# What makes a forest wild?

## Material-semiotic relations in a rewilded forest

An Actor-Network Theory inquiry into wilderness

Master thesis in environmental sociology

At the Forest and Nature Conservation Policy Group

Wageningen University and Research Centre

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M.Sc. in forest and nature conservation

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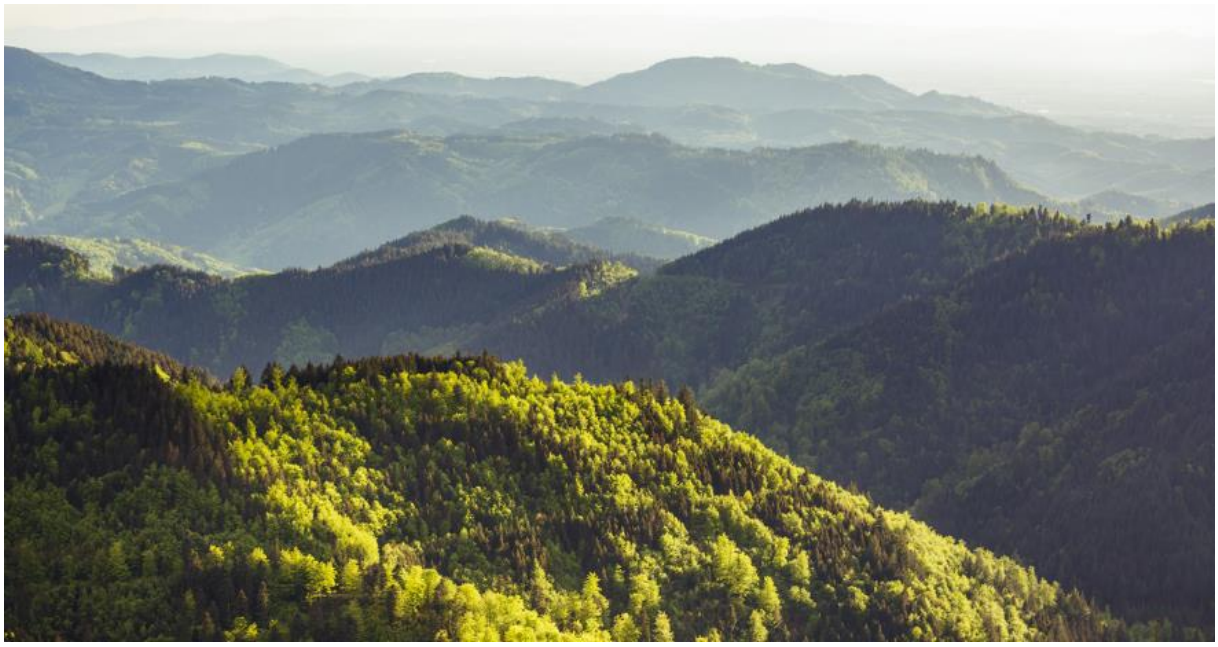
*Whether Jupiter grants you many a winter,*
*or whether this is the last,*
*which now strikes the Tyrrhenian Sea*
*against the unchanging rocks,*
*be wise, filter your liquor,*
*and adjust your great horizons*
*to the fugacity of life.*

*As we speak, jealous time flees.*
*Enjoy the gifts of today,*
*because the future is uncertain,*
*and everything is going to fade away...*

***Odes by Horace (23 B.C.)***

# Acknowledgements

I would like to thank Dr. Oliver Human and Dr. Koen Arts, and my family for encouraging me throughout the process of research, collection and data analysis, as well as writing. It was not always easy, because despite my background in hard sciences, I had decided to do a sociological dissertation, which meant that I had to acquire a lot of additional knowledge. Furthermore, due to personal circumstances, I had to interrupt this work for a while. I could not have succeeded without their methodological advice, their knowledge of social sciences, their bibliographical expertise, and their moral support!



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# Abstract

In Germany, the federal government intends to create new wild ecosystems in previously managed landscapes by "allowing natural processes to develop freely", a practice akin to passive rewilding. The Schwarzwald National Park (SNP), established on a former commercial forest, was created to meet this goal in 2014. Although it is discursively presented as a park where wilderness can thrive on its own, the rewilding practices of managers have participated in the production of what is perceived as wild or natural. Furthermore, discourses of park wilderness do not capture how humans and non-humans collaborate to create a wild forest. This study examines how new wilderness practices are implemented in Schwarzwald NP, by describing how humans and non-humans are enrolled toward the goal of protecting natural processes. For this purpose, the theory of the actor-network, as developed by Bruno Latour, was used. According to this theory, humans and non-humans co-construct together the different material and semiotic aspects of wilderness. Wilderness is the result of precarious processes of enrolment and negotiation that blend social, biological, and phenomenological worlds. The researcher is an interpreter of these relationships, which must be depicted and described accurately. Data was collected through participant observation, guided tour recordings, and semi-open-ended interviews with eight rangers and members of the national park science team. Discourse analysis, during which perspectives of managers on forest actors and natural processes were classified through coding, allowed for the reconstruction of the diverse relationships of humans and non-humans to each other. The main findings of this thesis are: first, participants were polarized on the degree of wildness of the forest, with some focusing more on changes induced by natural processes, and others on the continued influence of humans. They also made a distinction between rewilded and wild landscapes. Second, managers have used a variety of rhetorical tools to discursively transform the commercial forest into a wild forest; these discourses have been informed both by scientific theories and by the perspectives they have constructed through experience with forest trees. They used a variety of conceptualizations to understand and anticipate the changes they expect from the forest. However, these conceptualizations were challenged by what was happening on the ground, where ecological changes and their interpretation are context-dependent, a fact that is rarely reflected in current institutional wilderness discourses. Third, managers, in their position as custodians of the forest, shaped it according to their protection objectives, which sometimes conflicted with rewilding, not hesitating to interfere with the normal course of things (i.e., natural processes) when necessary. In some areas of the forest, they have conducted 'wilderness experiments', interventions designed to stimulate the formation of wilderness, which further blur the separation between human and non-human ontologies. Finally, the non-humans of the forest, through aesthetic displays, the marginalization of human interests, and the flight from human presence, have successfully recruited managers to see their interests and needs as distinct from those of humans, and have enrolled rangers as managers of human-wildlife conflicts who protect them through measures against human disturbance. Non-humans have also been able to influence managers through the experiences they have induced in them, so that managers have been “rewilded”. As a consequence, wilderness can become a place where both the non-humans and the managers become wild. With this work, I hope to lay the groundwork for a discussion of new wilderness ecosystems as *nature-cultures*, that is, as hybrid landscapes, both material and symbolic, that reconcile the natural and cultural, physical, and non-physical, and human and non-human aspects of wilderness. A non-polarized perspective on wilderness practices is the most promising way to reconcile the tensions of rewilding and to enable us to think about nature so as to solve the challenge of the 21st century.

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# Prologue

*23 July 2019*

*"It's a hot afternoon, even here in the mountains. I dragged my mother along to my fieldwork, and we are slowly scrambling down a cliff towards the Bannwald forest. The forest is the oldest in the National Park. It's located in a cirque, which is cauldron-like valley excavated by a small glacier during the Ice Ages, just below the ridge of the Schwarzwald mountains. Since then, the bottom of the cauldron, slowly silting up over the centuries, has filled with a lake. Around the lake lies a forest which hasn't been exploited for a century. The path is steep, narrow, and strewn with sandstone boulders. We climb down using our hands. Down below, between the vegetation of scots pines, firs, and mountain ash, the Wildsee lake is glinting in a brownish colour. The warm summer wind rushes through the branches and I feel it cooling my sweaty shirt. Flying sheltered from the wind, crane fly swarms perform their mating dance, their wings shining in the sun. Now and then, colourful beetles run away on the dead tree trunks that we climb over. The whole forest perspires tranquillity and permanence, and I feel at peace, in a timeless mind state, my worries and thoughts disappearing while I concentrate on the uneven terrain.*

*Picture1: Tree trunks are athwart the trail… Credit: own picture*

*About midway down, we encounter a gigantic tree, with a trunk twice the size of nearby trees. It is gnarled, studded with dead branches and towers over the surroundings. I recognize it from the touristic pictures I saw on the Internet, it's called the Grossvatertanne, or "grandpa fir"; it is 250-year-old, and already one hundred years ago, it was a touristic attraction. It is*

*monumental. It makes me wonder how much events this tree has witnessed. When we arrive at the lake, we rest a little, and I eat blueberries collected from the sides of the path. I notice that we didn't encounter any people but a young couple of Spanish tourists. Not surprising, knowing how steep and uneven the path was. None of the families or the groups of pensioners I saw near the parking lot would go down this way. But if they would, if the path was evened out, would I still have perceived the forest as peaceful? Or as filled with wildlife? Undoubtedly, I would have a different experience going down a path accessible to anyone. There would have been no feeling of peacefulness or a feeling of immersion into a world in which time flows differently because I wouldn't have to concentrate so much on the path or the surroundings, and because the path would be busier. Nor would I feel such a strong connection with nature, because large paths keep animals and plants at a distance."*

# 1. Introduction

## 1.1. Rewilding and the Black Forest National Park (Schwarzwald NP)

Current environmental and societal changes defy traditional conservation initiatives. Starting in the '70s, the international community had become increasingly aware of the threats to humanity's natural heritage. Among others, climate change, habitat loss, land abandonment and urbanization have led to a worldwide decline in biodiversity and degradation of wildlands. In 1992, the Convention on Biological Diversity (CBD) was signed by United Nations members. In this agreement, member countries pledged to develop strategies for the conservation of natural and wild habitats. In the wake of this agreement, the German government published a 'national strategy for biodiversity' (*Nationale Strategie zur biologischen Vielfalt, hereafter called NBS*) (Küchler-Krischun & Walter, 2007) in which it proposed the creation of wilderness areas (*Wildnisgebiete*) to promote biodiversity. According to the NBS, wilderness areas were defined as "*extended, unfragmented areas that are free of use that serve to preserve and sustain natural processes unaffected from humans*"(Finck, 2013, p. 342). Subsequently, as the execution of the proposed wilderness restoration measures was lagging behind, an implementation program called 'nature protection offensive 2020' (Naturschutz-Offensive 2020) was designed to prioritize goals that could be achieved by 2020 (Küchler-Krischun, 2015; Küchler-Krischun & Walter, 2007; Schumacher, Finck, Riecken, & Klein, 2018). One of these goals was to have 2% of the land area covered by wilderness, which by its extent created a challenge to nature practitioners to find new experimental approaches to nature conservation, that instead of trying to restore existing wild ecosystems or landscapes, create novel ones (Schumacher et al., 2018). Many nature areas were not managed to produce wilderness prior to the NBS. To adapt their policy to the demands of the NBS/Offensive, several protected areas turned towards protecting *natural processes*, a practice known as *Prozessschutz* and similar to "passive management rewilding" (Lorimer et al., 2015a), which is known to be an easy way to kickstart wilderness (Rosenthal et al., 2015). Rewilding is suited to create new wilderness areas (Corlett, 2016; Jepson, 2016). It is defined as "passive management of ecological succession with the goal of restoring natural ecosystem processes and reducing human control of landscapes" (C. Brown, McMorran, & Price, 2011; Pereira & Navarro, 2015), and is characterized by the uncertainty of its outcomes(Lorimer & Driessen, 2014).

The term 'rewilding' was first used by ecologists Soule and Noss (1998) to promote the reintroduction of large carnivores, which are considered key players of self-regulating ecosystems. Their approach to wilderness management was based on the 'three Cs': large core reserves, connectivity through wildlife corridors and reintroduction of large carnivores or keystone species. From its inception, the term 'rewilding' had a political purpose, which was to promote the reintroduction of wild animals. Since then, other ecologists have introduced definitions that highlight a range of aspects, such as the hands-off approach to ecological restoration, the replacement of extinct prehistorical megafauna by large herbivores, or the restoration of (pre-)historic landscapes by reintroducing species that have a high impact on ecosystems (C. Brown et al., 2011). The concept was based on the understanding of biological processes at the scale of landscapes and the impact of big animals with large territories on the trophic chains. The original argument for rewilding was to increase the resiliency and naturalness of ecosystems by reintroducing extinct carnivores and large herbivores, creating wildlife corridors, and creating large core reserves (Pereira & Navarro, 2015; Soule & Noss, 1998). While not every extinct

megafauna can be replaced in a 'Pleistocene rewilding' fashion in Europe, it has been proposed that large herbivores like bison could be reintroduced and domesticated animals could be 'de-domesticated', particularly ungulates (Klaver, Keulartz, & van den Belt, 2002). Rewilding has been thought of as an 'ecological rescue of degraded ecosystems' and has been linked to increased biodiversity and ecosystem functioning in several landscapes (S. Carver, 2016; Lorimer et al., 2015a; Svenning et al., 2016). In Europe, the context of rural farmland abandonment has led conservationists to see rewilding as an cheap reconversion opportunity (Pereira & Navarro, 2015); passive rewilding with the occasional reintroduction is considered as the most appropriate land use for large newly abandoned forest tracts.

**Picture 2:** Typical view of the foothills of the Black Forest Mountain Range, credit: Wikimedia commons

The Schwarzwald National Park (SNP), which lies in the northern part of the Black Forest in Germany, is one of the targets of the "2% land area covered by wilderness" goal. Created in 2014, it has an area of 10,062 hectares, meaning it is a rather small National Park (the area threshold for National Park denomination is 10,000 hectares). It is located in the Black Forest, which is a large, wooded mountain range in southwestern Germany, in the state of Baden-Württemberg, delimited by the Rhine valley to the west and the Schwäbische Alp to the east. Roughly oval in shape, with a length of 160 km and a width of approximately 50 km, the range's highest point is the Feldberg, whose altitude is 1,493 meters above sea level. Historically, the area was known for forestry and mining, but nowadays tourism has become the main activity. The SNP is split into two separate areas, one around the Hoher Ochsenkopf, situated more to the north, and the one around Ruhestein, situated more to the south. It reaches from approx. 500m to 1100m in altitude and is located in the montane vegetation zone. The SNP was, from its inception in 2014, managed as wilderness in accordance with the definition of the NBS. Establishing the Black Forest National Park was a tough job and involved lots of discussion. Originally used for forestry and hunting, the area has a long history of human exploitation and there was some opposition from locals towards the SNP project. Many were afraid of a bark beetle infestation or feared that jobs in the timber industry and tourism would be lost. Some did not like the sight of a forest left in its natural state. According to ecologists, the landscape of the park will change significantly in the future because of the long-term dynamics of ecosystems which will rewild it. The understanding of ecological

interrelationships and accurate data about local ecological communities is at the foundation of the park's rewilding concept. In order to get an overview of the ecological communities in the park, the scientific team of the Black Forest National Park has done a species inventory. In 2019, 2100 animal species were documented in the SNP, including 1400 insect species (Landesdienst Baden-Württemberg, 2019). Mixed mountain forests cover a large part of the SNP area, and are composed especially of spruce, beech, and silver fir tree species, as well as various ferns, lycopods and mosses. Characteristic bird species found in the SNP include the black woodpecker, spotted woodpecker, grey woodpecker, and the rare three-toed woodpecker. Spruce crossbills and pine jays are also found here. The birds of prey are particularly represented by the owl species Tawny Owl, Tengmalm's Owl and Pygmy Owl. Particularly noteworthy is the capercaillie, which has a culturally important presence in the area of the SNP. The mammals are represented by the large cloven-hoofed animals like the red deer, roe deer and wild boar. Furthermore, foxes, badgers, and brown hares can be found in the SNP.

**Picture 3:** How did the black forest get its name? 2000 years ago, the Romans moved north from what is now Italy to expand their empire. At that time, there were no rolling hills, meadows, and pastures here as there are today. There was only one large, continuous area of forest. The Romans gave this forest the name "silva nigra", which is Latin for "black forest". Credit: Wikimedia commons 'Black Forest nature' page

The development of the National Park had to take place within a framework already provided by laws and regulations. Broad management goals were fixed by state law; the management plan was decided by the SNP board. The board comprises representants of different interests: parties concerned with natural processes and ecological succession were the rangers and scientific team. The majority of decisions is taken at field level, however. The different goals of the National Park have been written down in the National Park law (for relevant paragraphs see Appendix C). The "protection purpose of the SNP" (§3 paragraph 1 NLPG) has been described as the protection of the:

- Free development of natural processes (process protection).
- Ecosystems.
- Uniqueness and scenic beauty.
- Native animal and plant populations (species protection).
- Characteristic temperate mixed mountain forests, moors, grindes (wet heathlands) and cirques.
- Enhancement of the preservation conditions (prohibition of degradation).
- Habitat types according to the Flora-Fauna-Habitat Directive 92/43/EEC.
- European bird sanctuaries.
- Habitats enclosed by the forest, such as rocky areas and water areas as well as springs, and fixed components of the natural landscape.

To accommodate those various goals, the land in the SNP was divided into 3 zones according to the degree of human interference in natural processes (Figure 1). The *core area* was left completely to itself, with only the paths being maintained. The *wilderness development area* is purposefully managed towards more wilderness with the aim of making it part of the core area in the next 30 years. The *management area* will be permanently managed towards other conservation or biodiversity goals. The focus on protecting natural processes as a wilderness development practice is mostly put on natural succession in the forests of the SNP. The goal is to obtain a wild forest in the core and development areas. Measures are taken to facilitate forest succession and to encourage the transition from a spruce-dominated forest to a mountain coniferous mixed forest, like choosing and fostering seed trees for example (Ziegler, 2018).

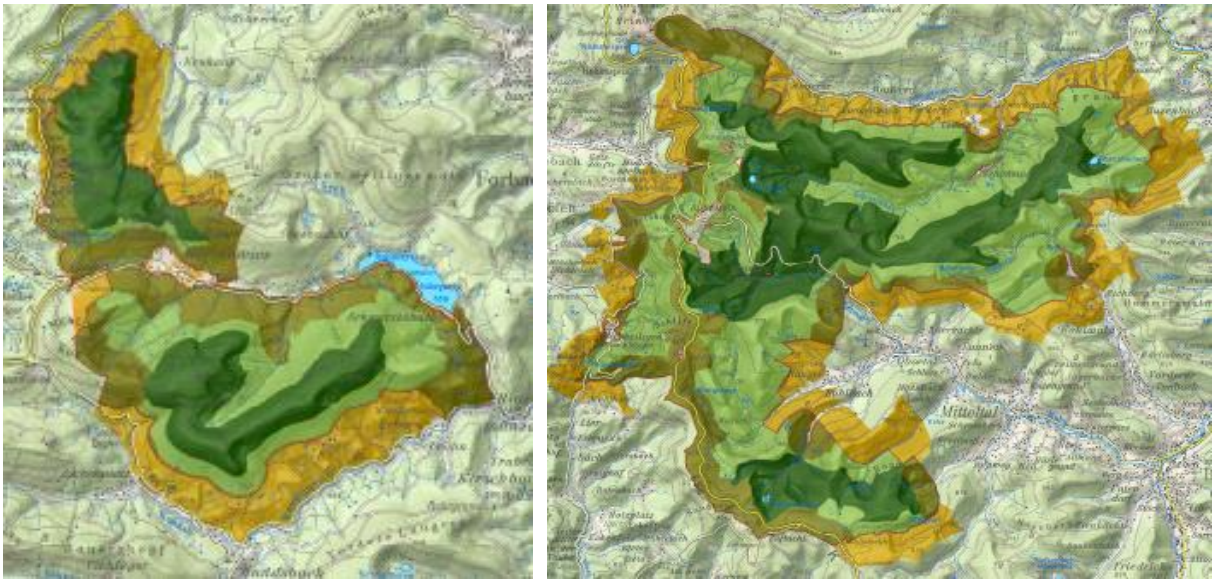

**Figure 1:** The SNP is split into two parts (North on the left, South part on the right), and has been zoned into 3 areas: the core area (*Kernzone*, dark green), the development area (*Entwicklungszone*, light green) and the management area (Managementzone, light and dark brown). Credit : Retrieved from 'Unterwergs in Nationalpark Schwarwald', NP Schwarzwald (2019)

Visitors are not left out; according to the park's touristic and educational agenda, they too should be able to enjoy and engage with the wilderness. A visitor centre is under construction, with various educational exhibits. In addition, several educational trails such as the Lotharpfad, which allows visitors to see the damage of the 1999 storm, have been built even in remote and wild areas. This way people can enjoy nature. The scientific team of the SNP uses the concept of '*Wildnishaftigkeit*' which combines both ecological criteria (naturalness) and subjective perceptions (wilderness experience) (von Lindern et al., 2019) as a way to reconcile human recreation with biodiversity restoration and rewilding goals. However, the team had perceived that the concept of wilderness was not consistently communicated in various media, which lead to confusion and a loss of credibility. Therefore, they recommended to critically review at which point wilderness is communicated in which way and with which target and underlined the utility of their concept as a landscape assessment tool.

