations, and extinctions of species of native fauna (Derham et al., 2018, Yalden, 1999). These have occurred through habitat destruction, via landscape and ecosystem changes, or through direct persecution. Many of these species would now be perceived as alien by people in the modern British landscape due to changes in human land use since these species were extirpated from Britain (Manning et al., 2009). A large proportion of animals extirpated from the UK have been due to direct persecution resulting from human-wildlife conflict including predation of livestock, crop foraging and damage, and land use. For example, raptors persecution to protect grouse and other game species has been recorded since the 16th century (Newton, 2021), the hunting of the last remaining grey wolves in the medieval period (Raye, 2023), and the Eurasian lynx (*Lynx lynx*) extirpation due to persecution fifteen hundred years ago (Johnson and Greenwood, 2020).

Due to changes in farming practices and land use in the UK becoming denser and more compact, there is more space for nature and species to be reintroduced. Species that have been reintroduced in the UK are; The red kite removed from Scotland and England by the late 1800s (Orros and Fellowes, 2015); white-tailed eagle (*Haliaeetus albicilla*) which was persecuted to extinction 100 years ago (Evans et al., 2009), and Eurasian beaver which has been extinct in the UK for 400 years (Stringer and Gaywood, 2016).

The Eurasian beaver has become an example of the allowance of (re)introduction through populace dissent against authority (Crowley et al., 2017). The unofficial releases of Eurasian beavers were kept and monitored due to the public pressuring of statutory powers to keep the resident beavers rather than the use of capture and control (Crowley et al., 2017, Ward and Prior, 2020). This is linked to a movement for nature-based solutions linking to the idea that beavers are ecosystem engineers, insofar as their dams will flood areas and create further habitat for other animal species and flora (Lorimer, 2024). Dam creation can act as an ecosystem service, to serve human interests, where water flow in water courses are slowed down or re-meandered (Lorimer, 2024, Ward and Prior, 2020). In the Forest of Dean there are two beaver release sites, to allow these ecosystem services to take place, Greathough Brook and Perry Hay (Forestry England, 2025).

Two controversial animals that have become recent topics of the reintroduction conversation, for two very different reasons, are the Eurasian lynx and wild boar (*Sus scrofa*). The Eurasian lynx became extinct in medieval Britain (Hetherington et al., 2006) and wild boar became extinct in the UK 700 years ago (Rackham, 1986). Eurasian lynx is listed in the Species and Habitat Directive 1992 created by the European Union whereas wild boar are not. This directive lists species that countries should consider reintroducing to areas that were once their range where the reintroduction would significantly benefit conservation efforts for that species (Howells and Edwards-Jones, 1997). Despite this directive and agreement from the UK at the Bern Convention (1979) and Rio Convention (1992), both of which stipulate similar conservation goals, there is still much contention over the reintroduction of Eurasian lynx to the UK. This controversy comes from people and communities that will be living near new founded lynx populations, many of whom are worried about the implications for livestock, game stock and pet predation from reintroduced lynx (Hetherington, 2006).

Wild boar have been widely established in the UK since the late 1990s through illegal release or escapees from farming stock (Goulding, 2009, Campbell and Hartley, 2010, DEFRA, 2015). Wild boar are not listed on the Species and Habitat Directive 1992, likely due to their high abundance and population growth in mainland Europe in the last century (Howells and Edwards-Jones, 1997) and current rapid population increases (Massei et al., 2015b). There is controversy over the establishment of wild boar, specifically whether it falls

under the realm of rewilding, reintroduction, and restoration or whether it is an invasive introduction. The debate is fuelled by different groups, some say that wild boar have been reintroduced and are part of greater rewilding movements, however DEFRA (Department for Environment, Farming and Rural Affairs) class the wild boar as feral (DEFRA, 2008). The reason for DEFRA's classification is twofold, the first being that UK wild boar are likely crossed with domestic pig stock, the second is that wild boar were not officially released and have been established through unmanaged populations. This latter aspect follows the IUCN guidelines for reintroduction (IUCN/SSC, 2013). Wild boar have impacted upon the human population where they have established due to their ecology and contact with people (Goulding, 2003). These impacts are linked to how the Forest of Dean is conceived by the people living there as a multispecies landscape with animal and human spaces where the wild boar are transgressing these borders (O'Mahony, 2022). The status of wild boar is also blurred in the Forest of Dean through their relations and interactions with humans creating controversy through over their status and the governance of the species (O'Mahony, 2020).

2.1.5 Human-wildlife conflict and coexistence

Reintroduction of species can create or increase human-wildlife conflict (Coz and Young, 2020). Human-wildlife conflict is a section of human wildlife interaction focusing on the negative impact of human wildlife encounters/interactions (Wieczorek Hudenko, 2012). Human-wildlife conflict is a complicated multi-faceted field which considers drivers from the individual human perspective (Wieczorek Hudenko, 2012), social and political aspects (Treves, 2009), economic loss (Graham et al., 2005), human-human conflict (Geodeke, 2005), as well as ecological and biological management (Conover, 2002). Human aspects of human-wildlife conflict depend on the stakeholders involved and can be created through emotion (Wieczorek Hudenko, 2012), myths, stories and religion (Dickman and Hazzah, 2016), as well as through more tangible economic and political aspects (Fletcher and Toncheva, 2021). Wildlife drivers of conflict can be created through crop foraging (Hill, 2000), habitat reduction and fragmentation (Ziółkowska et al., 2016), and reduction of prey species leading to increased predation of domestic species (Ambarli et al., 2016). This shows that to understand and mitigate against human-wildlife conflict a multi-disciplinary approach needs to be considered. The idea of studying wildlife conflict is to understand the

various aspects and sources of conflict and move towards coexistence through contextualising the type, severity and frequency of interaction (Nyhus, 2016).

Human-wildlife conflict is one point of the continuum of human-wildlife interaction where the opposing point is human-wildlife coexistence (Frank, 2016). Human wildlife coexistence is a concept that merges social and ecological aspects of human-wildlife interaction (Carter and Linnell, 2016b). Coexistence therefore has two facets, social compromise of existence between humans and wildlife (Frank, 2016) and balancing ecological niche and resource competition (Chapron and Lopez-Bao, 2016), creating differing metrics of success. With such compromises for coexistence comes the ideas of social tolerance and acceptance. Tolerance where the animal is not necessarily liked but “can be lived with”, and acceptance where species value is more recognised (Glikman et al., 2021). These can be qualified and quantified using social acceptance studies (Liordos et al., 2017), however coexistence becomes more complex when stakeholders are engaged due to differing agendas and levels of tolerance and acceptance (Glikman et al., 2021). For example, coexistence is usually favoured by those who have not been in conflict, or had contact, with the species (Konig et al., 2020) or are not cohabiting the same space as the species in question (Glikman et al., 2021), and conflict created when people’s emotions create potential barriers to coexistence (Jacobs and Waske, 2019).

Ecologically, both the humans and wildlife species should not inhibit survival of each the other for coexistence to occur (Iamb et al., 2020) which becomes complicated when considering land use and conflicts such as encroachment of farming into wild spaces and crop foraging (Mekonen, 2020, Graham et al., 2005). The challenge of moving along a linear continuum between conflict to coexistence is creating environments of less frequent or less severe negative interactions between humans and wildlife whilst ensuring more frequent positive or neutral interactions between humans and wildlife. This creates a pathway from conflict, through tolerance and acceptance, to coexistence considering all stakeholders and the ecological aspects of the wildlife concerned (Glikman et al., 2021). Due to the multiple agencies, both human and wildlife, involved the continuum between conflict and coexistence becomes three dimensional (Nyhus, 2016). Therefore, aiming for complete harmonious, or peaceful, coexistence is likely unattainable and coexistence and conflict occur simultaneously (Pooley et al., 2021) but have a temporal impermanence (Gao and

Clark, 2023). Coexistence therefore can be defined either at an individual level, through the majority of a human population in an area not experiencing negative interactions with wildlife, or a lack of unacceptable negative interactions between humans and wildlife. When reviewing human-wildlife interactions the positive, coexistence, and negatives, conflicts, need to be reviewed to fully understand these interactions, their permanence, and where on the spectrum of conflict and coexistence the populations of humans and wildlife in question exist.

2.1.6 Synopsis

Rewilding, reintroduction, and restoration are currently flawed in their application insofar that the three techniques lack solid definition in their approaches. Rewilding is described differently between North America and Europe; however, both agree that keystone species should be reintroduced. North America relates this to carnivores and Europe to large herbivores. Reintroduction of a species can be debated on genetics and purity of a species' heritage, and whether the species still has a niche in the ecosystem. Restoration relies on an agreed time-period to allow the landscape to return to the state of said agreed time-period. These factors create discourse and debate, which can lead to conflict. My research will add to discourse and discussion around the debate on the length of extinction of a species with a view on reintroduction timescale, increasing knowledge and understanding to what constitutes a reintroduction and whether wild boar in the Forest of Dean can be classified as a reintroduction or an introduced feral invasive species.

Human dimensions of these approaches are not fully studied. IUCN guidelines state that social impacts need to be measured before reintroduction (IUCN/SSC, 2013), however these findings are infrequently reported in journals or not given as much weighting as the ecological or biological impacts. Full social and economic impacts are reviewed once a species is established; this is usually after human-wildlife conflict has occurred and created further conflict between those who have been impacted and those who support the rewilding, reintroduction or restoration initiative, such as local versus non-local divides (Wilson, 2004). Wildlife coexistence will be determined through a lack of negative human-wild boar interactions.

This study will use the current situation with the wild boar in the Forest of Dean to explore the social impacts of the wild boar at local and individual scales, increasing dialogue around human dimensions in wildlife management with a view to inform legislation to reduce impacts of human wild boar conflicts in the Forest of Dean, as well as other species under consideration for reintroduction. This study aims to delve into the human dimensions of reintroduction to understand the drivers for people's views on reintroduction to create a depth of understanding to inform future reintroduction initiatives.

2.2 Wild boar

2.2.1 Characteristics, ecology, and behaviour

European wild boar (*Sus scrofa scrofa*), in this study referred to as wild boar, are even toed ungulate subspecies of Eurasian wild boar (*Sus scrofa*), a member of the suidae, pig, family (Porter, 1993). Wild boar are the progenitors of domestic pigs, with the European domestication of pigs estimated to have occurred nine thousand years ago (Larson et al., 2005). Wild boar are characterised, and differ from other pigs, by having large fore-shoulders with dense black wiry hair covering their bodies and have a narrow head and long snout with black muzzle, erect pointed ears, tusks, long legs and a straight tail with a tassel at the end (Sweeting, 2013). Adult boar can grow up to 180cm and 230kg (Sjarmidi and Gerard, 1988) with males predominantly larger than females (Porter, 1993). Young boar have a characteristic beige and brown striped body, giving rise to the nickname of humbugs² in the UK. This is different to domestic breed piglets who will be spotted or lack markings (Porter, 1993). Wild boar have a maximum age of twelve years, although in many cases the average age is lowered to two years where hunting is commonplace (Jezierski, 1977).

Wild boar are highly social animals, females form matriarchal groups called sounders. Humbugs will be raised by sounders with females joining the sounder or forming their own sounder at maturity, young males will be a part of the sounder until maturity. When males mature at 15 months old they leave the sounder (Sweeting, 2013) and form their own groups then disperse shortly before the rut season in October to seek a sounder for copulation (Cabanau, 2001). Maturity is measured differently for males and females,

² Humbugs are a brown and yellow striped boiled sweet in the UK.

males reach maturity between eight and twenty four months whereas female maturity is when they reach a breeding weight of thirty to forty kilograms (Cabanau, 2001). For their first year a hind³ will come into oestrus in October, whereas sows, mature females, can enter oestrus every 21 days (Sweeting, 2013). There are different factors dictating when a female may come into oestrus; photoperiodicity⁴, environmental factors and food availability, and social factors; sub females will come into oestrus after the matriarch. Each female will produce an average of six piglets in a litter, however between one and twelve piglets per sow have been recorded (Frauendorf et al., 2016). Typically sows have one litter per year but in favourable conditions a second rut can occur in July to September (Porter, 1993). Generally, sounders consist of six to eight females and therefore can have litters of approximately thirty-six humbugs. This allows for rapid population growth within the protection of the sounder system. Annual increases in population size can be as large as 150% (Massei and Tonini, 1992). This allows the wild boar to reach high population numbers and densities in a comparatively short time compared to other ungulates (Geisser and Reyer, 2005).

The home range of wild boar male groups and sounders differ; male wild boar are reported to have home ranges of 120-150km², whereas females 40-60km² (Sweeting, 2013). This is likely due to sounders consisting of adults and young, reducing the range that can be travelled, as well as male ranges needing to cover more than one sounder to increase success of mating. In the UK ranges have been reported to be as little as 1.0-9.6km² (Sweeting, 2013), suggesting that if conditions are correct wild boar will not travel far as their food and environmental needs are being met.

Wild boar differ from many ungulates as they are monogastric meaning that the gastrointestinal tract is not efficient at releasing carbohydrates from cellulose, therefore energy rich foods, such as acorns or beech mast, are preferred (Barrett, 1978). Due to this high energy need wild boar are opportunistic obligate omnivores, meaning that wild boar will consume plants and animals, whichever is available in their location. Wild boar collect food through rooting; using their cartilaginous snouts to dig to a depth of 5-15cm turning over the topsoil to access food sources underneath (Bratton, 1975). A wild boar can root an

³ Hind is the term for a juvenile female wild boar.

⁴ Shorter days and longer nights are a signal for oestrus.

average of 42.4m² per week (Sandom et al., 2013). Despite being opportunistic obligate omnivores the majority of wild boar food sources are plant based such as fruit, nuts, tubers, bulbs and other vegetative parts collected through rooting behaviour (Singer et al., 1984) with only 2-11% of a wild boar's diet consisting of animal parts (Massei and Genov, 2004). Although animal matter is a small percentage of wild boar diet it is consistently present, animal matter has been found in 94% of wild boar stomachs. The animal matter predominantly consists of invertebrates, larvae, and earthworms (Genov, 1981). Vertebrate components of wild boar diet consist of carrion, eggs and small vertebrates such as squirrels or passerines (Massei and Genov, 2004).

In terms of biological strategies, this makes wild boar both K and r strategists differing from other ungulates (Scandura et al., 2008). Wild boar show r strategist traits through opportunistic feeding, high ecological adaptability, and high reproductive potential (Geisser and Reyer, 2005). K strategist traits shown by wild boar are low adult mortality in temperate climates (Keuling et al., 2013) and sexual size dimorphism with males growing larger than females (Focardi et al., 2008). This combination of K and r strategy traits underpins the increase in population size in Europe and successful establishment of populations around the world.

2.2.2 History and range

The European wild boar are split into two subspecies: Iberian, or western European, wild boar, and eastern European wild boar. These two subspecies populations were separated in the Pleistocene ice age which caused a chromosomal count divergence (Goedbloed et al., 2013). Eastern European wild boar have a chromosomal count of $2n=38$, domestic pigs are domesticated eastern European wild boar and share the same chromosomal count (Fang et al., 2006, Porter, 1993). By contrast Iberian wild boar have a chromosomal count of $2n=36$ (Scandura et al., 2008). These two subspecies and domestic pigs, despite differing chromosomal counts, can create fertile offspring with a chromosomal count of $2n=37$ (Scandura et al., 2011). This creates difficulties proving genetic hybridisation, or purity, of a wild boar population, confounded by hybrid wild boar displaying normal wild boar phenotypes. Therefore conflicts about the authenticity of wild boar populations occurs (Scandura et al., 2011).

Wild boar are an historically important game species in Europe (Cabanau, 2001). The hunting of wild boar continues in many European countries with hunting bag⁵ statistics providing data to monitor population numbers (Keuling et al., 2008). This hunting pressure is also the reason for wild boar numbers dwindling in Europe in the nineteenth century. But due to reduced hunting (Massei et al., 2015a) and introduction the species range is now increasing. Wild boar have recolonised Sweden, Estonia and Finland (Erkinaro et al., 1982), as well as established feral populations in England (Goulding, 2001) and Scotland (Campbell and Hartley, 2010). Due to this utilisation as a game species wild boar have been distributed to other areas of the world following European colonisation, such as North America (Barrett, 1978), Australia and New Zealand (Choquenot et al., 1996). In the USA wild boar have become the most abundant free-ranging exotic ungulate (Seward et al., 2004) with numbers of feral pigs⁶ becoming an ecological and economic issue (Massei et al., 2011).

2.2.3 Wild boar in the UK

Wild boar were once native to Great Britain with an estimated minimum of one million wild boar roaming the deciduous woodlands of the isle six thousand years ago (Yalden, 1999). Free-living wild boar were thought to have become extinct in England in the 14th century through habitat destruction, via deforestation for wood and farmland, increased demand for boar meat and increasingly more efficient hunting methods (Rackham, 1986). The boar were hunted by the king and royal hunting parties and ordered for great feasts. One such feast of Henry III is said to have had two hundred wild boars from the Forest of Dean and a further one hundred from Pickering forest (Goulding, 2003). This level of hunting is likely to have caused the destruction of wild boar populations in Great Britain. Since the 14th century there have been unsuccessful attempts to reintroduce wild boar back into the British Isle. Once by Charles I in the New Forest⁷, and a later attempt in the 17th century in Essex which was not accepted well by the local populace, where it was described that “they digged [dug] up the earth so up, and did such spoyle [spoil], that the country would not endure it” (Howells and Edwards-Jones, 1997). During the late 1990s conservationists were debating the feasibility of official releases of wild boar into Scotland as part of an official

⁵ The recorded take from a hunt.

⁶ The term used by Americans for wild boar.

⁷ The largest Crown forest in the UK.

reintroduction plan (Howells and Edwards-Jones, 1997, Leaper et al., 1999). These feasibility studies were speculative and not indicative of a government led release of wild boar in the UK due to government policies relating to the stipulation that reintroductions should be prioritised on European-wide decline (Howells and Edwards-Jones, 1997). During this time wild boar populations in continental Europe were increasing due to factors such as farming and socioeconomic changes in rural areas, supplementary feeding from hunting, and a lack of non-human predation (Saez-Royuela and Telleria, 1986). The first contemporary populations of wild boar in the UK occurred at the same time as the feasibility studies, through escapees or releases from breeding farms or estates (Goulding, 2009). This mechanism for establishment of feral wild boar previously occurred in Sweden in 1970 giving similar population results to those seen in the UK now (Welanders, 2000). Currently there are populations of wild boar residing within several areas of the UK including Scotland, Devon, the southeast of England and the Forest of Dean; all populations are considered establishments through escapees (Goulding, 2009, Campbell and Hartley, 2010).

2.2.4 Wild boar in the Forest of Dean

The wild boar within the Forest of Dean are considered feral⁸. The wild boar have been present in the Forest of Dean since 1997 consisting of an initial small population of farm bred stock totalling twenty to thirty individuals released into woodland north of the main forest (Goulding and Smith, 1998). A second population, of twenty to thirty animals, appeared in the main forest in 2004 (Wilson, 2005). These populations have merged into one larger population as both populations migrated through the Forest of Dean, expanding into further areas of the Forest of Dean district. The owners of the released wild boar are officially unknown, however certain locals will allude to knowing who the releasers were. From this small population of forty to sixty wild boar the population has grown to a peak of 1500-2000 wild boar in the mid-2010s, which was considered by DEFRA to be the largest in England (DEFRA, 2015). The rapid growth of the population, which had not been reflected in European populations (Goedbloed et al., 2013), is thought to be due to many factors.

The main suspected factor is that the wild boar are not pure bred and therefore have a higher productivity, however this has not been proven (Goulding, 2001). This is due to

⁸ Feral animals are those that were once domestic but are now considered to be living wild.

domesticated wild boar traditionally being crossbred with breeds such as Tamworth pigs to increase litter size, productivity, and piglet growth speed which increases speed of meat production for those farming domesticated wild boar (Booth, 1995). The second suspected factor in the growth of the population of wild boar in the Forest of Dean is a lack of natural predator population control. The British Isles has historically removed most large and meso-predators, such as lynx, bears and wolves (Yalden, 1999). The range of the wild boar population in the Forest of Dean has increased to outside of the forested area, with anecdotal reports of wild boar as far south as Tutshill and Chepstow, and west over the river Wye into Goodrich and The Doward (Figure 5). It is unclear whether the wild boar swam, forded, or crossed the river via man-made bridges, however these sightings show that rivers in the UK are not a boundary for wild boar population movement and expansion.

It has not been proven that the wild boar of the Forest of Dean are a hybrid or cross breed between wild boar and domestic pig (Goulding, 2009). Genetically wild boar and domestic pigs are not able to be differentiated due to their shared history (Kyle, 1995, Porter, 1993). Phenotypic characteristics allow for differentiation between crossbred and purebred wild boar. Pure bred wild boar will have the characteristics, described previously, of a narrow head with long snout and black muzzle, erect pointed ears, long legs and tail with tassel at the end (Porter, 1993). Crossbred wild boar will show a mix of wild boar and pig-like characteristics, either through markings or physical features (Figure 1). The current generation of wild boar in the Forest of Dean show physical characteristics suggesting a pure-bred line, but this may be due to several feral populations reverting to a wild state. This may be through environmental factors and a lack of human caretaking causing phenotypic expression of genes in wild boar/domestic pig heterozygous loci to create wild boar characteristics (Goedbloed et al., 2013).



Figure 1: Crossbred wild boar, who has a domestic pig body shape with wild boar fur, with young wild boar; two showing the striped wild boar patterned coats, the other displaying a spotted pattern suggesting hybridisation (Christopher Jones/The Telegraph).

Due to the original domesticity and small numbers of the initial feral wild boar populations, the wild boar were seen as a novelty and were accepted and visited by individuals who enjoyed feeding the wild boar (Figure 2) (O'Mahony, 2022). As the wild boar population has increased in size, moved into deeper into the forest, and become further removed through each generation from the first released generation, the wild boar have adopted more wild behaviours such as becoming less approachable and wearier of people. These subsequent generations of wild boar have been reared without human contact, therefore with each generation the intrinsic trust of humans has been degraded. Some sounders will allow, through curiosity or the thought of being fed, human contact (Figure 3). However, many sounders and wild boar shy away from human contact.



Figure 2: A woman approaching a wild boar with neither showing signs of fear (David Slater/Alamy).



Figure 3: Children following wild boar in the forest (interviewee photograph).



Figure 4: wild boar rooting damage to a grass area in a village in the Forest of Dean (researcher photograph).

The lack of wild boar trust in humans has been further developed through culling by Forestry Commission rangers and hunting by poachers. The rangers and poachers will stalk the forest either at dawn or dusk to shoot wild boar (Gill, 2023). Wild boar have poor eyesight (Cabanau, 2001) and therefore will interpret a human shape as a hunter. Thus, many wild boar groups have become weary, defensive, and dangerous towards humans (O'Mahony, 2022). This increases negative interactions between people and wild boar. Behaviourally denoting a shift in the wild boar from domestic escapees to a feral established population. These behavioural changes and expansion of population and range, mean the wild boar will not seek human feeding or interaction, but will go into human areas to seek and graze for food (Castillo-Contreras et al., 2018).

The once small, rarely seen unless looked for, domesticated population has become a large regularly interacted with feral population, shifting how the wild boar are considered by the local population. The wild boar moved from a novelty to a social problem (Best, 1987) within the Forest of Dean. The wild boar, and their exploits, are described as

problematic in conversation, social media, and local media. Activities that have been labelled problematic are rooting of grass areas and rubbing against posts and stumps both in the forested area and the human areas of the Forest of Dean. Due to several stakeholders and interest groups in the Forest of Dean the debate of how to resolve or mitigate against human wild boar conflicts is on-going and unanswered. This can be attributed to a diversity of attitudes to wildlife management (Conover, 2002) which can be exaggerated through the media and other public forums for opinion (Hilgartner and Bosk, 1988). This has been seen in other wildlife management scenarios (Dizard, 1994, Geodeke, 2005). This study looks to examine these social issues in further detail to discern how these issues have arisen and to understand the viewpoints held by various stakeholders within the Forest of Dean to enable an informed review of solutions and mitigations which could be implemented.

2.3 Wild boar research

Due to the status of wild boar as a game species and the spread of wild boar globally there have been a range of research into several areas of wild boar ecology, epidemiology, and human interaction. Outside of the native range of Europe the focus of wild boar research is on management of an invasive species (Seward et al., 2004) or farming of wild boar (Rivero et al., 2013a). In native ranges the main body of research is in disease (Lange et al., 2014), human wild boar conflict (Pandey et al., 2015) and ecology (Markov et al., 2019). In the UK the small amount of research completed on wild boars is broad ranging from management (DEFRA, 2008), classification (Goulding, 2013), and ecological impacts (Sandom et al., 2013) to the social impact of certain wild boar populations (Goulding and Smith, 1998, Dutton et al., 2015).

2.3.1 Studies outside of Europe

In Asia, where species of wild boar are native, research is split between disease control and human wild boar conflict. Russian and Japanese research has been conducted on the emergence of disease and threats of transmission to livestock (Lange et al., 2014, Uni et al., 2015, Sakai et al., 2015). Japan, Nepal, India and China have reviewed environmental factors affecting wild boar distribution which affects and creates human wild boar conflict (Honda, 2009, Pandey et al., 2015, Chauhan et al., 2009, Cai et al., 2008, Li et al., 2010). These

studies centre on wild boar crop foraging in rural villages and farming outposts. In India human wild boar conflict caused over three hundred injuries to people between 1990 and 2008 (Chauhan et al., 2009). In China over ninety percent of study participants saw no value in wild boar, despite conservation efforts, with one in seven wanting wild boar controlled, and eighty-six percent of people deciding that they would kill wild boar if negatively impacted by wild boar (Li et al., 2010). Nepalese wild boar caused a nine percent loss in earnings through crop damage (Pandey et al., 2015). All three papers review mitigations for wild boar conflicts including fencing (Chauhan et al., 2009, Pandey et al., 2015), financial support or compensation, and diversification of land use (Pandey et al., 2015, Li et al., 2010, Chauhan et al., 2009). Pandey et al. (2015) were the only ones out of the three to suggest wild boar population management.

Research in the American continents is based on ecological damage or the economic gain to communities of the rapid population growth of invasive feral wild boar (Tolleson et al., 1995, Seward et al., 2004). In Texas and Florida wild boar have caused problems with disease, damage to property, and out-compete native species. However a growing industry of wild boar meat, and hunting are financial gains (Tolleson et al., 1995). In Chile and Argentina research is based on the negative ecological impact of wild boar in natural areas through diet and grazing/rooting habits (Hodgkinson et al., 2011, Ballari et al., 2014, Cuevas et al., 2010, Gürtler et al., 2017). Further Chilean research has reviewed ways to increase productivity of wild boar through breeding programmes and rotational grazing (Rivero et al., 2013a, Rivero et al., 2013b). For both these areas the process of removal of wild boar generates less controversy compared to native wild boar ranges.

Outside of Europe research is formed on whether wild boar are native or non-native. In non-native regions wild boar are viewed on their impact on local ecology or their profitability. Where wild boar are native human wild boar conflict has been studied and focussed upon, however this still focuses on the economy of wild boar where mitigations and solutions for human-wild boar conflicts are suggested however not reviewed in terms of efficacy or cost to those who are affected most.

2.3.2 European studies on wild boar

Most studies on wild boar in Europe focus on two areas; disease transmission and control, and ecology. Research into diseases carried by wild boar is varied accounting for diseases which affect multiple species, humans, and agriculture. Diseases researched are ASF (Petrov et al., 2014, Nurmoja et al., 2017, Wozniakowski et al., 2016), *Hepatitis E*. (Schlosser et al., 2015, Mazzei et al., 2015, Montagnaro et al., 2015, Oliveira-Filho et al., 2014), foot and mouth disease (Breithaupt et al., 2012, Mouchantat et al., 2014, Alexandrov et al., 2013), and *Toxoplasma gondii* (Coelho et al., 2014, Jokelainen et al., 2012) to less impactful disease such as dental disease (Malmsten et al., 2015) and nematodes (Jarvis et al., 2007). Research on wild boar ecology examines habitat use and distribution (Újváry et al., 2014, Brivio et al., 2017, Suselbeek et al., 2014, Macchi et al., 2010), and diet (Zeman et al., 2016, Schley and Roper, 2003). These papers consider social issues relation to disease transmission from wild boar to domestic stock or humans, but this is limited other than to financial implications for farmers. These considerations focus on management of wild boar to reduce crop damage (Amici et al., 2011, Schlageter and Haag-Wackernagel, 2011, Schlageter and Haag-Wackernagel, 2012, Gimenez-Anaya et al., 2016), the extent and impact of damage through diet evaluation (Herrero et al., 2006, Schley and Roper, 2003), or distribution of crop damage (Schley et al., 2008, Morelle et al., 2016, Bobek et al., 2017). The focus of these papers is on the quantitative economics of agricultural damage and mitigation strategies, and not on qualitative social impacts.

There is little research which reviews socioeconomic impacts of wild boar in Europe that does not have a focus on agricultural aspects. Licoppe et al. (2013) reviewed data on management of wild boar in peri-urban⁹ areas. This study was driven by quantitative data using questionnaires to examine the causes, impacts and public awareness of wild boar issues. The study touches upon people's attitudes towards wild boar, noting that fifty-five percent of respondents were ambivalent or indifferent to a wild boar's presence in peri-urban areas and that thirty-seven percent were negative to wild boar in peri-urban areas (Licoppe et al., 2013). Massei et al. (2015a) reviewed the increase in numbers of wild boar in Europe partly due to a decrease in hunting pressure due to a change in social acceptability

⁹ Areas which are suburban or small towns and villages – areas which are between urban and rural.

of hunting. Through this paper there is a suggestion that an increase in wild boar, promoted through a reduction in hunting and other factors, could increase human-wild boar conflict and that investigation into the best mitigation strategies is needed.

Boonman-Berson (2018) researched human wild boar interactions in the Netherlands and the concept of invasiveness of wild boar within human settings, and the drivers of conflict between the two species. These are compared to human and bear interactions in the USA in similar settings. Data were collected through interviews, focus groups, participant observation, analysis of scientific, policy, and educational documents and reflection on their own thoughts. Analysis of these data was through multi-sensory approaches. The study concludes that wildlife management in terms of cohabitation is created through continuous feedback between all parties involved, including wildlife, which invites dialogue (Boonman-Berson, 2018). Overall, European studies lack thorough analysis of the social impacts of wild boar or lack the use of qualitative sociological approaches to data collection and analysis. This lack of social analysis of wild boar from Europe is most likely due to the continuous presence of wild boar throughout European history meaning that predominantly people are coexisting with wild boar and conflict occurring irregularly. However, Boonman-Berson (2018) research starts to address this imbalance inviting more discussion around human wildlife interactions.

2.3.3 Wild boar studies in the UK

In the UK there has been little research into wild boar most likely due to the relatively short amount of time that wild boar have been present in the UK since their first extinction in the 14th Century (Rackham, 1986). Wild boar research has focused on management (DEFRA, 2008), classification and genetics (Goulding, 2001, Goulding et al., 2003, Goulding, 2013), and the ecological impacts of wild boar populations (Sims, 2005, Brownlow, 1994, Howells and Edwards-Jones, 1997, Sandom et al., 2013). Despite these areas of focus, there has been some discussion of social impacts (Goulding, 2006, Goulding, 2009). Goulding's first paper gives an unbiased review of wild boar, acknowledging conflicts with wild boar and issues with conventional farming and hunting methods, but also the ecological benefits such as bracken clearing and control (Goulding, 2006). In 2009, Goulding reviewed the social implications of the Forest of Dean wild boar following discussions and conclusions of the

district council and invested parties on controlling the wild boar (Goulding, 2009). Goulding comments that the “negatives outweigh the positives” but there is a decision to keep wild boar in the Forest of Dean.

In 2015 the Forestry Commission published a report on “The social aspects of the wild boar in the Forest of Dean” in conjunction with Worcestershire University (Dutton et al., 2015). This paper focused on quantifying the social issues of the wild boar concentrating on the quantitative analysis of three areas: impacts on public safety, impact on resident communities, and the economic impact. Dutton et al. (2015) did not review the views of people on the management of wild boar by the Forestry Commission or views on whether the wild boar should be managed in the Forest of Dean. Data were collected through a questionnaire, structured interviews, workshops and through the Forestry Commission incident reporting database. Data were only collected from those within the Forest of Dean and neglected views from outside of the district. The report did not give heed to anecdotal evidence or impacts other than physical damage or injury. This allows for a one-sided view on wild boar in the Forest of Dean. The incidence of wild boar is compared to that of a similar area in the Netherlands, but the report does not review the differences in social attitudes on wild boar between British and Dutch residents in their respective areas. Dutton et al. (2015) give practical advice on coexistence with wild boar in the forest of Dean, but this advice does not give costs or specification of ways to avoid damage to property by wild boar, such as fencing or extra security measures. Overall, the Forestry Commission report does not give a full picture of the wild boar situation in the Forest of Dean. It could be construed as bias as it is a report from the key stakeholder in the Forest of Dean with which there is conflict between themselves and those local to the Forest of Dean about the wild boar. With only two sets of research into the social impact of wild boar in the UK, there is a lack of depth and breadth of study in the scientific literature.

There has been little research on the social impacts of wild boar worldwide creating a small, uneven knowledge base on these impacts of the species either as a native or when it has been introduced or reintroduced into an area. Those that have studied the socioeconomic impact of the wild boar have focused on agricultural impacts and solutions but do not describe the full story surrounding human-wild boar conflict, such as potential

emotional tolls or the social impacts. These gaps in knowledge need to be addressed to be able to understand the full extent of socioeconomic impacts of wild boar.

2.4 The Forest of Dean

2.4.1 Forest of Dean Geography

“We were cut off from the world – from the rest of Gloucestershire by the Severn estuary, from Monmouthshire by the River Wye; and where the northernmost hills stopped, we stopped.”

- Foley (2011) p5

The Forest of Dean refers to two areas, the statutory forest and one of the six districts of the county of Gloucestershire (Figure 5). The Forest of Dean district covers the most western part of Gloucestershire, containing much of the statutory forest within the district boundaries. The district covers the most southern area of land between the River Severn and the River Wye, extending near to Ledbury to the north, Ross-on-Wye to the west and Gloucester to the east. Due to the rivers running east and west of the district meeting in the south at Chepstow the district has been historically isolated. The district borders the counties of Herefordshire, England, to the northwest and Monmouthshire, Wales, to the southwest. The name Forest of Dean is derived from the acquisition of wooded areas for hunting forests in 1080 after the Norman invasion of England by William the Conqueror in 1066 (Hart, 2000). The suffix of Dean is thought to have derived from the proximity to the town of Dean Magna, now known as Mitcheldean (Nicholls, 1966), or alternatively stemming from the word dene describing wooded valleys where pigs reside (Wren, 2013).

The land in the Forest of Dean district is a patchwork of various geological landscapes giving rise to different land uses (Landscape Design Associates, 2002). The statutory forest is located on a carboniferous coal measure sat within carboniferous limestone fold to the west and Devonian sandstone to the east, which gave rise to coal and mining industries with the forest (Dreghorn, 1968, Verey, 1970). The Wye Valley is situated on the carboniferous limestone fold and stretches north to south along the western most part of the Forest of Dean district. The valley is an Area of Outstanding Natural Beauty (AONB) and is mainly wooded with arable fields interspersed throughout (Landscape Design Associates, 2002). To

the southeast of the district is an area of unwooded vale with mature meadow and floodplain. To the immediate east of the forest are ridges and valleys which give rise to mixed arable and crop farmland, orchards, and coppiced woodland. There are limestone hills and plateaus to the west of the district giving rise to mixed arable and cropped farmland. In the north low hilled areas of the district are farmland and orchard. The district is rural and productive, from fruit and grain to meat and produce such as cheese (Landscape Design Associates, 2002).

and within the forest boundary, most notably Cannop in the centre of the forest, and Parkend which resides in the south of the forest. The Forest of Dean is not a ubiquitous untouched area of wooded land, but a forest historically lived in and managed by the people within it (Wren, 2013). It is crown property and was once a royal hunting forest with the last recorded royal hunt¹⁰ occurring in 1256 (Guest, 2004). There has been mining in the forest since 1216 through freemining rights (Anstis, 1986), with collieries, mines, and iron forges being the main source of employment within the Forest of Dean until 1965 (Baggs and Jurica, 1996a). The 1919 Forest Act, and the creation of the Forestry Commission, denoted the forest would be managed by the commission to promote afforestation and the production of timber, creating a new employer in the area (Cave, 1984). The Forest of Dean consists mainly of oak and beech trees with coniferous plantations interspersed.

The Verderers of the Forest of Dean

Within the United Kingdom there are three forests that hold a Verderers court: the New Forest, Epping Forest, and the Forest of Dean (Robinson, 2014). Historically, the role of the Verderer is to provide royal administration to the forest and to be judicial officers of the Forest Law (Mullan, 2013). The forest law covers the allowance of commoning and pannage within the statutory forest, collection of firewood (Estovers), and the prohibition of poaching, illegal felling and cutting of trees, alongside the encroachment of development into the forest grounds (Hart, 1971). The Forest of Dean Verderers have further duties not seen in the New Forest or Epping Forest, in the release of timber and giving of mining rights, in conjunction with the Gaveller, to the freeminers within the Forest of Dean (Verderers, 2018). Verderers are second to the High Sheriff of the county, who is second to the king (

¹⁰ A hunt that royalty attends. ALLSEN, T. T. 2011. *The Royal Hunt in Eurasian History*, Pennsylvania, University of Pennsylvania Press.

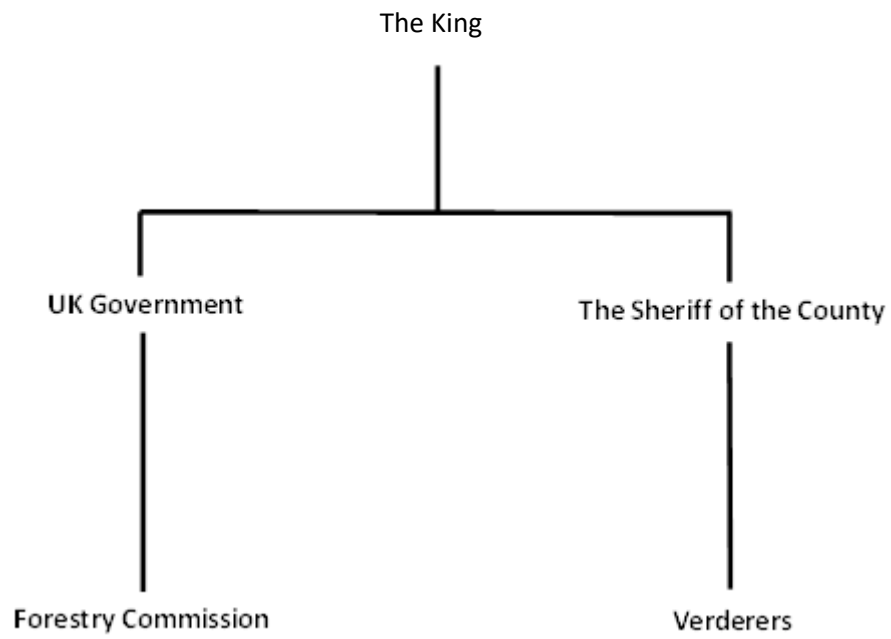


Figure 6) (Hart, 1971).

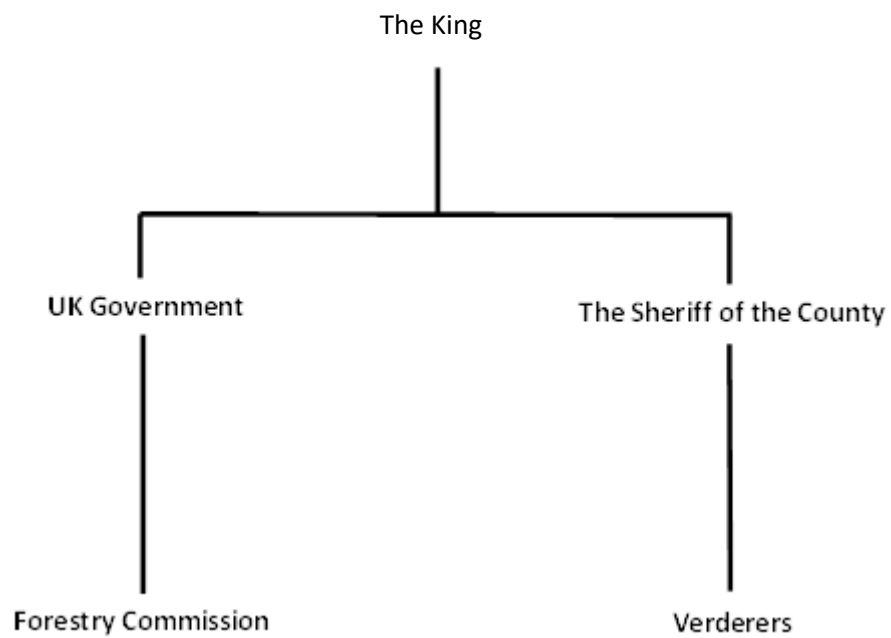


Figure 6: Diagram of the hierarchy of the Verderers and Forestry Commission in relation to the head of state.

The first documentation of the Forest of Dean Verderers was in 1216 where the Verderers, and other forest officials, were put under the leadership of John of Monmouth (Hart, 1971). Since then and until modern times, the Verderers have acted as a court to the Forest of Dean deciding punishments fitting the crimes stated earlier. The Verderer's courts take place in Speech House, a version of which still stands prominently in the geographic centre of the statutory forest. The Verderer's court room is still used to hold the Verderer's court (Verderers, 2017b), however the rest of Speech House is now a hotel and restaurant (The Speech House Hotel, 2018).

The current Forest of Dean Verderers are a committee of four men¹¹ elected by the freeholders of the county of Gloucestershire, excluding those within the cities of Bristol and Gloucester (Verderers, 2018). The role has no salary and is held until death (McBain, 2011). After the death of a Verderer the high sheriff of Gloucestershire will arrange a vote for a new Verderer, by writ of the Court of Justice (Hart, 1971). The vote is carried out through a show of hands; a system that hasn't changed for eight hundred years (Verderers, 2018). Due to the large number of freeholders within the county of Gloucestershire, the counting of raised hands is becoming increasingly difficult causing the Verderers to consider breaking tradition and using a more modern voting system. However, this has not been a forced issue yet. After election the Verderer is sworn in to the court by repeating the oath:

"I swear by Almighty God that I will truly serve our Sovereign King. In the office of a Verderer in the Forest of Dean, I will to the uttermost of my power and knowledge do for the profit of the Queen so far as it doth appertain unto me to do, I will preserve and maintain the ancient rights and franchises of Her Crown, I will not conceal from Her Majesty any rights or privileges nor any offence either in vert or venison nor any other thing, I will not withdraw or abridge any defaults, but will endeavour myself to manifest and redress the same, and if I cannot do that of myself I will give knowledge thereof unto the Queen or unto Her justice of the forest, I will deal indifferently with all the Queen's liege people, I will execute the laws of the Forest and do equal right and justice as well unto the poor as unto the rich in that appertaineth unto my office, I will not oppress any person by colour thereof for any reward, favour or malice. All these things I will to the uttermost of my power observe and keep."

¹¹ The role is not restricted to men.

Since The Forestry Act 1927 stating that the Forestry Commission produce by-laws within the forests of England, the Verderer is a relatively powerless role, despite the high levels of tradition that surrounds the role of the Verderer. It does not encroach on the Verderers' jurisdiction but means that cases of infringement are now judged through the magistrate's court and not the Verderers' court (Verderers, 2018). The role of the Verderer is now to monitor the use of the Forest of Dean rather than control or preside over it, it is administrative rather than judicial (McBain, 2011). The Verderers' court meets quarterly to discuss issues of the Forest of Dean with Forestry Commission representatives, High Sheriff and other interested parties (Quine et al., 2004). The meetings will discuss reports on the minerals within the Forest of Dean; commoning of sheep within the forest; deer, boar and feral pigs¹²; deputy surveyors report; and any other issues arising within the statutory forest within the period of the quarterly meeting (Verderers, 2017a). During the discussion the Verderers will give advice on current issues and decide what action they think should take place. Despite a decline in status and power the position of Verderer is still prestigious and rewarding, allowing the people of Gloucestershire to have an administrative voice about their forest and its affairs through an elected court.

