



Nature representation in forest fire management in Jämtland, Sweden

Swenja Dorn

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Naturrepresentation i skogsbrandshantering i Jämtlands län, Sverige

Swenja Dorn

Supervisor:	Amelia Mutter, Swedish University of Agricultural Sciences, Department of Urban and Rural Development
Examiner:	Camilo Calderon, Swedish University of Agricultural Sciences, Department of Urban and Rural Development
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Swedish University of Agricultural Sciences
Faculty of Natural Resources and Agricultural Sciences
Department of Urban and Rural Development
Division of Environmental Communication

Abstract

With a globally increasing mean temperature and drier summers in Europe, forest fires are becoming a wider known issue in the forest landscape. Having been part of the boreal forest landscape for millennia, their influence becomes more pronounced due to these changes. Sweden is one of the exemplary countries with a highly productive forestry sector and had far-reaching wildfires in 2014 and 2018 allowing it to be an interesting study region.

In this study, I analyse the representation of nature in the context of forest fire management in order to understand how nature is taking part in the management mechanics and how nature in its occurrence as fire is conceptualized by the stakeholders. The results produced by this paper are formed by interviews of key stakeholders in forest fire management in Jämtland, a country in the north of Sweden. The analysis is based on representation theory (O'Neill. 2001, Wysocki. 2012, Boström et al. 2018, Guasti & Geissl. 2019) and my understanding of these theorems.

My results and analysis propose that a predominantly scientific approach to understanding nature is being applied. The representatives of nature are the experts that claim to have scientific and academic knowledge, experience within the field and are accepted by their colleagues in this claim. They use scientific language and knowledge as a means to represent nature. This results in a focus on control of nature that contrasts with the emerging theme of nature as having 'intrinsic values', a voice, and the need for a standing, in human processes. I argue that the scientific perspective excludes alternatives of validating and grasping nature and through that prevent a less controlling and more intimate perspective to surface.

By connecting nature representation theory to a local context, this paper aims to contribute to the wider understanding of how nature representation is developed. It further opens the field for further studies regarding nature representation and how it affects modern management systems.

Keywords: nature, representation, nature representation, forest fire management

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Abbreviations

CAB	County Administrative Board
FFM	Forest Fire Management
FSC	Forest Stewardship Council
MSB	Myndigheten för samhällsskydd och beredskap – Swedish Civil Contingencies Agency
PEFC	Program for Endorsement of Forest Certification
Swedish EPA	Swedish Environmental Protection Agency

1. Introduction

In our current society, forest ecosystems are one of the most endangered ones due to biotic and abiotic disturbances. They are being used for many purposes in human daily affairs, such as direct products (e.g. the wood harvested), indirect products (e.g. ecosystem service of air purification) and recreation. (Eriksson et al. 2018)

Globally, the progress in sustainable forest management has been expanding. Management plans are increasingly including sustainable usage as well as nature conservation (Shono & Jonsson, 2022). Sweden serves as an example of the global debate when it comes to forestry, as it is the seventh highest ranked wood trader by total value of wood product and more than 60% of its landmass is covered in forest (Worldbank, 2020). This has strong influence on the economic sector and through that social and political repercussions. Since the 1990s, efforts at including sustainable forestry measures have taken great steps towards a balance in between production and conservation as well as changing the perspective through which forests are viewed. (McDermott et al. 2010)

Nevertheless, efforts regarding protection and conservation are still unambitious and even though nature conservationists alert to the need of 17% of total forest mass to be protected in conservation efforts countries in Europe and Sweden itself allocate a maximum of 9% depending on measurements used (Greenpeace, 2021).

Forest fires are one of the most visible and substantial threats to the ecosystem as they are bound to increase due to warmer temperatures, vulnerabilities through disease, nutrient loss and considerable expansion of commercial forestry. They also pose one of the most dangerous threats to human communities around it. Historically at least 1% of the forest landscape burned, whereas today through active management this number decreased to only at 0,016% yearly

(Naturvårdsverket, 2005). This change is happening due to continuously advancing management practices of the landscape through agriculture, forestry, transportation and housing systems. In order to keep the forest fire rate this low, extensive management practices have been set in place in order to allow for a control over potential wildfires and their dangers. Alongside this, the planning and construction of planned prescribed burnings exists in parts of commercial forest and nature reserves.

Within these practices efforts have been made to enable community engagement through decision-making processes in Sweden (Eckerberg & Buizer, 2016). The paper further points out that taking nature into consideration has been a growing trend in the forestry sector and policies.

On the note of public perception, Eriksson et al. (2018) studied the public opinion of reactive and proactive forest risk management processes in Sweden to understand how these measures are being received by the wider population. In their results it shows that ecological values, such as diversity, are accepted more readily than, for example, one-species production. Nevertheless, traditional and new management practices invoked a discrepancy between these two management strategies (diversification of tree species vs. one-species) that is leading back to the concept of familiarity. What is known and familiar to the stakeholders is what is more readily accepted. The studies show in general that the personal values attached to the forest overall have a higher influence on acceptance of management practices than imminent risks. (Eriksson et al. 2018)

Looking at this study, the relationships humans have with nature seem to be one of the most important considerations when looking at how the stakeholders integrate nature into their management practices. Identifying how nature representation is incorporated is thus an interesting factor for forest fire risk management. Nature representation here refers to the active or passive concern of taking nature and its role as a stakeholder into account when engaging in management and decision-making practices.

Considering the challenges encountered in participatory processes within these structures, it becomes even more interesting to look at the role of nature as a stakeholder itself within them. Participatory processes within the forest fire management (FFM) involves multiple stakeholders at different levels that on both legal and voluntary terms create a consensus based unit that check on each other as well as decide upon important decisions together in a forum. The environment plays an ever more present role in global debates around climate change, therefore incorporating it into human-made structures poses several challenges from a representation theory perspective.

Nature representation as a term and concept has had little impact in research thus far and only recently has seen an increased consideration (as found in literature review). The field of representation theory has advanced in recent

decades due to emerging concepts such as collaborative democracy and other democratic approaches where the subject of who represents what and why and how becomes ever more important. In their study, McConnell & Jacobs (2020) found significant evidence that when an individual views nature as bigger and interconnected with oneself pro-environmental behaviour and conservation efforts increase. Seeing this, nature becomes its own entity that is being given consideration. These concepts are important when engaging with representation of nature. Coming from a political and social science perspective, representative claims have a new resurgence in understanding nature's standing in it. O'Neill (2001) formulated early on that representing nature (and future generations) is at cross-roads with current democratic practices as they need physical representation. Physical representation means to have a material or physical form that can represent its own claims and can partake in decision-making processes. He highlights that through the absence of other spheres of representation and claims, such as authorization and accountability, the only legitimate claim to the representation of nature and future generations lies within epistemic claims and care (O'Neill, 2001). In his words, the most prominent questions when looking at nature representation remains the following to this day: "who can claim to speak on behalf of others, where the only claims for legitimacy are knowledge claims, and authorisation, accountability, or presence are impossible?" (O'Neill, 2001:15)

Forest fires have an enormous effect on both nature and human existence as well as having been under change for the past millennia. Considering this, the understanding of nature's representation in the current and historical processes of forest fire management become of interest and has thus far not received any attention. Through a literature search, no significant overlaps have been found within forest fire management practices and analysis and nature representation literature. Connecting this potential learning ground of forest fire management in Jämtland's county in northern Sweden with the potential new insights on nature representation bridges the identified research gap. The region of Jämtland is characterized by a significant portion of the landmass being boreal forests and has been chosen as a study ground due to its personal relevance to me.

This paper aims to understand how the involved stakeholders in Jämtland's FFM are making sense of nature representation. The research questions that were leading this research were that of:

1. Who or what in FFM in Jämtlands county is representing nature?
2. How are this representation and nature conceptualized by the stakeholders?

In this thesis, I look into this nexus of different stakeholders to identify their roles and ideologies behind the practices reinforced by the FFM practices in order to understand how then nature is being represented and how this representation is legitimized by the stakeholders and the practices. The study region of Jämtland is

characterized by large forest areas and thus, forestry is a significant aspect of the county's infrastructure. The region is adjacent to larger forest fires that have happened in the past and there are personal connections relating me to the area through earlier studies conducted there. However, the region is not particular in its way on how often forest fires happen, it thus becomes a relevant case for management that is enacted on that basis in for example other counties in Sweden or regions with boreal forest. Furthermore, this study focuses on forest fires as a part of nature and thus referring to nature is in connection to the element and phenomenon of fire.