## 1.2. Rewilding: a second-hand wilderness

*"The key challenge to park and wilderness stewardship is to decide where, when and how to intervene in physical and biological processes to conserve what we value in these places."*

*"No single management approach can protect and preserve the full range and diversity of park and wilderness purposes and values. Trade-offs are necessary."*

*Cole and Yung (2012, pp. 7-8)*

Since its creation in 2014, the SNP operates under the process protection paradigm in its core area. Process protection is a conservation paradigm that inserts itself into the wider framework of rewilding and is based on the non-intervention on natural processes of ecosystems. "Process protection means the maintenance of natural processes (ecological changes in space and time) in the form of dynamic phenomena at the level of species, biocenoses [i.e., biological communities], biotopes or ecotopes [i.e., habitats], ecosystems and landscapes" (Jedicke, 1998). The following billboard (figure 2, English translation on the right), which can be found on the "wilderness track" inside the SNP, explains that in Germany and in Central Europe, there is no wilderness in the 'true sense' (i.e., 'unspoiled' nature) anymore, but promotes the narrative that disturbances are processes that by *destructive creation* generate a wild dynamic on the territory. The theoretical foundation to process protection is the intermediate disturbance hypothesis (Connell & Slatyer, 1977). The intermediate disturbance hypothesis diversity promoted the view that natural disturbances – wildfires, pests – are a cause of high species diversity and have significant functional importance for the maintenance of communities. Contrary to "maintenance" conservation strategies, the process protection strategy is not suitable for the retention of unchangeable ecological target states. Instead, the focus is on the conservation of natural dynamic processes that lead to new, not exactly predictable system states. This means that process protection is oriented neither "backwards" at restoring a past ecosystem nor "forwards" at achieving quantifiable ecological goals. In some ways, protecting natural processes and evaluating their contribution to wilderness is like walking in the dark. This begs the questions: *If there is no goal or end-state, how do we determine what wilderness looks like? How do we know if the practices have actually borne fruit?*

The process protection paradigm has also garnered criticism. According to Potthast (2000), the current paradigm of self-organizing "natural processes" is not necessarily realistic. In reality, things happen stochastically, and processes don't adapt themselves to the local conditions to reach some sort of "balance" or "natural order". Blindly following the maxim "nature knows best" might actually lead to ecological processes that undermine goals like biodiversity conservation, and in extreme cases, lead to ecosystem failure. Discussions about 'naturalness' when talking about processes is thus counterproductive because they obscure the need for human intervention and guardianship to preserve natural dynamics. For Cole and Yung (2012), this is illustrated on a daily, practical basis by the *'stewardship dilemmas'* faced by park managers. Broadly, these dilemmas can be categorized into: (1) non-equilibrium ecological pathways/thresholds that force managers to intervene to go back to a pre-disturbance state. (2) the loss of historical disturbance processes which leads to loss of structure, successional replacement etc… and which have to be replaced artificially (3) the management of the numbers of wild herbivore populations (4) the reintroduction of extinct species – i.e., rewilding *stricto sensu* – and (5) interventions to deal with the effects of climate change. This creates a tension where humans have to constantly intervene to preserve naturality. *Should a process that was initiated by*

*humans still be called natural? What about processes that need constant human intervention? Which stewardship dilemmas do SNP managers face? Which theories and ecological concepts on natural processes do SNP managers use to contextualize those dilemmas?*


**Figure 2: "*Second-hand wilderness" billboard, entrance of the wilderness trail, SNP.***

*"Wilderness areas, i.e., landscapes uninfluenced by humans, no longer exist in Germany or even in Central Europe. Man has left his traces everywhere.*

*Even the 70-hectare wilderness area on the Plättig, through which the Wilderness Trail leads, is not wilderness in the true sense of the word, but was not so long ago a managed timber forest, albeit in a very natural formation. Already at that time, the spruce-fir-beech forest with its species-rich natural growth, was more than 150 years old, and would have been considered by the unbiased observer as an almost unaffected "natural forest".*

*The spring storms Vivian and Wiebke in 1990 and above all the hurricane Lothar on 26.12.1999 turned in a few minutes the high growth forest into a landscape that was no longer shaped by the steering influences of man, but in which the enormous forces of nature had been at work: mighty trees now lie on top of each other like Mikado sticks, giant trees are uprooted, root plates several meters high pile up to insurmountable mountains.*

*Since then, the areas have been left to nature. Forest and landscape continue to change. Not only is the new forest already growing in the undergrowth, but many an old tree that only survived as a ruined trunk came back to life through a side branch. Yet another tree has lost the fight against the bark beetle. Bleached white by sun, wind, and weather, it now rises to the sky as standing deadwood. Huge root plates collapse, dead wood is decomposed by powerful console fungi and insects. Changes that continue day after day. The landscape changes – the former forest becomes wilderness.*

*Even if it is only a small area, hardly unaffected by outside influences ; much of what the visitor discovers here is typical of wilderness landscapes. They give a fascinating impression of the former primeval forests of Central Europe. "*

*Credit: own picture*

Autonomy is an inherent quality of rewilded landscapes (Arts, Fischer, & van der Wal, 2016; Soule & Noss, 1998); rewilding aims to limit human intervention into a landscape for the land to become self-willed. Fostering the autonomy of nature is an important part of the SNP management plan; the slogan of the SNP is "Allow nature to be nature"[1]. Interestingly, this slogan reflects common tensions between natural autonomy and rewilding practices. Firstly, while twice repeated, 'nature' does not designate the same object in both cases. Indeed, by "allowing nature to be nature" the park authorities try to associate the newly designated wilderness with broader conceptions of 'nature'. Specifically, the implication here is that the familiar 'biological nature' of the park, under the right conditions, can develop into a manifestation of 'Nature', a metaphysical concept related to Aristotle's "force that governs all physical things or the original source of growing things" (Aristotle, 1970). As appealing as this rhetorical imperative is, the link between the actual practices of nature conservation and the non-interference with 'Nature' is far from obvious and can hardly be understood at face value. *What field*

[1] "Natur Natur sein lassen"[translated by the author]

*practices are behind the transmutation of an old commercial forest into an autonomous, self-willed entity? Through which discourses is the autonomy of nature accentuated?*

Secondly, this slogan implies that nature was not *allowed* to be itself before the creation of the National Park. The underlying meaning, which can also be found in the literature(Adams & Mulligan, 2012), is that a rewilded landscape incarnates a landscape self-evolving under the influence of natural processes which, prior to rewilding, were artificially held back through *human control*. This relates back to a *definition by negation* of wilderness as excluding human intervention on natural processes (Buijs, 2009). The imperative "allow", shows that wilderness cannot exist without an allower, someone who decides what is wild and what is not. This raises a contradiction in the park's slogan: albeit being discursively portrayed as a park where nature can develop by itself, local human practices participate to produce what is perceived as wild or natural. According to Katz (1996, 2000), rewilding is a fiction because by restoring a landscape, it becomes a human artefact that is inherently lesser than a naturally occurring landscape, because it is imbued with *human intentionality* and has no historical continuity. Ontologically, nature is not freed from human influence, but remains under its domination(Katz, 1996). Similarly, Lennon (2017) explains that rewilding, while creating novel ecosystems that do not reference historical ones, are effectively *self-referencing*, and only engineered by humans, which defeats their purpose as natural. A critique by opponents of the park was that the forest is "pseudo-wilderness", because the now protected "wild" forest was a commercial forest (Unser Nordschwarzwald e.V., 2013a) until 2014, and local foresters have argued that what the park labels as wilderness is a cultural landscape resulting from traditional management. They accused the SNP of concealing this reality by masking management activities from public knowledge by renaming them; for example, regulatory hunting, which was a traditional activity formerly performed by locals, was named "wildlife management" (Unser Nordschwarzwald e.V., 2013a). Same practices, different goals. It's the manager's task to decide which processes to allow and which ones to thwart. *How are human interventions and human intentionality negotiated and justified?*

The issue of the autonomy of nature also raises the issues of non-human ontology (Gammon, 2018). The autonomy of wilderness is achieved by promoting all the processes initiated by non-humans (animals, plants, physical and geological processes, meteorology, etc.), thus achieving what Gammon calls "non-human ontological purity". The story in Figure 2, which describes how the winter storms Lothar and Wiebke are apparently actors in the transformation of an anthropogenic landscape into a wild one, is a good example. It is interesting to note that these storms, like the other actors in rewilding, also acted outside the park boundaries; that the same destructive processes are at work everywhere. The crucial difference is, of course, that these influences are meant to take precedence in the SNP. This creates tension, because the passive management of rewilding and the non-human ontology leads to the erasure of humans, both symbolically and physically. The SNP has been criticized for subjecting conservation to an ideological type of management that denies the material and historical realities that form the basis of this natural area (Unser Nordschwarzwald e.V., 2013b). Opponents view the Northern Black Forest as a model of forest management based on the conservation of natural resources over the last centuries, and the creation of a national park has jeopardized this legacy. In their view, historical forest management already overcomes the conflict between human and non-human conservation objectives. As such, they argue that the historical approach makes the separation of forest lands into "productive forestry" and "national parks" unnecessary and irrelevant. *How do managers deal with their own presence?*

## 1.3. Key objectives

The objectives and functions of wilderness in National Parks in the 21st century are multiple – as opposed to the simple agenda of 'preserving' natural areas in the 19th and 20th centuries – and often require trade-offs between recreation and human experience, biodiversity, historical continuity and cultural integration of the landscape, conservation of natural dynamics and processes, to name but a few objectives. The National Park's scientific team (as mentioned earlier in the first sub-section), faced with the confusion that the term wilderness encounters among the public, has developed the concept of *Wildnishaftigkeit*,[2] which measures both the physical and biological qualities and the human experience of a wild landscape. Contrary to wilderness, *Wildnishaftigkeit* is a spectrum that can be attributed to landscapes that are still under human influence. As such, wildness is an ecological-social tool and can be seen as a first step towards a multi-layered conceptualization of wilderness, which holds the potential to reconcile human experience and needs with nature conservation. However, according to Drenthen (2018b), the implementation of purely pragmatic compromises to those competing values is not enough to address the 'narrative horizon' in which those values exist. Indeed, people's identity and sense of belonging to a place rests on larger narrative context, through which people understand themselves and interpret the landscape (O'neill, Holland, & Light, 2008).

In this thesis, I will try **to re-trace and describe wilderness networks** by investigating the following issues:

- Which discourses about wilderness and natural processes prevail among managers?
- How were material settings (landscape features, biological diversity, natural processes, …) interpreted into wilderness discourses?
- How did conservation practices enhance the perceived wilderness of the forest after the creation of the park?

[2] In German literally 'wildness-ness', and approx. meaning "the quality of having wildness", and as such being a level of abstraction greater than wildness alone.

## 1.4. Material semiotics and the construction of a wild landscape

The defining qualities of wilderness vary depending on perspective; for example, ecologists define wilderness through its biophysical components. These biophysical criteria have been explored by several researchers and are also the basis of the wilderness definition by the NBS. For example, Mc Morran, Price, and Warren (2008), proposed a typology of Scottish wild areas according to criteria of size, topography, ecological communities, husbandry or forestry activities, and presence of human physical artefacts. However, while biophysical criteria may be sufficient to explain some conservation practices, other efforts such as understanding how rewilding practices increase the autonomy of wilderness ("*What field practices are behind the transmutation of an old commercial forest into an autonomous, self-willed entity?*") require an understanding of human interpretation of wild landscapes. Ehrhart and Schraml (2014) wrote that "even if some German areas have become known as 'wildernesses' on the basis of their legal status and their development processes, this can hardly be grasped with objectifiable or scientific categories. It is still unclear to what extent these forest areas are actually perceived by visitors as areas of natural forest dynamics." The national park science team (as mentioned earlier), faced with public confusion about the term wilderness, developed the concept of *Wildnishaftigkeit*, which measures both the physical and biological qualities and the human experience of a wild landscape, and takes a phenomenological standpoint by taking into account human perceptions in its concept.

Landscape interpretation can help us to discover the material-semiotic mechanisms by which natural processes and wilderness are 'inscribed into' and 'read from' the park landscape. Some researchers define wilderness through physical sensations, images and associations that are based on a subjective and phenomenological characterisation of a landscape. Those interpretive aspects of wilderness as a landscape are based on the experience of wilderness. This experience of wilderness is intersubjective and can be collected and exchanged, making it a good heuristic for determining whether a place is wild or not. Indeed, alongside quantitative measures such as wildlife census or ecological functioning, it is perceptions such as isolation, absence of noise, sight of wildlife that 'authenticate' the landscape as wild (Habron, 1998). Using photographic questionnaires on the characteristics of 'wild land' in a Scottish reserve, Habron (1998) shows that visitors differentiate between several aspects of wilderness, namely landscape beauty, naturalness and wildness. Humans themselves need to be immersed in a landscape they perceive as wild for the landscape to be wild; the 'landscape must rewild the visitor' (Monbiot, 2013). I myself witnessed this process of *self-rewilding* – of transformation – during my visits and observation of rangers in the park (see foreword for an immersive and embodied account). Subsequently, wilderness discourses mediate these perceptions, intuitions and the materiality of non-human actors into public consciousness. In this way, the experiences of managers and visitors also influence the very meanings of wilderness, and a new definition is 'constructed'. The Lothar Trail, created by the SNP after the 1999 storm, is an example. It allows people to experience the effects of this winter storm on the forest structure. By walking, climbing on the rocks or crawling under the trunks, visitors have "the opportunity to personally observe the annual changes and to witness the exciting process of the emergence of a new wild forest" (Megerle, 2007). Reversely, these commonly shared perceptions and intuitions associated with the landscape are key drivers for the protection of natural processes. According to Prior and Brady (2017), managers often use aesthetic-ethical visions to justify their management process. Imagining the qualities of unmanaged landscapes is an integral part of the decision-making and management process. An important part of my research will therefore be to investigate managers' perceptions of perceived changes in the forest.

Understanding managers' experience of wilderness also contributes to the analysis of human/non-human interactions and rewilding practices. Indeed, it is precisely through their experience of non-humans and their empirical background that managers most often make their management decisions. Yet sociological studies of conservation often fail to account for the processes of negotiation between natural/non-human processes and human interests in making management decisions (Murdoch, 2001). According to Buller (2004) and Whatmore (1997), what defines wilderness is that it is inhabited by wild non-humans. It is precisely these 'wild things' that make a place wild, but they are only linked to that place through human imagination and practices, practices that are important to elucidate. The sociologists Callon and Law (1997) and Latour (2007) suggest that non-humans are *enrolled* (engaged, recruited, enrolled) into the imaginary of the wild by humans who assign them roles and freedoms. But this does not happen without resistance from non-humans, who have their own interests. Humans can also enrol nonhumans in wilderness creation networks through the experience they offer. Whether or not a non-human is enrolled then depends on the symbolic associations and aesthetic perceptions they recall (Buller, 2004; Goldsmith & Warren, 1993).

In this introduction, we have first seen that rewilding and wilderness are both debated on a pragmatic and a social basis, as a solution to current social and environmental challenges. Debates about environmental concerns, non-human interests, natural constraints, and pathways all play into shaping what rewilding and wilderness are. However, those disparate problematics are rarely combined to provide an understanding of what happens at a local level. While the problematics associated with loss of wilderness are often treated at regional and global level, the local negotiations about what constitutes wilderness worth protecting are rarely the focus of research. It is also important to understand how human wilderness experience is created and maintained. Motivators for wilderness protection are socially constructed human value judgements, whether instrumental like recreation (Habron, 1998), or intrinsic like views on nature (Buijs, 2009) which can be the direct result of local experiences. Moreover, discourses about wilderness often fail to explain through which mechanisms humans and non-humans collaborate to create the material reality of wilderness. Since public opinion and political decisions depend on those wilderness discourses and human value judgements, it is important to produce descriptions of conservation practices and decisions that are grounded in materiality and less biased about what wilderness practices consist of. This can be achieved by uncovering the mechanisms through which natural processes and wilderness are "written into" and "read from" the park landscape. This semiotic relation, where both ecologists or conservationists and natural processes shape and define one another is the focus of this thesis. Symbolic interactionism seems a well fitted theoretical approach for this purpose, because it assumes that social meanings arise out of human practices.

## 1.5. Research questions

In this thesis, I will try to answer the following questions:

1) What wilderness discourses do managers construct around the wild forest?
   a) How are forest dynamics conceptualized?
   b) Which different perspectives on trees are enacted by natural process protection?

2) How do humans enrol non-humans to enact wilderness?
   a) Which non-humans are enrolled into wilderness networks? Which non-humans are excluded from the park?
   b) Which management practices are used to enrol them?

3) How do non-humans shape rewilding practices?
   a) What are the interests of non-humans? How do these differ from those of managers?
   b) Which wilderness experiences do have an influence on conservation practices?
   c) How do trees enable or constrain managers in their efforts to create a wild forest? What *stewardship dilemmas* do managers face and how are they met?

# 2. Theory

## 2.1. Theoretical background: 'The Trouble with Rewilderness'

*Words can assume quite different meanings as time passes, as context changes, or even as they are spoken by different people. In resource management, the interpretation of a few key phrases has caused and continues to cause untold havoc.*

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***Luna Leopold, in Keiter and Boyce (1994, p. ix)***

Wilderness is far from being an undeniable physical reality. It is an interpretation of a landscape that depends on the cultural environment in which it is embedded (Cronon, 1996). Furthermore, it is not a fixed concept, but is constantly redefined and adapted to contemporary social discourses and societal problems. In the Middle Ages, wilderness was perceived in Europe as an inhospitable, barren and worthless land. Cronon (1996) explains that the current positive meaning of wilderness originated in the United States in the early 19th century. During the conquest of the Wild West and in parallel with Western Romanticism in art, wilderness had become a sacred place where one could perceive God's creation and experience "free and uncivilised lands". Later, in the mid-20th century, it also served as a point of reference for "bourgeois anti-modernism" and was seen as "a very attractive natural alternative to the hideous artificiality of modern civilisation". In sum, until the middle of the 20th century, the notion of wilderness meant nothing more than uncivilised landscapes, and although the evaluation of the latter changed from negative to positive, these uncivilised landscapes were still perceived from an instrumental and recreational perspective and without much regard for natural values. It was only with emblematic figures like Leopold and Schwartz (1949) of the conservation movement that wilderness acquired an intrinsic value in public consciousness. Today, the concept of wilderness has been adopted by ecologists and biologists to refer to primary or old-growth forests and enjoys widespread support on both sides of the Atlantic (Buijs, 2009; Küchler-Krischun, Schell, Erdmann, & Mues, 2014; Küchler-Krischun & Walter, 2007). Although the modern concept of wilderness is inherited from America, several cultures have since developed their own version, reflecting different perceptions of wilderness (Habron, 1998). A distinctive feature of wilderness in Germany according to NBS is that it is not primarily seen as a source of inspiration for human visitors, but rather as a vital space for species and natural features threatened by human development (Küchler-Krischun & Walter, 2007).

The concern to preserve natural landscape features originated from the industrial revolution's transformations of natural landscapes. At the time, the main goal of conservation was to preserve natural areas from biological degradation and aesthetic impoverishment. The protection of natural qualities by drawing boundaries around wildlands and parks - a practice now called "fortress conservation" - was seen as a bulwark against the encroachment of development and the increasing exploitation of natural resources. These concerns, while still present, do not reflect the problems facing natural areas in the 21st century. Indeed, protecting areas from human disturbance is no longer sufficient to preserve nature and direct intervention is needed, as extinctions, overgrazing, invasive

species, and non-equilibrium dynamics have shown worldwide. Indeed, many ecosystems perceived as natural have been shaped by human activity to such a substantial degree that the distinction between natural and artificial has become blurred. According to, Cole and Yung (2012), this contemporary questioning of the place of human intervention in physical and biological processes stems from the overly limited definitions of naturalness and they consequently call for a rethinking of naturalness. Thinking of naturalness as only an absence of human control, or an absence of human impact or artefacts, is at odds with intervention, which involves "the exercise of human control to compensate for [previous] human impact on the land" (Cole & Yung, 2012). Aplet and Cole (2010) highlight three different meanings related to how naturalness is used: (1) the absence of human effect: a place is natural if it is free of human artefacts and is not threatened by human activities (2) the absence of intentional human control: a place is natural if it is self-willed, autonomous (3) the historical authenticity of ecosystems: natural ecosystems should function as they did in the past. A practical way out of this multiplicity of meanings is proposed by Aplet and Cole (2010): "[It is no longer] appropriate to balance competing meanings of naturalness. Rather, it [is] important to be clear about which meaning to emphasize." In this paper, we will therefore examine the different aspects of naturalness that are highlighted in the different practices of SNP managers. Concurrently, it has been argued that a more flexible definition of wilderness is needed for its use in a European context(S. J. Carver & Fritz, 1995; Mc Morran et al., 2008).

Like wilderness, rewilding is also a social construct (Castree & Braun, 2001; Cronon, 1996) and as such is the result of shared assumptions and discourses about reality. In total, the environmental historian Jørgensen (2015) lists 6 different meanings, which underlines the lack of scientific consensus on what rewilding entails. Jørgensen remarked that the word had become *plastic*, because although it does mean "to make wild again" and implies giving autonomy back to nature, it is not consistently tied to any management practice and has increasingly been used to mean whatever policy one wishes to advertise to the public. As a result, it has been widely adopted by conservationists wanting to reach a large audience. In a response, Gammon (2018) argues that the conclusion of Jørgensen is an exaggerated depiction of the cluster of meanings that rewilding is, and that the themes associated to rewilding remained constant. The salient key themes that emerge from her examination were the *exclusion from humans*, '*ontological purity*' (meaning having nonhumans origins), and the *indifference towards cultural landscapes*. These three themes have in common the repudiation of humans and human influence on the area, whether physically, ontologically, or culturally. The rejection of human influence is reminiscent of the nature/culture dichotomy, which contrasts the state of nature with human artificiality. This dichotomy has been the subject of study by restorationists who have sought to resolve the tensions in modern rewilding (Descola & Pálsson, 1996; Franklin, 2003; Lennon, 2017).

The dichotomy between nature and culture creates multiple tensions. Firstly, there is confusion about what rewilding should mean for society. On the one hand, the historical nature/culture dichotomy has led conservation initiatives to advocate hands-off management and to reject visible traces of human intervention in the landscape (Kalamandeen & Gillson, 2007). Wilderness is then seen as primarily excluding human influence and interests (Cronon, 1996; Monbiot, 2013) and therefore unable to provide solutions to the societal problems of the Anthropocene. Conversely, nature and wilderness are seen as a panacea to environmental problems and economically beneficial (Jepson, 2016; Navarro & Pereira, 2015). A second tension associated to the nature/culture dichotomy and which is a recurring theme in rewilding (Prior & Ward, 2016), is an ontological one between human and non-human origins of rewilded areas. Arts et al. (2016) explain that wilderness is both a social and spatial construct. In practice, this means that wilderness delineates areas in which processes and entities will be linked to nature and its qualities (such as autonomy) and allows people to approach the area with certain preconceived symbolic associations and aesthetic expectations. Humans appropriate meanings through the systematization and social organization of visual representations and human experience of the landscape in order to establish coherent relationships and expectations with the

environment (Bell, 1993). Environmental and scientific discourses, as well as in visual representations such as the one in image 4 (Finck, 2013) then relay and mediate expectations of what can be found in a reforested area. In a rewilded area however, it is expected from wilderness management that human influence will be reduced to give more space to non-humans (animals, plants, natural processes, etc.). "*Rewilding rekindles an interest in the non-human, that which is outside of us, that which surpasses the human; it questions the idea that landscapes should be meaningful, that our appropriation of meaning matters at all.*" (Gammon, 2018, p. 347). However, parks such as SNP are always part of a social context, with human expectations and practices (recreation, management, etc.), so that the withdrawal of human meanings is never complete, all-the-while images and discourses that speak of 'untouched nature' are still being produced. According to Plumwood (2006), the nature/culture dualism and the human appropriation of meaning distorts how a landscape is interpreted, encouraging people "*to view it as either pure nature or as a cultural product, not nature at all, thus hyperseparating nature and culture and representing nature as an absence of the human (Plumwood, 2006, p. 141)*". When the landscape is represented as a cultural product, non-human influences, i.e., creatures and their materialities, tend to be ignored. Conversely, when wilderness is portrayed as natural, any indication of its dependence on culture is erased. Most importantly, the erasure of all human traces on the land must be done invisibly, otherwise cognitive dissonance may arise: "In order for this illusion [a manless, primitive landscape] to be effective… the process of [self-]erasure must erase itself"(Igoe & Igoe, 2004). Plumwood strongly criticises this reductionism, which is based on a hegemonic human monologue as master of a passive landscape, transforming it and putting non-humans on display as they please.

**Picture 4:** A snowmelt river meandering through a narrow alpine valley on a rocky riverbed, north of Mittenwald. Representations such as these are used as template for current German wilderness naturalness for montane riverine habitats in the NBS, retrieved from Finck (2013, p. 345).

These tensions between human and non-human ontologies need to be addressed and should not be interpreted as a lack of holistic approaches that view humans and non-humans as organic contributors to rewilding. Several authors argue that rewilding can have multiple dimensions, like recreation, culture, and ecology (Mc Morran, Price, & Warren, 2008) and that the way people care about the environment – i.e., social meanings – and conserve it – history – matter as much as the conservation of ecological communities. Urbanik (2012) express the idea that the places non-humans inhabit become *relational* places, borderlands, between humans and non-humans. The influences of humans or non-humans become then nothing more than layers of a rewilded landscape; a landscape whose human or non-human meanings are either put to the foreground or relegated to the background through practices and narratives (Drenthen, 2018a; Hourdequin & Havlick, 2016). Plumwood defends that only collective "dialogical stories" (Plumwood, 2006, p. 125), which see human and non-human agencies as collaborating to create landscapes, can help understand the natural world and our relationship to it. On those grounds, one could argue that the Black Forest National Park is a 'semi-cultural landscape', in that it is more a social staging. a co-production – i.e., an *enactment* – of what the wild represents in the collective consciousness, a theatre where the *actors* – i.e., the non-humans and human visitors – can play "themselves", improvise and interact in front of the crowd of the human collective. This thesis proposes to follow the call of Plumwood (2006) and Drenthen (2018a), who ask for 'dialogical stories' about the collaboration of humans and non-humans to create new landscapes, and 'layered narratives' that enable multiple viewpoints on wilderness, by investigating further how experiences, facts and conflicts of interest are negotiated in the rewilded SNP.