The Forestry Commission

The Forestry Commission holds ward over the Forest of Dean. It was founded as a national organisation in 1919 following the Forestry Act 1919 (Forestry Commission, 2017a) due to the deforestation of one sixth of the three million acres of forest in Britain during the first world war (Oosthoek, 2000). The aim of the commission was to reduce the import of wood into the UK and to reforest areas of the UK through acquiring land and assisting landowners, both public and private, to afforest land through support and incentivisation (Oosthoek, 2000). The Forestry Commission was split into 10 management areas across England, Scotland, Wales and Ireland. Initially the role of the Forestry Commission was to increase British timber production; this was achieved through the planting of monoculture pine plantations throughout forestry land (Forestry Commission, 2017b). This was criticised by many in the 1980s when the environmental impact of pure pine plantations came under scrutiny by environmentalist groups. The Forestry Commission resolved this issue by

¹² Although it is unclear what their distinction of the two is.

implementing local authorities and national nature conservationists as advisors to the Forestry Commission on what would be best planted in that local area to reduce the environmental impact of forestry (Aldhous, 1997). In the 1990s the Forestry Commission moved from pure timber production to include recreation and conservation in a multi-purpose management scheme (Forestry Commission, 2017b). When the UK undertook devolution in 2003, the Forestry Commission was split between the four devolved countries creating a forestry commission under the English, Scottish and Welsh governments and the Forestry Service in Northern Ireland. In 2013 the Welsh Forestry Commission was amalgamated into Natural Resources Wales alongside Countryside Council for Wales and Environment Agency Wales (Welsh Government, 2013). The English Forestry Commission is now a non-ministerial government department under DEFRA (Forestry Commission, 2017b).

The Forestry Commissions have been stewards over the public land of the Forest of Dean since 1923 (Aldhous, 1997), designating the Forest of Dean a National Forest Park in 1938 (Pinder, 2018). The Forestry Commission manages the production of timber in the Forest of Dean as well as recreational facilities, such as Beechenhurst Lodge and the footpaths and cycleways of the Forest of Dean; and animals residing within the Forest including deer and wild boar (Forestry Commission, 2017b). The Forestry Commission reports their management of the woodland to the Verderers of the Forest of Dean at the Verderers Court (Verderers, 2017b). Despite lengthy ties to the Forest of Dean, and employment of foresters throughout its history, the Forestry Commission is seen as a foreigner by some of those in the Forest of Dean. It is an outside organisation that is in charge. The Forestry Commission in the Forest of Dean is currently at the forefront of the wild boar management locally and consequently is subject to controversy from members of the public of their management of the wild boar which will be studied in this thesis.

2.4.5 Synopsis

The Forest of Dean has a history of isolation and introspection, but this has changed over the last century to become more open with less power from the residents over the area and more power over the land from outside organization such as the Forestry Commission. Notwithstanding this there are rights from the history and heritage of the people of the Forest of Dean which are still used by those residing in the Forest today. These traditional

rights confuse who has power over the Forest of Dean despite public ownership and management by the Forestry Commission. The Verderers give the local populace a say over the management of the Forest of Dean, even if the power of the Verderers has been diminished. The Forest of Dean is seeing more foreigners have moved into the area whilst simultaneously an increase in the younger foresters moving out of the forest for work and education. This is coinciding with an establishment of wild boar in the area, and these different viewpoints of forester and foreigner are potentially increasing conflict surrounding the wild boar.

The change in demographics of the Forest of Dean creates a shift in the historical consciousness within the area. There is a remembrance for the old ways and rules in the older generation, but less of a younger generation to carry on and support these rules and ways. This is further confounded by an influx of foreigners to the area, further diluting the community consciousness. Many of the sources used in this section are from those who are or were of the older generation of forester. These sources potentially show romanticism toward the Forest of Dean and bias toward their ownership experiences and exploits in the Forest of Dean and lack objectivity. But this also shows that the Forest of Dean is held dearly by those who were born and raised in the area, with any change of the forest seen as a change of their heritage. These people see themselves, and those of the forest, as different to the rest of the country. They have a rich heritage of important national uses of the people, steel, and wood of the Forest of Dean. The Forest of Dean has been insular and regulated by those who live in it. This shift from isolated community in control of their land to one that is more linked and in less control is important to recognize when reviewing the interactions of people and wild boar in the area. The wild boars are another driver of change in the history of the Forest of Dean creating conflict.

2.6 The researcher and the Forest of Dean

I have resided in Gloucester for all of my life and therefore have been geographically close to the Forest of Dean. As a child I would visit the Forest of Dean for walks, cycling, or to the tourist destinations in the district with no real considerations towards the people, wildlife, or conflicts between the two. I knew people from the Forest of Dean who would attend school with me. They would have to ride an early bus into Gloucester which would take two

hours each way given the amount of stops the bus had to complete, therefore when at school the Forest of Dean seemed further away than it is. Throughout my life the insular nature of the foresters was mocked and part of jokes from those outside and inside the Forest of Dean, further adding to a level of mysteriousness to the area.

I left the local area for four years, to complete a BSc Zoology and MSc Wildlife Management and Conservation at the University of Reading. After graduating from my MSc I moved to the Wye Valley, to a house slightly outside of the statutory forest. During this time, I worked in administration with people from the Forest of Dean and was able to explore the Forest of Dean as an adult. I would look for wildlife, explore the social history and the interconnection between the two as shown through ruins of old industry or railway lines converted into footpaths and cycle trails as well as visiting restaurants and pubs in the area, some of which were welcoming of tourists and “foreigners”, others of which were more “local”. Through this I have experienced the changes described by the Forest of Dean social historians and commentators (Potter, 1996, Phelps, 2008). During this time my family bought a neglected orchard in Mitcheldean within the statutory forest. The sale of the land took six months to complete, while this was happening the neighbours to the orchard mentioned watching the wild boar lay under the plum trees of the orchard eating fallen plums in the sun. The wild boar did further activities in the orchard, most notably rooting, which created large patches of bare soil and uneven ground where the grass had been rolled and flipped. This was not much of an issue for us, we had bought the orchard for the trees, and we flipped the grass back over and checked the fences to fill in holes to stop entry of wild boars. This experience allowed me to see where crop foraging was happening within a field near to the orchard, there were empty corn cobs and damaged corn plants on the edge of fields. These observations gave me an appreciation of the issues of wild boar in the Forest of Dean.

Through the orchard we became part of the community around it. The neighbours would regularly chat and discuss plans for their land and our plans for the orchard, the people on the lane and who they liked and didn't, and the reasons why¹³. The neighbour

¹³ Some of these reasons were non-locals moving to the area and not having an appreciation for those living in the area. Most notably was one person who had bought an old school and converted it into an activity centre with loud visitors in what is usually a quiet, almost silent, lane.

connected us with a sheep badger who rotated their sheep grazing between people's fields in the lane, and we happily allowed them to graze their sheep in the orchard to manage the grass and other plants. The sheep damaged freshly planted fruit trees and therefore this agreement ended, however these experiences gave me an appreciation for the way of life that exists in the Forest of Dean, perpetuated through generations.

These experiences and explorations of the Forest of Dean opened my view to the social and natural history of the area, allowing me to become part of the community but also an outside observer. The combination of experiences in the area and the knowledge gained from my degrees created a curiosity to explore the conflicts between people and wild boar and mitigations or solutions.

3. Methods

To allow a broader study of the discourse around wild boar in the Forest of Dean the design of this study was exploratory (Stebbins, 2001) and inductive (Strauss and Corbin, 1998) rather than hypothesis driven. This allows for a breadth of data to be collected and limits the skewing of results through preconceptions generated through hypotheses (Thomas, 2006). Mixed methods data collection¹⁴ was used to strengthen the validity of theories created and insights gained (Bryman, 2004, Brennan, 2000, Teddlie and Tashakkori, 2010). Once data were collected thematic analysis (Braun and Clarke, 2012) was used to create themes to explore and understand the social, economic, and ecological factors surrounding wild boar in the Forest of Dean (Newing, 2011).

To gather a broad range of qualitative and quantitative data, an online questionnaire was distributed alongside conducting semi-structured interviews, both of which contained open and closed-ended questions. Distribution of questionnaires and advertising for interviews was conducted using a mix of targeted and availability sampling with chain referral from participants to collect as much data as possible (Heckathorn, 2015). The study was advertised through posters and fliers in local amenities (cafes, shops, pubs), online through various local interest groups on Facebook, and through contacting local institutions and voluntary groups. The flier features an eye-catching wild boar picture¹⁵ with a description of the study, researcher contact details and a web-link to the online questionnaire (appendix 1). To capture as many views as possible from strata of different social groups (Rosetta, 2010), four main groups of participants were contacted to contribute to the research: residents, recreational groups, businesses, and farmers. There were no exclusions based on ethnicity, background, gender identity or sexuality. Participants were only those over the age of 16 years old, with those younger excluded from the study.

Interview participants were further recruited through convenience cluster sampling to allow for quick recruitment of participants (Acharya et al., 2013). Initial participants were contacted through known associates or through contact with local people while the researcher was in the area, with assurances that they should not feel obliged to participate

¹⁴ A mix of qualitative and quantitative data.

¹⁵ The picture was selected to show a wild boar neither looking friendly or aggressive to not show bias.

in the study and that any participation was purely voluntary. Participants were encouraged to refer the study to their wider group (Heckathorn, 2015) to encourage increased participation in the study from groups who the researcher would not have access to otherwise. This method worked well to acknowledge potential gatekeepers and allowed for the recognition of social hierarchies in the area.

Local and recreational groups, businesses and organisations were contacted through their website or advertised contact details. A link to the online questionnaire was distributed through organisations, media, and groups relevant to the Forest of Dean and surrounding area. Distribution was enabled through contacts created throughout the study. When advertising on social media the explicit permission by the social media page owner was sought. A link was only posted once permission had been granted, without repetition later, and if the post caused argument on the social media page it was removed. As the study progressed groups were targeted to gain interview and questionnaire data from balanced strata of demographics (Rosetta, 2010).

3.1 Ethical considerations

Ethical approval by Oxford Brookes University was granted on the 7th of July 2016 by the University Research Ethics Committee. To ensure that the study was ethical, informed consent of the participant was obtained before participation. Before participation in the study participants were notified about the aims of the study and why data were being collected. Before interviews, those who were participating in an interview were given a document to read outlining the aims of the study and how it was conducted (Appendix 2). Consent was recorded through a signed form completed before the start of the interview (Appendix 3). The online questionnaire was hosted on a wordpress.com website. On the website there were explanations of the reason for the study and rights of those completing the questionnaire. Consent for participating in the study via questionnaire was assumed through completion of the online questionnaire after reading an explanation of the study, in accordance with UREC recommendations at the time.

Any identifiable data were de-identified. Those who participated in interviews were given a letter coding and are referred to using that code rather than their name unless they were acting on behalf of a company or organization. Questionnaire participants were kept

anonymous with contact information not used in any analysis of the study. Participants were informed that they could remove any data from the study if needed. Any information on illegal activity in interviews was treated as hearsay.

Only data essential to the study were collected and stored within the guidelines of the Data Protection Act (1998) and later the General Data Protection Regulation (GDPR) when the Data Protection Act was updated in 2018. Data were secured on the researcher's computer and a Google Drive account solely used by the researcher and owned by the university. Any signed forms or other personal data in hard form¹⁶ was filed and stored securely at the researcher's residence.

3.2 Questionnaire and interview design

Questions for the online questionnaire and interviews followed the same structure. These questions are categorised into four areas of interest: the participant and the local area, wild boar encounters in the Forest of Dean, knowledge of wild boar in the Forest of Dean, and the participants views of wild boar in the Forest of Dean (appendix 4).

The participant and the local area section was used to gain demographic data of respondents and to understand their usage of the Forest of Dean. Over twenty years was chosen as the largest category for how long respondents had lived or visited the Forest of Dean as this is roughly the amount of time that the wild boar have been established in the Forest of Dean at the time of study. Therefore, any of those who had lived in the Forest of Dean for longer than twenty years have experience of the Forest of Dean before wild boar. The question on news articles was open-ended to reduce any influence that the question would have on participants' answers. A question on wildlife awareness and encounters was asked to give a profile of participants knowledge and experience of wildlife in the Forest of Dean.

The section on wild boar encounters in the Forest of Dean was designed to gain data on participants' and their contact's experience and feelings surrounding wild boar. The word encounter was used as it is a neutral term ensuring no bias in the questions or from respondents answering the questions. The closed question asking if people had

¹⁶ Hard form: data which are not stored on a computer, comprising of paper copies.

encountered wild boar contained a maybe option so those that were unsure if they had encountered wild boar could answer honestly. The other questions in this section were left open-ended to ascertain data which would be as true to the experience of the participant as possible. The question on advice about wild boar was included to understand whether people were giving advice similar to other participants and that of authorities. To understand participants' knowledge about wild boar the knowledge of wild boar in the Forest of Dean section asked four open-ended questions on wild boar size, social structures/mating, food sources, and location. These were open-ended to allow honest answering (Newing, 2011).

The final section asked participants on their views of wild boar in the Forest of Dean and consisted of eight questions. A closed-ended yes/no know question on safety was asked to give a clear count of who did not feel safe due to the presence of wild boar in the Forest of Dean. When asked about management participants were able to answer yes, no, or I don't know to allow for participants to admit a lack of knowledge on wild boar management. The subsequent three questions were open-ended to allow participants to give opinion without being influenced by options. This design was used to give respondents the ability to describe novel management strategies and individual circumstances around their expenses due to the wild boar. The last three questions of this section allowed the participants to review the wild boar in terms of the whole Forest of Dean and not through their individual lens. The last question allowed respondents to select a neutral effect of the wild boar to be given, and therefore a representative response, rather than respondents being forced to answer if the wild boar are a net gain or loss. The final part of the questionnaire asked whether questionnaire participants would be happy to be contacted further for an interview or clarification of answers.

The semi-structured interviews used the same questions as the questionnaire to guide the interview. Those questions that had categorical answers were open-ended. Interview audio was recorded, after consent given through the consent form, and a transcript of the interview was produced afterwards. Interviewees were invited to explain their questions further with discussions allowed to move away from answering the guide questions to explore further related themes with more depth. Interviews were not restricted for a one-on-one format. This allowed for couples or groups of people to be

interviewed at one time if that was the wish of the interviewees. This allowed for the first-hand recording of debates and discourse surrounding wild boar in the Forest of Dean. To ensure that interviewees were giving their true opinions in these group settings it was made clear to interviewees that they should not interrupt other interviewees or try to influence their opinions. In the case of any conflict or arguments arising the interview was stopped and both sides calmed before continuing with the interviews.

3.4 Data analysis

Interview data were analysed through qualitative methods, whereas questionnaire data were analysed through both qualitative and quantitative methods. Qualitative data were analysed using NVivo 12 Pro and quantitative data analysis was completed using IBM SPSS v29. Thematic analysis was conducted on those questions in the questionnaire which were open-ended to create themes (Braun and Clarke, 2012) to allow for quantitative analysis:

What news articles relating to wild boar have you read/watched on TV/listened to on the radio recently? What were the main messages about the wild boar?

For this question questionnaire responses were categorised into four main media messages: positive, negative, mixed, and none/no message. Positive articles were where they had explicitly stated that the media report had given positive character traits to the boar such as being an asset or native. Negative media main messages were categorised if the respondent had said that media articles that they had viewed talked about contained negative aspects such as damage or attacks. Mixed articles were categorised if they had mentioned both negative and positive traits. The other category is for those who had answered what media they had viewed on the wild boar, but the article did not fit a positive, negative or mixed message. The no message category is for those who hadn't seen any media on the wild boar recently.

If yes, could you describe the encounter and how it made you feel?

Questionnaire respondents' answers were categorised into positive, negative, indifferent/neutral, and null/no answer. Positive answers were categorised if they described a personal positive experience. Negative answers were categorised if they had used negative descriptors about their reaction with the boar. Indifferent/neutral answers were

those that were neither positive nor negative. Null/no answers were where the question was left blank, or the response did not answer the question.

If yes, why do you think wild boar should be managed?

Data for this question were categorised and split into counts for each reason why wild boar should be managed. Categories were boar damage, human area damage, ecological damage, numbers, spread outside of forest, safety, dangers for boar, fear, lost, forest use, negative interaction, lost income, not native/indigenous, no/null answer. The total number of responses for all categories exceeds the number of questionnaire responses since this was an open question and therefore respondents could give more than one reason for wild boar management.

Have you or your friends and family had to spend money due to the wild boar? If so, what was the expenditure and why (fencing, repairs etc)?

Questionnaire answers to this question were categorised into yes or no, depending on whether they explicitly said that they had or someone they knew had spent money due to the wild boar. Whether a significant amount of people had to spend money due to wild boar was tested using a chi-squared goodness of fit test.

Do you think the wild boar bring money to the Forest of Dean? If yes, in what ways?

Questionnaire answers to this question were categorised into yes, no, ambiguous, maybe and unsure. Ambiguous data were where the answerer did not fill in their answer appropriately to the question (e.g. Wild boar burgers and sausages, lush.). The responses were categorised into yes, no, maybe and unsure were where they had stated as such.

The ways in which boar bring money into the Forest of Dean was further categorised if respondents gave reasons for money being brought into the area with ten categories created: tourism, boar food products, shops, shooting, photography, hospitality, car parks, merchandise, amenities, attractions. A further “negative” category was counted if a respondent had entered a negative economic factor of the wild boar in the Forest of Dean. Responses were categories as hospitality if respondents explicitly mentioned hotels, bed and breakfasts, camping, pubs, or cafes.

What advice would you give to someone about the wild boar?

Questionnaire answers to this question were grouped into different types of advice; keep dog(s) under control, respect the wild boar, keep distance from wild boar, do not intimidate the wild boar, do not feed wild boar, make noise around wild boar, stand still, drive slowly, shoot the wild boar, carry a stick. The total for these categories was higher than the number of questionnaire responses due to respondents imparting multiple types of advice.

3.5 Questionnaire response and interviewee profiles

Overall, there were 175 questionnaire responses. Four responses removed due to either duplication, or incomplete or improper completion of the questionnaire. Eighty questionnaire respondents had lived in the Forest of Dean over twenty years at time of data collection. These questionnaire respondents would have experienced the Forest of Dean when wild boar were not present. Ninety-one questionnaire respondents had resided in the Forest of Dean for less than twenty years and therefore not have experience of the Forest of Dean when there were not wild boar present. Eleven questionnaire respondents did not live within the Forest of Dean.

A total of twenty-five people were interviewed. Interviewees were from varying backgrounds however all resided within or had resided within the Forest of Dean (Table 1).

Table 1: Interviewee code and information about the residence and nativity to the Forest of Dean.

<i>Interviewee code</i>	<i>Forester or foreigner</i>	<i>Resident in the Forest of Dean</i>
<i>DL</i>	Older Forester	Yes
<i>GM</i>	Young Forester	Yes
<i>LC</i>	Young Forester	Yes
<i>MS</i>	Older foreigner	Yes
<i>RS</i>	Older foreigner	Yes
<i>MT</i>	Older foreigner	Yes
<i>ST</i>	Older foreigner	Yes
<i>MC</i>	Older Forester	Yes
<i>PI</i>	Older foreigner	Yes
<i>RW</i>	Young Forester	Yes
<i>VF</i>	Older forester	Yes
<i>NF</i>	Older forester	Yes
<i>SA</i>	Young foreigner	Yes
<i>LL</i>	Young foreigner	Yes
<i>M</i>	Older forester	Yes
<i>C</i>	Older forester	Yes
<i>H</i>	Older forester	Yes
<i>R</i>	Older foreigner	Yes
<i>W</i>	Older forester	Yes
<i>OF</i>	Older forester	Yes
<i>CL</i>	Older forester	Yes
<i>PH</i>	Young foreigner	Yes
<i>LF</i>	Older foreigner	Yes
<i>AL</i>	Older foreigner	Yes
<i>BD</i>	Older forester	No

Only one interviewee lived outside of the Forest of Dean but was in the Forest of Dean at the time of data collection. Eleven interviewees were older foresters, who had resided in the Forest of Dean throughout their life and were above the age of forty. The age of forty is

used to distinguish between older and young as those over forty would have memory of the Forest of Dean if they had lived in or visited before the wild boar population establishment. Eleven interviewees were foreigners who had moved into the area between two and twenty years ago, therefore did not have experience of living in the Forest of Dean without wild boar present. Some of the older foreigners visited the Forest of Dean before relocating to the area so had some knowledge of the Forest of Dean before wild boar. There were six young foresters and foreigners interviewed, this group would not have any first-hand knowledge of the Forest of Dean before wild boar.

Interview and questionnaire data represent the population of the Forest of Dean at the time of data collection which is skewed towards an older population of people born in the district (Forest of Dean District Council, 2011).

3.6 Chapter creation

Through thematic analysis of the data collected six themes became apparent which are explored in the next chapters. The first chapter explores the study participants use of the Forest of Dean and their interactions with wild boar with the effects of these interactions on their views of safety whilst in the Forest of Dean. The second is the socioeconomic impact of the wild boar on those that live within the Forest of Dean. This has led to conflict and confusion over the ownership of wild boar through a lack of accountability for expenses through wild boar. The wild boar have also created conflict over the rights and ownership surrounding the Forest of Dean. These conflicts are the subject of the third chapter. The fourth chapter concentrates on how people view the wild boar considering their interactions and the effects of the wild boar on their lives. This is further complicated through the nature of the release of the wild boar. The penultimate chapter reviews the media's effect on the discourse, and perceptions and management of wild boar, the current strategies and how these are viewed by study participants, with a review of efficacy of the management strategies suggested by participants.

4. Human wild boar interactions

People have been living alongside wild boar since the establishment of the wild boar population in the Forest of Dean (Goulding et al., 2003). As the population has grown and spread throughout the forest there have been more opportunities for human wild boar interactions. These interactions range from seeing wild boar from a distance to physical contact with the wild boar. In the same manner an interaction can be seen as positive, negative, or neutral¹⁷ by those involved. The type of interaction between a person and wild boar will inform the person's opinion on the wild boar population with further formation of opinions through stories of interactions with wild boar from others within that person's community (Woodroffe et al., 2008).

This links to that person's sense of place and connectedness to the area (Corbett, 2006). People have a sense of place where they have given value, meaning, or emotional bond to that place (Williams and Stewart, 1998). This sense of place and connectedness can be created through familial connections, historical connections, and use of the area (Waterton, 2005, Chapin and Knapp, 2015). Negative interactions endanger this sense of place, creating conflict, whereas positive interactions can increase a sense of place and lead towards coexistence between humans and other species (Gao and Clark, 2023, Glikman et al., 2021). These can be extended to a community level where if a person's community is in conflict or coexistence with wild boar, they are likely to take on that standpoint. For wild boar in the Forest of Dean understanding how interactions have occurred and how these have affected opinion of the wild boar underpins whether the wild boar population will be, or can be, accepted by and coexist with the people residing in the Forest of Dean.

To understand whether this can occur, this chapter explores what people value in the Forest of Dean and how they use the area to understand the person's sense of place and connectivity to the area. This sense of place will be examined in relation to the person's perceived interaction with wild boar to ascertain the effect of wild boar on their sense of place. Further to their sense of place, participants' sense of safety in the Forest of Dean with wild boar present will be examined and checked for correlation with their perceived

¹⁷ Neutral is used here to describe an interaction where there is no recorded emotional response.

interaction with wild boar. Alongside sense of place and safety, their view on the need for management of wild boar will be reviewed against their perceived interaction.

The dynamics of discussed interactions with wild boar will be examined to understand what creates a perception of a negative, positive, and neutral interaction to ascertain whether certain activities reported were more likely to create each type of interaction. Within this there will be discussion of mitigation strategies for common types of negative interactions. Advice from study participants on what to do in an encounter with wild boar is reviewed alongside their experiences. This advice is examined against advice from DEFRA and the Forestry Commission to understand whether more communication about safe interactions between people and wild boar is necessary. Perceived safer interactions are more likely to be positive and therefore lead to coexistence rather than conflict with wild boar.

4.1 Perceived human wild boar interactions.

Of 171 questionnaire respondents 164 (95.90%) reported having interacted with wild boar in the Forest of Dean, of which 156 respondents gave emotional descriptions of their interaction with the wild boar. Those that did not give an emotional response when describing their interaction with wild boar had their interaction categorised as neutral. More respondents described their interaction as negative (45.12%) compared to a third (33.54%) of respondents describing a positive interaction (Figure 7).

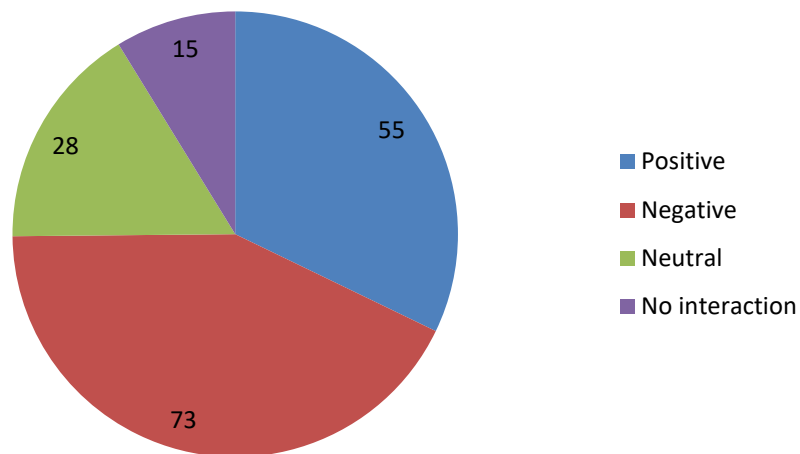


Figure 7: numbers of positive, negative, and neutral interactions described by questionnaire respondents (N=171).

These data show that not all interactions between people and wild boar in the Forest of Dean are negative. Therefore, there are other factors surrounding the interaction which influence a respondent's perception of their interaction with wild boar than the fact that it is an interaction with a wild boar. Factors surrounding the respondents and wild boar need to be investigated in further detail to understand the extent of what determines the perception of the interaction. The length of time a respondent has lived in the area, what drew the respondent to the Forest of Dean¹⁸, and the type of activity that was occurring when respondent interacted with wild boar need to be explored.

4.1.1 Influence of perceived interaction on opinions of management of wild boar.

Whether respondents had a positive, negative, neutral or no interaction with wild boar did not have sway in their want for management of wild boar. All groups were significantly in favour of wild boar management (positive N=55: $X(2)=42.145$, $p<0.001$, negative N=73: $X(2)=87.973$, $p<0.001$, neutral N=28: $X(2)=26.643$, $p<0.001$, no interaction N=15: $X(2)=6.400$, $p=0.041$) (Figure 8).

¹⁸ This links to their connection, value, and sense of place in the Forest of Dean.

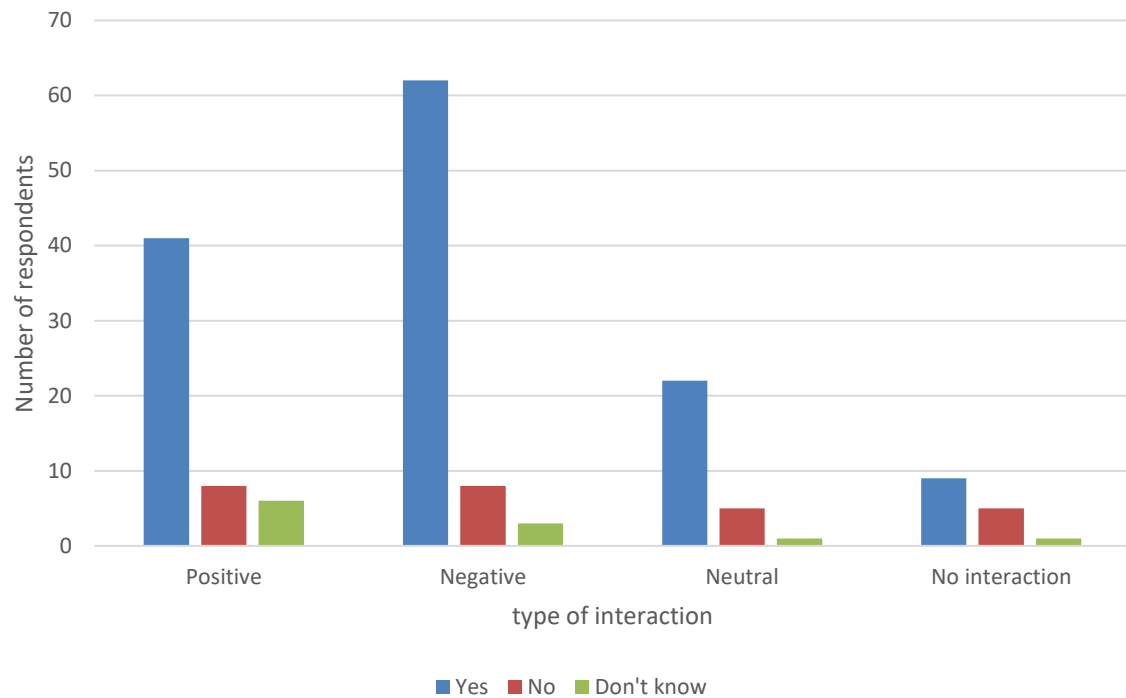


Figure 8: Number of respondents for each type of perceived interaction with wild boar and whether the respondent thought management of wild boar is necessary (N=171).

4.1.2 Interactions and a sense of safety

The perceived type of interaction that respondents had with wild boar was associated with whether the respondent felt safe in the Forest of Dean with wild boar present (Figure 10). Those that had a positive interaction (N=55) felt safe in the Forest of Dean with wild boar present $\chi^2(1)=51.073$, $p<0.001$. Those that had a negative interaction (N=73) were likely to feel unsafe in the Forest of Dean with wild boar present $\chi^2(1)=9.986$, $p=0.002$. Those who had a neutral interaction (N=28) were also likely to feel safe in the Forest of Dean $\chi^2(1)=11.571$, $p<0.001$. However, those who have not interacted with the wild boar (N=15) were neither likely to feel safe or unsafe $\chi^2(1)=3.267$, $p=0.071$. This may be due to a small sample size.

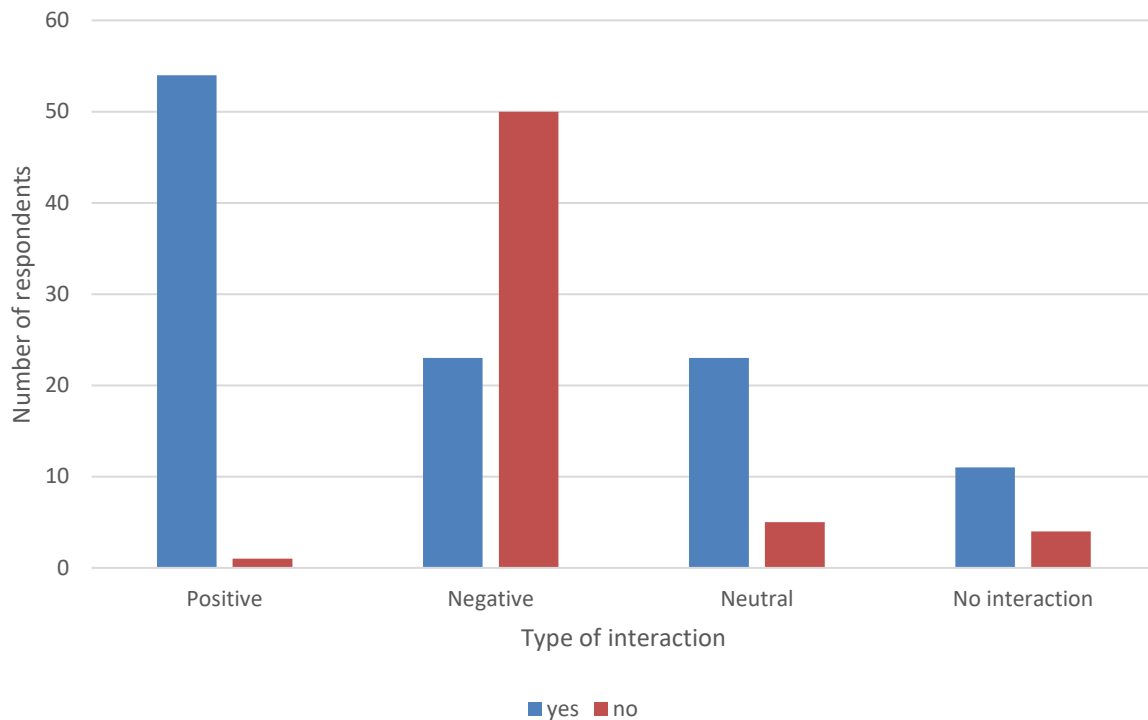


Figure 9: Number of those who feel safe (Yes) or not safe (No) In the Forest of Dean with wild boar present given their perceived interaction with wild boar (N=171).

4.2 The influence of connection to the Forest of Dean on perception of wild boar interactions

4.2.1 Forest of Dean value

The values that a person holds of an area creates their connection to the area (Waterton, 2005). The values associated with the Forest of Dean that drew questionnaire respondents to the area were grouped into eight categories (Figure 10**Error! Reference source not found.**). The most frequent values associated with the Forest of Dean were nature (44.44%), family (42.68%) and work (30.41%). Those who valued nature were more likely to have a positive interaction with wild boar $X(3)=24.632$, $p<0.001$. Those whose value of the Forest of Dean was family ties were more likely to have a negative interaction $X(3)=30.945$, $p<0.001$. Those drawn to the Forest of Dean for work were likely to have positive or negative interactions over neutral or no interactions with wild boar $X(3)=20.462$, $p<0.001$. The other five categories were nonsignificant or had too few responses to complete the analysis (Figure 10).

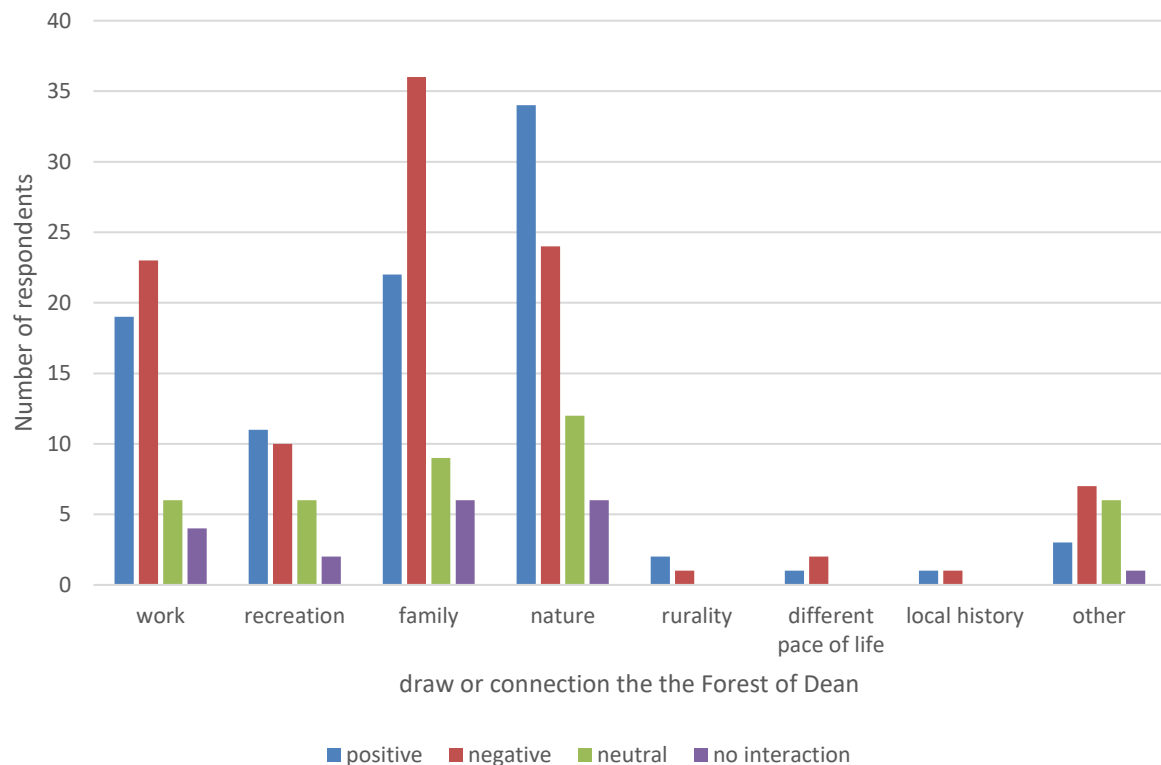


Figure 10: Number of respondents for each type of perceived interaction with wild boar given the category of what drew them to the area (N=171)

4.2.2 The influence of time spent in the Forest of Dean and perception of interactions with wild boar.

Data were collected in an unbiased selection process however data were skewed towards people who have lived in the Forest of Dean for over twenty years (n=80), with few respondents who had lived in the Forest of Dean for less than a year (n=3). However, the middle ranges had analogous numbers of respondents in each. There were no significant relationships between those that had lived in the Forest of Dean for ten or fewer years and their perceived interactions with wild boar, nor for those who had lived in the Forest of Dean for sixteen to twenty years (Figure 11). Those who had lived in the Forest of Dean for eleven to fifteen years were more likely to have a positive experience $X(3)=10.684$, $p=0.014$. Those who lived in the Forest of Dean for over twenty years, before the wild boar were introduced, recorded significantly more perceived negative interactions $X(3)= 32.300$, $p<0.001$.

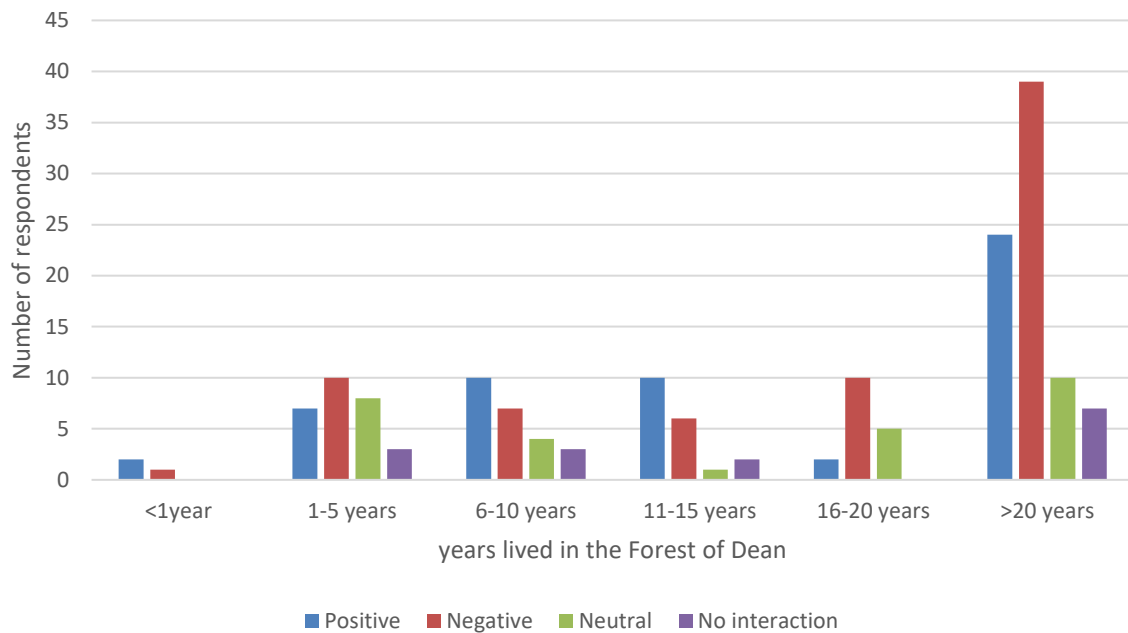


Figure 11: Number of respondents categorised between how long that they have resided in the Forest of Dean and their perceived interaction with wild boar (N=171).

4.2.3 Influence of recreation on perception of wild boar interactions.

Despite recreation not being a draw to the area for respondents, all respondents used the Forest of Dean for one or more form of recreation. The majority of questionnaire respondents used the Forest of Dean for walking or dog walking, with almost half using it for nature watching (Figure 12).

There was variance in the type of recreational activity and respondents' perceived interactions with wild boar (Figure 12). Those who used the Forest of Dean for walking were more likely to have interactions with wild boar and for these to be negative $X(3)=39.681$, $p<0.001$. This trend was seen with dog walkers as well $X(3)=53.357$, $p<0.001$, and cyclists $X(3)=21.742$, $p<0.001$. Those who took part in bird watching were likely to have positive interactions, $X(3)=22.696$, $p<0.001$, as well as those who took part in nature watching $X(3)=19.675$, $p<0.001$. Those who took part in running or photography were few and did not show significance in their perception of interactions. Those who rode horses in the Forest of Dean were more likely to have a perceived negative interaction with wild boar $X(3)=9.500$, $p=0.009$.

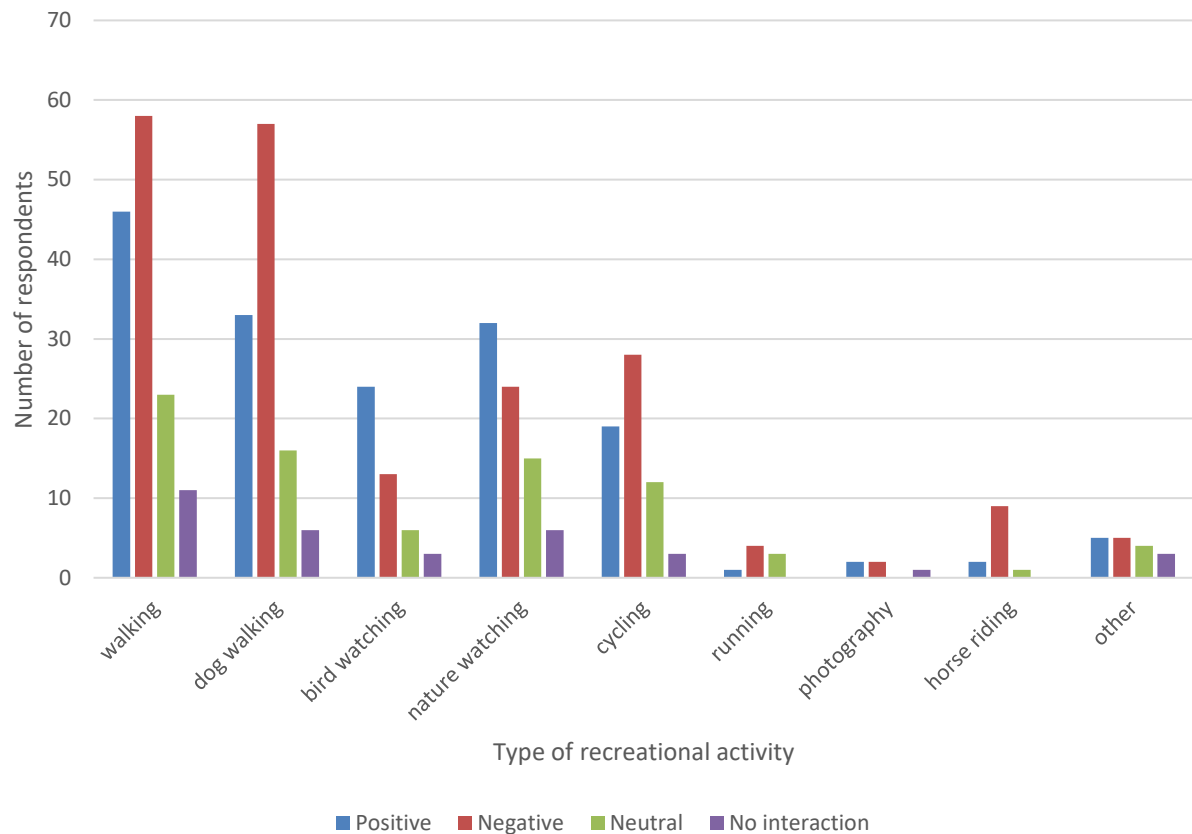


Figure 12: Type of recreational activity undertaken by respondents compared to perceived interactions with wild boar (N=171).

4.3 Activities participated in when an interaction with a wild boar occurred.

Respondents were asked to describe their interaction with wild boar including what activity was occurring when they interacted with wild boar. Of 164 interactions described by respondents where an emotional description was given, 70 did not give a description of the activity that the respondent was undertaking when their wild boar interaction occurred. The most common activity described as dog walking (N=58), followed by walking (N=58), driving (n=13) and the respondent being at home (n=11). These categories were divided into the perception of the interaction with wild boar (figure 16). There were two categories which gave significant results; dog walking was significantly associated with a negative interaction with wild boar $X(2)=24.241$, $p<0.001$, and no description of activity associated with positively perceived interactions with wild boar $X(2)=7.743$, $p=0.021$. The other categories were not significant.