In the first section, forest fires and its mechanisms will be explained. The following section will describe the context of what representation theory is and how it can be connected to the concept of nature. The methodology that discloses my approach to this study and leads into the result section showing the outcomes of the analysis of how nature representation is shaped within FFM in Jämtland is then introduced. Lastly the discussion will emphasize and relate these results to each other and to previous literature.

2. Forest Fire Management Practices

Fire has been seen by humankind as one of the most destructive forces, whilst also having been used as a tool for agriculture and landscape cultivation (Hannon et al 2018; Dobryshev et al. 2014). The anthropocentric perspective of fire in certain ecosystems has changed over the millennia and through that has changed the way in which management practices have been established.

In this chapter, I will highlight the significance of forest fires in natural ecosystems, such as the boreal forest in the northern hemisphere, and the understanding in human-made systems throughout the years through the reconstruction of literature. In a later step, this understanding of forest fire will be linked to its management practices as a response and how the current understandings of forest fires shape the way management practices are being formed. The aim to provide context through which one can understand representations of nature in the process of FFM practices today.

2.1 Forest Fire significance

Forest fires are commonly known to have two origins: ignition through natural factors, such as lightning, and human-made fire that has traditionally been used to cultivate the land. Starting from the initial ignition, ‘wild forest fires’ spread depending on “the fire behaviour triangle” (Thomas et al. 2010:65). The three factors determining the sides of the triangle are fuel, or what consumables the fire oxidises such as dry wood, weather or climate, and the topography of the ignition zone. These variables influence each other, creating ever changing conditions for forest fires to happen, making it hard to predict how a fire will behave (Thomas et al. 2010). Consequently, when fires are initiated by human management, substantial energy goes into planning and controlling the fire in order to allow for it to be as predictable as possible. (MSB. 2022)

In the boreal and temperate climate forest landscapes, forest fires play a consistent and key role in maintaining the ecosystem (Dobryshev et al. 2014; Granström & Niklasson, 2008; Thomas et al. 2010; Hannon et al. 2018). Continuous research has shown the dependency of certain species of insects, plants and fungi on the existence of regular forest fires (Edman & Eriksson. 2016; Hannon et al. 2018; Naturvårdsverket. 2005).

The very significance of the ecosystem services the forest provides, such as air cleansing, carbon dioxide sequestration and protection from erosion of the soil, is important to note. Forests, and forestry practices are of high economic importance, and hold high recreational and cultural value (Peters et al. 2023)

Looking back historically, the perception of forest fires, its occurrence in nature, and its connection to humans has changed continuously and sometimes drastically resulting in different practices. Furthermore, fire frequency and intensity are changing due to these practices, including the homogenization of crops within forestry as well as to climate change effects (Hannon et al. 2018). Forest fire as a destructive force and as a cultivation and biological process is a relevant and current topic in society. Management practices that deal with these fires are needed to ensure stability for human communities.

2.2 Forest Fire Management development and trends

Traditionally fire has been accepted as a beneficial phenomenon. It has been used as a tool and acknowledged as a natural process (Hannon et al. 2018). Fire has been used to prepare forest sites for replanting in forestry or use them for other types of production, such as agriculture. (Dobryshev et al. 2014) In indigenous cultures that are connected to forests, fires have been used in order to take care of the land and to ensure biodiversity and the spiritual connection with the land (Kimmerer. 2013).

In relation to natural occurring wildfires, societies have developed management techniques that “modify [the] fire’s impact on people, the things they value, and the ecosystem about which they are concerned” (Martell. 2001:527). This includes mostly to protect lives as well as their property once fire has started, or to allow monitoring and prevention of wildfires (MSB. 2022).

According to the perspective on the ecosystem that humans had in any point in time, the relationship and management practices changed respectively. By the start of the 20th century, the framing of forest fires as a natural phenomenon was lost between research and forest workers. The result being that a focus on human impact and causes of wildfires emerged (Johnson & Miyanishi. 2001). Developing from this was an active fire management that was established in many places around the world in which forest fires were seen as ‘man-made’ and needed to be prevented at all costs. This could be seen in formulations such as ‘fire protection’ or ‘combating fire’ (Martell. 2001) as well as strategies and policies regarding FFM (Thomas et al. 2010). Thus, FFM actively worked to impede fires throughout the 20th century. Even today remains of this type of thinking and management can be found in certain aspects of practices (Cogos et al. 2020).

During the end of the 1980s a shift towards the understanding of forest fires lead by researchers, happened that clarified the significance of forest fires in

boreal forests (Axelsson et al. 2002). The overall understanding within FFM and forestry grew to include the point that forest fires are an intrinsic part of the ecosystem and boost biodiversity. Concerns regarding the climate and biodiversity starting with the Brundtland report (1987) and the Rio Declaration (1992) fuelled initiatives for a more ecosystem-based approach to managing forests including forest fires. Later, awareness that the current practices did not support such measures increased. Furthermore, there have been legislations passed both globally and in Sweden that affected such changes by responding to growing concerns on climate change and biodiversity loss especially in a forest context (Regeringskansliet. 1998; UNFCCC. 2015; UN. 2015). Initiatives such as the REDD+ network¹ exemplify this, paying special attention to the importance of forests and their connection to global nutrient cycles, local fauna and the climate. Nevertheless, there is a discrepancy between the acceptance of fire as an integral part to the ecosystem and the management practice of wildfires.

FFM in itself is dealing with a complex system of interactions between “natural processes, people and machines” (Martell. 2001:529) and this can be found as well in Swedish FFM.

2.2.1 Swedish Forest Fire Management today

The shifts described above have been prominent within Swedish FFM. The permeation of research information on the significance of forest fires into official government bodies and supporting organisations has been happening over the past decades. Changes started within the local municipality and were then brought towards nation-state organisations such as Swedish EPA (Naturvårdsverket). Now, prescribed burnings are part of policies within state-owned nature reserves and within the Forest Stewardship Council (FSC) certification process for forest owners (FSC. 2019). Even though prescribed burnings are part of the management practices regarding forestry, there still is a state-wide fire ban active (MSB. 2022). Thus, every fire that is being detected and has not been planned for has to be put out.

The local counties have a significant and independent steering capacity within Sweden, and most of the local FFM is being negotiated within this political organisational level (Naturvårdsverket. 2005). There can be three different actors identified which are central within FFM on a municipal level: county administrative board (Länsstyrelsen) and connected fire protection association (brandskyddsförening), the forest companies and private-owned prescribed burning companies who offer these services to the other actors. These actors co-exist depending on their responsibility areas, differentiated between privately-owned and state-owned forest land. There are country-wise legislations and guidelines in place that advise their decisions and actions.

¹<https://redd.unfccc.int/fact-sheets.html>

As FFM standards that implemented by the state, Swedish Forest Agency (skogstyrelsen) and Swedish Environmental Protection Agency (EPA), they are the same in all of the counties and Jämtland county is no exception. Yet, there are county administered efforts regarding ‘sustainable forestry’ including aspects of forest fires and their importance. This is especially interesting to look at regarding this thesis. Furthermore, the region Jämtland Härjedalen has been chosen as a personal preference by me, as it was the first place that I have come into contact with forest fires and their repercussions and possibilities. It nevertheless is also the region in Sweden that has been hit by wildfires in 2018 and is right next to the region of Västermansland that has had wildfires in 2014 and 2018 and through this history makes it relevant as an object of study.

3. Nature Representation

Representation in itself has been a concern in human-made systems from the beginning. Especially in law and political context it becomes a critical perspective to look at. Who is representing what based on which authority or legitimacy? This question is crucial when it comes to governance practices today as well.

In cases of practising deliberative democracy and other democratic processes, the problems regarding representation are becoming more varied and of utmost interest (O'Neill. 2001). Coming back to the recent developments in sustainability sciences and the human effort to work through and with climate change, the question of how to represent nature in political and juridical processes has been under scrutiny for a better part of the 20th and 21st century.

This chapter focuses on explaining the current practices and understandings regarding the understanding of nature representation.

