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## Private governance in Europe's logging industry

A cross-national comparison of FSC certification compliance within the logging sector in Europe.

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## Abstract

Sustainable forest management (SFM) refers to a “dynamic and evolving concept, which aims to maintain and enhance the economic, social and environmental values of all types of forests, for the benefit of present and future generations” (FAO, 2020). In Europe there has been historic over exploitation of forests which has resulted in the degradation of their quality. With approximately 19.15% of the total production of timber globally coming from Europe (FAOSTAT, 2020), and production numbers continuing to rise, it is vital to ensure that forests are being managed in sustainable ways. Public institutions and private companies are increasingly turning to private governance systems to provide standards to monitor and prevent environmental and social degradation. With this increase in uptake it is becoming more important than ever to ensure that non-state market driven (NSMD) systems can ensure that sustainable forestry standards are upheld and enforced properly.

This research combines policy analysis and corrective action request (CAR) analysis to investigate the effectiveness of the Forest Stewardship Council (FSC) at ensuring compliance with their voluntary forest management standard. To investigate this, three countries were selected for analysis. The three countries identified were Sweden, Finland and Germany. These countries were selected as they are the largest producers of roundwood in Europe, which is a common indicator used to determine the scale of logging (Cook, 2018). Policy was analysed at both EU and national policy levels. The aim of this was to contextually understand the environment within which logging companies were operating. Audit data was then extracted from the FSC database (<https://info.fsc.org/>) to identify the extent to which logging companies do not comply with FSC standards. Data was collected for all logging companies within Sweden, Finland and Germany who have been FSC certified (either in the past or current). This identified a total of 2625 CARs from a total of 97 companies between the years of 2005 and 2020.

The results from this research suggest that the FSC, and NSMD systems more generally, struggle to effectively enforce their standards in relation to SFM. These issues are further compounded by ambiguous and poorly enforced legislation which means that the FSC's standards build upon unclear foundations. Environmental non-conformities represent over 44% of the total CARs and suggest that stricter standards are needed to force companies to change their operations and reduce the level of non-compliance. Additionally, questions should be asked over the audit process itself to ensure that standards are being upheld. Moreover, for NSMD systems to be effective there needs to be a change in the way they gain authority in order to enhance their power over private companies, this is especially the case as they become more common place within the governance domain.

## Preface

This thesis marks the final part of my MSc Sustainable Development degree at the University of Utrecht. The skills and experience I have gained throughout this course have enabled me to develop as an individual, and in turn have culminated through the creation of this thesis.

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## Table of Contents

Abstract.....	2
Preface .....	3
Acknowledgements.....	3
Table of Contents.....	4
List of Figures .....	6
List of Tables .....	6
List of Appendices.....	6
List of Abbreviations .....	7
Introduction .....	8
Research Aim .....	9
Research Question .....	10
Research Framework .....	11
Scientific Relevance .....	11
Societal Relevance .....	11
Theory .....	12
The Changing Perspectives of Governance in the Private Sector.....	12
Sustainable Forest Management .....	15
History of Forest Management.....	15
Contemporary Sustainable Forest Management.....	16
Outline of the Levels of State Governance .....	17
European Law.....	17
National Law .....	18
Certification Schemes .....	18
Forest Certification .....	18
Methodology and Data Analysis .....	21
Methods.....	21
Country Selection.....	21
Company Selection .....	21
Corrective Action Request Identification.....	25
Corrective Action Request Data Extraction .....	25
Public Policy Analysis .....	27
Grey Literature .....	27
Data Analysis.....	28
Public Policy Analysis .....	28
Analysis of Corrective Action Requests.....	28

Analysis of Grey Literature.....	29
Limitations .....	29
Identifying the legal ‘bare minimum’ .....	30
Contextual Overview of European Legislation, Communications and Regulations.....	30
EU Timber Regulation .....	31
National Legislation.....	32
Contextual Overview of National Laws.....	32
Identification of National Laws .....	32
Identification of the ‘Bare Minimum’ .....	32
The Forest Stewardship Council.....	36
Background Information on the FSC.....	36
FSC Certification Process.....	37
CARs in Practice - The Case of Sweden, Finland and Germany .....	40
Discussion.....	48
Conclusion.....	52
Bibliography .....	53
Appendix .....	70

## List of Figures

Figure 1: Indicative figure displaying historical changes in land use in three world regions from 0 A.D. - 2000 A.D. (IPCC, 2001).....	16
Figure 2: A graph to show the number of audits which resulted in CARs between 2005 and 2020 for Sweden, Finland and Germany. Data was collected from audits made available through the FSC database.....	42
Figure 3: Figure to show the total number of major and minor CARs from FSC forest management certified companies in Sweden, Finland and Germany between 2005 and 2020. The data was collected from audits which are made available through the FSC database.....	43
Figure 4: A graph to show the average number of CARs per audit for FSC forest management certified companies in Sweden, Finland and Germany between 2005 and 2020. The data was collected from audits which are available through the FSC database.....	44
Figure 5: Figure to show the number of CARs per meta-category for FSC forest management certified companies in Sweden, Finland and Germany between 2005 and 2020. Data was collected from audits which are available through the FSC database. ....	46
Figure 6: Figure to show the number of CARs per meta-category for the 10 companies with the greatest number of CARs based on FSC forest management audits between 2005 and 2020 in Sweden, Finland and Germany. Data was collected from audits which are available through the FSC database.....	47

## List of Tables

Table 1: Table to show all eligible companies who have a valid or terminated FSC FM certificate based on available data from the FSC database.....	22
Table 2: Conversion of each FSC standard's categories to the appropriate meta-categories.....	26
Table 3: List of databases used to search for legislation related to sustainable forest management, a brief description of the database and the organisation responsible for its upkeep. ....	27
Table 4: Table to show keyword search for each database to find relevant legislation. ....	27
Table 5: Table to show the meta-categories and example CARs from the dataset for each meta-category. ....	41
Table 7: A table to show the top and bottom 5 companies in terms of CARs for forest management non-conformities across Sweden, Finland and Germany between 2005 and 2020. Data was collected from audits which are available through the FSC database. ....	45

## List of Appendices

Appendix A: List of all companies that were used for CAR analysis in this research, information includes country of company, company name, FSC certification code, year of certification, year of termination, validity of FSC certification and the number of audits. ....	73
Appendix B: List of all companies that were excluded from CAR analysis in this research. Information includes country of company, company name, FSC certification code, year of certification, year of termination, validity of FSC certification and the number of audits. ....	77

## List of Abbreviations

ASI - Assurance Services International  
CAB – Conformity assessment body  
CAR – Corrective action request  
CoC – Chain of Custody  
DD – Due diligence  
EU – European Union  
EUTR – European Union Timber Regulation  
FAO – Food and Agriculture Organization  
FLEGT AP - Forest Law Enforcement Governance and Trade Action Plan  
FM – Forest management  
FMU – Forest management unit  
FSC – Forest Stewardship Council  
IGES – Institute for Global Environmental Strategies  
ITTO – International Tropical Timber Organization  
LoF – List of findings  
MCPFE – Ministerial Conference on the Protection of Forests in Europe  
NGO – Non-governmental organisation  
NSMD – Non-state market driven  
RAFT – Responsible Asia Forestry and Trade  
RSPO – Roundtable on Sustainable Palm Oil  
SFM – Sustainable forest management  
UNCED – United Nations Conference on Environment and Development  
USDA - United States Department of Agriculture  
VPA – Voluntary Partnership Agreement  
WWF – World Wildlife Fund for Nature

## Introduction

Globally, society and governments are starting to place a greater importance on the sustainable origin of products and the protection of natural habitats due to the historic over-exploitation of the planet's finite resources (Casey and Sieber, 2016). One of the sectors this has had the largest impact on is the forestry industry, and all the actors involved in its supply chains. The European Commission (2019a: p.1) identifies that *"forests cover approximately 30% of the global land surface and hosts 80% of its biodiversity"*. Due to the value of forests, researchers and conservationists, for decades have been highlighting the need for their protection and restoration (e.g. Ballick *et al.*, 1996; Lindenmayer and Franklin, 2002; Paulson, 2006; Arnold *et al.*, 2011). The European Commission (2020a) estimates that approximately 5% of the world's forests are situated within the European Union (EU), which equates to 182 million hectares of forests covering over 43% of the EU's land area (European Commission, 2020b). Beyond the EU, responses across the globe have attempted to address the degradation of forests, with many focussing on sustainable forest management (SFM), seeing it as vital to protect and restore forests (e.g. Prah, 1994; Contreras-Hermosilla, 1999; Lindenmayer *et al.*, 2000; Ghazanfari *et al.*, 2004; Wang, 2004; Von Gadow *et al.*, 2012). The Food and Agriculture Organization (FAO) defines SFM as a *"dynamic and evolving concept, which aims to maintain and enhance the economic, social and environmental values of all types of forests, for the benefit of present and future generations"* (FAO, 2020: p.1). However, unsustainable forestry practices, such as illegal logging and the over exploitation of natural resources, are common causes for forest degradation and still frequently occur (Laveshova, 2011). The impacts of these activities also go beyond just environmental impacts, with social problems being closely linked to poor forestry practices (Hirakuri, 2003). Moreover, forests provide more than just environmental benefits, they provide important social and cultural links while also providing employment for over 3.9 million people in Europe alone (Csóka, 2003; Lehtonen *et al.*, 2003; Blackman *et al.*, 2013; Halalisan *et al.*, 2016; Romero and Putz, 2018; Forest Europe, 2020). In order to protect this sector, and those people who depend on it, SFM is vital to ensure the continued health of European forests.

In order to understand how well SFM practices are upheld in the forestry sector, the logging industry will be examined. This is due to the fact that logging by its very nature is a destructive activity which involves the felling of trees. Logging can be defined as *"the process of cutting and processing trees to produce timber and pulp to supply the world's markets for furniture, construction, paper and other products"* (Global Forest Atlas, 2020: p.1). The scale of logging processes varies from individuals who harvest wood for fuel to large-scale commercial operations. As such, the sector encompasses a vast range of stakeholders and different practices employed due to the specific owner of a forest management unit (FMU). In Europe the most common primary designation for forests is production and this mainly refers to wood but can also include non-wood products, such as acorns, pine nuts and berries (European Commission, 2011). Again, this further highlights the extent to which forestry is embedded in forests across Europe and reinforces the need for sustainable practices to be guaranteed. There are various measurements which are used to assess the scale of the logging industry, but one common method is to measure roundwood production. This is defined as *"all quantities of roundwood which is removed from the forest or other felling sites and stripped of the bark (under bark)"* (European Commission, 2011: p.30). Data from the FAO suggests that the EU accounts for 19.15% of all roundwood production globally, and the volume produced is steadily increasing annually – in 2018 the total amount of roundwood produced in the EU exceeded 500 million m<sup>3</sup> for the first time in history (FAOSTAT, 2020). At the same time, there is a growing trend for non-state market driven (NSMD) governance systems to be adopted by private companies on a voluntary basis. As explained in more detail later on, NSMD systems attempt to provide private standards which are adopted by the market in order to reduce the negative externalities which have often been



associated with business activities (Bernstein and Cashore, 2007). This trend represents the changing dynamics between state authority and the growth of private autonomy to self-regulate without the need for state oversight (Cashore, 2002; Webb, 2002; Gereffi and Mayer, 2006; Gereffi and Mayer, 2010). This theory is gaining increasing relevance as the trend to decentralise power continues to grow and therefore the effectiveness of NSMD systems must be assessed as it becomes common place in ensuring sustainability commitments (Djogo and Syaf, 2003; Colfer, 2012). This is especially important as these systems which provide certification to companies are used by consumers as a mark that a company is operating in an environmentally, and socially, coconscious ways (Cashore et al., 2007). In the forestry sector there is no clearer example than the Forest Stewardship Council (FSC) who certify over 212 million hectares of forests globally (FSC, 2020a). The FSC has created their own SFM certification scheme which consists of 10 principles and 56 criteria. FSC forest management certification confirms that a “*forest is being managed in a way that preserves biological diversity and benefits the lives of local people and workers, while ensuring it sustains economic viability*” (FSC, 2020c). The way that certification is awarded is through audits which are conducted by an independent third party who assesses FMUs to determine whether or not adequate compliance is reached. Any non-conformities are noted down as a corrective action request (CAR). However, NSMD systems have traditionally been questioned based on loopholes within regulation, lax enforcement of standards and the ability for producers to shop for schemes which have lower thresholds for certification (Van der Ven et al., 2018). Consequently, this thesis attempts to understand the effectiveness of these voluntary standards in enforcing SFM practices, and with them becoming more popular within both the public and private domains it is becoming increasingly important to understand their strengths and weaknesses.

Moreover, this research will concentrate specifically on logging companies within the EU context. Based on the report *Forestry in the EU and the world: A statistical portrait* (European Commission, 2011) the three countries with the highest levels of roundwood removals in the EU were selected, namely Sweden, Finland and Germany. Within these three countries the FSC will be assessed to determine the effectiveness of NSMD systems at enforcing voluntary standards. While the FSC has been assessed in other countries (see Blackman et al., 2013; 2014; Hermudananto, 2017; Romero and Putz, 2018; Van der Ven et al., 2018) there is a much smaller body of literature available related to the European context (Halalisan et al., 2016). Therefore, this research will contribute towards the European context which has been underrepresented in relation to other global regions. Additionally, the findings presented throughout this thesis will provide additional insights into the wider discussion of the suitability for NSMD governance systems to be used in place of binding legislation imposed by local, national or supranational institutions.

## Research Aim

The aim of this research is to assess how effective NSMD systems are at enforcing their standards. In this research specific focus will be placed on the FSC standards and regulations. To understand the level to which the FSC enforces their standards firstly the ‘bare minimum’ must be identified. In the case of this research the ‘bare minimum’ will be defined as EU and national laws which logging companies must comply with in order to legally operate. The primary aim of this research is to improve reduce the knowledge gap in regards to the effectiveness of the FSC within Europe while also looking more broadly at the discussion surrounding the ability of NSMD mechanisms to ensure companies comply with their regulations (Maletz and Tysiachniouk, 2009; Cubbage et al., 2010; Blackman et al., 2013; 2014; Halalisan et al., 2016; Hermudananto, 2017; Romero and Putz, 2018). With minimal research focussing on the effectiveness of the FSC in the European context (see Halalisan et al., 2016) this research attempts to broaden the knowledge within the region and allow for recommendations

to be provided on how NSMD regulations can be improved to strengthen the enforcement of SFM practices.

### Research Question

The degree to which the FSC's forest management certification scheme is effective at ensuring the compliance of voluntary sustainable forest management standards in Europe?

