Moving Towards Coexistence with Otters (*Lutra lutra*) in Lower Saxony

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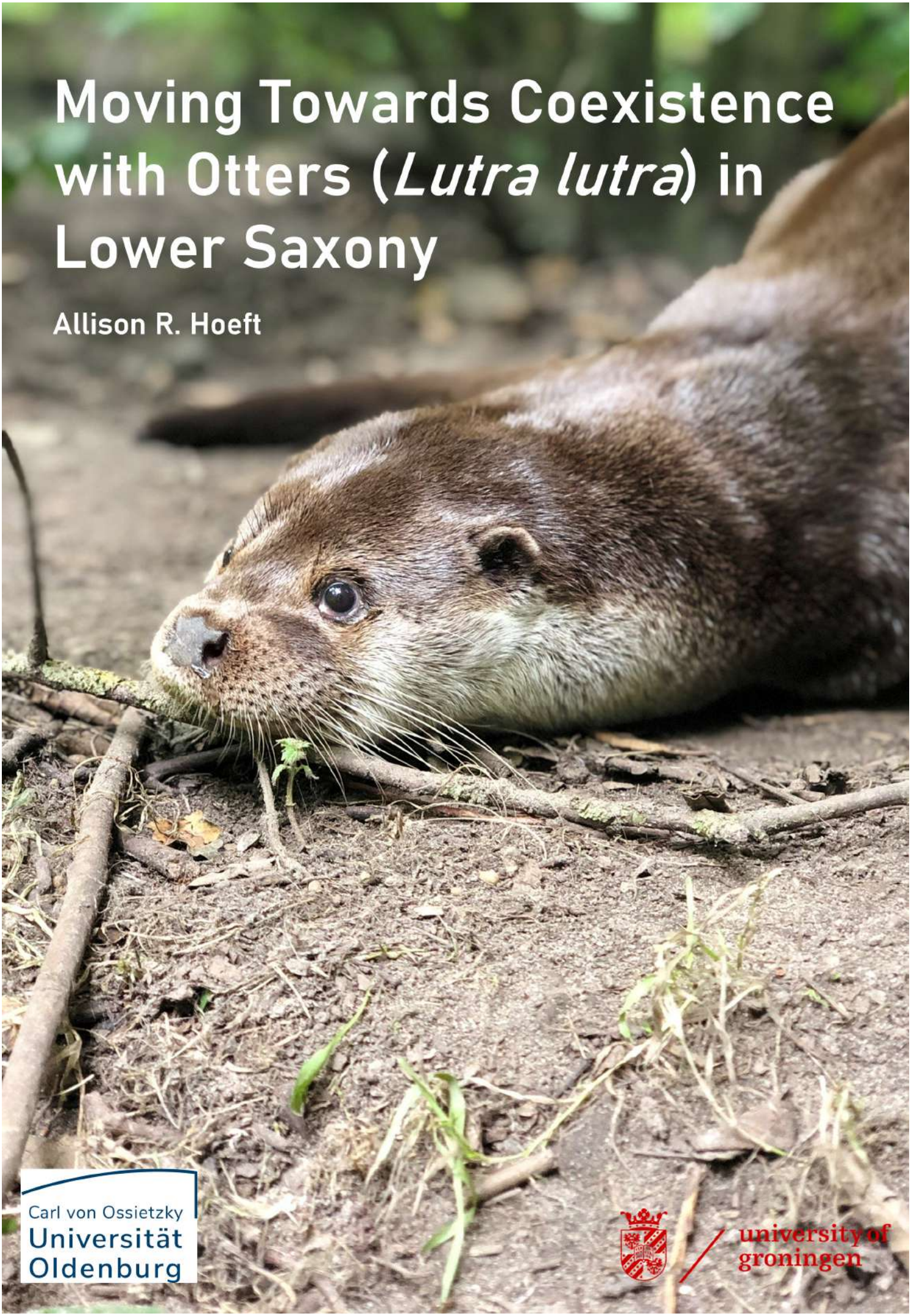

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Abstract

Wildlife management is increasingly important to environmental planning as human development continues at the same time the need to protect endangered wildlife drastically rises. As the threatened Eurasian otter (*Lutra lutra*) population redistributes across the German state of Lower Saxony after decades of conservation efforts, damage caused by otter predation on fishponds is becoming increasingly common. How to deal with the problem has created conflict between fishpond farmers who have to live with the damage otters cause and the conservationists and government who want to protect the species. Through a document analysis and semi-structured interviews, this research looks at how values, beliefs, and attitudes towards otters influence how otter damage is dealt with in the federal state. The results indicate that fish farmers, conservationists, and the government have closely related ideas of what methods should be used to remedy the damages caused by otters, but the negative beliefs behind the word 'management' has caused pause in finding an agreeable solution. The recommended use of wildlife damage management in the Lower Saxony helps rid the word 'management' of its negative connotations by giving a voice through participation to fishpond farmers, allowing for transparency and integration between governmental agencies, while also giving insight towards comprehensive and adaptable prevention and mitigation techniques.

Keywords: Human-Wildlife Conflict, Coexistence, Nature Conservation, Wildlife Management, Environmental Planning, Sustainable Development, Participation, Integration

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List of Abbreviations

AFS	Campaign for Otter Protection (Aktion Fischotterschutz)
CAP	Common Agriculture Policy
CFP	Common Fisheries Policy
DUH	German Environmental Help Organization (Deutsche Umwelt Hilfe)
EPI	Environmental Policy Integration
EMFAF	European Marine Fisheries and Aquaculture Fund
EMFF	European Maritime and Fisheries Fund
HEPI	Horizontal Environmental Policy Integration
HWC	Human-Wildlife Conflict
LAVES	Ministry of Consumer Protection and Food Safety (Landesamt für Verbraucherschutz und Lebensmittelsicherheit)
MU	Ministry of Environment (Ministerium für Umwelt)
NLWKN	Lower Saxony Enterprise for Water Management, Coastal Defense, and Nature Conservation (Niedersächsische Landesbetrieb für Wasserwirtschaft, Küsten-, und Naturschutz)
UNBn	Lower Departments of Nature Protection (Untere Naturschutzbehörde)
VBAs	Values, Beliefs, and Attitudes
VEPI	Vertical Environmental Policy Integration
WDM	Wildlife Conflict Management
WFD	Water Framework Directive

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1. Purpose

In this section, the relevance of coexistence to environmental planning and society will be discussed. Then, the aims of the research will be presented along with the main- and sub- research questions. Lastly, an outline of the research is presented to orient the reader for the rest of this thesis.

1.1 Scientific and Social Relevance

Traditionally, humans and wildlife have lived among one another and humans have used a plethora of techniques to manage wildlife sustainably. Only over the last two centuries have wildlife, specifically medium- to large carnivorous, been labeled as pests because they are perceived to threaten human safety or, more notably, are associated with economic loss of domesticated animals for farmers and other landowners (FAO, 2015; Fernandez-Gil et al., 2018; United States Congress, 1972). This view of these carnivores as nuisances led to poor management of the species as neither the ecosystem as a whole nor the repercussions of declining populations of the animals themselves were considered (Fernandez-Gil et al., 2018).

Due to a societal shift in thinking about the value of the environment, wildlife protection became a topic of importance during the 1970s and 1980s (United Nations, 1972). Since the rise of environmental awareness, many species of wildlife have gained protected status after their populations dwindled due to human activity or habitat fragmentation. Today, these are still considered the two main threats to terrestrial biodiversity (Rogan & Lacher, 2018). Development of the landscape has modified an approximated 15 percent of the Earth's surface, an area twice the size of the United States (Routley, 2021). Faced with the sixth mass extinction, which studies confirm has been forced and accelerated by humans, the future looks bleak as it is expected that as much as one third of plant and animal species will go extinct by 2070 (Ceballos et al., 2015; Cowie et al., 2022; Gingerich, 2020; Román-Palacios & Wiens, 2020).

While the outlook for many species does not look promising, the conservation of the mammalian carnivores which were once seen as pests are now seen as one of the best ways to protect entire ecosystems because such species' presence indicate the health of the rest of the ecosystem they preside over (Daly, 2021; Jooste et al., 2014). Around the world, successful conservation efforts through a combination of protective policies, increased

environmental quality, and habitat restoration has brought back endangered species from the brink of extinction (Vaughan, 2021).

Unsurprisingly, a consequence of the measures put in place to protect such species has allowed for populations to grow, and protected species have started to spread back into their historical ranges (Daly, 2021). While the expanding ranges of carnivores is considered a great success by conservationists, many of the areas that used to belong to species' historical ranges have been developed by humans. Now, as these protected species move back into their historical ranges, they are again coming into conflict with humans. Modern conflict can be dangerous for both animals and humans, but solutions to wildlife management used in the past, such as removal, are often no longer perceived as acceptable practices and in many cases are illegal due to a species' protected status. Therefore, modern solutions are needed to avoid modern human-wildlife conflict.

One example of this is the Eurasian otter (*Lutra lutra*). The Eurasian otter population decreased heavily due to human influence and environmental degradation over the past two hundred years, but more research of the species indicated that they added value to the environment and helped keep freshwater ecosystems healthy, and therefore, they were protected (Aktion Fischotterschutz 2019). Now, their population is expanding back into the areas they were void of for so long, but as their numbers continue to grow, otters are running into increasing amounts of conflict with fish farmers (Klenke et al., 2013).

Historically, fish farmers have killed otters seen at their ponds because otters are able to deplete fish ponds quickly, and this was one of the main reasons for otters vanishing from the landscape (ibid). Due to the otter's protected status and the shift in mentality around the environment, removal of otters is extremely limited, and fish farmers are accepting of the idea of wildlife conservation as a necessity. Nevertheless, otters are again depleting fish stocks in ponds, which creates a hardship for fish farmers who mainly consist of small, family-run facilities who are already struggling to make end's meet because of other predatory animals as well as consumers turning to buying fish that is imported from around the world (R1, 2022; R3, 2022). Hence, techniques have been sought to prevent and mitigate further otter predation.

Thus, advancing approaches and methods of wildlife management to be inclusive of wildlife by understanding the current state of societal values, beliefs, and attitudes of those being affected by the damage wildlife causes is important. Furthermore, this research is relevant to environmental planning and seeks to help guide adaptive management plans that help understand how to live *with* reemerging wildlife populations (Fernandez-Gil et al., 2018). One method of doing this is taking a wildlife damage management approach, an adaptive

approach to wildlife management that has so far had much success in the United States, and can be applied in an European context, in such cases as the Eurasian otter. Using a wildlife damage management approach will help to provide understanding and acknowledgement of the perceptions of stakeholders to create a holistic management framework with the goal of creating harmony between humans and otters.

1.2 Aim & Research Questions

The aim of this research is to create a broader understanding of the needs of otters as well as fish farmers in order to find a future where otters and humans can coexist. Specifically, this study's purpose is to identify how wildlife damage management can support otter conservation as well as the livelihoods of fish farmers in Lower Saxony through assessing the perceptions and traditional knowledge of the species, current practices within fish farming and dilemmas within managing the species. Therefore, my main research question is:

How can principles of Wildlife Damage Management support fisheries and otters (Lutra lutra) to coexist in Lower Saxony?

Due to this question containing multiple parts, my sub-questions include:

1. *What are the origins of human-wildlife conflict between humans and otters?*
2. *How are changing perceptions of wildlife affecting the management of it?*
3. *How do current regulations interact to mitigate conflicts between fishpond farmers and otters in Lower Saxony?*
4. *Since their protection, how have fish farmers reacted to damage by otters?*

1.3 Outline

This thesis is organized in five chapters. Chapter 2 provides a framework of the current academic literature concerning the tragedy of the human-wildlife conflicts and the factors that decisively affect conflicts. Chapter 3 is used to expand upon data collection and analysis methods of collected data. Chapter 4 discusses the analysis and results of the document analysis and semi-structured interviews. Chapter 5 includes a summary of the results and a discussion of the implications for communicative wildlife management and planning practice as well as a reflection on the research conducted. Lastly, Chapter 6 will conclude the research conducted.

2.Theoretical Framework

In this section, the first and second sub-questions will be answered through a literature review:

1. What are the origins of human-wildlife conflict between humans and otters?
2. How are changing perceptions of wildlife affecting the management of it?

2.1 Human-Wildlife Conflict

2.1.1 Wildlife

The term ‘wildlife’ has many definitions trying to classify what counts as wildlife and what does not. Early definitions of the word were used by hunters and sportsmen to specify any non-domesticated, terrestrial vertebrates they were able to kill (Decker & Purdy, 1988). In 1973, the definition evolved around the world as the United States invoked the Endangered Species Act which expanded the definition to include marine animals as well as invertebrates. Since then, it has evolved further, and presently, the definition includes all animals defined in the Endangered Species Act, and additionally includes the rest of the ecosystem. Therefore, the current definition of wildlife can be stated simply as any non-domesticated plant or animal (Miller & Reidinger, 2013).

2.1.2 Wildlife Management

Simply put, wildlife management is the same as any other type of management– it is getting wildlife to do what the manager wants (Miller & Reidinger, 2013). Wildlife management is an interdisciplinary approach combining the natural sciences, planning, politics, and perceptions (Schaller, 2007). The modern concept of wildlife management was established in the United States, coming about in 1933, when Aldo Leopold published his book, “Game Management”. The book focused on management techniques to produce a sustained harvest of game– wild animals hunted for meat and/or recreation– on chosen areas of land. Since Leopold’s book was published, wildlife management has evolved to include the management of not just game, but that of all wildlife, as defined in Section 2.1.1.

Wildlife management today deals with the interaction between all wildlife, whether it be game, pests, invasive species, endangered species, overpopulation and habitat impact, wildlife disease, and zoonoses (Miller & Reidinger, 2013; Teel et al., 2014). The basis of

wildlife management is land management and the concept of biological carrying capacity, or the ability for a certain piece of land to provide food, water, and shelter to a certain amount of wildlife (Decker & Purdy, 1988). Moreover, the aim of modern wildlife management is to balance the needs between habitats, humans, and animals, especially as humans encroach on lands that were previously undeveloped (Koprowski & Krausman, 2019). When managing wildlife, managers need to take into account how each group interacts with the other and through this, make informed decisions on how to proceed with the best solutions possible (Figure 1). Therefore, when dealing with the results of wildlife damage, decisions made around conflicts cannot not be limited to only the one actor that the damage directly affected.