3.1 Representation theory

One of the earliest and most crucial contributions to representation theory have been made by Putkin (1967) in which she highlighted the concepts of representation in terms of 'standing for' and 'acting for'. These concepts identify representation as being part of a group (standing for) or not (acting for). Furthermore, representation can further include that the acting for is on behalf of another entity and that this entity can be "an abstract idea (e.g. solidarity, justice or sustainability)" (Boström et al. 2018:116).

Representation of a subject is achieved through different levels of legitimacy. Starting from Putkin who sees this solely achieved by and through election, and as a counterpart non-election, the field of deliberative democracy has broadened the scope in which representation can be legitimized (Guasti & Geissl. 2019). According to O'Neill (2001) the spheres through which representation is constituted lie in i) authorisation and democratic accountability, ii) presence and shared identity which depends on i), and iii) epistemic values, for example through expertise and knowledge.

Emerging from the studies that authorisation and presence are not always present when looking at representation (Guasti & Geissl, 2019), the act of making claims has become an important aspect through which representation is

legitimized. It is a far more dynamic process and is situated within a specific context. More generally, one can speak of the claim-making act as a claim maker who speaks for a claimed representative who acts on behalf of a claimed constituency (a subject, a scheme, etc.) via a claimed linkage or connection. For example, an elected representative as the claim maker speaks on behalf of a subject through the proclamation of having a connection to the claim and its subject. The representative can in different occasions be identical with the claim maker or be someone else. (Guasti & Geissl. 2019)

Furthermore, there are different types of claims and these can be accepted or rejected. Through the process of making claims the sphere of representation is opening the possibility to go beyond election as a representation legitimacy. The public sphere and representative democracies are constituted of claim makers and their claims, also self-elected. (Guasti & Geissl. 2019)

When it comes to most human-system processes, the representation of different stakeholders is legitimized through the democratic process of electing members that represent one's own ideas and values. This can be on the local or on national political level. Decisions will be achieved by these representatives voting scheme and by all parties being involved in the process. Even here the issue of whose voice is heard and through which legitimacy procedure the representation had been approved has arisen.

The decision to represent someone or something through an election of representative is always followed by the shadow of 'under-representation' (O'Neill. 2001:484). These types of decisions have to be analysed in order to understand what representation in a specific context means and entails. What are the parameters for decision-making in regards to who represents and where and when it is represented? This further necessitates an understanding of the concepts of standing as a legal term and voice in a process.

Standing is a concept used within legal processes to

“connote[...] only the doctrine that defines the means by which a man, woman, or legal entity may make claim before the court representing the law governing that person or entity” (Wysocki. 2012:27).

It refers to the possibility of a reciprocal obligation and understanding of a claim made by one upon the other in a specific context. A great deal of governance processes are supported and decided upon through legal measurements and thus standing is an important aspect to take into account when looking at representation and its legitimacy. 'Voice' has a similar understanding but is not legalistic and derives from Albert Hirschmann (1970) in organisation management. 'Voice' is defined there as the means to appeal to a change in management and authorities, in the form of mobilizations of the public opinion (Hirschmann, 1970). It can be found in many discussions regarding nature representation and environmentalism today. (Wysocki. 2012)

Coming back to Pitkin (1967), representation was determined by being able to object representation by an entity on the behalf of those that are being represented. Yet, some entities do not and can not exist prior to the representation, as for example the concept of future generations shows. (O'Neill. 2001, Saward. 2006) Representatives make active claims in a representation procedure and through that take an operating role in the construction of said representation and the role of the representative in it. In the words of Boström et al. (2018:116): “representatives and the represented are mutually constituted in practices of representation, which take place in institutional settings with certain cultural norms.”

The above presented concepts of voice, standing and claims making in representation become crucial when it comes to the representation of nature which will be highlighted in the next section.

3.2 The representation of nature

In case of nature and the environment, these representational spheres do not all apply. There are traditionally no legal structures enforcing the standing of nature within legal processes (Stone. 2010) as they have been made for human entities. Nature cannot represent itself in human-made processes as understanding is inhibited by language, the question of presence and that of what counts as being a subject. Therefore, if one is to represent nature the first two levels introduced by O'Neill (2001) do not take effect and thus only the third sphere of epistemic values can be taken into account when representing nature as long as the legal structures do not change. It is important to mention that in recent years, several laws and constitutions have been passed in which nature has been made a subject of its own volition and thus has received representative power in juridical processes (Stone, 2010; Hallgren & Larsdotter Thiel. 2022). In Sweden, this law concerning FFM and other enterprises is, as an example of an overall strategy, 'Swedish Environmental Code (Miljöbalken)' (Regeringskansliet. 1998) in which sustainable development for future generations, the protection of the environment and the importance of biodiversity have become a legislation. There are furthermore more nuanced legislations active, such as the 'Species Protection Regulation' (Regeringskansliet. 2007). These laws incorporate the necessity of a functioning ecosystem and through that give the voice to nature that it has a right to co-exist with humans. This brings attention to sustainably interact with nature and that it is further integrated into many processes regarding the development of the human species. Most of the documents focus on the key role that the forest plays in a sustainable development in the future. The general outlook on the forest is that of a natural resource with 'a special intrinsic value'. Forest fires are an increasing risk and in some instances not named specifically outside of wildfires as a disturbance (Länstyrelsen Jämtlands län, 2019). Forming a representational

framework these laws and guidelines can be seen as a starting point from which to consider nature representation.

Even though these directives and laws exist, there is no encompassing law active in Sweden that takes nature as its own legal entity into account.

As nature has not been given voice in legal processes, the question of finding representatives is at the fore in order to be able to make a case for nature (Boström et al. 2018). According to Saward (2008), representation happening for environmental causes is always connected to complexity, as the issues it concerns are also complex, abstract, often unfelt and can have a time lag (Boström & Ugglå. 2016). Representation of the environment can then happen through actors or “aesthetic and symbolic devices, such as paintings, songs, eco-labels, or the image of polar bears[...].” (Boström et al. 2018:116).

In the form of actors, environmental representatives often serve multiple purposes as an individual whilst for example being associated with an organisation, they are also part of a community, a family, a country, et cetera. Thus, coming from a variety of backgrounds, a representative can claim to be a representative of a subject or object. Referred and put forward to by Saward in 2010: “A claim-maker of representations puts forward a subject, which stands for an object that is related to a referent and is offered to an audience.” However, not all aspects of this have to be present in order to work as a claim (Guasti & Geissel. 2019). Representation can then be understood as a series and process of making claims, as well as putting them out for discussion and being accepted and gaining situated legitimacy (Disch. 2015). The situated legitimacy in this case is important, as the acknowledgement gained by epistemic values depends on the time and space in which they – knowledge, expertise or judgement – are performed and referenced. The acceptance or rejection can be decided upon by claimed constituency and decision-making authorities which in reality is often a complex network of claim-maker, claim-representative, claims and authorisation entities (Guasti & Geissel. 2019).

Understanding the intricate web of representation and its claims that is upheld by the stakeholders in Forest Fire Management in the region of Jämtland in Sweden is the exemplary study of this thesis. To find out how stakeholders are giving voice and standing to nature and how they make sense of and legitimize the process of representation/representing itself. The above presented theoretical standpoints influenced the way through which I analysed my material and the results are very much determined by them.

4. Methods

4.1 Case description and methodology

This study aims to understand the construction of representation of nature within the complex system of forest fire management in Jämtland county. It is another aim to understand how this representation is understood by different actors. In order to analyse these in-depth understandings of the system, a qualitative approach is needed. To find an encompassing picture of how environmental representation is being practised and made sense of in this field, I conducted seven one-on-one Zoom interviews that were each about 50 minutes long. Besides the interviews, the material includes one informative e-mail exchange with a participant who was only comfortable with providing written information. The interviewees were chosen within a varied field of professions related to forestry and FFM. These included private companies working as outside contractors to do prescribed burnings, state-representatives, researchers, fire fighters, a private forestry company and a representative of the rescue service in the area. With regards to marginalized voices, I was not able to procure interviews with important stakeholders, e.g. sámí villages that are affected by wildfires and prescribed burnings. They were mentioned in one of the interviews and I am aware of their contribution to the landscape and management practices but cannot represent their views in this paper.