The FSC has been selected as the organisation for this thesis because it is one of the first, and most well-known, examples of NSMD governance systems and has operated for 26 years. During this time its certification has spread to 89 countries globally (FSC, 2020c). Consequently, it is a highly influential SFM certification system with its label commonly linked to the perception to sustainable forest practices. However, to ensure that the integrity of the standard is upheld it is important to understand how effective

*SQ1: What is the 'bare minimum' requirements that logging companies in Sweden, Finland and Germany must adhere to?*

SQ1 will attempt to identify the legal 'bare minimum' at both the European and national level. This will be vital in understanding how much higher the FSC's standards are than those provided by existing legislation set by states. By understanding the 'bare minimum' it will create and understanding of any inherent shortcomings within national and international legislations and highlight potential opportunities for the FSC to create more robust SFM regulations. Moreover, this will allow for an understanding of where state regulation ends, and private governance begins.

*SQ2: What is the FSC's history and structure?*

SQ2 will outline the history of the FSC to generate a clear understanding of their history and structure. By examining the principles on which the FSC was founded it is possible to better understand why the FSC has certain fundamental values. As the FSC is one of the largest and oldest NSMD systems for the forestry sector it provides an interesting example of how non-state mechanisms are designed. This will allow for discussion about the appropriateness of NSMD systems at a larger scale to be undertaken.

*SQ3: How does the FSC award certification to companies?*

SQ3 will be used to identify the methods of certification that are utilised by the FSC. This allows for an assessment of the effectiveness of the FSC's certification system to be conducted, as to identify the strengths and pitfalls of a certification system it must firstly be understood.

*SQ4: How well does the FSC enforce its forest management certification scheme in order to ensure that companies comply with SFM practices?*

Once the operational systems within the FSC have been identified it is then important to understand how effective the FSC has been at ensuring the compliance of its forest management standard. SQ3 will attempt to achieve this through CAR analysis which is used to highlight non-conformities of companies that are either trying to achieve FSC certification or retain their existing certification. This will allow for an understanding of the level of compliance with these standards, with greater compliance resulting in lower CARs.

## Research Framework

The following chapter will identify the scientific and societal relevance of this research. The aim of this is to highlight the benefits that this research will provide for the scientific community and society.

### Scientific Relevance

This research will aim to add to the knowledge surrounding how effective the FSC is at enforcing their standards which are related to SFM. Current research has investigated how effectiveness of NSMDs before (Cashore 2002; Berstein and Cashore, 2004; Cashore *et al.*, 2007; Auld *et al.*, 2008; Cashore *et al.*, 2011) and concluded that due to the fact that these standards are driven by private companies, and the market as a whole, standards can lack the same levels of effectiveness as those set through state regulation. To compound this, most research that has been conducted which assesses the level of FSC compliance through CAR analysis has been conducted outside of the EU context (Maletz and Tysiachniouk, 2009; Cubbage *et al.*, 2010; Blackman *et al.*, 2013; Blackman *et al.*, 2014; Halalisan *et al.*, 2016; Hermudananto, 2017; Romero and Putz, 2018) with only a handful of studies focusing on the EU (Halalisan *et al.*, 2016). Additionally, research conducted by Buliga and Nichiforel (2019) suggests that there is a growing trend of non-compliance resulting in an increasing number of CARs being issued during audits. As such, this research will help to add knowledge to the wider debate on the effectiveness on the effectiveness of NSMD enforcement, while more specifically increasing knowledge in the EU narrative.

### Societal Relevance

Logging by its very nature is a destructive process involving the felling of trees (Putz *et al.*, 2008). Ideally, logging would cease all together to reduce carbon emissions. However, this is not a feasible solution as there are many economic and social interests and benefits that are linked to the logging industry such as local communities who depend on forests for their livelihoods (e.g. Buschbacher, 1990; Vogt *et al.*, 1999; Carle *et al.*, 2002; Cambero and Sowlati, 2016), and instead the rate of logging is increasing within the EU (FAOSTAT, 2020). As such, the current methods regarding logging must be assessed to ensure that they are safeguarding the future of forests and do not result in the degradation of forest quality. New certification systems, such as those offered by the FSC, are starting to be introduced in order to create more sustainable practices, with smaller negative impacts on forests (Pinard and Putz, 1997; Feldpausch *et al.*, 2005; Putz *et al.*, 2008). With these market-driven certification bodies now acting as voluntary regulatory bodies the question that needs to be answered is how effective they are at achieving their targets. As consumer demand for certified products increases, it is important to know if the bodies are making positive and meaningful impacts towards their sustainability objectives.

## Theory

This section will outline the main theories which were applied during this research. Firstly, non-state market driven (NSMD) system theory will be identified and reviewed to provide an overarching theoretical lens in which to ground this research. The results of this research will then be used to add to the debate surrounding NSMD system theory, specifically focussing on how appropriate it is as a replacement to state mandated legislation. Following this, a summary of historic forest management in Europe will be discussed to provide an outline of how SFM has developed within Europe over time. Once these trends have been identified, attention will then be placed upon contemporary SFM practices in Europe in order to facilitate a detailed understanding of the SFM movement within the EU context. Once SFM in Europe has been examined, the latter sections of this chapter will look to identify the levels of regulation which are experienced - this will include legislation at the European and national level. This, in turn, will enable the power dynamics between the EU and national legislative authorities to be identified and explain to which the EU supersedes national law. Following this, NSMD certification will be studied to enable an overview of the trends towards non-state governance, and then more specifically forest certification is described. Finally, the growth of green marketing will be discussed, and this will highlight the potential benefits that are associated with adopting NSMD governance systems.

### The Changing Perspectives of Governance in the Private Sector

The term 'governance' is one which has traditionally been associated with the idea of 'governing', a term often left to the jurisdiction of the state (Mayntz, 2003). However, more recently the idea of governance has transitioned away from this traditional view to a new meaning, and it is this new understanding of the term governance, that will form the theoretical lens of this research. Instead, governing will be defined as:

*"the totality of interactions, in which public as well as private actors participate, aimed at solving societal problems or creating societal opportunities; attending to the institutions as contexts for these governing interactions; and establishing a normative foundation for all those activities"* (Kooiman, 2003: p.4).

In other words, governance attempts to bring together a collection of different organisations and institutions from the public, private and third sector in order to create solutions for social issues. Governance is then *"the totality of theoretical conceptions on governing"* (Kooiman, 2003: p.4).

Private governance then, is one step beyond the ideas outlined by Kooiman (2003). Non-state actors have featured significantly in research from political scientists in regards to the role they play in agenda setting, lobbying, and international agreements (Weiss and Gordenker, 1996; Raustiala, 1997; Arts, 1998; Keck and Sikkink, 1998; Rowlands, 2001; Pattberg, 2005a). However, while this research has focussed on the joint partnerships which have traditionally been present within the governance sphere it has ignored the growth of governance systems which have become institutionalised within the private sector, and that no longer rely on governments or international agencies (Pattberg, 2005a).

Since the mid-1990s there has been significant focus placed on the emergence and rapid growth of *"self-regulating, market-based, and "private" regulatory regimes"* (Cashore *et al.*, 2007). Institutions now take it upon themselves to oversee tasks and duties that were traditionally exclusively reserved for state policy-making institutions. Instead, it is now becoming commonplace for this authority to be shared with business, environmental, and other interests which seek to influence policy (Clapp, 1998; Coleman and Perl, 1999; Cashore, 2002). One of the most notable aspects of this new form of governance are the attempts of these private regulatory regimes to minimise and control the negative

externalities that are often associated with economic activities (Gereffi and Mayer, 2006; Mayer and Gereffi, 2010). This is a significant departure from the traditional state control seen by Mayntz (2003), with the private sector, and more specifically consumer decisions, now shaping the way sectors operate (Cashore *et al.*, 2007).

Private governance has rapidly proliferated into countless markets including forestry, fisheries, coffee, food production, and tourism (Cashore, 2002). These forms of private governance are often spearheaded by non-governmental organisations (NGOs) who are attempting to create better social and environmental regulations related to the production and sales of products (Cashore, 2002). While there is a plethora of literature on private governance which identified corporate social responsibility (CSR) (Vogel, 2005), industry self-regulation (Webb, 2002), political consumerism (Micheletti *et al.*, 2003) and public-private partnerships (Rosenau, 2000), there has been a lack of consensus over the role of non-state market driven (NSMD) governance systems (Bernstein and Cashore, 2007). This is because unlike other methods of private governance which try to operate on a voluntary basis, NSMD attempts to create rules which are binding and can be enforced - in other words, non-compliance results in repercussions such as removal from the certification scheme (Cashore, 2002; Bernstein and Cashore, 2007). Therefore, for this thesis NSMD systems will be defined as:

*“deliberative and adaptive governance institutions designed to embed social and environmental norms in the global marketplace that derive authority directly from interested audiences, including those they seek to regulate, not from sovereign states”* (Bernstein and Cashore, 2007: p.348).

These systems are based within global supply chains and attempt to track and label products and services which are identified to have originated from companies which are both environmentally and socially responsible (Bernstein and Cashore, 2007). NSMD systems can be defined through five key characteristics as highlighted by Bernstein and Cashore (2007).

Firstly, NSMD systems have no power given to them from the state in terms of policy-making power and have no accountability requirements to states. As noted by Cashore (2002), states still can have an important role through the provision of financial support and changing the legal environments within which NSMD systems operate (Bernstein and Cashore, 2007). Secondly, the aim of NSMD bodies is to enable collective action within which multiple stakeholders can come together to achieve a wider goal. This promotes the development of knowledge, inclusion, and adaptation to the challenges faced. While traditional forms of ecolabelling have a *“static measure of environmental quality a firm must adopt to receive certification”* (Bernstein and Cashore, 2007: p.349), NSMD systems attempt to provide democratic, open and transparent measures which adapt dynamically. Thirdly, NSMD systems gain authority from the supply chain of the market they are trying to improve. Producers can decide whether they wish to sign up to a NSMD certificate and consumers can actively look for companies which have been certified (Bernstein and Cashore, 2007). Fourthly, NSMD systems also attempt to change the status quo of market in the sense that they encourage private companies to make changes to their operations which they otherwise would have no incentive to do. Bernstein and Cashore (2007) also identify this as a deviation from other forms of private governance as NSMDs go beyond trying to standardise operations of private businesses in order to ensure that there is no grey area when it comes to compliance (Porter, 2007). Finally, NSMD systems aim to create rules and regulations which are enforceable, and that have visible repercussions for non-compliance. This in turn means that these systems can create their own mandatory standards for companies and organisations who sign up to NSMD certification schemes (Bernstein and Cashore, 2007).

These five key characteristics are what defines NSMD systems; however, there is still the issue of legitimacy. NSMD systems cannot rely on appealing to a company's strategic interests for continued

compliance (Meidinger, 2006), so the question remains as to why NSMD systems are adopted by companies. While traditional sovereign states have legitimacy, and international organisations are given legitimacy by sovereign states, NSMD systems must aim to achieve political legitimacy (Suchman, 1995; Bernstein and Cashore, 2007). Political legitimacy requires “*institutionalized authority (whether concentrated or diffuse) with power resources to exercise rule as well as shared norms among the community*” (Bernstein and Cashore, 2007: p.351). Moreover, without political legitimacy NSMD systems cannot gain traction within a market and thus cannot have effective implementation.

However, there are also critiques of NSMD systems which must be addressed. A significant proportion of academic literature focuses on countries outside of the EU. Consequently, this cannot provide information, which is directly relevant to the countries in question, however, the research does identify fundamental concerns with NSMD systems as a whole which is important. Firstly, NSMD systems have historically been linked with a lack of clarity regarding the language used within standards. This leads to loopholes which can be exploited by companies to avoid having to comply with certain standards (Van der Ven *et al.*, 2018). One example of this is identified by Greenpeace (2008) who highlighted that United Plantations was using subsidiaries to clear peatlands while operating under the certification of the Roundtable of Sustainable Palm Oil (RSPO) - a certification scheme for sustainable palm oil which attempts to prevent deforestation (RSPO, 2020). Additionally, when these violations are identified, responses have often been slow and companies rarely face sanctions (Van der Ven *et al.*, 2018). While these issues are associated with another NSMD system, similar scenarios have been linked to the FSC. One example of this was in Indonesia in 2019 when Auriga Nusantara (and Indonesian environmental NGO) officially filed a complaint with the FSC regarding the violation of sustainability commitments by PT Fajar Surya Sawadaya and PT Silva Rimba Lestari (Jong, 2019). Here the FSC were accused of not acting upon information provided by Auriga Nusantara and other NGOs which confirmed this deforestation was taking place, and even after the initial complaint was submitted it took over two months for the FSC to respond (Greenpeace, 2019b; Jong, 2019). Beyond loopholes and slow responses from certification organisations, there is also the issue of unequal geographic distribution of certified companies, with the majority being located in the global north. Evidence, as noted by Pattberg (2005b) suggests this is due to the fact that companies in the global north have more established infrastructure, which is not always the case in other regions, and thus greater levels of systemic change are required to achieve certification in the global south.

Another critique to the design of NSMD mechanisms is that by their very nature they are voluntary, and thus enable companies to opt in and out depending on their needs. As highlighted previously in this section NSMD systems gain authority from the markets they are trying to improve, however, as more standards are being developed in each sector it increases competition. As such, producers can “forum shop” in order to select standards which are less stringent, while still providing sustainable certification (Fortin and Richardson, 2013; Van der Ven *et al.*, 2018). This in turn reduces the impacts that certification can have on changing production patterns. Finally, auditors also have an intrinsic dependence on companies. Auditors are paid, and hired, by the company who is undergoing an audit and as such it can create a conflict of interest for the auditing company. If an external auditing company has repeat clients which may eventually lead to them becoming dependent on a specific company for revenue and as such they may be more likely to overlook non-conformities which may jeopardise future business (Van der Heijden, 2017; Van der Ven *et al.*, 2018). Due to these issues which are associated with NSMD governance it is therefore important to assess how effective the FSC is at ensuring their standard is being enforced well and that logging companies are meeting the SFM standards.

## Sustainable Forest Management

### History of Forest Management

Development of civilisations and the preservation of forests are often seen as oxymoronic in nature. As humans have developed through the centuries our consumption patterns have changed, and thus the amount of land required for civilisation has increased (Michalak, 2020). In Europe this issue has become especially acute since the Neolithic period as humans started to shift away from traditional hunter gatherer civilisations to ones which started to engage in primitive agricultural practices (Michalak, 2020). As populations across the continent increased, and the size of settlements grew, there was greater pressure placed upon forests at the local level. This is because forests were considered as valuable sources for fuel, tools and building materials (Michalak, 2020). As a result of this activity, deforestation across the continent started to accelerate, although it did not occur in a uniform pattern. Initially Central Europe was the epicentre of intense deforestation practices, however, North-Eastern Europe became more intense later into the medieval era (Michalak, 2020). Due to technological limitations and the delayed impacts of climate change there was minimal literature which related to the consequences of climate change, and only recently have scientific reports fully understood the impacts that deforestation had on climate during this time (Kaplan *et al.*, 2009). In comparison, in the present day there is a plethora of information available regarding the impacts of deforestation globally (e.g. Wunder and Sayer, 2000; Barbier and Burgess, 2001; Rolett and Diamond, 2004; Kuvan, 2010; Lawrence and Vandecar, 2015). The consequences of deforestation practices meant that by the end of the Middle Ages forests covered less than 10% of the continent, in comparison to 80% at the beginning of the Common Era (Michalak, 2020). Figure 1 identifies this trend of deforestation which continued to occur until the 18<sup>th</sup> Century and has been attributed to the factors highlighted above.