To recapitulate, it has been explained how both wilderness, rewilding and naturalness *originate neither from the social world nor from non-human nature, but from the interplay of social and natural forces*. These concepts are often considered as social constructs, but in fact they are redefined according to contemporary environmental issues (extinctions, habitat degradation) that are linked to material realities. These can generate the need to rethink these constructions. At the same time, the nature/culture dichotomy that has been the basis of conservationist thinking over the past century creates tensions both at the ontological level and in discourses about human and non-human contributions. While the regional authorities' arguments for establishing the park reveal that the nature/culture dichotomy is still embedded in the conceptualization of the separation between protected and anthropomorphized spaces, research – and public opinion, as evidenced by the positions of the park's opponents – has long since debunked this as a false dichotomy(Drenthen, 2018b; Plumwood, 2006; Soper, 1995). Examples of perspectives that blur this dogma are that "humans are nature" or that "humans and non-humans are co-citizens of a shared land"(Callicott, 1980; Leopold, 2017). To develop and disseminate these new philosophies, to portray this play and to give non-humans a voice, a representation, new narratives of wilderness are needed. This places us in front of a complicated task: it is a question of finding a way to describe wilderness that allows an "inhuman" or "cyborg" geography(Thrift, 1996), which is not solely focused on human places, trajectories and timeframes. In other words, the issue turns into: how do we describe non-human lives and destinies in such a way that their otherness, agency, and co-habitation – in all its liveliness – of a wild space is both understood and upheld by the collective of humans/non-humans that is to be built there? How to represent ecological, social, and cultural interactions without falling into the reductionism implied by "wilderness management" all the while recognizing the impossibility of escaping from an anthropocentric interpretation of wilderness? All these questions bring us back to Gammon (2018) and his request for a non-human ontology and non-human culture, which will be addressed – humbly – in this thesis; it proposes to contribute to this broad questioning by unveiling some mechanisms of negotiation – fragments of "dialogues" for lack of being able to write a drama – between humans and non-humans in the SNP.

## 2.2. On actor-network theory

This research project will describe how new rewilding practices are built around natural processes such as ecological succession by humans and non-humans. The aim is to account for how humans and non-humans enact natural succession in forests. To do this, this thesis draws on symbolic interactionism and material semiotics. Symbolic interactionism is a family of social theories that assumes that 'humans act towards things on the basis of the meanings they attribute to those things'. The meanings attributed to a place depend on the social functions associated with it, and result from ongoing interactions between people and each other, and between people and their environments. Material semiotics, as presented by Law (2008), can provide a useful framework to understand human-non-human interactions. As part of the family of theories of symbolic interactionism, material semiotics suggests that the functions attributed to wilderness and non-humans are synergistic with the practices, material setting and perceptions of the actors within them. Material semiotics is a theoretical approach that treats "everything in the social and natural worlds as a continuously generated effect of the webs of relations within which they are located" (Law, 2008, p. 141). It examines how material and semiotic relations create all the different types of actors: ideas, humans, objects. In our case, this means that wilderness practices are creators of material change, of meaning of the landscape, and of the identities of the practitioner (there is no practitioner without a practice) and of the non-humans on whom they are applied. These actors do not exist before the relationships that implement them; specifically, through practices a network of relationships and roles is established.

Material semiotics help investigate "how practices in the social world are woven out of threads to form weaves that are simultaneously semiotic (because they are relational, and/or they carry meanings) and material (because they are about the physical stuff caught up and shaped in those relations)" (Law, 2019, p. 1). The Bannwald, the oldest unmanaged forest in the SNP, can be used to give an example of the semiotics-material perspective. Until the middle of the 19th century, local foresters and shepherds were the only people to spend time in this area. They would have perceived the Bannwald as a place of work, in and on which they acted, shaping it to favour their survival. Their practices, such as cattle herding, logging and rafting techniques, and the associated infrastructure such as mountain huts or lapping paths formed a specific network of material relationships with the non-humans of the territory. Since then, and for more than a hundred years now, this forest has been used for recreation and tourism. It is a peaceful place, secluded in the mountains, far from our daily worries, where people could enjoy fresh air; the practice of tourism has emphasised these characteristics and reinforced the way people perceive and interact with this forest. Today, now that the national park has been established, the actors shaping the forest are natural processes, non-humans and park managers. The non-humans, such as the trees, by growing, falling, and then decaying, and the management, by deciding on the location of trails and their accessibility, by controlling the use of the forest, have constructed a certain forest, characterised by special practices and a shared meaning. It is this co-construction that (Mol, 2002) calls *enactment*. Built on the idea that reality is constituted in practice, enactment describes practices as producing objects(Law & Mol, 2008); *wilderness does not exist before being produced and articulated by practices*. The emphasis on enactment means that wilderness is not taken for granted but is a precarious achievement that needs to be constantly maintained. Actor-network theory (ANT) was developed by Law (2008), Callon (1984) and Latour (1999a) and is a material semiotic tool that studies how the material world interacts with concepts to explain reality. Using ANT to study practices involving non-humans has been used by several sociologists (Alhonnoro, 2014; Bennett, 2018; Callon, 1984) because it can provide important information about the relationships that give life to wilderness. ANT allows different actors to be linked through the actions they make each other do, tracing the different actions observed. These actions are mapped and conceptualised as the

links between various nodes, ‘nodes’ that are ‘actors’ (Latour, 2007, pp. 128-133). As Latour (1996a) writes: it is ‘detective work’. The particularity of ANT is that it focuses on relationships, which are defined as material-semiotic interactions or, in other words, the simple observable change flowing through different entities(Latour, 2007). These entities, or actors, are then considered only as effects of the relationships, arising and being modified by them. There is no causality, only a ‘relational semiotics’ (Law & Mol, 2008, p. 58) between the actors, where the two actors are defined by the relationship that binds them. In this framework, rewilding practices are seen as the *enactment* of wilderness through ‘constellated networks’ (Law & Hassard, 1999) of relationships between different human and non-human actors. The actor (human or non-human) and the network (a 'natural process') are two sides of the same coin. The consequence of this way of interpreting reality has led to the adoption of a generalised symmetry (Callon, 1984) in the description of reality: the same vocabulary is used for both actors, e.g. humans can enrol non-humans and vice versa. ANT can also help to understand that wilderness is a precarious realisation or “experiment of the wild” (Lorimer & Driessen, 2014), which has to be continuously implemented and maintained by local practices. Thus, instead of assuming that wilderness practices are socially constructed (Brechin, Wilshusen, Fortwangler, & West, 2002), I assume that practice is shaped by a back-and-forth between materiality and the social.

Subsequently, it is important to define the processes by which networks are built and maintained. In his seminal study of scallops, Callon (1984) defined (among others) a term that can help to operationalize actor-network theory: *enrolment.* Enrolment, as described by Callon, refers to all practices that give specific roles to other actors or the “device by which interrelated roles are defined and attributed to actors who accept them”(Callon, 1984, p. 206). It is important to note however that those meanings are not assigned democratically (among human actors); meanings of wild landscapes are tied to power relations in colonised societies (Bell, 1993). Specifically, actors who can control the material environment can influence meanings of place. As Cresswell (2009, p. 5) puts it: “The meanings associated with these places, insofar as they are shared, are also more likely than not to be meanings assigned to place by people with the power to do so – the people who build the buildings and monuments and inscribe texts on to the material fabric of place.”

ANT also attempts to understand how meanings ascribed by different actors are disseminated and may prevail over others, and to make explicit the process by which global concepts take on local meanings. An interesting concept to conceptualize these issues is *translation*. Inspired by works of Michel Serres and introduced into ANT (Latour, 1996b), it means making two concepts equivalent, but as they become linked, their meaning also shifts. Through a series of *translations*, wilderness practices enter a dialogue with social cognitions of nature, which shape them to the same extent as the material world (Castree & Braun, 2001). Thus, chains of translation are what link the wilderness areas and wilderness concepts. As Callon and Law (1997, p. 501) put it, “there isn't a reality on the one hand, and a representation of that reality on the other. Rather, there are chains of translation.” Translation can be seen as a process of network building during which some actors (mostly humans) take control of others. The study of the interpretation of renaturation practices and the identification of the actors who are subject to them will make it possible to understand through which translation chains the networks of actors can "speak" about the natural succession of forests, for example. In our case, taking control of other actors involves practices that favour one interpretation of their material-semiotic relationships and displace others. It is translation that enables the conceptual leap between semiotic and material relations and discourses of wilderness. To answer the call of Plumwood (2006) for 'dialogical' narratives, it is therefore necessary to understand which actors take the centre of the stage when talking about rewilding.

Let us illustrate with a simple example the different terms used so far; this will allow us to understand what the theory of the network actor brings to material semiotics, and what perspectives it can open to the investigation of social effects. Material semiotics says that materiality and sociality are produced together, meaning that materials are social (in the same way that the social is material), because they are relational effects. So, let us take the example of a desk lamp in the library. It is, when we look at it, an object with a precise function and use; but how can we understand it in a larger social context? Where does it come from? Material semiotics will say that it is not just an object, but a result of various material-semiotic relationships. It is the effect among other things of an ore mine in Russia, blast furnaces in China, the invention of the light bulb, glassmakers, the needs of students and of national education, container ships and international market laws, the habits and working hours of students, the hazards of the weather, etc…, which all create a need for lighting. The ANT adds that those relationships form a social network. This lamp came into existence as an effect of this network, as an assembly of various social and material actors. All those social actors had to be enrolled and mobilised to produce, maintain, and use the object desk lamp as a light source (and not as a golf club for example). Its nature is to be at the same time a node of this network, and to be a network itself, because it links these various actors and perpetuates, or at least materializes, by its existence, this same network. (What would university libraries be without study spots? Cargo ships without shipment? Etc….). By this dualistic nature, (like a photon, which is a wave and a particle) the lamp is at the same time an actor and a network, a “patterned network of heterogeneous materials” called an "actor-network" (Alhonnoro, 2014).

## 2.3. Conceptual framework

In order to conceptualise wilderness, we need sub-themes that allow us to connect the tensions we visited in the introduction to wilderness discourses, and further, to the *enactment* of the wild forest. For this we will draw on Arts et al (2016), who theorise that human experience is integral to a rewilded landscape. They consider the rewilded landscape as a 'palimpsest' composed of several layers constituting the nature-culture spectrum: ecological functioning, wilderness experience and natural autonomy. These aspects are not hierarchical, but rather overlap in the landscape according to conservation objectives, sometimes in synergy, sometimes in conflict. Figure 4 shows a rough diagram of the interactions between humans, non-humans and the three aspects of wilderness. Human conservation practices constantly influence the behaviour of non-humans, as well as the ecological functioning, naturalness, and experience of wilderness through a number of direct and indirect translations.

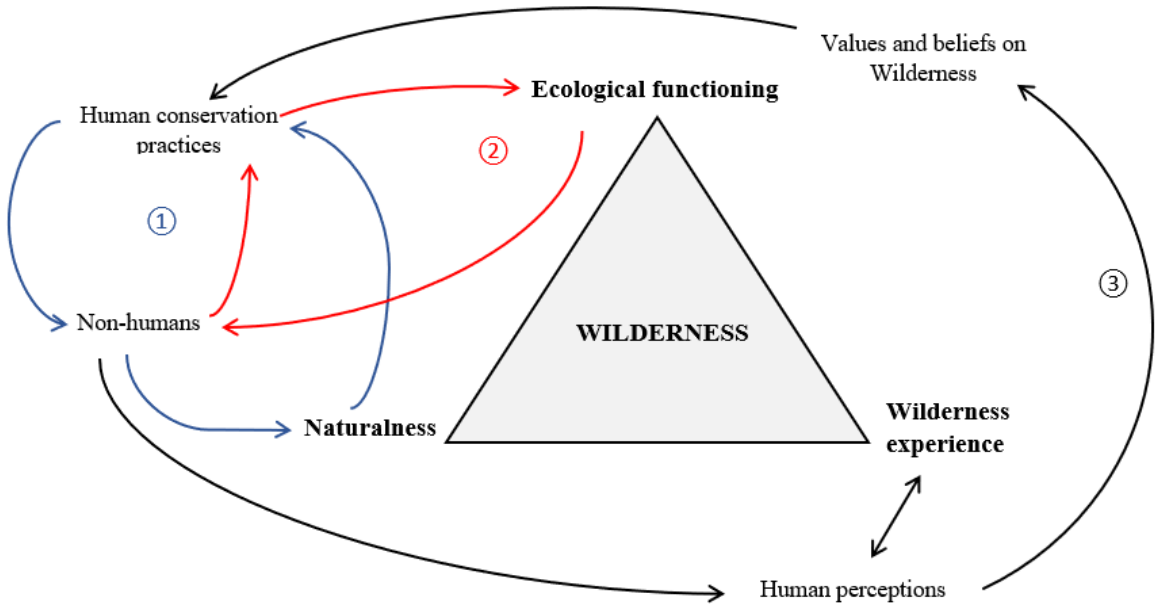



**Figure 3**: Schematic overview of how non-humans and humans interact with the three 'layers of wilderness' of Arts et al. (2016).

① *Natural processes feedback loop (blue): non-humans provide dynamic feedback to conservation practices through their behaviour, there is constant adjustment and negotiation from both sides over natural processes.*

② *Species and ecological conservation feedback loop (red): Conservation practices entail biodiversity and species protection goals which influence non-humans.*

③ *'Wilderness' feedback loop (black): non-humans affect human perceptions and aesthetic experience. These perceptions are assessed through a value system and these assessments inform new conservation practices.*

The first translation relates to the park's goal of protecting natural processes and the non-humans who are essential participants in those processes. Natural processes are constrained and defined by human conservation practices, which enrol them in a wilderness network. For example, when a forest ranger describes insects as "doing their job and participating in the decomposition process" (Regierung

Baden-Württemberg, 2014), he is actively assigning them the role of nutrient recyclers. On the other hand, when he then decides to keep fallen trees on the forest floor to increase nutrient recycling, the insects enrol him as a food provider. In this simple example we can see how functional understandings and practices are interlocking and mutually reinforcing. In this instance, managers who want to increase biodiversity and the natural dynamics of biomass turnover (biomass which was previously harvested as wood) and detritivores who need a certain amount of dead wood to maintain a viable population. It is when human and non-human actors, with their different objectives, establish a workable contract, enrol each other, that wilderness networks are created and maintained. The second translation conceptualized the park's administration pursuit of species and ecosystem conservation goals. Ecosystem conservation can entail human modification and intervention in natural areas and involves managing conflicting conservation interests, objectives, and practices, which were conceptualised as "stewardship dilemmas" in the previous chapter. This thesis will try to examine how these conflicting interests are managed in the field and in discourses. The third translation examines how social and scientific perceptions and constructs about wilderness interact with phenomena that occur in the field. The changes in the landscape create specific aesthetic and phenomenological perceptions (Etteger, Brink, Gremmen, & Gerwen, 2016; Habron, 1998) and 'wilderness experiences' (von Lindern et al., 2019). Psychological mechanisms, on which wilderness experience relies, mediate the materiality of non-human actors into wilderness discourses(Buijs, 2009; Jones, 2003). Managers will try to adapt current scientific and popular discourses about wilderness to the circumstances they encounter locally; For example, German conservationists often equate wilderness with natural dynamics, like succession; and evidence for natural succession is then seen as evidence for wilderness. A first step in understanding translation will be to understand the narratives that rangers use to describe the wild forest and how those narratives are used to justify conservation measures.

# 3. Methodology

## 3.1. Overview

This thesis is an ethnographic case study. Symbolic interactionism and material semiotics are practical theories, deeply rooted in the lived reality of managers and their interpretation of the environment through language and practices. As such, these theories encourage an experimental and inductive practice, where the re-searcher – in all that the word implies – is dedicated to an ethnographic approach, in pursuit of narratives that might enable him or her to understand the social constructions around which practices are articulated. To do this, the National Park must be treated as both a 'semi-cultural landscape' and a material one, whose natural features depend on geomorphology, flora, fauna and local institutions and practices. The inspiration and methodological guidance for the ethnographic approach comes from Bruno Latour and his theory of the actor-network. Actor-network theory has no clear methodology, instead Latour (1999b) proposes to “follow the actor”. Using the method by Hitchings (2003), who looked at how plants and gardeners enacted each other in Londonian gardens, I “followed the rangers” by observing the rangers’ field practices in their everyday work and interviewed them. To achieve this, participant observation is an adequate research method. Participant observation has many advantages over other methods. Instead of relying on second-hand information, the researcher has access to raw data in the form of observations. This allows a first-hand understanding of events to be created and it being consequently compared with the participants' subjective understanding. It also allows the difference between discourse and action to be seen (Bernard & Gravlee, 2014). After following the ranger, I “followed the affected non-humans” to try to tell their story from their point of view. Non-humans can enrol humans to care for them; for example, Hitchings (2003, p. 1) tells that “plants performed themselves into existence” and persuaded humans to care for them, by enticing them with their beauty. This is the kind of accounts to look out for. To analyse those discourses, discourse analysis was used.

Discourse analysis is a multi-disciplinary approach borrowing from sociology, psychology, and philosophy, and has been developed in the West since the 1960s. It is a method of analysing the use of written, spoken, or gestured language, or any meaningful semiotic event. Discourse analysis is performed by looking for recurring themes, associations, practices, and actors in the discourses of the managers. “Discourse analysis is a field of research composed of multiple heterogeneous, largely qualitative, approaches to the study of relationships between language-in-use and the social world” (Johnson & McLean, 2020). Discourse analysis is concerned with the concepts, linguistics, and narrative organisation of the discourses it studies. The analyst must bring out the traces of constraints, oppositions, and resistances within the discourse. In the perspective of Jacques Lacan, these traces constitute 'symbolic relations' (between representatives). The various aspects of the scientific enterprise in which this work is engaged has forced the use of a hybrid, interdisciplinary method of data analysis, and one inspired only by discourse analysis in its classical definition (Starks & Brown Trinidad, 2007). Ethnography-based discourse analysis is a form of analysis that aims to gain an insider's understanding of culture, customs and habits through participant observation (i.e., by observing participants directly, rather than focusing only on pre-existing texts). It has been proposed as a tool for understanding the cultural context of practices in both Western and non-Western societies, as it allows for a local (i.e. on-site) and concrete (i.e. material) understanding of the social processes at play (Oberhuber & Krzyzanowski, 2008), which is appropriate for this research. Indeed,

investigations such as the experience of wilderness by managers require a more phenomenological study, in that it focuses on the discovery and categorization of the various experiences of managers in contact with nature. Moreover, this dissertation does not focus exclusively on how discourses on wilderness fit into current social constructions, but rather takes a more fundamentally material approach to the social processes at play. Indeed, the study of the construction of both semiotic and material social relations does not allow us to conceive the collected discourses as finished products, but only as " fragments of dialogues " between human managers and the nature that responds to them. This is why it is necessary to adopt a grounded lens about discourses, a grounding which will be provided by the documentation of material practices.

## 3.2. Data collection design

As a first step, preliminary literature research on the region allowed me to identify the issues and themes surrounding the wilderness topic in the region. For this purpose, management plans and discourses on wilderness in the SNP, SNP pamphlets, research work of park researchers, legal texts and research by German ecologists were compiled and examined. I was able to learn about the history, ecology, traditional resource management practices, conservation objectives set by national and *Bundesland* laws, and thus understand the controversies and discourses surrounding the area. It was this research that enabled me to formulate the research questions as well as to write the interview questionnaire for the managers' interviews; the feedback from the managers on this material forms the basis for understanding the decisions and practices in the field. The synthesis of the differences and similarities between the respondents' discourses for each question is presented in the next chapter. In a second step, I confronted this information with field practices. The participant observation took place over 3 days, during which I accompanied the rangers and a member of the park's scientific team on wilderness management activities. In addition, I participated in 5 different thematic guided tours given by the rangers. As part of the participant observation, I established the following data collection procedure. During the hikes and guided tours, I wrote my own impressions in a notebook and photographed what was explained. The guided tours were also recorded. During participant observation, I conducted interviews to gain access to how rangers enrol non-humans and vice versa. The purpose of the interviews was both to gain insight into the different beliefs and narratives about wilderness that exist within the park team, as well as a means of investigating views about natural forest succession and wilderness practices.

### 3.2.1. Preliminary literature research

In order to triangulate the data, the mission statements, educational pamphlets by the SNP, reports by the scientific team of the National Park, laws and regulations were taken as the "official discourse", the basis on which the managers' discourse was interpreted. Official documents, management plans and educational brochures of the SNP and former institutions governing the forest before the establishment of the park in 2014 provided background information on the natural and socio-economic history of the forest. Using a thematic approach to qualitative coding, this material was rapidly examined in order to find themes and actors commonly associated with wilderness and natural succession. A list of those actors was created to represent the results. This list was then used as a first model to map the semiotic relations around wilderness and to design the questions of an interview questionnaire. There was no need to associate the text snippets to the obtained actors, since the goal of that preliminary literature research was only to identify first categories, and key themes associated

with wilderness in the Black Forest that came up. For a list of references of the reviewed material, see Appendix B; the interview questionnaire can be found in Annex A.

### 3.2.2. Field work

For this work, several trips were made to the Black Forest. The fieldwork was carried out between May and August 2019. First, I sought to acquaint myself with the wild landscapes of the SNP. With this goal in mind, I first hiked across the National Park, during which time I took notes in a logbook as well as photographs. I spent the nights in the camping sites made available by the park administration. In a second time, I booked guided hikes that the rangers propose in the area, that are available on this page: https://www.National Park-schwarzwald.de/de/erleben/veranstaltungskalender/ Those guided tours included hikes that ranged from leisurely to difficult and from 1 to 4 hours. They were addressed to people who are interested in the natural attractions, landscapes, cultural sites, and history of the SNP. The 4 different guided tours in which I participated were audio recorded and pictures were taken with the authorization of participants and guides. I used photographs to document practices when possible. After the hikes or during a break, when possible, I performed an interview of the rangers that guided the tours about their practical and ecological knowledge, as well as their "embodied experience" of natural processes. The interview guide used for the semi-structured interviews can be found in Appendix A. In one particular case, I deemed necessary to perform a catch-up interview in order to gather some complementary information. For privacy reasons, names of the interviewees are not published in this work.

- *Sampling of interview participants*

All people that were interviewed or observed were employed by the SNP. Out of the 12 rangers, I interviewed 6, and also interviewed 2 researchers from the scientific team of the National Park. Several other researchers and rangers provided additional information during informal discussions but weren't interviewed. The focus was placed on those two groups because I assume that those two groups are the primary actors who inform management decisions at the local level and because those have an embodied experience of wilderness. For reasons of time and effort, interviews of other actors like tourists or public officials were not made.

The sampling methodology used was based on the "follow the actor" method by Latour (2007), and focused on exploring the material semiotic network of the wild forests rather than explaining it. To find contact persons, an internet search was performed, and first contact was established by telephone, which resulted in several half-days with rangers on the field. In parallel to that, the guided tours provided by the park were recorded and the rangers that gave the tour were interviewed. It gave me a foothold in the ranger community and the scientific team of the SNP, and thereafter *snowball sampling* was used and one contact person naturally redirected me to another. This was justified by the small number of staff that works in the wilderness management department of the SNP. Once the responses to the semi-structured questionnaire questions were redundant, indicating that *information saturation* was reached, no further data was collected.