Moreover, it was crucial for the interviewees to consent to an interview as I generally contacted different companies and state services that are based in Jämtland to find participants. The ambition was to generate nuances and heterogeneity of experiences through these varying perspectives. Throughout the information gathering process, the same semi-structured interview guide has been used for all interviewees (see appendix) with varying questions depending on the answers given. This allowed for a base set of themes covered within the interviews and a base set of comparative data. The interviews themselves have been recorded and transcribed and been used as material for the analysis according to the representational themes covered in them. (Creswell & Creswell, 2018; Robson & Poole, 2003)

In addition to the interviews, I have done a literature review to accompany and broaden the perspective on nature representation within the field. The literature analysed includes company presentations and documents as well as state

documents and policies. These policy documents include the law ‘Miljöbalken’ that has been passed in 1998, the Skogslågstiftning, as well as the law ‘protection against accidents’ (Skydd mot olyckor). There are further guiding documents given out by the different authorities. These include ‘Naturvårdsbränning Rapport’ from Naturvårdsverket (Naturvårdsverket, 2005), environmental guidelines in FFM by MSB’s (MSB, 2020) and Jämtlands Räddningstjänst’s included in their general guidelines on FFM, environmental considerations given out by Skogsstyrelsen (Skogsstyrelsen, 2018) and the county (Länsstyrelsen Jämtlands län, 2019) including an integrated national forest programme (Lantbrukarnas Riksförbund, 2018).

Using these as resources to start the analysis process, the main research questions followed within it were regarding who was identified as nature representative and how do stakeholders make sense of the nature relationship with representation and the management process itself. In order for me to be able to gather this material, the questions that informed my interviews were open-ended questions concerning how the interviewee refers to their profession and relative connection to the forest, where they see important decisions being made and how nature as a stakeholder is made sense of during these processes. It concluded with the question of how the interviewee personally made sense of the concept of representation within their professional interactions.

The conception of nature itself that is presented in this thesis is in connection to prescribed burnings and wildfires alike. It is a certain aspect of nature that is considered and even when ‘nature’ is mentioned in the text, this thesis can only allow for an understanding of nature in connection to fire, not an overall understanding of what nature entails in this specific case.

In order to analyse the data of both interviews and literature I have used thematic analysis (Delve & Limpacher. 2020; Braun & Clarke. 2006), using codified colours in the respective documents and then collected these codes in a common master sheet that was organized to contain all relevant themes that came up during the analysis. This included statements regarding nature representation, responsibilities, conception of nature and wildfire and overall management mechanisms referring to any of the other topics. Using thematic analysis is appropriate in order to find themes according to the data and use them for sense-making of the study topic and research questions. The earlier explained and mentioned representation theory serves as both underpinning concept as well as analytical lens to make sense of what has come up in the interviews. In practice, I used abductive coding (Schwartz-Shea & Yanow. 2011) that was informed by my understanding of nature representation from said theory. It was instrumental in identifying the representation themes in the material and is presented in the results section. To be able to do this, I familiarized myself with the data through the transcription and note taking during the interviews, as well as the repeated going

through the texts of the transcriptions. These themes were then tested and contested by going through the material again until the list that is presented in the results section came into being.

4.2 Approach

When engaging in qualitative research it is important to consider the ethical repercussions ones proceedings can have. In order to minimize repercussions during the final steps of my master thesis, I tried to inform all participants in due time about what will be done during and after the interview, with their data and the interview itself. I have double checked with all participants that they have consented to being recorded and have sent them the transcription for approval as a last step before being able to use it. This initial information process was done via e-mail communication and a consent form that I have sent in together with the initial interest e-mail. This document further stated that refusal or dropping out of the project was possible at any time. The referral to the finished document is a given and many interviewees specifically asked for a potential insight into the final document.

To allow for minimal risk after my study, the participants have been anonymized according to a numerical system (interviewee 1, 2, 3, ...) and are referred to only by numbers when quoted (e.g. “...” (1)). They will only be referred to depending on which stakeholder position they hold (state-owned enterprise, communal level, private company, ...) (see Appendix Table 1). Throughout the interviewing process I have not sent out prior questions to the interviewees, to keep the answers as impromptu as possible, and to assure that all participants have the same starting point when engaging in the interviews. Furthermore, before the interview I have clarified my research aim and theme of the thesis so that all participants were aware of what study they are contributing to. After the transcription, I send out the transcription document to the participants in order to get their consent on whether I can use it. If there was no response to me sending the transcription document, I interpreted this as a ‘yes’, as no negative answer to the transcription procedure was given during the interviews themselves when I asked about them. Some of the interviews have been conducted in Swedish. The quotes that were used during the analysis have been translated into English by myself.

Lastly, though some statements have a general notion, the study area is that of Jämtlands county in the north of Sweden and thus my results are only connected this context.

5. Results

The following results are the themes that emerged when analysing my interview and literature data pertaining to how nature is being represented and how that is expressed and legitimized in FFM in Jämtland. The results are presented in a set of three representation themes:

- Experts representing nature through their knowledge and experience claims
- Controlling ‘the other’,
- Nature being ‘Everything everywhere all at once’.

The themes that emerged are organized by first explaining who is representing nature in each case, followed by 5.1.1 and 5.1.2. that illustrate how that is being accomplished. Followed by 5.2. in which the why is demonstrated or what repercussions this representational frame has. The last section of 5.3. explores and questions broader themes of representation. These findings are a compilation of the interviews general input, specific quotes that exemplify what has been coming up, the literature analysis as well as my own understandings of the theory and what has been spoken to me. If not otherwise referenced, these results present my own interpretations.

5.1 Experts as representatives of nature through experience, legitimization by others and scientific knowledge claims

When it comes to nature, expertise and knowledge have been predominant in literature as a legitimate means of representation. As a means to understand the ever-changing and ever-growing connections found within natural phenomena, science has become a crucial representative for how we understand and take nature into account. Science is referring to scientific institutions, academia and a natural science bias. The importance of expertise and expert knowledge has been very apparent throughout my data collection. Both in terms of nature representation and its legitimacy. Expertise can here be defined as scientific or academic knowledge, or experience within a job or field, and is accepted and legitimized by other stakeholders in the corresponding field.

Selection bias results in over-representation of environmental expertise being seen as a legitimate representation for nature in the process of FFM. The actors who agreed to be interviewed view themselves as, or are viewed by referring colleagues as capable of representing nature because of their expert status. This includes conservation researchers, people with a background in forestry, related fields and those concerned about environmental issues and have record of enacting that. Most of the interviewees can be categorized as an expert through acquiring scientific knowledge in their field regarding the environment and thus have representative positions inside the management system. Whether it is deciding upon where to lay a controlled fire or whether forest fires are historically significant, these experts represent a voice of nature and its needs. This can be exemplified by one of the statements when asked to describe their employment and how it connects to forest as nature:

“I also have a forestry education at SLU. So, I am also a forester next to this [job as firefighter]. The connection to the forest is natural to me.” (1)

The explicit referral to the past education in a forestry relevant background is highlighted and was given. It shows the immediate connection from academic knowledge gained during earlier years as a connection from the interviewee to the forest. This is true for other interviewees as well (2, 3, 5, 7)

In the decision-making process around where to do a prescribed burn in the forest and in evaluating the ‘natural value’ of forest patches, expert knowledge is relied upon. ‘Natural value’ in this context refers to the characteristics that are determining the state and intricateness of the forest including species quantity and quality of habitat, wood density and quality and historical records of fire. Expertise is the very pinnacle on which nature finds its voice in the process. Through scientific language and practices the experts assess potential sites for burning, they elaborate in decision-making processes where to burn, why it is important there and how it should be done. They assess plots of land according to the principle of ‘key biotope’ with high conservation values, whether it is one and through that is eligible for prescribed burnings. The guiding documents stress those procedures that create a legitimate process and measurement criteria through which this is achieved. Experts are also consulted in general forestry decisions.

One of the interviewees describes their experience working as a conservation expert with this phenomenon as:

“[...] in the beginning I started working more at the production part, because it is quite hard to convince people that you know something. And in the beginning I could only convince people about this part of my knowledge. But I built on.” (5)

Found within this statement is also the conception of how the knowledge is legitimized by the other stakeholders. The interviewee had experience and an academic background in forestry production, but was more interested in conservation efforts. Convincing people that they are also proficient in that type

of knowledge took more time so that they could prove experience by gaining relevant proficiency. The expertise needed in order to be a spokesperson in regards of nature has been legitimized through experience in the field and how long a specific practice has been in place. The following statement describes the importance of experience as a denominator of expertise by combining ‘being good at something’ and ‘having a lot of experience’ (interviewee 8) through a repeated practise.