From the 1800's onwards the levels of deforestation in Europe levels out, as highlighted in Figure 1. This is predominantly due to the change in understanding that forests were a finite resource which take time to regenerate and as such must be managed in a better way (Ferrell *et al.*, 2000; McGrath *et al.*, 2015; Michalak, 2020). Moreover, Michalak (2020) notes that the predominant reason for the restoration of these forests was to protect economic interests, but it was still the first concrete form of forest management. An example of these economic benefits is highlighted by Smout (1997) who identified that forests in Scotland had significant economic value when protected as they could be turned into "deer forests" which were managed for the benefit of sport hunting.

While Figure 1 also shows deforestation occurring in North America and the Tropics these have been to lesser extents. In North America, for example, forest areas declined from around 60% of the total area to almost 30% in the 1900s. However, in recent years there has been an increase in forest cover, with it returning to around 50% and the upward trend can be seen to continue. This is in part due to over exploitation of forests leading to economic concerns (Cunningham, 2007), in addition the creation of protected forests by the United States Department of Agriculture (USDA) has been seen to help restore a large amount of forests across the United States (Dumroese *et al.*, 2005).

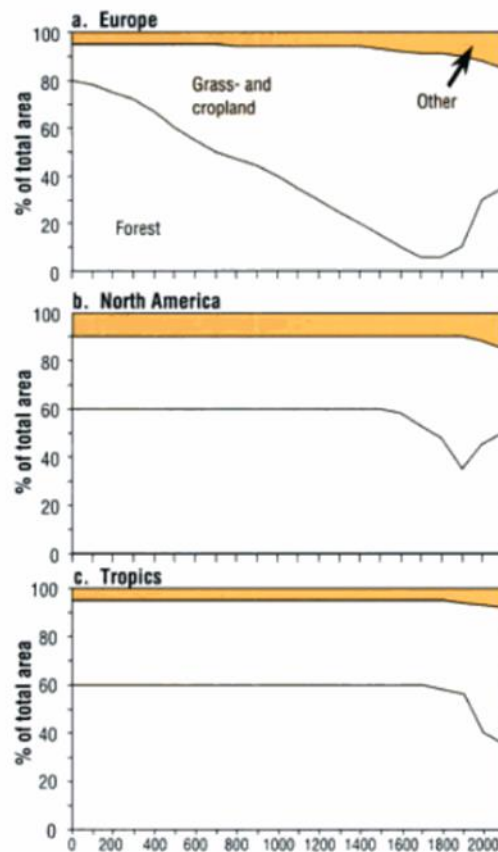


Figure 1: Indicative figure displaying historical changes in land use in three world regions from 0 A.D. - 2000 A.D. (IPCC, 2001).

## Contemporary Sustainable Forest Management

While SFM is not a new phenomenon and has been occurring for centuries during the last few decades of the 20<sup>th</sup> century there were significant changes to the way SFM was defined due to the growth of sustainable development (Rametsteiner and Simula, 2003). One of the clearest examples of this has been the development of United Nations Conference on Environment and Development (UNCED) which was formed in 1992 and resulting from this multiple national, and international organisations and bodies have been developed to try and better monitor the usage of natural resources (Rametsteiner and Simula, 2003). Specific to Europe, major changes have occurred which have attempted to create a more holistic understanding of SFM within the wider discussion of sustainable development which have been led by the Ministerial Conference on the Protection of Forests in Europe (MCPFE). The MCPFE was originally created to address the concerns of forest degradation across Europe and the potential impacts that this would have (Buck *et al.*, 2000). Since its introduction the MCPFE has grown significantly and now has 44 European states and the European Community who actively use this platform to promote common views on effective SFM policy and commit to targets periodically (Rametsteiner and Simula, 2003). Additionally, in 1993 at the 2nd Ministerial Conference there was a common definition accepted of what SFM was within the European context. The result of this conference was that European signatories agreed that SFM is:

*“Sustainable management means the stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential*



*to fulfil, now and in the future, relevant ecological, economic and social functions, at local, national, and global levels, and that does not cause damage to other ecosystems” (Helsinki Resolution, 1993: p.1).*

This commitment was significant and has since been further developed. The use of indicators has been crucial in assessing the progress of SFM and have changed significantly over the years as technology has developed (Rametsteiner and Simula, 2003). These conferences have continued with countries reasserting their commitments to the protection of forests with the most recent being the 7<sup>th</sup> Ministerial Conference held in Madrid in 2015 (Forest Europe, 2020). The topics have continued to evolve as knowledge and research surrounding SFM values develops. The most recent Conference focused on certain high priority topics such as *“the enhancement of the social functions of forests and the potential role of forests in the transition to a green economy; the protection of forests in a changing environment; the need to address global challenges related to forests at the regional level and the future directions of the FOREST EUROPE process”* (Forest Europe, 2020).

These commitments have also helped to pave the way for NSMD certification to be a suitable replacement to government legislation. As changes to forestry standards are more frequent, and easier than changing entrenched legislation, it allows for greater flexibility and less stagnation regarding the relevance of forestry regulations. However, while the adoption of certification systems has been growing there is the risk that contemporary forest management systems rely too much on voluntary standards and not enough on binding legislation at the national or intranational level (Kiekens, 1995). In addition, SFM is often seen as a financial disadvantage due to the slow growth rate which is present in many of the natural forests globally. An example of this is the preference for “cut and run” options which are often more profitable on the shorter term by liquidating all available timber in a specific stand (Howard et al., 1996; Contreras-Hermosilla, 1999). Moreover, there are also discrepancies in what value is placed on specific objectives related to SFM, with these varying depending on specific stakeholders and region. Consequently, there can be significant differences between what SFM means in actuality which causes tensions when determining what to prioritise; the timeframe in which to achieve changes; and how objectives can be balanced (Contreras-Hermosilla, 1999). Building on upon this, research by Brandt *et al.* (2016) identified that compliance with SFM policy in the Republic of Congo resulted in higher levels of production and increased levels of deforestation. This suggests that SFM does not automatically result in desirable environmental consequences, and that there are complex contributing factors which must also be addressed in order to achieve meaningful sustainable forestry.

## Outline of the Levels of State Governance

While there are various levels of governance, this thesis will focus on two levels namely the European and the national level. This will allow for an understanding of what rules are set by the EU and how national governments further this through their own policies. Another key point of legislation is the level of ambiguity present. Law by its very nature is a combination of words which set out rules. However, as noted by Schane (2002) and Farnsworth *et al.* (2010) there are inherent issues with law which means that multiple meanings of the same law can occur. This can then lead for different action to occur as a result of the same law.

## European Law

There is a complex array of regulations which companies must adhere to in order to operate legally within European countries. There is a strict hierarchical structure in place with regards to laws and regulations, with European law (Publications Office of the European Union, 2020a) and the European precedence principle (Publications Office of the European Union, 2020b) superseding laws set at the

national level. This first officially came into effect in 1964 during the case of *Costa vs. Enel* (Publications Office of the European Union, 2020b). It can create a complex relationship and it has been seen by some as a threat to the “*safe havens of national identity*” (Barents, 2009: p.421) as it can impose a European super-state. However, regardless of how EU law is perceived by individuals, its objective is to allow for a uniform interpretation and implementation to ensure that the law’s full effects are achieved (Barents, 2009). EU law, both written and unwritten, can therefore be seen as complete and unconditional. EU countries must apply EU law in all situations regardless of whether national rules were adopted prior to or after an EU law was passed (Barents, 2009).

### National Law

As briefly mentioned in the section above, national law is the second highest level of legislation after EU law. In Europe if there is not an EU law or directive in place then national law is the next level of absolute power. These are, of course, country specific and are at the discretion of the legislative powers within a specific country. These laws also do not have to agree with EU law; however, EU law is given priority over national law (Barnets, 2009). National laws will vary by country, and in the case of this research Sweden, Finland and Germany will all have different policies which place specific focus on unique aspects providing different platforms for SFM.

### Certification Schemes

The final level of authority which we will identify in this section is certification schemes. These consist of voluntary, NSMD trends within economic and political spheres and have rapidly grown since the 1990’s (Rosenbaum, 1995; Tollefson, 1998; Harrison, 1999; Cashore, 2002; Cashore *et al.*, 2003). In the last two decades there has been significant attention from international relations and comparative public policy schools that have focussed on the emergence of these self-regulating, market driven, and privately managed regulatory regimes (Cashore *et al.*, 2007). These regulatory bodies have developed due to failures of national and international regulations regarding social and environmental issues (Howlett, 2000; Haufler, 2001; Gunningham *et al.*, 2003; Hay *et al.*, 2005; Bernstein *et al.*, 2007). NSMD systems are unique from other forms of voluntary systems because they aim to create binding and enforceable rules (Cashore, 2002). As Bernstein *et al.* (2007) eloquently states “*NSMD systems are defined here as deliberative and adaptive governance institutions designed to embed social and environmental norms in the global marketplace that derive authority directly from interested audiences, including those they seek to regulate, not from sovereign states*” (Bernstein *et al.*, 2007: p.348). The audiences that Bernstein *et al.* (2007) refers too include NGOs and other environmental groups who provide upward pressure. This has consequently resulted in certification schemes that encourage private business to go beyond the legal requirements set out by law, and instead to strive for greater levels of accountability and environmental protection (Auld *et al.*, 2009).

Beyond forest management, NSMD certification schemes have spread to almost every commercial sector across the globe and are continuing to grow in their percentage share of each market – even though they have a relatively small market share currently (Cohn and O’Rourke, 2011; van der Ven, 2015; van der Ven, 2018). To further support the growth of these certification schemes many lead firms in buyer-driven value chains are making it entrenched in business policy that suppliers must meet minimum sustainability standards (Agrawal *et al.*, 2011). Even with the adoption of these standards across supply chains forested areas are still declining globally, while agricultural areas continue to rise (Alexander *et al.*, 2015).

### Forest Certification

Forest certification can be dated back to the 1990s when it was originally introduced to try and provide assurances to the public amid concerns over tropical deforestation (Rametsteiner and Simula, 2003;

Auld *et al.*, 2008). The result of deforestation was a loss of biodiversity and the perceived poor forest management practices that were being employed in tropical regions. The attention NGOs placed on market mechanisms in relation to forestry increased following the failures of the UN Conference on Environment and Development in Rio de Janeiro in 1992 where the International Tropical Timber Organization (ITTO) refused to support a proposal to develop a system which ensured the sustainable management of forests (Bernstein and Cashore, 1999; Bernstein and Cashore, 2000; Cashore *et al.*, 2003). As a result of this failure, and general dissatisfaction with state-organised international action, a group of transnational groups which were led by the World Wide Fund for Nature (WWF) turned to the market for certification schemes to be created (Humphreys, 1996; Gale, 1998; Cashore *et al.*, 2003; Auld *et al.*, 2008). These would attempt to ensure that sustainable forestry was practiced, and incentives were created for private companies to become involved instead of the traditional approach which only resulted in boycotting (Cashore *et al.*, 2003). One of the most common tools that NSMD systems utilise is certification schemes which ensure that products meet specific requirements such as social and environmental standards. Certification schemes provide a form of third-party regulation which helps to ensure that standards are being maintained (Rametsteiner and Simula, 2003; Auld *et al.*, 2008). For sustainable forestry, certification is associated with the compliance of *“performance-based sustainable resource management standards developed by nonstate actors, such as environmental nongovernmental organizations (NGOs), industry associations, and social groups”* (Auld *et al.*, 2008: p.188). In 1993, and as a response to the 1992 Rio de Janeiro conference the FSC was created. Research which investigated FSC certification in Europe was conducted by Rametsteiner and Simula (2003) who reviewed 130 CARs from 32 FSC certified FMUs. The results of this research identified that the principal reason auditors fail FMUs was due to environmental and forest management issues. The lack of compliance with FSC standards further questions how seriously logging companies take SFM and how much authority the FSC has to enforce their standards.

When companies do not comply with regulations, they can be removed from the certification scheme. An example of the FSC exercising its power can be seen when looking at Romania. In 2015 WWF Germany filed an official complaint against *Holzindustrie Schweighofer GmbH* (FSC, 2017) claiming that the company was involved in illegal logging activities. While the complaint was filed in 2015, a news article published in The Guardian suggested that there had been a two-year investigation which identified officials as knowingly, and willingly, purchasing illegal timber (Vaughan, 2015). To add to this, the forest which was being harvested was virgin forest which has significant importance with aspects such as pristine natural habits and cultural heritage being key points for their protection (Veen *et al.*, 2010; Petritan *et al.*, 2013; Planton *et al.*, 2019). The FSC terminated their association with Holzindustrie Schweighofer GmbH citing that *“irregularities and illegalities in its timber trade operations and its reported involvement in illegal logging by its Romanian forest land enterprise, as well as on the additional information brought to the attention of FSC in January 2017 about the possible violation of Romanian timber measurement standards by HS”* (FSC, 2017: p.2). The decision taken by the FSC can therefore be seen as positive because they actively chose to disassociate themselves with companies which have breached their principles, effectively protecting the integrity of the FSC’s NSMD system. However, these practices were occurring for extended periods of time and have had impacts on the FSC’s aim to prevent illegal timber from entering their supply chain. In addition, all the FSC were able to do was disassociate themselves from Holzindustrie Schweighofer GmbH.

Since 1993 forest certification schemes have grown rapidly, with it becoming commonly accepted as a valuable tool to ensure that forests, and forests products, are meeting environmental and social standards and are attempting to improve sustainability efforts (Lewin *et al.*, 2019). The growth of major certification schemes has meant that larger amounts of forest are now covered by forest

certification. For example, the FSC has certified over 210 million hectares of forests in over 90 countries (FSC, 2020a). However, even though there has been significant growth in the uptake of forest certification it is predominantly limited to Northern Europe, North America, Australia and New Zealand (United Nations, 2018). With this being said, there are efforts in more tropical areas to increase the levels of SFM. One example of this is the Responsible Asia Forestry and Trade (RAFT) partnership, which is “a partnership of seven leading organizations” (Raft, 2020a). Some of the main partners in RAFT include the WWF, the Institute for Global Environmental Strategies (IGES) and The Nature Conservancy. However, previous research looking into the effectiveness of NSMD governance has shown that for many locations there has been little to no change in land use, and instead in countries such as Indonesia the rate of deforestation is increasing, while in Brazil and Cote d’Ivoire it remains constant (FAO, 2015).

## Methodology and Data Analysis

### Methods

This section will outline the main methods involved throughout this research, with both qualitative and quantitative data being used (Verschuren and Doorewaard, 2010). Firstly, the country selection will be explained and justified. Secondly, the selection process of each company is described, and the companies examined in this thesis are identified. Thirdly, the steps taken during the public policy analysis will be identified and the databases used will be outlined. Fourthly, content analysis will be conducted in order to describe the workings and the structure of the FSC. Fifthly, the method for identifying CARs will be highlighted. Finally, the methods for extracting data from CARs will be analysed.