- *Time expenditure and materials*

For recording and reproducibility purposes, I provide a short overview of the time and resources spent/needed for this work. In all, the actual research time spent in the field amounted to:

- Autonomous hiking: 3 days
- Participant observation: guided tours through the park (4 days); field days with rangers (2,5 days)
- Semi-structured interviews of 30-45 minutes (8 interviews)

The technical equipment used was:

- Hiking gear: sleeping bag, boots, maps, sunscreen, water bottle & co
- Transportation: Personal car, rail tickets
- Data collection equipment: Canon EOS camera, audio recorder, field notebook

## 3.3. Analysis procedure

The recordings of the guided tours and interviews are the primary source of information. Before starting the analysis, I had to transcribe from audio to text almost 10 hours of recordings of guided tours and interviews. The transcripts were then printed, and the speeches were analysed. Inspired by Ellerup Nielsen and Nørreklit (2009), analysis was performed on two separate levels:

1. The vocabulary, the use of metaphor and rhetorical forms, the types of argument used in the communication
2. The discourse practice, examining how the communication interacts with practice within that topic.

The coding process was carried out using pen and paper. The coding procedure was mixed, (i.e., neither completely inductive nor deductive) insofar as I had a list of important actors and themes from the preliminary literature research, but these were not always selected, even though they helped to establish the final codes. The preliminary thematic coding of the documents had been done in Excel. The problem I encountered when using the codes/actors from the preliminary literature research for the interviews/guided tours was that the themes and involved actors that I had found in the bibliography were different from those found in the managers' speeches, and that said themes were not always related to my research questions. As my data came from a variety of perspectives, and managers often engaged in informal discourse or personal opinions, a *reflexive approach to coding* was used. With this type of analysis, researchers can modify, delete, and add codes as they work with the data. I therefore made two passes during the coding. In a first reading, I assigned the preliminary codes to the extracts that seemed to correspond to them; various associated extracts received the same coding by hand. In addition, new codes were established inductively when content directly related to the research questions was encountered. In the next phase, it was important to reorganise the thematic hierarchy between the different codes; some themes and sub-themes were not relevant categories for the new codes and had to be reorganised. Some codes were also deleted when they were irrelevant to the research questions. One example is the different classes of human actors ("conservation NGOs", "forestry sector", "local service providers", "local administrations", etc.), which although important in shaping the discourses on wilderness in the region, did not contribute much to the understanding of the local practices and realities of the managers. The different coded sections were then compared with each other in order to highlight the contrasts between the various positions

of managers, ensuring that the codes assigned were still consistent with their content, or alternatively whether any of the new codes were more appropriate. This back and forth between research questions and the original text, which sometimes led to the reformulation of certain sub-questions, is part of the reflexive methodology of ethnographic discourse analysis (Oberhuber & Krzyzanowski, 2008). Once the codes and themes were established, a second round of purely deductive coding, was done to ensure the completeness of the process. The codes that were developed are as follows.

| Non-humans | Practices | Emotions | Humans |
|---|---|---|---|
| •herbivores & hunting<br>•new species<br>•endangered species<br>•funghi, bacteria, insects<br>•big mammals | •restoration & interventions<br>•visitor control<br>•selective thinning<br>•species introduction<br>•education<br>•path management<br>•wilderness experiments<br>•monitoring | •awe-striken<br>•surprised<br>•curious<br>•self-restraint<br>•relaxation<br>•calm<br>•complexed | •exploiters, commercial role<br>•guardener, ecologic role<br>•spectators, guest role<br>•health, recreation<br>•law enforcer<br>•scientist role, research |

| Human perspectives | Disturbances | Wildness& natural processes |
|---|---|---|
| •agency, letting nature do<br>•letting go of control<br>•chaos<br>•danger (for humans)<br>•humans as short-lived organism | •storms<br>•frost<br>•fire<br>•pests | •natural competition/selection<br>•cultural landscape<br>•successional stages<br>•climate change<br>•tree species composition<br>•impenetrable jungle<br>•Biogeomorphological processes, landscape changes<br>•decomposition and decay |

Once the codes were established, the different coded sections were linked to the different research questions. A lot of the information related to the first research question as it was specifically about the discourses that managers were constructing around the wild forest. The managers used numerous theories to describe how the commercial forest was gradually being transformed into a wild forest; this was also reflected them having certain aesthetic-ecological perspectives on the trees and their role in the rewilding of the forest. Relating the coded sections of text to the research questions was relatively easy as the reflexive development of codes already incorporated a reflection on the research questions. Additionally, for the research questions on practices and enrolment, photographs and field notes collected during participatory observation were used and connected to the sections of text that described rewilding practices. In terms of what would be included in the results, it appears that the

amount of information in the following section is relatively proportional to the amount of data extracted. Due to the nature of actor-network methodology, the results can appear ‘all-over the place’, but that, instead of being a defect, is merely a reflection of the disorganised appearance of the wilderness network at first sight. The results presented are the result of an effort to be as exhaustive as possible, while restricting the description of discourses and practices to (1) discourses on non-humans present in the field, (2) discourses directly related to the practice and local decisions of the managers, (3) practices relayed or observed, and therefore for the most part specific to the period of data collection. For each research question, the most significant extracts have been translated into English.

It is only in the last part that one can reconstruct, like a detective, the interactions and the structure underlying rewilding practices and discourses. The last part of the analysis is the analysis of actor-networks and the construction of enrolment chains. These chains are constructed from all the data that the researcher has collected by following the 'actors'. They represent the different 'contracts' by which the different actors link together to construct the 'network of wilderness. The disparate data is thereby linked to the conceptual framework, to create a holistic understanding. The enrolment chains are presented in the discussion, in a schematic inspired by Hitchings (2003).

# 4. Results

The results section will address the research questions by describing the different discourses and practices encountered during the interviews and participant observation. The structure roughly aligns with the themes and coding used for discourse analysis. In the first part, I examine in detail the discourses that managers had on wilderness. Alongside the slogan 'let nature be nature', managers developed different narratives about the forest. In subsequent sections, I describe the different practices that allowed managers to handle natural processes and examine the material and psychological foundations on which these discourses are based, and how they interact with practices of natural process protection.

## 4.1. Wilderness discourses

The discourses of the managers regarding various aspects of wilderness and the protection of natural processes were examined. These discourses about wilderness in the Park had several purposes; the first was to give the public and themselves a frame of reference in which to understand the landscape by highlighting the 'static' features that made the park wild; the second purpose was to be able to interpret the dynamic changes that occurred within the forest; this was done through the adoption and discursive reproduction of ecological models about the processes observed in the forest; finally, these discourses served to make sense of the managers' day-to-day experience of nature. The opinions on the quality of the forest and whether it could be described as wild and comparable to other forests described as such were collected. Secondly, discourses on the interpretation of changes and more specifically on natural processes are discussed. Finally, I try to understand in more detail one natural process in particular, natural tree succession, by classifying the various discourses on trees and their role in rewilding the forest.

### 4.1.1. Wildness assessments of the forest: a natural ecosystem or a silvicultural wasteland?

Managers had varying assessments regarding the degree of wildness of the forest. They were divided as to whether they should interpret the forest becoming wilder or becoming neglected and unkempt. Seeing the same changes occurring in the forest, the first camp focused on how natural influences have increased. Believing in the return of wilderness, interviewee 4 explains that "you can really see the wilderness coming back step by step", while pointing to an opening that a winter storm created in the forest canopy. "It was a small storm in November 2014 that went through there" he says. Some managers had the idea that the forest, once subject to a commercial order, was now subject to a new non-human order. Other rangers tried to show how the "organizing" human influence was being replaced by "regulated" natural chaos, using scientific conceptualizations of forest dynamics.

On the other hand, the second camp saw the changes as the results of additional human management design. They emphasised how human actions continue to influence the development of the forest, and that the forest was still very dissimilar to other isolated old-growth forests. They also supported fortress conservation as an alternative to protecting natural processes. When asked if they perceived

the forest as becoming wilder, person 8 accentuates how human agency has shaped nature in the park and distances himself from the concept of wilderness:

> "The forest in the national park is not really wilderness, I would rather say it is 'rewilded'. You only have to compare it with a forest in Canada, it is a wilderness. Here the forest is not wild, it's just that it's not as orderly as in other forests in the region. European visitors would consider it wilderness, but for me the current forest management only reflects the lukewarm environmental policy of Baden-Württemberg. I would prefer to see a commitment to pure nature conservation and to fence off the park."

The distinction between wildness and wilderness came up several times and seems to illustrate the difference the managers make between a completely autonomous primary forest and the park's forest, which is still under human influence. Interviewee 7, while agreeing that the park was relatively wild, separated the concepts of naturalness and wildness, the latter being more closely related to human perception and the experience of hikers:

> "The forest has a high degree of naturalness compared to the surrounding landscape. What I mean is that there are more species that would appear naturally. [But I wouldn't confuse naturalness with wildness. For me, a wild forest is first and foremost a dense forest, where it is difficult to get out of the way."

An important debate among managers was whether the composition of the forest reflected well enough the native tree species of the region and whether to do something about it. "We want to foster the deciduous species" explains interviewee 1, „because they are the ones that suffered the strongest decline during forestry regime". One of the tree species that was seen as underrepresented was the beech (interviewee 4):

> "It is also important that the main tree species, the beech, comes back. Of course, it takes some time, we just let the process start. You just need to have patience, but we do not want to reach a specific goal, already the way towards it is success. At some point we expect that the beech will be dominant here because it is better adapted. In 500 to 1000 years, you'll find a natural tree community. But you need optimism and courage to endure the wait."

This consideration has led to beeches being planted in the management zone some years ago. Now measures are mostly about protecting trees that produce seeds and cutting down spruce. However, even when they didn't perceive the forest as wilderness due to un-natural processes or tree composition, all managers could nevertheless agree on the positive character of wilderness and that they were motivated by what they saw in the forest.

- Conceptual breadth and scientific speculation

The majority of participants said that the forest would become more natural, eventually resembling an ancient forest. However, they had difficulty describing what 'natural' meant. Instead of rigidly imposing an ecological vision of what a wild forest should be, some managers had a more open attitude: "It is important that nature shows us what it can do" and "we will allow to happen whatever will happen" (Interviewee 1). A consequence of their open attitude is also expressed in their difficulty in describing what the forest will look like in the future. Many pointed to the uncertainty of climate change or catastrophic events to explain their openness. The managers constantly emphasised their ignorance of future developments in the forest:

> "The history of our forest is a spruce monoculture, and we would like to have a stable mixed montane forest. But we will never have a typical 'Black Forest jungle' [i.e., an old growth temperate mixed broadleaf forest], we won't have that because of climate change." (Interviewee 1)
>
> "There is no older forest in Baden-Württemberg than the little one here, and with the national park we have reset it, we have started all processes. I have no idea how things are going to develop with climate change, storms and everything that is going to happen." (Interviewee 5)

However, this open attitude to change was not passive or indifferent. On the contrary, the managers were looking for indications that the natural succession of the forest was taking place, and, in this way, they were actively monitoring the changes that were taking place in the park. The managers accentuated the uncertainty of previous knowledge about forest succession. As a consequences of seeing themselves as ignorant, the managers perceived a knowledge gap that they wanted to fill. Interviewee 7, who was part of the national park's scientific team, explained that she saw the national park as an opportunity to study the effect of climate change on Central European montane forests, "here we want to see what would happen if humans did not intervene". Thus, changes in the forest were seen as providing answers, which were actively sought by scientific research.

What is remarkable about this open disposition to change is that it allows spontaneous and unplanned developments, not perceived as influenced by humans, to be seen as natural processes in hindsight. In this respect, their definition of the naturalness of the processes, when compared to the classification according to Aplet and Cole (2010), seems to come closer to the absence of human effects and the absence of human control rather than historical authenticity.

### 4.1.2. Conceptualizations of forest dynamics

Theorising change played an important role in the discourse of managers. As the forest changed, rangers sought to describe the changes they saw in terms of conceptual ecological reference frames. Managers used these conceptualisations of change to interpret the landscape and make sense of natural processes. In the following section I will describe the different frameworks used to describe natural processes, both at the scale of the landscape and at the scale of trees. I propose here a simple classification of the different theories defining natural processes. The classification was made according to the main actors who initiate them, with some examples.

Ecological theories play a prominent role in how these processes are explained. The S*NP* describes natural processes and their protection using the following formulation: 'In a large part of the region, nature develops freely according to its own laws or chance, without us intervening in the processes' *(Florian Weckbecker (Nationalpark Schwarzwald), 2019; Nationalpark Schwarzwald, 2019b).* In this perspective, nature has its laws, which manifest themselves when they are not hindered by man; this means that the study and scientific formulation of the laws governing natural phenomena is possible. These laws can be examined and predicted by humans, who can use this knowledge to enable or thwart these 'natural' developments. Chance also seems to have a place in the policy of protecting natural processes; with these "random" natural processes, the park refers mainly to disasters such as fires, drought, or storms.

- *Biogeomorphology*

At the broadest scale of natural processes, managers have drawn on a bio-geomorphological understanding to describe changes in the forest. Erosion and pedogenesis, sediment transport and deposition, landslides, rock falls, are all processes that structurally affect the forest. For example, interviewee 4 explains what will happen to the floating island in the Buhlbachsee, and the resulting choice for managers:

> "The natural dynamic would be that the lake silted up, and the floating carpet gradually moored to the land, populated with trees, and disappeared. This would be the natural development of the landscape. This is the way things are. In dry summers, when the lake level is lower, this threatens to happen faster and faster. We could regulate the water flow, but that's not what you really want to do, because of the protection of the natural process. Some people say they don't want the island to disappear. And then the discussion starts again: "do we accept the disappearance, or do we intervene again?

The process of this island eventually mooring to the shore and reducing the size of the lake is understood as natural, although the managers think it is a pity to lose this particular habitat form.

**Picture 6:** floating mat on the Buhlbachsee lake. Credit: schwarzwald-informationen website

- *'Potential Natural Vegetation' model*

One change that the managers observed closely was the change in tree species composition. Prior to the protection of the area, the species composition had been heavily shifted in favour of the common spruce, which is indeed a native tree of the black forest, but relatively rare in the wild. Over the past few centuries, the forest industry has favoured the planting of Norway spruce for practical reasons, as it is a faster growing species than other species. Several managers described the initial situation of the forest as a "spruce monoculture" (interviewees 4 and 7). The current forest is still very strongly dominated by spruce and is therefore historically and ecologically out of step with the composition of a naturally occurring forest at this locale. For this reason, the managers used an ecological model that deduces the vegetation that grows naturally there from the geological and climatic characteristics of the area under study. Interviewee 7, a member of the park's scientific team, explains the concept of 'potential natural vegetation', used to determine the natural composition of tree species:

> "The concept of potential natural vegetation was developed by a German plant ecologist, Tüxen. It predicts which plant community should be expected at which location depending on environmental factors such as climate, soil, etc. This is the model we use, where a natural community is equated with potential natural vegetation. However, it is subject to some criticism, as it only focuses on an end state, whereas ecologists today believe that the succession and evolution of tree communities is perpetual."

This model indicates that instead of a spruce-dominated forest, these mountains would be covered by a mixed conifer-beech forest dominated by fir and common beech. It has been used to justify certain practices such as the sowing of young shoots of deciduous trees of local provenance, from species that

are supposed to be more present according to this model. The current species composition was also deemed problematic because there were exotic tree species planted (as we will see in the next chapter).

- *Natural selection*

The managers pointed out the high mortality of young trees that they observed. Adopting a discourse from evolutionary biology, interviewee 7 explained that natural selection has replaced the human logic of timber production as the new force behind changes in forest tree structure and mortality. Indeed, in a commercial forest, trees are planted and then cut back gradually by forest guards to create just enough space for each tree to grow straight and produce good quality timber. In contrast, in an unmanaged forest, natural regeneration can create conditions of brutal competition, with young trees growing so tightly together that they eventually starve each other of resources and risk perishing in the slightest adverse conditions, like droughts. Interviewee 1 gives an example, showing small spruce trees:

> "Here in the forest, it's all about life and death. The trees fight for light, especially the spruces, because they are a species that needs a lot of light. Look at those in the shade, they will die miserably."

**Picture 7**

At every turn, one can find dense groups of dead young trees, victims of climatic hazards and competition for space and resources.

Credit: own picture

- *Tree life cycle*

The managers emphasised in their statements that instead of being harvested, the trees could grow old, die, and decay in the park, which played an important role in increasing the wilderness character of the area. Their discourse was based on an understanding of the process of decay and regeneration as part of a 'cycle' where young trees use old ones to grow, a self-sustaining and independent cycle once humans stop harvesting wood. The managers were adopting a discourse that I had found in the book 100 Jahre Bannwald - Wildsee during my preliminary literature search, published by the Baden-Württemberg Forest Service (Schlund, Jehle, & Ebel, 2011). In this book, the authors use the "tree life cycle" to describe the 4 different phases a tree would go through in its life in a "future Schwarzwald jungle". The tree life cycle refers to the different life stages of trees as commonly described in forestry literature: the young phase, the optimal phase, the mature phase, and the decay phase. The cycle begins when events such as windthrow or logging create an opening in the canopy. This is when the "young phase" is started, and the seedlings germinate and grow to a height of 5 to 10 metres. As the soil is filled with seeds from the surrounding trees, the seedlings are often tightly packed. The second phase is called the 'optimal phase', in which the number of trees in the stand decreases and the remaining trees grow very rapidly. In silver fir, this phase can last 500 years. "That is four times older than a forester wants", says interviewee 4, "When a forester talks about old trees that he wants to harvest, he means that the forest is 120 to 140 years old. [...] It's like killing a calf."

After the optimal phase comes the maturity phase, during which the tree loses its vitality, and becomes a habitat for many species. The branches fall off, allowing parasites and fungi to enter the tree and rot the wood. Woodpeckers attack the rotting wood to create caves. The final phase, called the decay phase, begins when the tree is dead. "A tree can last for 300 years before it collapses; and it is still a long time until it is decomposed, we don't even know by how much", says interviewee 2. During the decomposition phase, decomposers such as fungi or invertebrates break down the lignin and cellulose in the dead wood. This process releases nutrients that promote the growth of new seedlings on the decaying wood. These seedlings establish themselves on the dead wood and take root in the soil. Once the dead wood is completely decomposed, these young trees appear to have grown on stilts. Trees of this type are called "corpse trees" says interviewee 1.

The presence of the mature and decaying phases was particularly important as an indicator of a wild forest for the interviewees. Old trees and forests were seen as something special by all interviewees, something that should be protected in the national park. Interviewee 4, who was originally a forester, explains why it is so important to conserve old trees:

> "The aim of foresters is always to shorten the life span of trees [to harvest them earlier]; do you know how many old forests are left? Only 5 or 6%, there is a massive depletion. Many animal species depend on the maturity and decomposition phases of forests. Those are missing in Germany and that is why it is important to preserve old-growth forests."

Interviewee 1 compares his experience here to other places, explaining that old trees were perceived by him as making the forest older and more primeval, reminding him of native primary forests in other parts of the world:

> “I saw a fir in the Bavarian Forest that is 600 years old. Can you imagine that? That's very impressive. It sprouted around 1400 and is still standing. We will not see anything of that in our lifetimes here because we are all too old for that! No one will end up seeing a so-called end-stage or balanced state, like that of tropical or northern European forests. Here we only lay the foundations for future generations.”

### 4.1.3. Ecological-aesthetical perspectives on trees

The emphasis on the protection of natural processes in the national parks programme was also reflected in the managers' discourses of the trees that made up the forest. Rangers began to describe trees from particular perspectives. The changes they observed led them to discursively reinterpret the trees, drawing both on scientific notions such as age structure, ecological habitats, or natural selection, and on more romantic notions such as aesthetics or the search for a holistic perception of nature. These different narratives were categorised in the discourse analysis and are presented in this chapter.

- *The tree as a rewilded specimen*

An important sign of naturalness was the increase in the diversity of tree phenotypes, i.e., a greater diversity in tree appearance. To contrast with a commercial forest, which is a forest with a demographic structure of trees of the same age and uniform shape, a "forest whose sole purpose is to produce straight trunks without branches" (interviewee 1), the managers constructed the discourse that the SNP forest comprises very diverse manifestations of trees. As trees are no longer 'grown', but 'grow on their own', many life events that would have been avoided or erased (and made invisible) when the aim was to produce straight wood, now influence the appearance of trees. Here, "a green tree, a dead tree, a fallen tree or a crooked tree co-exist" (interviewee 4) in the same place and at the same time.

**Picture 8:** A winter storm tore off branches from a tree near a bench. The strong visual contrast between the resting area and the surroundings creates a dramatic display of the powers of nature.

Credit: own picture

A particular example of natural phenotypes are dead trees that have been killed by the European spruce bark beetle. These trees are closely monitored by forest rangers. The bark beetle is a parasite of the most common tree in the national park, the common spruce. As there are no longer any control measures in the core area, mass deaths were expected in some parts of the forest. As the fourth interviewee tells us:

> "When the national park was established, there were no beetles. I still remember when the first tree turned red. Then boom boom boom others fell. Many people were afraid that all the trees would turn red and eventually die.

In the end, this did not happen, but red spruce trees have since become a regular sight in the SNP. Another, more recent example of a tree phenotype is the "decapitated" tree: this winter, freezing temperatures coupled with a storm broke the tops of all the trees in the SNP (see photos below).

**Pictures 9 & 10:** Dead 'red' trees that were killed by the European bark beetle (left) and a 'beheaded' spruce (right). Credit: own picture

This diverse gathering has become a symbol of the protection of natural processes in the park. The diverse specimens of rewilded trees, which bear witness to storms, pests, and other calamities, have become an integral part of the landscape that the managers want to build. Interviewee 4 explains the concept behind the rewilding of tree specimens:

> "People always think that the national park must be something inspiring, something noble, like a thousand-year-old tree or incredible rock formations. That's in our heads, that's our idea of a national park. Indeed, there are some such national parks, but this is not necessarily the case. This is also a national park, and although normally this tree should have been cut down a long time ago [branches torn from a tree near a bank, see photo on previous page], here we leave it; it doesn't have to be beautiful. If it's not dangerous, then we leave the trees as they fell. Whether you like the carcass of the tree or not is not even the point. You must first learn that it still has value. A forest doesn't have to be beautiful but natural."

It is interesting to note that in the above statement, the ranger rejects any connotation of beauty to 'natural aesthetics'. He says that the natural landscape has value, but apparently this value is not in its aesthetics. According to him, the park has neither the grandiosity of high mountain parks, nor the dignity of primary forests; its value lies in the decay of trees, which are witnesses to the havoc and force of natural processes.

- *The tree as ecosystem engineer*

Another discourse on trees was about the role they played in creating new habitats, rewilding not only themselves but also their surroundings. In addition to having trees of different phenotypes, it was important for the managers to be able to witness different life phases of the trees simultaneously. Interviewee 7 explains that "in a nature left to its own devices, all phases of growth and decomposition take place in parallel", which can be contrasted with the same-aged stands of the old commercial forest. This juxtaposition of trees of different ages results in a heterogeneous mosaic structure, with gaps in the canopy in some places, and very dense areas in others. In this way, the rewilded tree begins to have a structuring role in the forest. In this perspective, trees were also thought to enrich their environment by creating new habitats for other species. Referring to a fallen tree, interviewee 4 explains:

> "If the tree had not fallen, it would still be beautiful of course, but it would not be as structurally rich as it is now. Structural richness means that more species can live in it, like the species that live in the decayed wood. So now there is something for everyone."