According to Boström et al. (2018), most interviewed representatives associate their representative claim as legitimate through ‘long-term learning’. They also emphasised performance aspects. By their own claim-making and through other’s acknowledgment of these, a professional persona is created that is legitimized as an expert. This was corroborated in the interviews by statements such as:

“And what I do in my spare time when I go fishing, I sort of put all of this aside and become another person more or less.” (8)

Here one can identify the difference in persona off-work and in-work. The expert is the one that is professionally employed by their company and proficient in what they do, yet outside of this context one becomes ‘a different person’ with different interests and opinions. This was highlighted by the same interviewee explaining that there is a difference in whether they would speak from their personal point of view or felt connected to the authorities guidelines and laws.

Another type of expertise is gained by spreading information via assigning tasks to and distributing knowledge as readily available documents, group consultations where knowledge can be shared, and trainings. Thus, expertise is made available to everyone involved in the process. This allows for every participant to be given the chance to make legitimate decisions about nature. In MSBs educational material, new firefighters and decision-makers are informed about nature impacts and “how [to use the] natural environment [...] to [...] both benefit [...], but also help put out, or stop the spread of the fire [...]. To promote use of techniques that minimise damage to the natural environment.” (interviewee 6 – who is working for MSB)

They along with the experts of FFM in Jämtland can be seen as what O’Neill (2001:495) refers to as ‘proxy representatives’. According to this concept, by having made a claim of expertise and knowledge, these experts, mainly conservationists and scientifically trained personnel, in FFM are speaking on behalf of nature to represent its needs, in this case the need for forest fires to be incorporated as a part of the management practises. This proxy representation is imperfect, but is according to representational theory a legitimate way to ensure that nature is taken into account if these claims are consciously accepted by all stakeholders. The representation by experts is very present throughout the data collected and is framed by the means of using formal scientific knowledge and experience to legitimize this representation.

5.1.1 How nature is being represented through scientific knowledge as chosen language

These experts from the interviews have a common denominator in how nature is made sense of: biodiversity. When speaking about nature's representation and why prescribed burnings are part of the management system, "[...] the main argument for using fire today in the forest is biodiversity." (interviewee 3)

The concept of biodiversity is highly linked to the type of knowledge that is seen as legitimate in these processes, namely the amount and diversity of species as well as historical significance of fire in a certain landscape. This is generally referred to by my interviewees as 'science'.

The term 'science' has been repeatedly named as its own statement and legitimate claim towards why a choice has been made. For instance:

"The most important ... I don't know... the science says the thing you could do to 'conservation management', when you make the biodiversity better in an area, the most important you can do where you can see the biggest effect in the short and in the long term is to burn the forest, to burn the right forest." (7)

Coming from the standpoint of 'the science says' it becomes clear that 'science' legitimises a certain perspective on what nature is and how it is assessed. It recommends scientifically assessed measures on how to deal with fire and which values are important for 'nature values' in forests.

The aforementioned personal values of the experts, potentially coming from outside their expert-persona, have little influence in the day-to-day affairs of FFM. The prominent language is 'science' and the personal views mentioned during the interviews were mentioned existing besides this predominant view, sometimes even contrasting it. An interaction that highlights this where the interviewee portrays the discrepancy between their personal opinion and that of the work place, the law or profession versus their outside-work persona:

"8: You want me to answer from a personal perspective or from a professional perspective?"

Me: You choose. You can do both!

8: It's very hard when I work a lot with the law and I have to keep them very separated. It's hard for me, I'm either here or I'm there."

FFM policy and Swedish legislation is informed by science and nature is then conceptualized by 'biodiversity' where the units of choice are species and their corresponding numbers. The very construction of 'nature' is incomplete in the political realm in our times, often with competing or changing understandings of what 'nature' entails (Blühdorn, 2011). Resulting in a reductionist set of imperatives which, in this case of FFM, is reduced to richness and diversity.

5.1.2 How scientific knowledge is conceptualized

During the interviews, it became apparent that scientific legitimacy is specifically based on percentages and measurable inputs and outputs. With biodiversity as a foundation of nature representation, this concept becomes underpinned by scientific tools and concepts that are measurable. Most prominent in that was the referral to 'red-listed species' and comparative percentages referring to historical data of burned forest landscape:

“So if you have an area with a lot of forest fires historically, you look at certain species to see if you have them.” (5)

This statement stresses the significance of scientific data in determining the necessary measures for the forest ecosystem to function as well as the importance of forest fires relative to the past in which they occurred.

When engaging with the guiding documents for prescribed burnings from Naturvårdsverket, the importance of endangered species and their richness was accentuated further. The guidelines regarding 'nature values for prescribed burnings' and their explanations as to why these are important are all connected to 'red-listed species'. Other aspects are named as well, such as the forests intrinsic values, but these go always alongside mentions of species. (Naturvårdsverket, 2005)

The techno-scientific approach to things can be found in all the documents that I have analysed. As an example Naturvårdsverket (2005) refers to the importance of the follow-up data from fires to be able to feed data into statistical procedures for forests and environmental monitoring. These systems reinforce the need and use of statistical measures.

The same approach can be found within the certification schemes that, for example the FSC certification, have a clause that demands a prescribed burning of 5% of the owned forestry land (FSC, 2019). Having a certification as a standard allows for forest fires to be an integral part in the decision-making processes and nature management policy. By stressing the fact that without the certification forest fires would not be wanted in an economic driven FFM adds to the significance of how nature is given a voice and a standing.

During the interviews there were many references and attention called upon percentages and quotas such as:

“I think today it is 5 % of the annual harvest area that they actually burn. And then there is a co-efficient if they burn standing forest, they can calculate twice as much [...]” (2)

It shows that these certification schemes shifted the perspective on nature by considering forest fire to be beneficial for biodiversity and that this should be reflected within the management practices. This leads towards a more conservationist approach that views fire as a positive and supporting tool. Instead of fire only being seen as man-made and a threat it was incorporated into the

functions of ecosystems. Accentuating the positive aspects of biodiversity and the gravity of ecosystem services held in balance by introducing forest fires, allows for nature as a regarded stakeholder to come to the fore. Further calling it a tool highlights that it is available to stakeholders in FFM as a ‘sustainable’ measure for the forest ecosystem.

In another instance, the power of the certifications is highlighted by one of the interviewees:

“I think we have these external drivers, like certifications FSC, PFEC, etc., that sort of drive the control part of this. I don’t think that most land-owners are very positive about wasting a couple of hectares to be burned unless they had these external drivers that sort of made it happen.” (8)

The certification process and its later application have a strong influence on how FFM is being executed and most interviewees referred to the certification as a positive force towards more significance of nature concerns when it comes to forest fires.

The reliance on specific outputs and results through conservation measures is present throughout the data collected. Experts evaluate a given set of forest to allow for forest fires to be prescribed there through the lens of distinct scientific measures that have been established by official documents as guidelines.

5.2 Control ‘the other’

The next two themes that have emerged, are very closely tied to the dichotomy that could be seen between wildfires and controlled prescribed burnings. It is this contrast in which nature as ‘the other/the enemy which needs to be controlled’ and ‘nature as all-encompassing/humans as part of nature’ emerged. This section is directed towards the former conception.

The environment, for the past centuries and still currently, does not have a standing in the realm of humans. It can be seen as “the referent other” (Wysocki, 2012:27) against which human society positions itself. This can be found within the forest legislation from the Swedish Forestry Agency (Skogstyrelsen, 2023), as all emerging fires need to be extinguished and that personal and economic damages are put on a higher priority than the environment as an immediate concern (MSB, 2022; interviewee 1, 6). This is in rivalry to the understanding that forest fires are an intricate part of the ecosystem and shaped this system that we can experience today. The interviews themselves can be divided into talking about forest fires through the lens of prescribed burnings, where it has a positive connotation, and that of wildfires being a destructive, negative power.

The man versus nature theme emerged further in the interviews. By highlighting that the system of fire protection counteracts the very maintenance of

the ecosystem on which it relies, this interviewee shows the discrepancy between practice and conservation efforts:

“Actually, we are counteracting nature conservation by putting out forest fires.” (1)

This instance seems to be a remnant of what has been continued throughout the history of fire management. Even though forest fires have been identified as integral to the system by authorities and counties alike, the whole connected system of forestry has been described by an interviewee as ‘traditional’ and ‘hard to change’ (8). Coming from decades of conceptualizing nature as something that needs controlling and is solely for the purpose of ‘man’ to be exploited. Together then with the new arising themes of how nature has an intrinsic value, mixing both ‘scientific’ and ‘experiential’ language from forest workers and researchers, the way we should engage with nature is unclear.