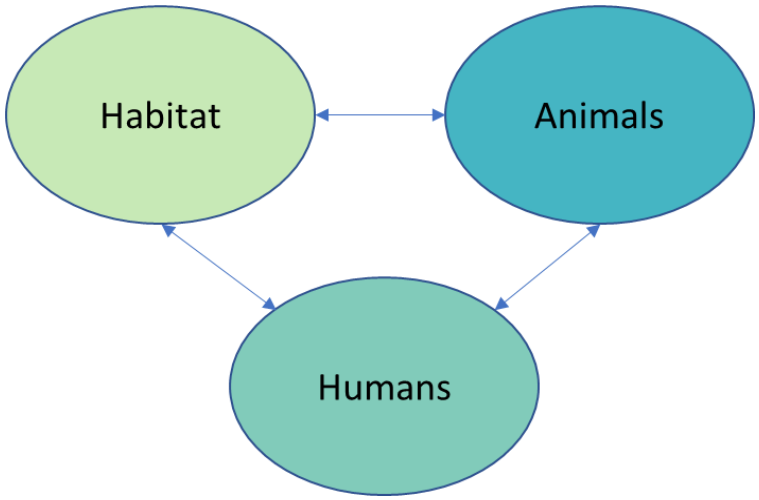

Figure 1. In wildlife management, habitat, animals, and humans all need to be considered. (Own work)

2.1.3 Human-Wildlife Conflict

Conflict is defined by Peterson et al. (2010) as: "*The expressed disagreements among people who see incompatible goals and potential interference in achieving these goals*." Human-wildlife conflict is the risk or perceived risk of wildlife causing damage to something that humans deem valuable (Miller & Reidinger, 2013). Wildlife that cause damage are deemed nuisances or pests. More specifically, pests are any individual, population, or species that cause damage (idib). Unsurprisingly, this definition of certain wildlife as pests conjures negative views of wildlife that caused damage, and has resulted in harsher management techniques to deal with their presence. The main method to deal with damage is pest control, meaning to essentially eradicate the problem of wildlife so that conflict no longer exists. Over time as the definition of wildlife has evolved, the view of pests has also changed. While many species are still considered pests, it is acknowledged that all wildlife have both positive and negative effects on what humans hold as valuable (Frank et

al., 2019). This addition of value does not mean that conflict between humans and wildlife no longer exists and does not immediately correlate to less harsh methods of control.

Humans are not the only victims in human-wildlife conflict, species are also susceptible to human threats. Today, threats to wildlife are no longer limited to hunters and sportsmen, but also include– among other things– anthropogenic climate change, human development, and habitat fragmentation (Decker & Purdy, 1988). Since 1970, a quarter of the wildlife population has been lost in Europe (WWF, 2021). At such a rate of species loss, the reemergence of endangered wildlife is encouraging to see and that nature conservation efforts are working (ibid). In Europe, however, species loss has been a problem long before the 1970s, where multiple species have been hunted to the point of extirpation and even extinction over the last two- to three-hundred years (Rewilding Europe, 2022). Naturally, as a result of the disappearance of wildlife in the landscape, Europeans were able to develop the society and economy without wildlife in it. From this, many Europeans forgot how to live with wildlife (Torres et al., 2016). So as wildlife reemerges across the continent and when Europeans perceive themselves and the infrastructure they have built to be threatened by wildlife, conflict between wildlife and humans can again arise.

While now accepting that wildlife have positive effects, negative effects tend to be more prominent because damage from wildlife can be frustrating or dangerous. Wildlife damage can be split into three categories: damage that threatens people's livelihoods, damage property, or threatens the safety of humans (Miller & Reidinger, 2013). Wildlife conflict resulting in the threatening of livelihoods comes in the form of wildlife killing or damaging agriculture, whether it be livestock, timber, or fisheries (Miller & Reidinger, 2013). The damage of said agriculture deplete farmers' profits, putting their business at risk. For example, in Germany, beavers make dams along streams that run along agricultural lands and through forests. The first problem beavers create is felling trees that belong to the forester, decreasing the amount of viable trees for the harvest of timber. Secondly, when the beaver builds its dam on bodies of water close to agricultural fields, the water can no longer flow freely as it had before, and can back up the waterway, flooding the area behind. This floods the adjacent fields and farmers lose their crops to the flooding.

Conflict resulting from damage to property is considered to be any destruction caused by wildlife to infrastructure. For instance, in Kenya and other parts of Africa, elephants are widely known to damage water structures like dams or boreholes as the elephants look for their own water supply. Also, elephants cause damage to structures like houses and fencing in search of food sources, such as going through someone's fence to collect fruit from a tree (Hauping et al., 2019). The damage done here inhibits the ability for

locals to reside comfortably in the area and also high costs of repairing the property accrues quickly, which some residents cannot afford to take on financially (ibid).

The need for human safety also creates human-wildlife conflict. This is the requirement set up by humans that wildlife should not injure or kill humans and can be seen at places such as airports (Miller & Reidinger, 2013). At airports, runways need to be kept free of animals such as birds, deer, and rabbits in order for planes to take-off and land safely. One example when people were put at risk was the downing of a United Airways airplane in New York City. A flock of geese were sucked into the plane's engine during take-off over the island of Manhattan, rendering the plane unable to fly. The pilot had to crash land the plane in the middle of the Hudson River. This time, all 155 people on board survived, but could have easily ended in catastrophe as not only those in the plane were put at risk, but if the pilot had missed the river and crashed into the surrounding buildings, many more people would have perished as well.

These three types of conflicts all demonstrate how wildlife causes problems for humans, so the easiest solution would be not to have them at all, then there would be no conflict. That being said, doing that in the present day is no longer acceptable, and eradicating a population would cause a tremendous amount of backlash. However, in all of these instances there is a commonality, none of them describe direct conflicts between humans and wildlife as it can be assumed that wildlife does not consciously know that they are causing harm to humans and their valuables. Therefore, according to Peterson et al. (2010), labeling such conflicts as human-wildlife is a misnomer. Peterson et al. (2010) goes on to further theorize that such instances show how human-human conflicts, since wildlife does not have a voice in the conflict and the real conflict is between different human interests and how to handle wildlife interfering with human life. Thus, wildlife is not the problem itself, but it is the human perception of wildlife that determines how wildlife is seen and solutions for conflict are dealt with. Instead, conflicts and solutions consist of interactions and power dynamics between one's own values, society, and politics (Miller & Reidinger, 2013; Peterson et al., 2010).

2.1.4 Perceptions of Wildlife

Wilson (1984) theorized that through a long history of coevolution of humans and wildlife living among the other, humans acquired an innate connection between ourselves and other living things – called biophilia – which affects people's relationship with the environment around them. The theory of biophilia attaches humans to wildlife at the core, but learned values, beliefs, and attitudes (VBAs) show the real relationship between humans

and wildlife. Hence, the basis of wildlife management comes from how humans perceive wildlife, and starts by analyzing how wildlife is being treated at the present moment (Figure 2) (Miller & Reidinger, 2013; Wilson, 1984).

Figure 2. Values, Beliefs, and Attitudes make up the basis for dealing with wildlife. (Own work)

2.1.4.1 Values

Values are the conceptions of what is good and bad and change little over the course of one's life. They are firstly inherited from parents or those who raise children and also form in the early stages of life through learning social norms, cultural upbringing, or ethics (Manfredo & Teel, 2008). Also, just as values are taught to one generation, they are long-standing beliefs and are passed further over multiple generations, helping to create social norms that run over the long-term (Miller & Reidinger, 2013). Values are the most important factor in perceptions towards wildlife as they provide the framework for our everyday thoughts and behavior (Miller & Reidinger, 2013). According to Kellert (1993), individual values are intertwined with biophilia because values surrounding the environment manifest themselves in nine different typologies (Table 1). These different values help to categorize how people then react to wildlife– for example, individuals with utilitarian values view nature as one for humans to use for their own gain and are more inclined to be pro-hunting whereas, those with romantic values view wildlife as something purely to be conserved and protected, and thus are more likely to be against hunting (Kellert, 1993; Manfredo, 2009).

Typology	Definition	Function
Utilitarian	Exploitation of nature for practical and material uses	Sustenance and security
Naturalistic	Direct contact with nature results in satisfaction	Mental and physical development
Ecological-Scientific	Study of structure and function in natural processes	Knowledge and understanding
Romantic	The appreciation of nature due to its aesthetics	Inspiration, harmony, and security
Symbolic	Nature as a use of expressive thought	Communication and mental development
Humanism	The emotional attachment to nature	Sharing, cooperation
Mutualism	Nature is an ethical concern	Give- and take- relationship, meaning of life
Dominionistic	Control and mastery over natural processes	Physical development
Negativism	Nature is something to be feared	Security and protection

Table 1. Nine types of values associated with wildlife. (Adapted from Kellert, 1993)

Kellert's typologies can also be linked to groups of people based on their background (i.e. religion, nationality, etc.) (Kellert, 1993; Manfredo, 2009; Teel et al., 2014). Over the past 300 years, western countries influenced by Europeans have largely held a dominionistic view of nature, believing that we humans can bend nature to our will and control it (Teel et al., 2014). As discussed in the previous sections, the results of these dominionistic values can be seen in modern-day life as humans have wiped out multiple species of animals such as the European brown bear, European gray wolf, or Eurasian otter, and also through acts like the straightening and channeling of rivers for flood control or transportation. Slowly though, as a result of modernization and evidence that wildlife brings its own value to the planet, a more mutualistic view of nature is being adopted, increasing the willingness of citizens to live with wildlife instead of trying to control it (Manfredo, 2009; Teel et al., 2014).

For instance, in North America, Native Americans, who held mutualistic values, sustainably managed sea otters for over 10,000 years. During that time, sea otters ranged along the coast from Baja California in Mexico up to the Aleutian Islands of Alaska, but when Europeans settled on the West Coast, things changed. Almost immediately, Europeans started fishing along that same coast without concern for the otter. Due to their dominionistic values, they saw the sea otter as direct competition for resources as sea otters were consuming the same species the Europeans were fishing for. Therefore, Europeans hunted sea otters to near extinction. Today, the consequences of European values are still being felt as, without the sea otter, vital coastal ecosystems– in particular kelp forest– are being

ravaged by hungry purple sea urchins, which sea otters would normally prey on. Protection and management of sea otters has helped populations grow again in some of their native regions, especially in areas where Native Americans are again managing the population, but along the majority of the coast, due to continued pressure by the fishing industry, the expansion of the sea otter population is still limited.

2.1.4.2 Beliefs

Beliefs are judgements which are made out to be true or false, whether it be either based on hard evidence or not (Allen et al., 2009). Like values, beliefs can present themselves in both the individual and in collective groups. They are cultivated thoughts and can change throughout life in reaction to unorganized, everyday experiences as well as organized structures such as religion (Allen et al., 2009; Manfredo, 2009). Beliefs are important to the connection to wildlife because they can be used as a form of knowledge (Miller & Reidinger, 2013). What is then "known" from one's beliefs contributes to how much someone accepts wildlife and how much tolerance there is when living with the risks wildlife bring to the area (Allen et al., 2009; Decker et al. 2002).

Beliefs in relationship to wildlife can be beneficial to living with said wildlife. They can be used for helping to manage wildlife populations, for example, through locals' observations of an animal population which outsiders may not be aware of, thus cultivating "local" or "traditional" knowledge (Decker et al. 2002). Local knowledge can prove invaluable when creating a plan for managing wildlife as, without it, aspects of how to do so within a local context may be missed. On the other hand, according to Miller & Reidinger (2013), there are three ways beliefs held can also create misconceptions about living with wildlife. First is when one's held beliefs are so strong that they ignore facts and evidence which disprove their beliefs. Secondly, beliefs can be based on anecdotal evidence, thus oversimplifying the situation. Lastly, beliefs around wildlife may form which have no obvious link between observations and their explanation. These three states of belief can be harmful as they lend themselves to negative perceptions of wildlife and skew appropriate measures of management.

One practical example of this is in the Catholic religion. It is traditional to abstain from meat of warm-blooded animals on Ash Wednesday, Good Friday, and all Fridays during Lent to honor Jesus dying on the cross and who sacrificed his own flesh and blood for humankind (Van Sloun, 2008). Therefore, fish is traditionally eaten on those days, but during the Middle Ages, members of the Church became bored by only eating fish, and asked Church authorities if there was anything else that they could eat. Their reaction was to allow the

eating of semi-aquatic animals such as beavers, nutria, muskrats, otters, and capybaras due to their stellar swimming ability– qualifying them as fish and appropriate to eat (Eskelner, 2019). The belief that semi-aquatic animals are considered fish, although all of these animals are warm-blooded and not related to fish, attributed to the decline in the population of some species around the world due to this practice.

2.1.4.3 Attitudes

Attitudes are our predispositions to react favorably or unfavorably to any given concept, situation, individual, or object and are important as they predict and influence our behavior (Pierce et al., 2001). Attitudes are largely shaped by our values and beliefs but, in contrast, attitudes can be changed through experience and education of the subject (Miller & Reidinger, 2013; Pierce et al., 2001).

Four characteristics make up attitudes: cognitive belief, evaluative belief, salience, and specificity (Pierce et al., 2001). (1) Cognitive beliefs are rational, evidence-based thoughts associated with a certain subject– for example, someone might have a negative disposition towards wolves because they are potentially dangerous. (2) Evaluative beliefs are the emotional beliefs created through the observation or evaluation of a situation, so someone may have a positive view of wolves because they are excited by the risks they present. (3) Salience is defined as the relevance or importance of a subject. Salient beliefs aid in understanding why someone has a certain attitude towards an object by looking at how much time and effort they have put into thinking about the matter at hand. For instance, if someone were to write down their reasons why they are either in support of or are against trapping wolves, the salient beliefs are the reasons they list. (4) Specificity is how closely a belief is related to an issue. Specificity of wildlife issues pinpoint where a problem lies and can therefore be used to accurately predict an individual's behavior when reacting to the issue and can be used to create management solutions.

2.2 Transition Towards Coexistence with Wildlife

Meadowcroft (2009) describes a transition as an anomaly that denotes change. This research presents collective action theory and sustainable development as instruments to observe the shift towards mutualism by moving past pure conservation in order to underpin the needs of collectively solving human-wildlife conflicts (Enzerink, 2017). More characteristically, a transition is the continuous process of fundamental, societal change across multiple scales which redefines a structure or sub-structure of society over the timespan of one generation, or 25-50 years (Geels & Schot, 2007; Van der Brugge et al.,

2009). Being classified as long-term change, transitions are seen as nonlinear processes that have both periods of slow and fast change, but ultimately are cross-temporal, cross-sectoral, and co-evolutionary change between two periods of equilibrium within technological, ecological, institutional, cultural, and economic developments (Rotmans & Kemp, 2003).

For a true transition to occur, Rotmans & Kemp (2003, p. 12) state that a transition must change structures across three different scales (Figure 3). First, the macro level is influenced by changes at a broad scale such as the environment, cultural views, or the macro economy– for example, biodiversity loss and globalization. Broad changes at the macro level take a significant amount of time and can be correlated to the speed at which the transition takes place. Below this, the meso level involves changes of social norms, regulations, and other value or belief systems through both the market and government. These changes can be made more rapidly than those on the macro scales, but are more acclimated to optimize structures, not transform them. Lastly, the micro level supports small-level changes that stimulate innovation and new social practices. These changes are the quickest within the three levels and shape a new status quo. Next, a transition must also be multi-staged. An S-curve is used to model a transition, which consists of four different stages (Figure 4) (Van Brugge et al., 2005, p. 166).