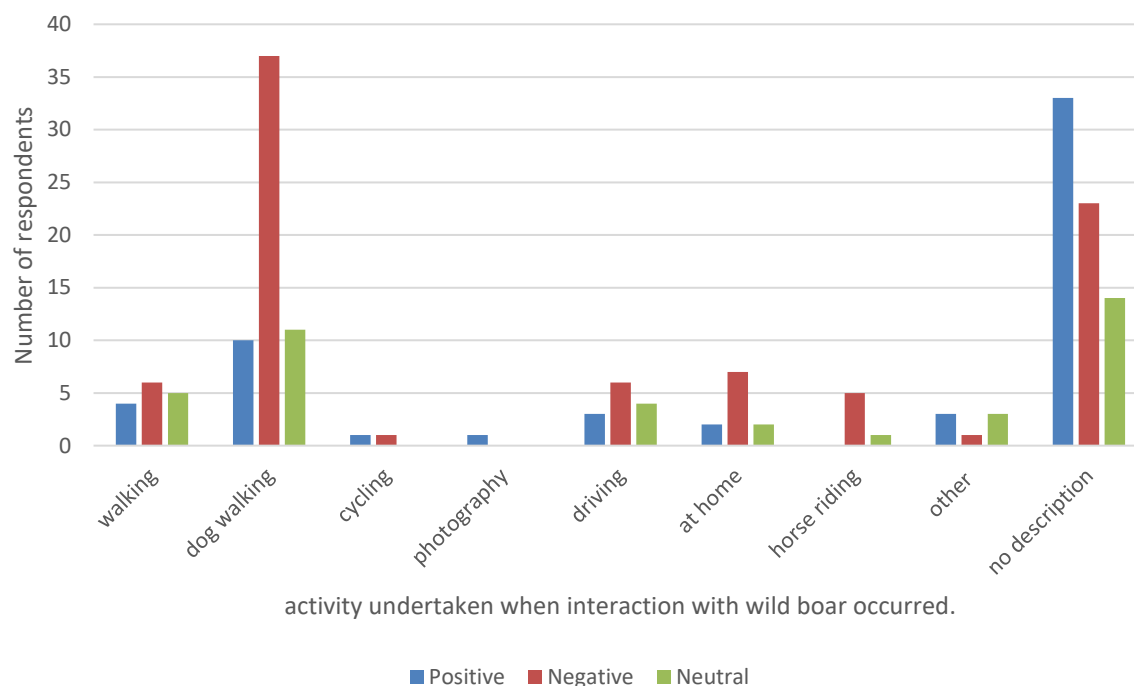


Figure 13: Activities of respondents when they interacted with wild boar and their perception of that interaction (N=164).

4.3.1 Interactions whilst dog walking

Negative interactions

Twenty of thirty-seven perceived negative interactions with wild boar whilst dog walking did not involve an altercation or physical interaction between dog walking or their dog, and wild boar. The negative connotations of these interactions were due to three factors; the intimidating size of wild boar, their behaviour, or uncertainty about what could happen during the interaction. Example responses on size give an idea to the respondents feeling when interacting with a wild boar:

“It’s intimidating, particularly when I have my dog with me. They are large animals.”

“I kept my distance, as they are huge and strong animals I felt respect, perhaps also fear.”

Wild boar are one of the largest wild mammals in the UK. Species of deer, such as red deer, are taller, but are not as stout or strong as wild boar, making wild boar seem more intimidating. For others the behaviour of wild boars were a cause for concern:

“Unafraid of people and come out of the woods”

“4 young boar spotted walking towards us (and the dog) up a forestry track. Made no attempt to stop or find a way around us. We stood still and they walked straight past us (approx. 2 feet away) and carried on up the hill.”

These show how the wild boar are unafraid of people despite dogs being present. This is the opposite reaction of other large mammals in the UK who will run away when encountering people, especially with dogs. For the rest of this cohort the anticipation of attack was the driving factor creating a negative interaction:

“I was afraid for our small dog in case they attacked.”

“We were walking our dog and spotted a mother and her young. We backed away but we were nervous about the mother charging at us.”

The potential for aggression, even if the wild boar wasn't being aggressive, was a driving factor for this group's perception of a negative interaction. These twenty respondents are describing a large, potentially aggressive wild boar, unafraid of people and dogs. However, no aggression was seen in these interactions.

Seventeen of those who had negative wild boar interactions whilst dog walking described a physical altercation between wild boar and a dog. This was either an interaction that the respondent had whilst walking their dog or that of a neighbour, relative, or friend who had an incident between their dog and wild boar. Those that had not had an interaction but had heard a second-hand account described how this created fear for the safety of their dog:

“My husband has been charged by a boar and a neighbour's dog has died as a result of a boar encounter.”

“My dog inadvertently disturbed one on a walk. It got up and walked away, as did my dog, but I was extremely nervous. More than a few dogs have been attacked by boar in the forest and the dogs don’t generally come off well.”

The latter respondent in this example had an interaction with wild boar where the wild boar had shown no aggression, nevertheless due to knowledge of other dogs that have been injured by wild boar this has created a fear of the wild boar. This shows the power of sharing negative experiences with others. Different respondents described negative interactions where they and their dog were attacked by wild boar. These reports suggest that they, and their dog, were innocent parties and the wild boar were aggressors:

“My son was chased when he was walking our chihuahua. He stuck to the paths, and they just came out of nowhere.”

“They’ve come out of the undergrowth several times and attacked our dogs walking on main track, fortunately so far no injuries apart from bruising.”

They give limited detail on why the wild boar were aggressive, however all were certain of either injury or the threat of injury. Two other respondents discussed both negative and either positive or indifferent interactions:

“Have had numerous encounters, ranging from benign to totally unprovoked attack on my dog.”

“Depends on the encounter, sometimes you can just watch them, and we (me and my previous dogs) have been attacked on one two occasions.”

Five of those who claimed to be attacked described their dog as disturbing or chasing wild boar:

“...Our large Labrador chased a female last year and needed several stitches in his side.”

“Whilst walking my dogs in the Blakeney woods area, they ran off into the undergrowth and started barking (indicating they were chasing something) I then hear grunting and squealing, and they are in a standoff with the mother pig. Eventually they come away back to me.”

“A couple of negative encounters with the boar chasing the dogs, they were only protecting their young.”

“Spotted a boar with 5 hoglets whilst walking our dog. The boar manoeuvred herself from the back of the group to position itself between us and the babies. Despite having the dog on the lead and standing still, the boar began stomping the ground then started to approach us at speed. Very frightening but clearly just trying to protect the hoglets.”

All but one of these suggests their dogs were off the lead. The dog has run off the path either through curiosity or to find an animal to chase. The dog has disturbed a wild boar and caused the wild boar to feel threatened for its own safety or the safety of the sounder and young. The last suggests that the sight of a dog, even on the lead, while a wild boar has young present will create a negative interaction. The wild boar will have a safe distance before it become aggressive; the walker with their dog strayed into this safe distance. This negative interaction could have been avoided by the walker giving more distance to the wild boar and her young. The issue of keeping dogs on a lead or well trained in the Forest of Dean was discussed by three interviewees. GM discusses how knowledge of your dog is important:

“People need to know their dogs, some dogs like to run off the path and jump through the trees, obviously that’s going to intimidate a pig and it’s going to protect itself or its family. If you have that type of dog, keep your dog on the lead, or at least some of the time. I’m no dog expert, but knowing if your dog is good at coming to your commands and then trusting him to is fairly clear, if you can’t trust him to come back to you or to not intimidate wildlife then it should probably be on a lead anyway, shouldn’t it?”

RW also suggested that dogs should be kept under control as well:

“I’ve heard dogs have been maimed and killed. Do they let it run in the forest out of sight? Does it bark? [One time I] saw a dog come out the bushes, it was chasing deer. It was an old lady’s dog; she was further down the path. I didn’t want to upset her but wanted to tell her that ‘her dog is going to die’. I don’t want to see dogs injured; people need a reality check if they truly love the dog.”

Both are dog owners who have experience with wild boar when walking their dog on and off a lead. The third, MC, was not a dog owner but felt strongly about dogs roaming free in the Forest of Dean:

“If you’ve got a dog, always walk with a dog on the lead in the forest, you should anyway, and if you can’t, if you don’t want it on the lead, make sure it is well trained and under close control. If you let your dog run wild, you’re asking for trouble. I’ve seen a buck in the deer rutting season chasing up a dog, if that buck would have caught [the dog, the buck] would have killed [the dog], and the human had no control whatsoever over it. So, keep it under control.”

All three discuss loose dogs having the potential to chase wild boar and increase the likelihood of a negative interaction, especially if the dog is not trained or under control. The wild boar have innate anti-predator responses but will also learn that people and dogs are dangerous and are more likely to create negative interactions with dog walkers. This is the same way that dog walkers who have had negative interactions with wild boar have negative associations with wild boar.

Other interviewees described similar negative experiences to those of questionnaire respondents. C describes how walking their dog has changed due to the increased wild boar numbers:

“Very few warning signs for people walking in the forest particularly with dogs. And the occasional dog does get taken or injured. Dogs on leads. I must admit in my local area, and I walk further than that, I know where I’ve got to put my dog on a lead. Initially when they first came into the forest the pigs were quite openly viewed, openly seen, and over the years they have sort of shrunk back to the point that most, most of the time you don’t see many pigs in the day.”

C’s description shows how people are adapting to wild boar presence, but also how the wild boar are becoming more elusive and therefore harder to avoid, creating more chance for surprise encounters. VF further discussed being attacked by wild boar:

"I have 3 on my doorstep, the dogs were attacked. Really gone for them, really terrified them. I let them out at 10pm to run around before they go to bed, they want to go out but stop dead and reverse back in if boar are here or close by."

In this case VF was at home letting her dogs out into the garden at night. Their dogs have adapted to wild boar in the Forest of Dean and show reluctance to leave the house if wild boar are nearby. Three other interviewees discussed how they knew others who have had negative interactions. CL says that people they work with have had negative interactions:

"Two of the girls have been chased at the office, but that, they do have dogs. I know they tend to go for people with dogs".

CL believes that dogs increase the risk of a negative interaction. MT discusses how they feel a lead would benefit those with dogs:

"I know of people who have had dogs chased... Keep dogs on a lead"

MT is under the impression that dogs will be chased if unaccompanied by a person, which is what is seen in the questionnaire responses. M's view is that dogs almost deserve to be chased if off leads:

"In a lot of respects, you see when these pigs first came about, and people initially said "Oh the pigs have had a go at my dog. The pigs have chased my dog", so yeah serves the bugger right because generally that dog was killing lambs. And when that dog runs after little pigs, out comes the sow and kills the dog."

This is because M, as a commoner, has had their sheep attacked by dogs whilst out to graze within the Forest of Dean. RW was attacked by a dog in the Forest of Dean and showed their scars in the interview, but removed the blame from the dog and placed it on the owner:

"I've been bitten by a dog in the forest. It came up off the lead and bit my hand. I pulled my hand away and it had ripped the flesh. Not the dog's fault but she (the owner) needed to warn me. Anyone else would ask for the dog to be destroyed. I'm more afraid of dogs [than boar]. [I] had my dog attacked by dogs, [my dogs] after watching boar are fine. People need to understand how small dogs behave around big dogs."

Both M and RW's experiences suggest that dogs not on leads are not just a danger to wild boar but also sheep and people. This may be due to a lack of training or innate responses in the dog.

Neutral interactions

There is some overlap between the dynamics of neutral interactions with negative interactions with wild boar whilst dog walking. The majority of those who had neutral interactions describe wild boar passing in front of them or stopping and acknowledging the dog walker and their dogs. Some have had close interactions with wild boar:

"[I] came across them several times with our last dog. They looked at each other, shrugged their shoulders and continued with what they were doing."

"I have encountered them on a number of occasions. A group of 11 or 12 of varying ages walked across a path when I was out with my dog. The matriarch of the group watched us for a while and when we posed no threat, she allowed the group to cross. Another walk with my dog we came face to face with a group of three adolescent boar. They stopped in their tracks and quickly ran away. There is a huge solitary male boar that seems to hang about not far from my house. Often come across him when out for a morning or evening dog walk.

Never any threat. He runs away as soon as he sees us. Rather glad he does as he is ginormous!"

The latter describes three separate interactions with wild boar. One interaction is suggesting that wild boar have a flight response opposite to the narrative of negative interactions. This shows the variance in response of wild boar to humans depending on the situation of the wild boar; alone, adult or juvenile, or protecting young.

There was a common theme of distance for those with neutral interactions. Many questionnaire respondents mentioned "giving a wide berth", "keeping their distance", or stating that they would be worried if they were closer to the wild boar. The theme of keeping dogs on their lead reemerged in the discussion of neutral interactions:

"With others and dogs always on lead... Only real concern was if we had been closer and dogs pulling to investigate."

“They are fine just keep your dog under control.”

These reiterate earlier arguments that dogs should be kept on a lead or well-trained to give better experiences when interacting with wild boar in the Forest of Dean. The interviewee GM’s interaction with a wild boar and a well-trained dog support this:

“I was walking between Mallards Pike and Parkend somewhere, we were off the path a little and the dog (she’s a Rhodesian Ridge Back crossed with a Rottweiler – so you can imagine she’s a big, bulky dog and one you would expect to react) and a boar had just walked right past each other, it was a male, you could tell from the size, it dwarfed her. She was probably 20 metres ahead of me... They walked within two or three metres of each other, just looked at each other and carried on. I called the dog back, by time she got to me the boar had gone.”

There are other factors that may suggest why this interaction was neutral, a lone wild boar, especially of the size described, suggests a lone male who does not have young to protect and therefore calmer. Another interviewee, LC, discussed seeing wild boar from afar and up close when walking and completing other activities with their dogs:

“We literally almost trod on a boar. You know it was sound asleep in the undergrowth, it had to be asleep otherwise it would have heard us coming. And yeah, it surprise me, and it surprised her [the dog] as it literally got up from under her feet and went scurrying off into the forest and just wanted to get out of the way of us. And that tends to be, from my experience of them, if we’re moving at all they tend to want to get out the way. I’ve come across loads [of boar] when I’ve been out on the bike with the dogs. The dogs are trained to pull the bikes so we’re going at quite a pace when we see them. And they’ve [the boar] never interfered with that, they’ve never interfered when I’ve been running with them [the dogs]. And in fact, another time with her, again near Nags head [park] I went along a path where suddenly about, I guess probably about a dozen boar came running down towards us. And they got within about 4 or 5 feet of us and just turned off the path and into the undergrowth and ran off. And that was adults and young, and again there was no threat from them. So, I think if, probably a lot of it with them is the way people react when they see them. I just kind of see them as a part of the forest and carry on doing whatever I am going to do. And I think the dogs kind of accept them as that as we come across them fairly regular here and when

we're over in Estonia we come across them almost daily. So, it's not anything new to the dogs."

They describe different interactions with wild boar. One where they scare a wild boar, others where they are moving fast, and the boar move out of the way. Since LC and their dogs are used to wild boar, having spent time in Estonia, neither are worried by interactions. They hint that if dogs and people are used to wild boar they will have less of a negative interaction. They suggest that people may get accustomed to wild boar in the forest over time and know how to interact with wild boar reducing negative interactions. This is the case in Estonia where the people have lived with wild boar for hundreds of years.

Positive interaction

Nine questionnaire respondents described positive interactions with wild boar when dog walking. These interactions involve a mix of dogs on and off the lead. The interactions show similarity to neutral interactions when described, apart from added positive adjectives and emotional language:

"Always excited and stunned at how awesome nature is. I've encountered them walking dogs, on my own and whilst out with my daughter - first encounter with her was when she was three months old. [I] have had no problems because I treat them respectfully as wild animals and keep my distance."

"Latest -Humbugs were on path ahead of me and my on-lead dogs. We watched and they left the path and went through the undergrowth. We continued our walk. Felt privileged to see them... My young dog left the path early one morning to run among the trees. She returned being chased by a boar. She came back to me, and my other dog and the boar stopped on the bank and retreated to the trees. She was unharmed."

Only one had an interaction that could be considered as negative where their dog got chased, but their perception of this interaction is not negative. For another respondent their encounter with several boars made them feel apprehensive, but this seems outweighed by their excitement from seeing them. Another questionnaire respondent describes how their dog has learnt to not chase or be too inquisitive about wild boar:

“At first was wary, they followed dog out of the forest, but they didn’t attack. Best encounter was when I came across a group of young boars and they were inquisitive about the dog, and a few came up to us and I stroked one. Once came across one at Cannop Ponds, it was so tame it didn’t run off, just kept sniffing around as we and other people passed by and took photos. Last encounter was last week when a female followed my dog and then I saw she had about 6 young ones (humbugs). I always just stare at the boar, and they eventually retreat, I’ve never felt threatened by them. My dog chased them when we first moved to the forest, but he has learnt to leave them alone now.”

The change in the behaviour of their dog has allowed the respondent to be calmer and confident around wild boar and more positive.

However close experiences are not preferred by all. One respondent felt that it is not advantageous to have close human wild boar interactions due to worries of wild boar becoming comfortable or confident around people that they may attack:

“Seeing them at a distance or in a more remote part of the forest is special. They are obviously intelligent, social animals and I have enjoyed watching them. Seeing them closer, especially when they are very near popular spots and show no fear of people isn’t so good. It worries me when people feed them and treat them as pets -they are powerful animals and can do a lot of damage, especially if they lose their caution around humans. I also worry my dog will get hurt – I keep her on a lead anywhere near them, but some of them are so confident around people I’m not sure that would be enough to keep us safe.”

Only one interviewee, PH, had a positive interaction with wild boar whilst walking their dog with their spouse:

“As long as you behave yourself there is no threat whatsoever. Even with the dog, if you keep the dog under control there is no problem. I was trying to, I had my camera on me, and I was trying to photograph them. I saw them coming towards me down the track, so I just asked her to “stand back with the dog to keep the dog out of the way” and then moved on down a bit and then just sat down because they were coming towards and eventually came in range. So, I just sat down and waited. Perfectly alright and the sow came within 4 yards of me and just looked at me and stared me straight in the face and I stared up at her, she wasn’t

bothered at all, you know. If I'm if I'm on my own and try to approach them with the dog its hopeless you can't get near them"

In this instance PH was walking with their spouse and dog. They had their dog on the lead, but also had their spouse move away with the dog, keeping distance, so that they could photograph the wild boar. This resonates with other positive interactions and neutral interactions: the dog was on a lead and kept a distance away from the wild boar.

Dog walking key themes

Whether an interaction is neutral or positive seems to depend on whether the person wants to see wild boar or enjoys seeing wild boar and feels in control. In terms of interaction dynamics, interactions follow the same formula, a well-trained dog or dog on a lead, distance, and mention of respect for the wild boar. These factors are not seen in negative interactions. There are both close negative and close positive interactions with wild boar. The positive interactions are communicated in a way in which suggests the person feels in control. Close negative interactions are the opposite where the person is caught by surprise or feels they are not in control of the situation. More negative interactions are described where there is a sounder involved and a higher proportion of positive or neutral reactions are described where it is a lone male. Negative interactions did not necessarily have any physical negative traits, but the fear of wild boar has created a negative interaction. For some participants this fear had been created through stories from others or previous experiences. Further to this not knowing what to expect from the wild boar or how to react to the wild boar could increase fear and negativity. There were further fears that people could be deemed lower than the wild boar in the wild boar social order which could lead to negative interactions and attacks as well as more movement into human areas (Cabanau, 2001).

A solution to reduce negative associations both from dog walkers to wild boar and wild boar to dog walkers would be education on why dogs should be kept on a lead and the importance of how to react when wild boar are present, i.e., keep dogs on their lead, and ensure dogs are properly trained in recall and behaviour around wild animals. This would stop the likelihood of dogs entering the undergrowth from the path and disturbing wild boar. There are issues with creating a policy that states only dogs on leads and well-trained

dogs in the Forest of Dean. The first is that there are several miles of forest paths, and it would be impossible to police dog walkers along these paths. Secondly those who are Foresters have a deep sense of connection with the Forest of Dean. They will have likely used the Forest of Dean as a play area when they grew up involving going into the undergrowth. To take away their right to use the forest in such a manner for them or their dogs would likely be contested by many, despite being in place for their safety and the safety of others.

Certain study participants suggested that experience for people and their dogs is key to create knowledge and appreciation of wild boar to give more positive interactions with wild boar with dogs. This suggests that sessions where people and their dogs interact with wild boar in a safe environment alongside learning about wild boar could be beneficial to reduce negative interactions.

Some questionnaire respondents who had a negative experience with wild boar whilst walking their dog have changed their use of the Forest of Dean. They have either completely stopped using the area despite living there, or changing timings of walks and the areas that they walk their dogs in. Two interviewees also mentioned that people they know are changing their dog walking habits in a similar way due to wild boar. This shows that wild boar are driving people away from the Forest of Dean. However, the reduction of dog walkers could be seen as a positive for those who seek to rewild areas, where less human interaction with an area creates a wilder area, especially as dog walking has a negative impact on biodiversity (Banks and Bryant, 2007). This creates two alternative strategies with dog walking; reduce dog walkers or educate and restrict the type of dog walking allowed within the Forest of Dean.

4.3.2 Interactions whilst walking without dogs

There was comparatively little discussion about interactions experienced whilst walking from questionnaire respondents and interviewees. Twelve questionnaire respondents and four interviewees discussed interacting with wild boar, despite the eighty percent of questionnaire respondents stating that they walk in the Forest of Dean. The lack of interaction with wild boar could be due to factors such as time of day of their walk or frequency of walking in the Forest of Dean. Many could be walking during the daytime and

not in the evening or early morning when wild boar are more active (Sweeting, 2013), whereas dog walking may be occurring before or after working hours and will be in the morning or afternoon. Despite the difference in numbers the rhetoric around interactions with wild boar when walking are categorised positive, neutral, or negative.

Positive interactions with wild boar.

Four questionnaire respondents who had positive interactions with wild boar whilst walking did not give details of the type of interaction in their answer, however they described the positive nature of being exposed to wild boar:

“Frequent watching boar whilst walking. I think that the boar have a natural place in the ecosystem; they are an indigenous species.”

“Often walking in the woods. I like seeing them, they’re out of the ordinary.”

“Bumping into them on walks - always makes me feel utterly privileged to be so close to them.”

There is a dichotomy of what makes the wild boar special between two of these respondents, one calling them ‘indigenous’, another ‘out of the ordinary’. The third respondent uses casual language around their interactions with the idiom “bumping into”. All four do not discuss seeking out wild boar but are happy to interact with wild boar. However, two interviewees walk in the Forest of Dean to view wild boar. Interviewee MC discussed their search for wild boar:

“I mean, I can, I will tell you where and when it happened I- I’ve had encounters with boar since 2007 when I first saw my first ever boar and it was the most wonderful thing because I’d been looking for months. we were out from about 8 A.M until 3.30 P.M and we found them at 3 o’clock. The first time I ever saw boar I was just so over-excited I was struggling to hold the camera steady.”

MC had moved to the Forest of Dean in 2004, it had taken them three years to find wild boar likely due to low wild boar population densities in the Forest at the time. They discuss a second interaction whilst looking for wild boar:

“Their interactions are so beautiful and I’m- how I respond and f- I’m always weary of wildlife. Because they are all unpredictable, all creatures are. Normally, their reaction is to run. But there have been times they haven’t run, there’s been times where they’ve circled

round behind me, and I've suddenly found myself in the middle of a sounder of boar and I've thought okay. Lay flat on ground, wait, do not become a threat to them. And I've been left babysitting a sounder where the adults have known I was there, and they've gone to sleep, and the babies have been out playing. Okay I'm in charge then, thanks. So, it's – and only once, and I will admit to it- I have been concerned, and that's only because I reacted wrong."

They ended having an intimate interaction with the sounder of wild boar. This may have been threatening to others, but due to MC's keenness to see wild boar they enjoyed it. When they mention a negative experience, they put the blame on themselves rather than the wild boar. This contrasts with the negative dog walking interactions, who put fault on the wild boar or their dog. RW is another person who seeks out wild boar, in part to photograph them. For their interview they took me out to an area in which wild boar inhabit. They were at ease with wild boar around them¹⁹ and enjoyed the connection to the wild boar. These six examples suggest that a want to see wild boar will give a positive experience, if this want to see wild boar is not present the interaction may become neutral or negative.

Neutral interactions with wild boar.

Questionnaire respondents who had neutral interactions (n=4) gave more of a description to their interaction:

"When walking and running I just wait for them to move on. I have never felt intimidated by them even when with my children, they tend to just move on. We enjoy seeing the humbugs (babies)."

"We've witnessed them at around 20 yards, as a group along a track. We stood and watched them, and they watched us, eventually wandering off into the trees. Also seen them crossing a track we use regularly. Watched them roaming and foraging in the trees. Never had any confrontational encounters, but we treat them with respect and let them get on with their lives. We don't have a dog and we walk quietly as a couple, enjoying the wildlife."

"[Saw a] lone boar asleep on side of forest path. Woke up, smelled the air and sat down again. 3. A field full of adolescent males behind a gate (trapped in field), they were curious

¹⁹ This ease transferred itself to me also.

about me at gate. 4. Twice seen sows with young. I kept my distance whilst watching from afar. They didn't see me."

These interactions have a similar theme to those of dog walking neutral interactions. The wild boar were at a distance and were not bothered by the respondent's presence. One respondent mentions the fact that they do not have a dog and that they walk quietly to not disturb the wild boar. This ensures the boar do not feel threatened or startled by their presence. The respondents waited for the wild boar to move on then carried on with their walk. Solitary male wild boar do not seem worried by people's presence and, unlike with dog walkers, neither were the sounders. One interviewee, RS, mentioned an interaction whilst rambling²⁰:

"The closest encounter was just before a ramble, where one came down to the carpark, the carpark at opposite Cannop ponds, it sort of trotted around the carpark for 10-15 minutes then trotted away again. It was ummm half past 9 in the morning. It was quite interesting because obviously whether it was hoping to get food, but it was dodging around the carpark, and I think most ramblers were quite surprised by how big it was actually."

The wild boar had decided to approach the group for food as they got ready for their walk. RS and the group were not unsettled by the wild boar's presence. There is potential for negativity in this interaction through the fact the boar has entered the carpark to forage for food either from the people or dropped on the floor. This could lead to negative interactions where the boar smells food and tries to take it from people.

Negative interactions

There were no negative interactions discussed where wild boar had come up to people asking for food. Nevertheless, negative interaction (n=5) dynamics were similar to the negative interactions of dog walkers:

"Most recent was when I was charged at and knocked down by one near Yorkley. Never saw it coming. I now try to avoid walking in the woods; it's no fun when you need to be watching

²⁰ Rambling is an organised group walk organised by The Ramblers' Association.

out for them all the time. Until that incident, I'd met them many times usually with no problem although their presence meant I had to change my walk route on many occasions."

"It is very unnerving to meet them on a narrow path in the woods; it makes both them and us jump. They usually rush off pretty fast. Meeting a male boar who starts pawing the ground is alarming. Seeing them in the distance is a delight. Having them in the forest is a great bonus."

"Extremely frightened to the extent that I have stopped going to certain places e.g. Speculation, Wenchford, and Carter's Peace. I try and stay this side of the Wye Valley nearer to Ross on Wye to avoid them."

The negative interaction had occurred on forest paths where either a wild boar had blocked the path, acted aggressive, or in one case charged at the respondent. The main difference is that a male wild boar is stated as being aggressive in one incident. This could be due to misidentification and not noticing the rest of the sounder. Despite this negative interaction the respondent still enjoys seeing wild boar at a distance. There is a variance in the effect of a negative interaction. For three of these respondents their interactions with wild boar have changed their use of the Forest of Dean. They now avoid certain areas of the forest or the Forest of Dean completely.

There was one interviewee, LF, who had a negative interaction whilst walking on the outskirts of their town:

"And I was walking to get the early morning train, and because it was dark and misty, I could just see this shape and I thought I can't see its eyes or what it was thinking so I walked over and actually I don't want to pass you and I walked all the way around and it didn't move it was still in the same position when I got around the other side, but that did shock me I was like actually here we go, you're encroaching now, this is town."

They describe how having to walk a detour to get past the wild boar, but the part of the experience that worried them was that wild boar were encroaching on the town – a human space. This did not stop them using the station or reduce their overall positivity towards the wild boar.

Interactions whilst walking without dogs conclusions.

Interactions whilst walking were very similar to those whilst walking with a dog. Those who were not seeking to see wild boar had positive interactions at a distance. Those who were not seeking wild boar and had a close interaction with wild boar perceived the interaction as negative. In addition to this in some areas wild boar are more confident to approach people who are walking without a dog, especially in areas where people are likely to have food. This confidence could create negative interactions through perceived harassment for food, or where a wild boar becomes aggressive. People are discouraged from feeding wild boar in the Forest of Dean due to this and the risk of disease spread.

4.3.3 Interactions whilst driving.

Interactions with wild boar while driving, or whilst inside, a vehicle were discussed by thirteen interviewees. Nine interviewees discussed interactions with wild boar whilst in a vehicle, three of which had hit wild boar with their car, or had a wild boar hit their car:

"Most recent encounter was I was a passenger in a car when we hit one on a main road. It dragged itself to the verge where I stood slowing down traffic (in case it went back into road) while watching it and waiting for the police. I found it upsetting seeing the boar hurt and knowing it was going to be shot."

"Walked into the side of my van whilst driving!! Very scary, if I was in a car, it could have been very dangerous!!!"

In these two excerpts one study participant was worried about the wild boar being injured and consequentially dispatched, the other study participant worried about their own safety if they were in a less robust vehicle. These are reflected in an interviewee's, GM's, experience of hitting a wild boar with their vehicle:

"I came from that feeling I was lucky, I just clipped the front end of her, if it had been a full body I think she would of flipped my car, apart from the cost element, my car is tiny, I think I would have come off a lot worse. People have since said what a nuisance they are and how dangerous it is having them on the road. Is it though? We have had sheep and deer on the roads, boar are just a bit more sturdy. But if you hit a deer or a sheep you are going to know about it."

This was echoed by ST, another interviewee, who worried about driving due to stories from friends who had hit wild boar and the damage it caused to their vehicle²¹. This concern was also reflected when discussing potential collisions with deer in the Forest of Dean. AL discusses their caution at night:

“We often drive back when it’s dark and it’s umm, you’re a bit conscious of them. I drive along looking for eyes you know why the eyes reflect. Because the deer are just as dangerous.”

This sentiment was repeated by NF, who had hit a deer:

“We had hit a deer and of course it had run off and we hadn’t got an idea where it was. But I am quite cautious with my driving in the forest because that incident has made me aware of the fact that when you are in those really sort of dense forestation anything can come out. And as I say we have been hit by a deer but also, I have seen this incident when all of a sudden boar just appear and that makes me quite cautious.”

Others felt the same way and suggests that a lack of caution by drivers increases the risk of hitting wild boar or deer. LC explains that they saw deer near a road but that no drivers were slowing down:

“We can see the deer you can see their eyes and it was surprising how many cars came along and despite the fact that you can quite clearly see the deer at the side of the road, they didn’t slow down. They were still going a long there going at 50 or 60 and who’s going to complain the first time they hit a deer; it’s going to be the person driving the car, isn’t it? The person that could have slowed down.”

NF agreed with this, stating that they see people who are not cautious of potential wildlife dangers whilst driving. For AL this may be due to the high level of tourists in the area:

“And you know if you’re a tourist that wouldn’t cross your mind... If you’re a tourist you’re not aware it”

²¹ This included costs, which are discussed in the socioeconomics chapter.

One questionnaire respondent had narrowly missed wild boar and deer due to naivety about the wildlife hazards:

“Very shortly after moving to the Forest of Dean, I was driving home after a work meeting, and I had to brake for a wild boar and then a fawn in quick succession. I thought 'You're not in London anymore.' Other times I have driven past and seen wild boar fairly close to the edge of the road. On one occasion two wild boar stepped out and crossed the road so I had to slow down for them.”

Most interactions discussed by study participants did not involve a collision with wild boar, but either wild boar crossing the road in front of them or foraging in verges by the side of the road. For one this was a negative experience as they worried about the wild boar being hit by a car behind them:

“Driving, 2 females wandered across the road followed their litters. I had to keep a nervous eye behind me in case a car came fast round the corner.”

Again, a lack of caution by drivers towards the dangers of wild boar was the subject of their worry. For many these were neutral interactions where they did not express emotion about the experience. There were three respondents who discussed seeing wild boar whilst driving as a positive experience, purely because they enjoy seeing wild boar. They do not give a description of the interaction but one mentioned that the wild boar seemed neutral to the traffic:

“They were munching by the road, and it made my day. They weren't bothered by the traffic or few people taking photos. They were just eating, and then moved away.”

This suggests that in areas wild boar could become a hazard due to a lack of fear of roads. It also shows the wild boar having an indifference to people similar to that experienced by those walking with or without dogs in the Forest of Dean.

Interactions whilst driving are limited to three types: direct collision, wild boar running across the road, and boar foraging on verges. Those that had negative interactions were either due to a collision with wild boar or through worry for the safety due to wild boar crossing roads. Other interactions were discussed in a neutral manner, unless the

respondents enjoy seeing wild boar. These interactions concern many of the study participants due to the likelihood of a collision, even if they are not directly involved in that collision. Those who are resident in the Forest of Dean are habituated to being cautious of wildlife crossing the road, but they fear that those visiting the area are not and this will create more collisions. This is likely to increase as the area is being promoted as a tourist attraction by the Forestry Commission (Forestry Commission, 2017b). Residential committees have asked for hazard signs about wild boar to be erected in the Forest of Dean like those for sheep and deer (Boar Solutions, 2019). Signs warning of animals crossing the road have been seen to reduce collisions with deer (Putman et al., 2004, Found and Boyce, 2011).

4.3.4 Interactions with wild boar whilst at home.

Interactions at home were mainly negative for both interviewees and questionnaire respondents. The main interaction was seeing wild boar damaging their garden through foraging. These were mainly viewed as negative by questionnaire respondents:

“We have had wild boar in our front garden trying to open our food caddy²². They have come back into our front garden several times but at night, so we don’t always see them only the mess they leave behind.”

“Angry because they are digging up my garden!”

Interviewees described similar incidents either in their home or that of someone they knew. CL discussed how an elderly neighbour had their garden damaged by wild boar foraging:

“The elderly lady that lives near the office, they’ve destroyed her garden, and they’ve actually pulled up all the paving slabs and seeing as she can’t get out and about, she was absolutely distraught. She didn’t know what to do.”

This had also happened to a friend of C:

“they had the boar get into the garden and destroy the garden of which their mother was extremely proud.”

²² A bin for food waste to be collected by the local council.

For VF the same had happened to her:

“They’ve destroyed raised beds, destroyed the terraced garden, they’ve been pulling stones out and pushing them down the slope. This used to be a show garden.”

Several other interviewees felt sympathy for anyone that had their garden damaged. NF discussed how despite having sheep and deer that would enter a garden and damage plants, wild boar are different:

“It must be heart-breaking And as I say at one time it used to be you know you would safeguard your garden from the deer possibly, but they didn’t really come into villages but sheep certainly. But so, it has been lifelong you would sort of protect your garden, but these are just annihilating it It’s not that they have eat your cabbage you know they have turned the whole lawn over.”

The scale of damage creates a more negative experience for people. This is linked to people being unable to scare away wild boar:

“It’s not like you can go outside and scare off a boar rooting your front garden”

MS suggests that unlike deer and sheep wild boar cannot be scared off. This is similar to other interactions with wild boar where the boar has been neutral to the presence of a person. There was only one instance where a questionnaire respondent detailed where a wild boar was aggressive towards them whilst at home:

“It charged by me outside my door; shit scared!”

However, this seems an anomalous incident due to only one study participant having experienced it. Those who have positive interactions with wild boar whilst at home, did suffer damage and inconvenience:

“In our driveway - very exciting even if inconvenient (we now have a gate....)”

“I was delighted to see them, even when they got into my vegetable patch!”

Despite this they enjoyed seeing the wild boar. One interviewee, PH, gave another positive experience:

“There was one night we had three youngsters even came up garden because they came, there’s a hole in the gate to let the badgers through, and they came in a nicked the badger food and went out again. I mean they’re too big to get in now.”

From PH’s account you can see that they enjoy wildlife so were not upset by seeing the wild boar. The boar did not do damage either, but instead stole food for other wildlife.

What gives the perception of a negative or positive interaction with wild boar at home is similar to that of those driving. If there is damage the interaction is more likely to be perceived negatively by people, whereas where there is an inconvenience, the interaction is positive if the person enjoys interacting with wild boar.

4.3.5 Interactions with wild boar whilst horse riding

Horse riding interactions were almost exclusively negative with only one neutral interaction. There was no discussion of horse riding from interviewees. For two respondents the interaction was negative due to the reaction of the horse to wild boar:

“Horses know when they’re around and get very spooky. Definitely scared, these are large dangerous animals who can inflict a lot of damage, there’s not always an alternative track to turn up.”

“On my horse and she bolted I was frightened.”

In each case the horse had an adverse reaction to the presence of wild boar creating a dangerous situation for anyone on the horse or in the area. This was the concern for another rider:

“Numerous encounters - when on horse-back, I feel very anxious when I come across the boar as they are unpredictable & can (and do) chase people. Horses are also unpredictable and can become very scared easily, meaning that they turn & run which is very dangerous for the rider & anyone who may get in the way.”

The unpredictability of the wild boar and their horse meant that they were nervous about their horse being spooked and creating a negative situation. This does seem to depend on the horse. The one neutral horse rider found their horse was unsure but able to pass the

wild boar. Other respondents did not comment on how their horses behaved but rather suggested that they felt intimidated by the wild boar.

Due to a lack of data, it is difficult to fully understand the interaction dynamics between horse riders and wild boar. However, the dynamic seems to be similar to those of dog walkers where a negative interaction occurs due to the interaction of the companion animal and wild boar and not the person. To understand how to reduce negative interactions between horse riders and wild boar, the horse wild boar dynamic needs to be studied further. Given the small number of study participants who mentioned horse riding interactions with wild boar; this does seem to be an area of limited concern in terms of overall interactions with wild boar.

4.4 Comparison of study participants' advice with official advice about interactions with wild boar.

4.4.1 Study participants' advice

Questionnaire respondents were asked to give advice on what to do when interacting or encountering a wild boar. Of 171 respondents, 158 gave advice. The most popular advice to give was to keep distance away from wild boar (n=94), controlling dogs was the second most popular advice (n=45) (Figure 14). Advice stating that people should not feed wild boar was also popular (n=41) despite no study participants discussing feeding wild boar in their interactions.

There is contradictory advice on whether to stay still (n=8) or walk away (n=31). The tactic of standing still is mentioned by Wye Dean Tourism but only if the person wants to view wild boar (Wye Dean Tourism, 2020). However, three study participants suggested standing still even if wild boar are moving towards you:

"If one comes out and starts to come towards you, don't panic. Stand your ground and stare back. If it continues to move towards you stretch your arms out and make a loud noise this should make the boar retreat."

This tactic worked for some study participants, but only when boar were described as non-aggressive. It also contravenes the advice by the Forestry Commission to move out of the

path of wild boar. The third respondent's advice to be loud also disobeys the advice of other respondents and the organisations about being threatening to wild boar. The six other respondents who suggested making noise framed this in a way to alert the boar to the presence of people. This was to make sure the approaching people do not surprise the wild boar. The one respondent who suggested carrying a stick did not give a reason for this, but the assumption would be to fend off the wild boar using a stick if a confrontation was to occur similar to the suggestion by Mayer (2013).

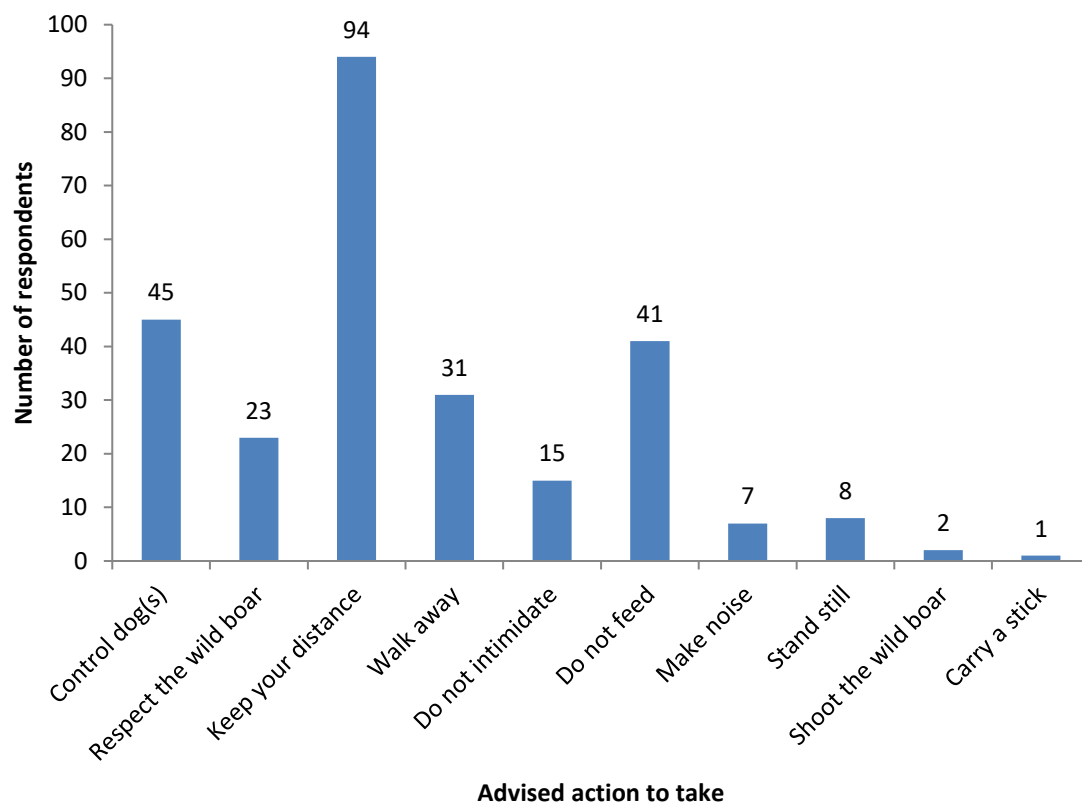


Figure 14: Count of respondents who gave each category of advice. The question was open ended and allowed for participants to give more than one area of advice (N=158).

Questionnaire respondents who had positive interactions were more likely to mention to respect the wild boar χ^2 (d.f. 3, N=171) = 11.225 $p < 0.05$. There were no other associations between advice and type of interaction. Those who had not interacted with wild boar still gave advice on how to interact with wild boar despite no experience. Nature watchers were more likely to mention respect in their advice χ^2 (d.f. 1, N=171) = 4.376 $p < 0.05$. Both nature watchers χ^2 (d.f. 1, N=171) = 9.300 $p < 0.05$ and bird watchers χ^2 (d.f. 1, N=171) = 7.291 $p < 0.05$ were more likely to suggest that dogs should be kept on the lead. This association is

likely explained by their knowledge and experience of the flight or fight response of animals when faced with dogs. Bird watchers were more likely to suggest people keep their distance when interacting with wild boar χ^2 (d.f. 1, N=171) = 4.748 $p < 0.05$. Dog walkers were associated with the advice to walk away from the wild boar χ^2 (d.f. 1, N=171) = 10.326 $p < 0.05$.

Ten interviewees gave advice on how to act when interacting with wild boar. These were analogous with the most common responses by questionnaire respondents. MC and GM both suggest keeping dogs on a lead or under control. LL, GM, MS, PH and MC all suggest staying still. For GM and MC this came with a caveat that if the wild boar behaviour was intimidating that one should move away from the wild boar slowly. RS, MT, ST, AL and NF all suggest walking away from a wild boar encounter. AL was the only interviewee who suggested making noise and to look bigger but did clarify that avoiding confrontation is key.