The ambiguous interpretations of what ‘nature’ is constituted of can thereby be filled with the threat and danger that it entails to humans and human possessions, similarly as by referring to nature as simply biodiversity.

Viewing nature as the other further gives a concrete connection to what ‘nature’ is, how it can be controlled and what it does.

The interviewees proclaimed different stances towards how forest fires are being received, some mentioning that it is an exciting thing to behold and watch whilst others say “[...] people are afraid of fire” (5). What became clear whilst analysing the data is that fire can be constituted as ‘good’ and ‘beneficial’ when it is understood to be so through education and information whilst also being controlled and planned for. When looking at the following statement:

“And I think it would be naive to think that well fire is good we just let it burn because it provides some values, because there are you know different values around who owns the forest and the economical aspects and the safety aspects. To some extent need to control anyhow somehow.” (2)

It becomes clear that different mechanisms are in place when looking at what is deemed ‘good’ and ‘bad’ within FFM. The ‘need to control’ is distinctly mentioned and can be connected to the aspect that fire is ‘good’ when it is controlled so that economical and safety aspects are not endangered and are valued higher than nature values.

Within FFM, the delimitations of beneficial and destructive become blurred “if a fire enters into a protected area for instance” (2). There the incentives whether putting out the fire or not also depend on control: “The risk of letting the [“unwanted”] fires burn is bigger than the potential benefit of them.” (6) Later this interviewee further explains the considerable measures and strategies going into predicting fires and what extensive efforts go into the prognosis and later quenching of the fire.

Yet, at the same time, the knowledge that wildfires are more beneficial to nature than prescribed burnings can be found within literature (Fredriksson, 2021) and the interviewees' statements, such as:

"[F]orest fires historically are not just with small flames, you have all different kind of fires. A wildfire will always be better than a prescribed burn [...]. And a forest fire has not been controlled before." (5)

As it is stated here, exactly the uncontrolled and 'chaotic' parts of the fire are what makes it constructive to nature, because due to its variety in types of fires it creates a more varied field layer and higher rates of deadwood that allows for a variety of species to thrive afterwards (Thomas et al. 2010, Interviewee 5 & 7). Prescribed burnings are trying to mimic this diversity, but have not achieved this. (Fredriksson, 2021)

The image that emerges here is that nature in the form of forest fires is emerging as a welcomed and important factor as long as control over it is established. This plays together with the other results in which experts and scientific knowledge, all measurable and 'controllable', are seen as the predominant way in how to represent nature.

5.3 Everything everywhere all at once

The last theme that emerged is that of the encompassing representation of nature through each and every part of the system. The interviewees had a hard time pinpointing representation to a single actor or concept. This can be partially attributed to the new and not yet established understanding of what nature representation can mean to them, but it can also be explained through the interactions and mutual representation of nature in FFM. As mentioned in an earlier chapter, nature itself is not well defined. Neither is the relationship between people working in FFM and nature around them.

However, there are practises in place that allow this problem to be bridged. Most interviewees commented on the fact that decisions are being made in connection with all other stakeholders, how important the environment is and that everyone is necessarily involved.

"But I mean during those larger forest fires, we sort of get together, all of the bigger companies as well as us and we work with them [...]" (8)

"Success factors for forest programs the work is a partnership between the state, business and civil society – a broad collaboration." (Länsstyrelsen, 2021)

The interviewee and documents here refer to a functioning approach in how to tackle forest fires and the development of FFM. A collaborative approach allows for the interplay of different perspectives and more parts of the system to engage with management practices. These statements show the interactions and

interrelatedness of all stakeholders of FFM being crucial in order to grasp what nature entails and through that how it can be represented.

Alongside the ‘controlled’ representation of nature, there exists the notion of a ‘standing of the natural environment’ that is enriching to all that surrounds it (Wysocki, 2012). Throughout all interviews, there has been the notion present that nature is more than what management practises are representing and that it is important:

“Personally, I think there are... I like a burnt forest. I like to walk in a burnt forest, because you see things that you don't see otherwise. And you understand that it's okay this is part of the system. And for me personally that's uh ... a very ... is a driving force.”(2)

“But for me it's very important, because even if maybe that fungi isn't very important, but if you take it away, you don't know what else you take away.” (5)

Following my line of interpretation, these two statements show the intricate relation that can be experienced when engaging with forest fire and its connection to the forest ecosystem. They further demonstrate the personal attachment these participants have with forests and how they themselves interact and relate to forest fires. Nature is experienced by everyone and an integral part of human existence.

Moreover, as nature can be seen as an all-encompassing entity it affects everything that happens in FFM. When looking at forest fires “it is a fairly small part, but it is divided on a lot of departments, because there are so many different aspects of it.” (6) Not only is nature connected to all aspects of the human system, so has also the human governance system grown more complex over time. There exist a vast amount of decision networks which offer different styles of participation that further allow different types of representation to emerge (Wysocki, 2012). On top of that, the understanding that humans are a part of nature is becoming more frequent and pronounced in all aspects of society:

“So I think change has been in multiple parts, it's not just the forest companies or skogsstyrelsen or something else. People are more aware of what's happening. [...] that we have forests and we are cutting them now and sometimes its not very well done.” (5)

What is talked about here is the change towards a more sustainable and conservationist approach in how to do forestry. The awareness of people is said to be raised through education and media. This recognition of ‘what’s happening’ supports the understanding that everyone is aware of how nature interacts with humans and vice versa and that it is currently in imbalance. The symbiosis of every aspect of society that creates and has a say in representing nature. The general public, media, and stakeholders in the value chain are identified to be necessarily interested in nature and through a dependency on the natural environment all have a potential stake and say in nature representation through epistemic values (O’Neill, 2001). As a mean to allow all parts of the system to be

permeated by the same notion ‘transparency’, ‘information spreading’ and ‘education’ have been identified (interviewee 3, 5, 6, 7).

Through dialogue and democracy the claims of everyone regarding nature can be legitimized.

Another message that can be distilled from the voices of the interviewees in regards to forest fires is that of understanding that it is a positive and necessary force. Even though some of the interviewees hinted at it being accepted because of certification and policy documents rather than a belief of intrinsic natural value, throughout the interviews forest fires have been seen as a requirement for future sustainable development. They further found beauty and interest in it.

“[T]here are these three aspects of biodiversity that are sort of central to me, the inhabitation in the forest, the structures of the forest but also the processes that shape the forest. [...F]or me the representation of nature has all these three aspects to it.” (2)

The processes that this interviewee refers to is the interrelatedness between how nature is being represented, what opinions are present in current dialogues, and how management practices are built up.

These relative connections are faced with the restrictions of the current system that is in place – politically, economically and bureaucratically. Economic values have been stated as the most obstructive force regarding an encompassing FFM that includes prescribed burnings for biodiversity. Despite the fact that a functioning economic system is necessary for human survival, it is given importance over social and environmental implications. The bureaucracy in place and management practices include standards procedures and protocol that impedes flexible approaches as to how to relate and deal with nature (Rogge & Reichhardt, 2016).

“[W]e don’t have dialogues with NGOs like Naturskyddsforening or ... because it would just be another one ... we work really hard to make these places to burn so much forest that we want to and that we do for FSC, if there would be ... we have to find it’s safe, we have to report to skogsstyrelsen and we have to talk to Sápmi, if we then had some nature NGO that also say ‘We want it to be there’ we wouldn’t have any place where it would burn at all.” (7)

This quote shows the many nodes that must be in place when looking at prescribed burnings specifically. When asked whether bureaucracy is inhibiting the process, this interviewee states that it is not in itself constraining, but on top of all the other things one has to keep in mind, it does add to the hindrances of a more flexible approach. Such an a mode could allow for a wider range of knowledges to arise and give more freedom to let emerging voices have a place to influence the practises in place. It shows that current ways of dealing with representation and FFM is not able to host the encompassing nature and necessity that it brings to fully grasp all parts of the whole. The constrictions of the in place

system are that of a confined possibility to let new representations arise by limiting the input of information to scientific means and control-based methods.