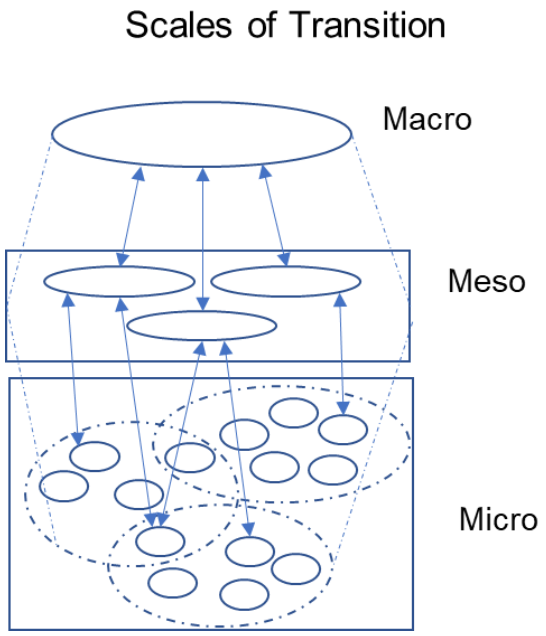

Figure 3. Three scales within a transition interact with each other to change views and support innovation. (Van der Brugge et al., 2005, p.166)

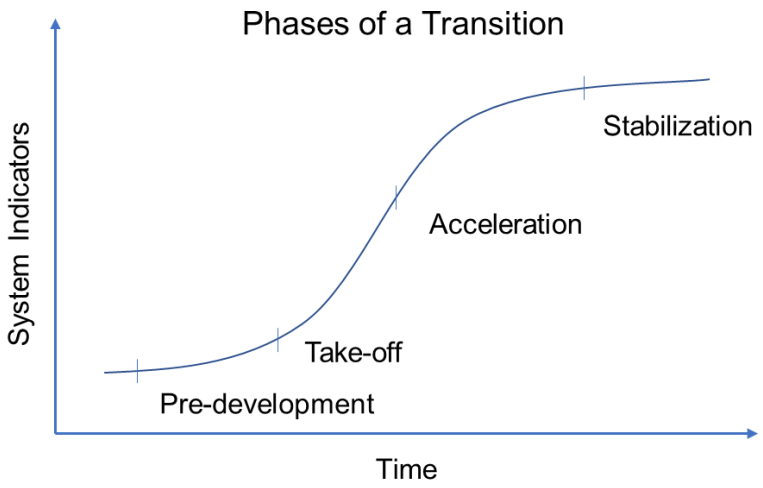

Figure 4. Multi-stage concept of a transition in four phases (Van der Brugge et al., 2005, p.166)

2.2.1 Pre-development

The first phase consists of the pre-development phase. This phase shows a dynamic equilibrium. At this point in time, a problem has been identified at the macro level which causes a stir within society, but change still lies in wait beneath the surface. In the transition to coexisting with wildlife, the changes at the macro level comes from biodiversity loss, globalization, climate change, and the realization that wildlife adds value to the human experience (Reidinger & Miller, 2013). The realization that humans cannot survive without well-functioning ecosystem took society from a place of environmental carelessness into the pre-development phase where notion was that humans need wildlife, pushing against the old ideas of having to dominate over wildlife (Manfredo et al., 2009; Miller & Reidinger, 2013; Teel et al., 2014).

Hardin's 'Tragedy of the Commons' (1968) illustrates the danger of having an unmanaged, shared resource, referring to it as "the commons", and can be used as the start of the transition towards coexistence. He continues to explain that within this, the consequence of a common is overpopulation due to the greed of each man. Personal incentives to maximize profits overrides the need of the commons to restore itself to be able to continue to provide for the population using it, and creating a loss in the long-term as, eventually, it will no longer be able to be used at all. As an example, Hardin describes multiple sheep herders who have a common pasture to use; each herder wants to maximize their profits for that season, and therefore, they each add as many sheep to their own flocks as possible. At the same time, any damage done to the pasture is shared between the

herders, but over the long-term as the pasture is overgrazed, neither the herders nor the sheep win as the pasture can no longer support the sheep nor help create profits for any of the herders.

The solution to the commons that Hardin comes up with is the choice between creating a government to manage the area or privatization so each herder takes responsibility for their own land and what happens to it (Hardin, 1689; Robbins et al., 2010). Since 1968, Hardin's theory and two solutions have been tried again and again, and while there are success stories of sustainably managed commons, few are due to either government *or* privatization as both lack the breadth to tackle the complexity of the issue and, therefore, are not well adept to manage space on their own (Colding et al., 2001; Obeng-Odoom, 2016; Ostrom, 2015; Olsson et al., 2004). Those projects that were successful relied on institutions in order to change social norms, policy, and eventually individuals' behavior by focusing on the contingencies within certain situations (Ostrom, 2015; Robbins et al., 2011). However, such neoliberal approaches have also been criticized for not fully incorporating the social side of resource management, leaving out important local stakeholders from the benefits gained through the project (Cox et al., 2010). In this research, the tragedy of the commons is used to explore the base of human values towards nature in an effort to understand what progress has been made towards mutualism, while Ostrom (2015) is used to explore institutional change and Cox et al.(2015) to understand the shift towards participatory resource management.

2.2.2 Take-Off

Next– Phase 2– known as take-off, occurs when actors see a window of opportunity to act upon the movement in the pre-development phase at the meso level. The changing worldview has led to meso level changes, such as the development of Sustainable Development Goals, the creation of laws and regulations protecting and conserving wildlife, and the subsequent changes of definition to wildlife management (Miller & Reidinger, 2013; Peterson et al., 2010).

Modern environmental protection came about during the 1970s and 1980s. Laws and regulations around environmental protection serve to safeguard nature from the negative impacts of anthropogenic development, or as previously put, the tragedy of the commons (European Union, 2013). The internationally recognized concept of sustainable development came about in the 1980s as the environmental movement took off and was solidified through the Brundtland Commission in 1987. The Brundtland Commission was inspired by theories such as that of the tragedy of the commons as they all referred to the negative

anthropogenic impacts have on the Earth, specifically when those actions went unchecked (Sustainable Development Commission, 2011). Since then, objectives of sustainable development have defined the need for the integration of three realms: 1) Economic- creating efficient stability and growth of the economy, 2) Social- creating equality and equity for all people, and 3) Ecological- creating resilience of ecological systems through restoration, conservation, and protection (Figure 5) (Munasinghe, 2007; Salameh, 2018). The result of merging all three realms together creates the prized goal of sustainability. With the goal of sustainability, sustainable development then looks for opportunities of harmonization and balance between what we need from the world and what it needs from humans.

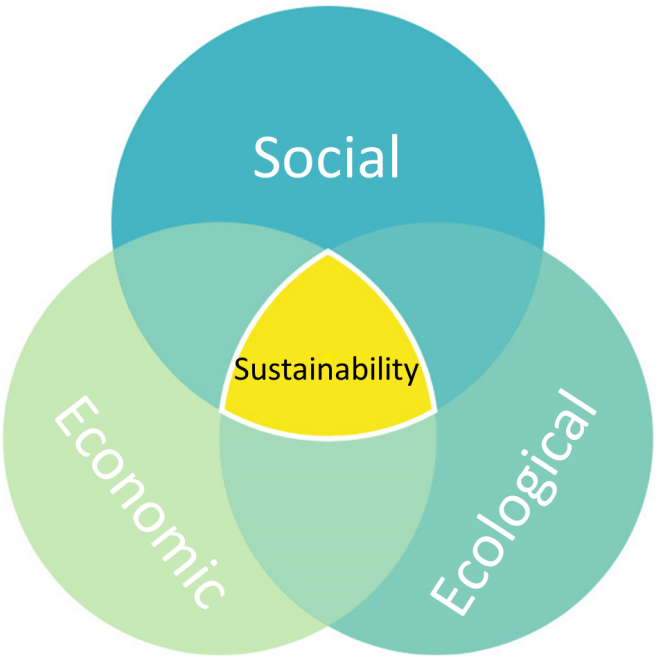

Figure 5. Sustainability triangle. Adapted from Munasinghe (2007) & Salameh (2018).

Since the development of the sustainability triangle, the United Nations has put forward multiple sets of goals in order to steer sustainable development. Most recently, in 2015, seventeen targeted areas of sustainable development, aptly named the Sustainable Development Goals (SDGs). Each SDG incorporates a theme of SD and a vision for the future. While well-meant, the topics are severely over-generalized, making them a fuzzy concept and in some cases objectives clash, blurring the line of what is feasible and necessary (De Roo & Porter, 2007). However, they are not meant to be used as a "one-size fits all" solution, but are to be used as a guideline for sustainable practices by those who

want to use them. No one area focuses on the transition towards coexistence itself, but three of the goals can be used to overlap in order to argue the need for it.

Goal 8: 'Decent Work and Economic Growth', strives to "*promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all*" (UN, 2015). Since wildlife can hinder or eliminate people's livelihoods, this goal seeks to establish principles and practices that can ensure valuable employment opportunities exist so that people are not put out when in conflict with local wildlife.

Goal 12: 'Responsible Production and Consumption' focuses on "*ensuring sustainable consumption and production patterns*" (ibid). This goal promotes the effort of localizing consumption patterns in order to reduce the impacts of climate change and biodiversity loss. Therefore, this goal promotes local, sustainable business practices that align with the goals of supporting wildlife while also supporting Goal 8 through supplying meaningful employment opportunities.

Goal 15: 'Life on Land' supports the "*protection, restoration, and promotion of sustainable use of terrestrial ecosystems… and halt and reverse land degradation and halt biodiversity loss*" (ibid). This goal most closely fits with coexistence; it implores conservation, preservation, and management is necessary to avoid further damages to the environment.

The move towards sustainability begs not for centralized regulation anymore, but that of participation and integration within adaptive approaches (König et al., 2020). Analyzing this turn is done in this study by researching emerging practices at the meso scale which are able to help push the transition of coexistence into the phase of 'Acceleration' (Figure 6). Miller & Reidinger (2013) theorize that this is the current state of the transition towards coexistence– actors within the fields of general wildlife management, natural resource management, and nature conservation are seeing the opportunity for wildlife management to be used for more integrated approaches to not only deal, but also include proponents of wildlife conservation to create a more integrated approach to wildlife management, especially for threatened and endangered species. Between the 1970s and 2000s, centralized measures such as policies and regulations were created by governments in order to conserve wildlife. These meso-level policies around protection and sustainable development have changed how humans interact with wildlife by creating a realm where both had to exist together (König et al., 2020).

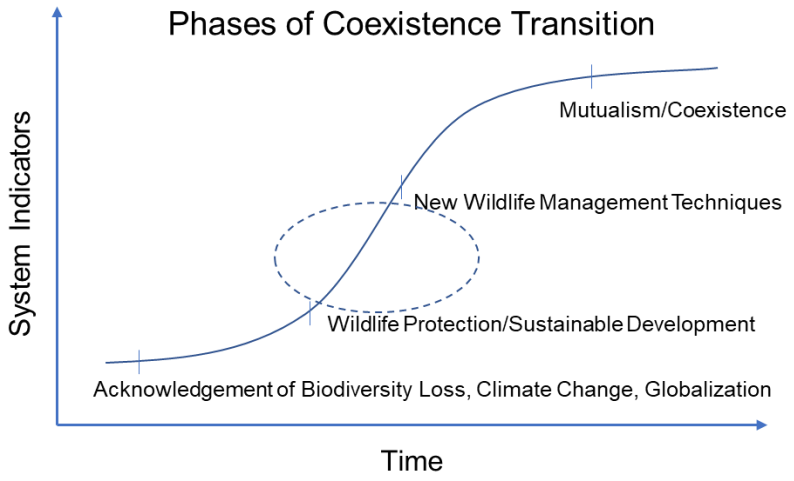

Figure 6. Starting from a position of dominionism, the transition to mutualism currently stands between the 'Take-off' and 'Acceleration' phases as the values of mutualism become increasingly popular. (Adapted from Van der Brugge et al., 2005, p.166)

2.2.3 Acceleration

Phase 3 is acceleration, which is defined as the system visibly transitioning and includes the innovation that creates gains for the economy, environment, and society (Van der Brugge et al., 2005). During this phase, changes are seen across scales at a rapid pace, spawning from innovation at the micro level. These effects of 'Acceleration' are then felt through the economy. Reaching this stage would mean the successful implementation of meso-level changes that support the need to change behaviors and practices. In terms of wildlife damage management, this would be the development of new techniques for wildlife which support coexistence and benefit those affected by human-wildlife conflict such as physical methods or compensation schemes.

2.2.4 Stabilization

Finally, Phase 4 is stabilization. This is the point where the system starts to fall into a new dynamic equilibrium (Van der Brugge et al., 2005). Here, coexistence with wildlife becomes the status quo across all three scales, awaiting the next development within wildlife management. For this research, this would be the time when coexistence is ingrained into VBAs, laws and regulations, and the methods used to manage wildlife. Realistically, due to the breadth of wildlife that needs to still be protected and subsequently managed to support coexistence, reaching this phase would take more than the proposed 50 years of transition.

2.3 Wildlife Damage Management

2.3.1 Defining Wildlife Damage Management

Out of the transition towards coexistence, older approaches to wildlife management are no longer appropriate and new meso-level approaches have emerged, one being Wildlife Damage Management (WDM). This approach goes by many names around the world, such as Community-Based Natural Resource Management or Human Wildlife Conflict Management (Enzerik, 2017, König, 2020). WDM evolved from pest control that was relatively restricted to animals such as rats and mice to where WDM now encompasses concepts from nature preservation and nature conservation. WDM is defined by Miller & Reidinger (2013, p. 6) as: "*The science and art of diminishing the negative aspects of wildlife while maintaining or enhancing their positive ones*."

Working towards the objective of coexistence, wildlife damage managers work on complex cases– first and foremost, because more and more species are being protected by local, national, and international laws. This is a win for wildlife that needs to be conserved, but as populations spread, it also creates a limited range of solutions for wildlife management that would otherwise have been acceptable to use in the past, such as trapping or removal (König et al., 2020). On top of this, WDM, like traditional wildlife management, is heavily influenced by stakeholder VBAs, even more so within changing societal views to apply methods that support mutualism over dominionism (Fall & Jackson, 2002; Miller & Reidinger, 2013). These characteristics put WDM in a position to manage both wildlife and human interactions (Fall & Jackson, 2002). In order to balance changing human behaviors and wildlife behaviors, WDM offers a holistic, adaptive strategy. This does not say that it is impervious to failure as there are both 'good' and 'bad' managers, but using integrated methods and involving stakeholders has proven thus far successful (Fall & Jackson, 2002; Jax & Schwarz, 2011; Miller & Reidinger, 2013).

The WDM approach is categorized as an anthropomorphic approach to wildlife management, meaning that WDM is human-oriented because the approach sees wildlife as not being aware of the damage being done by their presence in that area (Miller & Reidinger, 2013). From here, a multidimensional approach is to be fit to each situation. A multidimensional approach means to take ecological as well as human dimensional characteristics of the situation into account when developing a plan; ecological characteristics must be looked at on an individual, species, and ecosystem level (ibid). Human dimensions need to consider the aspects of the sustainability triangle, that being the social and economic characteristics. Doing so helps to guarantee that not only one

characteristic does not bear all the burden of change, but that both human and environmental characteristics will need to change in order for the plan to work. Thus, the involvement of human stakeholders is vital as humans are the ones making the decisions as they see fit. With the inclusion of human stakeholders, the goal of WDM is to involve all affected actors in order to create consensus between all parties, and find a solution that everyone can agree on. Nevertheless, WDM recognizes that implemented solutions may not work perfectly, and therefore, managers as well as stakeholders can and should expect some degree of failure within the management plan. Failure of one aspect of the plan though cannot immediately be considered a failure to the whole plan because of its adaptive nature, but allows stakeholders and managers to come back together to revise plans.