This research will also use secondary data sources in order to assess the effectiveness of FSC certification at ensuring logging companies to comply with SFM practices. Secondary data has been selected as the primary form of data because the information required is already available from multiple databases.

### Country Selection

The countries which this research shall focus on are Finland, Germany and Sweden. They have been selected because in the 2018 report titled *Agriculture, Forestry and Fisher Statistics – 2018 edition*, which was created by the European Commission, it identified these countries as being the greatest producers of roundwood in Europe (Cook, 2018). As previously mentioned, roundwood is a common indicator to assess the levels of production in the logging industry and it is measured in m<sup>3</sup> to show total volume of production. Under bark roundwood is then a measurement of roundwood but excludes the external layer of bark from the measurements (Eurostat, 2020). This unit of measure was selected as it enabled all countries to be analysed as some countries, such as Germany, did not have information available for roundwood removals as a whole. As such, under bark roundwood provides a more holistic measurement scale to highlight the companies which have the greatest levels of production.

Moreover, three countries (Finland, Sweden and Germany) were selected as it would not be feasible to investigate all European countries within the available timeframe. However, by selecting the three largest producing countries it is possible to gain an insight into the trends of logging companies within Europe.

### Company Selection

After Sweden, Finland and Germany were selected, the next step was to select companies which operate within these countries. Company select was done through the FSC database search tool. Using this function, all companies that have either a valid, terminated, or suspended FSC certificate for FM were selected. FM is the main standard that the FSC uses to ensure that forests are being managed in a sustainable way and the standards directly relate back to the FSC's Principles and Criteria (FSC, 2020c). Once the companies which had this certificate were identified, they were then refined down through the filters available within the FSC database (available at <https://info.fsc.org/>) to include only those that have operations in Sweden, Finland or Germany. This allowed for companies which undertook logging operations in these countries to be identified. Appendix A shows the list of companies which have either valid, terminated, or suspended certificates within these countries and at least one audit report, and this formed the data pool of companies before additional exclusion criteria (which is mentioned below) was applied. As some companies did not have any audit information available or did not have audit information available in English these were also excluded from the data pool. While the absence of data is an interesting finding, all the companies that have no

audits available have had a terminated FSC certificate – in total 94 companies were excluded due to no audit information being available. Additionally, it is worth mentioning that the companies where there was no audit information available in English were excluded and this can create a potential for selection bias (Heckman, 1990). This decision was taken as effective analysis could not be conducted otherwise. In total, 18 companies were excluded due to this criteria. However, the data sample was of a significant size that this will not have had a large impact on the results. Appendix B displays the companies which were excluded from this research. Additionally, companies which had multiple certificates were kept separate as in multiple cases one of the certificates was now terminated and replaced by a new certificate or have slightly changed name during reapplication for FSC certification. In total, there were 97 companies (27 companies in Sweden, 13 companies in Finland and 57 companies in Germany) which qualified for CAR analysis to be conducted upon. Table 1 displays all companies which were deemed eligible for this research, these companies all have some record of FSC certification, either currently valid or in the past and also all have operations in at least one country out of Sweden, Finland or Germany.

Table 1: Table to show all eligible companies who have a valid or terminated FSC FM certificate based on available data from the FSC database.

Company Name	Country Name	Certificate Code	Year of First Certification	Year of Termination (if applicable)	Certificate Status
Ålands Skogsvårdsförening rf	Finland	<b>DNV-FM/COC-001385</b>	2016		Valid
Bergs Timber Production AB	Sweden	<b>DNV-FM/COC-001787</b>	2019		Valid
BillerudKorsnäs Skog & Industri AB	Sweden	<b>SA-FM/COC-006912</b>	2014		Valid
BillerudKorsnäs Skog & Industri AB	Sweden	<b>DNV-FM/COC-001532</b>	1997		Valid
Boliden Mineral AB	Sweden	<b>DNV-FM/COC-000122</b>	2009		Valid
Briestische Forstverwaltung GbR	Germany	<b>GFA-FM/COC-001767</b>	2009	2019	Terminated
Eskilstuna kommun	Sweden	<b>DNV-FM/COC-000175</b>	2009	2018	Terminated
Eskilstuna kommun	Sweden	<b>DNV-FM/COC-001703</b>	2018		Valid
Family Jalas' Forest	Finland	<b>SW-FM/COC-000163</b>	2001	2010	Terminated
FBG Nürnberger Land w. V.	Germany	<b>GFA-FM/COC-002051</b>	2011		Valid
FINSILVA OYJ	Finland	<b>BV-FM/COC-139460</b>	2018		Valid
Forst Baden-Württemberg AöR	Germany	<b>TUVDC-FM/COC-300011</b>	2014		Valid
Forstbetriebsleitung Adelsheim	Germany	<b>GFA-FM/COC-001945</b>	2009	2014	Terminated
Freie und Hansestadt Hamburg, Behörde für Wirtschaft, Verkehr und Innovation	Germany	<b>GFA-FM/COC-001128</b>	2004		Valid
Freiherr von Rotenhan'sche Forstverwaltung	Germany	<b>GFA-FM/COC-001413</b>	2006	2014	Terminated
Gemeinde- und Städtebund Rheinland-Pfalz (GStB)	Germany	<b>GFA-FM/COC-002585</b>	1999		Valid
Gemeinde Wehrheim	Germany	<b>GFA-FM/COC-001199</b>	2005	2010	Terminated
Gemeindeforstamt Aachen	Germany	<b>SGS-FM/COC-001421</b>	2003	2013	Terminated
Gemeindeverwaltung Schlangenbad	Germany	<b>GFA-FM/COC-002240</b>	2011		Valid
Gräflich von Bernstorffsche Betriebe	Germany	<b>GFA-FM/COC-002019</b>	2001	2014	Terminated
Grönt Paraply i Sverige AB	Sweden	<b>SA-FM/COC-001104</b>	2006		Valid
Gruppe Bad Vilbel-Karben	Germany	<b>GFA-FM/COC-002201</b>	2011	2012	Terminated
Gut Hohenhaus	Germany	<b>GFA-FM/COC-001193</b>	2005		Valid
Hatzfeldt-Wildenburg'sche Verwaltung	Germany	<b>GFA-FM/COC-001946</b>	2009	2019	Valid
Holmen Skog	Sweden	<b>DNV-FM/COC-000043</b>	2008		Valid
Holmen Skog AB, Group scheme	Sweden	<b>DNV-FM/COC-000044</b>	2008		Valid
Innofor Finland Ltd	Finland	<b>GFA-FM/COC-004091</b>	2019		Valid

Innofor Finland Oy	Finland	SW-FM/COC-004291	2009	2014	Terminated
Kommunalwald der Stadt Chemnitz	Germany	TUVDC-FM/COC-300016	2002		Valid
Koskis Gård	Finland	DNV-FM/COC-000672	2013	2017	Terminated
Kreisstadt Hofheim am Taunus	Germany	GFA-FM/COC-002822	2016		Valid
Landesbetrieb Hessen-Forst, Forstamt Dieburg	Germany	TUVDC-FM/COC-300018	2008		Valid
Landesbetrieb Hessen-Forst, Forstamt Dieburg (STAATSWALD)	Germany	GFA-FM/COC-002158	2011	2015	Terminated
Landesbetrieb Wald und Holz Nordrhein-Westfalen	Germany	GFA-FM/COC-002246	2011		Valid
Landesforst Mecklenburg-Vorpommern (Forstamt Radelübbe)	Germany	GFA-FM/COC-001211	2005		Valid
Landesforsten Rheinland-Pfalz	Germany	GFA-FM/COC-002381	2012		Valid
Landeshauptstadt Stuttgart Garten,- Friedhofs- und Forstamt // Abteilung Forsten und Service Betriebe	Germany	TUVDC-FM/COC-300026	2019		Valid
Landeswald Oberförsterei Reiersdorf [in Vertretung der Gruppe „Waldzertifizierung Uckermark“]	Germany	GFA-FM/COC-002025	2001		Valid
Landeszentrum Wald, Betreuungforstamt Naumburg	Germany	GFA-FM/COC-002047	2002		Valid
Landratsamt Heilbronn, Kreisforstamt	Germany	GFA-FM/COC-004012	2009		Valid
Landratsamt Schwäbisch Hall, Forstamt (für die Zertifizierungsgruppe Schwäbisch Hall)	Germany	GFA-FM/COC-002033	2002	2018	Terminated
METSÄ GROUP	Finland	BV-FM/COC-006964	2012		Valid
Metsänomistajan Sertifiointiryhmä, CareliaForest Oy	Finland	BV-FM/COC-155171	2020		Valid
Nacka Community Forests	Sweden	SCS-FM/COC-00022N	2000	2015	Terminated
OY STOCKFORS AB	Finland	DNV-FM/COC-001411	2017		Valid
Pancert AB	Sweden	DNV-FM/COC-001516	2011		Valid
Sala Kommun	Sweden	SA-FM/COC-001064	2005		Valid
SCA SKOG AB	Sweden	DNV-FM/COC-001886	1999		Valid
SCA Skog AB	Sweden	SGS-FM/COC-000518	2000	2005	Terminated
SCA Skog AB, Virke	Sweden	SCS-FM/COC-004109	2012	2017	Terminated
Schleswig-Holsteinische Landesforsten (AöR)	Germany	GFA-FM/COC-001048	2005		Valid
Skogscertifiering Prosilva AB	Sweden	SCS-FM/COC-00153G	2011		Valid
Skogssällskapets Förvaltning AB (SFAB)	Sweden	DNV-FM/COC-000045	2008		Valid
Skogsutveckling Syd AB	Sweden	DNV-FM/COC-000049	2008		Valid
Södra Skogsägarna ekonomisk förening, Södra Skog	Sweden	DNV-FM/COC-000170	2009		Valid
Stadt Aachen Fachbereich Umwelt	Germany	TUVDC-FM/COC-300017	2013		Valid
Stadt Bad Vilbel	Germany	GFA-FM/COC-001200	2005	2010	Terminated

Stadt Duisburg Umweltamt	Germany	GFA-FM/COC-001086	2003		Valid
Stadt Eltmann (stellvertretend für "Gruppe Franken")	Germany	GFA-FM/COC-002823	2010		Valid
Stadt Erkrath	Germany	GFA-FM/COC-002420	2018		Valid
Stadt Essen, Fachbereich 67 Grün und Gruga	Germany	GFA-FM/COC-001371	2006		Valid
Stadt Frankfurt am Main - Grünflächenamt - Abteilung StadtForst	Germany	TUVDC-FM/COC-300010	2014		Valid
Stadt Furtwangen	Germany	GFA-FM/COC-001442	2007		Valid
Stadt Hofheim am Taunus	Germany	GFA-FM/COC-001239	2005	2010	Terminated
Stadt Kehl	Germany	GFA-FM/COC-001412	2006		Valid
Stadt Kelkheim	Germany	GFA-FM/COC-001240	2005	2010	Terminated
Stadt Köln, Amt für Landschaftspflege und Grünflächen	Germany	GFA-FM/COC-001031	2001		Valid
Stadt Leipzig Amt für Stadtgrün und Gewässer	Germany	IC-FM/COC-100001	2013	2015	Terminated
Stadt Lychen	Germany	GFA-FM/COC-001360	2009	2018	Terminated
Stadt Münster - Amt für Grünflächen, Umwelt und Nachhaltigkeit	Germany	GFA-FM/COC-001212	2005		Valid
Stadt Pfullingen	Germany	GFA-FM/COC-001318	2006		Valid
Stadt Rastatt	Germany	GFA-FM/COC-001409	2007		Valid
Stadt Rosbach v.d. Höhe	Germany	GFA-FM/COC-001408	2007	2012	Terminated
Stadt Templin	Germany	GFA-FM/COC-001367	2006	2020	Terminated
Stadtforstamt Leipzig	Germany	SGS-FM/COC-002490	2006	2011	Terminated
Stadtforstbetrieb Höxter [in Vertretung der Gruppe Ostwestfalen-Lippe]	Germany	GFA-FM/COC-001389	2007	2018	Terminated
Städtische Forstverwaltung Bamberg	Germany	SGS-FM/COC-000559	2005	2005	Terminated
Stadtwald Gladbeck Ingenieuramt – Abt. Stadtgrün	Germany	GFA-FM/COC-002214	2011	2014	Terminated
Stadtwald Heidelberg	Germany	GFA-FM/COC-001863	2009		Valid
Stadtwald Meiningen/ Gemeindewald Untermaßfeld	Germany	GFA-FM/COC-001732	2009	2019	Terminated
Statens Fastighetsverk	Sweden	SA-FM/COC-001156	2000		Valid
Stiftens Egendomsförvaltnings Förening	Sweden	DNV-FM/COC-000046	2008		Valid
STORA ENSO OYJ WOOD SUPPLY FINLAND	Finland	DNV-FM/COC-000805	2014		Valid
Stora Enso Skog AB	Sweden	DNV-FM/COC-000066	2008		Valid
Sveaskog Förvaltnings AB	Sweden	DNV-FM/COC-000736	2005	2019	Terminated
Sveaskog Förvaltnings AB	Sweden	BV-FM/COC-008344	2009		Valid
Svenska Skogsföretagares Certifieringsgrupp	Sweden	DNV-FM/COC-000047	2008	2019	Terminated



Sydved AB	Sweden	<b>BV-FM/COC-015573</b>	2008		Valid
Thomas Weber (Gruppe Mittelbrandenburg)	Germany	<b>GFA-FM/COC-002009</b>	2000		Valid
Tornator Oyj	Finland	<b>DNV-FM/COC-000986</b>	2014		Valid
Universitätsforstamt Sailershausen	Germany	<b>GFA-FM/COC-001307</b>	2006	2011	Terminated
Universitätsstadt Gießen	Germany	<b>TUVDC-FM/COC-300027</b>	2014		Valid
Universitätsstadt Tübingen - Stadtwald	Germany	<b>TUVDC-FM/COC-300025</b>	2003		Valid
UPM-Kymmene Corporation	Finland	<b>DNV-FM/COC-001705</b>	2011		Valid
UPM-Kymmene Corporation - FM Group Scheme	Finland	<b>DNV-FM/COC-001706</b>	2012		Valid
Vida Skog AB	Sweden	<b>DNV-FM/COC-000279</b>	2010	2020	Terminated
Wald und Grundbesitz GmbH	Germany	<b>NC-FM/COC-030258</b>	2018		Valid

### Corrective Action Request Identification

Following from Blackman *et al.* (2013; 2014) the data was extracted from publicly available audit information from the FSC website (<https://info.fsc.org/>). Each of the 97 companies were assessed to identify audit documents which contain CARs. The documents available for the companies included annual audits, surveillance audits, due diligence publications (DD), chain of custody (CoC) certificates. However, following the methodologies of Blackman *et al.* (2013), Hermudananto (2017) and Romero and Putz (2018), CoC and DD information was excluded as it was not related to FM and go beyond the scope of this research. A total of 595 audits were identified within this research which were assessed to identify CARs. The information of each company and their relevant certificate codes is presented in Appendix A which displays the certificate codes allowing for identification of the relevant search page in the FSC database.