4.4.2 Official advice

There are three organisations that give advice on their websites on what to do when encountering wild boar: Forestry Commission, Woodland Trust, and Wye Dean Tourism. Woodland Trust has a dedicated webpage to wild boar and suggests that wild boar should be treated with caution. This is further clarified that wild boar will usually flee, but sounders can be aggressive. Dogs should be kept on their lead and to move away slowly in the opposite direction if wild boar are encountered (Woodland Trust, 2020). Wye Dean Tourism also has a dedicated page to wild boar with a section on encountering wild boar. The advice from Wye Dean Tourism differs to that of the Woodland Trust. They suggest staying still while keeping distance to watch wild boar, but if you do not want to watch wild boar move in the opposite direction or take a wide path to avoid the wild boar (Wye Dean Tourism, 2020). Taking a wide path around wild boar may be difficult if on a forest path where undergrowth is present on both sides. This could also increase the likelihood of a close encounter with a wild boar unseen in this undergrowth. Wye Dean Tourism state that you should not feed wild boar, dogs should be under control or on a lead if the owner is unable to call it to heel, that you shouldn't walk in dense undergrowth, and to drive slower to be more aware of wild boar especially at night (Wye Dean Tourism, 2020).

Forestry Commission advice is harder to find than Wye Dean Tourism and Woodland Trust advice. The Forestry Commission page on wild boar does not give advice on interactions but does give a link to the report created by Dutton et al. (2015). The advice is located at the end of the report which creates a convoluted route of access for advice. The advice is more comprehensive than the other advice and includes:

- Keep to paths and do not go through undergrowth.
- Be vigilant to signs of wild boar.
- Be cautious when walking dogs off the lead.
- Do not call back dogs being chased or intervene if a dog is being attacked.
- Do not surprise, approach, or feed wild boar.
- If a wild boar is found injured, do not approach, and contact the Forestry Commission.
- Do not block the path of moving boar.
- Do not threaten or chase wild boar.
- Be aware of speed whilst cycling and when driving (Dutton et al., 2015).

This is accompanied by advice from Mayer (2013) on what to do in the case of a wild boar attack²³. This advice states to stay away from wild boar and give them a wide berth. If attacked by a wild boar to gain at least 6 feet (1.8m) of height above the ground if unable to climb, use equipment to fight the wild boar. Advice is to stay standing, but if on the floor kick the boar whilst recumbent until the wild boar moves away.

All three organisations advise people to keep distance away from wild boar and to move away from wild boar if necessary. Only Woodland Trust suggests that dogs should be kept on a lead, but all state that dogs should be under control.

4.5 Conclusions

In the Forest of Dean there are a mix of interactions between people and wild boar. Perception of interaction has associations with what that person values, the activities they take part in, and the activity that they were undertaking at the time of the interaction. Those walking their dogs at the time of the interaction were more associated with a

²³ This advice is accompanied by a caveat that these actions should be done in the case of a last resort.

perceived negative experience. Several negative experiences were due to dogs being walked off their lead, leading to a wild boar interaction. This could be negated by a policy to ensure dogs are walked on their lead in the Forest of Dean. Respondents walking, with or without their dog, were more likely to have a negative interaction when in close proximity to wild boar unless seeking out wild boar interactions. Negative interactions at home or whilst driving were linked to damage to property by the wild boar. Those who had not had negative interactions or issues with wild boar were sympathetic to people who had. There were suggestions of road signs to warn drivers and for people to fence their property to reduce the likelihood of property damage. Although it was raised that some people would not likely be able to afford to erect a wild boar proof fence²⁴.

Negative interactions were associated with study participants not feeling safe in the Forest of Dean with wild boar present. There were further associations with negative interactions and whether study respondents had lived in the Forest of Dean for more than fifteen years. There was an overlap between these groups suggesting that the wild boar are creating a change how the Forest of Dean can be used by people and changing people's sense of place. Whereas those who have been in the Forest of Dean for less than fifteen years²⁵ have not had to adapt their use of the area due to wild boar, so are less likely to have negative interactions through habits that are borne from when there were no wild boar. The negative interactions wild boar reduced support for reintroduction of other species in the Forest of Dean for fear that these animals would cause conflict in similar ways to the wild boar.

Positive interactions with wild boar were associated with respondents having a value in the nature of the Forest of Dean, bird watching, and nature watching. These study participants are likely more comfortable with wild animals therefore perceive wild boar as less of a threat than those who do not have an interest in nature. Increased knowledge and experience with animals has been seen to increase acceptance of species. Education and increasing local knowledge of a species has been successful with alligator education programmes in America (Skupien et al., 2016), the Antiguan racer (*Alsophis antguae*) reintroduction on offshore islands in Antiga (Daltry et al., 2017), and jaguars in the Amazon

²⁴ This is discussed further in the socioeconomic effects chapter.

²⁵ Less than the time that the wild boar have been established within the Forest of Dean.

rainforest (Marchini and Macdonald, 2020). Therefore similar education and public engagement strategies around wild boar should be used in the Forest of Dean to reduce conflict.

Despite most study participants understanding how to safely interact with wild boar, negative interactions were still prevalent. This could be through perceived threat of danger or uncertainty around wild boar behaviour. Some study participants did not follow official advice, such as walking their dog on a lead which would increase incidents of negative interactions. This suggests that reminders of Forestry Commission and DEFRA guidelines should be made available to the people living in and visiting the Forest of Dean. This could be through aforementioned education and engagement programmes, leaflet distribution and signs in popular recreational areas of the Forest of Dean (Conover, 2002, Dutton et al., 2015). Further to information signs in recreational areas, road warning signs are effective at increasing awareness of animals on roads (Al-Ghamdi and AlGadhi, 2004, Found and Boyce, 2011) with temporary signs being effective in reducing negative interactions with wildlife (Sullivan et al., 2004). Signs could be erected in the Forest of Dean when sounders are likely to have young creating protective matriarchs. However, such signs may create fear of wild boar in the Forest of Dean if information is not communicated well. These signs could be designed with the aid of the public to ensure clarity of information. Collaboration with local people would also improve engagement between people of the Forest of Dean and authorities which is lacking²⁶.

²⁶ This lack of engagement between authorities and the people is explored further in later chapters.

5. Socioeconomic effects of the wild boar.

The socioeconomic effects of animals living in proximity with people have been studied around the world (Carter and Linnell, 2016a, Branco et al., 2019, Siljander et al., 2020). These socioeconomic effects inform a person's opinion on whether they feel in conflict with, tolerate, accept, or can peacefully coexist with a species (Konig et al., 2020, Fletcher and Toncheva, 2021, Gulati et al., 2021). Wildlife can have positive socioeconomic effects, such as tourism, wildlife recreation and hunting (Messmer, 2009, Anup et al., 2015). For example, those who live in proximity to national parks, and the wildlife inside, felt that the park brought socioeconomic benefits through tourism and support for their livelihoods (Owino et al., 2012). Ecotourism has positively affected the socioeconomics of Nepal (Anup et al., 2015).

However the tourism trade does have consequences, Penteriani et al. (2017) discuss how brown bear (*Ursus arctos*) tourism increases the risk of negative interactions between bears and people as well as unwanted conditioning of bears at feeding points despite an increased local tolerance of brown bears due to increased revenue. Tourism whilst effective in providing socioeconomic benefits can be viewed as a lesser option to hunting due to reduced income compared to hunting (Mbaiwa, 2018, Homewood et al., 2012). Trophy hunting has improved the socioeconomics of Pakistan where revenue from hunting is shared with the community (Ali et al., 2015). Controversially trophy hunting can lead to coexistence (Rogan et al., 2018), this relies on people managing the hunted populations to ensure growth or stability and sustainability of the hunted populations to adhere to ecological definitions of coexistence (Pooley et al., 2021). Reliance on tourism or hunting to give people socioeconomic sustainability, and potential for coexistence, is not sustainable. Tourists can be fickle where they visit a place once and do not return, limiting repeat income (Bott, 2023). Covid-19 lockdowns across the world all but stopped tourism to Zimbabwe (Ndlovu et al., 2021) and South Africa (Dube, 2021, van der Merwe et al., 2021). Both countries rely on tourists and hunters from outside of the country to provide income, South African saw an eighty-six percent drop in international tourism in 2020 (Dube, 2021), and van der Merwe et al. (2021) determined a USD 300 million loss of income for South African reserves due to the first covid-19 lockdown lasting three months. In Zimbabwe the

protection of wildlife reserves remained consistent, however tourism dropped and local poaching and illegal fishing increased (Ndlovu et al., 2021). Therefore, sustainable methods to gain socioeconomic benefits when living alongside wildlife are needed.

As well as benefits species can inflict negative socioeconomic effects. This can be through crop foraging (Hill, 2015), livestock depredation (Dickman and Hazzah, 2016), property damage (Peterson et al., 2010), disease transmission (Hanisch-Kirkbride et al., 2013), vehicular collisions (Putzu et al., 2014), property rights restrictions (Messmer, 2009), and loss of use of an area through damage by, or presence of, a species²⁷ (Conover, 2002). These create threats to food security, human safety and health, and property for those living alongside wildlife (Nyhus, 2016). The magnitude of damage or socioeconomic issues created can be hard to quantify, due to different weightings given to these effects by different communities, making mitigation difficult (Messmer, 2009, Carter and Linnell, 2016a). Individuals and groups will have different thresholds for tolerance or acceptance, if these thresholds are not met people will feel in conflict with the species in question (Glikman et al., 2021).

For wild boar, the negative socioeconomic effects are wide ranging from crop foraging (Schley et al., 2008, Bobek et al., 2017, Cai et al., 2008, Chauhan et al., 2009, Gürtler et al., 2017), disease transmission to humans and livestock (Pikalo et al., 2019, Escribano-Romero et al., 2015), zoonotic parasites (Uni et al., 2015, Poglayen et al., 2016), wild boar vehicular collisions (Thurfjell et al., 2015, Kruuse et al., 2016) and property damage (Toger et al., 2018). The main discussed positive socioeconomic factor is hunting wild boar (von Essen, 2020) with an idea to mitigate effects of crop foraging (Gimenez-Anaya et al., 2016, Keuling et al., 2008). However, the social acceptance of hunting has been reducing in Europe (Massei et al., 2015a, Tsachalidis and Hadjisterkotis, 2008) suggesting that this potential socioeconomic benefit has a limited time to be effective. Unlike other species wild boar do not seem to be a benefit to tourism. Where positives in terms rewilding tourism has been observed, negatives due damage to traditional agricultural tourism have occurred (Hearn et al., 2014) or other tourist activities are negatively affected due to wild boar (Ikeda et al., 2019).

²⁷ This has been reviewed in the chapter on human wild boar interactions.

In the UK there has been one study into the socioeconomic factors of wild boar in the Forest of Dean (Dutton et al., 2015). This study was funded by the Forestry Commission, who manage wild boar in the Forest of Dean, which allows for bias. Dutton et al. (2015) discuss incident rates of wild boar damage, however, they do not review the details and the socioeconomic impacts both individually and in the wider social context of the area.

This chapter focuses on the socioeconomic costs and benefits of the wild boar in the Forest of Dean to understand their impacts on those living in the area. Both questionnaire and interview data are reviewed to understand socioeconomic impacts of the wild boar. Key themes are drawn for both benefits and costs and mitigations for costs discussed within the context of the Forest of Dean and the history of the people in the area.

5.1 Socioeconomic impact of the wild boar establishment

A significant majority of questionnaire respondents did not have to spend money due to wild boar, χ^2 (d.f. 1, N=171) = 8.006 $p < 0.05$, despite 59 of 171 questionnaire respondents citing damage as a reason for wild boar to be managed. This suggests that wild boar are more of a social issue than an economic issue for many of those within the Forest of Dean at the time of study. Although a significant number of study participants had not spent money due to wild boar costs should still be reviewed. There were eight categories of expenditure due to wild boar activities reported by study participants (Figure 15).

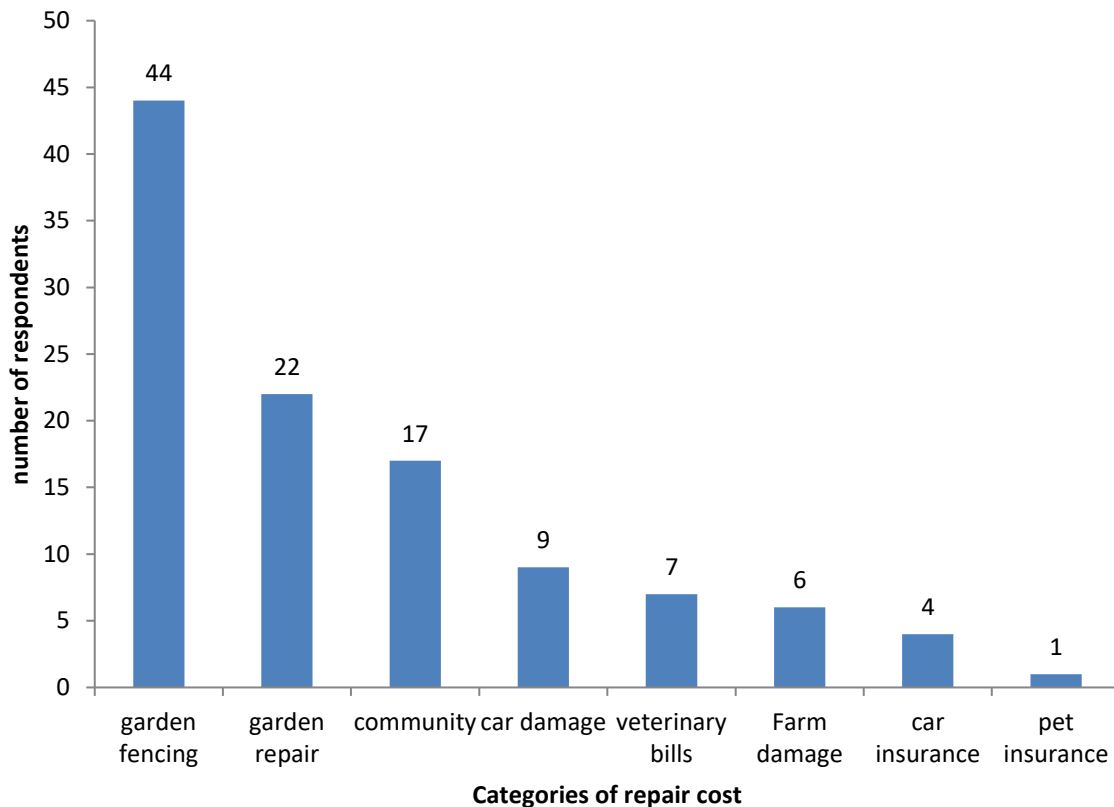


Figure 15: The number of people who have had expenditure due to wild boar in the Forest of Dean split by category. The total exceeds the number of those who had expenditures due to some respondents having more than one category of expenditure.

Garden fence repair was the most frequent reported cost. Three respondents gave an indication of costs ranging from “hundreds” to £2000. Where participants elaborated about garden repair costs these consisted of lawn repair from wild boar rooting behaviour. Community repairs consisted of money spent repairing common grass areas, pub beer gardens and amenities²⁸, with one respondent quoting £20,000 of repair costs for rooted grass areas. Of those who responded saying that they or someone else had to spend money on veterinary bills all but two stated their dog had been attacked by wild boar with the other two not elaborating. One person quoted spending a total of £1000 in veterinary expenses over two incidents. Car damage repair was quoted similarly to that of garden fence repairs, with the total cost between “hundreds of pounds” to £3000. Where figures are quoted, they suggest substantial costs borne by those who have had to pay money to repair wild boar damage.

²⁸ Amenities including sports areas, greens, church yards, and public houses.

5.1.1 Damage to gardens and fencing.

All respondents who experienced wild boar damage to their garden indicated they felt the need to fence their garden afterwards to protect the garden from further damage.

However, the majority (25 of 44) of those who stated fencing costs due to wild boar were either pre-emptive or due to fence damage by wild boar. These costs can be significant both in terms of economic outlay but also social significance. Damage to gardens and fencing is damage to a person's home which can be viewed as their territory, a safe space and part of their identity (Moore, 2000). This is reflected in interview data: VF, a pensioner living in a small village in the forest itself, had wild boar enter her garden and cause damage through foraging:

"They've destroyed raised beds, destroyed the terraced garden, they've been pulling stones out and pushing them down the slope. This used to be a show garden. It would be tens of thousands of pounds to repair the stream and path. I had roses and peonies; they'd been here for over thirty-four years, all gone! They've eaten all the bulbs and only a handful of daffodils remain. Hyacinths, tulips, dwarf daffodils."

"They've lifted patio slabs. I have spine problems, I'm scared to walk in the garden, and it's just a nightmare."

Her neighbour (DL) was also interviewed and clarified the cost to fence her property was £10,000. Her condition meant that she was physically unable to repair the damage and had limited use of the garden due to the damage created by wild boar, to the extent that she no longer felt safe in her garden for fear of injury. This was compounded by the fact that her garden was once owned by Jane Taylor, a well-known gardener and author. This had created a new outlook for VF:

"I belong to IFAW²⁹ and some ways support PETA³⁰, not an extremist. But wild boar have totally wrecked my life... Nobody knows how bad an influence it is on someone like me, having got to live with it."

²⁹ International Fund for Animal Welfare

³⁰ People for the Ethical Treatment of Animals

Regardless of being an advocate for these animal rights and welfare groups they were now against wild boar and further clarified that wild boar should be euthanised. Wild boar had not only impacted them economically but the presence of wild boar, or the threat of it, meant that they felt isolation as they are unable to use their garden or “have friends around for a barbeque” and changed their perspective from one of support for wildlife to one that advocated eradication. The cost of living in the same area as wild boar for VF has had substantial negative social and economic impacts. Similar to VF’s story CL discussed how a neighbour was “distraught” and “didn’t know what to do” given the wild boar rooting and moving of paving slabs in their garden. A garden can be lifelong projects and more than space or the money spent to maintain. CL mentions that they worked to repair the damage to their own property including fence and grass repairs. However, they had “given up” and feel that a wild boar proof fence would be too expensive and are sceptical of the fence’s efficacy.

DL had been more fortunate and had not had any damage caused to their home by wild boar but rooting outside of their property had caused issues with access to their property. Interviewee C discussed similar issues to VF with their parents’ property where damage was not only physical but emotional to their parents. The solution was extermination of wild boar, with twenty killed³¹ in the garden of a house in a housing estate³². This shows that wild boar damage is not restricted to rural areas but also urban and peri-urban areas through wild boar foraging in human habitats.

Interviewee NF, who lives in a large village in the Forest of Dean, had not experienced damage to their property however showed dismay at seeing damage to other people’s gardens:

“Now it’s a mud bath it must be heart-breaking And as I say at one time it used to be you know you would safeguard your garden from the deer possibly, but they didn’t really come into villages but sheep certainly. But so, it has been lifelong you would sort of protect your

³¹ Given this number it was likely a sounder of wild boar.

³² Housing estates are areas where several houses were built at the same time usually consisting of intertwined roads either urban or suburban.

garden, but these are just annihilating it. It's not that they have eat your cabbage you know they have turned the whole lawn over."

MF raises three important areas of discussion. The first is that wild boar rooting damage is more extensive than the browsing and grazing of deer and sheep. The second is that wild boar are less likely to be scared away than deer or sheep. The third is about protecting property and how an inability to do this can lead to emotional stress. MS adds to the second and third areas through discussion on restriction on fencing in certain areas of the forest:

"I mean the house I used to live at we were only allowed to have an 18-inch-high fence in the front garden. Well, you know that was the maximum, y'know, it had to be like open plan so if you got all your front, you know so these things can root them out, it's not like, cos I say it's not like the sheep you can go and scare off. It's not like you can go outside and scare off a boar rooting your front garden up."

MC, an interviewee who favours the wild boar in the Forest of Dean, sympathises with those who have had their garden or property damaged:

"so no it's not fair on somebody who's had their life affected because someone else has fed the boar, it's not fair on someone's who'd got boar in their back garden now because the boar run away out the forest because they're scared for their lives, but it's also not fair on the boar, because all they're doing is eating, they don't know our rules, they don't see a gate that's open and think 'that should be closed'."

MC presents both sides - those of the affected property owner and that of the wild boar. They are correct in stating the wild boar are simply foraging for food. They do seem to believe that boar only enter through gates and further explains the ease at which this can be stopped:

"Three pounds forty-nine Screwfix, automatic gate closing, that's all they cost, three pounds forty-nine, two screws each end, and your gate is permanently shut. Yeah, because delivery drivers leave gates open, postmen leave gates open, so, little things to adapt which can be cheap."

MC's suggestion is a suitable way to prevent boar entering property if there is a boar proof fence, and neglects to factor in the cost of such a fence if needed. MC also ignores those who are unable to have a gate or fencing for their property, such as those where MS lived. This gives a perception that those who support the wild boar establishment are not fully knowledgeable on the situations of those who have been adversely affected by the wild boar. This can lead to further tension between those who have been affected by wild boar and those who support the wild boar introduction.

The results of the survey suggest that garden damage from wild boar is not a significant issue for most residents in the Forest of Dean. However, if garden damage has occurred this can have significant social, emotional, and economic impacts on those affected. This is understood by those who are in favour of wild boar, but costs to protect property seem to not be fully understood or over-simplified.

5.1.2 Community damage

Damage to areas of non-domestic and non-commercial property were discussed by 10% of questionnaire respondents (n=17) when asked if they or anyone else they knew had to spend money due to wild boar. However, mention of community damage increased to 14% when respondents were asked why wild boar should be managed (n=24). Interviewees readily discussed community damage. Damage mentioned by both groups can be categorised into four themes: verges³³, footpaths, community facilities and amenities, and the Forest of Dean itself. All damage discussed was through the actions of wild boar rooting.

Verge damage was mentioned as an issue by interviewees and questionnaire respondents due to the “mess” that was created. Areas next to the road that were once flat and green have been turned into rough, muddy areas. Some of the respondents discussed how they or a family member would tidy the verges each time they noticed the damage. However, due to constant rooting behaviour one respondent had given up repairing the verges near their home. It was mentioned that verge damage could create issues with safety and tourism. One respondent noted that they felt they had a duty to repair verges to ensure safety of road users, where roads had become narrower due to material from the verge

³³ Grass areas adjacent to roads that are throughout the Forest of Dean.

encroaching onto the road. Road safety was also mentioned by C and MS in interviews. When MS discussed the issues with verge damage, they discuss that drainage ditches were disappearing due to boar activity, but were not being reinstated by the Highways Agency:

“It’s not really that you know it’s when looking at the curb side I complain anyway that I don’t think the roadsides are maintained like they were when I was here, there was always a ditch on the side for drainage which highways don’t seem to do that nowadays.”

This potentially creates a danger of standing water on the road, as well as mud, creating a surface where a vehicle could lose grip and create an accident. C elaborates on this further and discusses how the mud rooted up by wild boar could end up in drainage systems causing blockages and flooding on roads and private property:

“Properties are being now put in the state of being flooded, it will happen because [wild boar] dug up the verges that much that the drains are blocked. All up by [R] here, there is not one drain that works now... we all know that it’s the boar.... It is them that’s digging it up filling the drains in. Down by Wenchford it’s another picnic area, I don’t know how much they spent last year, the council, but they had to do the whole drain under the road. And this is a culvert drain mind where the boar had made it into a wallowing hole. And it finished up that there were no water going through and you couldn’t go up a flat road, where the water when it rained just flooded the road, it made it deadly.”

Further to the physical damage C suggests that the verge damage is affecting tourism:

“And as for [the presence of wild boar] not affecting tourists we’ve got a house by us that this year has only got 25% of its bookings, because where they drive up to the house it has been dug up and dug up, and people come in posh cars and Christ sake get mud on their wheels! And it just it is going to kill the tourist trade, you’ll get the boar people who will come and want to see them.”

This was also discussed by a questionnaire respondent who suggested that the mess left from wild boar rooting activity would also discourage people from visiting the Forest of Dean. The evidence of foraging and activity has been recorded next to roads and in human settlements (Figure 16).



Figure 16: Top – wild boar wallow around a powerline pole where the pole is undermined and mud on the side of the road. Bottom – wild boar rooting in a village in the Forest of Dean, maintained verges have been rooted (own photographs).

In contrast LC acknowledged verge damage, but feels that it is not an issue due to the quick recovery of the ground:

“they disturb the ground in their hunt for food, but the ground recovers very, very, quickly once you get some rain and people walking on it, grass growing and all that. All the damage disappears.”

LC’s comment undermines the argument of some of the other study participants and neglects the issue of uneven ground being hidden when the grass has grown back. This also neglects to consider that these verges are maintained by some of the respondents and therefore ignoring the ongoing conflict over maintenance.

Maintenance of community facilities was another conflict with wild boar and their rooting behaviour. These community facilities include sports areas, greens, church yards and monuments. These are areas of social significance as well as for recreation for those living in the Forest of Dean. GM discusses damage in their interview:

“The only time that [the damage] is kind of long term is when they accidentally get onto a football pitch or cricket field or something like that. But again, when you read the newspaper reports, a lot of that is because there’s inadequate fencing.”

Many of these facilities did not have fences as they either did not need to block animal access to the property or due to the historic dislike of fences within the Forest of Dean³⁴. Despite the presence of deer, sheep, and birds there was no need for fences as these animals would not cause extensive damage or would scare more easily than wild boar.

Ensuring that an area is adequately fenced is a significant outlay for those who are maintaining these community spaces. OF discussed their local community space the Primrose Hill playing fields:

“Our playing field we’re now in the process of trying to raise £3500 to fence the rec. now why should we have to raise £3500 in a little village?! Well, we’re thinking about crowd funding and things like that, you know to see if we can raise some money... But we only use

³⁴ This is discussed in the introduction to the Forest of Dean section.

it once a year for the village fete. But everybody that comes there and you get a lot of people that come there, and they say what a lovely place, lovely surroundings.”

OF shows the financial issue with fencing their recreational space. The space is important as a social space for the village and those who visit when the annual fete is held. OF has pride in the space which is further discussed in the interview:

“Ours is the only one left and if it had been used for a football field like. It used to be used as a football field, but then it got so bad over the years that ground sunk so they couldn’t play on it. But they said it was the only ground that was guaranteed that no matter what the weather was it never flooded. And we thought it was undermined by the coal mine because there’s a mine just below. They had the bore and all that come in and drilled and drilled down and said that there was no undermining at all.”

The Primrose Hill playing fields were a matter of pride for the village as it was one that would not flood despite others in the Forest of Dean having flooding issues, but now due to wild boar it has sunk, and people are unable to play on it. The second half of this statement links into a deeper social aspect of these areas too. Many of these recreational areas were built by Foresters for their communities, usually out of spoils from mining in the area (Baggs and Jurica, 1996b). These are areas which are linked to those native to the Forest of Dean through their heritage. The wild boar are not just damaging the aesthetic of these community areas, but areas which bring the community together and are a source of pride. This is further explained through a discussion by M of one of the church yards damaged in the Forest of Dean:

“I don’t know whether you’ve seen the photographs of the local church yard. Desecrated the graves and things to the point they’ve had to put a kissing gate of sorts outside the forest church. Now looking at that kissing gate outside the forest church to someone my age, that is well, a total disappointment to think that where were going to be buried now is going to be protected by metal and barbed wire. Its consecrated ground”

M is an older Forester who has ties to their local church yard, they feel the changes to protect the church yard from wild boar has ruined the sanctity of the area and damaged

their heritage. M noticed that other areas had been disrupted; their local green had been rooted by foraging wild boar which they fixed:

"We've had this job on the green here, I used to mow the green out here, twice a year. And the pigs come out there and turn it upside down and I went to the forest "look they been up here now, they turn it up you better come have a look" and them bloke come have a look and I go out there with a flail mower and flail all them tuffers smash it all up I go out with the chain arrows sprinkle some grass seed out there and chain arrow it all back in. I go out there with a three-time roller and roll it all down and in no time that'll come back. It'll regenerate it. I asked the forestry commission to give me the cost of a bag of grass seed and they refused, they wouldn't give me anything at all. I never ever got paid for mowing or turning the ground over, never got paid for preparing it. Sloughed all the green up."

This shows the high level of maintenance some residents of the Forest of Dean are putting into the area to ensure the historically tidy aesthetic of the villages in the area. M also mentions how the wild boar rooting of such areas causes rifts between the local people and Forestry Commission.

The final issue M raised was that of wild boar foraging damaging Pan Tod. Pan Tod is the highest point of elevation in the Forest of Dean, but also has deep social significance for those who are native to the Forest of Dean. Atop the hill is a memorial to fifty miners killed at Northern United Mine in 1951, an incident within living memory for the older Foresters in the area. There was a petition organised by M and the local community for the repair of this socially significant area which gained 791 signatures which secured funding for repair and protection.

Other areas mentioned by study participants were Yorkley cricket ground, this area was damaged by wild boar in 2015. The grounds were 135 years old at the time, but due to wild boar damage to the crease and green the club decided to abandon the grounds until a grant was given to the club in 2016 to fence and repair the grounds. One respondent mentioned that the pub beer gardens had been damaged reducing use for those who frequented the facility. Other facilities such as golf courses were mentioned where despite fencing wild boar had entered the grounds and caused damage to the fairway. LF discussed the damage to play areas and the difficulty of fencing animals out of areas. One

questionnaire respondent mentioned how to protect educational playing fields through fencing had cost twenty thousand pounds over five years, reinforcing the high cost of fencing mentioned when protecting personal property.

This links to GM's original comment; adequate fencing is a solution to protect these areas of social significance. However, the cost to adequately fence these areas is prohibitive to many villages and communities where funding may only be available through personal donations and charities. Relying on donations causes issues for many of these communities because it adds a level of uncertainty to the protection of these socially significant areas. This leads to further discussion of who is responsible for the wild boar and whether damages should be claimed from those who are responsible³⁵.

Further to damage to verges and community facilities, study participants discussed rooting damage to many of the pathways in the Forest of Dean. These pathways consist of large fire break tracks or footpaths, both of which are usually rough gravelly soil with vegetation at their edges. These areas are easier for wild boar to travel along and forage in than the forest floor due to a lack of substantial tree roots. There is also an increase in smaller vegetation that constitutes wild boar diet (Schley and Roper, 2003). Wild boar rooting creates uneven ground that can get hidden when the vegetation recovers, similar to verges discussed earlier. Interviewees R and M discussed how this detracts from their walking experience:

M: Yeah, again it's taking away from what the forest attractions were being out walking, if it's all muddy and...

R: Yeah, if you're having to look at your feet more, you're taking away from what you might see

The damage was likened to a ploughed field by two respondents and a quagmire by another. For all respondents that discussed footpath damage their experience of the forest had been negatively impacted and had been limited by wild boar foraging behaviour. This limits their enjoyment as residents of the Forest of Dean and potentially reduces their ability to connect to the area. Foresters who would be used to using the paths at will are now

³⁵ This is discussed further in the chapter on conflicts, rights, and ownership in the Forest of Dean.

restricted by wild boar rooting damage. The damage can be extensive, the picnic area at speculation car park was rooted almost completely (Figure 17**Error! Reference source not found.**). Such damage to paths and picnic areas reduce areas for tourism.



Figure 17: Wild boar rooting of a picnic area next to speculation carpark in the Forest of Dean (own photograph).

Ecology of the forest was discussed alongside reduced access to the Forest of Dean. Twenty-eight questionnaire respondents (16%) gave ecological damage to the Forest of Dean as a reason for management of wild boar, as well as several interviewees discussing this issue. Damage to the bluebells that grow in certain areas of the forest, and are an attraction for tourists, was an area of concern for two interviewees. MS mentions their worry for this attraction:

“I don’t know I did say that we’re not sure how the bluebells are because they’ve been in quite a few places. And again, you would have thought that was an amazing attraction in the spring and if they go and root them all up.”

NF clarifies this further:

“You know things like you know we would have visitors and we would always take them to Sudley to see the bluebells and you know they would be banks and banks and banks of them you know and I know that there are still some there but it has changed and will that never come back... that was a natural landscape that had evolved And the evolution of it ,it wasn’t we went along and planted bulbs the evolution of it has been damaged by something that not even indigenous to this area that’s my issue.”

NF feels that they cannot enjoy the bluebells at Soudley, nor show their visitors the area due to damage caused by wild boar. Their disdain is increased by their view that the wild boar are not Indigenous. An outsider is changing their forest. This sentiment was also shown by M and C when interviewed. For older Foresters wild boar are usurpers on their land and represent change that they do not want to see.

DL and VF reported in their interviews that ground nesting nightjars were once present in the scrub area near their houses but had not been seen in the area since the presence of wild boar and their rooting activity. One questionnaire respondent discussed the issue with vulnerable species:

“It has become clear that allowing the population to grow even further would have catastrophic results for a number of vulnerable species due to boar feeding habits, including Small Pearl-bordered Fritillary and Wood Warbler.”

PH discussed a presentation from the warden of Nags Head nature reserve in Parkend where there was concern for the impact of wild boar on disrupting species:

“Well, there’s damage, there’s some rooting which for wildlife could be beneficial but if it becomes excessive then it may be effecting ground nesting birds or some flora as well someone expressed concern at Nags Head [nature reserve] about damage to some flora... it was a report on last year’s season by the warden. I’m a volunteer there and at the end of the season [he] gives a talk to all the volunteers on what happened during the year, and you know there was some mention about them. Mentioned about them disrupting certain plant and animal species. So, it’s you know, just a question of numbers if they’re well managed. You would probably find at the moment there’s just too many of them.”

Which was a sentiment mirrored by LF:

“Just purely because some areas of the forest, I’m sure you’re aware, are literally mud everything so rooted up and you can’t see any living vegetation left. I think in the forest we’re quite lucky it’s very vast so at the moment there are other areas for the other species and habitats. But if it got turned and sustained damage it would be mud everywhere”

But what can be seen in these statements by LF and PH is that both believe the Forest of Dean can be balanced with wild boar present. This was echoed by NF; however NF was more pessimistic and worried about the timescale for damage, NF suggested that there is a point of no return for the ecosystem. These are areas which are unknown and untested within the Forest of Dean.

These views were opposed by some of those who took part in the study. GM stated that “[the wild] boar are good for the ecosystem, they should be here.” RW also believes that the wild boar are an asset who are helping to manage the habitat in line with the needs of the area:

“I think they’re a great asset to be honest. The rooting in the forest. Look here was nothing but this horrible grass. Now you can see it’s changed, and you get bird foraging. The grass [the plant life in general] will always grow back. They’re good for bracken control too. They trample it down to make nests, they take the top off. Year on year they go through an area rooting, which stops the return of it. Forestry Commissions and the Wildlife Trust’s biggest bug bear is the bracken, and boar help to keep it down. As people we grow food in the ground. We dig it, spread manure. Boar do it for free.”

RW’s view is in opposition to the other interviewees mentioned but all four agree that the wild boar are changing the landscape of the forest. RW further discusses that wild boar need managing because there is damage to human areas:

“If everyone had a poll, the majority would say keep them. Ninety percent would say ‘yes they’re great, but numbers need to be kept in check’ I am one of them. A slim minority would want no management. This would have a negative impact on the forest. Some say leave them alone they’ll find a balance. They won’t they’ll keep spreading out to towns and

villages, farms. You could see the negativity. Not a lawn but a large area [of rooting] so would look a lot worse.”

The wild boar are seen as a species which has significant impact on the landscape by those who took part in the study, whether this impact is positive, or negative is disputed. Those who are more positive about the wild boar believe the forest landscape is positively affected by the wild boar, and those who are negative about the wild boar feel the landscape changes are negatively impacting ecology and the beauty of the landscape. These views further demonstrates how the introduction of wild boar into the Forest of Dean has divided opinion creating friction between people within the Forest of Dean.

The social and economic impacts of wild boar are not limited to personal property. Wild boar are damaging areas of significant social importance to the people of the Forest of Dean. This is seen as a slight by some foresters towards their heritage, by both the wild boar and the Forestry Commission who are seen as owners of the wild boar³⁶. The economic effects are significant for those communities affected, even causing economic ruin in certain cases. The damage to pathways in the area restricts some people’s movements in the Forest of Dean creating a further rift in their established connection to the Forest of Dean. The landscape of the Forest of Dean has been changed by wild boar. For those who remember an older version of the Forest of Dean this is seen as a detriment to the area. The wild boar can be viewed as foreigners who are endangering the indigenous foresters through damage of community areas. There is division for those who are concerned about the ecology of the Forest of Dean, some believe the wild boar are enhancing the landscape, others that it will be detrimental for other species. This adds to the complexity of the social and economic effects of the wild boar.

5.1.3 Road safety and vehicle damage.

Wild boar on roads was an issue for study participants creating negative interactions. Eleven questionnaire respondents cited that they or someone they knew had to spend money on car repairs or insurance due to wild boar, with a further ten respondents discussing the dangers of wild boar collisions as a reason why wild boar need to be managed. There was

³⁶ This is discussed further in the chapter on ownership.

one respondent who spent money on car repairs due to wild boar and cited this as a reason for the wild boar to be managed. This is 12% of questionnaire respondents, but also shows that experiencing a wild boar collision may not be a factor that influences the decision on whether wild boar need to be managed.

Five interviewees discussed road safety and vehicle damage. GM describes their collision with a wild boar whilst driving:

“My most recent event was only three weeks ago. I had just bought a new car... I come around the corner and slammed on the brakes – I couldn’t believe it, five of them crossing the road. Well, I didn’t manage to stop, and I couldn’t have swerved, they were all across the road in a line. I hit the second biggest one. It threw me across the road a little... She had smashed up my bumper, I had to rip bits off so I could drive... she just got up shook herself off and was on her way!”

For GM, the cost of repairs and the fact it was a new car was substantial, but they feel it is a part of living in an area such as the Forest of Dean. When asked if hitting the wild boar in a new car had negatively affected his view on wild boar GM noted:

“No not really, hitting a boar with my car certainly does not make me feel against wild boar populations. If anything, it just reinforced the viewpoints I had before: any animal that can get hit by a car and walk off deserves respect (as all animals do obviously) which is the only reason people get themselves in situations with them in the FOD. Not respecting them for what they are - a big and capable wild animal. If anything, the whole car crash makes me think: if I can hit one, incur financial implications and still not find that a valid excuse to justify a prejudice argument about why the boar shouldn't be in the FOD or that they are a nuisance, then so can the rest of the population living here. “

This also gives further insight into GM’s thought process about the Forest of Dean and what people’s opinions should be; those who live in the area should respect wild boar and wildlife in general, it is a part of living in a rural, wild forest. LF’s family had a similar incident with wild boar, but had issues with increased insurance afterward and found difficulty processing the claim due to the insurance advisor not understanding what a wild boar is:

LF: It was about 35%, it was massive! It was it was huge. We've had the issue now where a lot that was wrong with the car hasn't been fixed. The insurance was saying it wasn't the boar and the car wasn't fine beforehand. But then personally I think they where it was going regardless, they were just trying to get out of it. So, I don't think it was necessarily just the boar.

Me: Do you think they understood how big boar are?

LF: No, we had it on the dash-cam, the actual impact. And the first few weeks they didn't want to know. And they were like "oo actually you did jump quite a bit, didn't you? It was quite an impact." But no, they weren't aware. The second claims handler we spoke to was like "oo what's that then?" yeah, a huge great big pig!

A questionnaire respondent felt that they were paying more for their car insurance due to wild boar in the forest but did not substantiate that claim. LF's experience also shows the ignorance of those outside the Forest of Dean about wild boar³⁷. BD discussed that when they had an accident involving a wild boar that they paid for the repairs rather than claim through their insurance to avoid losing their no claims bonus³⁸ and an increase in insurance cost.

CL, MT, and ST all knew people who had been in an accident with wild boar. For MT and ST there was fear that soon there would be a serious accident:

"A serious car accident is only a matter of time, and there will be uproar. It's bad enough with sheep."

So far, they had not known anyone seriously injured due to a wild boar collision but think that there will be a serious injury and that will turn more people against the wild boar and current management. CL felt that the number of people having accidents with the wild boar is high, but not reported:

³⁷ This is further discussed in the chapter on media around wild boar.

³⁸ A reduction in insurance cost due to not claiming which increases each year the insurance is not claimed on.

“Two of them in our office have had their car written off³⁹ now and I know [redacted]’s sister as I say it ran right into the side of the car completely wrote the car off. So that’s two in a small office that’s what fifteen people so. Did they go to the police, no because there’s no point ‘cause what would the police do? Nothing. So, they’re not going to be reported, are they? Unless any bodies”

This extract also shows how poor reported collisions with wild boar are in the Forest of Dean, potentially skewing official statistics. Gloucestershire Police released in a freedom of information request that between 2000 and 2016 only one road traffic collision had been reported with a boar out of a total of 64 reported collisions with animals (Steedman, 2017). However, there were fourteen reports that only state “animal” which suggests this number could be higher. To consolidate MT’s and ST’s discussion sheep and deer were most numerous in causing collisions, with RTAs involving sheep totalling 12 and for deer 17 for the 2000 to 2016 time period (Steedman, 2017).

Near miss situations were also discussed by those who took part in the study. CL mentioned that she had almost hit a sounder of wild boar:

“They say it’s their bad driving, but I mean, I came down from Lydney the other day and all out across the bank there was a whole load of them ran literally in front of the car.”

A questionnaire respondent also had a similar experience:

“I have had a couple of near misses whilst driving where the consequences of a boar collision would have been serious (for both parties)”

Others are worried about driving in the Forest of Dean in case of a collision. The danger of collisions is increased due to wild boar physiology and behaviour. Wild boar are generally inactive during the day and feeding activity starts at dusk and continues through the night (Goulding, 2003). The timings of activity in conjunction with a dark coat and non-reflective eyes mean that wild boar are hard to spot when driving at night (Cabanau, 2001).

³⁹ In insurance this means to have the cost of repair valued at more than the worth of the car, and therefore the car is not worth repairing.

Vehicular incidents with wild boar were not frequent in the responses to this study but caused high economic consequences for those participants involved when a collision occurred. The fear of hitting wild boar is also a feature for some of those who responded in the study, showing that there is a negative psychological impact of the introduction of wild boar for some of the people residing in the Forest of Dean. These factors are not significantly significant; however, they are substantial issues and concerns for some people residing in the Forest of Dean. However, the presence of wild boar could create drivers who are more cautious and safety conscious therefore reducing other vehicular accidents.

5.1.4 Farm damage and concerns.

Few study participants had experienced farm damage, partly due to demographics who responded to the study. For those who were concerned or had experienced damage these again were substantial. Damage, again, was linked to foraging and rooting behaviour or damage to fences. Farming concerns considered the potential for disease spread from wild boar to livestock on farms.

Those who had experienced damage by wild boar rooting discussed how this created an economic cost of damage repair, but C raised the issue of loss of feed for their animals which causes welfare issues:

“When you see a seven-acre field which has been put up for hay making ripped up in more or less overnight. Now the RSPCA could have come away two weeks later, and they could have summonsed me, you haven’t got no grazing for your sheep and then they turn round and start to jump on us because we’ve got to turn out in the end because our land what we have bought for our animals has been ripped up.”

Rooting damage by wild boar foraging on farmland reduces area for livestock food. The farmer will have to import food for their livestock which creates an economic cost. But the lack of feed can mean that the farmer can be prosecuted under the Animal Welfare Act 2006. Depending on the level of sanctions this could lead to removal of livestock from the farm and a loss of livelihood. Alongside this there are potential further social consequences for the farmer whose reputation could be damaged changing their social standing in the local community. The level of damage described by interviewees ranged from half an acre to

twelve acres, for one respondent the total damage was 13% of overall land area on their farm. Damage to farmland was reported by study participants on all types of fields; both pasture and crop producing land. C talks further about issues of wild boar predation on livestock:

“Another point is there’s evidence the wild boar are taking newly born lambs from the ewes almost as soon as they’re born or if they’re left on their own by the ewes ten yards away grazing, they will pick them up and kill them. The ewe of course is no match for an adult wild boar in temperament or ability to defend her stock.”

This was dismissed by MC, who described where he thought this view had begun:

“There was, couple of years back, a lady who just happened to be a vet was on her way home, Lydbrook way, and saw some boar eating a lamb on the side of the road, so she went to the press and put in the story that they kill sheep and all they were doing was eating the carcass of a dead lamb that had been killed by an RTA, because they’re scavengers, and she eventually retracted it- her retraction was on about page 807 of the tiny little print down the bottom right hand corner, by which point the Forest of Dean believed that the wild boar attack sheep, which they don’t- unless someone proves otherwise I will go to my grave saying they don’t”

These are both substantial claims by C and MC. Wild boar have been reported to be scavengers on carcasses of larger animals (Cabanau, 2001, Sweeting, 2013), but smaller animals, such as hares and rabbits, are hunted by wild boar (Schley and Roper, 2003). There is no scientifically recorded evidence of wild boar killing and eating lambs, but there have been news stories from around the world suggesting that this is wild boar behaviour (Tasker, 2020, O'Dowd, 2015), however these articles do not have photographic evidence.