This all being said, in the end, it is up to the manager to decide how much integration and participation of stakeholders is truly applied. Having a manager that does not believe that cross-sectoral integration and participation as an important aspect of WDM may lead to less successful outcomes or an increased amount of conflict between human stakeholders (Miller & Reidinger, 2013; World Bank, 2016). Moreover, the manager's knowledge of the situation and the decisions they make ultimately defines how holistic of a process WDM turns out to be. Therefore, it is vital to also pick the right manager for the development of a damage management plan (Fall & Jackson, 2002; Miller & Reidinger, 2013; World Bank, 2016).

2.3.1.1 Participation in WDM

When studying how stakeholders are affected by the implementation of WDM, it is integral to look at the participation in the process. In the WDM framework, choosing stakeholders and their roles are the building blocks of the approach. The ways and amount the stakeholders participate in managing human-wildlife conflicts directly corresponds with the outcomes of the management plan (Arnstein, 1968; Köning, 2020; Miller & Reidinger, 2013). Participation is important to planning processes that involve multiple stakeholders because it gives the ability to choose what is 'good' and 'right' after debate (Healey, 1992, p. 151). Participation increases the tolerance of the outcomes decided upon, but this does not mean that every stakeholder has the same influence on the decisions made. In urban planning, Arnstein's (1968) 'ladder of participation' is used, and can also be used for measuring the level of participation in WDM. The ladder is made up of eight rungs, each of which represents the extent of power stakeholders hold (ibid) (Figure 7). The eight rungs are further broken down into three degrees of participation. The bottom two rungs of the ladder, manipulation and therapy, are categorized into the degree of non-participation– this translates roughly into the stakeholders being educated, but the stakeholder does not have a

platform to change the status quo nor have a say in the matter at hand. Informing, consultation, and placation are situated in degrees of tokenism, meaning that while the stakeholder has a platform to be heard on, it does not guarantee that those in charge are listening or taking note of what they have to say. In the degrees of citizen power, the stakeholder is heard and their concerns are used in the implementation of the plan, thus changing the status quo (ibid).

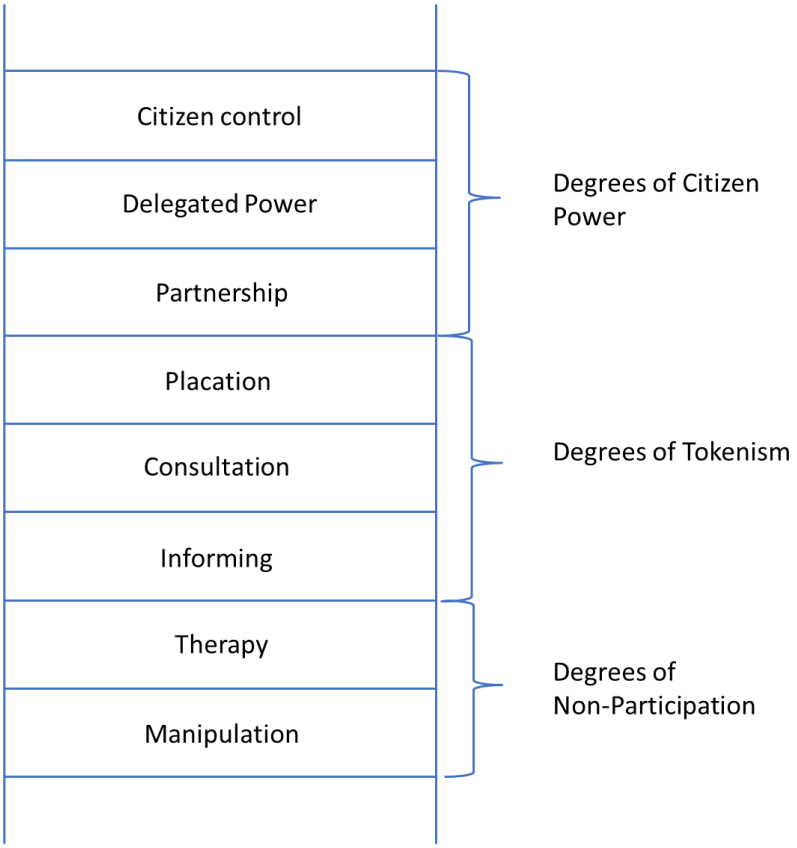

Figure 7. Ladder of Participation is separated into 3 categories and 8 rungs to represent the levels of participation in planning. (Arnstein, 1968)

Arnstein's ladder is important to this research as it also allows for an analysis of the role of the central government in WDM, especially when it comes to the amount of power the government wants to hold over wildlife management plans, and specifically in the case of endangered species (Shackleton & Campbell., 2001). High levels of participation, while crucial for the successful implementation of a plan, do not equal success in and of itself, and a guiding governmental body with the interest to lead is still very much needed in WDM (Shackleton & Campbell., 2001; Miller & Reidinger, 2013). In this research, Arnstein's ladder can be used as an instrument to form appropriate roles for stakeholders in WDM through assessing tolerance stakeholders have for damages involved in human-wildlife conflict and

the willingness and ability for stakeholders to participate in making solutions (Roldan et al., 2019).

2.3.1.2 Integration in WDM

Since most endangered large carnivores in Europe have some level of protection regulation already in place, and WDM works at the meso-level to manage wildlife, it is important for the managers of WDM projects to ensure that stakeholders include the appropriate authorities in the planning process. WDM is not a one-size-fits-all practice (Miller & Reidinger, 2013), thus VBAs and policy combine different sectors into one issue, the interrelation of human-wildlife conflicts demand that competing sectors communicate and cooperate in finding and maintaining solutions. To achieve integration, we can use Lafferty & Hovden's (2002) definition of environmental policy integration (EPI), which states EPI is: *"The incorporation of environmental objectives into all stages of policymaking in non-environmental policy sectors, with a specific recognition of this goal as a guiding principle for the planning and execution of policy… [and is] accompanied by an attempt to aggregate presumed environmental consequences into an overall evaluation of policy, and a commitment to minimize contradictions between environmental and sectoral policies by giving principled priority to the former over the latter."* Collier (1997, p. 36) then further defines EPI into three goals that are to be incorporated into the process: *(1) "To achieve sustainable development and prevent environmental damage", (2) "Remove contradictions between policies as well as within policies," (3) "Realize mutual benefits and the goal of making policies mutually supportive."*

There are two types of EPI– vertical environmental policy integration (VEPI) and horizontal environmental policy integration (HEPI)– both are valuable in their own ways, and depending on the current structure of the government and the policies and regulation involved (Collier, 1997; Lafferty & Hovden, 2002). VEPI is internal integration, thus, there is no overarching strategy, but each sector takes on a certain degree of environmental objectives. HEPI, on the other hand, is the government implementing an overall strategy, then sectors must coordinate with each other to create a coordinated response. Both of these structures aim to connect policies that focus acutely on one problem that is otherwise failing in tackling the complex aspects of modern socio-environmental issues (Briassoulis, 2005). However, both VEPI and HEPI cannot judge when the policy is balanced, creating the need for adaptation, when the situation calls for it (Lafferty & Hovden, 2002).

Figure 8. Visualization of HEPI. (Adapted from Zuidema, 2022)

For this research, HEPI will be concentrated on as the interconnectedness between sectors in coexistence depend on an overarching strategy in which agricultural and environmental sectors must work together in order to achieve objectives (Miller & Reidinger, 2013). Determining and understanding the current types of integration in the government reveals what changes are needed to be made in order for coexistence policies to be implemented. Furthermore, analyzing HEPI structures fits well into the WDM framework as the adaptive approach allows for alterations of policy in order to create a unique fit to each situation.

2.3.2 WDM Framework

The framework of WDM is a 6-step strategy (Miller & Reidinger, 2013). Before starting, the manager should understand the background of the situation, having gathered information about the history of the conflict as well as understanding any literature published about the subject, such as best practices in similar cases. This is where the manager can then decide which route to take as WDM is subdivided into two categories: autecological and synecological (Jax & Schwarz, 2011; Miller & Reidinger, 2013). Autecological refers to the ecology of a single species or individual, therefore, WDM in this case looks at management within the context of the individual or species. Synecology is the ecology of multiple species that are causing damage. Depending on the scenario, one of these classifications are used to base the rest of the strategy on.

Step 1 in the plan is to identify the stakeholders and impacts they have on the situation. This step has many important implications for the rest of the process. Participation

is important as it creates a base for understanding what is each party's interest and if/who is directly affected by the conflict– stakeholders come from an array of backgrounds, including, but not limited to: government officials, business leaders, nature conservation organizations, or the public (Rabinowitz, 2022). This also brings more ideas to the table when deciding on the management plan, while also helps the manager to avoid running into any concerns they were previously unaware about, and creates a relationship between stakeholders, bridging social capital (ibid). Additionally, VBAs can be assessed here by the manager to help decide which stakeholders hold the most salience in the process.

Step 2 consists of deciding on the stakeholders' roles and objectives in the planning process. This step achieves the goal of identifying the importance of each stakeholder that was chosen during the first step. In this step, VBAs of chosen stakeholders can further be assessed to understand how the developing plan can be created. Furthermore, what each stakeholder wishes to gain from the process and conducting this step also determines the level of participation each stakeholder will have in making the management plan (World Bank, 2016).

Step 3 starts looking at the conflict itself by assessing the impact of a conflict and subsequently identifying possible solutions. Taking this step instead of immediately delving into developing the plan allows for holistic assessments of the wildlife conflict. Working with stakeholders, the manager and stakeholders develop ideas to resolve the conflict, and assess the feasibility of said ideas (Fall & Jackson, 2002; Miller & Reidinger, 2013; World Bank, 2016).

In Step 4, a management plan is developed. This will include not only what will be done to prevent damage, control the wildlife population, and the change behaviors of both wildlife and humans, but must also include who will be responsible for aspects such as fiscal obligations and implementation of the plan. This is the time when consensus will need to be reached and an agreement drawn up so that plans can be implemented. One of the most important conditions will also be necessary here, and that is setting a date to reevaluate the situation to ensure an adaptive strategy.

Next, in Step 5, implementation takes place. The agreed upon solutions will go into effect and stakeholders will be responsible for holding to their responsibilities. During this time, patience and understanding is required in order to evaluate the outcomes in the next step.

Finally, in Step 6, evaluation of the plan's objectives and solutions will occur. Modifications may be made at this stage in order to increase the effectiveness, efficiency,

and robustness of the plan (Walker et al., 2019). To do this, the manager should conduct steps one through five again, making appropriate adjustments when necessary.

2.4 The Eurasian Otter in Human-Wildlife Conflict

Eurasian otters (Lutra lutra) are part of the weasel family and are one of thirteen otter species around the world. As the name indicates, Eurasian otters, referred hereinafter simply as ‘otter’, are native throughout the continents of Europe and Asia, while also being present in North Africa. Otters are semi-aquatic, carnivorous mammals that can grow up to 1.40 meters in length, and weigh between 6 and 12 kilograms (Aktion Fischotterschutz, 2019). Otters are keystone species, as they sit at the top of the food chain as well as indicator species because their presence directly correlates with the health of the surrounding ecosystem.

Figure 9. Eurasian otter (Image Courtesy of Eva Laumann)

2.4.1 Behavior

Research is lacking around otter behavior because otters are largely nocturnal and actively avoid humans. From what is known, otters are primarily solitary animals, and only come together for mating (Aktion Fischotterschutz, 2019). That being said, there is evidence that multiple otters can be found in areas with an abundance of food sources and territories often intersect one another (Aktion Fischotterschutz, 2019; Quaglietta et al., 2014).

2.4.2 Habitat

The otter's habitat includes rivers, streams, lakes, wetlands, and coastal areas (Roos et al., 2015). Otters prefer various shrubs and thick plant life along the water's edge, as they do not usually dig their own burrows, except when raising their young (Aktion Fischotterschutz, 2019). Their territory ranges from 10 to 50 kilometers along bodies of water, but depending on the suitability of their habitat, they have been observed traveling distances up to 50 kilometers over dry land to find suitable areas along other bodies of water (ibid).

2.4.3 Diet

An otter's diet consists of 80 percent fish, while the rest consist of a variety of species such as amphibians, small and young birds, crustaceans, and other small mammals (Aktion Fischotterschutz, 2019; Roos et al., 2015). Otters prefer to prey on fish species that measure 20 centimeters in length or less, but can also tackle larger fish such as carp or zander. Otters have a short digestion time– around one hour– and because of this, they have to 1) eat a quarter of their body weight daily, or approximately 1 to 1.5 kilograms per day, and 2) hunt multiple times per day (Aktion Fischotterschutz, 2019).

2.4.4 Historical Threats

Across western and central Europe during the 19th and 20th Centuries, Eurasian otters were seen as pests to the growing inland fishing industry in addition to being already being classified as game. This led to voracious hunting of the species, so much so, that a specialized hunting dog, the otterhound (Figure 10), was even bred for this specific purpose.

Figure 10. Otterhounds were bred for their loud bark, endurance, and water-repellent coat in order to help hunt otters. (Image courtesy of Eva Laumann)

Also during this same time period, natural waterways were being reconstructed to fit the needs of anthropogenic activities such as inland shipping and aquaculture. Furthermore, those same waterways were being polluted heavily by industry. Both growing industries and pollution simultaneously destroyed suitable otter habitats across the continent (Klenke et al., 2013). These acts ultimately led to the steep decline in the otter population, and in some areas otters completely disappeared, leaving the stable populations of otters in Western and Central Europe in Portugal and eastern Poland (Figure 11) (Aktion Fischotterschutz, 2019).

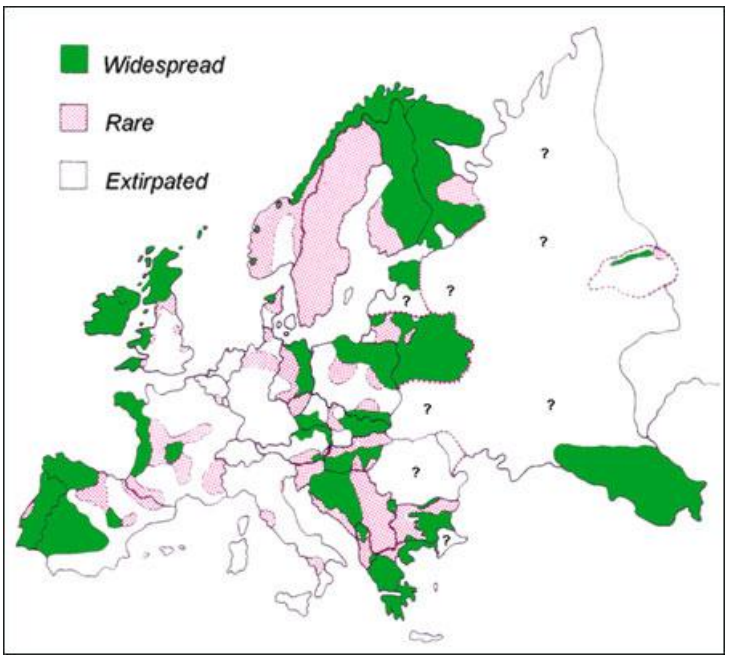

Figure 11. Extent of otter population at the end of the 1980s. (Courtesy of Aktion Fischotterschutz)

2.4.5 Present Threats

The largest current threat to otters is vehicular traffic (Klenke et al., 2013; Roos et al., 2021). Traffic accidents are due to habitat fragmentation, and occur when otters cross roads while going from one body of water to the next (Aktion Fischotterschutz; 2019; Klenke et al., 2013). Due to their dark color and short stature, drivers often do not see otters until it is too late.