### Corrective Action Request Data Extraction

Once the 595 audits had been identified, the data regarding CARs then needed to be extracted. These audit documents were separated into two categories, with the first being audit reports containing List of Findings (LoF) and the other category containing all other documents. Only the first category was needed in this research as the LoFs contain the non-conformities and the associated CARs that are identified during the audit process. CARs are categorised into 'major' and 'minor' depending on how severe the non-conformity is. This data was also recorded in this research to highlight how common serious non-conformities are in comparison to less serious infractions.

One variation to the four meta-categories identified by Blackman *et al.* (2013; 2014) and adapted by Hermudananto (2017) and Romero and Putz (2018) which was included in this report is the addition of 'transparency' to meta-category 3. This was added to subcategory 3 due to the importance placed on it by the FSC (FSC, 2020g). In the previous studies (Blackman *et al.*, 2013; Blackman *et al.*, 2014; Hermudananto, 2017; Romero and Putz, 2018) CARs related to transparency were included but not made explicit within meta-category 3. Therefore, by adding transparency to the title of the meta-category it makes it explicitly clear that these issues are included within the category.

Once the four meta-categories were identified, the FSC standards, and their specific clauses, had to be converted so that the CARs could be assigned to one of the meta-categories. This was done to allow for standardised responses across difference FSC standards. A total of five standards were identified from the 595 audits investigated during this research. Four of these are national standards (namely FSC-STD-SWE-02-04-2010 (FSC, 2010a), FSC-STD-FIN-01-01-2010 (FSC,2010b), FSC-STD-DEU-04-2012

(FSC, 2012b) and FSC-STD-DEU-03-2017 (FSC, 2017b)) which attempt to closely match the general FSC Principles and Criteria. While these standards are similar, there are slight differences in wording for headings and as such will be kept separate in regard to the meta-category conversion. Table 2 shows how each of the five standards was converted to their respective meta-category.

Table 2: Conversion of each FSC standard's categories to the appropriate meta-categories.

Name of Certificate	Principle Number	Name of Principle	Meta-category Conversion	Certification Reference
FSC-STD-SWE-02-04-2010	1	Compliance with Laws and FSC Principles	3	FSC, 2010a
	2	Tenure and Use Rights and Responsibilities	3	
	3	Indigenous Peoples' Rights	2	
	4	Community Relations and Worker's Rights	2	
	5	Benefits from the Forest	1	
	6	Environmental Impact	1	
	7	Management Plan	4	
	8	Monitoring and Assessment	4	
	9	Maintenance of High Conservation Value Forests	1	
	10	Plantations	4	
FSC-STD-FIN-01-01-2010	1	Compliance with Laws and FSC Principles	3	FSC, 2010b
	2	Tenure and Use Rights and Responsibilities	3	
	3	Indigenous Peoples' Rights	2	
	4	Community Relations and Worker's Rights	2	
	5	Benefits from the Forest	1	
	6	Environmental Impact	1	
	7	Management Plan	4	
	8	Monitoring and Assessment	4	
	9	Maintenance of High Conservation Value Forests	1	
	10	Plantations	4	
FSC-STD-DEU-04-2012	1	Compliance with Laws and FSC Principles	3	FSC, 2012b
	2	Tenure and Use Rights and Responsibilities	3	
	3	Indigenous Peoples' Rights	2	
	4	Community Relations and Worker's Rights	2	
	5	Benefits from the Forest	1	
	6	Environmental Impact	1	
	7	Management Plan	4	
	8	Monitoring and Assessment	4	
	9	Maintenance of High Conservation Value Forests	1	
	10	Plantations	4	
FSC-STD-DEU-03-2017	1	Compliance with Laws	3	FSC, 2017b
	2	Workers Rights and Employment Conditions	2	
	3	Indigenous Peoples' Rights	2	
	4	Community Relations	2	
	5	Benefits from the Forest	1	
	6	Environmental Values and Impacts	1	
	7	Management Planning	4	
	8	Monitoring and Assessment	4	
	9	High Conservation Values	1	
	10	Implementation of Management Activities	4	
FSC-STD-30-005	1	General Requirements	3	FSC, 2018
	2	Responsibilities	3	
	3	Group Entity's Procedures	3	
	4	Informed Consent of Group Members	2	
	5	Group Records	3	
	6	Group Size	3	
	7	Multinational Groups	3	
	8	Monitoring Requirements	4	
	9	Chain of Custody	3	

## Public Policy Analysis

To find legal documents which are relevant for this study multiple databases were utilised. The reasoning for the use of multiple databases is that they all specialised in different national or European legislative documents. In total four separate databases were utilised to analyse policy information related to SFM, these were the *EUR-Lex*, *Finlex Data Bank*, *Lagrummet* and the *Gesetze im Internet* databases. Table 3 displays each of the databases selected as well as a brief description and information regarding the publisher of each database. Once the databases were selected, keywords were then used to search for relevant policy. These keywords were identified through the literature review process and are displayed in Table 4. Once the relevant legislation was selected it was then reviewed to deduce the key information relevant to the three questions extracted from Dunn (2015), namely *policy problems*, *observed policy outcomes* and *policy performance*.

*Table 3: List of databases used to search for legislation related to sustainable forest management, a brief description of the database and the organisation responsible for its upkeep.*

No.	Database	Description	Publisher
1	EUR-Lex	Provides up to date information on EU Law.	Publications Office of the European Union
2	Finlex Data Bank	Up to date legislative and other information for Finland.	Finland's Ministry of Justice
3	Lagrummet	Provides Swedish legislation, case law, international law and preparatory work	Swedish National Courts Administration (Domstolsverket)
4	Gesetze im Internet	All current federal laws freely available	The Federal Ministry of Justice and Consumer Protection and the Federal Office of Justice

*Table 4: Table to show keyword search for each database to find relevant legislation.*

No.	Database	Keyword
1	EUR-Lex	"sustainable forest management"; "illegal logging"; "forestry"; "EU timber"
2	Finlex Data Bank	"sustainable forest management"; "illegal logging"; "forestry"
3	Lagrummet	"sustainable forest management"; "illegal logging"; "forestry"
4	Gesetze im Internet	"sustainable forest management"; "illegal logging"; "forestry"

## Grey Literature

Additionally, grey literature was used to collect data on the current extent to which private businesses currently report on SFM. This information varied from public reports to news articles which helped to provide important contextual information to issues which otherwise were ignored. The data collected through this method includes articles from NGOs such as Greenpeace and the FSC, as well as news articles from environmental news sites (such as The Guardian and Mongabay). These sources were chosen as they provide additional literature beyond what academia provides and helps contextualise issues and support findings. Grey literature from the FSC included information from both their database and more widely publications, and news posts through their website. This allowed for the collection of relevant up to date information to be conducted on issues such as the termination of FSC certificates which is not available elsewhere. Additionally, information from organisations such as the FAO and the European Union was collected. This allowed for accurate statistical information as the databases here are regularly updated.

Content analysis was the primary method employed to collect this data. Content analysis allows for the identification of the artefacts mentioned above and is an important tool for social scientists (Neuendorf and Kumar, 2015). A benefit of this method is that it is non-invasive and is suitable for secondary data which is what was used throughout this research.

## Data Analysis

### Public Policy Analysis

Public policy analysis, as identified by Yanow (2000), attempts to assess the actions which must be taken by companies in order to comply with legislation and regulations. More specifically, it can be defined as a “*multidisciplinary inquiry aiming at the creation, critical assessment, and communication of policy-relevant information*” (Dunn, 2015: p.2). Moreover, this method is one which attempts to provide not only a greater understanding of policy, but it also looks into the processes used to create them (Dunn, 2015). As highlighted within the highly respected book titled *Public Policy Analysis* (Dunn, 2015), it is made explicitly clear that policy analysis offers a significant amount of flexibility for the research in terms of the scientific methods employed as long as the final knowledge produced is reliable in the sense that it accurately represents the information and the methods can be repeated.

Policy analysis is in part descriptive in the sense that it has links to the traditional social science disciplines which aim to explain the causes and consequences of policies (Dunn, 2015). However, public policy analysis can also be seen as normative due to the fact that it assesses what should occur based on the information present. Stone (2001) further develops this idea by assessing it as a collection of trade-offs between the end (desired consequences) and the means (preferred course of action).

Dunn (2015) identifies five types of policy-relevant information that policy analysis seeks to answer, which are as follows: (1) *Policy problems*; (2) *Expected policy outcomes*; (3) *Preferred policies*; (4) *Observed policy outcomes*; and (5) *Policy performance*. One of the key sections of this research will be to identify the ‘bare minimum’ for EU and national legislation. To achieve this Dunn’s (2015) five key areas of policy analysis will be applied to this research. These will provide both descriptive and normative information as highlighted earlier which can then be applied to understand how public policy creates the ‘bare minimum’ standards which companies must then adhere to (Yanow, 2000).

### Analysis of Corrective Action Requests

The FSC was selected for investigation because they are one of the largest certification bodies in Europe, as well as globally (Maesano *et al.*, 2018). Another reason for the selection of the FSC is that they provide freely available information through their database (accessible at <https://info.fsc.org/>) and provide clear standards on the requirements which must be met in order for FMU’s to achieve certification.

Corrective action requests will be another key analytical tool within this research to investigate how the FSC enforces compliance with its standards. During audits CARs are issued for non-compliance with FSC standards, and as such CARs provide an insight into how seriously logging companies take SFM beyond the ‘bare minimum’. CARs are issued by external, third-party, auditors to FMUs if they fail to meet the standards set by the FSC. CARs provide relevant information of the changes which must be implemented to existing procedures and operations in order to obtain a new certification or retain an existing one (Blackman *et al.*, 2017). There have been multiple papers which focus on the FSC and have used CARs as a tool of analysis. These include papers such as those by Nebel *et al.* (2005), Schulze *et al.* (2008), Blackman *et al.* (2013; 2014; 2017), Hermudananto (2017), Romero and Putz (2018). While these papers have used CARs to analyse the extent to which FMU’s breach FSC standards

the focus of these pieces of research have been outside of the European context. Consequently, this research will attempt to apply similar methods to those which are used by Blackman *et al.* (2013; 2014), Hermudananto (2017) and Romero and Putz (2018) but apply them to the European context.

Following from Blackman *et al.* (2013; 2014), Hermudananto (2017) and Romero and Putz (2018) the CARs were sorted into four meta-categories. These meta-categories aim to place the different CARs into one of four categories related to a specific topic. In the research by Blackman *et al.* (2013; 2014), Hermudananto (2017) and Romero and Putz (2018) these meta-categories were *environmental, social, economic/legal, and forest management*. As some CARs were not related to any of these issues (such as those related to Trademarks) these were excluded – this was also in line with the methods of Hermudananto (2017) and Romero and Putz (2018). The data collection was completed by 20<sup>th</sup> August 2020.

### Analysis of Grey Literature

Grey literature is a term which is used to describe and identify documents which are not published by commercial publication organisations (Haddaway *et al.*, 2015). Grey literature includes organisation reports, government paper and NGO publications and can provide extremely relevant information despite not having been formally published (Bernes *et al.*, 2013; Haddaway *et al.*, 2015). In addition to this grey literature can be used to validate other data (Benzies *et al.*, 2006), and outside of the public policy analysis that uses grey literature that is how the grey literature is mainly used in this thesis. However, grey literature does not have to undergo peer review in the same way as academic literature and as such can suffer from publication bias. This is when research is more likely to be published if it has significant results which concur with the intended goal of the research and as such non-significant research is under reported (Haddaway *et al.*, 2015). This can, in turn, result in issues being overestimated in their size (Jennions and Moeller, 2002).

### Limitations

The following section will aim to outline the limitations of this research. Firstly, due to time constraints more countries could not be evaluated. The more data that can be collected will always result in more detailed results surrounding a topic, which in the case of this research was the effectiveness of the FSC to enforce its standards. By selecting the largest countries in Europe for roundwood production the aim was to enable an understanding of trends experienced within these countries and more widely across Europe and this has been achieved. A total of 2625 CARs were identified, and this has enabled reliable trends to be identified.

Another limitation is one of CAR analysis generally. As identified by Hermudananto (2017) and Romero and Putz (2018) the audits are only conducted by a few auditors over a short period of time (4 – 8 days). This means that some non-conformities may be overlooked and not reported, and as such the actual level of compliance may be worse than what is represented through the data. Additionally, auditors all have different backgrounds, as previously identified, and with this comes different attitudes which can influence their assessments resulting in diverging opinions of the same FMU (Maletz and Tysiachniouk, 2009). To further this point, there are also unavoidable levels of subjectivity which are involved in the auditing process which can have impacts on the consistency of reporting (Dilley *et al.*, 2012). Finally, CABs rely on FMUs for business and as such there is pressure to maintain a balance between guaranteeing objectivity and ensuring that the FMUs remain clients (Hermudananto, 2017). Nonetheless, CARs provide an important quantitative measurement of the levels of compliance of FMUs that operate under FSC certification.

## Identifying the legal ‘bare minimum’

This section displays the key findings regarding the European Union’s policies which target SFM. The relevant legislation has been collected from the EUR-Lex database (identified in Table 4) and then European Commission archives have been used to provide additional information related to the policy identified.

### Contextual Overview of European Legislation, Communications and Regulations

European law is extensive in its reach with regulations not only effecting countries within the EU but also countries that wish to trade in the European market. The findings of this research suggest that there two key areas of SFM which the EU primarily focuses on, namely the ‘3-D’s of Unsustainable Forest Management’ and ‘Illegal Logging’. These key concepts are clearly important for the EU’s perspective of SFM (as identified in the Helsinki Resolution (1993: p.1)) and aim to help not only within the European context but on a global level (Brack, 2012).

Firstly, the ‘3-D’s of Unsustainable Forest Management’ are identified by the European Commission (2020a) as *degradation*, *deforestation* and finally *desertification*. *Degradation*, in this initial phase natural resources become damaged and this can either be as a result of unsustainable logging, such as the removal of trees in a nonselective, concentrated, way which results in the inability of forests to recover, or through competition and detrimental practices which can include mining, infrastructure, agriculture and the resettlement of populations (European Commission, 2020a). *Deforestation*, this stage occurs if degradation can exist in an unchecked form. In this stage, most of, if not all, forest cover is lost (European Commission, 2020a). If left undisturbed by human interference and the natural elements do not cause further erosion, then these areas can partially or fully recover to their former state. However, more often it is observed that pressures from other land uses prevent this restoration from occurring and results in permanent deforestation. *Desertification* occurs when the forest cover which was once prevalent has now mostly, or completely, disappeared. To compound this issue, climatic conditions, such as rain, wind or snow, intervene in a destructive way to degrade the condition of the soil (European Commission, 2020a).