**Picture 11**

When decaying, a dead tree becomes a habitat and a resource for other organisms. On this dead trunk, one can see the activity of woodpeckers, ants, and fungi.

Credit: own picture

When trees were left to themselves, various life events turned them into as habitat creators: they became actors on their environment, creating new and diverse possibilities of exploitation by other organisms. Another example of trees creating habitats by aging was stated by interviewee 1:

> “The process protection is so diverse in many ways, in terms of the forms, but also in terms of the processes. I can always show only a few examples to open your eyes to what it means when a tree falls over. Here the tree's roots tore a hole in the ground when the tree fell. If I have a substrate that is reasonably watertight, then water can accumulate here. With all the consequences, as far as plants, aquatic plants and insects are concerned. When it comes to process protection, there are always new niches in which life in a variety of forms can settle. Everywhere it sprouts on the dead wood. It is banal as I said but a very important aspect of the process protection. Wild bees may also appear and dig their little nests, and so on. There are a thousand possibilities! And that is something we do not see in commercial forests in such a form and also cannot allow there.”

**Picture 12:** An uprooted tree creates a new habitat for a variety of insects. Credit: own picture.

For the managers, dead wood played a very important role in creating ecological niches. They appreciated the increasing amount of dead wood due to the ecological functions and processes it supported. “Deadwood adds value to the National Park”, tells interviewee 2 “in a primary forest, 30-40% of the wood stock is deadwood. A lot of animals benefit from it, like the bark beetle, the Eurasian three-toed woodpecker who feeds on these beetles or mushrooms. Every tree has its mushroom : deadwood was not just seen as detritus, but as an essential part of natural processes. "People are so derogatory about dead wood, but has tremendous value, because it regenerates nature", explains interviewee 1, „it is also an enormous reservoir of water, because in natural forests it makes up to 30% of the wood stock.”

## 4.2. Enrolment practices by humans

The construction of the national park as full of wild processes was not just discursive. The managers also played an active role in shaping the forest. They discriminated which non-humans were allowed into the park, interpreting some as an indication of 'naturalness' and others as anthropogenic or disturbing. Some endangered species and cultural heritage justified heavy interventions in the forest landscape. Managers' practices included experimenting with or mimicking natural processes, trying to speed them up or reproduce them, and excluding or disciplining other humans to contribute to a pacified forest.

### 4.2.1. Non-humans: politics of exclusion/inclusion

The managers did not enrol every non-human in the wilderness network, but rather differed in their assessment according to the actions of non-humans living in the area. Entry and acceptance of non-humans depended on whether they encouraged natural processes, challenged the ontology and historical continuity of the species in the area, or threatened to cause damage outside the park.

- *Exotic tree species*

Some of the species in the park were introduced by man, and in this way represented a problem for the managers who wanted to keep the landscape as close as possible to what it would have been if the forest had not been affected. A contentious example of a species that is not part of the perceived wilderness is the Douglas fir. This tree was introduced to the region from North America hundreds of years ago, so it is considered a neophyte. It is valued by foresters for its hardwood which makes good timber and the fact that the species grows faster than other conifers. Interviewee 4 emphasises the practical impossibility of returning to the pre-1492 wilderness standards, and the associated stewardship dilemma:

> “Should we imagine wilderness as something before 1492? That is, before world trade really took off ? Douglas firs have been here for 150 years, I would say. They were imported from North America. Guys had a good hunch. It doesn't belong here. In the beginning of the National Park, the question was, how should we deal with it in the core zone? Do we now have to send forestry workers around to tear out the trees? Or cut them down? That would be really ideological and silly, I admit. It would also be unaffordable and far too costly. But of course, you have to think about how to handle it.”

- *Naturalness indicators*

The numerous forms and processes in which trees where engaged allowed for new species to establish themselves in the National Park. These arrivals were interpreted as natural: “We are happy about every species that comes by itself. There are no special measures to attract new species in the core zone. Mostly the conditions are just right for them”, tells interviewee 5. However, the presence of different species was dealt with differently, depending on whether they were perceived as natural or not. During my fieldwork, I heard rangers continually assigning naturality to certain actors while negating it to others. New species linked to new habitats created by trees were called “indicators of naturalness.” These species were subjected to study by park experts: "we have mushroom experts, beetle experts, lichen experts, many universities have research projects here” interviewee 5 explains,” and every now and then, you hear that a new species has been discovered." An example of a species that has appeared

shortly in the National Park is the *Hericium flagellum* fungus, which grows on old silver firs in the Bannwald. As it is only found in old growth forests in other parts of Germany and Austria, it's appearance was celebrated as the arrival of an "primary forest fungus" (Schlund et al., 2011).

**Picture 13:** The fungus Hericium flagellum, nicknamed the "primary forest fungus". Credit: Schwarwald National Park Blog

- *Pests and decomposers*

The managers had a welcoming attitude towards new species of decomposers that are normally considered as pests, like the spruce bark beetle. The spruce bark beetle one of the newcomers since the establishment of the National Park, when measures against its proliferation stopped. Interviewee 4 explains:

> "The spruce bark beetle is considered a pest outside the National Park, but in the core zone no one cares about that. Society needs wood, but here we let the bark beetle regulate the amount of dead wood. He mainly attacks spruces that are at least 80-100 years, so already older trees. It is a natural process, but many do not like it and are afraid of it."

Theoretically, process protection also applies to animals, but the management encountered some difficulties because animals are mobile, and easily move in and out of the National Park. The tolerance that the park management demonstrated for pests had setbacks. Since forests adjacent to the National Park are still producing wood, the National Park had to make sure that the spruce bark beetle would not spread outside of its limits, in order to preserve the economic viability of adjacent forests. "The National Park is located in a densely populated area, so living together with our neighbours is very important to us" tells Interviewee 2 to explain how human interests are permeating the conservation practices. In order to protect the neighbouring forests, a strip of management area was created around the core area, in which the rangers are patrolling, on the lookout for infested trees. The infested trees

had then to be cut down in the two weeks following their discovery. “This operation requires a lot of manpower and resources”, tells interviewee 2.

- *Big ungulates*

On the other hand, some species that would normally have been considered as part of a natural landscape are excluded from protection. Big herbivores are still hunted in the National Park in order to protect the neighbouring forests from grazing that would become too intensive. Due to strong opposition from neighbouring forest owners, the park still allows hunting of deer and boars. After negotiations, the hunting did cease in some parts of the core zone from 2020 on. The management considers the species as “bio-engineers” that create new habitats in the ecosystems they inhabit (Nationalpark Schwarzwald, 2019a):

> “From an ecological point of view, ungulates don’t cause damage, but disturbances. […] Red deer, roe deer and wild boar are thus "bioengineers"[…]. By wallowing and raking up damp soil, new habitats for aquatic insects or spawning grounds for dragonfly species are created, through browsing they promote a denser growth of trees and bushes, which offer ideal nesting sites for many species of birds. The browsing of young trees can also increase the biodiversity in a forest, because open areas arise, which promote light-loving plants and animals.”

### 4.2.2. Wilderness development areas and zonation

In the following part we will examine the different practices that managers used to increase wilderness. As part of the goal to extend the core zone of the National Park, a large tract of the management area was allocated to experimental rewilding practices. In those wilderness development areas, natural selection was encouraged, and the team tried to mimic natural catastrophes.

- *Wilderness experiments*

Several locations in the wilderness management zone have been selected for wilderness experiments, to mimic or initiate processes that change the forest structure towards a wilder aesthetic. Speeding up wilderness processes seems paradoxical since increased human interference commonly means less wilderness and more artificialness; yet managers seemed not minding this. For example, the selective thinning of the former commercial forest to a more heterogeneous character: on the northern slopes of the Rotmurg and Mönchsgrund valleys the rangers cut down trees and left them to rot. The reasons given were many and related to what has been described as the creation of disturbances, creation of deadwood/habitats, increase of biodiversity, etc.

Another example is the reproduction of the passage of a storm on a forest; 500 metres from the Ruhestein car park, the trees had been sawn with the aim of giving an air of post-cataclysmic chaos (see photo below) with an educational aim (purportedly). The loggers went so far in *mimicking* the effects of a storm that they cut the trees in an 'irregular' manner. It is difficult not to see behind these measures a kind of communication stunt, as if the managers had wished that the storm Lothar, which passed further away, had destroyed the forest closer to the parking lot.

**Pictures 14 & 15:** in the management area, the scientific department of the National Park performs diverse “rewilding experiments”. Here one can see experimental thinning of the forest in order to get more light to the ground for rejuvenation and to increase the amount of deadwood on the forest floor. Managers try to mimic the appearance of a natural process when felling trees. Credit: own pictures

- *User management and path concepts*

It was also important for the managers to involve the visitors in creating and maintaining the quiet atmosphere of the area. In the course of establishing the SNP in 2014, a system of hiking trails was designed to welcome visitors. Due to the diverse history of exploitation over the past centuries, more than 75% of the park area was located less than 50 metres from the nearest hiking trail. The many paths left only a few places where the forest creatures were not disturbed by human influence (noise, smells, etc.). The trail concept aimed to define a network of trails that would make the National Park accessible to all, while on the other hand, protecting the undisturbed development of nature ("letting nature be nature"), and impairing process, nature and species protection as little as possible, as it’s the primary goal of the National Park's conservation policy. Herein lies a potential for conflict. In view of the great disturbance that the many paths and users caused to the park's wildlife, the administration therefore introduced path removal measures. This task was tackled by zoning – by creating "quiet zones" in certain parts of the park where most of the trails would be reclaimed. To reduce the impact of the works on the ecosystems and for financial reasons, the paths were left to themselves. Most of them will become overgrown by vegetation and unusable in time.


**Pictures 16 & 17:** In the management area, access to many paths is restricted. Faced with the non-respect of injunctions on panels, the rangers dissimulated the bifurcations, simply covering them with dead wood. Credit: own pictures.

This creates some funny situations when paths have to be kept open for maintenance or accessibility reasons for park employees but not accessible for hikers or other users. In these cases, a simple sign is displayed at the entrance of the path (see picture on the right). Not only must visitors turn a blind eye to visible paths, but these signs make this place look more like a heavy trafficked square than wilderness, which can disturb wilderness experience. In a sentence, to preserve wilderness, humans have to stay civilized : on the remaining paths, humans are subject to strict rules: stay on paths, no camping, no hiking in the night, no fires, no littering, no foraging; any infringement will be punished by a fine. Through these regulations, managers assigned the role of spectators to humans. Interviewee 5 explains:

> “Here nature develops by itself, through process protection, through the developing wilderness, and humans should not disturb. Above all, it is a culture of restraint [but it’s also about taking the back seat and to release control.]”

The discursive distinction between man and nature thus takes a very concrete form here, and 'disturbing' visitors have no place in a rewilded and 'pacified' landscape. Only the managers, who act as guardians ensuring the preservation of wilderness, are still allowed to walk on these paths.

### 4.2.3. Preservation of semi-open forest habitats

In some cases, the interests of iconic species prevailed over the concept of natural process protection. That led managers to enrol the forest to preserve a species, by recreating a habitat that wouldn't exist if natural processes were let to run free.


**Pictures 18 & 19:** In the management zone, the National Park is still cutting down trees (right) to create and preserve semi-open heathland (left). This is done for cultural reasons as well as for species conservation. Credit: own pictures.

An example where species protection overrides natural processes protection is the European capercaillie (*Tetrao urogallus*). The capercaillie is a relic species from the last glaciations which has strong cultural ties with the Schwarzwald region, it's for example the emblem of the city Freudenstadt. This species is in danger of extinction in the Black Forest and the National Park made a pledge to protect the species. This species relies on semi-open forest habitats in order to feed and to reproduce, but if the area was left to rejuvenate under natural process protection, open forest would disappear. Interestingly, semi-open heathlands were never actually a naturally occurring habitat. Capercaillies as umbrella species for a lot of other species dwelling in open landscapes were an important factor behind the park's decision to preserve open heathlands by cutting trees, as explains interviewee 3:

> "It's clear that if humans did not run habitat care, the capercaillie would die out. There is a discussion here, as to whether it really makes sense to invest so much money and effort to protect a species that has its natural habitat elsewhere. In Germany, the capercaillie is a relic species from the last glacial periods and normally occurs in northern Europe. On the other hand, the capercaillie is an umbrella species, which means that if you protect the capercaillie, you also protect many other species. "

## 4.3. Enrolment by the non-humans

For non-humans too, it was important to enrol humans in their protection and maintenance of the park. According to the guided tours, the trees gave the managers different perceptions and feelings. The Park rangers' experiences in the park played a central role in their conception of the wildness of the forest.

### 4.3.1. Interests of non-humans

Non-humans often had interests that differed from those of the managers. Most were trying to reproduce and propagate, whether inside the park or outside. Non-humans were not interested in human concepts such as biodiversity, naturalness, national park boundaries or the protection of natural processes or endangered species. They could threaten the ecological balance of the park. Examples we have seen before include the bark beetle or large ungulates, whose populations must be closely monitored and eradicated if they pose a danger to the surrounding forests.

Another interesting example are the discourses about plants to which the park managers have attributed interests. They suggested that the plants wanted to grow unhindered and be able to adapt to their environment and reproduce without being hindered by logging. As interviewee 8 recounted, "the growth of natural regeneration [i.e., young trees] is very haphazard, it grows where it wants, even in the middle of the paths". This willingness of plants to grow and thrive interferes with human conservation objectives. An example of this is the invasive purple heath grass (Molinia caerulea), explains interviewee 5: "The high pastures are part of the management area and are preserved because very special plants and insects live there, like the alpine grasshopper (Miramella alpina), the yellow gentian (Gentiana lutea). They are managed forever for natural and historical reasons. To maintain them, they have to be grazed, so we use sheep, cattle and goats, domestic animals that should not be part of a national park. But if we didn't do anything, the pipe grass would take over everything and most of the rare species would disappear." Inthis example, the competitive strength of purple heath grass in comparison to others and its drive to colonize space leads to the recruitment of managers to perceive the outcompeted species as needing protection. To the contrary of previously mentioned discourses about “natural selection” being allowed to follow its course as what happened with the bark beetle, they intervened to counter natural process. It can be said that the alpine grasshoppers and yellow gentian enrolled humans as protectors.

Non-humans do not only create conflicts with the park's conservation objectives, but also with visitor practices such as tourism and sport. An illustration of a conflict between recreation and animal livelihoods is the case of the European common viper (Vipera berus). In summer, these snakes gather sunlight on the exposed, rocky paths of the national park. "It's a shy animal that runs away at the slightest noise," says interviewee 6, "but you can still surprise it and walk on it. These animals are quite large, the males can reach 60-70 cm and the females 50 cm. A mountain biker at high speed would not be able to react fast enough and would run over it". To protect these animals, the paths around the Westweg and the Schliffkopf had to be closed to mountain bikers. This illustrates how the encroachment of non-humans on human infrastructure creates a need to continually regulate the visit and use of the park. In this, the common viper, through its interest in sunbathing in exposed areas and its willingness to colonize heavily frequented paths, has succeeded in enrolling the managers to regulate the traffic.

**Picture 20:** A threatened European adder (*Vipera berus*) encountered on a sunny path in the National Park (18 June 2019). Credit: own picture.

### 4.3.2. Wilderness experiences

Once that the practices and discourses on which wildlife is based have been explored, it is interesting to understand the motivations and perceptions that underlie them. Non-humans are able to mobilize humans to protect them by giving them various impressions, which could be perceived negatively, as problems to be solved (and thus push humans to action) or rather as beneficial, encouraging for example curiosity and interaction. In the following section, I will try to explore these different experiences.

- *Non-human agency & human loss of control*

Non-humans often had their own will, such as plants growing where they wanted, herbivores eating fir saplings or leaving the park boundaries, etc... This created a sense of loss of control in human interviewees. Yet, echoing the park's slogan, the managers wanted to allow the natural evolution of the forest to take place, even when this generated negative feelings: "you just have to learn to put up with the fact that it doesn't evolve in a direction you like" (person 4). Perceptions of loss of control were generally associated with the sight of dead wood and shrub encroachment. This loss which had to be accepted, as explained by interviewee 2:

> "Protecting natural processes means not intervening. It means not intervening and being able to put up with something happening that you don't like. If you have been used to intervening for years, this new concept can be tricky."

In this context, rangers saw themselves as spectators rather than actors. The forest was a landscape where humans were expected to be passive (person 4):

> "We leave the forest to itself so that it can shape itself naturally, and that's why the forest is also less ordered and maintained. I think this is very attractive because in Germany we are very removed from wilderness, whereas here it's what we are interested in. We don't always have to control everything."

Humans, like 19th century romantics, were only meant to admire the wonders of their environment.

- *Human perceptions of exclusion & disturbance*

Non-humans in the forest often contributed to the exclusion of humans. Several natural processes relied on the absence of human disturbance and induced managers to perceive a separation between humans and their environment. This created the perception that humans were undesirable, unsuitable, or disruptive to the conditions created by non-humans in the forest. Especially threatened animals relied on the quiet areas for foraging and breeding so that humans who ventured into these created human-wildlife conflicts. One example of a non-human creating a perceived disturbance, which we have seen before, is the European adder, which colonizes paths and forces managers to close paths. Managers had many practices that were aimed at reducing the impact of human visitors on the forest. Humans were perceived as competing for space with animals, by their mere presence in an area, explains interviewee 5:

> "If you go into the area, you disturb. Anyone can test that, as soon as you step from the way, the bird warning calls start. Out-of-the-way people means danger to them. In the case of grouse for example, the chicks will fly off at every danger as soon as they can."

The park's vegetation has also excluded humans from certain areas by becoming an impenetrable mass, overtaking the space on the ground. These conditions made it more difficult to get off the trails than in other forests. Interviewee 7 explained, "To me, this forest is not wild because of its biodiversity or similarity to old growth forests, but because it is impenetrable, such that we don't always have room to walk off the trails." As disturbing elements, humans were encouraged to stay on the paths. Restricting access and use of the National Park area has been a practice for several decades now and has led managers to consider the area as special and untouched. “The Bannwald forest is a magical place, something special, because humans have not done anything for 100 years “tells interviewee 5. It isn’t really accurate to say that humans didn’t do “anything” in the last centuries (see previous part), but the framing of this forest as “undisturbed” was essential to justify its preservation.

- *Surprises and curiosity*

Letting natural processes take over was an experience full of unexpected developments and twists for the managers. These surprises induced a sense of fascination and curiosity similar to the one reported by visitors to the park’s scientific team (von Lindern, Blech, & Gosteli, 2019). Managers were often surprised by the changes they saw in the forest and felt motivated by these changes. Interviewee 4 talks how curious he was about the evolution of the forest, and how much it defied his expectations:

> “I was curious myself at the beginning of the National Park how fast wilderness would return. I am surprised about the speed of the process. At some spots it did not happen, for example over there it looks a bit more commercial [*points towards a patch of forest down the way*]; each tree has the same thickness and height as the other. But there are many corners, which are out of the way, where I am surprised to see how fast that has changed.”

In addition, surprises were not only about the evolution of the forest landscape, but also about more mundane events. Interviewee 5 explains that “a lot of people come regularly out of curiosity to sense the novel wilderness and tell me that they see new things each time. I can confirm the feeling. When you walk the same path every day, you see something new every day.” It was about small things, like mushrooms sprouting, or a new bird nest, which constantly reminded the managers of the unpredictable natural dynamics happening in the forest.

Seeing changes reminded the managers that they couldn't always predict what would happen so that the constant little surprises created an experience of ignorance. The repeated experiences of ignorance led managers to *expect to be surprised.* As an example, here is interviewee 4 speculating about arrivals of new species to the forest:

> "I have already heard a Eurasian eagle owl on the other side of the lake, in the escarpment. That observation indicates that something is happening there. Then, if the owl calls in February and March, that means that it starts to brood. That would be a realistic scenario. To hear those calls would be an awesome experience for anyone, that would be a success [for the park]. Or maybe something else turns up, which we don't even suspect. One day you will then have the surprise, for example all of a sudden there's a wildcat living here."

The experience of ignorance not only led to curiosity about the potential of the forest, but also was a major driver of ecological research in the park. Because they saw themselves as ignorant, the scientists perceived a knowledge gap that they wanted to fill. Interviewee 4 presented one of the official objectives as follows: "The national park wants to create an understanding of what kind of ecosystem the forest really is." With such an ambition, it was crucial to investigate the processes and to do research in this new natural forest ecosystem (see section 4.1.1.). It can be said hat through the ebb and flow of arrivals of various species, which highlighted both surprises and ignorance, non-humans succeeded in enrolling both visitors and scientists to *pay attention.* The deployment of the non-humans was simultaneously the unveiling of wild nature and its processes, which was processed as a revelation.

- *Psychological well-being*

According to managers, the wild forest also provides benefits to their well-being. This view of the wilderness experience as a promoter of health is also reflected in the management plans, recreation measures, and various activities offered by the park. Interviewee 5 explains why she thinks humans benefit from wilderness:

> "Wilderness is good for humans. Health and recreation, how wilderness affects humans, is a very important issue in the national park. [...] I think it has to do with our instincts, it refreshes, it tickles, it's a balm for the soul. But I don't think it's a conscious phenomenon, but rather a subconscious one.

In the scientific report *Wildnis-Erleben im National Park Schwarzwald* by von Lindern et al. (2019), SNP scientists found that the perception of wildness is created, among other things, by psychological distance. Psychological distance is the perception of plunging into a completely different world that is removed from everyday life and common places. Psychologically distant environments provide a sense of leaving worries and thoughts behind. During my hike in the national park, I also experienced this feeling, created by the quietness that isolated me from man-made noises, such as cars on the Black Forest Road, and the need to focus on where I was walking, which forced me to stay present in the moment, and created a kind of 'flow' feeling that did not require thinking about anything else. It is this perception that underlies the talk about the rejuvenating effects of nature. Other benefits mentioned by the managers are fresh air and sports activity.

# 5. Discussion

The final part of the actor-network analysis is the construction of enrolment chains. The disparate data from the previous chapter, which was collected by 'following the actors', is then linked to the conceptual framework, to create an overall picture. As explained in the theoretical part, wilderness processes depend on a series of coordinated translations of discourses, concepts, practices and perceptions into a 'Wild Black Forest'. What is still missing is a synthetic overview of how these different devices fit together to implement the wilderness landscape of the national park from a material and semiotic point of view. Thanks to all the data collected by the different research questions, the processes, and motivations by which managers and non-humans enrol in a 'network of the wild' and stabilise it through practices, chains of enrolments can be constructed. They represent the different 'interactionist contracts' through which the different actors link together to construct a 'network of wilderness'. In the next chapter I will graphically describe how managers and trees enrol each other to implement wilderness in the national park. In a second step, I will link my results back to my theoretical framework and I will explain what my work contributes to the actor-network theory. In a final step, methodological reflections will be presented.