The extract from MC's interview also shows a level of rigidity in beliefs or opinions of the wild boar. They will not accept anecdotal evidence but need proof. From their discussion this proof will only be photographic or video. This rigidity can create further disparity of opinion and a lack of respect between the two sides of the argument. For C, the potential for lamb predation had made them decide keep lambs on their farm and only common older sheep, who are less prone to predation, on public land.

Three diseases were discussed by MC as having the potential to be carried by the wild boar population: bovine Tuberculosis, African Swine Fever, and Foot and Mouth disease. Bovine Tuberculosis (bTB) is carried by several wild species of mammal including deer and wild boar (Zanella et al., 2008). Interviewees and questionnaire respondents suggest that wild boar could function as a reservoir for bTB in the Forest of Dean with a potential to infect local livestock. There is a potential for nasal discharge of bTB by wild boar (Mayer and Bertagnolli, 2019), although it has been found that deer species are more likely to transmit bTB to other livestock and other species (Zanella et al., 2008). If bTB were transmitted from wild boar to cattle this would mean a loss of production for the farm, but also reputational damage to the farmer in the local community and farming community.

African Swine Fever was another disease of concern for study participants. This concern was reflected by The National Pig Association at the UK wild boar symposium. African Swine Fever (ASF) cases in wild boar are moving from east to west through Europe (Cwynar et al., 2019). ASF is difficult to control due to the nature of infection and transmission. Infection can be asymptomatic where infected animals are not identifiable without clinical testing. Clinical testing is not possible on the wild boar population. The current risk to the UK is reported as medium, with route of entry into the UK via infected meat imports (Pacey et al., 2020). Transmission can be through, infected feed, faeces, bodily fluids, direct contact, fomites⁴⁰, or via ticks (Pikalo et al., 2019). Therefore, transmission of ASF could happen readily between domestic pigs and wild boar. If ASF were transmitted to the wild boar population, the wild boar would act as a reservoir for the disease making it difficult to remove ASF from the area that the population resides in. If pigs or wild boar are found to have contracted ASF the population is to be destroyed and control zones are put into effect (DEFRA, 2020). Such tactics have been seen to be effective in Czechia and Belgium (Viltrop et al., 2021). If ASF was found in the Forest of Dean wild boar population this could extend the restrictions as wild boar have been seen to be difficult to control in the Forest of Dean⁴¹. Further to this, there is the social and economic impact of these tactics for pig farmers where trade is restricted, or livestock terminated. These impacts have been felt in the Forest of Dean community before through Foot and Mouth disease. M and C both

⁴⁰ non-biological vectors such as fences, vehicles, and clothing.

⁴¹ This is discussed further in the management chapter.

experienced the Foot and Mouth Disease outbreak in the UK in 2001. The outbreak and destruction of their livestock was emotional for C:

“We cried, well I did, when five thousand sheep was illegally slaughtered far as I’m concerned. If and I hope for Christ’s sake it don’t come from there, there was no management in this forest and I want that highlighted these pigs had been allowed to get onto the burial site and there was a possibility and I’m going to say was, foot and mouth, we should all be crying again. Because if it hit the centre of the forest of Dean it will go country wide. We stopped it last time I was one of them that took to court, I kept my sheep right to the very last day, I was one of the six and I defied any body and I defied, they were going to send a lorry up and I said you don’t send no bugger up here I don’t know.”

The animals that M and C steward are more than mere income or food sources (Convery et al., 2005). C shows a fear of wild boar digging foot and mouth disease burn sites and becoming infected. Wild boar are susceptible to foot and mouth disease (Alexandrov et al., 2013), however there is no recorded evidence of infection through rooting of burn sites. These diseases mentioned pose a significant threat to those who are livestock farmers in the area. A disease outbreak due to wild boar will affect farmers economically, emotionally, and socially.

5.2 Perception of the value of wild boar

A significant majority of questionnaire respondents felt that people are drawn to the area due to the wild boar, $X^2=38.368$, d.f.=1, $p<0.001$ (Figure 18). Those that thought that wild boar drew people into the area were more likely to state they thought the wild boar generated income in the area. Those that did not think that wild boar drew people to the area were more likely to think that wild boar did not generate income $X^2 = 12.055$, d.f.=3, $p=0.017$ (Figure 19). Around a third (29.37%) of those who thought wild boar drew people into the area also thought they did not bring in an income. Those who gave further clarification stated two main reasons; the damage created by the boar outweigh the income generated, or that wild boar deter more people visiting than are drawn to visit due to the wild boar. In contrast a quarter (26.67%) of those who thought boar did not draw people to the area did think that boar generates income in the area. Those that elaborated on their answers said that money generated was through tourism (7 of 12 respondents), boar food

products (2 of 12 respondents), shooting, photography, merchandise, or use of amenities (1 of 12 respondents for each).

One hundred and seventeen respondents elaborated on how they thought wild boar brought income into the Forest of Dean, with twenty-three of those giving negative aspects of the wild boar which are potentially losing income in the Forest of Dean. Overall, there were ten categories where wild boar were thought to bring income into the Forest of Dean; tourism, boar food products, shopping, shooting, photography, hospitality, car parking, merchandise, amenities, and attractions (Table 2).

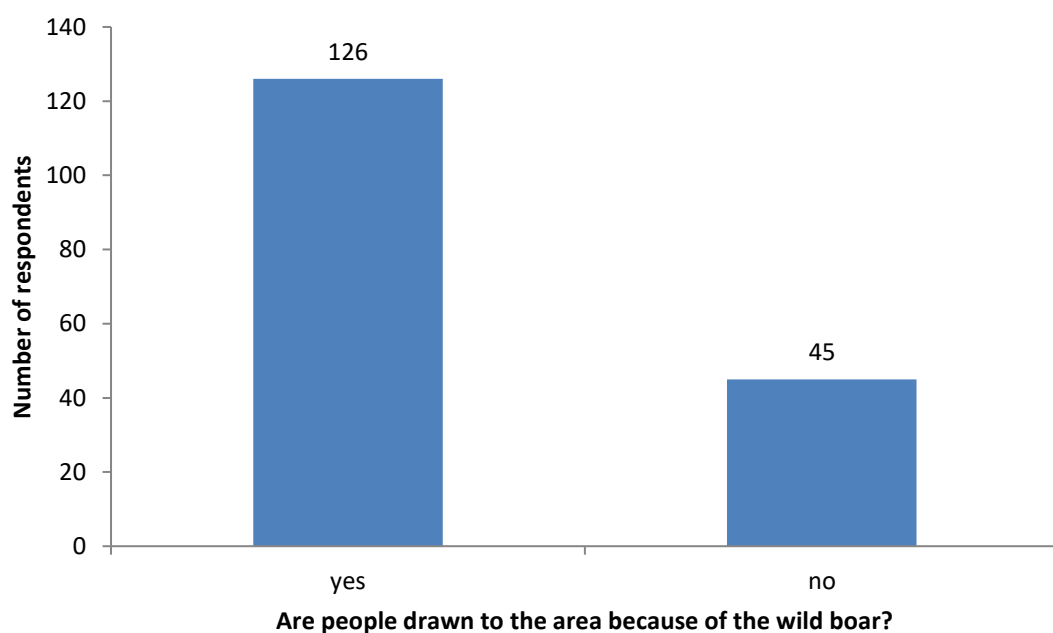


Figure 18: Number of questionnaire respondents for whether they think wild boar are a draw to the area or not (N=171).

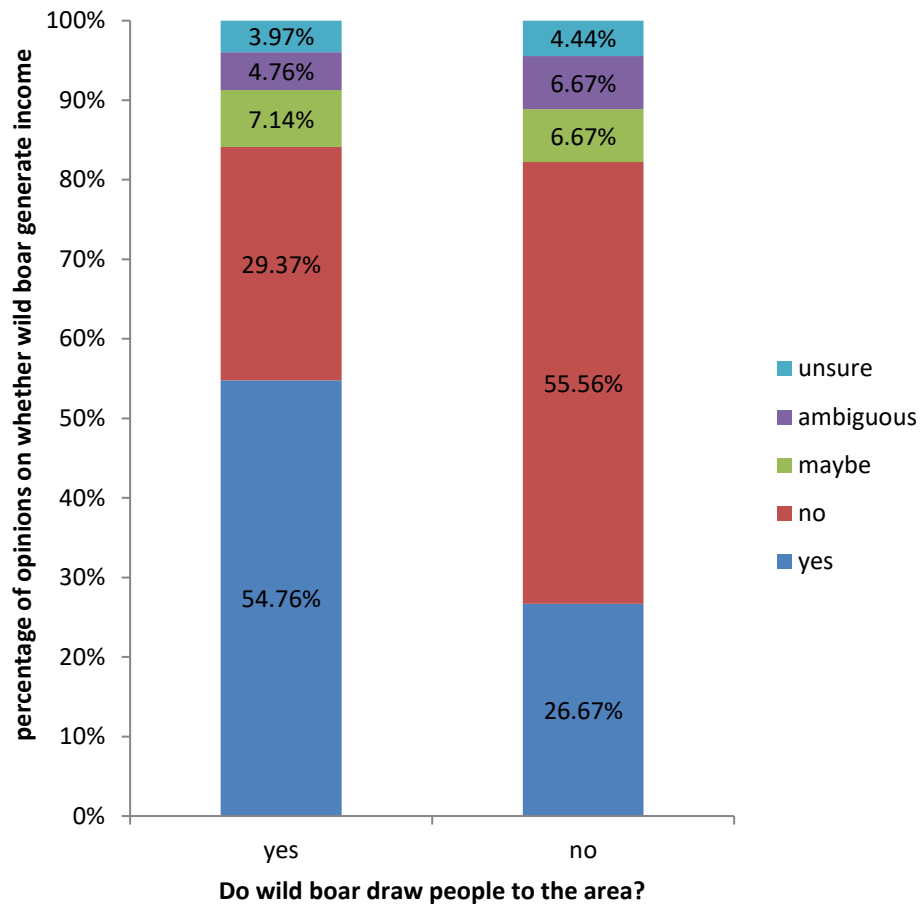


Figure 19: The percentage of whether people think wild boar generate income given whether they think wild boar are a draw to the area or not (N=171).

Table 2: Number of times each category of wild boar income was mentioned by questionnaire respondents (N=176).

<i>Category</i>	<i>Number of mentions</i>
<i>Tourism</i>	76
<i>Wild boar food products</i>	17
<i>Hospitality</i>	13
<i>Photography</i>	5
<i>Shopping</i>	4
<i>Car parks</i>	3
<i>Amenities</i>	3
<i>Shooting</i>	2
<i>Merchandise</i>	2
<i>Attractions</i>	2
<i>Negative</i>	23

Tourism was the most frequently submitted reason for income from wild boar, although for most tourism answers respondents did not specify how wild boar create tourism income. The next highest category is negative effects. Wild boar being a negative to income could be split into three themes. The first theme was wild boar rooting being a detriment to aesthetics of the area and making the area unsafe for people walking. The second was that wild boar would intimidate tourists and therefore tourists would avoid the Forest of Dean. Lastly, was that the cost of repairing rooting damage outweighs any income generated from wild boar. Wild boar food products are the next highest category; this is most likely through the forestry commission selling culled meat and local butchers' shops stocking wild boar products. These data suggest that wild boar have the potential to be a positive economic driver in the Forest of Dean and that it is perceived that some income is generated through the introduction of wild boar.

The last question on wild boar in the questionnaire asked whether respondents thought that wild boar created a net gain, loss, or neither in the Forest of Dean (Figure 20). There is little difference between gain and loss totals, although there are fewer respondents that believe the wild boar are neither a gain nor loss for the Forest of Dean. This suggests that the net worth of wild boar to the Forest of Dean are a divisive topic between respondents. When this is compared to the breakdown to answers for question 3 potential drivers of opinion can be discerned.

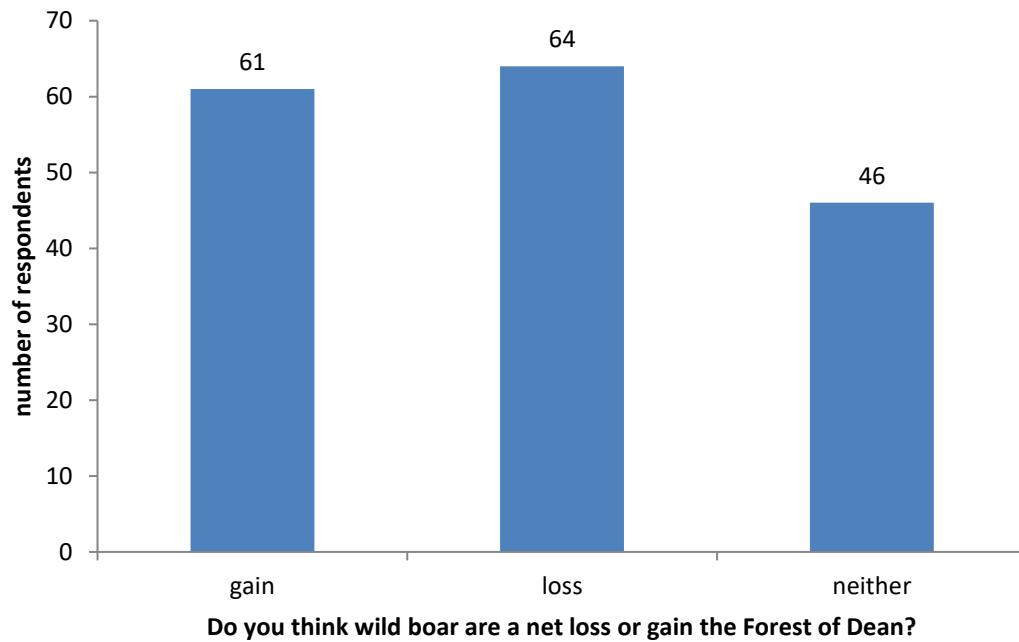
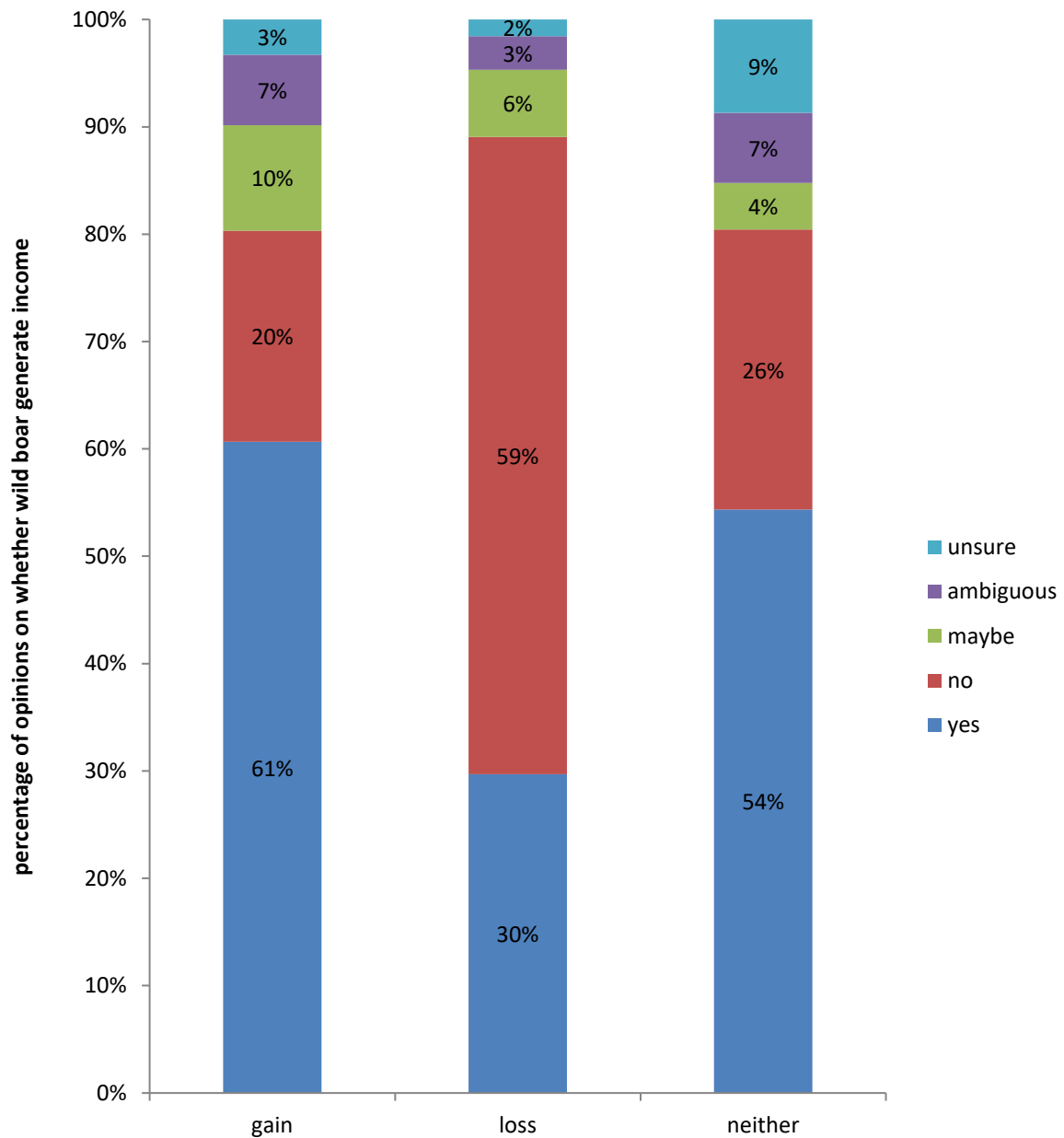


Figure 20: Total number of respondents for each category when asked if they think there is a net gain or loss from wild boar in the Forest of Dean (N=171).

There is an association between the view of whether wild boar created income to the Forest of Dean and the wild boars overall worth to the Forest of Dean $\chi^2 = 27.924$, d.f.=8, $p < 0.001$. Of those that thought wild boar were a net gain for the Forest of Dean 61% attributed that to the income brought to the area. Whereas 20% of questionnaire respondents believed that wild boar are a net gain to the Forest of Dean despite there being no perceived income generated from the wild boar (Figure 21). Similarly, 30% of those who thought wild boar were a net loss to the Forest of Dean felt that they did provide an income. This suggests that there are factors other than economics influencing opinions on whether wild boar are a gain or loss to the area.

To discern what these other factors may be whether wild boar are a net gain or loss data were tested against data on experience with boar, reasons for management of wild boar, and with whether boar bring an income into the Forest of Dean. A multinomial logistic regression model was used to compare these factors. The regression showed that no single factor was a significant contributor to opinions on net gain, loss or neither. There were no significant associations $X^2 (20, N=171) = 62.119$, $p > 0.05$, and a low Nagelkerke pseudo R^2 value of 0.344 suggesting other factors affect views of whether wild boar are a net gain or loss to the Forest of Dean. Positive experience ($p=0.074$), safety ($p=0.076$) as well as the

thought that boar brought no money into the Forest of Dean ($p=0.082$) were near significant for those who thought wild boar were a loss. More sampling of the population would be able to determine whether these factors are significant or not.



Do you think there is a net gain or loss in relation to wild boar in the Forest of Dean

Figure 21: Percentage of opinions on wild boar generating income for the Forest of Dean given whether the respondent thinks wild boar is a net gain or loss for the area (N=171).

Whether someone believes the wild boar are a net gain to the Forest of Dean is multifactorial, but data suggests that whether someone believes wild boar brings income to the area is a predictor for their belief of whether wild boar are a net gain for the area. Opinions of wild boar worth to the area are individual. This shows that negating social effects of wild boar could become difficult, as there are many effects which have individual combinations for each person.

5.3 Perceived safety in the Forest of Dean with wild boar present and changes of habits.

Of those who responded to the questionnaire 65% stated that they still felt safe within the Forest of Dean with wild boar present. The type of interaction with wild boar significantly affected whether the respondent felt safe in the Forest of Dean ($\chi^2 = 240.4$, d.f. = 8, $p < 0.05$) with 83% of those who do not feel safe having had a negative interaction with wild boar. Safety had further correlation with whether those respondents thought the wild boar were a net gain or loss in the Forest of Dean $\chi^2 = 217.2$, d.f.=6, $p < 0.05$. Eighty eight percent of those who thought wild boar were a gain for the Forest of Dean had had a positive experience with wild boar and 65.6% of those who thought wild boar were a net loss to the Forest of Dean had had a negative interaction with the wild boar. This gives insight, showing that feeling of safety is related to interactions with wild boar but also that wild boar worth is linked into feeling safe with wild boar in the Forest of Dean.

For some study participants the lack of perceived safety had changed their use of the Forest of Dean. Several of the study participants who no longer feel safe in the Forest of Dean had changed their use of the Forest of Dean due to wild boar or knew someone who had changed their use of the forest. The main changes were to walk or exercise in a new part of the Forest of Dean or to move outside of the forested area for their regiment. Two questionnaire respondents cited their children's safety as a cause for concern:

"I would no longer take my young grandchildren there on my own as they often choose to run a little ahead of me and I fear for their safety."

"my kids don't like going in the forest to walk the dog in the evening in case we see them."

The safety of children was also discussed by interviewees. CL mentions how they do not feel safe taking their grandchildren into the Forest of Dean:

"I wouldn't take my... I always used to walk all my grandchildren round the woods and the woods behinds us. But I wouldn't now because I feel like I couldn't get them all safe if one of them decided..."

CL didn't complete the sentence but through the content suggests a negative interaction.

For MS it is more than a lost use of the forest:

"I wouldn't go walking in the forest on my own not now. And I certainly wouldn't like kids out playing like we did when we were little."

It's a loss of a past time that MS had grown up with; the forest has changed from their childhood. These are potentially multigenerational changes, where the fear of negative interactions becomes a factor for younger generations passed down from the older generations. This could affect tourism and the use of the Forest of Dean in the future.

The wild boar are not only changing the forest use for those within the Forest of Dean, LF describes a conversation that they had with their friends after a visit to the forest:

"My friends will come out, and they're so excited to take the kids to see them to try and find the piggies. And then if they do see them, they think "they're terrifying we're not coming again they're scary"."

This suggests that the wild boar are not only changing the use of the forest by those who live in the area, but also those who would visit. The boar could reduce tourism from some groups of people. This extract also shows that there is a difference in opinion about the boar between those who live or have experiences with the boar and those who have not⁴².

Before their experience with the boar those who were visiting from outside of the Forest of Dean believe the wild boar were cute "piggies", but this opinion changes after seeing wild boar. This links into the ignorance of wild boar seen in previous sections of this chapter,

⁴² This theme is further explored in "Wild boar and the media" chapter.

therefore those outside of the Forest of Dean do not understand the extent of conflicts and issues living with wild boar⁴³.

⁴³ This is explored further in “Classification and conceptualisation of wild boar” chapter.

5.4 Conclusions

Despite most questionnaire respondents not reporting negative economic impacts due to the wild boar in the Forest of Dean, for those who did report negative economic impacts due to wild boar these were substantial. Social implications ranged from damage of personal, damage to community property, and safety concerns. These impacts of wild boar are seen elsewhere in the wild boar ranges; vehicle collision (Kruuse et al., 2016), property damage and peri-urban incursion (Peterson et al., 2010, Toger et al., 2018, Stillfried et al., 2017b, Castillo-Contreras et al., 2018), disease risk (Pikalo et al., 2019), crop foraging (Massei et al., 2015a), and a reduced sense of safety (Nyhus, 2016). The economic cost of wild boar was reported to range from hundreds to thousands of pounds with these costs recurring. These costs are reflective of those found in a survey of farmers in Sweden (Gren et al., 2019). Discussions of wild boar damage show that introduction does not have a purely economic impact either, but can have severe social impacts, such as an inability or a reluctance to use the forest or private property. These fit the model that there are discrete costs, such as payment for repairs, but also continuous events, such as fear of a negative wild boar interaction, (Khumalo and Yung, 2015). Concerns surrounding the negative impacts of wild boar on farming are comparable to the damage to agriculture in other countries within wild boar ranges (Herrero et al., 2006, Morelle et al., 2016). There were further concerns about the ecological impact of wild boar. These have not been tested in the Forest of Dean, however wild boar have been seen to change ecosystems across Europe (Focardi et al., 2015, Herrero et al., 2006, Markov et al., 2019, Zochowska-Kujawska et al., 2010).

Whether wild boar enabled more tourism to the Forest of Dean was debated. There was an aspect that those outside of the Forest of Dean would want to see wild boar, however wild boar behaviour and rooting damage would deter these visitors. This reflects studies on the effects of wild boar on tourism of an area (Hearn et al., 2014, Ikeda et al., 2019, Geeraerts et al., 2021). Further issues could arise from misunderstanding what wild boar are from those who do not live with wild boar leading to bad habits from people towards wild boar, such as feeding, which can lead to undesired behaviours and negative interactions (Dubois and Fraser, 2013, Orams, 2002, Penteriani et al., 2017). These

experiences can be managed to ensure positive meaningful experiences, where pre-encounter, encounter, and post-encounter experiences and emotions are developed to ensure positive outcomes (McIntosh and Wright, 2017). However, this is more difficult to manage with local people, where encounters are more sporadic and spontaneous. If visitor experiences are positive and residents' experiences are negative this could further entrench human-human conflict (Keuling et al., 2016).

This shows that (re)introductions of species need to be thoroughly planned to include social aspects of the animal, especially for liminal species which have several interactions with people living within that area. Potential negative interactions should be considered for a species and how much of an impact on people these interactions could have on individuals. Factoring in mitigation of these issues when planning a (re)introduction should reduce these interactions and their impact which should increase support for the (re)introduction and therefore increase the success of the (re)introduction.

6. Historical consciousness, ownership, and conflict in the Forest of Dean.

The people of the Forest of Dean have rights over the forest and the land on which it lies. These rights, which have been contested for over four hundred years, have given a sense of ownership of the forest to those who live within it⁴⁴. This sense of ownership still prevails in many foresters, some of whom still exercise those rights today. However, the owners of the Forest of Dean are the Crown estate, stewarded by the Forestry Commission. This has given rise to conflicts between the Foresters and Forestry Commission. Further to this there is conflict of ownership of the wild boar within the Forest of Dean. In this chapter the concepts of historical consciousness, ownership and rights will be explored and how these ideas have extended to conflict both over the Forest of Dean and the population of wild boar inside it.

Historical consciousness is the concept of how a person, community or entity views history and how this affects their interactions within a contemporary setting and what contemporary viewpoints affect their view of the past (Lukacs, 2017). This can be seen in a person's or group's heritage (Cheape et al., 2009) and identity (Smith, 2006). There is a rich history and heritage in the Forest of Dean⁴⁵ celebrated in murals and statues in conurbations and parks. Those living within the Forest of Dean have a historical consciousness. There is further evidence of historical consciousness when talking to those who are local to the area. The most striking is the phrase "don't talk about the bear", an insider's joke, which still dictates the social interactions of the people today⁴⁶. This chapter will explore the history of the Forest of Dean and review historical consciousness of those interviewed and the parties involved to discuss the conflicts that have developed both before and after the introduction of the wild boar.

Ownership is an abstract term which has had many connotations throughout history. Locke in his second treatise of governance defined that ownership of an item is declared once work has been put into an item; in his example the apple is owned by a person when it

⁴⁴ In this section the Forest of Dean is referring to the statutory forest, as described in the introduction and not the district.

⁴⁵ Discussed in the introductory chapter.

⁴⁶ This references a violent part of history of the Forest of Dean where four men killed a bear. For those who do not know, the bear is not meant to be discussed in the village of Ruardean.

has been picked up by that person (Locke, 2016). Hegel described ownership as power over an item (Hegel, 2018). Further to this, ownership has been defined as having a right, responsibility, and liability over an item (Bergström, 1999). There is also the concept of ownership in natural resource planning described by Lachapelle and McCool (2005) of ownership through process, outcome, and distribution of the natural resource. These definitions of ownership will be discussed whilst viewing claims of ownership, or lack of ownership, over the Forest of Dean and the wild boar residing within it.

6.1.9 Protection from Privatisation

In 1993 and 1994 the Forest of Dean came under threat of privatisation through a national initiative for countrywide privatisation of forests (FTCU, 2008). The Forest of Dean and other national forests would be sold to private owners rather than maintained by the Forestry Commission. Those living within the Forest of Dean once again petitioned their MP to stop the privatization, as part of a local protest which helped to quash the national initiative (HOOF, 2011). As part of these efforts to keep the Forest of Dean in government ownership, one forester wrote the song “Battle Hymn of the Dean” (Hunt, 2018):

*We'll fight to save our Forest.
Yes, we'll fight to save the Dean.
We can't believe you're serious,
Or that you could be so mean.
Perhaps you'll have another think,
Before you cause a scene.
Cause our fight will still go on . . .*

*Kip the mawlers off our Forest,
Kip the mawlers off our Forest,
We all think thus want thee yuds read,
If you privatize the Dean.*

*Our granchers walked the Forest paths,
To dig the Forest coal,*

*Our bands and choirs still do their bit,
They play their precious role.
Their song "The beautiful Forest of Dean,"
Must surely touch your soul,
So, our fight will still go on.*

*Kip the mawlers off our Forest,
Kip the mawlers off our Forest,
We all think thus want thee yuds read,
If you privatize the Dean.*

*There's Blackpool Brook and Mallard's Pike
And Cannop Ponds to cap
Bluebell carpets, cuckoo calls,
And the woodpecker's tap-tap.
A sacred place for all to share,
Not just a dot on the map,
So, our fight will still go on.*

*Kip the mawlers off our Forest,
Kip the mawlers off our Forest,
We all think thus want thee yuds read,
If you privatise the Dean.*

*Our lovely trees and forest walks,
The finest in the land,
Our heritage is dear to us,
Why can't you understand?
For now, you want to sell it,
Just to get some "cash in hand,"
So, our fight will still go on.*

*Kip the mawlers off our Forest,
Kip the mawlers off our Forest,
We all think thus want thee yuds read,
If you privatize the Dean.*

*We've always loved our Forest,
And our children love it too.
The stately foxgloves bow their heads,
They are surprised at you.
Why should so many things be changed,
By the whim of just a few?
So, our fight will still go on.*

*Kip the mawlers off our Forest,
Kip the mawlers off our Forest,
We all think thus want thee yuds read,
If you privatize the Dean.*

The song was sung in 1994 at protests against the sale of the Forest of Dean (Hunt, 2018). Written with local dialectic words “kip” (keep), “mawlers” (hands), “Granchers” (grandparents) and “yuds” (head), signifying the heritage of the people of the Forest of Dean, alongside lines about the grandparents digging coal. The song also mentions “our heritage”, that of those of the Forest of Dean, a potential reference to the strikes and riots of Warren James and others. There is a sense of ownership and community that is prevalent in the song through using the word “our”. The song could still be sung with “the” replacing “our” without losing any grammatical sense, but such substitution would dull the social meaning and pertinence of the battle song. “Our” lets those who the song is being recited at know how dear the Forest of Dean is to its inhabitants, reflecting sentiments in the writings of many of its authors (Phelps, 2008, Foley, 2011, Anstis, 1992, Nicholls, 1966). This song was published in the local newspaper *Forest of Dean and Wye Valley Review* in 2010 (Hunt, 2018) ahead of the 2010 to 2014 “Hands Off Our Forest” (HOOF) campaign. HOOF came

about after the first draft of the Public Bodies Act 2011, which in October 2010 stated that public land such as the Forest of Dean could be sold off to private owners once again.

6.1.10 Hands Off Our Forest Campaign

The first documented raising of concerns over the public status of the Forest of Dean came when the MP for Coalway started a campaign for the foresters to own the Forest of Dean, through purchasing the land and maintaining it (HOOF, 2018). The reaction of the people of Coalway was both pragmatic and emotional; there were questions on how they would manage and maintain the forest, and they “vehemently opposed” the idea of selling off the Forest of Dean to themselves or anyone else. The HOOF campaign was started by the two rival local newspapers of the Forest of Dean; *The Forester* and *Forest of Dean and Wye Valley Review* after the news of the MP’s actions were leaked (Adams, 2010). The HOOF campaign acquired full backing of the Forest of Dean District Council in December of 2010, who further petitioned parliament against this latest iteration of privatisation of the Forest of Dean (HOOF, 2018). In the start of January 2011, HOOF organized a rally and march. Three thousand foresters “braving the cold and snow” attended (HOOF, 2018), a number not dissimilar to that in the 1831 enclosure riots incited by Warren James (Anstis, 1986). One speech at the protest stated (HOOF, 2018):

"What we are not is a political group, and we would oppose any political party that was attempting to sell our Forest. The spirit of Warren James is alive and well and is in the Forest today".

The Baroness Jan Royall stated (HOOF, 2018):

"We are here to defend our ancient privileges and customs. We're standing in the middle of a glorious forest that belongs to us. We cannot and must not allow our Forest to be sold."

The opposition to the sale of England’s woods was reported to be fiercest in the Forest of Dean with posters and yellow ribbons tied around many of the trees in the forest (Vidal, 2011). At the march it was announced that the union Unite, The Free miners Association and Commoners Association, would support HOOF and raised £1000 for the campaign (HOOF, 2018). This sent a clear message about how passionate many people of the Forest of Dean were about the rights within the forest. HOOF claims their campaign sparked the

national 38degrees.com petition to save England's woodland from sale which gained 530,000 signatures (HOOF, 2018). The campaign announced victory in February 2011 when it was publicized that the government would remove forestry clauses from The Public Bodies Act 2011, with the amended act published in December of that year.

A call to arms was given to those of HOOF in May 2012. This was christened the "forest's D-day" (HOOF, 2018). An open letter to the members of HOOF was released describing a proposed publication by the Forestry Panel suggesting that the government could once again sell the Forest of Dean and other forest land within England. The closing sentence of the letter was (Daniels, 2012):

"For if they [the forestry panel] do not [stop their privatization plans], they will be on the wrong end of a Forester scorned again... and that is one place they surely do not want to be!"

The campaign claimed a second victory in February 2013 when the government, once again, reversed their decision from selling the Forest of Dean to private owners, keeping the Forest of Dean as public land (HOOF, 2018). Despite this U-turn, by July 2013 the HOOF campaign was back fighting the government, this time over initial proposals which gave ministers control over the forest estate. HOOF along with Our Forests, another public forests campaign, petitioned the government over the initial proposals and by August 2013 were placated. The start of January 2014 saw the HOOF flame reignite for a fourth time over the proposed formation of the Public Forest Estate (HOOF, 2018). This would threaten the Forest of Dean and other forests of being sold as part of the public corporation that would be born from the Public Forest Estate. These concerns were strengthened due to previous sales of public corporations such as Royal Mail, British Aerospace and National Express (HOOF, 2018). The campaign ended in victory after 400 HOOF protesters had a torchlight vigil around Mallards Pike lake in the center of the Forest of Dean (ITV, 2014). The HOOF campaign is currently dormant due to a lack of threat from those who would seek to privatize the Forest of Dean.

6.3 Ownership of the wild boar in the Forest of Dean

The wild boar were deliberately introduced into the Forest of Dean in 1997 and 2004 with no accepted responsibility from any party involved (Goulding, 2009). At the time of the introduction, the Forestry Commission legally could not control the population of wild boar until the investigation into who released the wild boar had finished (Stannard, 2018). This delay allowed the wild boar population to grow and become too large to remove completely from the Forest of Dean. By January 2009 a wild boar task group had been commissioned by the government to review the impact of the wild boar and create an action plan for further management (Wild Boar Task Group, 2010). The task group examined information from experts, the public, forestry commission, unions, and animal rights groups (Goulding, 2009). The task group gave recommendations that the Forestry Commission, as the main landowner, took responsibility for the management of the wild boar population giving seven recommendations for the management of the boar (Wild Boar Task Group, 2010):

1. The Forestry Commission would take responsibility in the Forest of Dean to effectively manage “wild boar and boar-like animals” where they might create a potential risk and menace.
2. The number of boars should be controlled at a level slightly less than that existing at the time⁴⁷, or at a level not causing damage or harm to the forest and its visitors.
3. Recognition that boar could be beneficial to biodiversity and tourism, and that boar should be encouraged to remain in wooded areas of the forest.
4. The Forestry Commission, in consultation with the Verderers, manage boar numbers with the proviso that problem animals should be removed immediately.
5. The Forestry Commission are to introduce a “comprehensive communication campaign” including visual guidance and precautionary notices and advice to communities and visitors, as well as educational presentations to schools and parish councils.
6. The Forestry commission to liaise with Gloucestershire Constabulary in developing a policy to address poaching issues.

⁴⁷ These numbers are not confirmed in the document.

7. A review of the recommendations every six months for a minimum of five years, with progress reports to police and parish councils.

These recommendations were accepted by Forest of Dean District Council and the Forestry Commission. Using the five criteria of ownership it could be argued that the Forestry Commission are owners of the boar through the recommendations. Lockean ownership is displayed through all seven recommendations; the Forestry Commission would be working maintaining the wild boar. The Forestry Commission will have power and the right to remove wild boar to maintain a wild boar population. The Forestry Commission also has a responsibility and liability over the wild boar to ensure the boar stay in wooded areas, do not cause harm to the forest or its visitors, and that problem animals should be removed. However, these are recommendations rather than mandates and it has been argued that not all recommendations were completed properly or could be completed fully. Recommendation two suggests that wild boar should be controlled at a level slightly less than that existing at the time, or at a level not causing damage or harm to the forest and its visitors. Study participants have reported damage, and the number of wild boar was unknown at the time and was increasing until recently (Gill and Waeber, 2016, Gill and Waeber, 2019, Gill, 2023). Information campaigns did occur (Dutton et al., 2015), and information is available online about what to do when encountering wild boar (Wye Dean Tourism, 2020).

During the task force meeting the legal implications, through the Dangerous Wild Animals Act 1976, of the boar were discussed. The Wild Boar Task Group decided that:

“A person is the keeper of an animal if that person owns the animal or has that animal in their possession. The group felt that it could be argued therefore, that boar in the Forest of Dean, is in the possession of the Forestry Commission when roaming their land.”

This gives the implication that the landowners of the land that contain boar are the owners of the boar, suggesting that the wild boars are owned by the Forestry Commission until they exit Forestry Commission land. However, the first recommendation by the task force could be interpreted as suggesting that the wild boar are owned by the Forestry Commission after the exit of their property when the wild boar become a risk or menace and therefore the Forestry Commission is liable for damages.

If wild boar are viewed through the model of resource planning ownership proposed by Lachapelle and McCool (2005) containing three characteristics: ownership in process, ownership in outcome and ownership distribution, the ownership of wild boar can be determined. All those with an interest in the wild boar have ownership over the process through the open consultation that occurred during the investigation of the task group. The ownership in outcome belongs to the Wild Boar Task Group through their proposals and recommendations alongside the Forestry Commission to create those outcomes. The ownership distribution belongs to that of the Forestry Commission through accepting the task force's management proposals and recommendations that the Forestry Commission should manage the wild boar. In this sense it could be argued that the Forestry Commission have ownership of the boar through distribution of the responsibility over the wild boar to the Forestry Commission. Through recommendation two, to manage the wild boar to an appropriate number, the Forestry Commission show ownership of the wild boar, through the process of culling, the outcome of wild boar meat and the distribution of this meat to the distributors who purchase the meat.

However, in an email to one interviewee, DL, the Forestry Commission states that "free roaming wild boar are feral wild animals, and as such do not belong to anyone" (Johns, 2018). The Forestry Commission also replied to another interviewee, AB, stating that they are following the DEFRA action plan, and that control was "down to decisions of individual landowners and local communities" (Harper, 2015). These statements by the Forestry Commission show that they do not accept any ownership over the boar legally. The Forestry Commission only perform annual culls of the wild boar in their Forest land (Gill, 2023) although the task force recommendations state "The Forestry Commission would take responsibility in the Forest of Dean", which could be interpreted as the district or the statutory forest. These communications start to create a scene of conflict over the ownership of the wild boar in the Forest of Dean through a disagreement of terms but also a lack of clarification of terms and vagueness of the recommendations.

6.3.1 conflicts over the wild boar

Conflicts through wild boar damage

The conflict through wild boar ownership has developed due to the incurred costs of repairs for wild boar damage. All interviewees had themselves, or knew someone who had, suffered some form of damage to property caused by wild boar. The damage ranged from rooting grass, turning over paving or damage to a vehicle or other property. Where there was land damage the interviewees thought that compensation should be given from the Forestry Commission given the findings of the Wild Boar Task Group stating that the Forestry Commission have responsibility to manage wild boar and keep wild boar to the wooded area with problem animals removed. As one interviewee, W, described in a scenario:

“I understand the law works out like this for instance. My sheep get onto M’s land, then eventually they get on to C’s land. He decides to take action against them, he doesn’t summons me because they’re my sheep, he summons M because they came off his land. So that applies to the pigs⁴⁸ don’t it, they come off, if you’re responsible, cos they’ve come off your land onto me.”

If the wild boar travel between forestry land onto private land and cause damage this is the fault of the Forestry Commission for not controlling the wild boar for which they hold responsibility. This is the law for farmers and commoners whose animals cause damage to others property. The Forestry Commission denies their liability for the boar and the damage that they cause on anyone else’s property. This denial is demonstrated in their letter in response to DL (Johns, 2018):

“Responsibility for controlling feral wild animals rests with individual landowners and land managers, however, the Action Plan stops short of requiring landowners to control feral wild boar, instead the document leaves decision making to individual landowners and local communities.”

⁴⁸ Some interviewees recognize the wild boar as pigs and not boar due to the hybrid and feral nature of the wild boar.

Although their statement is correct insofar as the Dangerous Wild Animals Act 1971, the action plan also stated that the Forestry Commission was to effectively manage wild boar and boar-like animals where they might create a potential risk and menace. If the wild boar have created potential risk and menace through the damage of a person's property, the Forestry Commission are liable for damages. This has created a scenario where those who have been affected by the wild boar feel they are entitled to compensation from the Forestry Commission, but at the same time the Forestry Commission is entitled to deny this. This has created a divide between the people and the Forestry Commission.

The Forestry Commission advises landowners to protect their property from wild boar through fencing measures described by the deer initiative⁴⁹. This has caused several interviewees to state that the Forestry Commission is "*Fencing the boar at our expense*" and that "*[the Forestry Commission] should be fencing them in*". This has again given a sense that the Forestry Commission is "*passing the buck*" over any cost to the local people caused by the wild boar. For one interviewee, VF, the cost of fencing their 2.5-acre property was £10,000, which was an issue given their limited finances. This issue has been especially contemptuous since several of the interviewees believe that the Forestry Commission is acquiring £100,000 profit per year through wild boar meat sales from culled carcasses. This money they believe should be used to recompense those who have been negatively affected by the wild boar. Forestry Commission have denied this sum. In this monetary dispute neither the Forestry Commission nor the people have provided evidence to prove either claim. This has escalated the conflict between the Forestry Commission and the people of the Forest of Dean as neither side can be proven, without doubt, correct.

Forestry commission using wild boar to remove commoners.

The commoners interviewed believe that the wild boar in the Forest of Dean are being used as a tool by the Forestry Commission to remove their rights to common within the Forest of Dean. They believe removal of commoning rights would allow the Forestry Commission or government to privatise the Forest of Dean. During an interview with the commoners, M declares:

⁴⁹ This is described in the chapter on wild boar management.

“There’s an ulterior motive here mind. And you’ve got to be open minded enough to look through the crap and see it. And the ulterior motive was to get rid of the sheep.”

They believe the wild boars are being used to destroy suitable grazing habitat in the Forest of Dean for the commoners’ sheep:

“These pigs have totally destroyed the grazing lands so the pigs cannot graze and were faced now currently with the situation where the minimum five thousand sheep grazed there is now not enough grazing for five hundred sheep.... What the forestry commission has achieved in the last ten years is something that two world wars were unable to achieve.”

It has been a matter of pride for the commoners that the group have retained their right to common through two world wars, but now they are being forced to stop commoning through an indirect means. The lack of grazing area is causing conflict between the commoners and other locals to the Forest of Dean as M explains:

“Which causes the sheep to roam, to wander from here to there, and to get into people’s gardens in search of food.”

“Well [redacted] sat here, did he not, sat here a while ago, is Stannard’s sidekick, and he said to me he said, he said “people’s expectations have changed now, they don’t want the mess of the sheep any more they’re not prepared to put up with it.” And I said “[redacted] are you really saying that 200 sheep in the forest are making more mess than 2000 boar?!” and he did not answer the question and neither did Stannard either. It’s a nonsense.”