Another threat are live traps set up for other animals, such as nutria, which are invasive in Europe (Aktion Fischotterschutz, 2019; Brussaard, 2021). Once an otter is trapped, they will try to find a way out. Unlike a nutria in a trap, otters will not tire out until they find a way out, and therefore, they are at risk of losing teeth or claws. Moreover, due to their thick fur coat, otters easily and quickly overheat, putting them at risk of death in a trap as bycatch.

Lastly and in this case, most importantly, the current problem lies again with aquaculture. Since the population decline of otters, the pond farming industry was able to expand over the past 150 years. The rise of numbers of otters over the past two decades has created controversy among fish farmers as otters again decimate fish stocks in ponds. The result is the threat of lethal action against otters, such as shooting them as a means of protecting fishponds, is not unheard of (Klenke et al., 2013). Nonetheless, many fish farmers'

attitudes have changed away from coming to the immediate conclusion that otters must be killed to protect their profits (R3, 2022).

2.5 Interim Conclusion & Conceptual Model

In this chapter, VBAs influence how humans interact with wildlife and the resulting outcomes in wildlife management is discussed with the goal of answering the first two sub-questions within this research:

1. What are the origins of human-wildlife conflict between humans and otters?
2. How are changing perceptions of wildlife affecting the management of it?

Human-wildlife conflict can be summed up as the interactions between humans and wildlife which cause harm to one or the other. Throughout history, humans have had different relationships with wildlife and factors such as traditional knowledge and personal experiences, influence the interaction between the two currently. Both positive and negative values, beliefs, and attitudes cultivated around wildlife shape what humans believe the worth of wildlife is and ultimately delineate what kind of tactics are used in the management of wildlife. In relation to otters, conflict comes from the perception that they would eat away profits from inland fishermen. Fishermen's beliefs and attitudes towards otters compelled them to decimate the population due to this conflict. Although founded on local knowledge, it was unknown at the time what impacts a landscape without otters would mean in the future.

In the larger picture, a transition can be seen from dominionism to mutualism. Policy change is a result of changing perceptions towards wildlife and has also been supported through the ideas coming from sustainability and sustainable development. Through policy change, a mandate of mutualism has set a precedent to coexist with wildlife, and as a result, innovative methods of wildlife management have started to emerge with the objectives of sustainability at the forefront.

Wildlife Damage Management is one of these new methods of wildlife damage management, but it comes with challenges. Marketed as a participatory, adaptive and integrated approach, WDM must find concrete ways to incorporate those affected by human-wildlife conflict. As an integral part of WDM, participation should include degrees of citizen power in an attempt to spur changes in behavior and VBAs. Furthermore, integration of governmental sectors drives the notion that the issue is interrelated home, and in order to continue the path of sustainable development, all must work together–not separately– to reach what objectives are embodied by the SDGs.

From these interim conclusions, a conceptual model can be created to encompass the argument of this research:

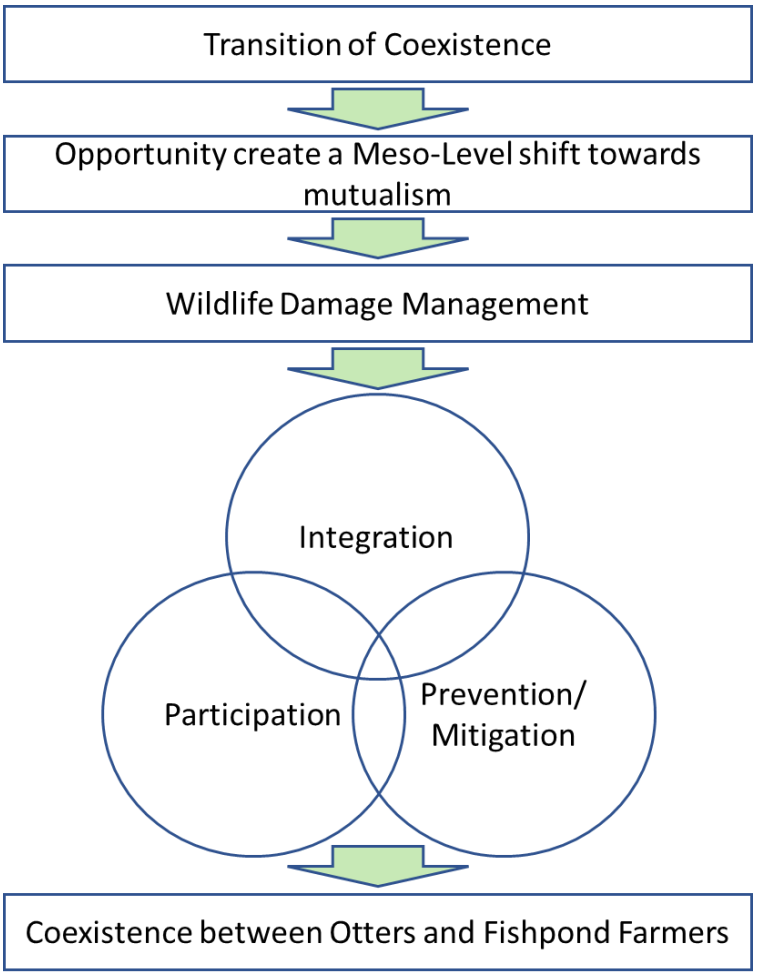

Figure 12. The conceptual model shows how participation, integration, and prevention/mitigation through the framework of WDM can support the transition towards coexistence. (Own work)

3. Methodology

This section expands on the research methods used in this study. First, the examined case study is explored. Then, the research design is expanded upon. Lastly, the ethical considerations are discussed.

3.1 Exploring the Case Study

In Lower Saxony, fish farmers and otters have had a long and complicated relationship, especially over the past 150 years. Eurasian otters are native to all areas of the federal state, and as the otter population in the state dwindled or even disappeared in some portions, fish farming expanded (Klenke et al., 2013; Knol & Vugteveen, 2017; Lampa, 2013). Lower Saxony became the fourth largest producer of farmed fish in the country behind Bavaria, Saxony, and Mecklenburg-West Pomerania (R1, 2022). Pond-farmed fisheries consisted mainly of carp (*Cyprinus carpio*) and trout (*Oncorhynchus mykiss*), and was important to the food culture of Lower Saxony because it was an accessible resource; the typical holiday meal consisted of fish (ibid).

Two aspects changed this situation. First, was the protection of the wildlife and their habitats at EU, national, and state levels between the 1960s to 1990s. This allowed otters to start to spread from regions that still had populations of otters back into Lower Saxony. Second, globalization popularized the import of fish from other parts of the world (ibid). This resulted in traditional fish farms losing profit and in some cases, their livelihoods, as less people would buy fish from local farmers (ibid).

Presently, Lower Saxony is home to some 108 commercial carp and trout fish farms which harvest 107 tonnes and 1,093 tonnes annually, respectively (LAVES, 2019). In total, due to predation, fish farmers can lose upwards of 50% to 80% of their fish stock before being ready to harvest and damages total approximately 40,000 Euros per year (LAVES, 2019; R1, 2022; R2, 2022). Otters are not the only animals predating fishponds though. Cormorants are the largest problem for fish farmers, but as otters move back into areas that were previously void of the animals for so long, these hungry, opportunistic predators are settling around fishponds where food sources are abundant and prey is easy to catch, making an even larger problem for the fish farmers. To add to the problem, although otters are considered solitary animals, due to the abundance of food “supplied” by fishponds,

multiple otters are able to reside in the same area, compounding the problem of fish being preyed upon (R2, 2022).

In Lower Saxony, otters now populate the majority of the state and the population is expanding (Figure 14) (NLWKN, 2011). Fish farmers have had evidence of otter predation since 2004. Out of the current 108 commercial fishponds, 15 of them are experiencing damage from otters on their fishponds. While damage from otters occurs year-round, winter is the main concern in the state (R2, 2022).

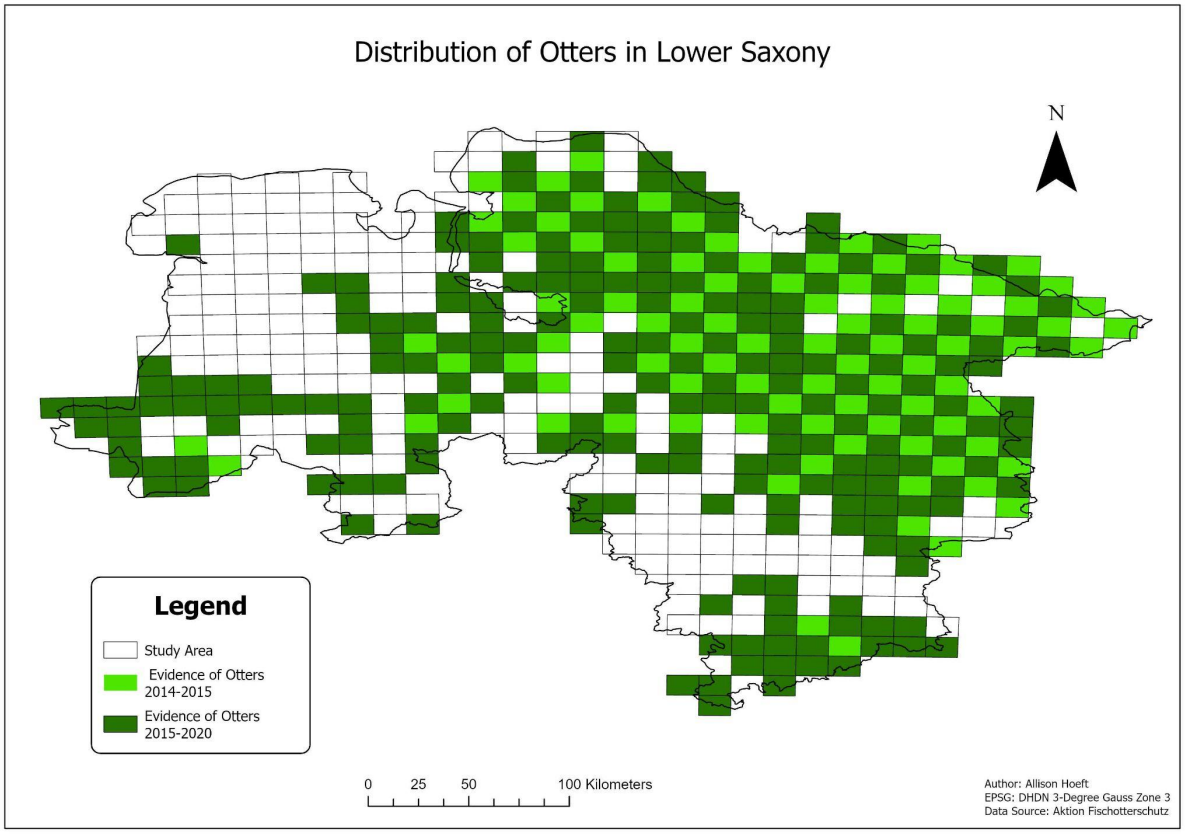

Figure 14. Monitoring of the otter population over six years. Distribution can be seen through the light green representing the stance in 2015 and dark green representing evidence found in 2020.

In summer, otters are able to prey upon smaller fish, quickly depleting the stock in the pond, and causing immediate profit loss for the fish farmer, but also have a multitude of other food sources other than fish, including frogs, small birds, and crawdads. In contrast, the winter provides few food sources for the otter and therefore, they look to find any food sources possible– fishponds often being an easy target. This is because fish farmers periodically drain their ponds in the winter in order to remineralize nutrients in the ponds for the coming year, and to do this, farmers must consolidate their large, breeding stocks into

small over-wintering ponds. Otters, although they do not prefer hunting fish larger than 20cm, prey on these stocks anyway (Figure 13). Like in summer, farmers lose profits immediately due to losing fish, but also lose long-term prospects for further breeding, impacting the viability of their business (R2, 2022; R3, 2022).

Figure 13. Remnants of a carp predated by an otter. Otters primarily eat in smaller portions throughout the day, but when larger fish are hunted, they often only eat what is referred to as "the tasty bits", usually referring to areas just behind the fish's gills, stomach, and lips. (Image Credit Cech & Cech, 2000)

Currently, there are only a few solutions for the damages inflicted by otters. Fences with and without electricity can be installed around smaller ponds, but many ponds are either too large to put a fence as it is too expensive or the land surrounding the ponds is not suitable for fence installation, rendering the technique useless. Furthermore, there is no financial compensation plan to alleviate the pain of losing one's fish stock to otters. This lack of robust solutions to deal with otter predation has led to frustration in the fishing farming community because state officials have made the wolf (*Canis lupus lupus*), another damage-causing, endangered species that is currently spreading across the state, a priority.

3.2 Research Design

Qualitative research tries to assess and understand the context of a certain anomaly, explain certain behaviors, beliefs, or experiences (Hennink et al., 2020, p. 17). Qualitative

research, in contrast to quantitative research, strives to understand participants' perspectives of a problem in an effort to resolve complex issues (Hennink et al., 2020). Because of its broader context, qualitative research can make generalizations through only a small number of sampled data and does so through collecting information through methods such as interviews and literature (ibid).

The objective of this research is to identify important principles of WDM which can support solutions for the conflict between otters and humans, not to quantify existing conflicts between the two. This research aims to achieve a more in-depth understanding of human-wildlife conflicts and the perspectives of stakeholders that heed the need for behavioral change. Due to human-wildlife conflict being extremely dependent on spatial, legal, and institutional context, a qualitative research approach is the most appropriate approach for such a study.

Furthermore, case study research supports a full and in-depth analysis of coexistence and human-wildlife conflicts within a local context, which makes a case study a fitting choice for my research (Yin, 2009). A case study is appropriate for this research question as the topic of interest can be analyzed when it meets certain conditions: an objective perspective, focuses on current events, there is no need to tamper events or with stakeholder perspectives nor control their ideas, and there is a enough evidence to support the theoretical base of the topic (Gagnon, 2010). Because all of these requirements are met by the research, the case study of the conflict between otters and fish pond farmers in Lower Saxony has been chosen due to the recent reemergence of otters in the area and the strict protection laws currently in place. Choosing a single case study such as this can be used to create a powerful example in order to understand how to manage otters in sensitive border regions (Flyvbjerg, 2006).

3.3 Data Collection

3.3.1 Document Analysis

For this study, a document analysis was conducted. A document analysis was used because the method creates more context around the research questions and develops empirical evidence (Bowen, 2009). The documents used were a mixture of international policy documents, national policy documents, state policy documents, and reports centered around the topic of otter conflict in Germany (Table 2). This document analysis serves to

understand the protection status of otters, as well as frameworks protecting fish ponds with the objective of assisting in answering the third and fourth sub-research questions.