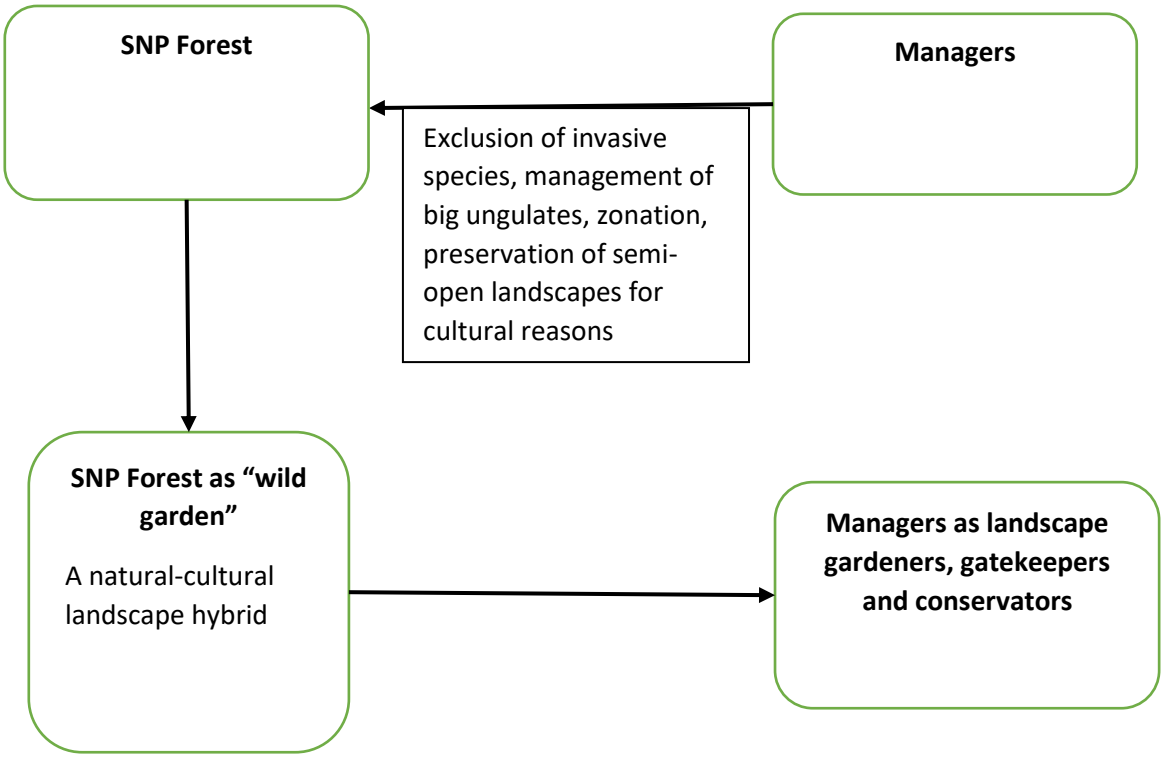
## 5.1. Enrolment chains

The visualization of the enrolment chains is inspired by a paper by Hitchings (2003). This visualisation is based on a relational understanding of enrolment where the different actors *perform each other* through symbolic actions and discourses. As Latour (1996a, p. 225) says, “humans and non-humans take on form by redistributing the competencies and performances of the multitudes of actors that they hold onto and that hold onto them”. Enrolment strategies play no small part in this process of redistribution. The presentation of enrolment chains is the following: on the right is the non-human actor, and on the left is the human one. At first, no status or roles are attributed to humans or non-humans, in the top two boxes of the diagram. Only through action, which is a relational effect of one actor on another, are roles then are defined. The actions taken by the different actors are described above the horizontal arrows. These actions generate symbolic reinterpretations, which allow the enrolled to authenticate his own role, accepting in spirit to be mobilised and mastered (vertical arrows).

### 5.1.1. Starting with the managers

- *Managers as gardeners*

The managers had their own interests in shaping the forests. Their strategy was to turn the park into a wilderness garden, using several roles. First, they acted as stewards of this wild forest. By selectively favouring certain tree species, enlisting dead wood to create new habitats, and creating different zones depending on the degree of influence they wished to exert on the forest, they enlisted non-humans to resemble what they felt was a wilder assemblage. This role was characterized more by "facilitation" than "control" practices. In addition, the managers implemented measures to conserve historic landscapes and biodiversity, since according to the National Park Law and due to landscape protection laws, the park must conserve cultural heritage and landscapes. This has led to a mismatch between the concept of protecting wilderness processes and the preservation of the historic mountain moors called "grindes", which are the result of the pastoral economy of the region. The preservation of the grindes also aims to protect the animals that depend on these rare wet heathland ecosystems.



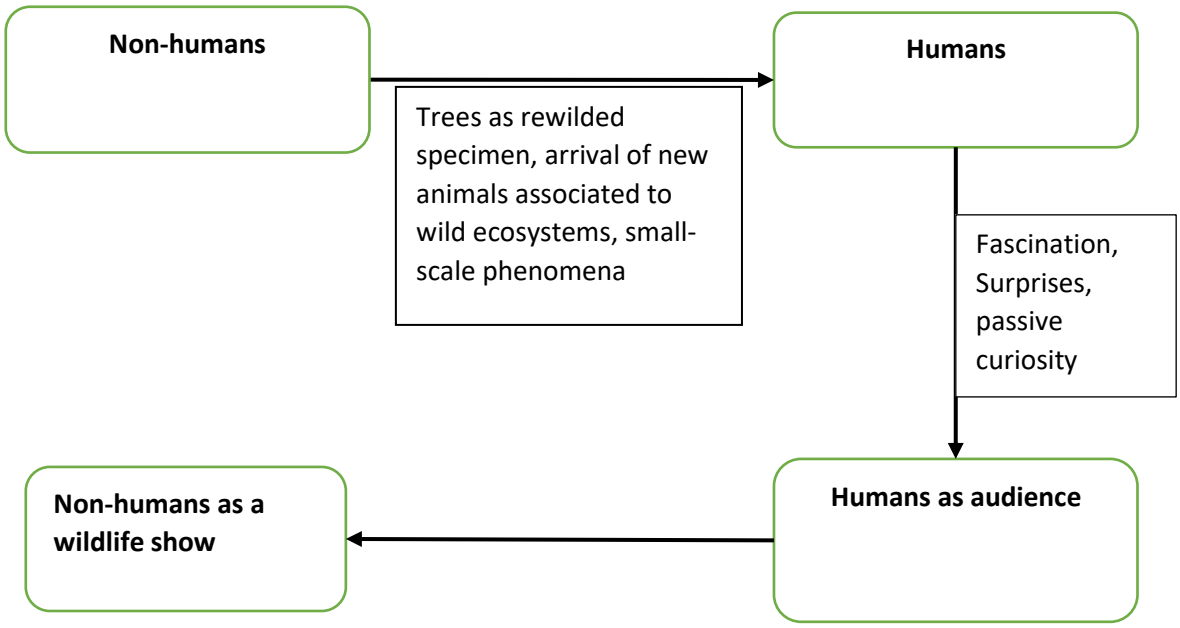

Finally, managers also acted as gatekeepers who controlled the boundaries of the park. Some processes could not be allowed to expand beyond the park boundaries, even though forest dwellers do not know boundaries. Some non-humans, such as bark beetles, threaten to create havoc in the surrounding forests. There is no question of allowing bark beetles to infect commercial forests or for the park area to be used as a breeding ground for deer and wild boar. Therefore, managers have implemented practices that prevent the "pests" from spreading to nearby commercial forests. As a result of these practices, the boundaries of the park were well defined. There is an "interior" that is the playground for creating an ideal wild forest and an exterior "human world" that serves as a repository for the profane by contrast. Hence, the forest that was enacted was a "wild garden" that required both care and restraint to complement the managers' vision. The rangers were fully aware

that they had sometimes competing objectives, between guiding and observing changes in the forest (interviewee 4), and that they could not 'let nature be nature' in all cases. This simple fact underlines that there will always be a part of humans in their interaction with the world, that humans can never completely separate themselves from what they are trying to protect. Although human presence and influence are rejected, the practice of guarding is necessary to maintain the cultural ideal of an "autonomous and wild" (i.e., uncivilized) nature.

### 5.1.2. Starting with the non-humans

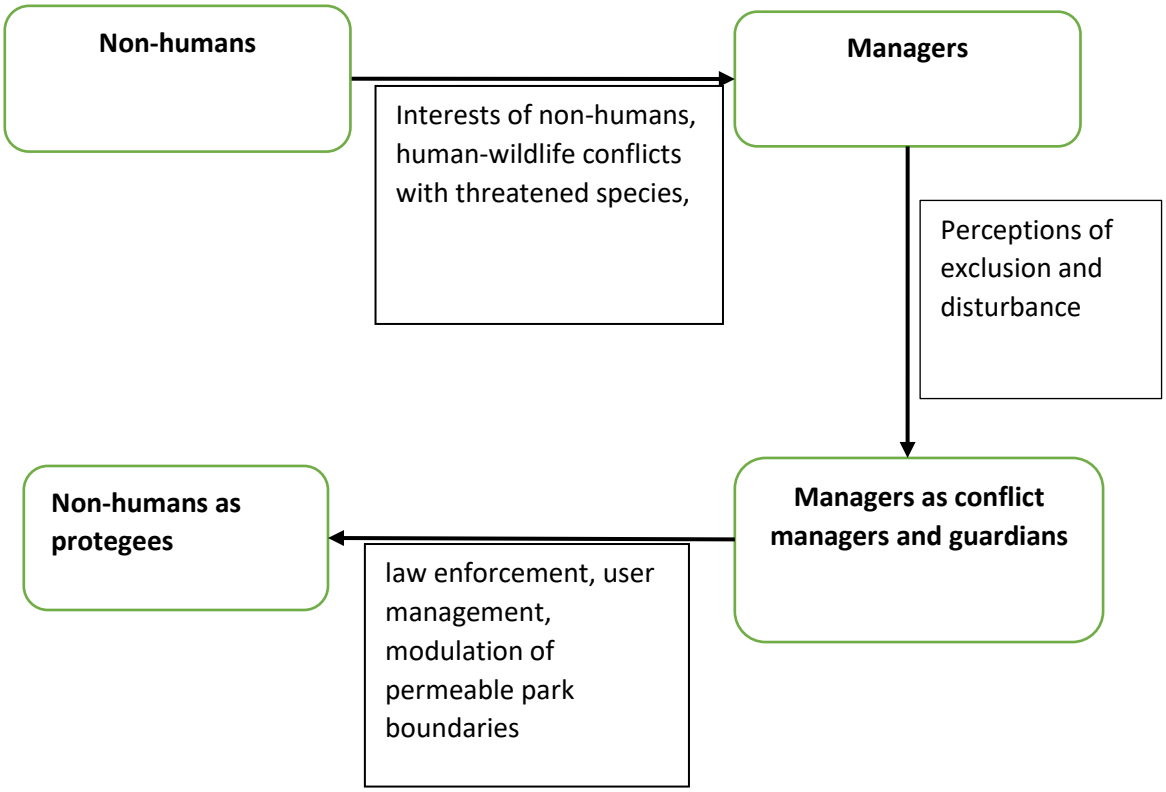
Evidence has been provided that trees, plants, and animals have their own interests that frequently collide with those of humans in the National Park. Yet they could convince the park managers not only to stop exploiting them, but to protect them. As a result, the managers looked after this sanctuary for species not usually valued by society. Non-humans employed different strategies to enrol managers.

- *Non-humans as a wildlife show*



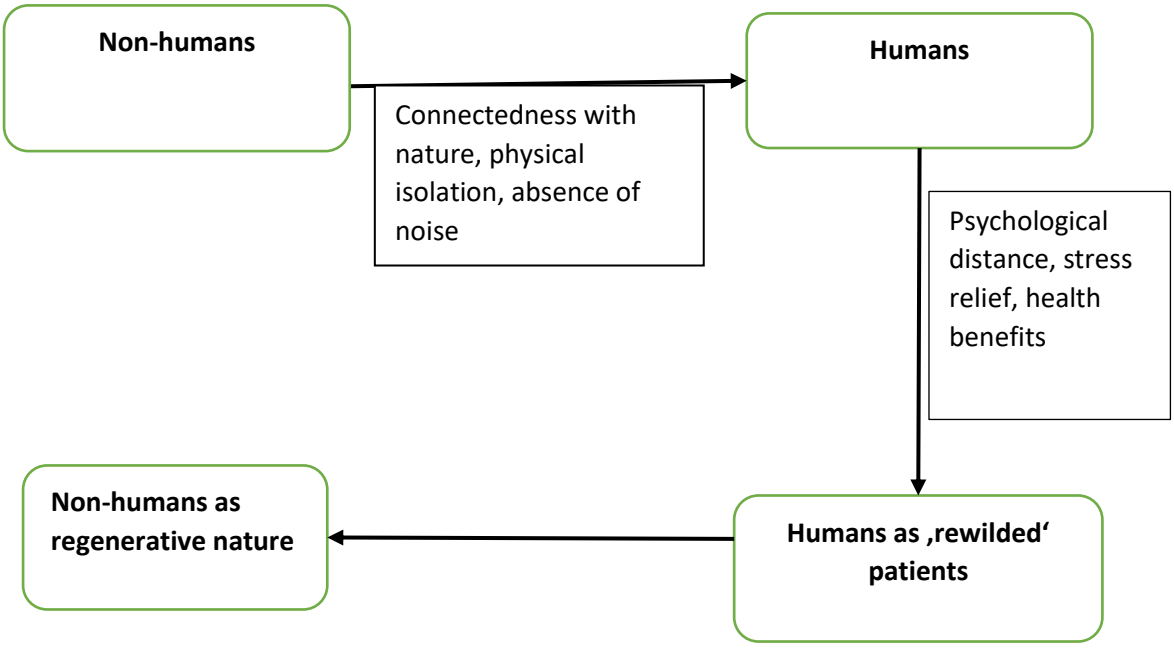

The first strategy of non-humans was to "put on a show."; through their various activities, introducing changes to the appearance of the forest. Indeed, non-humans embody, modify, and recreate their representations of what a wild forest looks like. Rewilded trees displayed their diversity of structure, age, and phenotypes, which fascinated managers and placed them in the role of spectators. For example, a tree, through its age, can put human life into perspective and becomes venerable to humans. Another, as it dies, becomes a habitat for species that had disappeared from the park and are returning, such as certain species of green woodpecker. Insects create new dynamics, and humans become an audience that is allowed to witness all of these processes, the spectacle of wildlife "reclaiming its rights" and thriving. Humans were relegated to passive roles, surprised by changes that disrupt their conception of the anthropic origins of the landscape. The non-humans are the creators of value that allow and justify the existence of the SNP and they enrol the park to preserve their existence.

- *Non-humans as protegees*




The second strategy of non-humans was to "*displace humans*". Some highly sensitive non-humans flee at the approach of humans and appear vulnerable to disturbance, such as the endangered capercaillie, fly away at the slightest noise, abandoning their brood. When humans leave the trails, the warning calls of ground-nesting birds are heard, indicating the presence of danger. This led managers to perceive humans as a disturbance. Other non-humans are more aggressive and willingly encroach on spaces dedicated to human activity. Snakes bask on mountain bike trails, trees recolonize the paths, and spaces intended for human use become a living space, a refuge for animals... Among forest rangers, this has led to them perceiving humans as "intruders" or "visitors" in an already used space. Perceiving the human presence as a disturbance, managers began to monitor and manage trail use, littering, foraging (berries, mushrooms), etc. Laws that regulate living together, or rather letting animals live but restricting humans to the role of guests were established. In this, the non-humans have succeeded in enrolling the rangers as protectors and law enforcers.

- *Non-humans as regenerative nature*

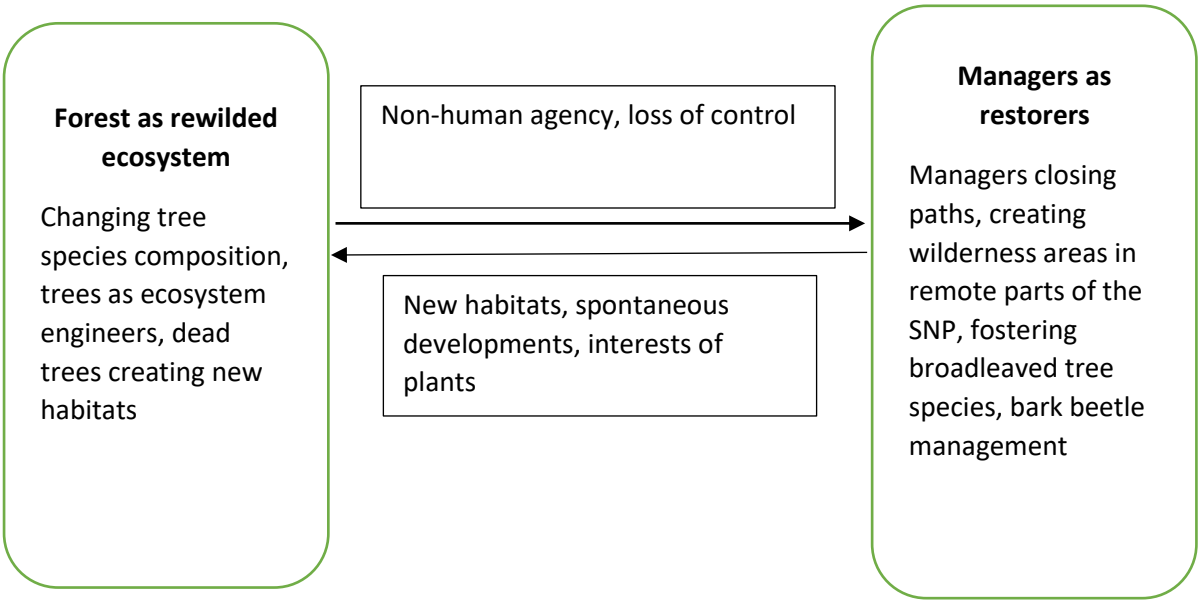



The last strategy was to isolate people from the rest of society and provide a meditative setting for them to process their own concerns. Obviously, non-humans create a setting free from human influence. Trees protect from road noise, wildlife attracts and retains attention, winding paths and natural sounds create a sense of solitude and reduce man-made stress. The rangers spoke of the silence, the isolation, the pleasant surroundings and the measured but constant effort of walking that requires a beneficial focus on the present moment. The environment created by the non-humans also allowed the rangers to get in touch with their own thoughts and instincts, to discover and interact with what they saw. This ability to let humans open up and enter into dialogue with both themselves and their surroundings had a regenerative effect on visitors and managers. The non-humans, through their lifestyles, their very different temporalities, their therapeutic influence, their ability to create an intrinsic and immediate meaning to actions, enrolled the visitors as patients who came to relax and rewild themselves, in an uncivilized setting.

### 5.1.3. Negotiations

In addition to unilateral enrolment chains, there were also negotiated enrolment chains, where both the non-humans and the humans recruited each other in shifting relations of power. The roles that actors gave each other were constantly reinforced, adjusted and reinstated by their interactions.

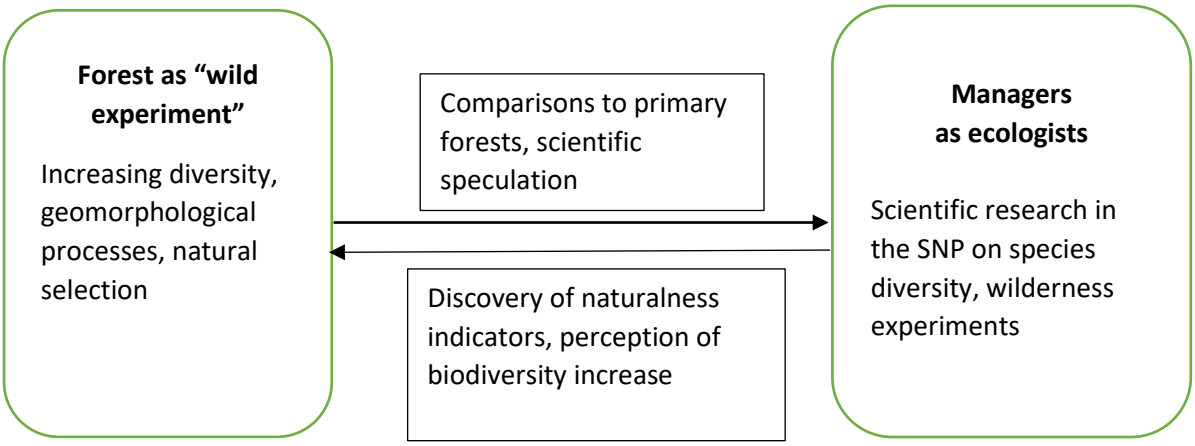
- *Rewilding as ecosystem restoration*




The first negotiation took place between managers trying to implement their vision of a wild National Park, and the natural processes and non-humans who responded to practices with new behaviours. The managers adopted a 'rewilding' role by closing paths in wilderness areas, by encouraging wilderness development, through selective felling and leaving dead wood to create new habitats and creating variations in tree structure. As a result, the ecological parameters of the forest changed, like tree species composition, with plant communities reorganising themselves through natural selection (Results section, Chapter 2), or new species moving into the area. Non-humans too adopted the role of rewilders. Trees generated new habitats and became ecosystem engineers. They produced dead wood, which plays an important role as a habitat for detritus feeders and other forest-dwelling species and increases forest biodiversity (Lassauce, Paillet, Jactel, & Bouget, 2011; Torres et al., 2018). The forest sometimes responded positively by developing new habitats or becoming more vegetated, but non-humans and natural processes have sometimes also thwarted expectations, with plants growing in unanticipated places, or with unpredictable events such as Hurricane Lothar razing whole swathes of forest, a bark beetle infestation threatening to become a calamity, or heavy frosts and snow loads (see "decapitated trees" in Results, Chapter 3). These unpredictable outcomes were defined as natural events or processes only in retrospect and created perceptions of surprise, ignorance and loss of control and separation between 'human' and 'non-human' intentions and notions of wilderness. The forest has thus been enacted as a rewilded ecosystem.

- *Rewilding as a wild experiment*

The second negotiation that took place between the managers and the forest enacted rewilding as a "wild experiment". Beyond ecological restoration, the managers had to innovate to turn the forest into a new wild ecosystem. They conducted various open experiments that were intended to replicate and accelerate natural processes. At the same time, the park managers and scientific team studied the natural processes and monitored the success of the rewilding through scientific research. Comparisons with similar patterns in primary forests were used as a response to doubts, uncertainties and speculations about forest evolution. Natural processes were conceptualised, such as natural selection as a mechanism for the evolution of the landscape towards 'potential natural vegetation'. Some of these conceptualisations have been replicated by these experiments, like the selective thinning in management areas which would replicate natural selection. As biodiversity increased and new 'indicators of naturalness' were discovered, managers could verify that their actions (or lack thereof in some cases) had created new conditions more conducive to wilderness.




Yet, monitoring rewilding progress is not as straightforward as it may seem (Torres et al., 2018). The National Park Forest became a "wild experiment" in the sense of Lorimer and Driessen (2014) ; which is a concept aiming to engage critically with real-world experiments in the Anthropocene. In contrast to the laboratory, they have recorded inferior epistemic properties of experiments in the field. In the field, there are numerous epistemological challenges to generating knowledge; since the environment is not controlled, scientists have to rely on spontaneous and unanticipated phenomena. Under such conditions, 'natural laws' cannot be observed, since the observed phenomena are contingent, i.e., they are only one possibility among others; truth therefore becomes *context dependent*. The "wild experiment" thus gives insight not into a transcendent Nature, but an always changing, immanent one. On a more critical note, one could argue that the science done is not objective in that human disturb their own experiment. Scientists in the park both investigate "naturalness" and its indicators and yet rely on a management of the place (as seen in the previous enrolment chains); this seems to be at the polar opposite of the supposed scientific objectivity. Bruno Latour would say that scientific facts are a precarious achievement that depend on facts validated by an actor-network.