Illegal logging refers to the “*harvesting of timber in contravention of the laws and regulations of the country of harvest*” (European Commission, 2020b). The European Commission links multiple negative impacts with illegal logging, these can be split into *economic*, *environmental* and *social* impacts. *Economic impacts* which specifically relate to the loss of revenue and other foregone benefits. Based on reports by the European Commission approximately 12-17% of timber entering the EU market is classified as suspicious (European Commission, 2007). If illegal logging was to be eliminated, then it would result in the EU increasing its domestic timber sales by approximately 5%. Therefore, based on estimates of softwood costing €70 and hardwood costing €200 per m<sup>3</sup> this would result in an increased revenue of €1.8billion per year (European Commission, 2007). *Environmental impacts* of illegal logging have severe negative impacts regarding deforestation, climate change, and biodiversity loss. Examples include the logging of national parks, and the illegal exploitation of wildlife. In addition to this, illegal logging can also increase the likelihood of forest fires (European Commission, 2007). *Social impacts* refer to land and resource conflicts which arise while local people can become disempowered with corruption and violence are issues which are strongly linked to the illegal exploitation of natural resources and armed conflict (European Commission, 2020b). Over longer periods of time, if left unaddressed, these impacts can manifest into the decline of livelihoods for forest-dependent people (European Commission, 2020b). Moreover, by preventing illegal logging these impacts can be mitigated as it means that there is greater transparency in the regions where timber is produced, and the policy aim is that issues such as though mentioned above are brought into the spotlight.

## EU Timber Regulation

With the key focal points of EU policy being identified in the previous section, this section will attempt to outline how they combine and are applied to EU policy. The key method employed by the EU to enforce SFM is through the *Forest Law Enforcement Governance and Trade Action Plan (FLEGT AP)*, *Council Regulation EC No 2173/2005* and *Commission Implementing Regulation EC No 1024/2008*. Within this action plan there are two prongs which attempt to work in unison to combat illegal timber globally. Firstly, there is the *EU Timber Regulation (EUTR)* and secondly there is the *Voluntary Partnership Agreements (VPAs)*. Both the EUTR and VPAs attempt to achieve the same goal of preventing illegal logging and improving forest governance practices. The main differences between the VPAs and EUTR is that the former focusses more specifically on countries external to the EU while the latter encompasses both countries within and outside the EU (EU FLEGT Facility, 2020a). Due to the nature of VPAs they are not relevant to this research as they focus on countries external to the EU, however, it is still worth briefly noting their functions as they form part of the wider FLEGT AP which is relevant to this research.

VPAs are a bilateral agreement between the EU and a non-EU timber exporting country which aim to ensure the legality of wood being exported from that country to the EU market (EU FLEGT Facility, 2020b). Each VPA is unique to the country which is attempting to sign the agreement. In these negotiations the EU acts on behalf of all member countries (EU FLEGT Facility, 2009). The agreements are voluntary for exporting countries, however when an agreement is reached and signed it becomes legally binding for both the exporting country and the EU. For a VPA negotiation to be successful there must be a Legality Assurance Systems (LAS) set up in the exporting country to ensure that timber is legal and there is transparency regarding its origin (EU FLEGT Facility, 2009). Currently there are seven countries which have successfully negotiated VPAs, these are Ghana, Republic of Congo, Cameroon, Indonesia, Central African Republic, Liberia and Vietnam.

The second area of the FLEGT AP which has a greater relevance to the countries being analysed in this research (Sweden, Finland and Germany) is the EUTR. The EUTR's aim is to counter the trade of illegally harvested timber, which in turn has the wider goal of improving the quality of forest management by improving the transparency of operations (Forest Europe, 2020). The EUTR attempts to achieve this by focussing on three key areas (1) prohibiting products being placed on the EU market if they are, or have been sourced from, illegal timber; (2) require that EU traders exercise due diligence when placing products on the EU market; and (3) keep records of both suppliers and customers to create a clear chain of custody. The key element which was introduced through the EUTR which has not been enforced before was the requirement of companies to exercise due diligence. This means that timber suppliers that are placing timber on the EU market for the first time (whether it has been imported or harvested within the EU) must have information regarding the source of the timber (this includes tree species, origin of the wood and confirmation that it complies with national laws and regulations) (EU FLEGT Facility, 2020). However, there has been a report by ClientEarth (2018) which suggests that the competent authorities have not been effective in enforcing the EUTR. The report continued to state that there is a variation in the level of enforcement across different EU countries which is not creating a level playing field for companies. Moreover, countries where enforcement is lax also negatively impacts the environment as companies are more likely to continue to violate the EUTR (ClientEarth, 2018). This means that some countries will have encourage more companies to set up logging if they are known to have less stringent enforcement of laws. Moreover, this is not only detrimental to the environment as companies know they can ignore legislation to a greater extent, but countries where legislation is stricter will also loose income which is generated through taxation as companies choose to locate elsewhere.

## National Legislation

### Contextual Overview of National Laws

Sweden, Finland and Germany all heavily rely on forestry for economic growth. Sweden provides 11% of the global timber supply, however it accounts for just 1% of the global forest cover (KSLA, 2012). In Finland, forests account for around 20% of Finland's export revenue which accounts to approximately €23 billion (Maa- ja metsätalousministeriö, 2020a). Forests in Germany cover 32% of the land surface (United Nations, 2019) and have a vast number of functions for both economic, environmental and social issues.

Sweden is a country which has relied on forests for economic, social and environmental benefits for centuries and has been instrumental in the nation's development. However, while forests were used as a form of development, historically, there were no reforestation measures in place which led to large proportions of Sweden's forests being depleted by the end of the 19th Century (Skogsstyrelsen, 2015). Similarly, Finland has a long history of using the forest for economic benefits and this has only increased since the 19th century when sawmills and the paper and pulp industries rapidly grew (Maa- ja metsätalousministeriö, 2020a). Germany also has a long history of forestry, however, there has also been a long history of attempted forest management. As highlighted by Radkau (1996), historic over-exploitation of forests led to concerns of 'forest famines', these fears in turn led to early forest management attempts which aimed to protect the environment while allowing for economic gain. All three countries heavily rely on forests and as such actively promote economically, ecologically, socially and culturally sustainable forest management (Bundesamt für Justiz, 1975; Ministry of Agriculture and Forestry, 2014; Skogsstyrelsen, 2015).

### Identification of National Laws

In Sweden the primary legislation related to SFM is the Forestry Act (Skogsstyrelsen, 2015), while in Finland two acts dictate sustainable forestry practices and are the Forest Act (Ministry of Agriculture and Forestry, 2014) and the Forest Damages Prevention Act (Ministry of Agriculture and Forestry, 2013). Finally, in Germany the Federal Forest Act is the overarching legislation which dictates how forests should be managed (Bundesamt für Justiz, 1975).

### Identification of the 'Bare Minimum'

Now that the legislation has been identified at the European and national levels it is important to explain how this regulation translates to the 'bare minimum'. The following section will identify the key areas of the regulations to provide a clear understanding of what the bare minimum entails. However, before this point it is important to note that legislation is vague. The language and targets are open to interpretation to a certain extent and because of this it makes it hard to pinpoint the exact meaning, and often multiple outcomes can be drawn by individuals depending on their background and objectives (Schane, 2002; Farnsworth *et al.*, 2010). Consequently, this means that the 'bare minimum' is an interpretation of the laws based on the knowledge of the researcher.

Therefore, at the European level the 'bare minimum' of legislation related to forestry is focused through the EUTR, *EU No 995/2010* (EUR-Lex, 2010). This regulation identifies three main areas of legislation, namely obligations of operators, obligation of traceability, and due diligence systems. Firstly, the obligations of operators refer to the responsibilities of traders before they place timber on the European market. *Article 4* explicitly states that the "placing on the market of illegally harvested timber or timber products derived from such timber shall be prohibited" (EUR-Lex, 2010a: p.23). Any timber that is placed on the EU market must be of legal origin, and this must be able to be proven if questioned. Other obligations of operators include the utilisation of due diligence systems when placing timber on the European market and the regular evaluation and maintenance of the due



diligence system by an established monitoring organisation. The requirements for these organisations are outlined in *Article 8* (EUR-Lex, 2010a), and also includes the criteria which a monitoring organisation must meet in order to apply for recognition with the European Commission. Following from this is the obligation of traceability which builds upon the due diligence system and states that traders can at every point along the supply chain identify *“the operators or the traders who have supplied the timber and timber products; and ... where applicable, the traders to whom they have supplied timber and timber products”* (EUR-Lex, 2010a: p.23). This information must then be kept for at least five years and can be provided to competent authorities on request.

The due diligence systems also consist of three main elements which are information, risk assessment and risk mitigation. Information refers to the need for operators to be able to provide information related to the timber and timber products, the country of harvest, quantity (either weight, volume or units), supplier details, documents confirming the timber products comply with national laws. Secondly, a risk assessment should be carried out to determine the risk of illegal timber entering the EU market based on (1) assuring that timber complies with applicable legislation, this can be done through certification or using other third-party certification schemes. (2) The prevalence of illegal harvesting of the specific tree species and (3) how common is illegal logging or other practices in the country (or sub-region) of harvest. These other considerations can include the likelihood of armed conflicts over natural resources. (4) Any sanctions that have been imposed by the UN Security Council or the Council of the European Union on timber imports or exports in the country of harvest, and finally (5) the complexity of the supply chain (EUR-Lex, 2010a). Risk mitigation then follows on from the risk assessment when there are potential risks which are identified. In these situations, additional information is required from the suppliers to ensure the legitimacy of timber. This addition of accountability is an effective way to make sure that purchases are official, and that deals can be traced easily. Moreover, this means traders themselves are more vigilant in ensuring the origin of timber from their suppliers.

Finally, while the European Commission is the body responsible for proposing legislation regarding the FLEGT AP, they have set up a separate group which advises the Commission when policy is being prepared. This body is called the ‘Expert Group on the EU Timber Regulation and the Forest Law Enforcement Governance and Trade (FLEGT) Regulation’ (European Commission, 2020f). In addition to this group, there are also Member States Competent Authorities who are responsible for enforcing the EUTR legislation and setting penalties for non-compliance within their respective country. In the case of Sweden the Competent Authority is the Skogsstyrelsen (Swedish Forest Agency), in Finland it is the Agency for Rural Affairs, and in Germany it is the Bundesanstalt für Landwirtschaft und Ernährung (Federal Agency for Agriculture and Food) (European Commission, 2018).

Below the European level is the national context. All three countries have similar objectives with their legislation that specifically focus on the importance of economic, social, environmental and cultural factors (Bundesamt für Justiz, 1975; Ministry of Agriculture and Forestry, 2014; Skogsstyrelsen, 2015). The Finnish Forest Act presents this in the clearest way stating that forest legislation focuses on *“economically, ecologically and socially sustainable management and utilisation of forests in order that the forests produce a good output in a sustainable way while their biological diversity is being preserved”* (Ministry of Agriculture and Forestry, 2014: p.1). All three countries highlight the importance of regenerating forest areas where felling has occurred, however there are differences in the timeframe to which this must occur. For example, Sweden states that regeneration activities to create new stands must begin immediately after logging has finished (Skogsstyrelsen, 2015). Finland, on the other hand, states that regeneration must occur within a timely manner after felling occurs and the timeframe which is identified through this is between 10 – 25 years after the termination of wood

harvesting (Maa- ja metsätalousministeriö, 2020a). Germany also states that afforestation should occur within a reasonable amount of time, however there is no indication as to what is considered reasonable. Moreover, forest managers in all countries must have detailed, up to date, plans on how they intend to manage the forests, including information about felling activities, any significant valuable natural resources which needs to be protected, and the management and use of forests. Additionally, in Sweden explicit importance is placed on Reindeer husbandry and must be considered in management plans by forest owners. This is not included in Finland or Germany's forest legislation and displays the importance placed on cultural practises. However, Germany does state the importance of cultural heritage and states that forests must also function as an archive of natural and cultural history (Bundesamt für Justiz, 1975).

Sweden and Finland also identify the responsibilities of the forest owner to ensure that insect damage does not occur to timber. This includes correctly storing timber when felled, with the Swedish Forestry Act stating that *"the Government, or public authority designated by the Government, may issue regulations for combating insect infestation in forests, for the processing of damaged trees, for the removal or storage of timber, and for other measures necessary to inhibit insect breeding grounds. Forest owners are responsible for ensuring that such measures are carried out"* (Skogsstyrelsen, 2015: p.3). The aim of this is to protect timber which has already been cut down and to prevent damage to existing stands. Germany on the other hand has no mention of the responsibilities of forest owners to manage insect threats within the Federal Forest Act. Examples of protecting timber include treating timber with approved protection products and storing in appropriate locations to prevent the spread of insects which cause damage to forests (Skogsstyrelsen, 2015). Again, the legislation on this topic is vague and while these claims are made there are no concrete methods directed which will help to achieve these targets.

All three countries also identify the authorities who are responsible for enforcing the legislation relevant to each company. In Finland the Ministry of Agriculture and Forestry is responsible for directing and developing legislation and policy which is related to forests as well as facilitates EU legislation being applied to the Finnish context. Additionally, the Metsähallitus (State Forests), the Natural Resources institute, and the Finnish Forest Centre operate under the guidance Ministry. The Finnish Forest Centre is a state-funded organisation which is also responsible for promoting SFM while providing advice for forest owners on the appropriate ways to manage forests. Additionally, they are responsible for collecting and sharing data related to forests in Finland and also enforcing the legislation regarding sustainable forestry (Maa- ja metsätalousministeriö, 2020c). Failure to comply with the Forest Act will result in a fine for 'forest infringement' (Ministry of Agriculture and Forestry, 2014) unless a more severe punishment is deemed necessary based on other law. In Sweden, the Skogsstyrelsen (Swedish Forest Agency) is responsible for enforcing the legislation set out in the Forestry Act (Skogsstyrelsen, 2015). Traditionally field evaluations have been conducted to assess the compliance of sites in terms of regulations, however, a focus is now being placed on the evaluation of the managerial systems of companies and organisations involved in the forestry sector (Skogsstyrelsen, 2015). If non-compliance is identified, either deliberately or through negligence, the result of this can be six-month imprisonment. The Federal Forest Act is set by the Federal Government in Germany and provides an overarching framework which is then applied at the regional level. As such, it is the responsibility of each region to appoint a competent authority which then is responsible for their specific geographic province. Companies are required by law to provide all relevant information to the relevant authorities upon request. If a company does not provide this information can face a fine of up to €10,000.