The conflict between the people and the commoners over the commoners’ sheep has been mentioned by other interviewees with some claiming that the sheep are more of a nuisance than the wild boar. In 2018 it was reported that 349 people had signed a petition calling for a ban on sheep commoning (Gogarty, 2018). The commoners believe that removing the sheep will remove the right of commoning in the Forest of Dean and the Forestry Commission will remove the wild boar after the commoners:

“So M isn’t it possible then, as I’ve said several times, that they’re using the boar to get rid of the sheep and once the sheep are gone that they will then control the boar.”

For the commoners the wild boar are seen as pawns in a Forestry Commission plan to claim full ownership over the Forest of Dean by removing the claim of ownership by the commoners through the commoners right to common and the commoners use of that right. C alludes to this by mentioning that:

"The Forestry [Commission] lost against "off" and ain't it funny how these things turned up after."

This is referencing the HOOF campaign earlier, that the foresters stopped the privatization of the Forest of Dean and the boar arrived shortly afterwards. They believe that the Forestry Commission allowed the boar to stay to remove the sheep from the forest and therefore commoning rights which would remove any rights to roam the Forest of Dean. M, H and C clarify this further:

C: There is no real official footpath over forestry land.

H: No there isn't

M: No, no

C: It's Crown land that is the trouble.

M: Well, you see the only way they can realistically do that, see C, the only people who have got any hold at all over the rights of access is the commoners.

C: Yeah, but once we go M...

M: Right once they stop your sheep going out there then you got no need to go out there. I can show you a document, well you'll see a document in a minute, and they've sort of prevised, well they're proposing now for feeding stations and a protocol for the feeding stations. They're all talking about licenses, permissions, peppercorn rents.

C: It's our rights! Why should we pay a peppercorn rent to our rights?!

M: Well, that's what I'm saying you see if they can destroy your rights, and in order to destroy your rights they've got to get rid of the sheep.

[Agreements from the room]

M: And how can they get rid of the sheep?

H: With the boar

M: Exactly and it don't cost them anything

H: *And then the boar can then be controlled with none of this political bits and pieces*

M: *Right once the sheep are gone that's, that's the job done with.*

The commoners still feel authority over the Forest of Dean through their commoning allowing the rights of access to the land for everyone, created through the commoners commoning rights, and therefore stopping privatisation of the Forest of Dean. The commoners are still conscious of the HOOOF campaign and what was seen as a “governmental plot” to privatise the Forest of Dean. The wild boar have become a new symbol of privatisation for the commoners, one that came into being shortly after the privatisation plans HOOOF fought against ceased. C explains this further:

“Because it's looking down to the thing, well we couldn't eat off years ago. If we stop people coming here and it gets to known you can't go to the forest of dean its muddy your kids get slowed up, the forestry's going to turn around sometime and say to the government, it's not feasible to keep this going. So, we might, either lease it off to private enterprise, or we sell it. Once that happens, there will be no Forest of Dean. Yeah, there will be a name but there'll be no right of ways for anybody to go walking through, or anything.”

C's logic is that once the sheep have gone the wild boar will fully dig up the forest reducing tourism and the income of the Forestry Commission. This will give an excuse for the Forestry Commission to sell the land that they own. C gives further historical knowledge of the struggles against authority that the foresters have abided throughout history:

“It's going to go, and the, somehow the people need to be woke up to this. Because the original rights to everything running along that forest was back to the settlement people. Wasn't up to the forestry commission there wasn't no forestry commission, lord of the manor he said you could do, get into the wood, he said you can collect ferns. I grew up over there cutting the ferns and drying it, that was for my grandfather for his pigs for the winter, that was their bedding. You couldn't go buy straw then. You can't do that now, the forestry rule, no you can't go cut bracken down now, you're not allowed to. As far as fencing the forest off, it was years ago past that all the fences supposed to come down. Now it suddenly turn up now as, oh we're suddenly going to be fencing off little areas for you to run sheep in. you can run sheep here you can run sheep there. That's alright if they're going to carry out

their bylaws. When someone walks through there with their little pet poodle, it's supposed to be on a leash."

In this paragraph C alludes to the old rights to use the resources in the forest, the hierarchies that were in place, and also the fence disputes that occurred, but have now been forgotten meaning that fences have been kept erected. The commoners have a high historical consciousness of their area, the Forest of Dean, and have used this to inform their views on the Forestry Commissions present actions.

Conflict over the right to keep "pigs" in the Forest of Dean

The right for the Forestry Commission to keep wild boar⁵⁰ in the Forest of Dean is viewed as contentious, and contemptuous, by the commoners and other foresters due to the removal of the right to pannage⁵¹. The letting of pigs out into a public area, whether wild boar or another breed, is illegal through the Animals Act 1971 which states that pigs, horses, and cattle are not allowed to be grazed in the Forest of Dean. The wild boar therefore should not be allowed to be in the Forest of Dean if there is no right to pannage and the Forestry Commission are in contempt of the law. The commoners explained this:

C: It's got to be animal welfare; they've got to do animal welfare.

[Agreements from the room]

W: This dangerous animal's act could do...

C: Well as I said if I'm led to have boar. I would have to have a proper enclosure and it would have to be ministry passed before I could even have one.

H: And they would be subject to the same licensing as domestic pigs

[Agreements from the room]

C: Ooh yeah, they're higher than that, mind, they're higher than that. Domestic pig is controllable you can control him with barbed wire and ordinary pig netting.

H: No, I mean the official licensing so they would be. They would be licensed against swine fever and all the other things they have to be licensed against and the

⁵⁰ Referred to as pigs by some interviewees, and the progenitor of domestic pigs. Whether the wild boar in the Forest of Dean is pigs or wild boar is discussed in the chapter on classification and conceptualisation of wild boar.

⁵¹ Pannage involved letting pigs roam the Forest of Dean once a year to consume acorns and beech mast, also known as the acorn drive.

movement certificates you've got to have. To move these pigs and they're moving all over the place.

M: Here's the thing they're in breach of these movements everyday

H: everyday

M: And every time something, if an animal moves from one holding to another there's a six-day standstill. There's no standstill for these pigs.

H: So, I mean they're, they're breaching every part of this regulation

M: Breaching everything and being encouraged to do so.

The commoners are using the argument that the Forestry Commission is breaking the law by keeping wild boar, classed as dangerous wild animals, in the Forest of Dean without restricting movement of the wild boar or access by the public to wild boar. They believe the boars are a public health and safety hazard, which is more pertinent through their experience with both foot and mouth disease⁵² and owning pigs⁵³.

There is an irony given that historically enclosures have been fought against, and such containment of wild boar would restrict access to areas of the Forest of Dean. This gives further complexity to mitigating and resolving conflicts around wild boar in the Forest of Dean.

6.3.2 Synopsis

The wild boar in the Forest of Dean are seen to be owned by the Forestry Commission by those living in the Forest of Dean district. This perceived ownership is due to the series of recommendations by the Wild Boar Task Group that were accepted and acted upon by the Forestry Commission. However, the recommendations are vague, for example citing the Forest of Dean as the area in which the wild boar are to be managed by the Forestry Commission despite the Forest of Dean relating to both the district and the statutory forest. This allows misinterpretation of the scale of liability and ownership of the Forestry Commission over the wild boar population. Further to this it can be argued that these are purely recommendations to be acted upon at will. This ownership of wild boar is contested

⁵² The commoners had over five thousand sheep slaughtered when foot and mouth disease entered the Forest of Dean.

⁵³ One commoner explained in the interview how he had seen many injuries to people from domestic pigs.

by the Forestry Commission who cites the Dangerous Wild Animals Act 1971 to protect themselves from any liability for the boar and any damage caused by the wild boar to other people's property. This has caused conflict with those who have had damage caused by the boar and want to claim compensation from the owners of wild boar. Those interviewees interpret the law to be that if an animal has come from the land of another landowner, it is that other landowner who owes them compensation for any damages caused. This conflict has developed further by the belief that the Forestry Commission are making substantial profits from the sale of culled wild boar meat. They believe this money could be given to those adversely affected by the boar. There is further conflict as the boar are believed to be a tool to remove the right to common through the destruction of land to common, but at the same time flaunting the same common rules that do not allow the pannage of pigs.

The conflicts that have arisen due to a lack of clarity and misunderstanding of who owns the boar and for what purposes the Forestry Commission are keeping the boar. Conflicts have escalated due to the lack of communication and trust between the Forestry Commission and the local population through contemporary actions but also linked to historical mistrust in authority.

6.4 Chapter Conclusions

The Forest of Dean has had several conflicts over ownership of the statutory forest which have been recorded for four hundred years. The conflicts have been due to the attempted removal of rights and access to the land and are now a part of the foresters' heritage and ownership of the Forest of Dean. There has been conflict over the duality of ownership of the Forest of Dean between the local people and authorities. The current foresters feel an ownership to the forest through their historical consciousness of these conflicts, their use of the area, and their rights within it. This sense of ownership is deeply rooted for some and extends through several generations of those who can trace their lineage in the area through these generations (Lukacs, 2017). This consciousness is shared with those who have less local ancestry through modern collective action events, such as HOOE, where historical conflicts are referenced. This historical consciousness for both groups of foresters, new and old, increases the feeling of local people's ownership and inspires to act against authority – the foresters have succeeded in such conflicts in the past. This ownership, and historical

consciousness, has created a duality of ownership between the modern-day foresters and the Forestry Commission. The Forestry Commission is the legal owner of the Forest of Dean, but it is also owned by the foresters through a history connected and rooted in the land reinforced through historical and modern action to retain rights and access to the Forest of Dean.

The duality of ownership has caused conflict over land use and wild boar in the Forest of Dean. The wild boar are seen to be owned by the Forestry Commission through their responsibility to control numbers and reduce negative interactions i.e., ownership as described by Bergström (1999). The Forestry Commission have the power to, and practice culling wild boar, thereby practicing ownership described by Hegel (1991) and Locke (2016). In terms of viewing wild boar as a natural resource the Forestry Commission meet the definitions of ownership through process, outcome and distribution as described by Lachapelle and McCool (2005) through the culling activity by the Forestry Commission. Wild boar are perceived to be profit making for the Forestry Commission at the expense of the local people. The story of the authority making a profit at the expense of the people of the Forest of Dean has been seen throughout the conflicts of the last four hundred years. The most notable comparisons are bread riots where foresters were expected to bear the costs of higher grain prices to support a profiteering market (Stern, 1964), and mining strikes where it was seen that foreign investment in the area was not giving fair compensation, for work in this case, to the local population (Marsh and Ryan, 1984).

Furthermore, the wild boar are seen as a tool to drive out the commoners from the Forest of Dean through the reduction of suitable common land for grazing due to wild boar rooting. This reflects the enclosure riots, where foresters were not able to common due to fences remaining standing after the fences should have been removed (Sharp, 1980, Ingram, 1984, Anstis, 1986). The removal of commoning would reduce the “right to roam” in the Forest of Dean and could ease a transition to privatisation of the Forest of Dean. This concern reflects the issues of twentieth century and early twenty first century conflicts of privatisation (HOOOF, 2011).

These conflicts of wild boar ownership have been escalated through a lack of communication between the Forestry Commission, the foresters, and commoners. Where

the Forestry Commission have been felt to “*fob off [the foresters] with some stereotype letter*” or “*standard letters*” rather than answer questions from foresters. These conflicts are important as a way to understand the effect the introduction of a feral wild boar population is having on those in the Forest of Dean. They show that some people in the Forest of Dean feel futility through confusion over ownership of the wild boar and that they are losing an important part of what makes their Forest of Dean.

This case study shows that ownership is not a singular concept but one that can be perceived by different groups in different ways. Ownership differences have been seen before in the wolf reintroduction to Yellowstone (Scarce, 1998). The wolves changed the perception of ownership of the park from those who lived in the areas around it to government owned. This dynamic is seen with wild boar in the Forest of Dean, the wild boar are drivers for a perceived change in ownership of the Forest of Dean. Conversely a lack of ownership of wild boar has also been studied in Germany where boar were seen to be someone else’s problem and human dimensions were dismissed (Keuling et al., 2016). The German study reflects attitudes by the Forestry Commission where wild boar are “someone else’s problem” due to the ambiguous legal status of wild boars once they have entered a property.

The concept of ownership is an important factor to consider when (re)introducing a species into an area. If the connection to the area by the people living in the area are not understood or acknowledged by those who are managing the new species this creates conflict. If the species is to be classed as feral or wild and not owned, then this needs to be clearly, legally, defined to ensure mitigation of confusion. Ensuring this understanding of ownership and sense of place alongside defining the ownership and status of a species will decrease human-human conflict that results from human wildlife conflict.

7. Classification and conceptualisation of the Forest of Dean wild boar

How a species is perceived can be viewed in the language surrounding that species (Webb and Raffaelli, 2008, Perfetto, 2021). This language can be used to understand the values of stakeholders where language influences opinion and *vice versa* (Arbieu et al., 2021, Orth and Schmitt, 2018, Wieczorek Hudenko, 2012). Castillo-Huitrón et al. (2020) found that language surrounding large carnivores was linked to emotions surrounding the carnivores. Those that had negative experiences of, or emotions towards animals used negative discourse, whereas those who expressed positive emotions or had positive experiences used positive language. The categorisation of animals as problematic links to people's interactions with the animal and this further links to people's valuation of the animals (Perfetto, 2021, Kellert, 1997). The value and concept of a species can be diverse between different groups of stakeholders (Arbieu et al., 2021) and understanding these differing values and concepts with how these have occurred, to the extent we can identify this, is key to understanding conflicts surrounding wildlife.

Descriptors of a species can influence decisions on management of that species. Gunnthorsdottir (2001) found that perceived physical attractiveness and descriptors were a decision factor influences efforts towards a species' preservation. In Australia opinion on lethal control of koalas (*Phascolarctos cinereus*) is more negatively received compared to kangaroo (*Macropus sp.*) lethal control, due to koalas being more acceptable to Australians (Drijfhout et al., 2020). Descriptions and classification of rarity was found to have similar effects within fisheries in the USA (Pritt and Frimpong, 2010). Larson et al. (2016) found that using militaristic metaphors can influence opinion about a species where a species will be seen as an enemy due to discourse surrounding it. This is further exemplified through the use of "invasive" which has been reported to vilify species and detrimental to the maintenance of populations (Inglis, 2020). The use of the phrase 'human-wildlife conflict' has been criticised as gives wildlife the role of a willing protagonist (Peterson et al., 2010) where this is likely not the case, however recognition of conflicts and human emotion need to be present to understand mitigation (Wieczorek Hudenko, 2012).

Language surrounding species or concepts can also cause confusion or miscommunication, for example the word sustainable has a variety of meaning for different groups which creates conflict through misunderstanding of use (Keller, 2012). The discourse around dingoes in Australia created dualities between being pests and protected species, whether the species is hybridised or not, and their classification of feral or native (Hyttén, 2009). In Yellowstone, USA, there have been similar disparities between what wolves represent to various groups of people (Wilson, 1997, Scarce, 1998). The wolves are seen by some as a native species returning to Yellowstone, but also a symbol of government takeover of the area from those who live in the area (Scarce, 1998).

The wild boar population in the Forest of Dean originated through the release of domestic wild boar stock into the statutory forest (Stannard, 2018). This has caused debate over whether the wild boar should be treated as native, feral, or domesticated, with further debate as to whether the wild boar are truly wild boar. This creates further questions about the status of wild boar in the Forest of Dean as to whether it is an establishment, reintroduction, or introduction of wild boar. These various classifications for the status of the Forest of Dean wild boar are being used by different stakeholder groups within the Forest of Dean and more widely in the UK. This chapter will explore why each classification of the population of wild boar (established, reintroduced, or introduced) and why the terminology for wild boar (for example feral wild boar, feral pigs, wild boar) is used.

The first part of this chapter will examine the genetic, phenotypic, and official classification of the Forest of Dean wild boar. The second part of this chapter will examine the language used to describe wild boar, people's encounters with wild boar and the concepts of the wild boar that these create. This will give an insight into further social impacts of the wild boar for those who are foresters, foreigners/counter-urbanites, visitors, and authorities. These concepts and their backgrounds will be examined to further understand the conflicts surrounding the wild boar.

7.1 What is a wild boar?

Wild boar are even-toed ungulates belonging to the pig family, *Suidae* (Porter, 1993) with European wild boar (*Sus scrofa scrofa*) a group within Eurasian wild boar (*Sus scrofa*). Genetically, European wild boar are unusual in the fact that they have three chromosomal

counts due to creation of two enclaves during the Pleistocene ice age (Goedbloed et al., 2013): $2n=36$ ⁵⁴ in Iberian or western European wild boar (Scandura et al., 2011), $2n=38$ in Balkan or eastern European wild boar (Fang et al., 2006), and $2n=37$ in hybrid boar between the two European enclaves (Scandura et al., 2011). Wild boar are also the progenitors of domestic pigs. The European domestication of pigs is estimated to have occurred 9000 years ago (Larson et al., 2005). The domestic pig has the same chromosomal count as eastern European wild boar (Porter, 1993) which allows for wild boar domestic pig hybrids (Scandura et al., 2011, Goedbloed et al., 2013, Šprem et al., 2014). These hybrids are indistinguishable through genetic or blood chemistry testing (Goulding, 2001, Kyle, 1995). Wild boar can have up to 25% domestic hybridization⁵⁵ and still display pure wild boar phenotypes (Booth, 1995).

Despite sharing the same genetics of domestic pigs, wild boar display a different phenotype to domestic pigs. Wild boar adults are characterized by having large fore-shoulders with black wiry hair densely covering the animal's body (Porter, 1993). They differ from other pig breeds by having a narrow head and long snout with black muzzle, erect pointed ears, long legs, and a straight tail with a tassel at the end (Sweeting, 2013). Wild boar are seasonal breeders with the rut taking place in October and young born in February to May, whereas most domestic pig breeds can breed throughout the year (Porter, 1993). The Forest of Dean wild boar are from domestic stock (Goulding, 2013, Stannard, 2018), meaning that the Forest of Dean wild boar are likely a hybridisation of wild boar and domestic pigs, such as Tamworth pigs (Booth, 1995). This hybridisation was likely done to increase production of the animals and therefore economic return. The Forest of Dean wild boar show wild boar phenotypic traits of coat and morphology; however, it is currently unclear if the Forest of Dean wild boar have one or two litters a year or can breed throughout the year. This has created speculation as to whether the Forest of Dean wild boar can be classed as a reintroduction of native species or an introduced species of wild boar-pig hybrid.

⁵⁴ This notation represents chromosome counts.

⁵⁵ The amount of genetic code derived from mating with domestic stock.

7.1.1 Official classification of the Forest of Dean wild boar.

The Forestry Commission and Gloucestershire Wildlife Trust deem the Forest of Dean wild boar as true wild boar (Stringer and Harvey, 2016). DEFRA also label the Forest of Dean wild boar population as wild boar (DEFRA, 2015). The Forest of Dean District Council in their scrutiny report label the Forest of Dean wild boar as “wild boar and boar-like animals” (Wild Boar Task Group, 2010). The scrutiny report was produced by a panel of district council representatives who consulted the Forest of Dean public whilst compiling the report (Goulding, 2009). This report is ambiguous over the status of the wild boar in the Forest of Dean, which reflects a disagreement between official classification and the public opinion. Dialogue between authorities and different groups or individuals can break down on a basis of nomenclature before debates of management, social impacts or ecological impacts have begun. This can extend further through the classification of the creation of the wild boar population, whether it is an introduced or reintroduced species.

DEFRA, the Forestry Commission and the Forest of Dean District Council label the wild boar population of the Forest of Dean as introduced (Stringer and Harvey, 2016, DEFRA, 2015, Wild Boar Task Group, 2010). The use of introduction in conservation terms suggests a non-native species has been moved into an area (IUCN/SSC, 2013). Gloucestershire Wildlife Trust classified the wild boar in the Forest of Dean as “illegally reintroduced” (Stringer and Harvey, 2016). This classification of reintroduced aligns with a classification of the wild boar as native, however it does not align with a reintroduction being purposeful for conservation (IUCN/SSC, 2013). Therefore, the Forest of Dean wild boar present a confused status of the wild boar in terms of nativity from authorities which increases confusion and conflict over the wild boar. However, all authorities agree that the wild boar population, after a presence of twenty years in the Forest of Dean and fifteen-fold increase in population size, are established and have formed a self-sustaining population (Goulding, 2013).

7.1.2 Different classifications of the Forest of Dean wild boar by interviewees

Older Foresters and Commoners

Many of the older foresters interviewed believe that the boar are not wild boar but are pigs. This is due to the suspected hybrid nature of the original population of domestic wild boar stock released into the Forest of Dean. The use of the label pig rather than wild boar is used to reduce, and change, the status of the wild boar in the Forest of Dean. The wild boar are not a wild animal nor a special species for the UK and the Forest of Dean but are a common animal that belong on a farm. This view originates from two main areas of reasoning: rights of pannage and experience and knowledge of farming of pigs.

The right of pannage is an old right to graze pigs on public land annually in autumn. This was practiced in the Forest of Dean until 1971, when the right of pannage was taken away through the implementation of the Animal Act 1971. Those who owned pigs would ring their pigs' noses and drive them out into the forest in the acorn drive⁵⁶, a community event used to feed the pigs and clean excess acorns and beech mast off the forest floor ensuring a clearer forest floor⁵⁷. The ringing of a pig's nose was important to ensure that the pig would not dig up the soil thereby keeping the floor clean and intact. OF recalled:

"If I kept pigs and I let them out without a ring in their nose I would be fined because they would damage the ground."

The wild boar do not have ringed noses thus allowing rooting of the forest floor, damaging the forest that these foresters protected when they were allowed to let their pigs out. This creates conflict between the old foresters and Forestry Commission due to the foresters' belief that the Forestry Commission owns the wild boar⁵⁸. The argument is that the Forestry Commission are allowed to pannage their pigs without rings, thirty years after foresters were banned from the pannage of pigs with rings. This is further criticised by the commoners because of wild boar rooting activity reducing the available sheep grazing areas within the forest⁵⁹. The boar are seen as a mechanism to reduce the rights to graze sheep in

⁵⁶ Acorn drive is a colloquialism for pannage used in the Forest of Dean and other areas of the UK.

⁵⁷ Another aspect on how the foresters managed the Forest of Dean.

⁵⁸ See section on wild boar ownership.

⁵⁹ This is explored in the section on ownership of the Forest of Dean.

the forest by the commoners. The standpoint that the wild boar are pigs helps reduce the wild boars' legitimacy to be in the forest as well as increasing the legitimacy of the commoners to argue against the current sustained population of wild boar. This increases conflict between the various authorities and the commoners, whereby the legitimacy of the right of the wild boar to be in the Forest of Dean is not questioned by DEFRA or the Forestry Commission, but the legitimacy and possibility of sheep commoning in the Forest of Dean is being reduced through the actions of wild boar.

This conflict is escalated as older foresters and commoners who had managed pigs expressed concern over the safety of the wild boar in the Forest of Dean. The wild boar are seen as domestic pigs and therefore have the same dangers as farmed pigs. C recalled how they had to carry a board to protect themselves when farming pigs:

"When we start on the pig farm the first thing you would get was a board. And you were told it was instant dismissal if you were ever caught without it. You always carried that by your leg, pig would be there, there. You never left it cos it's one swing and him had got ya. All the boar used to, we had proper training, goes like that, we had to drag him on to a steel tube in the yard and we had a proper little thing like the dentist, and we had to cut the tusk off. They were not allowed to keep the tusk."

Not only were they required to carry a board, but the pigs had their tusks removed to reduce the danger of injury from the animal:

"Now I worked on a pig farm which bred over seven thousand pigs a year, and when they were born, I had the job because I was sent to Hartpury. I had to go in there pick that pig up and I had a little gun and "pop" because safe to have. If that little pig starts squealing that sow attacks everything and it will kill every little pig in that pen bar that one little squealer. And if you're in the way of it it'll got you and what people have got to remember is when one of them bites between their tusks, they cannot open their mouths the only way they come out is by ripping out. So, if they hit you in the knee, they come up and out of your thigh and that'll be 240 odd stitches you'll have in you if you can get away from it. But if you go down a pig is known for leaving no trace, it will eat every bit of you and then it'll be 'awh what has happened.'"

This shows the level of damage that one older forester had suffered from a pig attack. C believes that the wild boar are capable of doing similar damage to a person in the Forest of Dean. While bite damage by wild boar has been recorded in medical journals (Kose et al., 2011, Gunduz et al., 2007) and is similar to what C describes, there are no reports of wild boar consuming a person. C raises the point of squealers⁶⁰, something that hasn't been documented in the Forest of Dean wild boar population but believed by C to be an occurrence in wild boar in the Forest of Dean due to the wild boars' domestic heritage. There were further concerns over the male wild boar and how these animals will become aggressive due to the social hierarchy of male boars:

"Now this is going to happen in the forest, I can assure you it will happen cos you're going to have two major boars meet. Now when they fight one will die, that one that survived with be like a ferocious lion he will take on anything. You gotta mind we've shot them on green pig farm in the yard; we actually had to have one man trained to shoot them. Where they flip, you walk him out; Sammy can be the best animal in the world! And he goes bang because he's been the master boar. And he suddenly smelt where you've walked the floor before."

C is concerned that someone may be walking in the forest and meets a "master wild boar"⁶¹. This gives concern that as the Forest of Dean wild boars are pigs, they will behave aggressively similar to the aggressive behaviour displayed by domesticated pigs in certain situations. As authorities class the wild boar as wild boar, and a tourist attraction, this belittles some of the concerns that these older foresters have over the wild boar. This creates an area of conflict about the wild boar population between authorities and older foresters.

Younger foresters and foreigners

Those who are younger, but still foresters, express differing viewpoints on the wild boar to the older foresters. GM, a born and bred forester like C, thinks that the boar are "*good for the Forest ecosystem, they should be here*". Despite sharing the connection of being born and bred in the Forest of Dean, GM and C's viewpoints differ due to their consciousness of

⁶⁰ Piglets who constantly call for their mother. The mother will do anything to protect the apparently distressed piglet.

⁶¹ A male wild boar in charge of a territory.

the Forest of Dean. C, being older, remembers a time when they and their family could pannage pigs and a time when there were no wild boar within the Forest of Dean, whereas GM was born after 1971⁶² and the wild boar have been present in the Forest of Dean for their adult life. GM further notes that:

“We made boar and many other animals in the forest, extinct in the wild across the UK, many hundreds of years ago, now, rightly, or wrongly, we have re-released them into the wild. We have an obligation to this world, this planet, all its inhabitants, not just the betterment of human beings.”

GM’s view is of stewardship; that reintroducing species is a positive aspect given people’s “obligation to this world”. This quote also shows a difference in viewpoints between GM and C, GM seems to show a global view of wildlife conservation whereas C is concerned with local problems of wild boar in the Forest of Dean. GM has a more global view due to the infrastructure and technological advancements giving a higher connection of the Forest of Dean to outside of the area while GM has lived in the Forest of Dean. Whereas C would not have had as high level of connectivity to outside of the district for the majority of his life. GM went to university out of the county where he would have developed more global views, whereas C went to college in Hartpury⁶³ to learn to become a pig farmer. Their experiences have given rise to GM’s more global view of wildlife management and C’s more introspective view of the management of the Forest of Dean.

RW, another younger forester, presented similar views to GM during their interview, talking about the benefits of the boar:

“I think they’re a great asset to be honest. The rooting in the forest, look here was nothing but this horrible grass. Now you can see it’s changed, and you get bird foraging. The grass [the plant life in general] will always grow back. They’re good for bracken control too. They trample it down to make nests, they take the top off. Year on year they go through an area rooting, which stops the return of it.”

⁶² When the right to pig pannaging was removed.

⁶³ A college, recently turned university, based in Gloucestershire close to the border of the Forest of Dean district.

RW concentrates on the positive ecological effects rather than the aesthetics of the Forest. Their argument is that the wild boar are part of the natural ecosystem and help to control other species that were hard to control previously.

RW, like GM, has been raised in a Forest of Dean more connected to the outside through road infrastructure and digital communication. RW is older than GM but has also been raised in a culture where most foresters did not enter traditional industries of the Forest of Dean (forestry, agriculture, or mining) and would work outside of the Forest of Dean. This has given RW a differing view of the wild boar compared to older foresters. These examples suggest a generational divide between older foresters (over 40 years old) and younger foresters (under 40 years old) which is likely to give rise to disagreement over the wild boar and their management in the Forest of Dean.

Foreigners⁶⁴ appear to have views that sit between those of the older and younger foresters depending on their time within the Forest of Dean. One foreigner interviewee, NF, said that they had noticed the change that the boar had created:

“I think my main [problem] is, to be honest, it’s not even the aesthetics of it, it is the fact that they have changed what the forest is. You know there was a, I don’t want to use the word sustainable because I don’t know what I’m talking about, but there was a cycle that, you know, each year you know bracken fell down and it rotted, things lived in rotten trees, and, you know, the next year the foxgloves came up. The natural flow of thing hasn’t just been disrupted it’s been ruined and there must be things that are disappearing as a consequence of it. Things that I don’t know about; the wildlife the insects the flowers there must be somethings that are disappearing because of the damage that [the wild boar] are doing. That is truly my concern the fact that the forest is completely changing from that to this, and will it be retrievable I suppose, all things are retrievable in nature aren’t they, but when? You know, if they are just allowed to go on and on and on when will it be retrievable?”

In this they show that they feel the boar are not natural to the forest and have ruined the “natural flow” of the forest through the seasons. NF sees the ecological changes associated with wild boar as negative, an opposing view to RW, and more in alignment with the views

⁶⁴ Those who have moved into the Forest of Dean from outside of the area.

of older foresters who are a similar age to NF. By contrast MC felt that the boar are natural and called the Forest of Dean the wild boars' home.

Both NF and MC are foreigners to the forest; NF has been living in the Forest of Dean 25 years while MC arrived only 15 years ago. Again, these views can be categorised from a time perspective. NF had viewed and interacted with the forest before the wild boar introduction in 1999, MC has only interacted with the forest after this date. NF can see changes that the boar have created whereas MC experiences the forest that the wild boar have created. This difference in consciousness of the Forest of Dean has led to different understandings of the forest and the place of the wild boar within it.

Urbanites, counter-urbanites, and outsiders

Those that live in urban areas outside the Forest of Dean or have recently⁶⁵ moved into the area have a different concept and understanding of the wild boar. Urbanites and counter-urbanites will often mistake the wild boar as less of a wild animal but view the wild boar almost as a zoological exhibit. LF noted in the interview that their friends who visited the Forest of Dean called the wild boar "*piggies*" and wanted to take their children to see the wild boar. LF felt that their friends did not consider the wild boar with a serious manner because LF's friends had no real knowledge, or experience of, the wild boar in the Forest of Dean. This ignorance of wild boar and the conflicts with wild boar has caused a divide in the family for M:

"Well, I've got two boys in Gloucester and if I say to our [redacted] or [redacted] y'know these pigs are getting me down, they say 'awh dad don't keep on about it.'"

His adult sons, who are now urbanites, apparently do not care for, and want to stay ignorant of, the problems of their father who is still part of the rural community.

This misunderstanding of the capability of the wild boar to inflict damage to property by urbanites has not only affected relationships between friends and family, but had affected the insurance claim of LF who hit two wild boars with their car:

⁶⁵ Within the last 5 years

"We had it on the dash-cam, the actual impact. And the first few weeks they didn't want to know. And they were like "oo actually you did jump quite a bit, didn't you? It was quite an impact." But no, they weren't aware. The second claims handler we spoke to was like "oo what's that then?" yeah, a huge great big pig!"

Initially those handling their insurance claim were dismissive of wild boar being the sole cause of damage to their vehicle. The handlers did not have knowledge of wild boar and therefore were sceptical of the claim suggesting that LF was trying to commit fraud.

Further to this is the issue with those that do not live in the area but are in favour of the wild boar in the Forest of Dean. OF describes this sentiment with an example of people in Gloucester:

"I mean it's alright for these boar lovers to say, oh you know "wild boar in the forest, lovely!" If I lived in Gloucester, I would say it was a bloody good idea as well! To go into the forest to see wild animals, I should like to see a few wolves and bears as well! If I was in Gloucester. But when you're living in a pig farm it's a different matter."

OF refers to those outside of the Forest of Dean who like the wild boar "boar lovers". OF sarcastically sympathises with people loving wild boar suggesting that he would be the same if he lived in Gloucester, fifteen miles away, where he is unaffected by the damage. This sentiment caused anger towards celebrities endorsing the wild boar population:

H: *It's that great chump Hugh Fearnley-Whittingstall I think is behind all this*
Agreements from the room

H: *Because he's been in the forest and made a film about it hasn't, he?*
More agreements and mentions of Countryfile⁶⁶.

H: *And he said this is a wonderful opportunity for the Forest of Dean and it's something that should be encouraged as a national something or other.*

R: *Boar centre or whatever*

C: *Yeah, but nobody has sat down and looked at the aftermath, like I said there. We, well everybody in this room, has had a nice rise on their council [tax].*

⁶⁶ A popular BBC television programme about the British countryside

The interviewees here felt that the celebrity (Hugh Fearnley-Whittingstall) did not fairly represent the true extent of boar damage in his television show “Hugh’s Wild West” which celebrated the wildlife of the west of England. To further this they mention a rise in council tax to pay for community damage that has occurred due to wild boar activities such as desilting drains and repairing verges and hedgerows. Hugh Fearnley-Whittingstall, despite acknowledging that boar damage does occur, did not fully cover the potential dangers of the wild boar in his television episode on wild boar.

However, these dangers were noted by other outsiders and urbanites after encountering wild boar. One questionnaire respondent remarked:

“My friend (a Londoner) was relieved there was a fence between us.”

Another respondent after their first encounter with the boar noted:

“Very shortly after moving to the Forest of Dean, I was driving home after a work meeting, and I had to brake for a wild boar and then a fawn in quick succession. I thought 'you're not in London anymore.'”

This is reflected in LF’s friends, who once encountered the wild boar, thought the wild boar were terrifying and did not wish to visit the Forest of Dean again. These show that those who reside outside of the Forest of Dean fail to understand the wild boar and the dangers that the animals create. This has led to misunderstandings between those outside and those who do reside within the Forest of Dean⁶⁷ causing resentment and frustration within those who reside within the Forest of Dean.

7.1.3 synopsis

There are as many classifications and concepts of the wild boar as there are classifications of people living within or visiting the Forest of Dean. Those foresters interviewed who were older classified the wild boar as an introduced species which has negatively impacted the Forest of Dean and the ecology within it. Younger Foresters classify the wild boar as natural and a reintroduction, giving the wild boar a right to be in the Forest of Dean, which is positively affecting the Forest of Dean and the ecology within it. Those who are foreigners

⁶⁷ Whether forester or foreigner.

share either viewpoint depending on their time spent in the Forest of Dean; those who have lived in the Forest of Dean before wild boar were established share the views of older foresters, and those who have not share the views of the younger foresters. This difference stems from knowledge and experience of the Forest of Dean before wild boar, those who have knowledge and experience of the Forest of Dean before wild boar view this version of the Forest of Dean as favourable. Those who do not have this knowledge and experience do not have this reference point and therefore do not have this view.

Urbanites and those who have not experienced the wild boar and live outside of the Forest of Dean seem to view the boar as friendly pigs, an attraction to visit. This creates a duality of the definition of a pig. Older foresters who claim the boar are mere pigs, do this as a tactic to show the dangers of the wild boar, while outsiders who see the wild boar as pigs do not regard them as dangerous. Therefore, the classification of “pig” has two highly different connotations depending on the user of the phrase. When non-celebrity outsiders meet wild boar, they are surprised by the wild boar and become aware of the dangerous nature of the wild boar and understand the viewpoints of those living within the Forest of Dean. Differing experiences give differing views on the Forest of Dean wild boar, understanding experiences is crucial to understanding conflict with, and surrounding, wild boar in the Forest of Dean.

7.2 Conceptualisation of the Forest of Dean wild boar.

The previous section explored what groups of people classify the wild boar as; native/non-native, introduced/reintroduced, wild boar/pig. This section reviews questionnaire data to explore people’s ambivalent and contradictory concepts of the wild boar through people’s descriptors of the wild boar and the language used to describe their experiences with these animals. Furthermore, people’s emotions surrounding wild boar encounters will be reviewed to understand what makes an emotionally good, neutral, or bad experience with wild boar in the Forest of Dean. In total there were eighty-six negative responses to wild boar, sixty-five positive responses and forty-two neutral responses, with those who did not answer were omitted from the results.

7.2.1 Descriptors of wild boar

Words used to describe the Forest of Dean wild boar were compiled from questionnaire respondents' descriptions of their interaction with the wild boar, categorised by type of interaction⁶⁸, and listed in order of most used to least used for words (Table 3).

Table 3: Descriptors of wild boar ordered from most used to least used and grouped using the type of experience; negative, neutral, or positive.

negative interaction wild boar descriptors	Neutral interaction wild boar descriptors	Positive interaction wild boar descriptors
large	Surprisingly large, ginormous	timid
aggressive	Huge, strong	amazing sight
damaging	Not aggressive	natural
dangerous	Fine	wild animals
intimidating, threatening	Not bothered	inquisitive,
protective	Tame	intelligent, social
unpredictable, unexpected	No threat	placid
annoying, offensive		private
benign		peaceful no threat
bold		out of the ordinary
confident		natural, indigenous
docile, unaggressive		cuddly to people, vicious to dog
killer, maunder		beautiful
powerful		
trundling		
unafraid		
uncontrollable		

Those that had a negative interaction with wild boar built a negative concept of the wild boar. The wild boar in the Forest of Dean are seen as large, aggressive, intimidating,

⁶⁸ Categorised in the human wild boar interactions chapter.

and unpredictable beasts that worry and scare users of the Forest of Dean. This further creates a concept of the Forest of Dean being an intimidating place to enter for these respondents. Four and a half percent of questionnaire respondents who had a negative interaction with wild boar mentioned they would not visit the Forest of Dean due to the wild boar, and a further 8.1% of respondents changed their behaviour while in the Forest of Dean due to wild boar presence and activity.

Those who had a neutral interaction with wild boar in the Forest of Dean most commonly mentioned the large size of wild boar and the strength of wild boar. This is similar to those who had negative interactions. However, those who had neutral interactions also used antonyms to the negative group such as “no threat” and “not aggressive”. Both groups agree that boar are large but disagree on their behavioural traits. Those who had a neutral interaction with the boar view the boar as large unthreatening animals either tame or not bothered by people.

Many of the descriptors of wild boar used by those who had a positive interaction with wild boar are contradictory of the descriptors used by those who had negative interactions with the wild boar. Positive interaction respondents called the wild boar timid, placid, and peaceful whereas those who had negative experiences most commonly labelled the boar as large and aggressive. Respondents who had a positive experience with wild boar labelled the wild boar as inquisitive and intelligent; such behaviour could be interpreted as boldness and confidence, two labels from the negative respondents, showing the duality of interpretation of the wild boar actions. One positive respondent admits that even though the boar was “cuddly” to people but was vicious towards their dog. Again, this is similar to negative interaction respondents who gave accounts of their dogs being chased or injured by wild boar. Positive interaction respondents used similar language to describe the boar as neutral interaction respondents in that the wild boar were no threat and peaceful. Those who had a positive interaction with the boar view the boar as natural, placid, or timid, non-threatening and beautiful. These respondents had a mix of both close and distant encounters with the wild boar.

Those that had positive interactions did not mention the size of wild boar in their responses. This may be due to knowledge of the size of wild boar; therefore, the size was

not a key point to discuss. Whereas those who had negative or neutral interactions did not know the size of wild boar and therefore the large size of wild boar was a surprise and a point for discussion.

7.2.2 Emotional responses to the wild boar

Sixty nine of the eighty-six respondents who described negative interactions with the boar gave adjectives describing how they felt when meeting the boar (Figure 22 **Error! Reference source not found.**). The most popular adjectives for describing how the respondent felt were “nervous” (17.50%), “scared” (16.25%), worried (12.50%) and “frightened” (11.25%).

Nine respondents who had neutral interactions with wild boar in the Forest of Dean gave descriptions of their emotional response to the wild boar (Table 4). There is a lack of fear from these respondents, however those who did express what could be viewed as a negative emotion also stated that they felt safe or not scared.

The positive interaction group had the highest proportion of respondents to give an adjective about their emotion when encountering the boar (positive: 87.69%, negative: 80.23%, neutral: 21.43%). The most often used adjective was “excited” (22.08%) with “privileged” (9.09%) second and “awe” (5.05%) third. Those who had positive interactions had a highly positive emotional responses to interacting with the wild boar (Figure 22).

Table 4: List of emotions and feelings from questionnaire respondents when they had neutral interactions with wild boar.

Emotional response
Respect, perhaps fear
Ready to react but not scared
Unnerved but safe
Not frightened
Used to the boar
Neutral
Wary of own actions
Not bothered
Weary but ok

These data show that there are several differing emotional responses when interacting with wild boar in the Forest of Dean. Those who had negative interactions describe their experience from a level of mystery, or ignorance, about the wild boar. They describe fear, nervousness, being scared, frightened, or intimidated. Those who had negative interactions did not necessarily know what the wild boar were doing, or going to do, in their interaction. These aspects suggest respondents feel a sense of lack of control of the situation when interacting with wild boar.

Positive interaction emotions suggest there are no issues around control of the interaction, but rather potentially that wild boar and the respondent were equals in the interaction. Their emotions do not portray uncertainty about the outcome of the interaction but an excitement and privilege to have had it. Some of these respondents discussed being unthreatened, which suggests that there is a narrative and expectation of being threatened by wild boar in the Forest of Dean. This expectation and narrative could be influenced by a number of factors including size of wild boar, observed behaviours or previous negative publicity about aggressive wild boar.

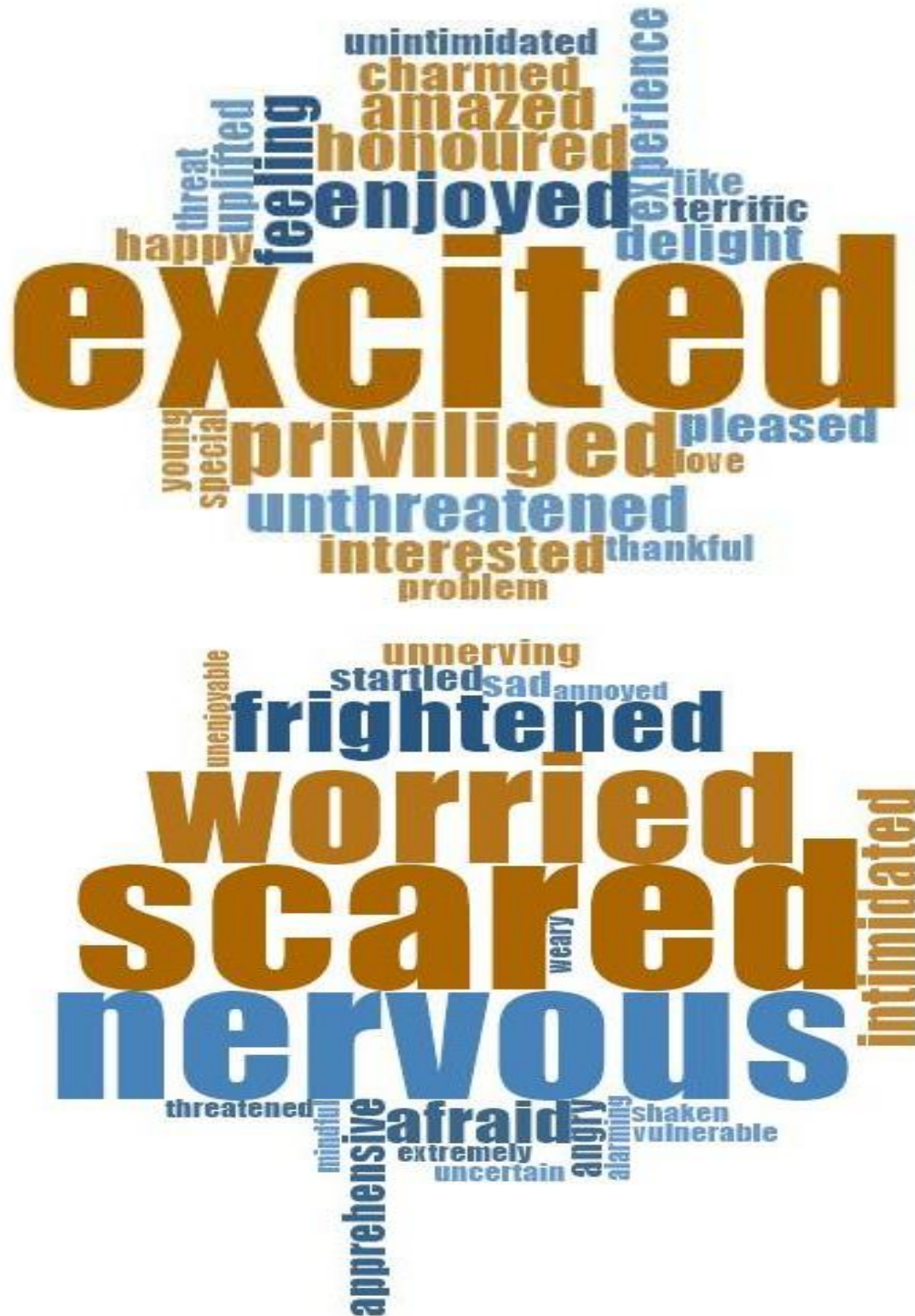


Figure 22: Comparative word clouds created in NVivo 12 Pro giving a representation of the proportions of positive emotions (top) and negative emotions (bottom) from questionnaire respondents when interacting with wild boar.