Year	Document Title	Reference
1952	Federal Hunting Act	BJagdG, 1952
1962	Common Agricultural Policy	CAP, 1962
1972	Federal Animal Protection Act	TierSchG, 1972
1979	Convention on the Conservation of European Wildlife and Natural Habitats	Bern Convention, 1979
1992	Council Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora	Habitats Directive, 1992
1994	Lower Saxony Nature Conservation Act	NNatG, 1994
2000	Directive 2000/60/EC of the European Parliament and of the Council Establishing a Framework for the Community Action in the Field of Water Policy	Water Framework Directive, 2000
2009	Federal Nature Conservation Act	BNatSschG, 2009
2013	Common Fisheries Policy	CFP, 2013
2019	Evaluation of the Lower Saxony Cormorant Ordinance of June 9, 2010: Partial report on "Fisheries and Fish Species Protection"	LAVES, 2019
2021	Otter Protection and Pond Management in Germany: A Guide to Avoiding and Reducing Conflicts	Roy et al., 2021
2022	Lower Saxony Hunting Act	NJagdG, 2022

Table 2. Overview of documents chosen for analysis.

3.3.2 Semi-Structured Interviews

For this study, a semi-structured interview format was used as a method of data collection. Semi-structured interviews are the most common type of interview in a qualitative research approach and "...provide the opportunity for identifying new ways of seeing and understanding the topic at hand," (Stuckey, 2013, p. 57). "The semi-structured interview involves prepared questioning guided by identified themes in a consistent and systematic manner interposed with probes designed to elicit more elaborate responses," (Qu & Dumay, 2011, p. 246). As implied in the quote, such a design of interviews are valuable to qualitative research as the method is able to impart rich information that would otherwise not be able to be collected through any other method (Given, 2016). Moreover, semi-structured interviews offer the opportunity to gather both standardized, thematic answers to the questions asked while also being able to expose more previously diverged topics or details (Qu & Dumay,

2011). These characteristics of semi-structured interviews are relevant for this case study because it depends largely on the ABVs of humans towards the Eurasian otter, and therefore, the structure allows for context-dependent answers, especially those that are deeply ingrained in the different interests who are involved and interviewed (Qu & Dumay, 2011; Stuckey, 2013).

3.3.3 Selecting & Conducting Interviews

In the case of human-otter conflict in Lower Saxony, there are two main– and opposing– viewpoints, one that agrees more with the conservation of the otter population and one of preserving fish farms. Due to the locality of the conflict, the pool of relevant actors is relatively small, therefore, the most relevant experts and authorities were selected for interviews first (Mosley, 2013). Then, to ensure that multiple points of view were taken into account, a 'snowballing' technique was used to expand the number of interviewees. The term 'snowballing' refers to asking interviewees if there is anyone else that should be contacted in order to gain a more overarching understanding of the situation (ibid). The result of this snowballing majoridly resulted in an overlap of suggested interview partners, thus suggesting that my ability to contact more experts had been reached. To contact all four experts and authorities, email was used to contact them and set up an appointment for interviewing them. In total, four interviews were conducted and have been listed in Table 3 with an identifier. All interviews were conducted over video-conferencing software due to the distance needed to be traveled between the interviewer and interviewee, scheduling conflicts, and an illness of the interviewer. Interviews were conducted in both German and English for the comfort of the interviewees. The respondents were able to choose which language they preferred to do the interview in.

ID	Entity	Background	Date	Duration
R1	Lower Saxony State Office of Consumer Protection & Food Safety	Biologist, specialist of eel management and carp ponds	12 July 2022	37 min
R2	Lower Saxony Enterprise for Water Management, Coastal Defense, and Nature Conservation	Specialist for national nature conservation responsible for amphibians, reptiles and semi-aquatic mammals, and wild cats	18 July 2022	27 min
R3	Lower Saxony Fisheries Association	Chair of the Lower Saxony Fisheries Association, owner of the Aschau fishponds	12 July 2022	48 min
R4	Campaign for Eurasian Otter Protection	Behavioral biologist, head of animal husbandry and research	20 July 2022	25 min

Table 3. Overview of conducted interviews.

To conduct the interview, an interview guide in both languages was created, which can be found in Appendix 1 and Appendix 2, and was made to steer the interview and bridge the topics that were discussed (Given, 2016). The interview consisted of six parts. First, the interviewer read the consent form verbally and received consent from the respondents to conduct the interview. Next, the interviewee was asked to introduce themselves and what they do. The third section was focused on questions about ABVs around wildlife and how respondents viewed humans' relationship with nature. Then, the fourth section talked about stakeholders and their involvement in the issue and how they interact with one another. Fifthly, came questions about the management of otters, including current legislation around otters, management techniques, and the challenges that go along with the process of making a management plan, particularly in the state of Lower Saxony. Lastly, section six was an outro, asking if respondents wanted to add anything to the topics that had been discussed or that they believed had been overlooked as well as thanking the interviewees for their time before ending the interview.

3.4 Coding & Analysis

After the interviews were completed, they were transcribed and, if necessary, translated. Transcriptions were completed through Descript software. Through this software, filler words were removed from the transcript to make reading and analyzing the text smoother (Kuckartz et al., 2008). Translations were done by the researcher's husband, who is a native German speaker and has a background in German-English translations. When transcription and translation were finished, coding was done through MAXQDA2022.

A directed qualitative content analysis approach was used to analyze the interviews. Directed content analysis "*focuses on the characteristics of language as communication with attention to the content or contextual meaning of the text*," in order to add value to already established theory (Hseih & Shannon, 2005, p. 1278). To take this approach, pre-selected categories are identified to address key topics centered around the research questions (ibid). Because this was done in order to create the interview guide, the categories aligned with the interview guide, thus, the codes were: 'ABVs', 'Stakeholders', and 'Management' and any other relevant text was then put into its own category as 'Other' as it can still be considered important for the context of the findings (ibid).

3.5 Limitations

Qualitative research analysis has its limitations. First of all, even though interview respondents were from a wide range of backgrounds, due to only a small sample size being

used, findings are in themselves limited. This limits the research to generalizations instead of an explicit answer to the research questions being asked (Kuckartz et al., 2008). For example, only one fish farmer was interviewed for this research, and although they are considered a reliable and respectable choice of respondent, are suffering from otter damage on their property, and have their own opinions about management, this does not mean that their opinions are the opinions of every fish farmer in Lower Saxony. Secondly, due to the pre-categorization of themes to use for the coding process, an inherent bias is brought into the research (Boruch & Petrosino, 2015; Hseih & Shannon, 2005). With this bias, there is a higher chance of finding supportive evidence of the research questions and theory than unsupportive evidence (Hseih & Shannon, 2005). Another limitation is the possibility that interviewees may feel compelled to answer in a way that pleases the interviewer, this can skew findings without the interviewer knowing of an inconsistency in the collected data (ibid). Lastly, a limitation to the methodology chosen is that there is a possibility that the theory behind the coded categories can overshadow patterns that exist outside of the context of the chosen categories (ibid). Making sure to also thoroughly analyze the 'Other' category helped to avoid this phenomenon.

3.5 Validity & Reliability

Reliability of the research is ensured by being subjective throughout the research process. To eliminate any subjectivity in research is necessary in order to make the research reproducible. Having worked in the field of otter conservation, the researcher strived to put their own VBAs aside in the name of scientific research. Doing so guards against inserting one's own perspectives of the case study because, "...*we have no certain guard against the impact of that observer's subjectivity*," (Babbie, 2010, p.158).

Cohen et al. (2007) states that validity can be measured through four characteristics. First, an appropriate time scale is selected– the research was conducted over the span of multiple months, this ensures that the results are not conducted in an overly-hurried manner. Second, the appropriate methods are being used– the thesis is qualitative research as it is aiming to understand the perspectives of stakeholders and specify how principles of WDM can be used to create an appropriate solution to the otter damage in Lower Saxony. Third, a suitable sample method was used– the interviews and conducted desk research to understand the aforementioned perspectives. Fourth, respondents are not pressured to give any specific answers– the researcher attempted to eliminate any leading question in the interviews to ensure truthful answers from the interviewees.

3.6 Ethics

An ethical research design is vital within scientific research (NWO, 2018). Therefore, ethical practices and ideologies are used throughout this research. To do this, principles set forward by the Dutch Research Council, which comprise of: Honesty, Scrupulousness, Transparency, Independence, and Responsibility were used as a guideline for the research conducted. Using these principles helped to ensure the integrity and credibility of scientific research were not undermined.

Due to the qualitative nature of the research, ethical considerations are not only limited to desk research, but also to data collection through interviews. As stated in Section 3.3.3, to conduct an ethical interview, enthusiastic consent was received from interviewees before starting the interview in the form of either reading the consent form and asking for consent or through the written version of the consent form (Appendix 3; Appendix 4). Moreover, to safeguard the identities of the interviewees by the personal information of the respondents were anonymized in the results to protect their privacy and uphold the integrity of the interview.

4. Results

In this chapter, the findings from the analysis of the interviews and documents are presented. This chapter answers the third and fourth sub-questions by looking at the regulations that guide current prevention and mitigation techniques. Then, as calls for coexistence grow, perceptions of additional management are analyzed.

3. How do current regulations interact to mitigate conflicts between fishpond farmers and otters in Lower Saxony?
4. Since their protection, how have fish farmers reacted to an increase in damage by otters?

4.1 Regulatory Measures

This section focuses on the regulations protecting Eurasian otters and traditional fisheries as well as how governmental agencies interact to mitigate otter damage.

4.1.1 Policies and Regulations

Today, through meso-level policies and regulations, the Eurasian otter is considered one of the most strictly protected species in Europe. To understand how this affects otter protection and human-wildlife conflict with otters in Lower Saxony, it is necessary to understand the regulations in place that have a trickle-down effect around conservation and coexistence.

At the European level, otters are protected through two conventions. First, they are protected through Annex II of Convention on the Protection of European Wildlife and Natural Habitats (Bern Convention). The Bern Convention (1979) states that otters are to be protected from: "*(1) all forms of deliberate capture and keeping and deliberate killing; (2) the deliberate damage to or destruction of breeding or resting sites; (3) the deliberate disturbance of wild fauna, particularly during the period of breeding, rearing and hibernation…*" That being said, the Bern Convention also states that exceptions can be made in the event of damage to "*fisheries, water, and other types of property*," and when no other solution to the problem can be found (1979).

Otters are also protected by Annex II and IV of the European Union's Council Directive No. 92/43/EEC (Habitats Directive) (1992). In Annex II, otters and more specifically, their habitats, are protected by the designation of core habitats as Sites of Community Importance and Natura 2000 areas. This mandates that such areas have to be "*managed in*

accordance with the ecological needs of the species," (Habitats Directive, 1992). Annex IV of the Habitats Directive overlaps with the protections within the Bern Convention regulations and creates strict protection of otters. In this regulation, it is banned to deliberately or knowingly, trap, kill, or disturb otters within Natura 2000 areas, Sites of Community Importance, and throughout their entire natural range within the European Union in order to protect ecological functionality. Again like the Bern Convention, the Habitats Directive also includes the clause which indicates that in times where no other solutions can be found for damage caused by otters, then lethal action against them can be taken.

Complimentary to the Bern Convention and Habitats Directive are the Common Agricultural Policy (CAP), the Common Fisheries Policy (CFP), and the Water Framework Directive (WFD). The first two policies support fish farming in the European Union by encouraging the integration of eco-agricultural practices under the guidance of the Bern Convention and Habitats Directive. Furthermore, the European Maritime and Fisheries Fund (EMFF) European Maritime, Fisheries, and Aquaculture Fund (EMFAF), which supports the CFP and CAP, is a fund from the European Union which provides reimbursement payments of 50% of total damages to fish farmers who are suffering from their ponds being predated. The WFD has a more unique relationship with the issue as the directive strives to improve surface water quality and thereinto the habitats adjacent to the water. The WFD is mandatory in areas that are classified as Natura 2000 as well as other protected areas.

In Germany, otters are protected under the Federal Nature Protection Act (Bundesnaturschutzgesetz) (2009) and Federal Animal Protection Act (Tierschutzgesetz) (1972). These laws have similar clauses to that of Bern Convention and Habitat Directives, protecting both otters and their habitats. Additionally, otters are not listed on the Federal Hunting Act (Bundesjagdgesetz) (1952), making it illegal to hunt otters year-round. Furthermore, in the federal state of Lower Saxony, otters are also further protected under the State Nature and Hunting Acts (1994; 2022), again preventing killing or disturbance of any kind, except in specific situations that first must be approved by the government.

4.1.2 Integration in Lower Saxony

For Lower Saxony, there is no direct mention of any regulations guiding the transition towards coexistence with otters. That being said, this is unsurprising since otters are so strictly protected, and through the regulations, it is clear that conservation is the main priority of the federal state. The presiding bodies– the Lower Saxony Ministry for Environment, Energy, Construction, and Climate Change (MU) is responsible for federal state's environmental concerns as well as the Lower Departments for Nature Conservation (UNBn),

which are responsible for smaller regions, usually individual counties– are aware of otter damages occurring at fishponds, but "*does not find it necessary*" to enact any type of management plan for otters (R2, 2022). Therefore, within the EU protection measures outlined by the Habitats Directive and Bern Convention, the main objective for Lower Saxony is the redistribution of otters across the rest of the state.

Due to this stance of the MU and UNBn, lower agencies, which in this case are the Lower Saxony Enterprise for Water Management, Coastal Defense, and Nature Conservation (NLWKN) and the State Office for Consumer Protection and Food Safety (LAVES) take an advisory role in the protection of otters (R1,2022; R2, 2022). The NLWKN's role in the protection of otters consists of two components. First, the NLWKN is responsible for conducting statewide monitoring every six years with the intent to survey the population growth, but this is limited to surveying the evidence of otters, not the actual population number due to their illucivity and the reports published only estimate the number of otters based on the amount of evidence found. As R2 (2022) explained in their interview, "*The focus [of the NLWKN] is on the care management of these species and areas and their monitoring in the context of Natura 2000. For example, the participation in the creation of the [Habitat Directive] reports.*"

Secondly, their job is to provide information to pond farmers and others who are experiencing otter damage about preventative measures to avoid otter predation. LAVES's responsibility lies with the European Maritime and Fisheries Fund (EMFF), and most likely the European Maritime, Fisheries and, Aquaculture Fund (EMFAF), the successor of the EMFF starting in 2023, which provides 50% compensation to pond farmers for damages in the case of fishpond predation, no matter the predator.

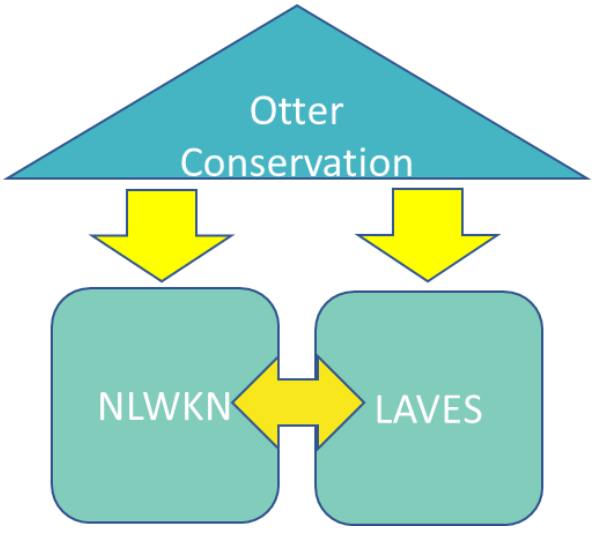

Figure 15. Otter conservation is the overarching strategy in Lower Saxony put forward by the MU, therefore, the NLWKN and LAVES must work together to integrate otter conservation into their day-to-day business. (Adapted from Zuidema, 2022)

While the population monitoring from the NLWKN is conducted and shared between agencies, communication around otter damage between governmental agencies otherwise lacks. The respondent from the NLWKN admits themself that they are unaware of the amount of otter damage occurring as a result of not having a uniform or mandatory reporting of otter damage by stating: *"If any damage is reported at all, [otter damage] will be reported to the responsible UNBn. However, they only pass this data on to the NLWKN in individual cases, if at all. Therefore, my knowledge of damage caused by otters is very low.*" LAVES, on the other hand, works more closely with affected fish farmers on the subject matter as it relates to all predation matters instead of in accordance with the NLWKN, but at the same time the agency is unable to concretely say what the exact amount of damage caused by otters is. Furthermore, LAVES lacks any personnel that deals directly with otter damage. However, LAVES would be involved with the NLWKN in the case that more funding for further protection or management measures was to be allocated (R1, 2022). This would expand the capacity of both the NLWKN and LAVES in order to, together, create a sort of "counseling" which would involve both agencies going directly to fish farmers and fishing associations to survey the rate of loss of fish stocks from otter damage with the objective of figuring out which next steps to take in preventing or mitigating the problem (ibid).