To conclude, the 'bare minimum' can be split into two levels – the EU and the national requirements. At the EU level, companies must ensure that timber entering the EU is legal and this is enforced through the EUTR which stipulates that traders (1) do not place illegal timber on the EU market; (2) conduct due diligence to identify the levels of risk associated with products; and (3) keep records of suppliers and customers for at least five years. However, concerns are raised over the way in which the EUTR is being enforced by competent authorities across Europe with certain countries taking harder stances than others. It is interesting to note that within the EUTR legislation (EUR-Lex, 2010a) it explicitly states that third-party certification companies can be used to certify the legitimacy of timber. This gives authority to NSMD systems such as the FSC who can provide this service to ensure that timber is legal and comply with national legislation. Moreover, this reinforces the importance of NSMD certification systems to be able to effectively enforce standards as the EU is trying to embed these organisations within policy. Below the EU level is the national level and at this point the level of ambiguity within the policy increases. Issues such as general statements and unspecific timeframes result in the potential for multiple interpretations of law to become present. However, at the national level there are common targets across all three countries as the overarching aims are similar, and the target for all is SFM. All countries state the need for afforestation after felling activities occur, with detailed forest plans being required to demonstrate how this will occur while protecting existing biodiversity. Additionally, Sweden and Germany place explicit importance on the protection of cultural heritage. Protection of forests from insects is also important to Sweden and Finland and forest owners must display ways in which they minimise the risk within their forest management plans. Finally, Finland and Germany explicitly state the financial implications for non-compliance with fines being up to €10,000, however in Sweden the repercussions can also include prison time. It is worth noting here that Finland did not specify a specific amount that a fine could be. Additionally, with the forest industry in these three countries being worth 22.9bn (European Commission 2020a) it can question the effectiveness that a fine of this scale might have on changing practices.

## The Forest Stewardship Council

This chapter outlines the key information related to the FSC. Firstly, background information will be provided surrounding the formation and objectives of the organisation. Secondly, non-compliances will be highlighted, and the methods employed for assessing non-compliance will be explained. Finally, the auditing practices will be outlined as it is a crucial part to fully understanding the certification process.

### Background Information on the FSC

The Forest Stewardship Council (FSC) was founded in 1993 following the failure of the 1992 UN Conference on Environment and Development to create a binding convention regarding deforestation and the promotion of SFM. The organisation was created by a plethora of different stakeholders, including the WWF, other environmental NGOs, timber traders, indigenous peoples' groups, forest worker organisations, and other stakeholders who aim to promote SFM (Auld *et al.*, 2008). The aim behind this project is to help promote *"environmentally appropriate, socially beneficial, and economically viable management of the world's forests"* (FSC, 2002: p.1). These terms are clarified further to mean that *"environmentally appropriate"* forest management aims to ensure that while the logging of forest products can occur *"the forest's biodiversity, productivity, and ecological processes"* are maintained (FSC, 2002: p.1). Socially beneficial forest management relates to both the individual and societal levels in order *"to enjoy long term benefits and also provides strong incentives to local people to sustain the forest resources and adhere to long-term management plans"* (FSC, 2002: p.1). *"Economically viable"* refers to the management of forests in a way that is *"sufficiently profitable, without generating financial profit at the expense of the forest resource, the ecosystem, or affected communities"* (FSC, 2002: p.1). While these aims have now expanded to include other issues such as a primary focus of reducing tropical forest loss and degradation as well as the rights of indigenous peoples, the originally aimed to improve the management of forests globally (FSC, 2015c).

The FSC Founding Assembly was held in Toronto in 1993 in Toronto, Canada (FSC, 2019). The headquarters of the FSC was originally located in Mexico, however, in 2003 it moved to Bonn in Germany. Financially, the FSC is funded predominantly through donations from a range of stakeholders, including charitable foundations, governments and companies as well as having membership fees and accreditation costs from certification bodies (Eden, 2009).

The FSC is a global organisation whose Board of Directors set standards which each national FSC branch must then comply with. The FSC is designed to be a democratic organisation in the sense that any policy, procedure or revisions to the 10 principle (see below) must be voted on at a General Assembly and requires a majority vote to pass (FSC, 2019; FSC, 2020h). These General Assemblies are held every three years and all members of the FSC are invited to attend, the Assembly is then divided into three chambers which represent social, environmental and economic interests with each chamber having one third of the total vote (FSC, 2019; FSC, 2020h). These chambers are then subdivided to allow for equal representation from the North and South. Additionally, the Board of Directors are elected through the same process at the General Assembly's and are charged with the day-to-day management of the organisation (FSC, 2019; FSC, 2020h).

The FSC operates, and relies upon, a certification system which attempts to ensure that sustainable forestry is being adopted in the timber industry. This certification scheme is that visually applied to help consumers have informed knowledge on the responsible practices that companies are expected to be undertaking while FSC certified (FSC, 2019).

The FSC is based upon 10 Principles and 56 Criteria which ensure that forests are managed in a sustainable way and must be met for certification to be achieved (Buliga and Nichiforel, 2019). These Principles are as follows: (1) compliance with laws, (2) workers' rights and employment conditions, (3) indigenous peoples' rights, (4) community relations, (5) benefits from the forest, (6) environmental values and impact, (7) management planning, (8) monitoring and assessment, (9) high conservation values, and (10) implementation of management activities (FSC, 2020b). The Criteria are then subdivisions within each Principle that enables smaller, more specific, conditions which must be met. Additionally, the FSC does not require constant perfection in regard to upholding the principles and standards as they accept that changes in cultural, social, economic and ecological spheres can cause temporary failures in compliance – however, these issues must be quickly solved (FSC, 2015a). These principles aim to cover a broad area of issues to ensure that companies comply with important legal, social, cultural and environmental considerations. The FSC states that *"laws alone are not enough to protect wildlife habitat, limit use of hazardous chemicals, and protect rivers, lakes and streams from harmful effects of destructive forestry"* (FSC, 2020j: p.1). Consequently, the FSC state that they go beyond the legal requirements to prohibit deforestation; protect wildlife habitats; protect water quality; tightly restrict the use of hazardous chemicals; ensure forests are managed at sustainable rates of growth and harvesting; protect rare, old-growth forests; and protect the rights of Indigenous Peoples (FSC, 2020j).

### FSC Certification Process

The FSC defines itself as a performance-based standard, and as such their Principles and Criteria explicitly state the requirements of certified members. To become FSC certified a company must pass an audit which is conducted by a conformity assessment body (CAB). CABs are third-party companies which perform main evaluation audits, annual surveillance audits, re-evaluation audits and verification audits which check to see if non-conformities have been resolved (Hermudananto, 2017). In countries where there are more than 20 FSC certificate holders an auditor cannot server as a member of the audit team for more than three consecutive audits of the same client. In countries with 11 to 20 certificate holders the same rule applies, unless there is a valid justification as to why this is not possible and can demonstrate how the auditor has remained impartial. For countries with 10 or less certificate holders it is recommended to rotate auditors (FSC, 2015). These regulations are put in place to protect the integrity of the FSC certification process by ensuring than an auditor does not become reliant on a specific client.

The FSC provides detailed information on how organisations should conduct themselves, including the importance of transparency in reporting (FSC, 2015b). These Criteria supplied by the FSC allow for an evaluation to be conducted into how successful the specific Principle is in an audit (FSC, 2015b). These set of Principles and Criteria provide the framework which is used by external auditors when deciding if an organisation is complying with FSC standards. If organisations adhere to this set of social, economic and environmental standards that is set out then FSC certification is given, and steps towards sustainable forest management are seen to be achieved (FSC, 2015b). These Principles and Criteria are *"generally independent of spatial scale and intensity of management activities"* (FSC, 2015b: p.8), meaning that they aim to be applicable to all scenarios and ultimately all certificated companies must comply.

The FSC does not conduct their own assessments of FMU's in order to determine whether or not they are complying with the forest management standards set by the FSC. Instead, this is the responsibility of CABs who act on behalf of the FSC to determine whether or not a FMU can receive certification. These bodies are required to comply with *FSC-STD-20-001* and *FSC-STD-20-007* which outline the requirements of CABs in order to ensure consistency, objectivity and fairness throughout the audit

process. Moreover, all CABs are checked by Assurance Services International (ASI) to ensure that they comply with the FSC standards. This is achieved through a combination of field and office audits (FSC, 2020i). ASI is an independent body who is appointed by scheme owners (in this case the FSC) and they are tasked with ensuring that CABs uphold a minimum standard and that there are no vulnerabilities within the certification process (ASI, 2020). To add to this, both the FSC and ASI are members of the ISEAL Alliance which is a global organisation for sustainability standards that audits both the FSC and ASI to ensure that they are adhering to standards related to the quality of standards and the impartiality and quality of auditing procedures (FSC, 2020g). FMUs must pay for audits based on a specific fee system which is designed by the CAB that audits, however, in line with *FSC-STD-20-001* this information must be publicly available (FSC, 2020g). Furthermore, this can lead to issues of competitive pricing for companies wanting to get more businesses as they must be selected by an FMU. Moreover, companies with lower audit costs will most likely be more popular with FMUs. This highlights the reliance that CABs have on FMUs to provide income as they must be hired by an FMU to conduct an audit and consequently receive an income.

An audit will usually consist of 2-4 auditors who have some form of background in a field such as ecology, sociology and forestry (Hermudananto, 2017). During these audits the auditors will conduct field visits, interview relevant stakeholders, and document reviews to systematically determine whether or no FSC standards are being adhered to (Hermudananto, 2017). This process usually takes between 4 – 8 days (Romero and Putz, 2018). Any non-conformities are noted down, and on the chance that individuals on the team disagree on whether there should be a CAR the primary auditor will make the final decision (Romero and Putz, 2018). On the final day of the audit the auditing team will present their preliminary findings to the FMU in a meeting. After this point the primary auditor is responsible for compiling all the information and producing the final report which is then reviewed by two independent reviewers (Romero and Putz, 2018). The final audit report is then sent to the FMU and a summary document and LoF (if applicable) of the audit is uploaded to the FSC's online database (<http://info.fsc.org/>). When a certificate is granted it is valid for five years, but requires an annual audit (Hermudananto, 2017).

CARs can be split into two categories, namely minor and major CARs. A CAR is classified as minor if *"it is a temporary lapse, or ... it is unusual/non-systematic, or ... the impacts of the nonconformity are limited in their temporal and organizational scale, and ... it does not result in a fundamental failure to achieve the objective of the relevant requirement"* (FSC, 2016: p.30). Major CARs are classified as fundamental failures which *"continue over a long period of time, or ... are systematic, or ... affect a wide range of the production, or ... affect the integrity of the FSC system, or ... are not corrected or adequately addressed by the client once they have been identified"* (FSC, 2016: p.31). Additionally, minor non-conformities must be resolved within 12 months of the audit results being presented to the FMU, while major non-conformities must be resolved within 3 months (FSC, 2016). If major CARs are identified an additional audit will occur 3 months later to determine whether or not appropriate changes have been made. If a minor CAR is not adequately resolved within the 12-month timeframe then it is upgraded to a major CAR. Furthermore, if five major non-conformities are identified in one surveillance evaluation then a certificate can be suspended. If major CARs are not solved within the 3-month period, then this can also be grounds for FSC certification to be suspended. A certificate can be reinstated if all major non-conformities have been corrected (FSC, 2016).

To summarise this section, the FSC is an organisation which provides an environmental standard which, when granted, highlights a specific company as a sustainable forestry business. The FSC uses external bodies called CABs to conduct the audits. These companies are overseen by an external organisation called ASI which ensures that CABs are operating within the set rules of the FSC. In

addition to this, both ASI and the FSC are members of ISEAL Alliance which oversees sustainable certification programmes to ensure that they are operating in a sustainable and legitimate manner. This complexity of supervision is to ensure that corruption, bias, and poor practices cannot impact the integrity of FSC certification. While this process is bureaucratic and not fully efficient, the aim is to ensure that all companies are trusted, and certification schemes do not lose their veracity. Audits by CABs consist of a small team of experts who will visit the FMU site to look for non-conformities. These non-conformities are split into major and minor CARs depending on how significant the issue is. This is subjective to the individuals who are conducting the audit and as such this can lead to some human errors as individuals may not agree on whether a non-conformity should be a major or minor deviation, or a deviation at all. However, in these cases the ultimate decision is down to the lead auditor. While this removes a split decision it still does not remove the possibility of bias in results due to the subjective nature of field auditing. Once the CAB has completed their audit, they provide a copy of the report to the FMU and upload a summary version and a LoF to the FSC database.

## CARs in Practice - The Case of Sweden, Finland and Germany

With the previous chapter of this thesis outlining the way in which the FSC is organised, the certification process, and the ramifications for non-compliance this chapter provides an applied case study to see how effective the FSC has been at enforcing SFM practices. The aim of this section is to display the extent to which companies comply with FSC certifications. The purpose of this chapter is to provide quantitative evidence which shows how effective the FSC has been at ensuring compliance with their rules and standards. If companies fully comply with the FSC's regulations, then the expected result is that no CARs would be identified. However, a total of 595 audit documents were identified across 97 companies and resulted in 2625 CARs which highlights that in fact companies are not complying with FSC standards. This chapter then attempts to break down the CARs to highlight trends across the dataset. Firstly, an overview of the CARs is presented to give a wider understanding of non-compliance across FSC certified companies as a whole. Following this, the data is then broken down to display the top and bottom five companies for CARs and then the results are split into meta-categories to identify what are the most common issues for logging companies in Europe. Examples of CARs that fall into each meta-category, as defined by Romero and Putz (2018), are shown within Table 5. These examples are pulled from information identified through the CAR data extraction methodology in order to provide an overview of the type of issues that are classified into each meta-category.



Table 5: Table to show the meta-categories and example CARs from the dataset for each meta-category.

Meta-category	Examples of CARs
Environmental	<p>10 trees/ha representative of the stand has not been left in clear felling.</p> <p>High stumps have not been made in second thinning. This is considered a minor because it is only found in one case and high stumps have been made in final felling.</p> <p>Soildamage in small creek/wet area that change the direction of water transport. This is considered a minor because the affect of the damage is limited and it is only found in one place.</p> <p>Enough of trees have not been left in final felling. This is considered a minor because it is only found in one case.</p>
Social	<p>The group member (xxxx) has not checked the documents of all service providers yhat they have taken care of their statutory charges (employment pension contributes).</p> <p>The employees training and development plans are not continuously documented.</p> <p>In agreements on "skogsvård" with companies performing harvest has no requirements for competence, workers rights etc. according to the FSC principles.</p> <p>E.K. has not ensured that the consultation responsibility for health and safety issues agreed between Ek and contractors engaged, e.g by the way this is written into the agreement.</p>
Environmental, legal and transparency	<p>During a visit to a harvested logging site where ditch clearing had been made it was noted that the ditch clearing had not been reported to the Forestry Board.</p> <p>FME shall ensure that proper instructions are provided to those who carry out silviculture, logging or other forest management operations.</p> <p>The game feeding regulations resp. hunting regulations are not respected. Although game feeding machines are not allowed, they were found in one department.</p> <p>identified deviation District Klosterwald, section 18-11a. Wind throw logs workup: The forest workers employed had started work without internally prescribed training by the technical production manager (TPL).</p>
Forest Management	<p>The monitoring requirements must be more specified and the routines for completing these in the manual: the internal annual monitoring, corrective action and the documentation of these</p> <p>E.k. has not ensure the implementation of replicable monitoring procedures that allow comparisons of results and evaluations of changes related to relevant Indicators of this Standard.</p> <p>Areas set aside for environmental protection are not clearly marked in the management plan and maps.</p> <p>For approx. 40% of the former forestry dept. area Dhronecken is not available an effective FM plan. The forest management plan available dates from 1998 with an update / review of 2004. For the other areas of the Forestry Dept. is available a FM plan of 2011.</p>

Figure 2 displays how the audits which resulted in CARs were distributed between 2005 and 2020. Audit information could not be found before 2005 and thus the data starts from 2005. There is an evident trend highlighting a rapid increase in the number of audits resulting in CARs available from 2008 onwards with the highest number of audits being seen in 2018 and 2019 with 55 and 53 audits resulting in CARs respectively. Out of the 595 audits a total of 477 audits resulted in CARs. This means that 80% of audits result in at least one CAR being issued. The rise in audits can partly be attributed to the growth of FSC certification scheme, however, questions can also be asked as to whether the development of the FSC's standards have also led to a greater number of CARs being issued.