6. Discussion

In this study, I have called attention to the connections between nature representation and the Swedish forest fire management practices in Jämtland county. Through my analysis I have illuminated how nature representation is constituted within Swedish FFM. I confirmed that mostly expertise and scientific knowledge were the prevalent representational frames found within the data as well as the themes of ‘nature as other’ and ‘nature is all around us’. These findings add to the growing importance of representation considerations and how nature is represented within a local human practice. It further stresses the importance of the meanings attached to the environment and how those effect the resulting management that comes from it.

Most of the results showed that nature in the shape of forest fires is represented by scientific knowledge, expertise and the fact that control is viewed as crucial. Experts function as “claimed representatives” (Guasti & Geissl. 2019:102) that speak on behalf of nature through their knowledge, experience and legitimization by others in the field. The claimed linkage between the experts and the representation is then the knowledge they possess of nature by being educated by academic means, and that this knowledge allows FFM to take control over nature and allow for nature to become predictable. The organizational structures present an intellectualized version of the environment. While it is measurable and controllable nature has a voice in the human discourse.

This theme that emerged of humans wanting to control nature has been set in a dichotomy between ‘wanted’ and ‘unwanted’ fire. As mentioned in the results section, ‘wanted’ is connected to prescribed burnings in favour of biodiversity. The control aspect makes it the preferred type of forest fire. When it comes to ‘unwanted’, it is the uncontrolled chaotic wildfires that happen by chance and are unpredictable despite modern technology.

Furthermore, in the case of wildfires being seen as a threat and their results as “damage” (8), the perception of nature as a threat supports the understanding of Driscoll and Starik (2004). They postulated that nature is managed through risk-based approaches and through that only seen as a secondary stakeholder rather than an active participant with a standing. Without standing, nature has legitimacy and urgency in stakeholder theory, but it is lacking power and thus becomes dependent on “the will or voice of another to represent it” (Wysocki, 2012:32).

This point was confirmed through the interviewees reflections on nature representation within their everyday working life. Those with conservationist backgrounds (interviewees 2,3,5,7) could report that nature is actively given a voice in their work environment and is considered a concern due to forest fire being seen as a necessary part of the ecosystem. Interviewees working in disaster management on the other hand found that nature is of limited concern and the focus lies on forest fires as a threat. It further proves the point that when nature is considered dangerous or in need of control, its voice is diminished.

All these instances highlight a need for control in order to work with the environment, whether it is by allowing for controlled fires to happen or to prevent wildfires to start. The stakeholders are relying on science as the way to understand nature by focusing on face-value measurements and considerations and this in turn enhances the notion that nature can be controlled with the right calculations.

Rapid techno scientific development in society allows for a deep permeation of scientific and expert knowledge into every sphere of daily life. The same is true for FFM in Jämtland where expertise is highly valued and the epitome of nature representation. This could further be phrased in Lidskog & Sundqvist's (2018:168&171) words of 'scientisation of society and politics'. The wider debate of this topic is more expansive than this paper, but the increasing importance and reliance on science as the only means to understand the world around us is a narrow approach.

Even though nature is increasingly referred to as having 'intrinsic value' and being of importance, the scope through which it is being incorporated is restricted by scientific means. I use the word 'restricted' as this approach has certain connotation attached to it. If one solely relies on the prospect of defining nature (and through extension the connection to forest fires) through biodiversity, richness and diversity, it is a very face-value estimation of the land. It measures certain categorized aspects that have been given importance by FFM, such as how many endangered species are present in this piece of land and how they are dependent on fire, but disregards other values. These could include personal reference to the place, importance as a foraging spot (Butler et al. 2019) or cultural heritage of the local population in the area. The consideration of the indigenous *sámi* in Jämtland is present, yet on a reactionary basis where the plans are made by the forest companies or the governmental bodies and the decision is mitigated to them to be approved or not. Including their opinion could enhance management practises and involve other types of knowledge such as generational experience and spiritual connection.

One of the interviewees (5) highlights the narrow perspective that statistical categorization exudes in a comment showing that if it does not exhibit specific criteria, being a 'key biotope', it does not matter how high the conservation values are estimated to be. The result ultimately will be that the land will be handled

differently depending on how the owner sees fit. If it is not a ‘key biotope’, there is no law confining that fire is necessary in this ecosystem. Which then returns back to the fact that production, the economic value, stays the main objective unless it is a state-owned nature reserve. A statistical value thus decides upon whether nature is considered valuable enough to engage in biodiversity measures or whether business as usual is applied.

In general, according to the interviews, laws and guidelines of FFM hold an anthropocentric perspective, using the forest as a means for human development and sustenance. As Wysocki (2012:34) introduces ‘sustainable development’, he identifies that within it:

“nature no longer stands on its own but is subsumed into a process of sustainability defined anthropocentrically. Man’s actions no longer occur in the context of the environment but rather in the context of man’s own developmental vision set in time: “development that meets the needs of the present without limiting the ability of the future to meet its needs.”

This explanation of sustainable development has no standing or voice for nature. The future is entirely set to be for the purpose of humans. Nature can only find an expression within that set parameter. Within the data procured in this study, the emphasis on the economic factors that play into FFM were considerable. Being taken into account as a significant secondary stakeholder in FFM, nature also has to be made usable and fit into the conception of what is needed of it to secure survival of humans, e.g. wood products and ecosystem services. Being defined from an anthropocentric standpoint is not problematic itself, it could be considered the only thing that is possible from humans (Dienstag, 2021), yet it severely limits the ways in which nature can become represented.

According to Boström et al. (2018.114):

“None of the[...] actors can claim direct representation of nature[,] they must take a detour through, for example, an organization, expertise, or certain value-statement. Accordingly there is an inherent complexity and ambiguity in environmental representation.”

With this understanding, the combination of expertise, knowledge and the will to give voice to nature by organizational structures is one way to represent nature. This can be connected to the notion that Goodin (1996) proclaimed. He put forward that nature representation is most practicably achieved once enough politically engaged people internalize what nature wants and through that achieve that nature is given voice. Despite FFM’s limited perspective on what nature can entail, extensive concerns are being voiced and efforts implemented at the organizational level to impact how nature is being received and its importance within the practice.

Concluding this thought, the representation that nature gets in FFM in Jämtland is that of an anthropocentric, scientific perspective that is re-enacted by expert proxy representatives. There is no legislative or authoritative legitimate representation present according to O'Neill (2001), thus, nature in the form of forest fires does not have a standing of its own in this process (Wysocki, 2012).

However, as it is shown in the last section of the results, nature cannot only be confined into these measurements. Nature itself has a very strong individual connection to the stakeholders working in FFM. Even though the FFM practices and organisational structures only give representation in the form of anthropocentric and scientific means, the sphere of 'care' is present. Representation theory struggles to delineate humanities and natures boundaries and how one incorporates nature into the human political system. It further highlights that science is not a reliable factor to consider as a means to make moral and political appraisals as it differs depending on the discipline and theorem behind it. It is a universal necessity to extend concern and care. No matter how much science we apply in order to come to an understanding of what nature entails, "all our talk about animals and nature, however caring, will always be merely *about* them, never really *with* them." (Dienstag, 2021:630)

Thus, finding that the means through which nature is being made sense of in FFM is that of a scientific approach, it becomes important to understand the need to look and feel more into the 'intrinsic value'. It has been postulated in many of the documents and interviews, but nevertheless cannot be characterised by a single definition. In my understanding, this 'intrinsic value' can be connected to the idea of nature having a voice and standing. Nature has the intrinsic value to also be considered a stakeholder, just as every human being has the intrinsic value by being a human. Just by existing there is an intrinsic value to continue doing so. It is connected to the individual care of every part of the system which at this point does not find space within the scientific and economic management itself.

By furthering and trying to incorporate this, the participants in FFM show willingness to represent nature in its entire complexity. One can then deduce that the current type of representation is present due to the fact that the organisational structures as well as the stakeholders are trying to incorporate as much complexity as is currently possible. The very fact that they are incorporating all these measures to ensure forest fires to be present in the ecosystem displays the understanding that it is necessary. Moreover, the complexity of the approach to coordinate prescribed burnings in itself shows the connectedness of all things to this topic. Nature affects all aspects of life and this is represented within the complexity of the management practices.