The combination of the lack of hard evidence indicating the true numbers behind the otter population, no way to uniformly report otter damage, and the lack of inter-agency communication has created the inability for the MU to accurately make informed decisions on the measures concerning otter protection and management. This creates a vicious cycle where, as R2 calls for more transparency between government agencies and states: "*If there is no lack of funds, there is a lack of personnel or different political/strategic decisions are made…[Hence] it is important for the acceptance of protection and conservation measures for species (e.g. otters) to bring all the stakeholders concerned to one table and to openly discuss all (different) perspectives with one another and to work out a solution proposal together.*"

4.2 Prevention and Mitigation Techniques

In this section, the results answering sub-question 4 will be presented. First, the prevention and mitigation techniques available to fish farmers in Lower Saxony will be laid out to understand how fish farmers do and can currently protect their ponds against

predation as discussed Next, the perspectives around management of otters is examined. Finally, fish farmers' status as stakeholders will be discussed, including their ability and willingness to participate in finding solutions for otter predation. These questions will be answered through the four interviews conducted as well as Roy et al. (2021), for aspects that were not discussed during the interview.

4.2.1 Healthy Habitats

"*Biodiversity has a big impact. It's very necessary to have a big diversity [of wildlife]. So it's not only for the otter, but for all populations,*" (R3, 2022). In Lower Saxony, eight commercial fish farms lie within Habitat Directive, Natura2000, or other types of protected areas. This demands a level of landscape management to improve and maintain healthy habitats which can support biodiversity. The fish farmer interviewed, owns fishponds which are located in the Lutter-Lachte-Aschau Habitats Directive protected area. They stated that they appreciate the biodiversity that their pond brings to the landscape and were excited to have an otter on their property for the goal of having more biodiversity in the state. Moreover, the ponds at the facility are also annually stocked to account for predation by otters and other predators. On the other hand, they stated that the higher number of prey availability and healthier habitats makes otters more prone to settle on fish ponds, decreasing the profitability of the stocked ponds (Roy et al., 2021).

One additional solution recommended by Roy et al. (2021) is the building of a diversion pond, which can be stocked with biodiverse and native fish that otters are more likely to eat than a facility's carp or trout stocks. Moreover, this solution supports the renaturation of the area around fishponds to create synergy in the environment and acts in accordance with the regulations set by the WFD (Roy et al., 2021). So far though, diversion ponds have not been a popular technique in Lower Saxony because fish farmers lack either the funds, space, or infrastructure to create them (R3, 2022).

4.2.2 Fencing

The most commonly implemented technique by fish farmers in the state to prevent otters from predating fish ponds is fencing (R1, 2022; R2, 2022; R3, 2022; R4, 2022). Fences are considered to be the most reliable form of prevention when it comes to otters, and when constructed correctly, can fully protect against otter damage (Roy et al., 2021). A variety of fences have been tested by a multitude of organizations across Europe, including by the Campaign for Eurasian Otter Protection (AFS), and scientifically proven to stave off otters from fishponds. Fish farmers have used these knowledge-based solutions to help

protect their ponds from such predation. Three types of fencing are available to minimize otters' impact: (1) permanent fencing, (2) electrical fencing, (3) combined permanent and electrical fencing (Figure 16). Otters are known to be able to climb over permanent fencing and can also dig under permanent and electrical fencing, therefore, a combination fence that extends underground with electrical wires located close to the ground and towards the top of the fence is considered to be the most effective at deterring otters (Roy et al., 2021).

Figure 16. Permanent, electric, and combination fencing are all methods used to keep otters away from fish ponds. (Image Credit, from left to right: A. Ertl, M. Schmalz, A. Ertl in Roy et al., 2021)

While fences are effective, they are also expensive and not all fish farmers can afford them (R3, 2022). From 2016-2019, EU De-minimis funding was granted so that fish farmers could fence their property against predatory animals and were reimbursed up to 90% of the cost, but this is now over (R1, 2022). Fish farmers are also able to be reimbursed through EMFAF, but this is not widely used because the process to apply for funding is long and tedious, so most fish farmers do not feel it is worth going through the process of applying (R1, 2022; R3, 2022).

Moreover, fences are not always possible to build around ponds. First of all, different types of landscapes, for example, soil type or forested areas do not lend themselves to building a stable fence. Also, the size of the fishponds is important for fence construction; as R3 states *"Around little ponds you can build these fences with electricity and can keep the fish secure, but in the big farms, [for example] we have 70 acres, you can't put fencing around these."* To clarify, small, over-wintering ponds are ideal to build fences around, but it is nearly impossible for larger facilities with large ponds, which again comes down to the

price of the fence as well as the amount of maintenance needed, even more so when electric wires are installed.

4.2.3 Removal

Because the problem on some fishponds has become the overpopulation of otters, R3 admitted that removal of otters could be a potential solution to the otter predation problem: "*I would not be worried if we only had one otter or one otter family, but I guess that we nearly have three otter families… Normally, a female otter raises one or two babies to adulthood, but here one otter female had four babies grow to adulthood, so it's a problem.*" Answering their own question of whether this was a real and feasible option, they ultimately acknowledged that it was not truly a solution because as opportunistic feeders with a tendency to wander long distances in search of food, and so even if the otter was to be removed, the next otter would come along and start predating their ponds soon thereafter.

4.2.4 Compensation

Fish pond farmers are able to receive 50% reimbursement for predation, not only limited to otters, through the EMFF/EMFAF (R1, 2022). As mentioned in Section 4.2.1.2, though, the application process for this is long and tedious, and many do not consider it a worthwhile investment of the time and effort it takes to do so. Fish farmers therefore feel left without a solution to the profits they lose out on due to predation, which is supported by the otter conservation efforts put into place by the government (R1, 2022; R3, 2022). Furthermore, without any other type of compensation from the state or European Union, fish farmers cannot sufficiently cope with the damages done to fish stocks, R3 calling it: "*A slow death of the carp ponds.*" Thus, fish farmers have championed the idea of having more comprehensive and accessible funds from both the EU and the state government to save their business and as an alternative to the removal of species around their ponds (R1, 2022; R3, 2022).

4.2.5 Monitoring

In September 2022, a pilot project monitoring otters– more accurately estimating their population and analyzing their feeding behaviors– is slated to begin. The study will take place in the Lutter-Lachte-Aschau Habitat Directive protected area and is being conducted by the Hanover Veterinary College's Institute for Terrestrial and Aquatic Wildlife Research (ITAW) with funding by LAVES. R3 is working in cooperation with ITAW who will use R3's fishpond facility as the study area with the objective of studying the efficacy of existing

mitigation techniques as well as develop potential new methods of mitigation. This cooperation further indicates that fish farmers are willing and able to support the protection of the species in a context that allows them to also continue their livelihood.

4.3 Management

4.3.1 Perceptions of Management

When conducting and analyzing the interviews, the term ‘management’ drew a negative meaning for two of the interviewees. In their interview, when asked if it was important to manage the otter population, the representative of the R1 stated: “*I don’t like talking about ‘management’ because it has negative connotations and can mostly be associated with regulation of stocks and removal of individuals. I prefer to speak of ‘maintenance’ measures to protect, preserve and support the species.*” Furthermore, when asked the same question, R4 said: “*Management, which equals reduction, is not necessary… [as] otters have yet to return… in three federal states… and management would slow down or stop their dispersal.*” This use of the word ‘management’ contradicts that of the definition of ‘management’ defined in Section 2.2, where any measure of prevention or mitigation is considered management.

Speaking to the representatives from LAVES and the Fisheries Association, a different picture was painted. The respondent from LAVES was blunt in their reply when asked the same question as the NLWKN and AFS about the need for otter management, saying that the management of otters was not a matter of ‘if’, but that of ‘when’ and ‘how.’ The representative of the Fisheries Association parroted that of R1, answering: “*My favorite solution is a political…We need a management plan [everywhere] for all the species. It's a problem that often in Germany all the regional communes think only in their area for each individual. If it's a bird, if it's an otter, if it's a wolf, all these individuals don't know any borders. So all the management plans have to be built up for the whole state or even all for the whole of Europe...*”

The negative connotation of ‘management’ has been at least in part derived from an attempt by fishpond farmers and politicians in the federal state of Bavaria (R4, 2022). There, an otter management plan is in place, and after the implementation, an amendment was approved by the state government to start reducing the otter population around fishponds. The act triggered a lawsuit by the AFS in 2018 to stop the measure under the regulations of the Habitats Directive and was successful in efforts to stop the pilot project allowing the removal of otters. The pushback from conservationists for any implementation of a

management plan has frustrated fish farmers (R3, 2022). Nevertheless, both fish farmers and conservationists are open to implementing non-lethal measures to prevent otter damage (R3, 2022; R4, 2022).

The one management solution put forward was more compensation for fish farmers, and was agreed upon by all four respondents, albeit having differing opinions about what that compensation should look like. Two respondents gave more in-depth responses of the type of compensation that they believed was adequate to mitigate predation on fishponds, both of which acknowledged could happen at a state/national level or through an EU-wide fund. First, R4 proposes a more general form of compensation, saying: "*The owners of the ponds should be compensated for maintaining the pond ecosystem by the local authorities with payments or by the EU as a part of agricultural subsidies, even if no otter damage occurs*." Next, R3 suggested three forms of compensation: (1) a payment to "*earn money for a measured stock of otter, so you get X€ for each otter [confirmed to reside on your property]*," (2) a tax could be levied to support all of nature and coexistence, and (3) a full reimbursement from the state or EU for the profits lost due to otter damage.

4.3.2 Fishpond Farmers as Stakeholders

Any change to the protection and management of otters in Lower Saxony would impact fishing practices and conservation measures, thus it is important to include fishpond farmers in the planning process (R1, 2022; R2, 2022). Due to the viewpoint of otter protection over management that the MU currently holds, nature conservationists have long played a large role in the planning process. For instance, the AFS takes a partnership role in participation, according to Arnstein's (1968) ladder of participation. AFS is consistently contracted to carry out studies for the NLWKN and their findings are used directly in current protection measures, such as being contracted to conduct the statewide monitoring mentioned in Section 4.1.2.

On the other hand, pond farmers are currently only advised on changes to protection measures and educated about the species as well as preventative measures to deter otters from predating their ponds (R2, 2022; R4, 2022). On Arnstein's ladder, this lands them between the rungs of 'Therapy' and 'Informing', placing them between the degrees of 'Non-Participation' and 'Tokenism'. During the interview with R3, there was evidence that the amount of education that fish farmers received about otters and their population is still limited. When asked about how management may need to look different in Lower Saxony compared to other regions, R3 replied: "*You have good populations of the otter here and east of Lower Saxony, but maybe you have no otter population in Portugal, I don't know, but,*

maybe you need [do not have] an otter population in Portugal, so you have to think it's good to have otters here, but in other areas of Europe, you don't have… otters because of humans… or other reasons." Conservationists know that one of the most stable populations of otters is in Portugal, but this has not been conveyed to fish farmers.

Due to the lack of participation in how otters are currently managed, fish farmers feel largely ignored and left out of the process of looking for solutions to both protect otters while protecting their livelihoods. R3 pointed out when asked about being part of solutions for the management of otters in the state:

"I *have asked… every color of politician [for over 10 years]…but nowadays we [fish farmers] are too few. These 15 farmers in Lower Saxony have no standing in the political surrounding. We are too little and nobody sees the chance to get a political benefit if the politicians help us. So it's the problem of the weak ones… I think the biggest problem of all these stakeholders is that the fish farmers are let alone with the problem. We are the feeders of these populations and all the other stakeholders say, oh, it's nice to have more otters, but they are not these ones to earn the money to live from the fish that are eaten. So the other stakeholders have good marketing. That's what they do and what they want politics to discuss and we as the fish farmers are the bad parties, we only want to hunt the otters and we only want to get rid of them, so this is a problem in the marketing."*

Though this is the case, the participation of R3 in the Lutter-Lachte-Aschau Project discussed in Section 4.2.5 as well as their persistence in looking for a more comprehensive solution to otter management indicates they are willing and able to take a more prominent participatory role in otter management in Lower Saxony.

5. Discussion, Conclusion and Reflection

In this last chapter, the theories used and the qualitative data collected comes together to answer the main research question: *How can principles of Wildlife Damage Management support fisheries and otters (Lutra lutra) to co-exist in Lower Saxony?* This chapter also includes concluding remarks and a reflection of the writing process and possibilities for future research.

5.1 Discussion

5.1.1 Integration

Horizontal environmental policy integration, discussed in Section 2.3.1.2, is a valid theory that consists of an overall strategy that is then expected to be enforced at and between lower levels of government. This concept can be observed in Lower Saxony in relation to otters as the MU and UNBn follow the Bern Convention, Habitats Directive, and all federal and state laws which state that otters are to be conserved, and the NLWKN and LAVES, must comply and work together to ensure those goals, directives, and regulations are met. While there is nothing inherently wrong with this, and conservation of the species is still necessary to support the spread of otters into their historical range, the documentation of consequences of conservation measures have been ignored, as discussed in Section 4.1.2, creating a lack of comprehensive knowledge and communication between governmental agencies.

Due to this reason, the concept of HEPI also should also include arrows that go back up to the from the lower governmental agencies, in an effort to quantify the success or failure of the overarching strategy (Figure 17). This model would then also fit more accurately into the the goals of sustainability, which states its goal is to balance environmental, economic, and social needs, but without accountability, communication, and transparency, the Triangle of Sustainability will be off-kilter.

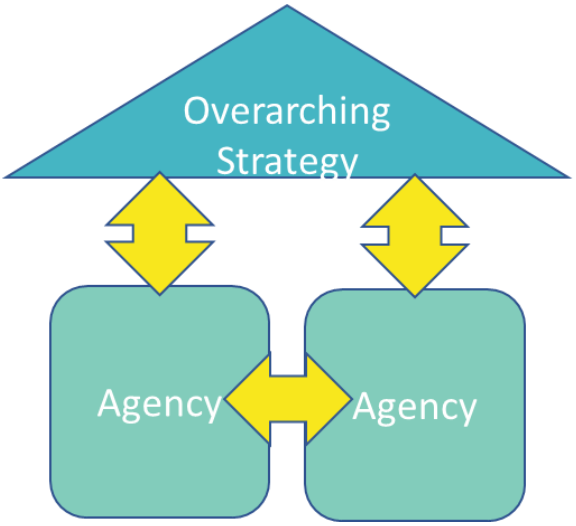

Figure 17. Adjusted HEPI model would identify the successes and failures of overarching policies and offer the ability for external ideas to better integration between agencies.