## 5.2. Methodological reflection

It is important, both to avoid jumping to conclusions and to understand the issues and key points of the results presented earlier, to clearly identify the benefits and the potential limitations of the research methodology employed. The results presented cannot be considered independent of the data collection method, and actor-network theory being a qualitative research method implies that the results are not replicable. A different researcher, using the same methodology, would not collect the same data, analyse them in the same way or reach the same conclusions. The strength of a qualitative method lies elsewhere: in the first-hand experience as well as in the ability to explore and formulate innovative hypotheses. This research draws on the realities of the field to produce a new perspective on a sociology of wilderness.

- *Validity and representativity*

The results presented are neither exhaustive nor static. The enrolment chains represent a picture at a *given time and under given circumstances* of the enrolment dynamics in which the different actors are engaged. The lack of confidence in the results was mitigated by several techniques. Attempts were made to ensure the validity of the results using triangulation methods. Various sources, i.e., official documents, testimonies, and the personal experience of the researcher were considered. On the other hand, during data collection, a technique to exhaust completeness was used in snowball sampling. The number of participants continued to increase until the responses to the questionnaire were redundant. In this way, the chances of collecting the most prevalent responses from the park management were optimized.

Another problem that arises in relation to representativity lies inside the study group. Each employee of the Parc makes sense of what he sees by himself; even if the meanings and networks are fixed by common practices, the interpretation of them always contains a personal and idiosyncratic part. A. D. Brown, Stacey, and Nandhakumar (2008) speak of "simultaneously agreed and discrepant sensemaking". One can then wonder how agreement is reached between different sensemaking approaches by different managers.

- *Recommendations*

The student researcher who would like to follow in my footsteps might look for some practical recommendations. The elaboration of this dissertation has not been without extensive research, both in terms of the extent of the theoretical research and the extent of the fieldwork that had to be done. Due to the broad agenda and the grounded approach of this research work, only a very basic logic could be applied. This work sometimes required the unabashed removal of details and nuances, resulting in a grossly generalised representation of the subject. This is the price to pay for having the broadest representation, with a systemic understanding of the material semiotics of rewilding. Moreover, I tried to answer philosophical problems by practical and empirical research, which also poses many problems of subjectivity and interpretation. From a methodological point of view, I find that it was a lot of work; using three methods of data collection, made triangulation complicated and probably one method of data collection, with more humble research questions, would have sufficed. The coding of the speeches would also have been easier if it had not been done by hand; there are very good programs for this, I hear. In the end, for a master's thesis, focusing only on practices or discourses would have been enough; but if a more fundamental and iconoclastic approach appeals to you as it did to me, feel free.

## 5.3. Reflection and contribution to theory

- *From enrolment chains to enactment: how to understand translation*

We have thus seen how humans and non-humans co-construct the discourses and practices around a wilderness by enrolling each other. These different chains of enrolment are at the origin of the enactment of wilderness. In the same way that enrolment fixates the co-constructed status of the different actors, the enactment fixates the different meanings of wilderness through translations. These different meanings are transferred from the local to the global scale through discourses. Based on my fieldwork, I examine the interpretation of the wilderness in the landscape. An information brochure for visitors might describe the wild woodland as a plethora of wild animals, but in rewilding practice, the wild seems to be many other things as well. From moment to moment, from place to place, from human to human, from specialty to specialty, from practice to practice, it is a slightly different 'wild forest' that is discussed, observed or created. Humans have different roles, such as guardians, patients, conflict managers, and so do non-humans, such as wildlife performers, aesthetic specimens, detritivores, etc. But as Mol (2002) writes in *Body multiple*, this multiplicity does not imply fragmentation; on the contrary, the wild is made coherent through a series of tactics including signposting, image production, guided tours, exhibitions. These discursive productions serve to recreate an overall vision of the wilderness, a kaleidoscopic image, a holograph of the wilderness. The wilderness is 'multiple' (see Figure 4), and the ontology of wilderness is thus 'decentred' on a multitude of practices, as Mol would say, and made up of several layers of overlapping networks. It is precisely through these acts of translation that we can succeed in answering Drenthen and Plumwood's call for 'layered' narratives as a response to the problems of the introduction. Unfortunately for us, this journey ends here, and it is up to the reader to imagine their own stories through the chains of enrolment that I have described here.

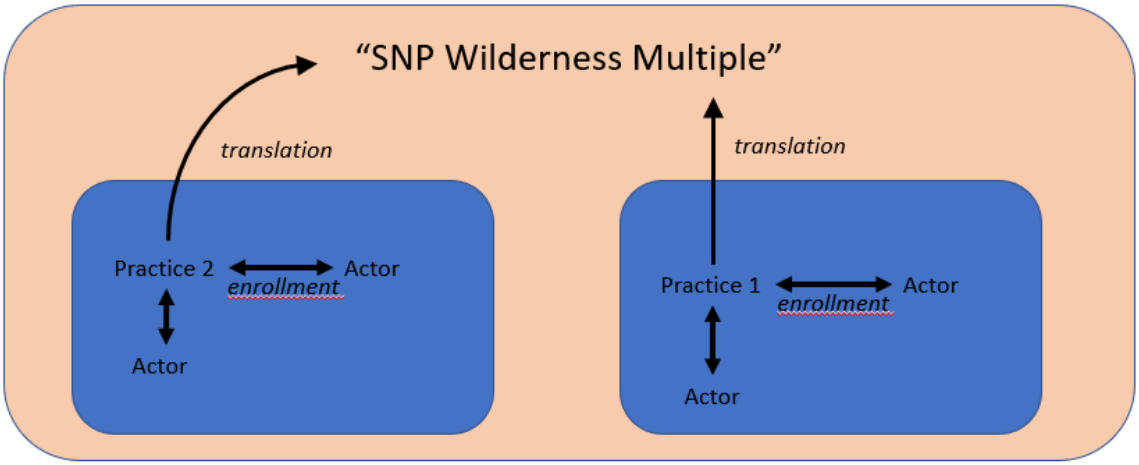



**Figure 4:** Through practices, rangers enter a material relationship with human and non-human actors. These actors, through a series of translations, are then used as representatives of forest succession. Each translated practice, however, creates another reality, so that the resulting concept of natural forest succession can be referred to as "multiple".

- *Link to the conceptual model: back to the drawing board*

We have henceforth summarised the different reciprocal mobilisations of actors in the form of chains of enrolment. It is interesting to link those chains with the conceptual framework and the diagram in section 2.3. Several discrepancies can be noted. Firstly, the enrolment chains do not strictly correspond to the three translation loops represented in Figure 3. Some chains are representative of both the natural processes feedback loop and the species and ecological conservation translation; this is the case with the chain "managers as wildlife conflict managers". It would seem, therefore, that the different aspects of wildlife as described by Arts et al. do not each interact independently with humans and non-humans, but also interact with each other; these overlap zones between wilderness aspects are a blind area in this study and are the source of increased complexity in the wilderness network.

Secondly, although these chains are able to represent the same things as the different translations, the sociological assumptions are quite different. Indeed, enrolment chains are based on ANT theory, which considers everything to be 'at the same horizontal level' in power hierarchies and as such is rather blind to power relations. ANT is based on a network perspective, which easily blurs the difference between 'making wilder' and 'becoming wilder'. This has the consequence that the monopoly of agency is not definitively located in one actor, which is a preconception of actor network theory, as the latter claims that ANT researchers should be "as undecided as possible on which elements will be tied together, on when they will start to have a common fate, on which interest will eventually win out over which" (Latour, 1987, pp. 175-176). This is an advantage when trying to discover how a network is constructed, but a disadvantage when trying to understand where the initiative is located in a network. Murdoch (1997, 2001) posits that humans and non-humans, while enmeshed in networks and co-constructing wilderness still have distinct qualities. Humans possess 'interactivity', which is the ability to reflect upon one's incorporation into socio-material relationships and the reflexive action upon these. In essence, although non-humans can enrol humans, only humans have the free will to accept to be enrolled or to create and place interpretations on the landscape; and in this, have more power than non-humans. This shortcoming of ANT is tackled in the Conceptual Figure 3, because in it the translation loops always start with the actor with the greatest degree of freedom, which happens to be the human managers. Consequently, I propose that a useful conceptual addition to the actor-network theory would be that of 'degree of freedom', which would always locate the initiative in the co-construction of a network.

- *From static to fluid networks*

It is also interesting to reflect on the fact that we have finally crystallised the network of wilderness through the different methodologies of ANT and enactment. This crystallisation is however illusory, as networks can be deconstructed as quickly as they are constructed. Mol (2002) writes that an object is constantly constituted and re-constituted, through the relationships that enact it, and therefore does not exist as a static actor-network. This ability to see the holistic, the flowing, the transient that is the essence of living things is important to distance oneself from any rigid understanding of actor-networks. To continue this discussion, I would like to raise some of the tensions created by the impermanence of networks, without having any answers myself:

> - Negotiations as mechanisms: if chains of enrolment are understood as mechanisms, does this not lead to a mechanistic understanding of the relations between humans and non-humans? These 'static' roles that actors assign to each other are far less persistent than the network itself.

- The empirical methodology of ANT as inadequate to capture ephemeral phenomena: I have seen that there is a paradoxical alternation between static and dynamic representations of the forest in the minds of managers, but I do not think that ANT can provide a solution to this problem. Furthermore, the natural succession of forests is a process, which has been documented with photos, i.e., *static images*, and this had an impact on the scientific results of my work.

- The construction of the wild as a self-reference: How can park management cope with the unknown and unattainable objectives and outcomes inherent in a type of process-based management, where the means justify the end? How can we escape the arbitrary absence of direction and by extension meaning?

# 6. Conclusion

Wilderness is a place full of opportunities for profound experiences, a powerful symbol that stimulates the imagination. To talk about wilderness is to tell a story, and thus, to reconstruct wilderness is to write stories that represent a new environmental imaginary. For humanity, this generates a potential for reunification and fusion with nature and, beyond that, a possibility of self-discovery. With this work, I hope to have laid the groundwork for a discussion of new wilderness ecosystems as 'nature-cultures', that is, as hybrid landscapes, both material and symbolic, reconciling natural and cultural, physical and non-physical, and human and non-human aspects of the wild. This non-polarised perspective of rewilding practices is the most promising way to reconcile the tensions of rewilding and to think about nature in the 21st century. The goal of this thesis was to reveal the material and semiotic complexities behind the concepts of wilderness, "wild forest" and "natural processes". To conclude this work, it is interesting to ask to which extent this endeavour was successful. Has the interplay between practices, discourses, and our understanding of the human role in creating new nature become clearer? We have seen that discourses about the park are based on competing narratives of what constitutes wilderness. Managers constantly alternated between emphasizing either the anthropomorphic origin of the forest or its naturalness, and thus alternately addressed different layers of the landscape. In their practice, too, it was evident that managers exhibited behaviours and practices that oscillated between participation and self-exclusion of humans, between incentivization and inhibition of natural processes. Roles overlapped and intertwined, and sometimes they were even part of opposing networks. Discourses also interacted with the material environment in which the managers evolved. It was in the face of situations that brought out the opposition between different conservation objectives, such as the natural disappearance of the floating island or the destruction of the forest by bark beetles, that stewardship dilemmas appeared. These events provided the starting point for the definition and redefinition of wilderness processes in the managers' discourses. Managers also oscillated between acceptance and rejection of non-humans, welcoming those non-humans that indicated naturalness according to their theoretical models and rejecting those that were the result of human influence – exploitation – on the land.

Managers and non-humans enrol each other to produce – enact – the park's wilderness setting. These practices can be understood as *performances* in Judith Butler's sense; non-humans and humans “act wild”, meaning that naturalness indicators are recruited, natural scientists are aroused by curiosity, visitors are relived and rewilded, managers engage in protection, etc. From these various performances emerge various enactments of the wild forest; it was both a forest that needed to be restored with conservation practices, to be preserved through modulation of boundaries and of users, and to be gardened through ungulate management or tree felling in semi-open areas. Humans and non-humans play a multitude of roles, alternately active and passive, depending on the point of view; they either manage or let nature do the work, protect, or allow themselves to be seduced into protecting; similarly, non-humans colonize or allow themselves to be protected, show themselves and negotiate which rewilding practices will be effective. It is within this intermingling of roles and narratives that the wild forest is enacted, through this cross-fertilization that the wild landscape is born. It is the description of these overlapping narratives that Plumwood (2006) and Drenthen (2018b) sought, because beyond the practices, discourses, and other performances of wilderness, they allow us to understand the material and semiotic reality of wilderness in its multidimensionality. That said, although wilderness is enacted by the various actors in the story, these performances are not enough

to create wilderness as something the SNP can preserve. The SNP needs to enrol the concept of the wild forest, which is done through policy documents. This concept, described in the introduction, is what is critiqued with those layered narratives. In the end, we were able to show that the construction of the concepts of "wild forest", "wild processes", or "natural" used by governance documents is much more fragile than they appear, as we assumed when using an ANT approach focussed on practices. We have come full circle.

Negotiations between humans and non-humans about what constitutes wilderness are inherently political. The various enrolments in the park show that humans are capable of working with the forest to create new landscapes, not only as masters or custodians, but also as part of nature. Likewise, far from being passive, non-humans participate in shaping the rewilding process. This fact, which is often difficult to observe, proves that non-humans, rather than being separate from social constructs, are in fact co-creators of them. In the broadest sense, non-humans are de facto integrated as participants into the construction of a socio-natural hybrid landscape. Through this lens, the human/non-human interaction becomes a way of "cross-wilding," through the creation of a material, ecological, and social context from which wilderness ensues. Buller (2004) describes the wild as the place which “wild things” inhabit, but what he omits is that these things are not wild in their essence but become so through their actions and the networks of which they are a part; therefore, humans and non-humans are “cross-wilded”. From there it is only a step to ask whether this requires "giving them a voice" or co-citizenship, as Callicott (2016) has proposed. From a sociological perspective, the enactment of wilderness by humans and non-humans, can be seen as their contributions to the same space, making them 'co-citizens' of that space, so that integrating their contributions as a form of citizenship into a ‘human/non-human moral collective’ would make sense.

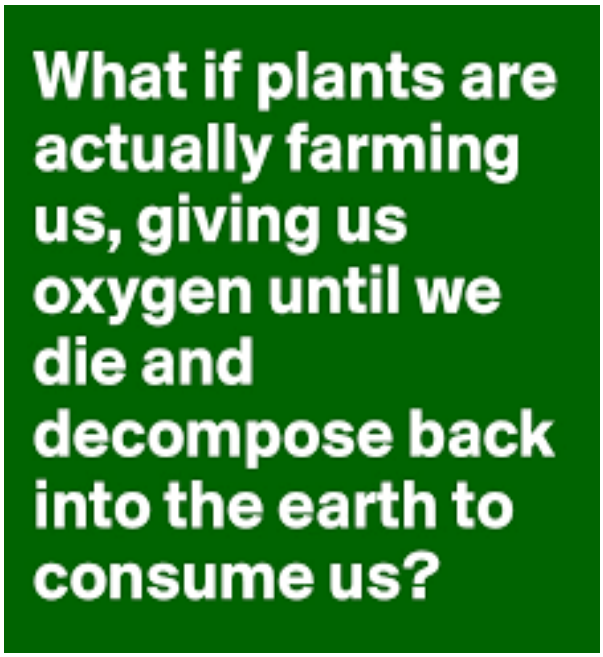
Another goal of this paper was to provide an account of the co-construction of wilderness from a non-dualistic perspective. In the introduction, we noted that wilderness concepts such as rewilding originate in a constant flow between the social and the natural, the human and the non-human, and that there is a need to redefine global concepts in relation to local contexts. Whether I have really managed to give a completely non-dualistic account is questionable. The non-humans were never given the word in the literal sense, as my work was always based on the discourses of the managers; however, ANT and especially enactment could be a key in achieving this. The network actor theory, with its flat ontology, does not distinguish between human and non-human, between macro and micro, near and far. This allowed us to make the leap from micro-level practices to a larger network of actors. Time and space interact with biological species to create a hybrid collective that implodes an inside/outside binary that defines social action as a property of discrete individuals or collectives. Through this creation of meaning from heterogeneous data that was "scattered all over the place" (literally and figuratively), we can gain a better understanding of the interrelationships between humans and non-humans and perceive new horizons, new expectations for nature conservation and rewilding. Therefore, seeing wilderness as an enactment, or performance, can lead to a rethinking of the separation between humans and nature and question the value of wilderness as it has been constructed to date and thus place this thesis in the broader social context of the 21$^{st}$ century. Protectionist thinking originated in the era of environmental destruction by human activities, and it has changed little in its content or purpose since then. Today, we are witnessing a total transformation of our planet, which is a living space for so many species with different needs, constraints, and interactions. The question of man's place arises, no longer as the sole master and owner of nature, but as a member of a world with finite resources that must co-habit with different entities and processes. Murdoch (2001) raises the point that ecology poses a challenge to sociology when it assumes that "humans and non-humans [are] necessarily interrelated and therefore interdependent, which requires rejecting the separation of natural and social entities into two distinct ontological categories and ...

challenging any mode of thinking based on such a distinction." This challenge implies a questioning of a supposed superiority of humans over their environment, of the tendency to place themselves, out of pride, as the '(re-)creators' or 'saviours' of wild nature, or even of their ability to protect it without depending on it or changing it. The co-constructive thinking that actor-network theory exemplifies is an example of thinking that can meet this "ecological challenge" that Murdoch speaks of, because it can assemble social and natural entities into heterogeneous networks and create an opportunity to engage in hybrid "culture-natures" that determine the shape of the natural world. The Park is that hybrid space where culture and nature overlap in flat networks, and whose boundaries are porous; a space co-constructed for an established moment where human social values are attuned and come into synchrony with the needs and behaviour of non-humans. However, Murdoch also states that humans and non-humans (though interwoven in networks and contributing to the same world) still have distinct qualities and that the human/nature distinction has reasons to exist, such as the question of responsibility or "interactivity", which is the ability to reflect on one's incorporation into and reflexive action upon socio-material relations. Murdoch argues for the flexible use of the human/non-human distinction, so that we can identify where social causes are decisive and where social and natural entities are more or less aligned. He proposes to consider rewilded ecologies as " spectrums " (an idea that can be extended to nature-cultures as a spectrum).

Another consequence of the blurring of the distinction between the human and non-human component of the wilderness network is, as we have seen, the abolition of the monopoly of agency. Not only is it difficult to distinguish where the human begins and the non-human begins, but it is also complicated to distinguish between 'doing' and 'letting', and to ascertain which state is more active than the other. Basically, the study of networks takes the focus off the question of action initiation and focuses on the action alone. This focus dissolves and blends human and non-human initiative and intentionality, and in doing so, allows for the conception of a shared ontology to wilderness. This shared ontology is in direct contradiction with the nature/culture dichotomy and challenges the idea that the autonomy of human nature is an essential characteristic of wildness, as Arts et al. state in the introduction. The actor network theory allows us to see that trying to sever the relation between human worlds and non-human worlds is not realistic. I would go so far as to say that a complete separation is impossible, for a philosophical reason: a separation is still a semantic relation; this means in practice that natural autonomy doesn't exist without human (self-)control within and outside of natural areas, in the same way that shadow cannot exist without (the absence of) light. I therefore propose to abandon the idea of nature's autonomy as a state. Instead of approaching wilderness by postulating a virtually impossible autonomy from human influence, it would be more appropriate to conceive of naturalness and autonomy as characteristics of certain 'modes of being and acting', which non-humans and humans can adopt when interacting together. The act of 'cross-rewilding' then becomes one of these modes.

# Afterword

I would like to end this thesis with this simple image, which was the trigger for this work for me.




"Maybe the trees are growing us and will eventually consume us" is more than just a funny idea. For me, it raised questions about the rhetorical gap between discourses on environmental protection and the material reality of it. Our daily lifestyle, alienated from the natural world and its vagaries, tends to obscure our complete dependence on its resources. For example, foresters do not “grow trees”; it is the trees that “grow” humans by producing the CO2 necessary for their existence. Nature existed before humanity and will surely continue to exist afterwards, so that humanity could in fact be understood as an emergent and contingent phenomenon. It is then impossible to understand nature as a social construct alone; is it not rather humanity that is a natural construct?

Furthermore, the space and time scales of humans are different from those of non-humans, and what is "static" for us, such as mountains, forests, etc., is not necessarily static from the point of view of non-humans. A forester knows this, as he plants trees, but it will be the next generation of foresters who will harvest them. As the tree sees human generations pass, its exploitation locates humans in a time frame that transcends their own existence and actions. One could argue that in this perspective, the actions of humans become part of a network of actions that extends across various human and non-human space-times. Hence, answering "who does what to whom when" becomes a difficult question to answer, because causality is spread across different actors in different times.

A common criticism of postmodern constructionists like Latour is that they aimlessly complicate the understanding of knowledge production and by their critique engender relativism in relation to it. This is a strawman that could be made about my work too; yet I have been careful not to say, "wilderness does not exist" but “wilderness does not exist without a contribution from both humans and non-humans”. This deconstruction is not a whim but rather serves a social purpose; it clears the terrain and lays the foundation for the later construction of an ecological thinking. The 'Weltanschauung' we have about our natural environment is crucial as it shapes the conservation practices of today and tomorrow, and a big paradigm shift is needed to make the transition from a post-industrialist society to a sustainable ecological society. Such a transition is not optional, as the survival of humanity depends on it. We’ll need a worldview that enables humanity to see natural landscapes as a space for cooperation between humans and non-humans, and thus avoids ecological extremism when it is not necessary (such as fortress conservation in Western Europe) and allows the Earth to be seen as a planet to be shared. Sharing is caring!

I encourage all readers to follow their curiosity in their research, as this can only open up their horizons and perhaps, sometimes, contribute to discover something new.

# References

## Literature


Adams, W. B., & Mulligan, M. (2012). *Decolonizing nature: strategies for conservation in a post-colonial era*: Routledge.

Alhonnoro, L. (2014). Practice as a patterned network of heterogeneous materials-an actor-network approach to practice theory. *Kulutustutkimus. Nyt, 8*(2), 16-28.

Aplet, G. H., & Cole, D. N. (2010). The trouble with naturalness: Rethinking park and wilderness goals. *Beyond naturalness: Rethinking park and wilderness stewardship in an era of rapid change, 12*, 21-22.

Aristotle. (1970). *Aristotle's Physics. Books 1 & 2*: Oxford : Clarendon P., 1970.

Arts, K., Fischer, A., & van der Wal, R. (2016). Boundaries of the wolf and the wild: A conceptual examination of the relationship between rewilding and animal reintroduction. *Restoration Ecology, 24*(1), 27-34.

Bell, D. (1993). Framing nature: first steps into the wilderness for a sociology of the landscape. *Irish Journal of Sociology, 3*(1), 1-22.

Bennett, J. (2018). Whose Place Is This Anyway? An Actor-Network Theory Exploration of a Conservation Conflict. *Space and Culture, 21*, 159 - 169.

Bernard, H. R., & Gravlee, C. C. (2014). *Handbook of methods in cultural anthropology*: Rowman & Littlefield.

Brechin, S. R., Wilshusen, P. R., Fortwangler, C. L., & West, P. C. (2002). Beyond the square wheel: toward a more comprehensive understanding of biodiversity conservation as social and political process. *Society & Natural Resources, 15*(1), 41-64.

Brown, A. D., Stacey, P., & Nandhakumar, J. (2008). Making sense of sensemaking narratives. *Human Relations, 61*(8), 1035-1062. doi:10.1177/0018726708094858

Brown, C., McMorran, R., & Price, M. F. (2011). Rewilding–a new paradigm for nature conservation in Scotland? *Scottish Geographical Journal, 127*(4), 288-314.

Buijs, A. (2009). *Public natures: social representations of nature and local practices*: Wageningen Universiteit (Wageningen University).