Throughout the field work and the analysis, it crystallized that identifying nature's voice and representation was not straight-forward. The concept was not easily grasped by the participants outside of referral to guidelines and company

rules in a work context. What does that say about the discourse around this topic? It was interesting to come to understand that the concept of how nature is being represented has not found any dominant conceptualisation in FFM and with the people that I have interviewed. The term ‘nature representation’ often had to be explained to the participants. Also, what personal connections the interviewees had with nature were contrasted then to the working system in which they found themselves. It might also not be seen as an immediate concern to expand on the current practises or integrate nature’s voice more, because FFM as it is has been successful. This can be seen from the fire ban and the less than 1% of forest landscape burning every year (Naturvårdsverket, 2005). Especially, if one contrasts FFM to the predominant economic-driven forestry sector that continues to production results that it is set out to accomplish and where forest fires are mainly seen as a disturbance.

This potential lack of immediacy and through that importance is countered by stressing the need for human-nature considerations when looking at the statement of Dienstag (2021:627):

“We cannot abandon an account of human distinctiveness without also abandoning our standpoint for speaking about the value of humans and nature. Without a human perspective nature is meaningless and valueless.”

Through the human experience and concern we can grant meaning to non-human entities and with that allow for a necessarily flexible and yet intimate relation to nature. In current FFM in Jämtland county, this care is defined by mostly scientific means through which extensive management and organisational efforts are being applied to assure that forest fires have a standing in the overall managed ecosystem. These structures currently exclude other possible appraisals of nature and its representation within the process that could elaborate on other possible ways to organize FFM.

Conclusion

This thesis on nature representation in Forest Fire Management in Jämtland, Sweden, discovered different sets of representational frames and legitimacies through which it is re-enacted.

Firstly, nature is being represented through experts that use an anthropocentrically defined scientific set of language. This includes evaluation criteria, guidelines and laws for the set-up of prescribed burnings and how to consider nature in wildfire situations. This perspective illuminates a predominantly one-sided understanding of how nature is represented and excludes other experiences to make up how nature representation can be interpreted. It helps to create a standard within the field that allows for uniformity in procedures, but ignores other, more dynamic forms of sense- and claim-making. The scientific lens that is being used in order to describe and work with nature has several implications for the management practises themselves. They create a divide between the workplace expert and the outside-work persona where both experiences do not coincide with each other. Furthermore, it allows for a less dynamic and encompassing appraisal of nature within FFM.

Using primarily anthropologically defined scientific ways to understand nature allows for an ‘othering’ of nature that leads into the second theme that emerged. The dichotomy present within FFM is either portrayed as nature as something outside of the human experience that needs to be controlled in order for humans to thrive and that of an intrinsic human-nature connection that is characterized by an intricate web of concern and care. These two angles contrast each other and become opposing ideologies within FFM. However, they exist side by side. The former theme of control is strengthened by the identified scientific lens as using clear structures and measurements allows for it. Furthermore, the current structures in FFM are top-down and based on the scientific knowledge as a uniform language. Despite having incorporated participatory and democratic processes, the system itself proves to be rather static and clearly defined by economic drivers as well as science as denominator.

Including a more broad perspective, meaning to incorporate concern, care and inviting alternatives of understanding allows for a more intricate relationship between humans and nature.

The methods applied within this thesis are limited and have framed the study as it appears here. The selection of the interviewees was framed by their job description or through referral by people who assumed them to be experts. The results show this clearly. Including a more diverse and potentially more arbitrary set of participants could demonstrate different results, especially if including marginalized voices such as indigenous perspectives. Furthermore, the set of guiding questions can be altered to focus more on the nature conceptions the participants have or frame the interview in a disparate direction by giving more direct instructions on my understanding of what nature representation is. The way in which I conducted this study does not elaborate on the organizational structures that are in place in a more in depth manner, but rather focuses on the personal opinions of the participants. It further does not allow for any deduction of how the communication within FFM is taking place or how decisions are being made in a more exemplary manner. Focusing on the literature study could also prove an interesting future study. Furthermore, the region of Jämtland county is representative for counties that do not face increased amounts of fire ignitions yet nor is it a region with particularly high fire hazards at this point in time. It might be interesting to look into regions such as Västmanland itself where the large wildfires happened or into regions that experience exceptionally high fire ignitions and how that affects the perception and representation of nature.

By these findings this paper contributes to the overall literature on nature representation and further gives a local specific example of how it can be conceptualized and analysed. This analysis answers my research questions by identifying experts as the instance representing nature and which conceptualizations of both representation and nature have been found within this set of interviewees.

Understanding and recommending what the most prosperous solution for FFM to include nature representation are could be a possible subject for future studies. It could further be interesting to look at how these nature representation perspectives influence concrete decision-making processes and how they directly affect the management structures.

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Popular science summary

Forest fires ignite reflections on nature representation

Representation is a wide field that affects each and everyone of us in our daily lives. Who gets to talk for our interests in politics, who can truly speak for someone absent from an ongoing debate? Similar issues become ever more clear in regards to nature and how it is being represented in days of climate change and biodiversity loss. Therefore, looking at how nature can be represented in a world where interpretations, laws and society are all centred around human interests and affairs.

By interviewing people connected through forest fire management in Jämtland county, I managed to map and analyse how nature representation is being made sense of and who or what it is attributed to. I interacted with different people connected to forest fire management that through their job description had affiliations to forest fires and either by referral or own proclamation also considered themselves associated to nature.

Most interviewees connected nature in their work field with accredited scientific knowledge, achieved through schooling at universities or years of experience in their job. The way nature is measured and represented is through statistical means that allows for exact structures to handle. With quite a high percentage, this representation was given experts that have more know-how than others in the field and through that get to make decisions that also include nature. How this decision is being made is through assessing nature values through statistical means. Thus, these experts use these values in order to determine whether an area has important flora and fauna that needs fires to exist or whether forest fires have been a prominent force in an area. Then, they recommend whether fire is needed or not in the case of prescribed burnings.

An interesting note here is that forest fire had two very opposing ideals in the interviews. One side was that of the threat of forest fires destroying and threatening people and their possessions. On the other hand, forest fires are seen as helping biodiversity and as an important part of the ecosystem. As fire can be seen as a threat, control is a very dominant theme in how the interviewees perceive forest fires. Heavily relying on statistical structures can then very easily lead into the idea that humans can control nature.

Nevertheless, the interviewees presented the idea that nature is more than how their workplace makes out to be. Referencing personal connections with the environment, some of the interviewees said to have different opinions about how nature should be represented than what the mainstream handling of it shows. Further highlighting that alternative ways of understanding nature are out there, but not yet grasped by the system.

So when one understand how nature is represented in different scenarios, it adds to the overall awareness and possible new insights into how this is affecting different parts of society – in this case, forest fire management in Jämtland, both for the management system itself as well as the people that I interviewed for the purpose of this.

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Appendix

Interview Question Guide of semi-structured nature

- What is your occupation? How is it connected to forest fire management?
- What are your strategies?
- What values do you have in doing this?
- What are the goals of the specific forest fire management strategies?
- Where are ecosystem services placed in this? Trending sustainability?
- How do you make sense of sustainability in this process?
- Who is the driving force behind a shift in this?
- How do you make sense of nature in this process?
- How is nature represented and given voice in the adaption of such processes?
- What opportunities and obstacles do you see in including nature's voice into the process?
- What do you associate with nature and fire and the process?

Interview Guide in Swedish

- Vad är ditt yrke? Hur är det kopplat till skogsbrandshantering?
- Vilka är dina strategier?
- Vilka värderingar har du i att göra så där?
- Vilka är målen för de specifika skogsbrandshanteringsstrategierna?
- Var placeras ekosystemtjänster i detta? Trendande hållbarhet?
- Hur ser du på hållbarhet i denna process?
- Hur förstår du naturen i den här processen?
- Vilka drivkrafter finns där
- Hur representeras och får naturen röst i anpassningen av sådana processer?
- Vilka möjligheter och hinder ser du i att ta med naturens röst i processen?
- Vad förknippar du med natur och eld och processen?

Table 1 of interviewees and their profession:

Interviewee	Profession
1	Firefighter
2	Biology Researcher
3	Forestry Researcher
4	Countyadministrator
5	Conservationist from independent company
6	Forest Fire Behaviour Expert at MSB
7	Conservationist at Holmen Skog
8	Forest Damage Expert at Skogstyrelsen

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