7.2.3 synopsis

These data from the questionnaire give an indication of the contradictory concepts of the wild boar in the Forest of Dean held by those who have interacted with the wild boar. Those who have had negative interactions with the wild boar are more likely to use negative descriptors of the wild boar within their narrative surrounding the wild boar in the Forest of Dean. Conversely those who have had positive experiences will likely use more flattering descriptors in their narratives around wild boar in the Forest of Dean. This corresponds to findings by Castillo-Huitrón et al. (2020) where discussion of emotions surrounding wildlife found similar connections. Respondents who had negative or neutral interactions were more likely to comment on the size of wild boar than respondents who had a positive interaction. Those who had negative interactions used language of uncertainty within their emotive response, whereas those who had positive interactions did not use uncertain language. This suggests that those who had positive interactions were more certain and knowledgeable about wild boar compared to those who had negative interactions. Therefore, increasing knowledge may reduce negative interactions and conflict with wild boar in the Forest of Dean.

Respondents who had positive interactions were more likely to categorise the wild boar as natural or Indigenous, whereas those who had negative interactions labelled the wild boar as over numerous or uncontrollable suggesting that the wild boar are less than natural in behaviour and numbers. Those who had neutral interactions did not comment on these aspects of the wild boar. This is reflected in research on language around blue catfish by Orth and Schmitt (2018) which also suggested interactions with a species affects language used about that species.

Understanding the language used allows for understanding human-human conflict surrounding the wild boar. When two people with opposing concepts and emotions surrounding the wild boar meet, they will likely argue over whose concept is more correct. Language is likely to perpetuate misunderstandings about why people feel certain emotions to wild boar, their standpoint on the wild boar population and the management of the wild boar population in the Forest of Dean.

7.3 Chapter conclusions

Study participants have different classifications and concepts of the wild boar. Those who had negative interactions with wild boar are more likely to suggest that the wild boar were illegally introduced and therefore not indigenous. Those who have had a more positive experience with the wild boar class the boar as indigenous and a reintroduction. This shows that interaction with boar influences opinion on their classification. Conejero et al. (2019) found similar aspects of interaction and perception of wild boar in Barcelona. Interaction, or incidents, with wild boar was the main driver for perceptions of wild boar. These data and the Barcelona study reflect research on other species where interaction has affected emotions and therefore concepts of species (Orth and Schmitt, 2018, Castillo-Huitrón et al., 2020).

The concept of wild boar in the Forest of Dean as a nuisance or invasive species was held by those people whose residence preceded the wild boar establishment. These people had consciousness of the Forest of Dean before wild boar and therefore perceived the wild boar as a driver of change in the area. The wild boar have changed these people's use of the area. The people have either stopped their use of the Forest of Dean as a whole or certain areas through fear of the wild boar. In Yellowstone national park the reintroduction of wolves was viewed in a similar vein where the reintroduction had been perceived to remove the right of use or accessibility of the national park (Scarce, 1998). Interviewees who are younger foresters or have started living in the Forest of Dean after the boar were introduced see the boar as native to the UK and support the reintroduction. This is due to a less local view and potentially a more global view of wildlife management. However more global views can cause issues if local aspects are not considered and addressed (McDonald et al., 2015). Those who live outside of the Forest of Dean view the wild boar differently to those who live within the Forest of Dean. A difference of views between local and non-local has been seen in various wildlife scenarios and can be a driver for conflict (Wilson, 1997, Nilsen et al., 2007).

However, both locals and non-locals who had negative interactions with the wild boar agreed in their conceptualisation of the wild boar and that wild boar changed their use of the Forest of Dean. These findings aligning with results from Munro et al. (2017) who

found that despite diverse views and values there will be some alignment between locals and non-locals. There are groups of locals and non-locals that call the wild boar pigs. Certain non-locals were using the term in an endearing, but ignorant, way. In their view the wild boar were just like domestic pigs and could be visited and viewed safely. This delegitimises the wild boar as a true wild boar in the same way that the commoners were using the term to delegitimise the population. The commoners used the term pigs to delegitimise the wild boar and create a narrative that the Forestry Commission were pannaging the wild boar despite fifty-year-old legislation prohibiting pannaging, therefore the wild boar population should be removed. The official classification of the wild boar is that they are an established illegally introduced wild boar population and un-owned⁶⁹ like deer populations in the Forest of Dean (DEFRA, 2008, Stannard, 2018). These disagreements between management authorities and locals are seen worldwide across multiple species (Scarce, 1998, Mutanga et al., 2015, O'Rourke, 2014).

These potentially conflicting concepts of the wild boar population, its status as introduced or native, and the reality of interactions between wild boar and different people have caused divides between members of the community within the Forest of Dean, authorities and the groups within the Forest of Dean, as well as divides between those inside the Forest of Dean and outside of the Forest of Dean. This divide appears when the wild boar are discussed. Those that had negative interactions were likely surprised by the size of wild boar and uncertain about the wild boar's behaviour and therefore their safety. Increasing knowledge of wild boar may be beneficial to increase positive interactions and positivity around the wild boar.

⁶⁹ As defined in the Dangerous Wild Animals Act 1972.

8. Wild boar in the media

News outlets can act as opinion formers where news consumed will reinforce or challenge opinions to change (Reah, 2002). News outlets can cause confirmation bias where information presented is less thoroughly scrutinised (Klayman, 1995) and disconfirmation bias where information is more extensively scrutinised (Edwards and Smith, 1996). Therefore news outlets are an important factor to consider when evaluating the formation of opinions and views within human-wildlife conflict (Corbett, 2006).

The portrayal of wildlife and wildlife conflict has been extensively researched around the world with a consensus on the importance of media messages (Lunney and Moon, 2008, Hart et al., 2011, Lyngdoh et al., 2017). In New York State the perceived risks of black bears (*Ursus americanus*) was amplified by local media articles causing acceptance of the species to decrease with exposure to a neighbourhood watch newsletter (Gore et al., 2006). Gandiwa et al. (2014) found that international news outlets created “myths” around wildlife conservation in areas of political unrest in Zimbabwe. International news articles connected political unrest to land use and conservation where there were no connections. Linked to this, Lunney and Moon (2012) found that in some case news outlets and journalists would not approach scientists and researchers for their view nor review the scientific and research reports on the subjects being reported upon. This has been seen to be reflected in social media responses, where more ecological or scientific responses were not praised as highly as non-scientific comments (Fidino et al., 2018). Media favours negative emotional contents of stories (Cho et al., 2003) with television amplifying these aspects in coverage of stories (Glasner, 1999). Further to this, articles that are short and eye-catching with a sensational photo have a higher potential to mislead readers where information is not correctly parsed by the reader (Lunney and Moon, 2008, Corbett, 1995).

The framing of species can be divisive. Dayer et al. (2017) found that piping plovers (*Charadrius melodus*) were portrayed as the driver for conflict more than policy makers as a protagonist of conflict rather than a species existing alongside humans. This anthropomorphises the animal and gives negative intentions to their actions, rather than that of pure existence. This can create an “us versus them” attitude to wildlife where animals are seen as a protagonist (Jones, 2017, Baranovitch, 2021) allowing for the creation

of a narrative of an animal which is purposefully creating conflict rather than passive conflict creation through the species existing alongside humans (Anand and Radhakrishna, 2017). The us versus them narrative can be further fuelled through the duality of portrayal, or framing, of species as either dangerous or lovable such as dingoes in Australia (Hytten, 2009) and Eurasian badgers in the UK (Cassidy, 2010, Cassidy, 2012).

There is potential for different messages to be pervasive in different areas. Corbett (1995) found that rural media coverage of species was more utilitarian, an economical use of wildlife (Conover, 2002), and urban media coverage framed wildlife through human stewardship. This differs from Lyngdoh et al. (2017) study in India which showed there was no difference between national, regional, and business news reporting on species, but that the media preferred controversy. However, these differences may be due to cultural differences between USA and India. Finally, the effect of celebrity has been shown to affect wildlife issues positively. The famous Australian zoo owner and environmentalist Steve Irwin's death created an increase in worldwide discussion on wildlife issues and donations to wildlife causes (Brown, 2010). The use of celebrities in conservation allows for higher willingness by the public to engage with conservation (Duthie et al., 2017) and increases funding for conservation (Sullivan, 2011).

Due to the divisive nature of the wild boar, the animals have been extensively reported upon in local newspapers and reviewed in national newspapers and television. This chapter will explore the relationships between people and the media in relation to the wild boar in the Forest of Dean. It will examine questionnaire respondents' answers to what they see in the media about wild boar which will be compared to their opinions of the wild boar to examine whether (1) the media outlet may have affected their opinion of the wild boar, (2) the articles viewed affect their view on the news outlets, and (3) the media articles align with their views and perception of the wild boar. The chapter will further review wild boar in television programmes mentioned by study participants and social media pages based on the wild boar in the Forest of Dean. This will allow exploration of how views of the wild boar are portrayed through these media and how these views and perceptions in the media align with study participants' views and perceptions of the wild boar in the Forest of Dean. Studying the interaction between people and the media will give further information about

how people's views about the wild boar are influenced and the discourse surrounding the wild boar.

8.1 Local newspapers

There are two local newspapers in the Forest of Dean district: *The Forest of Dean and Wye Valley Review*⁷⁰ and *The Forester*. There are also two main county newspapers: *The Citizen* and *Gloucestershire Echo*. *The Review* and *The Forester* are low-cost weekly newspapers. *The Citizen* was published 6 days a week until 2017 where it became a weekly newspaper. It is produced in Cheltenham and covers the whole of Gloucestershire but has a Forest of Dean edition. *Gloucestershire Echo* is also a weekly newspaper based under the same company as *The Citizen* in Cheltenham but does not have a Forest of Dean edition. *The Citizen* and *Echo* are both more expensive than the Forest of Dean newspapers. Questionnaire respondents were asked which local newspapers they read and could give multiple answers.

The Review was most widely read by those who responded to the questionnaire (117 of 171 respondents), *The Forester* was second highest with 65 of 171 respondents and those who did not read any newspaper were third highest with 33 (Figure 23 **Error! Reference source not found.**). The favourability of these newspapers may be due to their lower price and more local relevance. This could also be the result of the involvement of the local newspapers within the community and campaigns such as HOOF⁷¹, or as some interviewees noted that when they relocated to a house in the Forest of Dean the local newspapers were already delivered to their residence.

⁷⁰ Sometimes referred to as "*The Review*".

⁷¹ Hands Off Our Forest campaign, see chapter on conflict for more details.

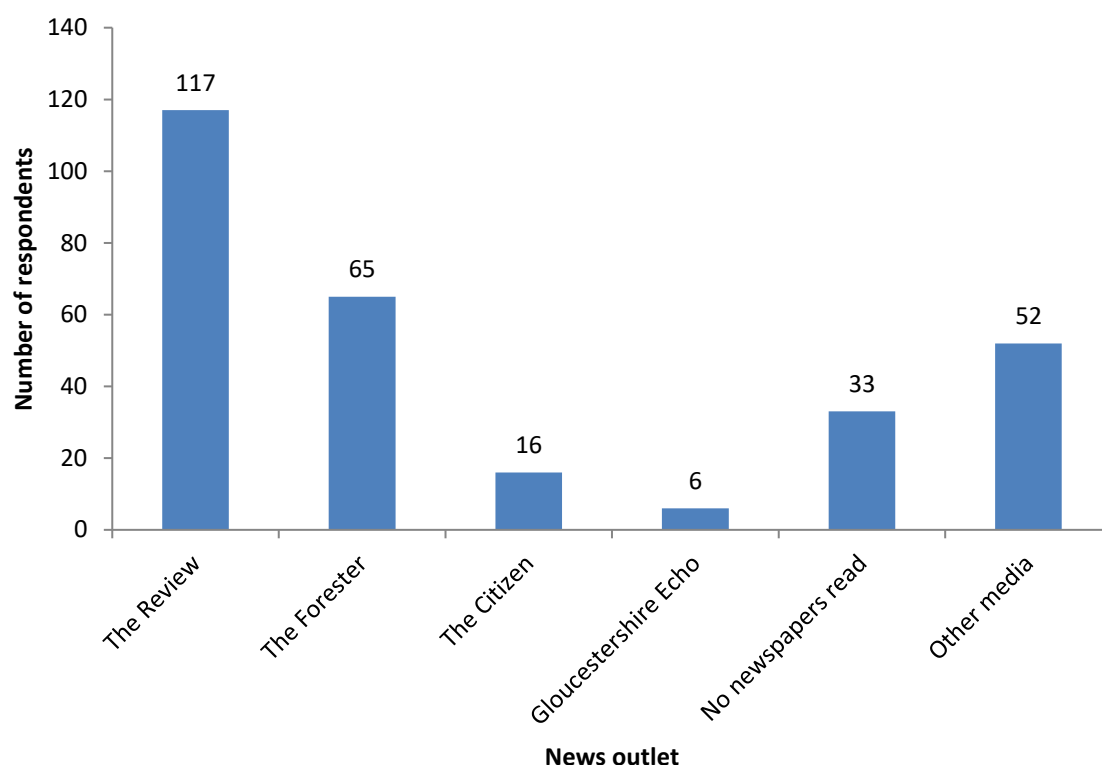


Figure 23: Graph showing the readership of each newspaper and consumption of other news media of questionnaire respondents (N=171).

Nineteen percent (33 of 171) of respondents did not read local newspapers which is likely a result of the global decline in newspaper readership (Peiser, 2000). Fifty-one questionnaire respondents noted that they had received information about the wild boar in the Forest of Dean through other media sources such as radio, social media and television.

8.1.2 Wild boar in the media

Study participants were asked “what news articles relating to wild boar have you read/watched on TV/listened to on the radio recently? What were the main messages about the boar?”. Questionnaire respondents’ responses were categorised into five message themes: positive, negative, mixed, none/no message, and other. Positive articles were where they had explicitly stated that the media report had given positive character traits to the boar such as being an asset or native. Negative media main messages were categorised if the respondent had said that media articles, they had viewed talked about negative aspects such as damage or attacks. Mixed articles were categorised if they had mentioned both negative and positive traits. The other category is for those who had answered what

media they had viewed on the wild boar, but the article did not fit a positive, negative or mixed message. The no message category is for those who hadn't seen any media on the wild boar recently.

The media was seen as significantly negative toward the wild boar, $\chi^2=151.407$ (d.f.=4), $p<0.001$, with over half of respondents noting negative media surrounding wild boar (Figure 24). The 8.80% who are labelled as other discussed traits that could be labelled as either positive or negative depending on the standpoint of the reviewer such as population growth⁷².

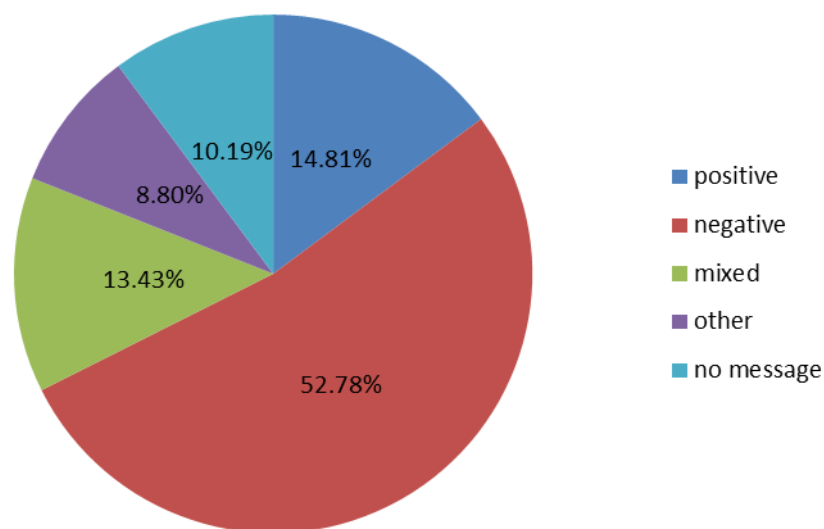


Figure 24: Pie chart of percentages for each type of media message seen to be given by the media according to questionnaire respondents (N=171).

There is a relationship between news outlets and the type of media messages presented by those news outlets, $\chi^2=172.258$ (d.f.=20), $p<0.001$. Local newspapers were perceived as more negative towards wild boar and other, non-local, media outlets are viewed as more positive towards wild boar in the Forest of Dean (Figure 25).

The contrast between local newspapers and other media could be explained through who and how these messages were communicated. Newspapers have been found to favour a negative news story over a positive story (Weigman et al., 1989, Brants and Voltmer, 2011) which is shown in the four newspapers read by study participants. In the “other

⁷² Population growth is a positive trait for boar supporters and a negative trait for those who do not like the wild boar.

media” category the main media mentioned were television shows; one called *Hugh’s Wild West*, and the other called *Countryfile*. Both of these programmes aired on BBC during the period of this study. One episode of *Hugh’s Wild West* saw the presenter Hugh Fearnley-Whittingstall visiting the Forest of Dean to view wildlife. During Hugh’s visit he entered the Forest of Dean with a local photographer to view wild boar. Hugh spent most of the section on wild boar praising their increase in population in the Forest of Dean and briefly mentioning some of the damage caused by the boar. *Countryfile* also gave a positive perception to the wild boar. This creates a partition of how people view the wild boar; outside of the Forest of Dean people are being shown a more positive perspective of the wild boar, and those inside the Forest of Dean who read newspapers are being shown a negative perspective on the wild boar.

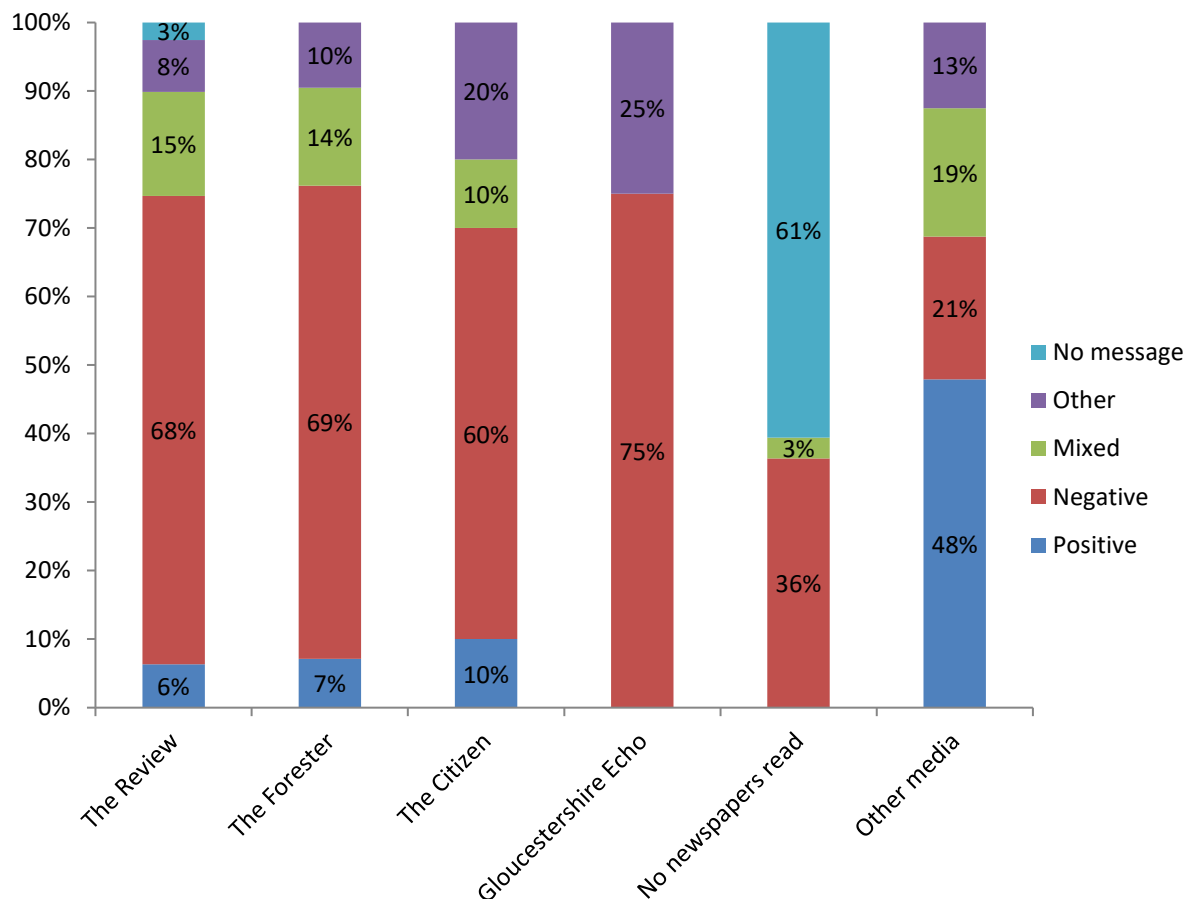


Figure 25: Percentage perceived category of media message about wild boar per news outlet.

Although there was a difference between local and non-local media observed by respondents, the effect of these media messages on those who had viewed them seem

minimal. Comparing whether respondents feel safe within the Forest of Dean with wild boar present and what media messages respondents have viewed using a binary logistic regression showed that those who viewed negative media messages were significantly associated with feeling safe in the Forest of Dean with wild boar present (Table 5, Figure 26). However, there were no other associations between media messages and feelings of safety.

Table 5: Binary logistic regression results for media message category and perception of safety.

<i>Media message</i>	<i>B</i>	<i>S.e.</i>	<i>Wald</i>	<i>Df</i>	<i>Significance</i>	<i>Exp (b)</i>
Mixed	.575	.583	.973	1	.324	1.778
Negative	1.114	.479	5.401	1	.020*	3.048
No message	.310	.569	.297	1	.586	1.364
Other	-.560	.748	.560	1	.454	.571
Constant	.000	.408	.000	1	1.000	1.000

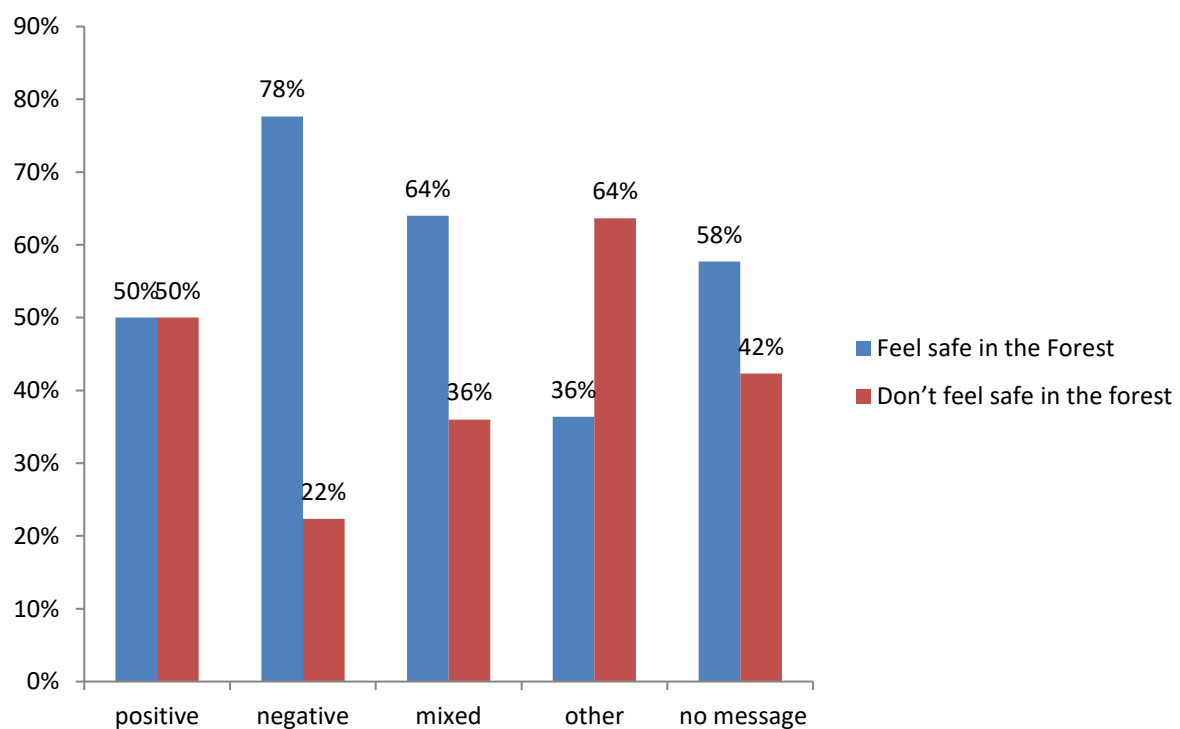


Figure 26: Graph depicting the proportion of perception of safety given each category of media message (N=171).

These results seem contradictory, it would be expected that negative news articles would reduce a sense of safety in the Forest of Dean with wild boar present. This contradiction may be due to negative effect and disconfirmation bias. Those respondents that viewed negative information are more likely to remember this information than they

are positive information (Martijn et al., 1992, Gruhn and Scheibe, 2007) and therefore recall the negative article when asked. Respondents are more likely to scrutinise information that contradicts their views (Edwards and Smith, 1996), which will also assist memory and recall of that information. This could also explain the equal split in views on safety for positive messages.

These biases are seen when the wording of some responses were analysed. Some of those who felt safe claimed the negative articles were “scaremongering”. Those who saw positive articles but do not feel safe with the wild boar in the Forest of Dean claimed the positive articles were written by “boar-huggers” or commented on the fact that the author of the article do not live in the area. This feeds further into the narrative of wild boar being a divisive species. Some of those that responded are categorising and drawing dividing lines of “scaremongers” and “boar-huggers”. These divisions are also extended into conflict between those who live in the Forest of Dean with the wild boar and those who live outside the Forest of Dean without wild boar.

8.1.3 Synopsis

These results show that news outlet messages about wild boar in the Forest of Dean differ depending on the scope of their audience; regional news outlets gave more negative aspects to the wild boar whereas national news outlets were more positive. This differs from the study by Lyngdoh et al. (2017) who found that the scope, from local to national, of a news outlet did not change the message presented about a species. This may be due to cultural differences in viewpoints on wildlife between India and the UK, or differences in media practices. The difference found in this study is similar to findings by Corbett (1995) where there was a duality of framing of messages between rural and urban communities. Local newspapers will be read by rural and peri-urban residents where national newspaper articles will likely be consumed by more urban audiences. The results of national media, especially television shows mentioned by respondents, as being more positive contradicts findings by Glasner (1999), which suggests a change in the use of televisual media to present wildlife more positively to aid conservation efforts (Sullivan, 2011).

Data suggested that media messages had limited effect on sense of safety in the Forest of Dean for respondents with only negative messages correlating to a feeling of

safety. This contradicts the findings from Gore and Knuth (2009) that negative news reports increased risk perception and therefore decreased feelings of safety. National media on wild boar was presented through celebrities which could be increasing the influence of this media on viewpoints on wild boar (Sullivan, 2011). Further research is needed to understand the full effect of media on non-locals to review whether there is a correlation between national media and feelings of safety in the Forest of Dean with wild boar present.

8.2 Wild boar in social media

Study participants did not discuss social media when asked about where they had read articles relating to wild boar in the Forest of Dean. However, social media has become more important in everyday life with more people acquiring information from social media than from newspapers and television (Correa et al., 2019). It has become a platform for people and interest groups to promote their opinions to a wide receiving audience (Gil de Zuniga et al., 2012). This section will use qualitative analysis to review messages from three groups on the social media site Facebook and the discourse surrounding these groups about the wild boar in the Forest of Dean. This is compared to other rhetoric surrounding the wild boar and published reports to understand the controversy between these groups, local people and authorities. *The Boaring Truth* is a group formed to help people “Learn about wild boar in a, totally independent, family friendly environment”. *Boar Solutions* is a bipartisan group formed to promote solutions to problems concerning the wild boar conflicts. *Forest of Dean Wild Boar Cull Saboteurs* is a group who are devoted to restricting culling efforts and promoting an unmanaged Forest of Dean wild boar population. These three groups were selected as they were the most prominent groups at the time of data collection and were mentioned by study participants.

8.2.1 The Boaring Truth

The Boaring Truth has over three thousand “likes and people following their page on Facebook, the group also have their own dedicated website, leaflets and merchandise. The group is open to people residing within and outside of the Forest of Dean with the group stating that their three aims are to:

1. *Build an honest platform where anyone can learn about wild boar and gain a true understanding of this species and #beboaraware.*
2. *Liaise with local and national media outlets to provide a truthful balanced account of wild boar, in the UK, through text, photo and videos.*
3. *Give only facts about wild boar. Counter the scaremongering with the truth and allow readers to make up their own opinion.*

These aims provide an insight into the discourse surrounding the wild boar within the media. In their second aim they state that they want to promote “*truthful balanced account of wild boar*” and to counter “*scaremongering*”. This shows that they believe that people and the media are untruthful about the wild boar by being overly negative towards the population of wild boar within the Forest of Dean. This coupled with the word “truth” in the group’s name suggest that they feel, and gives the impression, that they are more honest than other media outlets when it comes to information about the wild boar.

The Boaring Truth group acknowledges that rooting takes place, but label rooting as “field signs” and describe rooting positively:

“Turfs of grass are turned over as the wild boar root for food. This can have a very positive effective on the soil and other surrounding wildlife, especially in winter as it helps the birds/small mammals feed when the ground is frozen.” *The Boaring Truth* (2019b)

The group seem to ignore that rooting is seen as damage by many people within the Forest of Dean and the effects rooting behaviour has on these people. The group, which state “truth” in their name, suggest that rooting is positive for wildlife and that rooting is not negative, however this has not been fully proven (Bueno and Jiménez, 2014, Sims, 2005). This, coupled with their statement to combat scaremongering, suggests that those who complain about rooting damage are scaremongering and being untruthful about the extent of rooting damage. On their webpage “An introduction to wild boar in the Forest of Dean” the group state:

“To form an opinion on anything you need to be armed with the facts... here is a short introduction to wild boar, and some information about this special species that inhabits the Forest of Dean, and UK. we will go into more detail in other pages on this website. The wild

boar (Sus scrofa) is a true native species to Britain. Historically they were a favourite festive meat for Royals, because of this, and as a result of hunting, they became extinct across Britain during the 13th century. Throughout Europe, over many centuries, it has been almost unheard of for wild boar to become aggressive towards well-meaning humans.” The Boaring Truth (2019c)

This statement is followed by uncited facts about wild boar physiology and behaviour. But this opening paragraph gives a further insight into the rhetoric being used by the group. The group use the words and phrases “*special*”, “*true native*” and “*favourite festive meat for Royals*” to describe the wild boar. This gives the wild boar in the Forest of Dean a higher status compared to other species that inhabit the Forest of Dean. The group then vilify those who complain of attacks stating that wild boar don’t attack “*well-meaning humans*”, thereby implying those people that have been attacked weren’t well-meaning. This is labelled under facts, giving the reader a sense that it is true, especially as it is from a group with “truth” in their name.

On social media the group posts pictures of young wild boar⁷³ with slogans and sentences, sometime attributed to a famous person, to push a pro-wild boar agenda. Many of these sentences attribute negativity towards the human race, such as killers and nature destroyers, and give positive traits to wild boar through association of the sentence with a picture of a wild boar, such as natural, or a victim of man’s persecution (The Boaring Truth, 2019e). These are supported through quotes from presenters of wildlife television programmes who praise the introduction of wild boar in the Forest of Dean.

The group further scrutinise those who are seen by the group as “anti-boar”⁷⁴. The MP for Hereford and South Herefordshire authored an article for a local newspaper about their worries about the boar moving north into Herefordshire. The MP calls the boar a “menace” and describes the problems that the Forestry Commission have in controlling the population and problems that could be soon faced by those living in south Herefordshire due to the culling encouraging the wild boar to leave the confines of the statutory forest

⁷³ Young wild boar: both infant and juvenile wild boar.

⁷⁴ Anti-boar: those who have a negative viewpoint on the wild boar in the Forest of Dean.

(Norman, 2019). The group shared the MP's article on Facebook and attacked the MP and their post about the article:

"This regressive uneducated type of outburst only further confirms why some politicians are contributing to the demise of the planet. Had the MP, who probably never sees wild boar, done his research he would know they are a positive factor in a healthy ecosystem. Or is he simply jumping on the band wagon of a very few farmers who cannot adapt to wild boar? We have been asked to respond and we will be doing so, very honestly, later today." The Boaring Truth (2019d)

The group invite the MP to walk with them within the Forested area to show where the boar are a "menace" (The Boaring Truth, 2019d). This puts the burden of proof on the MP, but also invites the MP to an area where there is likely no sign of "menacing" behaviour to push a view that the MP's message is hyperbole. The letter further critiques Forestry Commission culling of the wild boar, noting that it encourages the wild boar to leave the confines of the forest into human settlement⁷⁵.

A second letter from *The Boaring Truth* was posted on their Facebook page in response to the news that there is going to be an increase in Forestry Commission rangers to aid culling efforts (The Boaring Truth, 2019a, BBC News, 2019). The group call the increase a *"snap decision; a decision which would appear to be cowering in response to scaremongering by the farming industry regarding the threat of African Swine Fever"*. They go on to create safety fears:

"But now we can't help but fear for the safety of visitors, dog walkers, cyclists and locals, with 6 people walking around a public forest with loaded guns every day, that's without all the illegal guns in the woods from illegal poaching." The Boaring Truth (2019a)

These statements are incorrect. There were six Forestry Commission rangers within the Forest of Dean to cull wild boar and deer before 2019, but this number reduced due to threats from anti wild boar cull groups threatening rangers, causing the rangers to leave their employment (Stannard, 2018). This means that the proposed increase is actually a return to full numbers of rangers. Further to this the Forestry Commission use rifles with

⁷⁵ The cull affecting wild boar movements is discussed in the wild boar management chapter.

infra-red cameras and perform the cull over at night when there is less human activity (Stannard, 2018). Therefore, the second part of the statement is also misleading.

The group label themselves as the “truth” but post more opinion and hyperbole than truth on their website and social media. The group almost glorify wild boar and vilify those who manage the wild boar in the Forest of Dean or see the wild boar as a menace. The group mix factual information in with opinion to further push their agenda. The group has a wider audience through their higher social media presence and allows a reader who is pro-boar⁷⁶ to confirm their beliefs.

8.2.2 Boar Solutions

Boar Solutions is a group that was founded in 2016. It started as a group of pro-boar and anti-boar members in an effort to find a common middle ground on what is seen as increasing wild boar problems. The group have a Facebook page with around 250 members which:

“will only admit residents of the Forest of Dean, as this is a local matter unless they are offering financial assistance, expertise or are members of the press.” Boar Solutions (2019)

The group posts updates on their work to resolve wild boar issues claimed by local residents. The group also provides a platform for questions and opinions about the wild boar to be put forth and answered by other members in the group. The group’s main messages are to “be boar aware”, “do not feed the boar” and “shut the gate”⁷⁷.

Boar Solutions does not post pictures of wild boar with insightful phrases. The Facebook page of boar solutions has very few posts which are generated by the members of the group. These posts are local people asking for help, showing news articles, useful information, or pictures from wild boar encounters⁷⁸. The posts are mainly positive towards wild boar, but there are other posts which will show damage or discuss the legitimacy of the wild boar population. These posts are not vilified but open discussion is encouraged in the group. This shows more of a community spirit to the group than that of *The Boaring Truth*.

⁷⁶ Pro-boar: those who view the wild boar as a positive in the Forest of Dean.

⁷⁷ Many people have had issues with boar entering their land due to a gate onto their property being left open.

⁷⁸ Posts are not able to be included due to the group’s rules on the use of their content.

This could be due to the restricted membership and posting of content by the members of the group rather than centralised communications from those that run the group.

Due to the policy of only admitting residents of the Forest of Dean the group does not have a wide audience and is not well publicised. This gives a comparatively small audience compared to *The Boaring Truth*. The group was founded to promote discussion and solutions and therefore does not promote either opinion which allows for solutions to be discussed. This again is in contrast to that of *The Boaring Truth* who create articles based on opinion and continuance of rhetoric around the wild boar. *Boar solutions* meet outside of social media to discuss issues and promote solutions but do not have leaflets or a dedicated website like *The Boaring Truth* decreasing their impact on local and national opinion.

8.2.3 Forest of Dean Wild Boar Cull Saboteurs

The Cull Saboteurs started in 2014 and is dedicated to stopping the wild boar cull in the Forest of Dean as part of a larger group of hunt and cull saboteurs in the UK. The group is open to anyone to join and has approximately three thousand members (Forest of Dean Wild Boar Cull Saboteurs, 2019). The group uses their social media to identify Forestry Commission rangers, post aesthetically pleasing pictures of wild boar, post pictures of damage to cull stations and shooting posts, and pictures of those who have reportedly committed wildlife crimes or animal abuse. The group post articles from around the world which support their anti-cull sentiment, whether wild boar or not. This creates a powerful mix of media messages and associations. The Forestry Commission rangers are categorised with the animal abusers through association of their pictures appearing on their social media. The damage to cull equipment is glorified, and the Forestry Commission is mocked through comments by people in the group who call shooting stations “killing towers” adding to a rhetoric of negativity towards the cull (Forest of Dean Wild Boar Cull Saboteurs, 2019).

8.2.4 synopsis

These social media groups add to the understanding of the discourse around wild boar in the Forest of Dean. Two of these groups, the cull saboteurs and *The Boaring Truth*, are perpetuating opinions and narratives to suit their agendas (Gil de Zuniga et al., 2012). *Boar Solutions* seems to be creating a community where people can gain information and an

online space where people can potentially more openly discuss issues (Correa et al., 2019). However, *Boar Solutions* is the smallest group and has the smallest audience. Those groups that support a pro-boar message are more accessible and allow those from outside the Forest of Dean to view their messages and posts which helps perpetuate a pro-boar message to a wider audience. Social media is being used in a similar way to other media outlets to perpetuate opinions, but importantly can spread their message to a far wider audience than other media which will have a regional or national area of influence. This is helping to perpetuate conflict between those who are within the Forest of Dean and those outside the Forest of Dean.

8.3 Conclusions

Those who viewed local media perceived it as more negative to wild boar whereas national or international media is viewed as more positive towards the wild boar. This was reflected in the three social media groups reviewed where the larger, more open, groups were positive towards wild boar whereas the smaller group was more balanced. Both traditional and social media are perpetuating a divide between those people living within the Forest of Dean and people who live outside of the Forest of Dean. At a non-local level positive stories are published which seems to contradict studies by Cho et al. (2003) and Lyngdoh et al. (2017) that media prefers controversy and negative emotion. However, the divide of non-local positive media about wild boar and local negative media about wild boar reflects the local utilitarian views and urban stewardship views found by Corbett (1995).

Social media creates a skew in distribution of information about wild boar and therefore perception of the wild boar and those managing the population of wild boar. This has been shown to create changes in the number of rangers managing the wild boar in the Forest of Dean reflecting findings by Gore and Knuth (2009). This shows that social media is a powerful tool in managing expectations around wildlife management.

News articles did not affect a sense of safety in the Forest of Dean but rather showed a disconfirmation bias (Edwards and Smith, 1996). Those who felt safe were more likely to mention negative media about the wild boar which opposed their view that the Forest of Dean is safe with wild boar present. This contradicts the findings of Gore et al. (2006) where black bears acceptance decreased with more exposure to negative articles on

the species. This may show a difference between people in New York State and those of the Forest of Dean or be linked to the species and their perceived dangers. Celebrity has created positivity around species (Brown, 2010, Duthie et al., 2017, Sullivan, 2011). However, this was not shown with the wild boar in the Forest of Dean where celebrities who endorsed the wild boar population in the Forest of Dean were mentioned negatively by study respondents due to the misleading messages that these celebrities had decided to portray to the public.

Media stories did not seem to show the wild boar to be protagonists, as research by Jones (2017) and Baranovitch (2021) suggests, rather the duality of portrayal of wild boar was more noteworthy as shown in research by Lunney and Moon (2008), Cassidy (2012) and Hytten (2009). Media messages reflect study participants' duality of portrayal of wild boars⁷⁹. Both traditional media and social media have created an "us versus them" divide between people who live in the Forest of Dean and those who do not. This suggests that narratives between these locations needs to be equalised in their portrayal of both positives and negatives surrounding the wild boar in the Forest of Dean to reduce conflict between these groups.

⁷⁹ Seen in the conceptualisation and classification of wild boar chapter.

9. Wild boar management in the Forest of Dean

Ten years after the wild boar population established in the Forest of Dean DEFRA released their wild boar action plan. The plan declared that there would be no national eradication of wild boar but rather management at a local level (DEFRA, 2008). The plan did not give practical guidance on wild boar management or legal and practical implications for landowners with wild boar on their property (Goulding, 2009). Due to a lack of national government guidance the Forest of Dean District Council and Forestry Commission created a Wild Boar Task Group in 2009 who held a consultation to create a plan to manage the increasing wild boar population in the Forest of Dean.

The Wild Boar Task Group consisted of nine councillors, who were not knowledgeable about wild boar, and the Forestry Commission. The task group opened their meetings to other council members and the public to understand their interactions and opinions on the wild boar (Goulding, 2009). The Wild Boar Task Group invited DEFRA to attend meetings but did not receive a reply. After considering the testimonials of ten speakers and over one hundred emails and letters from the public the task group had considered themselves to have conducted a “full and comprehensive review” of the wild boar in the Forest of Dean. The task group decided the Forest of Dean District Council would not act themselves but deferred the responsibility to the Forestry Commission and created seven “recommendations”⁸⁰.

These recommendations are being followed by the Forestry Commission (Stannard, 2018); however, the recommendations are fallible. The second recommendation that wild boar would be controlled “at a level slightly less than that existing at the time” however the number of wild boar at the time was not known (Goulding, 2009). The wild boar numbers had been increasing since the recommendations and have recently plateaued (Gill and Waeber, 2016, Gill and Waeber, 2019, Gill, 2023). The second part of this recommendation “at a level not causing damage or harm to the forest and it’s visitors” is in contention with those who had have damage to their property by the wild boar in the Forest of Dean. However, the “forest” could be interpreted as just the statutory forest that is the

⁸⁰ See section 6.3 for the list of recommendations.

responsibility of the Forestry Commission and not used as the colloquial term for the Forest of Dean as a whole. Study participants argued that the culling by the forestry Commission does not encourage the wild boar to stay within the statutory forest but pushes the wild boar into open areas and towns contradicting the third recommendation.

Some study participants believed that for the fifth recommendation to be effective road warning signs about the wild boar should be erected the same as the warning signs about sheep and deer. However, it has been stated that the signs warning of deer are generic and warn about the wild boar as well (Stannard, 2018). There are practicality considerations with this approach as deer are visible at night and have reflective eyes, whereas wild boar do not (Cabanau, 2001, Sweeting, 2013). Therefore, a sign warning of deer does not give the same expectations to drivers as one warning of wild boar. This shows that there is contention over the management strategies of wild boar in the Forest of Dean.