Buller, H. (2004). Where the wild things are: the evolving iconography of rural fauna. *Journal of Rural Studies, 20*(2), 131-141. doi:https://doi.org/10.1016/j.jrurstud.2003.08.009

Callicott, J. B. (1980). Animal liberation: A triangular affair. *Environmental Ethics, 2*(4), 311-338.

Callicott, J. B. (2016). How ecological collectives are morally considerable. *The Oxford handbook of environmental ethics. Oxford University Press, New York*, 113-124.

Callicott, J. B., & Nelson, M. P. (1998). *The great new wilderness debate*: University of Georgia Press.

Callon, M. (1984). Some elements of a sociology of translation: domestication of the scallops and the fishermen of St Brieuc Bay. *The sociological review, 32*(1_suppl), 196-233.

Callon, M., & Law, J. (1997). Agency and the Hybrid Collectif

Mathematics, Science, and Postclassical Theory. In B. H. Smith & A. Plotnitsky (Eds.), (pp. 0): Duke University Press.

Carver, S. (2016). Flood management and nature–can rewilding help. *Ecos, 37*, 32-42.

Carver, S. J., & Fritz, S. (1995). Mapping the wilderness continuum. *Proceedings of the GIS Research UK, 15*.

Castree, N., & Braun, B. (2001). Social nature theory, practice, and politics.

Cole, D. N., & Yung, L. (2012). *Beyond naturalness: rethinking park and wilderness stewardship in an era of rapid change*: Island Press.

Connell, J. H., & Slatyer, R. O. (1977). Mechanisms of succession in natural communities and their role in community stability and organization. *The American Naturalist, 111*(982), 1119-1144.
Corlett, R. T. (2016). Restoration, reintroduction, and rewilding in a changing world. *Trends in ecology & evolution, 31*(6), 453-462.
Cresswell, T. (2009). Place. In *International Encyclopedia of Human Geography* (Vol. 8): Elsevier Science B.V.
Cronon, W. (1996). The trouble with wilderness: or, getting back to the wrong nature. *Environmental History, 1*(1), 7-28.
Descola, P., & Pálsson, G. (1996). *Nature and Society: Anthropological Perspectives* (E. A. o. S. Anthropologists Ed.): Routledge.
Drenthen, M. (2018a). Rewilding in cultural layered landscapes. *Environmental Values, 27*(4), 325-331.
Drenthen, M. (2018b). Rewilding in Layered Landscapes as a Challenge to Place Identity. *Environmental Values, 27*(4), 405-425. doi:10.3197/096327118X15251686827732
Ehrhart, S., & Schraml, U. (2014). Perception and evaluation of natural forest dynamics. *Allgemeine Forst- und Jagdzeitung, 185*, 166-183.
Ellerup Nielsen, A., & Nørreklit, H. (2009). A discourse analysis of the disciplinary power of management coaching. *Society and Business Review, 4*(3), 202-214. doi:10.1108/17465680910994209
Etteger, R. v., Brink, A. v. d. P. d., Gremmen, H. G. J. P. d., & Gerwen, R. C. H. M. v. D. (2016). *Beyond the visible : prolegomenon to an aesthetics of designed landscapes.* Wageningen University, Wageningen. Retrieved from https://doi.org/10.18174/385562 WorldCat.org database.
Finck, P., Klein, M. & Riecken, U. (2013). Wildnisgebiete in Deutschland – von der Vision zur Umsetzung. *Natur und Landschaft, 88*(8), 342–346.
Florian Weckbecker (Nationalpark Schwarzwald). (2019). Was ist Prozesschutz? youtube.com: Nationalpark Schwarzwald.
Franklin, S. (2003). Re-thinking nature—culture:Anthropology and the new genetics. *Anthropological Theory, 3*(1), 65-85. doi:10.1177/1463499603003001752
Gammon, A. R. (2018). The many meanings of rewilding: An introduction and the case for a broad conceptualisation. *Environmental Values, 27*(4), 331-350.
Goldsmith, F. B., & Warren, A. (1993). *Conservation in progress*. Chichester ;: Wiley.
Habron, D. (1998). Visual perception of wild land in Scotland. *Landscape and Urban Planning, 42*(1), 45-56. doi:https://doi.org/10.1016/S0169-2046(98)00069-3
Hitchings, R. (2003). People, plants and performance: on actor network theory and the material pleasures of the private garden. *Social & Cultural Geography, 4*(1), 99-114.
Hourdequin, M., & Havlick, D. G. (2016). *Restoring layered landscapes: History, ecology, and culture*: Oxford University Press, USA.
Igoe, J. J., & Igoe, J. (2004). *Conservation and globalization: A study of national parks and indigenous communities from East Africa to South Dakota*: Wadsworth Publishing Company.
Jedicke, E. (1998). Raum-Zeit-Dynamik in Oekosystemen und Landschaften: Kenntnisstand der Landschafisoekologie und Formulierung einer Prozessschutz-Definition. *Naturschutz und Landschaftsplanung, 30*, 229-236.
Jepson, P. (2016). A rewilding agenda for Europe: creating a network of experimental reserves. *Ecography, 39*(2).
Johnson, M. N. P., & McLean, E. (2020). Discourse Analysis. In A. Kobayashi (Ed.), *International Encyclopedia of Human Geography (Second Edition)* (pp. 377-383). Oxford: Elsevier.
Jones, M. (2003). The concept of cultural landscape: discourse and narratives. In *Landscape interfaces* (pp. 21-51): Springer.
Jørgensen, D. (2015). Rethinking rewilding. *Geoforum, 65*, 482-488.
Kalamandeen, M., & Gillson, L. (2007). Demything "wilderness": implications for protected area designation and management. *Biodiversity and Conservation, 16*(1), 165-182. doi:10.1007/s10531-006-9122-x

Katz, E. (1996). The problem of ecological restoration. *Environmental Ethics, 18*(2), 222-224.
Katz, E. (2000). Another look at restoration: technology and artificial nature. *Restoring nature: Perspectives from the social sciences and humanities*, 37-48.
Keiter, R. B., & Boyce, M. S. (1994). *The Greater Yellowstone Ecosystem: Redefining America's Wilderness Heritage*: Yale University Press.
Klaver, I., Keulartz, J., & van den Belt, H. (2002). Born to be Wild. *Environmental Ethics, 24*(1), 3-21.
Küchler-Krischun, J. (2015). *Naturschutz-Offensive 2020, Für biologische Vielfalt!* Berlin: Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (BMUB).
Küchler-Krischun, J., Schell, C., Erdmann, K.-H., & Mues, A. W. (2014). *Naturbewusstsein 2013*. Berlin/Bonn: BMUB (Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit)

BfN (Bundesamt für Naturschutz).
Küchler-Krischun, J., & Walter, A. M. (2007). *Nationale Strategie zur biologischen Vielfalt, Kabinettsbeschluss vom 7. November 2007*. Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (BMUB).
Landesdienst Baden-Württemberg. (2019, 24.06.2019). Nordschwarzwald - Tausende Arten leben im Nationalpark. *Schwarzwälder Bote*.
Lassauce, A., Paillet, Y., Jactel, H., & Bouget, C. (2011). Deadwood as a surrogate for forest biodiversity: meta-analysis of correlations between deadwood volume and species richness of saproxylic organisms. *Ecological Indicators, 11*(5), 1027-1039.
Latour, B. (1987). *Science in action: How to follow scientists and engineers through society*: Harvard university press.
Latour, B. (1996a). *Aramis, or the Love of Technology*: Harvard University Press.
Latour, B. (1996b). On actor-network theory: A few clarifications. *Soziale welt*, 369-381.
Latour, B. (1999a). On recalling ANT. *The sociological review, 47*(1_suppl), 15-25.
Latour, B. (1999b). *Pandora's hope: essays on the reality of science studies*: Harvard university press.
Latour, B. (2007). Reassembling the social: An introduction to actor-network-theory (Clarendon Lectures in Management Studies).
Law, J. (2008). Actor network theory and material semiotics. *The new Blackwell companion to social theory*, 141-158.
Law, J. (2019). Material semiotics. *URL: www. heterogeneities. net/publications/Law2019Material Semiotics. pdf*.
Law, J., & Hassard, J. (1999). Actor network theory and after.
Law, J., & Mol, A. (2008). The actor-enacted: Cumbrian sheep in 2001. In *Material agency* (pp. 57-77): Springer.
Lennon, M. (2017). Moral-material ontologies of nature conservation: Exploring the discord between ecological restoration and novel ecosystems. *Environmental Values, 26*(1), 5-29.
Leopold, A. (2017). *The land ethic*: Routledge.
Leopold, A., & Schwartz, C. W. (1949). *A Sand Country almanac and Sketches here and there* (0195007778). Retrieved from
Lorimer, J., & Driessen, C. (2014). Wild experiments at the Oostvaardersplassen: rethinking environmentalism in the Anthropocene. *Transactions of the Institute of British Geographers, 39*(2), 169-181.
Lorimer, J., Sandom, C., Jepson, P., Doughty, C., Barua, M., & Kirby, K. J. (2015a). Rewilding: science, practice, and politics. *Annual Review of Environment and Resources, 40*, 39-62.
Lorimer, J., Sandom, C., Jepson, P., Doughty, C., Barua, M., & Kirby, K. J. (2015b). Rewilding: Science, Practice, and Politics. *Annual Review of Environment and Resources, 40*(1), 39-62. doi:10.1146/annurev-environ-102014-021406
Mc Morran, R., Price, M. F., & Warren, C. R. (2008). The call of different wilds: the importance of definition and perception in protecting and managing Scottish wild landscapes. *Journal of Environmental Planning and Management, 51*(2), 177-199. doi:10.1080/09640560701862955

Mol, A. (2002). *The body multiple*: Duke University Press.
Monbiot, G. (2013). *Feral: Searching for enchantment on the frontiers of rewilding*: Penguin UK.
Murdoch, J. (1997). Inhuman/nonhuman/human: actor-network theory and the prospects for a nondualistic and symmetrical perspective on nature and society. *Environment and planning D: Society and Space, 15*(6), 731-756.
Murdoch, J. (2001). Ecologising Sociology: Actor-Network Theory, Co-Construction and the Problem of Human Exemptionalism. *Sociology, 35*(1), 111-133. doi:10.1177/0038038501035001008
Nationalpark Schwarzwald. (2019a). Nationalparkplan, Modul Wildtiermanagement. In N. Schwarzwald (Ed.): Nationalpark Schwarzwald
Nationalpark Schwarzwald. (2019b). Wilkommen im Nationalpark Schwarzwald. In N. Schwarzwald (Ed.). Seebach, Germany: Nationalpark Schwarzwald.
Navarro, L. M., & Pereira, H. M. (2015). Rewilding abandoned landscapes in Europe. In *Rewilding European Landscapes* (pp. 3-23): Springer, Cham.
O'neill, J., Holland, A., & Light, A. (2008). *Environmental values*: Routledge.
Oberhuber, F., & Krzyzanowski, M. (2008). Discourse analysis and ethnography. *Qualitative discourse analysis in the social sciences*, 182-203.
Pereira, H. M., & Navarro, L. M. (2015). *Rewilding european landscapes*: Springer Nature.
Plumwood, V. (2006). The concept of a cultural landscape: Nature, culture and agency in the land. *Ethics and the Environment*, 115-150.
Potthast, T. (2000). Funktionssicherung und/oder Aufbruch ins Ungewisse? Anmerkungen zum Prozeßschutz. In (pp. 61-78).
Prior, J., & Brady, E. (2017). Environmental aesthetics and rewilding. *Environmental Values, 26*(1), 31-51.
Prior, J., & Ward, K. J. (2016). Rethinking rewilding: A response to Jørgensen. *Geoforum, 69*, 132-135.
Regierung Baden-Württemberg. (2014). Unterwegs im Nationalpark Schwarzwald: Youtube.
Rosenthal, G., Mengel, A., Reif, A., Opitz, S., Schoof, N., & Reppin, N. (2015). *Umsetzung des 2 % - Ziels für Wildnisgebiete aus der Nationalen Biodiversitätsstrategie*. Bonn - Bad Godesberg: Bundesamt für Naturschutz Retrieved from https://www.bfn.de/fileadmin/BfN/service/Dokumente/skripten/Skript422.pdf.
Schlund, W., Jehle, G., & Ebel, C. (2011). *100 Jahre Bannwald - Wildsee* (P. Klüber Ed.). Stuttgart: Forst BW.
Schumacher, H., Finck, P., Riecken, U., & Klein, M. (2018). More wilderness for Germany: Implementing an important objective of Germany's National Strategy on Biological Diversity. *Journal for Nature Conservation, 42*, 45-52. doi:https://doi.org/10.1016/j.jnc.2018.01.002
Schwarzwald, N. (2019). Unterwegs im Nationalpark Schwarzwald. In N. Schwarzwald (Ed.). Seebach, Germany: Nationalpark Schwarzwald.
Soper, K. (1995). *What is Nature: Culture, Politics and the Non-Human* (Vol. 7): Blackwell.
Soule, M., & Noss, R. (1998). Rewilding and biodiversity: complementary goals for continental conservation. *Wild Earth, 8*, 18-28.
Starks, H., & Brown Trinidad, S. (2007). Choose Your Method: A Comparison of Phenomenology, Discourse Analysis, and Grounded Theory. *Qualitative Health Research, 17*(10), 1372-1380. doi:10.1177/1049732307307031
Stroh, H., & Megerle, H. E. (2017). Wahrnehmung von Wald und Wildnis am Beispiel des Lotharpfads im Nationalpark Nordschwarzwald. In *Landschaftsästhetik und Landschaftswandel* (pp. 139-157): Springer.
Svenning, J.-C., Pedersen, P. B. M., Donlan, C. J., Ejrnæs, R., Faurby, S., Galetti, M., . . . Vera, F. W. M. (2016). Science for a wilder Anthropocene: Synthesis and future directions for trophic rewilding research. *Proceedings of the national academy of sciences, 113*(4), 898-906. doi:10.1073/pnas.1502556112
Thrift, N. (1996). Inhuman Geographies: Landscapes of Speed, Light and Power. *Spatial Formations*, 256-310. doi:10.4135/9781446222362

Torres, A., Fernández, N., Zu Ermgassen, S., Helmer, W., Revilla, E., Saavedra, D., . . . Selva, N. (2018). Measuring rewilding progress. *Philosophical Transactions of the Royal Society B: Biological Sciences, 373*(1761), 20170433.
Urbanik, J. (2012). *Placing animals: An introduction to the geography of human-animal relations*: Rowman & Littlefield.
von Lindern, E., Blech, S., & Gosteli, F. (2019). *Wildnis-Erleben im Nationalpark Schwarzwald*. Retrieved from Zürich & Seebach:
Ziegler, J. (2018). Steckbrief Modul Waldmanagement. In N. Schwarzwald (Ed.): Nationalpark Schwarzwald.

# Picture Sources

- Pictures

Title picture: David Lohmueller

Picture 1: own picture

Picture 2 & 3: Retrieved from the Wikimedia commons 'Black Forest nature' page

Picture 4: Retrieved from Finck (2013)

Picture 5: own picture

Picture 6: Source: https://www.schwarzwald-informationen.de/wandern-im-National Park-schwarzwald/rundwanderung-zum-buhlbachsee.html

Pictures 7 to 12: own pictures

Picture 13: Schwarzwald National Park website, retrieved from https://National Park.blog/tannenstachelbart-hericium-flagellum/

Pictures 14 to 20: own pictures

- Figures

Figure 1: Schwarzwald National Park, retrieved from https://www.National Park-schwarzwald.de/fileadmin/Mediendatenbank_National Park/06_Karten_und_Broschueren/Karten/20180104_National Park_Gebietsgliederung.pdf

Figure 2: own picture

Figure 5: Retrieved from Starks and Brown Trinidad (2007)

# Appendix A: Interview guide

## Master thesis

## Semi-structured Interview guide[3]

### 1. Wilderness

- Why do we need wilderness?
- What does “allow nature to be nature”/“calming the forest” mean?
- Is the forest “wild” or “overgrown” like a derelict commercial forest?
- Sometimes the term “the return to the primeval Black Forest” is used to describe the goal of the National Park. Do you think the park will achieve that?
- Could you describe the Bannwald Forest in 100 years?

### 2. The Forest

- Can you describe some changes you perceived in the forest since the start of your work here?
- How do you explain these changes? Are they natural?
- How did these changes affect your perception of the forest?

### 3. Enrolment/Practices

- What do you perceive the role of humans to be in the National Park?
- What has been done to make visitors comply?
- What kind of experiences does the National Park offer to visitors?

- Through which practices has the park encouraged natural succession?
- How did it go? What were the results?
- Is the park responsible for new species that appear? What about invasive species? Examples?

[3] The questions were adapted as new information came flowing in. This means that not all questions were asked in all interviews. The questions in this interview guide reflect the final state of the questionnaire.

# Appendix B: References of documents used for preliminary literature research


Finck, P., Klein, M. & Riecken, U. (2013). Wildnisgebiete in Deutschland – von der Vision zur Umsetzung. *Natur und Landschaft, 88* (8), 342–346.

Florian Weckbecker (National Park Schwarzwald). (2019). Was ist Prozesschutz? youtube.com: National Park Schwarzwald.

Küchler-Krischun, J., Schell, C., Erdmann, K.-H., & Mues, A. W. (2014). *Naturbewusstsein 2013*. Berlin/Bonn: BMUB (Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit), BfN (Bundesamt für Naturschutz).

Küchler-Krischun, J., & Walter, A. M. (2007). *Nationale Strategie zur biologischen Vielfalt, Kabinettsbeschluss vom 7. November 2007*. Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (BMUB).

LUBW Landesanstalt für Umwelt Baden-Württemberg. (2019). EnBW -Förderprogramm "Impulse für die Vielfalt" Amphibien und Reptilien. In L. L. f. U. Baden-Württemberg (Ed.): LUBW Landesanstalt für Umwelt Baden-Württemberg.

National Park Schwarzwald. Der Wildnispfad - Wo sich die Natur entwickeln darf. In N. P. Schwarzwald (Ed.). Seebach, Germany: National Park Schwarzwald.

National Park Schwarzwald. (2019a). Jahresprogramm 2019 - Natur kennt keine Grenzen! In National Park Schwarzwald (Ed.). Seebach.

National Park Schwarzwald. (2019b). Leitbild National Park Schwarzwald In N. Schwarzwald (Ed.), *www.schwarzwald-National Park.de*. Seebach: National Park Schwarzwald.

National Park Schwarzwald. (2019c). Wilkommen im National Park Schwarzwald. In N. Schwarzwald (Ed.). Seebach, Germany: National Park Schwarzwald.

National Parkplan, Modul Wildtiermanagement. (2019). In N. Schwarzwald (Ed.): National Park Schwarzwald

PricewaterhouseCoopers & Ökonzept. (2013). *Gutachten zum potenziellen National Park im Nordschwarzwald*. Retrieved from Berlin:

Regierung Baden-Württemberg. (2014). Unterwegs im National Park Schwarzwald: Youtube.

Rosenthal, G., Mengel, A., Reif, A., Opitz, S., Schoof, N., & Reppin, N. (2015). *Umsetzung des 2 % - Ziels für Wildnisgebiete aus der Nationalen Biodiversitätsstrategie*. Bonn - Bad Godesberg: Bundesamt für Naturschutz Retrieved from https://www.bfn.de/fileadmin/BfN/service/Dokumente/skripten/Skript422.pdf.

Schlund, W., Jehle, G., & Ebel, C. (2011). *100 Jahre Bannwald - Wildsee* (P. Klüber Ed.). Stuttgart: Forst BW.

Schubert, S. (2016). National Parks in Deutschland - wild und schön. In N. Naturlandschaften (Ed.), (Second Edition ed.). Berlin: Europard Deutschland E.V.

Schwarzwald, N. (2019a). Der Luchspfad. In N. Schwarzwald (Ed.). Seebach, Germany: National Park Schwarzwald.

Schwarzwald, N. (2019b). Unterwegs im National Park Schwarzwald. In N. Schwarzwald (Ed.). Seebach, Germany: National Park Schwarzwald.

Stefan Dangel, J. W. (2019). National Park Magazin. *National Park Magazin*.

Sturm, K. (1993). Prozeßschutz–ein Konzept für naturschutzgerechte Waldwirtschaft. *Zeitschrift für Ökologie und Naturschutz, 2* (3), 181-192.

Unser Nordschwarzwald e.V. (2013a). Positionspapier: Auch regionale Förster sprechen sich gegen National Park aus. In.
Unser Nordschwarzwald e.V. (2013b). Unser Motto für 2013: Wir setzen auf VERNUNFT statt auf Ideologie & Willkür. Retrieved from http://www.unser-nordschwarzwald.de/profi/vernunft/
von Lindern, E., Blech, S., & Gosteli, F. (2019). *Wildnis-Erleben im National Park Schwarzwald*. Retrieved from Zürich & Seebach:
Wildnis in Deutschland. (2019). NATIONAL PARK SCHWARZWALD - Eine Spur wilder. Retrieved from https://wildnisindeutschland.de/gebiete/schwarzwald/
Ziegler, J. (2018). Steckbrief Modul Waldmanagement. In N. Schwarzwald (Ed.): National Park Schwarzwald.

# Appendix C: Relevant excerpts from the law on the Establishment of the Black Forest National Park (National Park Act - NLPG) Of 3 December 2013

***§ 3 Protection purpose***

***1. The main purposes of the National park are,***

*1.1. To ensure that the action of natural environmental forces and the dynamics of biotic communities are as far as possible free from human interference (process protection),*

*1.2. To protect the natural and near-natural ecosystems as well as the special character and scenic beauty of the national park area and to conserve and develop the species-rich indigenous flora and fauna,*

*1.3. To preserve and promote the mixed mountain forest characteristic of the northern Black Forest as well as the moors, ridges, cirques, and other areas of high nature conservation value,*

*1.4. To maintain or restore a favourable conservation status of the habitat types listed in Annex 3 to Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, and of the wild fauna and flora listed in Annex II to that Directive, in the sites of Community importance as delineated in Article 1 (3), and*

*1.5. To maintain or restore a favourable conservation status of the bird species protected by the Ordinance on European bird sanctuaries.*

***2. Within the framework of subsection (1) and in accordance with the territorial division pursuant to section 7, the national park shall also aim to,***

*2.1. To restore the forests, which have been shaped by their previous history of use, to a natural development largely uninfluenced by man, applying scientific knowledge,*

*2.2. to preserve habitats enclosed by the forest, such as rocky areas and water bodies as well as springs, as integral parts of the natural landscape or to restore them to a favourable state of conservation and to keep human disturbances away from them to a large extent,*

*2.3. To scientifically observe and research the dynamics of the ecosystem processes of the forest, which are largely uninfluenced by humans; and*

*2.4. To open the area to the public for educational and recreational purposes.*

***3. In addition, the national park shall serve the structural improvement in its surroundings, especially in the field of tourism, as far as it does not contradict the purposes mentioned in paragraphs 1 and 2.***

### *§ 12 Forest management measures and wildlife management*

*(1) Forest development and management measures shall be exclusively in accordance with the conservation purpose of the National park. Where necessary, the development of semi-natural forests at suitable sites outside the core zone shall be supported by appropriate silvicultural measures, including planting measures. Individual measures according to sentences 1 and 2 shall be laid down in the national park plan.*

*(2) The National park Authority shall regulate the population of huntable wild animals in compliance with the conservation purpose of the National park and the provisions of the National park Plan. In doing so, it shall consider the current results of wildlife biology studies. Wildlife rest areas shall be provided in the core zones.2.*