For Lower Saxony, this means coordinating a scheme that can verifiably identify and document otter damage. This scheme should furthermore be accessible to all governmental agencies to create transparency about the amount of otter damage occurring, reducing the ability for agencies to say they do not know the extent of damage, and therefore can do nothing about it. Opening channels of communication and transparency between the NLWKN, LAVES, and even the UNBn would provide knowledge-based information to the MU, which in turn can make informed decisions about the future conservation measures and the management of otters.

Both the original concept of HEPI and the adjusted version lies within the principles of WDM being an adaptive meso-level approach. Increasing communication and transparency between government agencies and the overarching environmental strategy allows for adaptation of the system to occur. Currently, the system in Lower Saxony does not allow room for adaptation because it is solely focused on conservation, but in order to support the shift towards sustainability and coexistence, reliable information needs to be available.

5.1.2 Participation

The case study of Lower Saxony's conflict between fish farmers and otters clearly shows the differences of Arntein's (1968) degrees of participation among stakeholders (Section 2.3.1.1). AFS exerts much more power and influence as a stakeholder than fishpond farmers because they have partnered with the government on their strategy of conservation for a longer period of time than otter damage to fishponds has been occurring

in Lower Saxony. Now that an increasing amount of damage has reportedly started to occur and current methods of prevention, mitigation, and compensation are not enough to limit the impact of otter predation on the livelihoods of traditional fish farmers, the degree of participation for fish farmers should be reevaluated.

The fear that comes with the participation of fish farmers comes with the notion that lethal measures will be implemented and the spread of otters back into their natural range will be hindered, is misguided. Participation of other stakeholder groups supports new ideas that may have been missed otherwise. Therefore, participation of fish farmers can be the catapult for new, innovative management techniques to be created at the micro-level, as discussed in Section 2.2.3, accelerating the speed at which the transition towards coexistence takes place and pushing the transition towards the 'Acceleration' phase.

WDM embraces the need for participation and the role of stakeholders during the planning process of building a management plan in Steps 1 and 2 of the framework (Section 2.3.2). Furthermore, in the approach's push for participation, it also concedes that the initial outcomes will come with disappointment for one stakeholder or the other, but that does not mean that the initial solutions put in place will become the new status quo. Thus, the participation of fish farmers should not be feared, but viewed as an opportunity to find the balance between management and conservation through the adaptive process.

5.1.3 Management

Section 2.1.4 introduces the concept of how humans' values, beliefs, and attitudes affect wildlife management. From this, it can be inferred that the base of wildlife management comes from the perceptions humans have of it. If it is believed that wildlife have value to humans and their environment, then wildlife should be preserved, if not, then wildlife can be removed without concern. This is the transition that is being seen between dominionism and mutualism. The issue lies in that society has built policies and regulations around the values of dominionism, so even the thought of changing the status quo becomes frightening. Mutualism does not mean that humans have to give up their way of life and let wildlife takeover, it simply means that both populations have the capacity to thrive in the same environment.

In Lower Saxony, blatant dominionism was displayed as fishpond farming grew. Fish farmers killed otters because they did not hold value, and were only seen as an animal taking away their profits. Only as it was realized that otters help create healthy environments that benefit humans, did protection become relevant. Today, many fishpond farmers value

biodiversity and acknowledge that otters bring benefits to the environment; this is why they strive to make their ponds places where wildlife has a place to flourish (R3, 2022). Yet, fish farmers are currently caught between making a living on what they have spent their whole lives pursuing, dominionistic policies and regulations that do not account for the influence of predatory wildlife on business, the romantic values of protection directives (Table 1) (R1, 2022), and the fear of term ‘management’ (R2, 2022; R4, 2022).

The principles of Wildlife Damage Management, specifically Step 3 in the planning process, takes VBAs into consideration when discussing a wildlife management plan (Miller & Reidinger, 2013). This supports the transition towards coexistence by establishing a knowledge-based system to determine the true cost of otter conflict in Lower Saxony. This would relieve the current system of both emotional volatility caused by the feelings of possibly losing one’s livelihood and informed ignorance that otter damage is not occurring (R3, 2022; R4, 2022). This phase has already started happening in Lower Saxony with the Lutter-Lachte-Aschau Project, but as a pilot project, its initial outcomes are limited due to its small research area. While the results may be limited, if the project is successful within the study area, this would be a major step forward in assessing how to incorporate otters into the concept of sustainable development in a practical, not just theoretical way, and a step forward in using the WDM framework in Lower Saxony.

5.2 Conclusion

In conclusion, human-wildlife conflicts between otters and fishpond farmers originated due to the development of land without regard to the impact on wildlife and competition for fish stocks in fishponds as fish farming became a more lucrative business. After over a century of their absence, the otter population has started to rebound due to protection regulations put in place, but that rebound has again led fishpond farmers, a much less lucrative business in the present-day, to having their facilities predated by otters, decreasing their profits and putting their livelihoods in jeopardy.

Over the same period of time, society's perceptions about otters and other wildlife have started to shift from dominionistic views, where wildlife is there to be conquered, to a point now, where wildlife is recognized as an important part of the Earth and the belief that humans and wildlife can live amongst one another. This change in perspective has led fishpond farmers in Lower Saxony to be less quick to jump to the conclusion that the removal of otters is the only way to protect their fishponds. Current solutions available to pond farmers are non-lethal prevention and mitigation measures such as fencing and compensation, but pond farmers do not believe these are sufficient to tackle the problem at

large. However, when trying to ask the government for more say in prevention and mitigation techniques, fishpond farmers feel largely ignored. This is only compounded by the lack of hard evidence of otter damage shared between governmental agencies as well as the stigma surrounding the word ‘management.’ Nevertheless, the results indicate that fishpond farmers, conservationists, and the government largely agree on the need for compensation and the development of new methods to prevent otter predation on fishponds.

Using the integrative and participatory principles of WDM provides the opportunity for the protection of otters to stay at the forefront of the human-wildlife conflict issue by creating room for more knowledge to be gained through research and monitoring, to horizontally integrate government agencies, and create more opportunities for fishpond farmers to participate in the planning process. Since Lower Saxony is an exceptionally important area for otter conservation, such a change in the way otters are managed in the state would be able to influence other German federal states in their handling of otter damage by creating a precedent of how to balance otters and humans without removal in the future and push the transition further toward coexistence.

5.3 Reflection and Future Research

The aim of this section is to reflect on the research conducted and identify the methodological and analytical limitations posed during the research process. Also, this section reviews the strengths and weaknesses of the research. The last aim here is to propose future research that could be carried out.

In Section 3.5, limitations of qualitative research design were discussed, but it was not able to deduct what exactly would happen during this case study. For instance, Section 3.5 acknowledged that a small sample size would limit the array of potential responses, but it could not predict that initially during this research, eight interviews were expected to be conducted, but due to time pressure, two respondents were not able to participate, and the two of the original respondents stopped corresponding without notice. Moreover, theory could not predict that after the first round of interviews were conducted, some respondents would ultimately not be available for follow-up questions. During this research, when asked for further information, three of the four respondents were not able to respond. Two were not able to answer as they were on vacation, and one was preoccupied with a large fire that occured at their facility and, understandably, did not have time to reply to more questions.

Although limitations were present, there were successes in this research. Through interviews, document analysis, and theoretical framework, a clearer view of the conflict came

into view. Analyzing VBAs of interviews allowed for not only a political understanding of the situation, but also an emotional analysis, thus permitting the recognition that more than pure politics are behind policymaking.

If things were to be done differently, it would have come down to having the theme of the research being firmly established sooner than it was. This would have allowed more time fine tuning the theoretical framework, for more interviews to be conducted and follow-up questions could have been answered in a more timely manner, and a more comprehensive analysis could have been executed. Nonetheless, the outcomes of the case study seem to be convincing. This is because, although not all stakeholders, such as all fishpond farmers, were interviewed, leading representatives of the main actors were still able to participate in the study and give their views of the situation. Through this, generalizations about solutions surrounding the topic of coexistence and the conflict between fishpond farmers and otters in Lower Saxony could be made.

The results presented through this thesis also open more doors for more research about coexistence. Around Germany, Europe, and the world there are many endangered species that are successfully being protected and which are expanding their range back into the same areas that were once blamed for their demise. Therefore, it is important to research further about how VBAs affect policy making around wildlife management. Furthermore, as more management plans are put into place, comparative research should also be conducted to more fully grasp the similarities and differences between wildlife management cases, especially as every case is unique depending on the geographical, political, and social landscape.

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Appendix 1: English Interview Guide

Context	Question	Probe
Consent	*Thank you for meeting with me today. Before we start, I would like to reiterate to you the purpose of this interview is for my master's thesis and will include questions about human beliefs and values in an effort to create management options for otters in Lower Saxony.* *To ethically conduct this interview and collect data, your consent is necessary. Any and all information will be handled discreetly and professionally, I will only use your information for the purpose of my thesis.* *All personal details will be anonymised under your request and stored separately from the interview itself according to the GDPR regulations and I will delete it after I turn in my thesis. Any information used in my research will be anonymized.* *Additionally, you have the right not to respond, change your response, or withdraw at any time. You may also request a copy of the transcript and ask to have any changes made to it before I process it. With your permission, I would also like to record the interview so that I may transcribe the interview later.* Q: Would you please confirm that you consent to these terms? Q: Would you like to have your name anonymized for this thesis?	Is there anything I can clarify for you?
Intro	Q: Can you please tell me a bit about yourself and what you do? Q: How are you involved in developing solutions for otter management?	-Occupation/Position? How long? - Field of research? -Which research/projects?
Attitudes, Beliefs, & Values	Q: In your opinion, what value does biodiversity have to the landscape? Q: In your opinion, how is fish farming important to Lower Saxony? Q: Is it important to protect fish ponds? Why or why not? Q: Is it important to manage the otter population? Why or why not? Q: Where do you see the role of humans in managing otters?	-Conservation? Biodiversity? Food security? Tradition? -No intervention? Mitigation? Prevention? Extermination?
Stakeholders	Q: Which parties are involved in working on solutions for the damage otters cause? What are their roles?	-Government? Market?

Context	Question	Probe
	Q: How do you interact with other stakeholders?	Conservation? How much contact? How much?
Management	Q: What is the extent of otter damage in Lower Saxony? Q: How is otter damage in Lower Saxony currently managed? Q: Why is there no management plan already in place? Q: What are the current challenges to making a management plan? Q: How would a management plan in Lower Saxony need to differ from the ones in other German states?	-Frequency? Amount? -Documentation? Fencing? Compensation? Advisor? Too new of a problem? Conflict? -Budget? Lack of consensus? Loss of tradition?
Outro	Q: Is there anything else you would like to add to the questions I have asked? *Thank you so much for your time, this helps me so much in my research!*	-Did I miss anything? Is there anyone else you think I should contact?

Appendix 2: German Interview Guide

Thema	Fragen	Probe
Intro	Q: Können Sie mir ein bisschen über sich selbst und was sie tun erzählen?	Job/Position? Wie lang arbeiten Sie schon dort? Was ist der Fokus Ihrer Forschung?
	Q: Wie sehr sind sie eingebunden in die Entwicklung von Aspekten des Otter-Managements?	An welchen Projekten waren Sie beteiligt?
Attitüden, Glauben, & Werten	Q: Ist es wichtig die Population von Ottern zu managen?	Naturschutz? Biodiversität? Versorgungssicherheit? Tradition?
	Q: Ist es wichtig Fischteiche zu schützen?	
	Q: Wo sehen sie die Rolle des Menschen beim Otter-Management?	Keine Einmischung? Schadensminderung? Vorbeugung? Reduktion der Population?
Stakeholders	Q: Welche Institutionen sind involviert, wenn es um entstandene Otterschäden geht? Was sind ihre Rollen?	Behörden? Markt? NGO? Unis?
Management	Q: Wie hoch sind die Schäden von Ottern in Niedersachsen?	Wie oft?
	Q: Wie werden die Otterschäden zur Zeit gemanagt?	Dokumentation? Zäune? Kompensationszahlungen? Otter-Berater?
	Q: Warum gibt es bisher keine Management-Pläne?	Ist es ein zu neues Problem? Gibt es Konflikte?
	Q: Was sind die Herausforderungen solch einen Management-Plan zu erstellen?	Budget? Fehlende Zustimmung? Verlust der Tradition?
	Q: Inwiefern würde sich solch ein Management-Plan von anderen Bundesländern unterscheiden?	

Thema	Fragen	Probe
Outro	Q: Gibt es noch etwas von Ihrer Seite, dass Sie zu den gestellten Fragen hinzufügen möchten?	Habe ich etwas vergessen? Gibt es Ihrer Meinung nach noch Personen oder Institutionen, die ich kontaktieren könnte?

Appendix 3: English Interview Consent Form

Informed Consent Form

To ethically conduct this interview and collect data, your consent is necessary.

All information will be handled discreetly and professionally, and your information will only be used for the purpose of the interviewer's master's thesis.

All personal details will be anonymized under your request. The information will be stored separately from the interview itself according to the GDPR regulations and it will be deleted after the interviewer submits their thesis.

As the respondent, you have the right to ask questions, not to respond to questions, change your response, or withdraw at any time.

With your permission, the interview will also be recorded for the purpose of transcription after the interview. You may also request a copy of the transcript and ask to have any changes made to it before processing it.

Please check all that apply:

- ☐ I have read this form and voluntarily consent to conducting the interview.
- ☐ I would like my information to be anonymized.
- ☐ I consent to having the interview recorded for the purpose of transcription.

_____

Repondent's Name- Printed

_____

Repondent's Signature

_____

Place, Date

Appendix 4: German Interview Consent Form

Einwilligungserklärung

Um dieses Interview ethisch korrekt durchzuführen und Daten zu sammeln, ist Ihre Zustimmung erforderlich.

Alle Informationen werden diskret und professionell behandelt und Ihre Informationen werden nur für die Masterarbeit des Interviewers verwendet.

Alle persönlichen Daten werden auf Ihre Anfrage hin anonymisiert. Die Informationen werden entsprechend den Vorschriften der DSGVO getrennt vom Interview selbst gespeichert und nach Abgabe der Abschlussarbeit durch den Interviewer gelöscht.

Als Befragter haben Sie jederzeit das Recht, Fragen zu stellen, nicht auf Fragen zu antworten, Ihre Antwort zu ändern oder sie zurückzuziehen.

Mit Ihrem Einverständnis wird das Interview auch zum Zwecke der Transkription nach dem Interview aufgezeichnet. Sie können auch eine Kopie des Transkripts anfordern und Änderungen daran verlangen, bevor es weiterverarbeitet wird.

Bitte wählen Sie die zutreffenden Punkte aus:

- ☐ Ich habe dieses Formular gelesen und stimme der Durchführung des Interviews freiwillig zu.
- ☐ Ich möchte, dass meine Daten anonymisiert werden.
- ☐ Ich bin damit einverstanden, dass das Interview zum Zwecke der Transkription aufgezeichnet wird.

_____

Name des Befragten

_____

Unterschrift des Befragten

_____

Ort, Datum