9.1 suggested management

Due to the nature of the conflicts surrounding wild boar in the Forest of Dean, the management techniques to control the wild boar population have come under scrutiny by the people living in the Forest of Dean. Study participants were asked about their views on the management of the wild boar in the Forest of Dean and to suggest any alternative management techniques that they thought would be beneficial to the Forest of Dean. The significant majority of study participants believed that the wild boar population in the Forest of Dean needed to be managed to reduce damage to other negative interactions between the local people and wild boar, $\chi^2 = 95.66$, d.f.=2, $p < 0.001$ (Figure 27). The level of severity of management wanted varied between those who wanted wild boar managed, however all participants in the study disagreed with the current management strategies in terms of ethics and efficacy.

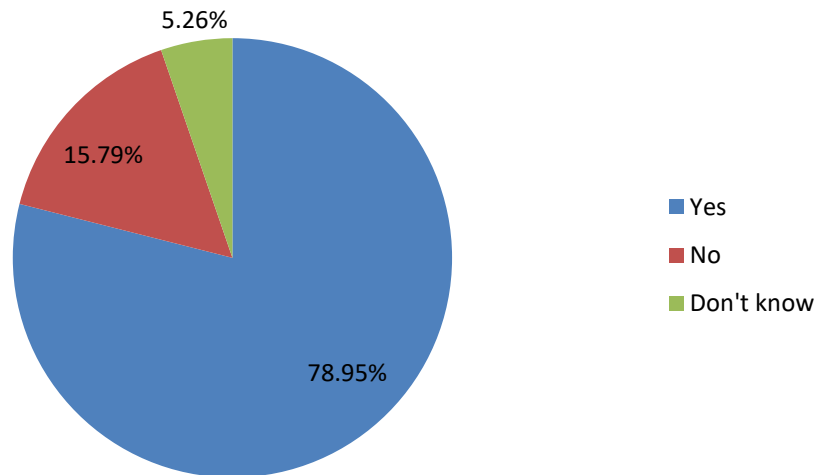


Figure 27: Pie chart showing percentage of study participants' responses to whether wild boar should be managed in the Forest of Dean.

Study participants were asked what alternative strategies they would consider for control of the wild boar in the Forest of Dean and why they believe these strategies would work. Many participants had several suggestions when asked, these ranged from extermination to fencing the population of wild boar in an enclosure (Figure 28). The majority of participants suggested a cull, which was clarified further to include culling the wild boar population down to four hundred individuals, a number suggested by The Wild Boar Task Group (Wild Boar Task Group, 2010), and fencing the remaining wild boar in an enclosure. Fencing or isolation of the population and contraception were the second most popular suggestions. Fencing or isolation included cattle grids to protect human populations against wild boar moving into populated areas via the road network. The next highest category was the idea that management was not necessary. One of these respondents believed that management currently drives the boar out of “the deep parts of the forest” and into human populated areas. Another felt that boar numbers will be controlled by food availability, and a third that the population is not excessive in size.

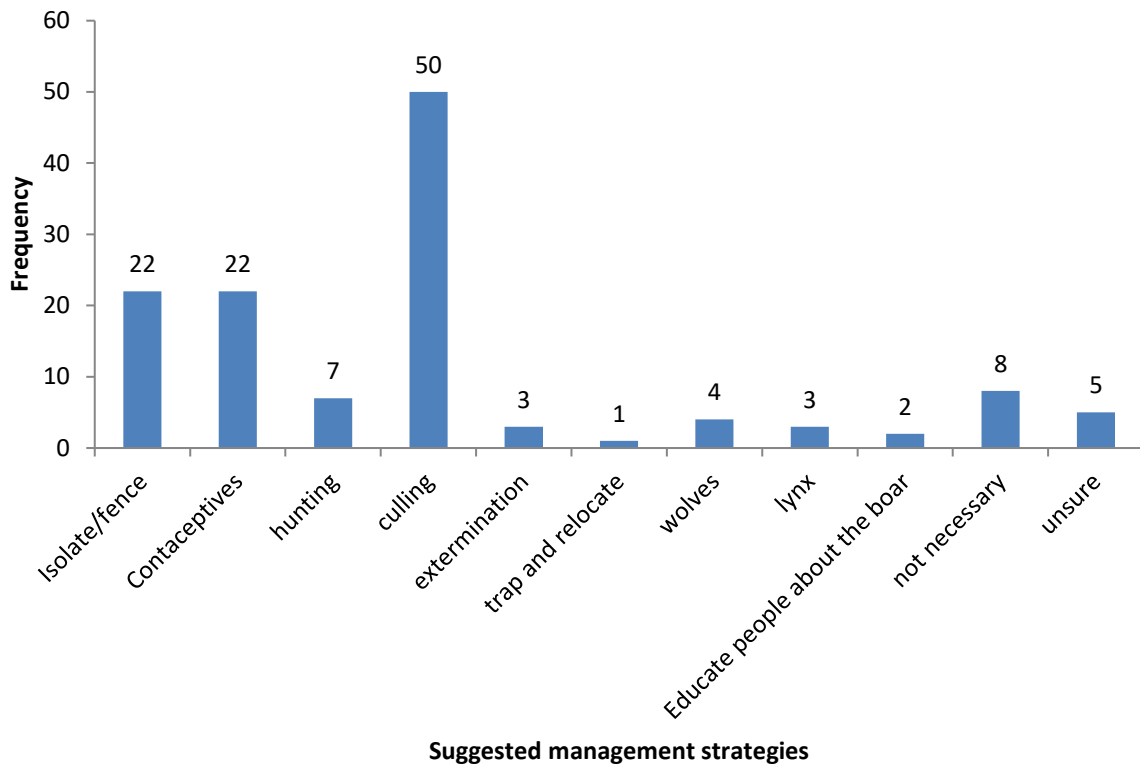


Figure 28: Suggested management strategies and their frequencies from questionnaire data (N=171).

9.1.1 Culling

Culling the wild boar was the most suggested management technique, however this is likely due to this technique currently being enacted and therefore known by study participants. The culling is deemed as ineffective due to rising wild boar numbers (Gill and Waeber, 2016, Gill and Waeber, 2019). Study participants state that the Forestry Commission are using “deer tactics”. This is the tactic of returning to the same area night on night to be able to shoot deer due to the deer returning to the same area night on night. However, wild boar are intelligent and adaptable (Erdtmann and Keuling, 2020). They do not return as quickly as deer to an area if there has been hunting even when there is a food shortage (Drimaj et al., 2021). This has been confirmed by the Forestry Commission as an issue with the current culling technique (Stannard, 2018). Culling has had public opposition through The Forest of Dean Wild Boar Cull Saboteurs and The Boaring Truth (The Boaring Truth, 2019a, Forest of Dean Wild Boar Cull Saboteurs, 2019) and through some of the study participants. Similar anti-culling trends for wild boar have been seen in Italy (Frank et al., 2015). There is further

controversy over whether the cull is encouraging wild boar to leave the statutory forest, however this is unconfirmed.

Culling therefore does not seem an effective method of wild boar control but is cost effective for the Forestry Commission who regain costs through the sale of wild boar meat if negative for disease (Stannard, 2018).

9.1.2 Fencing

One of the most popular suggestions to manage wild boar and mitigate against human wild boar conflicts was to enclose a wild boar population within the Forest of Dean inside a fenced area. Any wild boar outside of this enclosure would be exterminated. The reasoning for this would be to allow the wild boar to be a tourism attraction but keep the wild boar population in an area which would reduce negative interactions between people and wild boar. Within the Forest of Dean there are areas and amenities which have been successfully fenced off from the wild boar (Figure 33). However, there are several complications and debates given a fenced population of wild boar. The first is the size of the population and management of inbreeding within the population which is further complicated by wild boar social and mating structure. A male will mate with a sounder of up to six females, all of which will produce an average for six offspring (Frauendorf et al., 2016). Therefore, a male may sire an average for thirty-six offspring. If the population is controlled to four hundred individuals, this would mean a nine percent population increase from one male. This would reduce genetic diversity within the population, increasing chances of inbreeding depression, especially over consecutive generations. This could be mitigated by a cycle of introducing new breeding individuals to the population and removing dominant males to reduce inbreeding (Dudash and Fenster, 2000).



Figure 29: Wild boar rooting restricted by a fence protecting football grounds (own photograph).

The next consideration is a suitable location for the wild boar enclosure. However, as discussed in previous chapters, there is contention over access to the Forest of Dean where historical conflicts over enclosures blocking access to areas of the Forest of Dean is still within the consciousness of some foresters. The Forest of Dean has several footpaths and accessways which would also have to be managed when the site of the enclosure is considered. These decisions would need consultation with the people of the Forest of Dean as well as the Forestry Commission and Forest of Dean District Council which could draw out the process of finding a suitable location for the enclosure.

To ensure a controlled population of wild boar that do not escape the enclosure would need to follow boar proof standards (The Deer Initiative, 2009). The standards suggest a 1.5-1.8m high fence to stop wild boar jumping over the fence, with an extra 0.3-0.4m of fence buried in the ground with barbed wire at ground level to stop wild boar digging under the fence to escape. If the fence cannot be buried it should be staked at 3m intervals with 0.75m stakes.

The fence should be secured at 3m intervals to 10cm diameter posts and consist of 2.5mm locked joint HT 17/190/15 mesh (The Deer Initiative, 2009). Standard fencing for deer or rabbits can easily be destroyed by stronger wild boar. This mesh is currently £318 per 100m, barbed wire is £25.50 per 100m, and fence posts are £14.50 each or £493 per 100m which totals £782.50 per 100m of fence (McVeigh-Parker, 2024). Wild boar home range sizes in the UK have been reported to be 1-9.6km² (Sweeting, 2013), therefore to fence an area at the maximum size of 9.6km² would mean a 3km by 3.2km rectangle in the simplest form. This would cost approximately ninety-seven thousand pounds for materials. This excludes fixings and labour costs to erect the fence. There are further costs surrounding upkeep of the fence, all these costs would need to be sourced from the Forestry Commission or Forest of Dean District Council.

Study participants were concerned over escapees from an enclosure and the need for protection against vandalism by animal activists who would like to see a non-captive wild boar population or by poachers seeking to kill wild boar for their meat. The suggestion was that the enclosure fence would need to be policed. This could be through paid security, or through volunteers. The latter was used for the enclosed beaver population near The Pludds in the Forest of Dean. Further to fence maintenance costs would be the costs of maintaining a healthy wild boar population and environment within the enclosure. There would also be the initial costs of removing all wild boar from the Forest of Dean outside the enclosure. The cull has not been as effective with twenty years of wild boar population increase since their release into the Forest of Dean (Gill and Waeber, 2019), therefore extermination of the population would be near impossible with current techniques. Wild boar who have migrated outside of the statutory forest may move back into the statutory forest due to source-sink dynamics seen in wild boar populations (Veličković et al., 2016, Stillfried et al., 2017a). The wild boar would need to be eradicated in areas further than the Forestry Commission and potentially Forest of Dean District Council jurisdiction. If wild boar were to repopulate the Forest of Dean after extermination the new population could quickly establish due to high reproductive output of wild boar (Frauendorf et al., 2016). These factors suggest that fencing the wild boar into an enclosure is not a viable option.

9.1.3 Contraceptives

Contraceptives were jointly second most suggested method to control wild boar. There are currently three methods to administer contraceptives; darting, injection or through feed (Massei et al., 2011). All three methods have disadvantages due to their application, but also due to the need to sterilise a meaningful amount of the wild boar population to cause a plateau or decline in the population. If wild boar sows are not sterilised through contraception they will mate and produce more reproductive wild boar which in turn need to be sterilised alongside their mother. Therefore contraception needs to be thorough and occur year on year to ensure that the percentage of sterile wild boar is constant or increasing to effectively reduce wild boar numbers. Due to contraceptives not being lethal to the wild boar the effects of the treatment will be slow in reducing human wild boar conflict, the wild boar will still be present and therefore have a potential to be in conflict with people whilst alive (Wimpenny et al., 2021).

Darting involves the stalking of wild boar, as if hunting, and shooting a dart into the wild boar which releases a contraceptive sterilising the individual. Darting needs to ensure that wild boar only receive one dart and that the other wild boar in the group or sounder do not run on the sound of the shot. Injection of contraceptives involve the capture of wild boar in a trap, injection of contraception and release. There are several ways of trapping wild boar. There are small traps to capture singular and a small groups of wild boar, and large circular traps which capture whole sounders including young (West et al., 2009). Traps need to be baited and are most effective when the availability of food is low (Massei et al., 2011). Traps are effective and capturing adults but can miss humbugs and young wild boar. These missed individuals will not be sterilised and therefore could create unwanted population growth. Another issue with trapping is wild boar have been observed to release other wild boar from traps (Masilkova et al., 2021). Wild boar can become aggressive when trapped (Cabanau, 2001), therefore caution and tranquilisers are potentially needed. There are high equipment costs for this method which likely make it prohibitive. Contraceptives in feed stations has been explored, however wild boar usually spill food whilst eating and the contraceptive is likely to be consumed by other species (Croft et al., 2020). This may affect other species population numbers causing ecological issues. Similar to trapping, food abundance needs to be low (Massei et al., 2011) which is not demonstrated in the Forest of Dean.

A mixed approach of contraception and culling has been mathematically modelled and shown to be effective at controlling wild boar populations (Croft et al., 2020, Burton et al., 2013). However, this would cause the same issues as culling where there will be public against the use of such measures to control the wild boar population in the Forest of Dean.

9.1.4 Wolves and Lynx

Wolves and lynx were suggested by a small number of questionnaire respondents, but also, usually in jest, by interviewees. When asked to clarify interviewees thought that the Forest of Dean was too small for a population of wolves or lynx. However, there have been projects and research discussing the feasibility of introducing both species into the UK (Manning et al., 2009, Hetherington, 2006, White et al., 2015) which likely inspired these suggestions. Further issues with the idea of introducing these predators are the several roads, footpaths, bridleways, cycling routes and other amenities and access points to the Forest of Dean. These allow for a high level of human activity within the Forest of Dean which would likely cause conflict with wolves and lynx. Commoner's rights mean that there are free ranging domestic sheep within the Forest of Dean which would be predated upon by the wolves and lynx (Russo et al., 2020, Khoronzryan and Heurich, 2022, Odden et al., 2013).

Wolf home ranges vary between countries and habitat. In central Italy wolf home range was measured at 197km² (Ciucci et al., 1997) whereas in Scandinavia home ranges have been observed to be between 259-1676km² (Mattisson et al., 2013). The statutory forest is 110km² and the Forest of Dean district is 525km². Therefore, a wolf population would not be contained in the statutory forest and wolves would range into the wider district given home ranges in Italy and Scandinavia. Outside of the statutory forest the land of the Forest of Dean district is mainly pastoral farmland interspersed with human settlement. The movement of wolves into this area would create conflict with any introduced wolves.

Wolves are opportunistic predators and will prefer easier prey such as domestic sheep and deer (Okama, 1995), however in Estonia wolves have been shown to be useful to control wild boar numbers (Lõhmus, 2001). The wolf numbers are controlled to ensure that predation of wild boar is regulated to allow for enough wild boar for game hunting. Lõhmus (2001) suggests that two hundred wolves will prey upon eleven thousand wild boars without causing a significant decrease in wild boar population, giving a ratio of one wolf for

fifty-five wild boars. Therefore, in the Forest of Dean, ignoring other variables, twenty-seven wolves would create a plateau in the wild boar population with other prey species present and no decrease in wild boar numbers through other means. A sudden decrease in wild boar numbers would cause a wolf population to seek food from domestic settings including pets (Valdmann et al., 2005). This was shown in Estonia where wild boar numbers have declined since 2014 due to an outbreak of African Swine Fever (Nurmoja et al., 2017). The idea of wolves to control wild boar in the Forest of Dean would likely create human-wolf conflict in addition to human-wild boar conflict.

Lynx are likely to cause less conflict than wolves, however there is controversy over lynx reintroduction in the UK due to fears of livestock predation (White et al., 2015). Odden et al. (2013) found that lynx will not prey upon sheep if the density of roe deer is high. Lynx have been observed to sporadically prey upon wild boar (Okarma et al., 1997) however lynx are more likely to experience kleptoparasitism⁸¹ by wild boar (Dul'a and Krofel, 2020). Lynx would be a viable option to control cervid populations but may increase food for wild boar rather than kill and control wild boar numbers. The reintroduction of wolves and lynx to the Forest of Dean will likely cause further human-wildlife conflict and have little effect on human-wild boar conflicts.

9.1.5 Wild boar hunting rights

Questionnaire respondents suggested allowing hunting rights and licensing within the Forest of Dean for individuals and groups to hunt wild boar. On continental Europe hunting wild boar is a common practice in rural areas (Keuling et al., 2008). Currently the Forestry Commission rangers who cull the wild boar are the only legal hunters in the statutory forest which is highly regulated and controlled (DEFRA, 2008, Gill and Waeber, 2016, Stannard, 2018). However, this does not stop other people entering the forest and poaching wild boar. This was a theme with interviewees who discussed “friends who go lamping⁸²” or who “take a [wild boar] for the freezer for Christmas”. One interviewee gave a story of a man who lived in a hamlet within the statutory forest whose garden bordered the forest. He would throw his surplus apples from his garden over the fence to encourage wild boar near to his

⁸¹ Where wild boar will eat lynx kills.

⁸² Lamping is a practice of driving a 4x4 vehicle with bright lights into the forest to startle animals to shoot before it has a chance to run.

property then shoot the wild boar as they fed. This activity, going into the Forest of Dean to poach and “lamp” are illegal. However, the Dangerous Wild Animals Act 1976 and Animal Act 1971 allow for shooting of wild boar if the wild boar are on that person’s property. This has allowed some people to run wild boar hunts on farms within the Forest of Dean and profit from the wild boar.

Selling gun hunting rights within the Forest of Dean could create income for the area which could be used to compensate those who are negatively affected by the wild boar. Hunting could increase revenue through hotel and amenities use and increase employment in the area. Many European hunts involving battues, a party of beaters who move game toward the shooters, these could be implemented in the Forest of Dean to reduce the spread of hunters within the forest and increase employment.

There is likely to be concerns over public safety if gun hunters are in the Forest of Dean. These concerns would be for walkers, runners and cyclists using footpaths and rights of way. Creating a viable hunting area would be difficult considering these rights of way throughout the Forest of Dean. Length of travel of a bullet or shot from a rifle or gun would be another concern for damage of property away from the origin of the shot. Fencing off areas of the forest could be a viable solution to this, but people may ignore the fence and signs, and the wild boar would soon move out of the fenced area as found in culling attempts. Hunting and Battues, driving game through an area to be shot, have been found to drive boar through areas outside of their home range (Maillard and Fournier, 1995) which could lead to further damage to property by wild boar (Keuling et al., 2008).

One interviewee suggested bow hunting of wild boar in the Forest of Dean, as this is a practice in Spain. The interviewee was a bow hunter and argued that bows were safer for hunting than guns due to a reduced range and lower velocity of projectile. The bow hunter needs to be closer to the wild boar, increasing risk for the hunter, but decreasing the risk to other people within the Forest of Dean from stray projectiles or from being mistaken as a wild boar. Both gun and bow hunting would likely to come under opposition and scrutiny by the public either over safety concerns, or due to resistance to killing wild boar from pro-boar groups.

9.1.6 Extermination

Extermination was suggested by three questionnaire respondents, however interviewees who had negative interactions with wild boar also suggested extermination of the wild boar population. Extermination may be the least viable solution to reduce conflict with the wild boar in the Forest of Dean due to practicality and opposition from pro-boar groups. Current cull tactics have not been effective in controlling wild boar numbers in the Forest of Dean and Forestry Commission rangers have found it more difficult to locate and dispatch wild boar (Stannard, 2018). This difficulty could be mitigated through trapping, however wild boar have learnt to escape some trap designs (Masilkova et al., 2021) and could become trap shy. Wild boar population numbers are estimated with large margins for error (Gill, 2023), therefore confirming full removal of wild boar in the Forest of Dean would be difficult. Wild boar are territorial and there are wild boar populations outside of the statutory forest. As these populations grow individuals will migrate into the statutory forest founding new populations (Stillfried et al., 2017a). These factors make extermination near impossible.

There are opposition groups to wild boar culling in the Forest of Dean one of which is connected to larger anti-culling groups (Forest of Dean Wild Boar Cull Saboteurs, 2019). These groups have shown opposition through the media and praised the work of “pixies⁸³” who have damaged Forestry Commission property (Morris, 2017, Hughes, 2017). There would be opposition members of the public also, interviewees mentioned they wanted to see the wild boar population managed but do not want to “see the wild boar disappear” and are against complete eradication.

9.1.7 Nematodes

A less intrusive method for wild boar management suggested by The Boar Solutions was nematodes. The mechanism for nematodes to reduce wild boar is through removing wild boar food sources from grassland areas. The nematodes would be introduced into grassed areas to destroy insect populations in the topsoil which would reduce food for wild boar. However, there are likely to be knock on ecological effects for other species. Grassland

⁸³ Pixies are activist who have taken physical action against those who cull wild boar and other animals.

insects are important food for wild bird species (Tanis et al., 2020), if grassland insects are reduced this would reduce wild birds which is likely to cause a trophic cascade degrading the grassland areas and other habitats. Further to this the nematodes could spread past the intended areas and enact damage to those ecosystems.

The introduction of nematodes has not been tested. Wild boar may still root an area where nematodes are present to check for food and the grassland is not protected. If wild boar are unable to find food in these grassland areas. they will move to other areas in search of food. These areas are likely to include human areas where food is more easily accessible (Castillo-Contreras et al., 2018, Stillfried et al., 2017b, Toger et al., 2018). Human-wild boar conflict would increase as a result of the introduction of nematodes.

9.2 Conclusions

The culling of wild boar is unpopular due to two factors; the efficacy of the cull in reducing wild boar and the thought that it increases conflict, and the dislike of culling as a wildlife management strategy. The reduction of the acceptability of hunting and culling of wild boar has been observed throughout Europe (Massei et al., 2015b, von Essen, 2020, Frank et al., 2015). This is a general trend of reduced acceptance of lethal wildlife management where culling is seen as the cheap and easy option not recognising the life of the animal (Mehmet and Simmons, 2018, von Essen and Redmalm, 2023). This links to the idea of compassionate conservation where lethal force should not be considered before other alternatives if positive conservation outcomes are not guaranteed (Wallach et al., 2015). However compassionate conservation has come under scrutiny due to the time to complete analysis of the efficacy of other management methods and then the length of time to achieve the outcome of these methods if chosen. During this time damage caused by the species to be managed could be substantial and irreversible (Gray, 2018, Hayward et al., 2019).

Comparatively, culling is a quick and relatively easy method of wildlife management. Wild boar will move between areas of high and low concentration and to safer areas (Stillfried et al., 2017a), which gives weight to the argument that wild boar may be moving into towns and cities away from Forestry Commission culling.

Linked to culling were extermination and hunting. Extermination would be difficult to complete due to the cryptic nature of wild boar and movement of wild boar from outside of

the Forest of Dean into the forest through natural range expansion (Stillfried et al., 2017a). Hunting would be difficult due to the right to roam the Forest of Dean where restricting access to allow hunting would be challenged similar to historical challenges to removal or rights. Hunting and extermination would also come under the same ethical scrutiny as culling.

Three wild boar control methods involved introducing a second species into the Forest of Dean: wolves, lynx, and nematodes. The introduction of predators would likely create conflict with these species (White et al., 2015, Khoronzyan and Heurich, 2022, Russo et al., 2020). Nematodes would likely reduce natural food for wild boar making the wild boar move into urban areas in search of food (Castillo-Contreras et al., 2018). All three species would alter the ecosystems in the Forest of Dean.

Contraception seems to be the most acceptable solution in terms of people's tolerance as it is not killing wild boar nor encouraging wild boar into urban/human areas however there are issues with contraception. Contraception may be expensive due to the equipment and skills needed (Massei et al., 2011, West et al., 2009), contraception may enter the ecosystem and non-target species (Croft et al., 2020), and there are questions over the efficacy of techniques to ensure enough wild boar are sterilised to cause a plateau or decrease in the wild boar population (Burton et al., 2013). Contraceptives will not reduce the wild boar population immediately therefore human-wild boar conflict will not be resolved immediately with this solution. Contraceptives and culling as a joint management technique was found to be most effective (Burton et al., 2013, Croft et al., 2020), however this could fall under the same scrutiny as solely culling by the public.

Despite public knowledge and suggestions of alternatives management methods and dislike of the culling, culling with hunting on private property is the most effective method of control in terms of resources and economics. If more money and resources were available contraceptives would be an alternative to culling which could be considered to reduce conflict between the Forestry Commission and the public over wild boar management.

Fencing wild boar into an area would be expensive in terms of materials for the fence, labour to erect the fence and removal of wild boar outside of the fenced area. The fence would need to be monitored and maintained to reduce damage from poachers and

protesters. Wild boar from outside of the Forest of Dean may repopulate the area once a fenced population has been established (Stillfried et al., 2017a) which would lead to the reestablishment of a wild boar population and conflicts.

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10. Further research

This study was a snapshot of the effects and opinions of the wild boar in the Forest of Dean on a sample of people of the Forest of Dean. These opinions are likely to evolve overtime depending on further interactions with the wild boar and whether the wild boar population increases. The people of the Forest of Dean are likely to become more acclimatised to the presence of wild boar and reduce conflict scenarios. The wild boar have migrated into areas of Herefordshire and south Wales as well as other discrete populations being present in other areas of the UK. Therefore, differences in opinions and human wild boar conflicts experiences in these areas should be explored to inform mitigation of human wild boar conflicts in all areas.

Negativity around wild boar has rendered negativity from study participants to the reintroduction of other species to the Forest of Dean. The opinions around beaver and pine marten reintroductions should be studied to understand the impact that wild boar have had on conflicts, if any, with these species and how positive practices with these species may be used to reduce human wild boar conflict.

The ecological impact of wild boar has not been formally studied. There were discussions by study participants that the wild boar were negatively affecting populations of ground nesting birds such as night jars (*Caprimulgus europaeus*) which are in decline in the UK (Raymond et al., 2020). There is further concern that rooting is reducing biodiversity. These should be tested, if these are incorrect the negativity and conflict around wild boar may reduce. If wild boar are shown to increase biodiversity in the Forest of Dean and to have positive ecological impact, the wild boar may be more accepted and have less conflict surrounding them.

Finally, more research needs to be completed on successful wild boar damage mitigation strategies. These strategies should be conscientious where the strategy is socially acceptable, economically affordable, and not ecologically damaging. The strategies suggested by participants did not meet these criteria. However, scent fencing, discussed in chapter 8, should be investigated. Scent fencing could prove a cost-effective deterrent, be socially acceptable as it would not be a physical barrier, and not ecologically damage the forest. Further investigations into the social acceptability of this method and other wild boar mitigation strategies is needed.

Conscientious conservation and reintroduction involves high short-term expenditure and increases research before a reintroduction can take place but would increase the support for a species reintroduction and reduce conflict between species, locals and management organisations and potentially decrease long-term expenditure for reintroduction projects.

11. Conclusions

The wild boars in the forest of dean are an illegally reintroduced invasive native species. The population is from domestic stock and saw initial rapid population growth. The Forestry Commission, following legislation on escaped livestock, did not eradicate this population.

Due to the abundance of food, moderate climate, and lack of predators the wild boar population in the Forest of Dean became the biggest in the UK. It was decided by the Forest of Dean District Council and the Forestry Commission that the wild boar would be culled. Despite an original suggestion of one hundred individuals by local people in a public consultation a target of four hundred wild boar in the Forest of Dean was set. The target of four hundred individuals was not achieved until 2022 where wild boar numbers are estimated at 441, however numbers have increased to 658 in 2023 (Gill, 2023). The ignoring of local people's suggested wild boar population size has caused part of the conflict between local people and the Forestry Commission.

study participants were not in favour of the cull due to ethics and the inefficiency of the cull to reduce wild boar numbers and to keep wild boar within the statutory forest. Study participants gave suggestions of contraception, fencing a smaller population of wild boar, extermination of the population, allowing hunting of wild boar, and introduction of other species to manage wild boar numbers. All of these methods are flawed due to the ecology of wild boar and the use of the Forest of Dean by people. Culling is the most economically effective management technique. Research suggests that scent fencing wild boar out of human areas and a mix of contraception and culling would be the most efficient wild boar management tactics. Wild boar management and culling in the Forest of Dean is a wicked problem where decisions to cull or not to cull will not appease all parties and stakeholders and therefore perpetuate conflicts.

The people of the Forest of Dean have a strong connection to the area through a shared history with the Forest of Dean. Foresters worked within forestry and resource extraction in the area and fought to keep their rights of industry and access over the area from outside entities. These historical conflicts are still in the consciousness of the people of the Forest of Dean and have been referenced and reflected in more modern conflicts in the area such as

the HOOF and FOOF campaigns. Study participants mentioned that they would use the Forest of Dean for recreation and commoning, exercising their rights of access over the area. The wild boar were seen as agents which remove a forester's sense of place in the Forest of Dean. This was through two means. The first was that negative interactions meant study participants stopped using the forest. The second was through rooting behaviour damaging grass areas and removing the ability for foresters to common sheep. There was a belief that removal of commoning would remove rights to roam the Forest of Dean.

For a significant majority of the study participants the wild boar had not caused negative economic effects, however the effect was substantial for those who had been negatively affected. Costs surrounding wild boar involved fence and property repair, and veterinary bills due to injured animals. Costs surrounding damage to domestic property was the most common issue. For some participants domestic damage had resulted in large unaffordable repair costs. Damage to community areas was also a cause of conflict. Community areas have historical importance and are multi-use spaces. When wild boar damaged these areas, they were also damaging the foresters' sense of place. The costs surrounding repairing community areas was also high. The wild boar in the Forest of Dean are a low economic risk in terms of likelihood, but a high risk in terms of impact.

There was an association with dog walking and negative interactions. These were either due to poor timing where wild boar and dog walkers crossed paths or due to off-lead dogs chasing wild boar. Keeping your dog on a lead was the second most popular advice from study participants when asked how to avoid negative interactions. This action would mitigate against dogs chasing wild boar. The enforcement of this would be difficult due to the lack of individuals to enforce this rule in the Forest of Dean. A further mitigation strategy could be to create fenced dog parks in certain areas of the Forest of Dean to create safe spaces for off-lead dogs. Making a law that bans off-lead dogs in the Forest of Dean may cause conflict due to this change being seen as infringement on the people's rights to roam in the Forest of Dean.

The wild boar were seen as owned by the Forestry Commission due to the Forestry Commission managing the population of wild boar through the cull. Due to the Forestry Commission selling culled wild boar meat study participants felt that the Forestry

Commission may be profiting from the wild boar at the expense of those living within the Forest of Dean and therefore use some of this profit to pay for damage repair.

There was a divide between perceived views of locals and non-locals about the wild boar in the Forest of Dean. This divide was fuelled by media outlets where local media outlets favoured negative stories about wild boar and national/international media outlets favoured positive stories about the wild boar. Study participants felt that the negativity surrounding wild boars was not being represented in national and international media stories leading to ignorance of the issues the study participants were facing. This created a sense of isolation for the people of the Forest of Dean. There needs to be a shift in media representation of experiences with wildlife to ensure that all types of interactions are represented fairly.

The main conflicts surrounding wild boar in the Forest of Dean are human-human conflicts rather than conflicts with wild boar themselves. To mitigate against conflicts between people and management agencies, conscientious conservation and wildlife management should be practiced. This is where human social implications of wildlife are given equal weighting to economical, and ecological aspects. These social aspects should be considered before species are introduced or the species is established and before there is conflict between the species and people. When funding conservation projects, especially reintroductions, there should be money allocated to pre-emptive mitigations for human-wildlife conflict as well as funding for human-wildlife conflicts which occur subsequently to the aims of the conservation project being achieved.

12. Glossary of people and groups

12.1 Authorities

DEFRA:

The Department for Environment Food and Rural Affairs (DEFRA) are “responsible for safeguarding our natural environment, supporting our world-leading food and farming industry, and sustaining a thriving rural economy.” (DEFRA, 2018). In 2008 DEFRA released the Wild Boar Action Plan. This declared that there was no national eradication or management plan for wild boar in the UK, and that the wild boar were to be managed at a local level (DEFRA, 2008). The document gave no practical guidance on wild boar management or legal and practical implications for landowners with wild boar occupying their land.

Forest of Dean District Council:

The Forest of Dean District Council in response to DEFRA's Wild Boar Action Plan created a Wild Boar Task Group in 2009. This group consisted of 9 councillors and representatives from the Forestry Commission. An invitation was sent to DEFRA but received no reply. The task group meetings were open to the public and allowed speakers. It was agreed by the task group that the Forestry Commission would take responsibility in the Forest of Dean to effectively manage “wild boar and boar-like animals” where they might create a potential risk and menace and keep numbers of boar at a lower level than they were in 2009. Apart from a twice annual scrutiny report from the Forestry Commission the district council do not involve themselves with the management of boar. On their website they state:

“As a Council we acknowledge that the wild boar population is an issue of much community interest, however, the control of boar numbers in the district is not the responsibility of the District Council. Feral boar are wild animals, and as such do not belong to anyone and are a matter for individual landowners. The Forestry Commission only have jurisdiction over land they manage... It is the responsibility of

the landowner to protect their land and property from wildlife. For information and guidelines on wild boar preventative fencing visit www.wild-boar.org.uk”

Forestry Commission:

The Forestry Commission manage, protect, conserve, restore and provide leisure and recreational facilities in the statutory Forest of Dean (Forestry Commission, 2017).

The statutory Forest of Dean is the forested area of the Forest of Dean and does not include the whole district. Since 2009 this has included managing wild boar numbers.

The Forestry Commission have culled the wild boar population within the statutory Forest of Dean every year since the 2009 task group. The Forestry Commission cull the wild boar using trained rangers with rifles and shooting towers. An annual survey of the wild boar population is conducted via transect survey of the Forest of Dean using a helicopter with an infrared camera. The last counts were 1500 boar for 2017 and 1200 boar for 2018. But due to large margins of error the population may have plateaued and not decreased. These population counts are far higher than the 400 boar that were suggested by the wild boar task group in 2009.

Parish councils:

There are 28 parish councils within the Forest of Dean district. Out of these 28, only West Dean, Lydbrook, Ruspidge and Soudley, Coleford, Cinderford and Drybrook cover the statutory Forest of Dean. Of these the largest by area and population is West Dean, which covers over half of the statutory Forest of Dean and includes many of the small villages and hamlets affected by the wild boar. The parish councils have provided money and fundraising for fencing of many sports clubs, recreational grounds and other public amenities to keep boar from damaging the grass and property.

Verderers:

The Verderers are an ancient council of the Forest of Dean within the hundreds of St Braivels, an Anglo-Saxon administrative division of counties still used in few areas of the UK. Men who own property within the hundreds of St Braivels have voting rights to elect the Forest of Dean Verderers to the Verderer’s Court (Hart, 1971). The

Verderers oversee the “vert and venison”, trees and deer, of the Forest of Dean and St Briavels hundred. This gives the people of the Forest of Dean some rights and say, through the Verderers, over the management of the Forest of Dean. This is managed through quarterly meetings between the Verderers, the High Sheriff of Gloucestershire, who is a secular and non-political officer for the county, a Forestry Commission representative and other interested parties invited. Currently, these meetings are used to discuss recent management of the forest, in terms of wildlife, wood and minerals. At these monthly meetings the Forestry Commission will report to the Verderers on the condition of the boar population and efforts to cull the boar. The Verderers will offer advice if any is to be given.

12.2 Local people

Foresters:

Foresters are those who were born and bred within the statutory Forest of Dean. For some this is very prescriptive and will only allow those who fit the criteria to be a true forester, for example someone who lives in Lydney, a town that borders onto the forest, is a “Lydney-man” not a forester. For others they will accept anyone who loves and lives in the forest as a forester, this has led to “the Cockney Forester” a jovial name about one resident, who moved from London into the Forest of Dean. Foresters have an accent which is a mix of rural Gloucester, west county with a hint of Welsh. Many of the older foresters have lived in the Forest of Dean all their life with many being able to trace their ancestry through several generations in the Forest of Dean. This led to another quip from a forester friend when talking to another forester “you can’t live here [the small village they were in], you have the wrong surname” to which she replied that she had just got married and that is why she had the wrong surname.

Commoners & sheep badgers:

An ancient right in the Forest of Dean is that of commoning and pannage. Commoning is the act of rearing sheep within a forest and wood, to pannage is to rear pigs in a wood or forest. Commoners, or sheep badgers, have the right to

common the Forest of Dean since the 'Charter of the Forest' was issued in 1217. The right to pannage has dissipated since the release of feral wild boar in the Forest of Dean. The sheep badgers are regulated by the Verderers and Forestry Commission, with the livestock registered before being able to be let roam the forest of Dean. The current cohort of commoners has a strained relationship with the Forestry Commission due to the wild boar in the Forest of Dean reducing the land available to common.

"Foreigners":

Those people, like me, who have relocated into the Forest of Dean district. For the most part this is said in jest, but if a foreigner says something incorrect of condescending about the Forest of Dean or history of the Forest of Dean, they will be told they "don't know anything, they're a foreigner". Some foresters feel the foreigners are rejuvenating the area through taking part in local groups and village events, something that younger generations are less inclined to involve themselves in. Others believe the foreigners are changing the Forest of Dean for the worst and removing some of the heritage of the area for recreation.

Tourists:

The Forest of Dean was voted Britain's Favourite Forest in 2017. During the summer months, thousands of people visit the Forest of Dean to walk or cycle the many pathways dissecting the Forest of Dean, visit many of the tourist attractions and stay in the Bed and Breakfasts and campsites that are scattered around the Forest of Dean. Some tourists visit the Forest of Dean to see the boar; they can be seen with their large, lensed camera in groups where boar have been spotted. The tourist is a valuable income generator for the Forest of Dean district, but there is friction between some foresters and tourists. These foresters feel that the tourist and recreation industry is removing the Forest of Dean from the heritage of the area and blocking traditional forest activity.

12.3 Local groups

Boar Solutions:

Boar solutions started as a group of foresters and foreigners who wanted to solve many of the issues that have occurred since the release of wild boar. The group invited Parish Councillors to join their group, help to create solutions and petition the District Council and Forestry Commission to implement changes that would benefit the residents of the Forest of Dean, tourists and the boar themselves. The group consisted of those who are both for and against boar in the Forest of Dean. Currently Boar Solutions has made little headway with the Forestry Commission and District Council but have helped to educate people about the boar and implement signage making people aware of wildlife along roads and pathways.

Sab the wild boar cull:

Sab The Wild Boar Cull are a group dedicated to sabotaging the cull of wild boar in the Forest of Dean. The end-goal of the group is to stop the cull completely to allow the population of boar to “self-manage and regulate”. The Saboteurs have vandalised shooting stations within the Forest of Dean and have allegedly threatened forestry staff who enact the cull. Such threats have reduced the numbers of people culling the wild boar. Any act of sabotage is blamed on “the pixies” in the Forest of Dean; that only the Saboteur group believe in.

13. References

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14. Appendices

Appendix 1: Poster

**OXFORD
BROOKES
UNIVERSITY**

Wild boar research

**People-wild boar (*Sus scrofa*) interactions in the Forest of Dean,
and the effects on attitudes and land use in the area.**

Would you like to talk about your views and experiences of the wild boar in the Forest of Dean?

I am looking for participants who would be happy to take part
in a semi-structured interview lasting 40 minutes to an hour.

Interviews can be in person or over the phone.

Alternatively you can fill in an online form at:

BrookesBearResearch.wordpress.com

Data will be de-identified and anonymous within the study, and
any interview data can be removed after collection upon request.

If you are interested in taking part in the study please contact me at

ben.klinkenberg-2016@brookes.ac.uk

Appendix 2: Informed consent information

Study Title: People wild boar (*Sus scrofa*) interactions in the Forest of Dean, and the effects on attitudes and land use in the area.

You are being invited to take part in a research study. Before you decide whether or not to take part, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information about the study carefully before making your decision.

As a user of the Forest of Dean through residency, recreation or business, you have been invited to participate and share your views on the boar and their establishment in the FoD. Participation will be through an initial interview, the interview will last approximately an hour, with the possibility of follow-up interviews. Interviews will be arranged at a convenient time and place for you. Interviews will be audio recorded to enable accurate transcription of the conversation. The number of interviewees needed is approximately 50 to 60.

Participation is completely voluntary. If you do decide to take part, you will be given this information sheet to keep and be asked to sign a consent form. You are free to withdraw from this research at any time and without giving a reason. You are also free to not answer questions and to withdraw unprocessed data from the research at any time without giving a reason.

The purpose of the study is to understand the social impacts of, and people's responses to, the recent establishment of feral wild boar to the Forest of Dean. This focus of this study is to examine people's interactions with, and attitudes towards boar, their knowledge and views of boars and their management, costs to users of the forest and any lifestyle changes due to the establishment of feral wild boar. The interviews will explore a range of themes; your use of the Forest of Dean, your knowledge of wildlife and wild boar within the Forest of Dean, your experiences of the wild boar, your views of the wild boar and what you believe to be the costs and benefits of the wild boar.

This research will contribute to a wider understanding of the local effects of the feral wild boar establishment as well as a broader understanding of human-wildlife interactions and the human dimensions of wildlife establishments, reintroductions and rewildings. I am carrying out this research as part of my PhD. It will be written up as a PhD thesis, and key results presented at conferences and published in academic papers. The research will allow you to voice your opinions about the boar and for you to contribute to scientific research.

Data will be de-identified; no names will be used in the publication of this study. Personal information may be collected to be used in large data sets. All data will be kept anonymous and securely in accordance with the Data Protection Act 1998 and Oxford Brookes University policy subject to legal limitations. Data will be retained for ten years after the study in accordance to the Universities policy on academic integrity.

This project is funded through a Studentship granted by Oxford Brookes University and has been reviewed and approved by the University Research Ethics Committee.

Please take this information sheet and consent form with you and give yourself at least two days to decide if you would like to participate. If you wish to participate in the study please sign and date the

attached consent form and email it back to me with your contact details at ben.klinkenberg-2016@brookes.ac.uk to register your interest in my study.

Thank you for your interest in this research project.

Ben Klinkenberg
Research Student
Dept. of Social Sciences,
Faculty of Humanities & Social Sciences
Oxford Brookes University

For Further information, please contact Ben Klinkenberg by email at ben.klinkenberg-2016@brookes.ac.uk.

If you have any issues with the way the study is being conducted please contact the Chair of the University Research Ethics Committee at ethics@brookes.ac.uk

Appendix 3: Informed consent form



CONSENT FORM

Human-wild boar interactions and the socioeconomic impacts of these in the Forest of Dean and surrounding areas.

Ben Klinkenberg, research student Oxford Brookes University, Gibbs building, Headington Campus, Oxford, OX3 0BP

Please initial box

1. I confirm that I have read and understand the information sheet for the above study and have had the opportunity to ask questions.
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving reason.
3. I agree to take part in the above study.

☐☐☐

Please initial box

4. I agree to the interview being audio recorded and transcribed at a later date
5. I agree to the use of de-identified quotes in publications
6. I agree that my data gathered in this study may be stored (after it has been de-identified) in a specialist data centre and may be used for future research.

Yes

No

☐☐☐☐☐☐

Name of Participant

Date

Signature

Name of Researcher

Date

Signature

Appendix 4: Questionnaire

1. Do you live in the Forest of Dean district?

Yes

No

If yes, where in the Forest of Dean you live? [box to enter details]

2. How long have you lived or have been visiting the Forest of Dean?

<1 year

1-5 years

6-10 years

11-20 years

20+ years

All my life [box to enter how many years]

3. What drew you to the area? Select as many answers as appropriate

Nature

Family

Work

Recreation [box to enter what]

Other [box to enter what]

4. Which local newspapers do you read? Select as many answers as appropriate

The Forester

Forest of Dean and Wye Valley Review

Citizen

Gloucestershire Echo

If you have read these newspapers what wild boar articles have you read recently?

[Text box]

5. What wildlife are you aware of or have encountered in the Forest of Dean?

[text box]

6. Have you encountered boar?

Yes

No

If yes could you describe the encounter and how it made you feel?

7. How common are boar encounters?

8. What advice would you give to someone if they were to come across the boar?

9. What knowledge do you have of wild boar (size, social structure/mating, food sources, location etc)?
10. Do you feel safe in the forest with boar present?
11. In your opinion, what management strategies should be used for the boar?
12. Have you, your friends or family had to spend money due to the boar (fencing, repairs etc)?
13. Do you think the boar bring money into the Forest of Dean? If yes, in what ways?
14. Do you think there is a net gain or loss due to the boar?