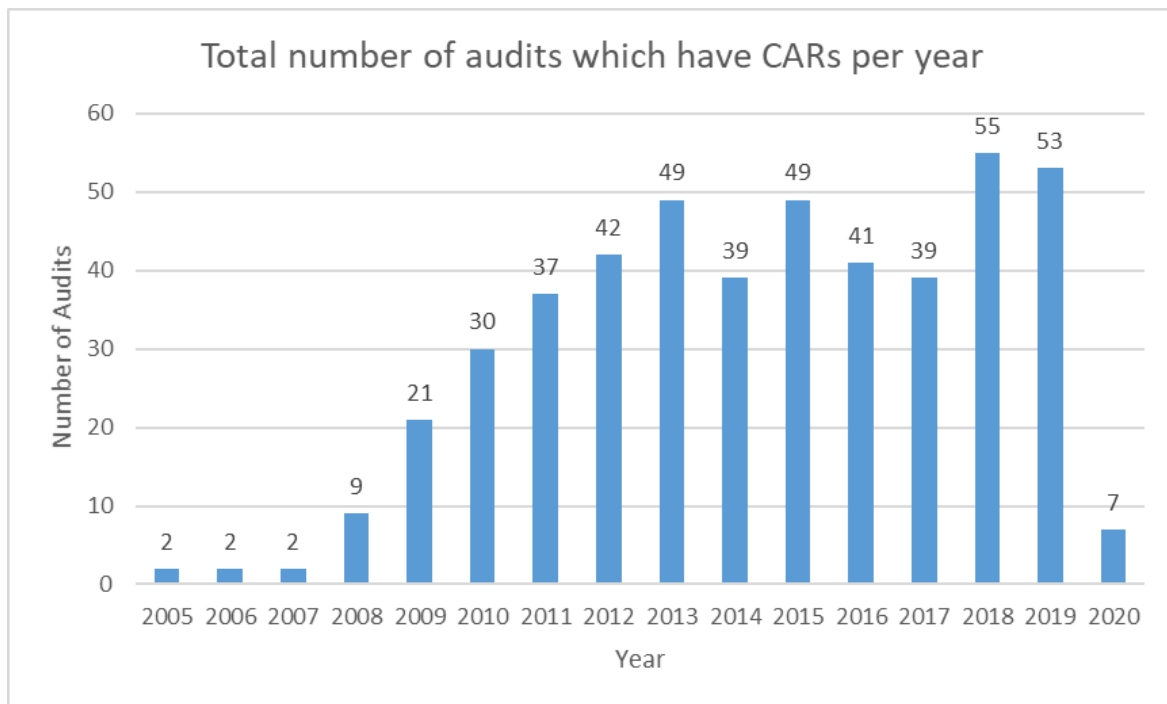


Figure 2: A graph to show the number of audits which resulted in CARs between 2005 and 2020 for Sweden, Finland and Germany. Data was collected from audits made available through the FSC database.

Once the audits were identified they were then examined to identify the number of CARs. Figure 3 highlights how these CARs are split between major and minor CARs, with the former having to be corrected within 3 months of the audit while the latter must be addressed within 12 months. The distribution of CARs shows that there are significantly more minor CARs, accounting for over 87% of the total CARs. In comparison, major CARs only account for 12.4% of the total CARs. Finally, 9 CARs were identified from audits, however, no severity for non-conformity could be identified and as such they could not be assigned to either the major or minor categories. While there were 325 major CARs identified, it is positive to see that the majority of CARs are minor meaning that they are not serious non-compliances.

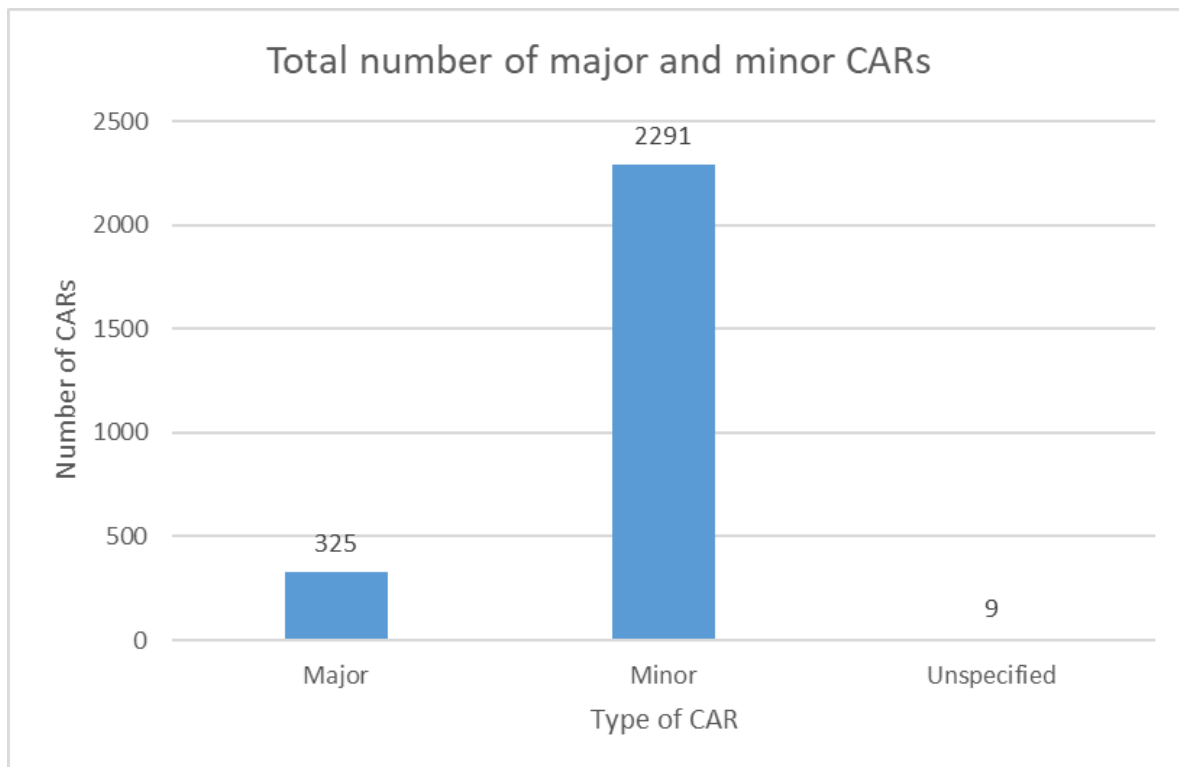


Figure 3: Figure to show the total number of major and minor CARs from FSC forest management certified companies in Sweden, Finland and Germany between 2005 and 2020. The data was collected from audits which are made available through the FSC database.

As the number of audits per year is not uniform it therefore means that a simple assessment of the number of CARs per year is not possible. Instead by taking the average number of CARs per audit per year it allows for standardised data which can then be compared against one another. Figure 4 displays this data for CARs between 2005 and 2020. While 2005 shows the most CARs on average with a total of 8.5 CARs per audit, it is also worth noting that this year also only has 2 audits available and as such can provide less accurate information due to the low sample size. When looking at other years it is apparent that 2011 has the highest number of CARs on average with 6.57 CARs per audit. Moreover, this suggests that in recent years logging companies have been more effective at complying with FSC regulations. Another interesting note is that since 2015 the number of CARs per audit are also starting to rise gradually suggesting that in recent years there has been an increase in the level of non-compliance which has resulted in more CARs being issued. This suggests two possible outcomes, (1) companies are not taking the FSC certification seriously and are not taking SFM standards seriously; or (2) CABs are performing stricter audits which in turn has resulted in a greater number of CARs being issued.

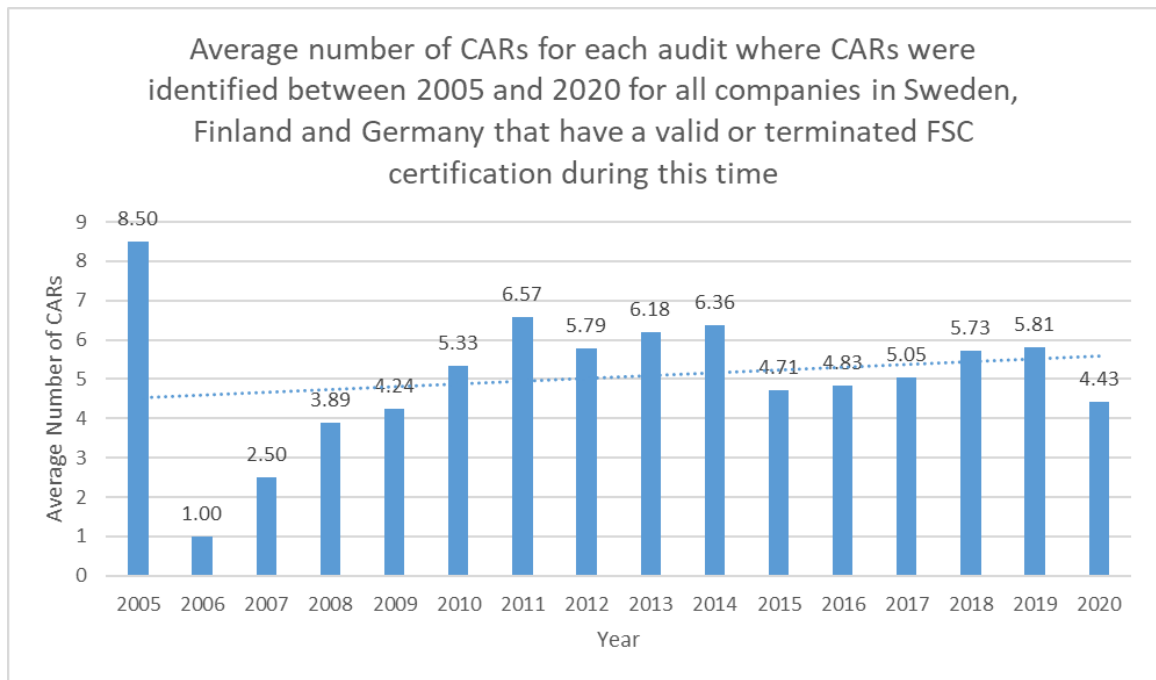


Figure 4: A graph to show the average number of CARs per audit for FSC forest management certified companies in Sweden, Finland and Germany between 2005 and 2020. The data was collected from audits which are available through the FSC database.

To give more context to this data, Table 7 provides examples of the top and bottom five companies which have been ranked by the number of CARs they have been issued. This helps to provide valuable insights into information such as in which country has the companies which have the greatest number of CARs, as well as how the CARs are distributed per company.

The two companies with the highest number of CARs are both located in Germany (*Landesforsten Rheinland-Pfalz* and *Gemeinde- und Städtebund Rheinland-Pfalz (GStB)*) and account for 305 CARs, or 11.6% of all CARs. Moreover, 22.6% of all CARs are distributed between the top 5 companies. This figure suggests that there are a minority of companies which are accounting for the greatest number of CARs being issued. It is also important to take into account the number of audits each company has. When looking at the top five companies again it is apparent that they all have at least 9 audits except for *Södra Skogsägarna ekonomisk förening, Södra Skog* who has 3 audits available. This therefore suggests that they are the company which has significantly more CARs identified in a smaller amount of time. Consequently, this would mean that this company is more likely to violate the FSC's FM standards, however, it is interesting to note that the company is still FSC certified. This brings into question the effectiveness of FSC standards as even companies where there are a significant number of CARs are still able to operate under the FSC banner.

On the other end of the spectrum, the five companies with the lowest number of CARs only account for 0.3% of the 2625 CARs. Again, the information is not as simple as it first seems as three of these companies have only had one audit meaning that the number of CARs should be low. The other two companies (*Wald und Grundbesitz GmbH* and *Nacka Community Forests*), however, have a minimum of three audits each. Consequently, these companies provide more impressive results in terms of the number of CARs identified across multiple audits. If *Södra Skogsägarna ekonomisk förening, Södra Skog* and *Wald und Grundbesitz GmbH* are compared due to the fact they have both had three audits it is a significant gap in the number of non-conformities identified. In fact, *Södra Skogsägarna*

*ekonomisk förening, Södra Skog* has 55 times the number of CARs as *Wald und Grundbesitz GmbH* has within the same number of audits, and they are still FSC certified. This in turn raises questions about the effectiveness of FSC certification that two companies can both retain their certificate and have such a large difference in the number of non-conformities.

Table 6: A table to show the top and bottom 5 companies in terms of CARs for forest management non-conformities across Sweden, Finland and Germany between 2005 and 2020. Data was collected from audits which are available through the FSC database.

Company Name	Number of CARs	Minor CARs	Major CARs	Country of Company	FSC Certification Status	Number of Audits
Landesforsten Rheinland-Pfalz	163	149	14	Germany	Valid	10
Gemeinde- und Städtebund Rheinland-Pfalz (GStB)	142	105	37	Germany	Valid	9
Södra Skogsägarna ekonomisk förening, Södra Skog	110	105	5	Sweden	Valid	3
Skogssällskapetets Förvaltning AB (SFAB)	96	70	26	Sweden	Valid	9
Landeszentrum Wald, Betreuungsförstamt Naumburg	81	63	18	Germany	Valid	9
Family Jalas' Forest	2	2	0	Finland	Terminated	1
Universitätsstadt Gießen	2	2	0	Germany	Valid	1
Wald und Grundbesitz GmbH	2	2	0	Germany	Valid	3
Städtische Forstverwaltung Bamberg	1	1	0	Germany	Terminated	1
Nacka Community Forests	0	0	0	Sweden	Terminated	4

While the previous results have identified how CARs have varied in terms of minor and major CARs, the following figures will provide an extra layer of detail to identify what the reasons for non-conformities are. The four categories used, as identified in research by Blackman *et al.* (2013), Hermudananto (2017), and Romero and Putz (2018), are *environmental*; *social*; *economic, legal and transparency*; and *forest management*. Figure 5 illustrates how the data is distributed across the different meta-categories. 9 CARs found through the audits were not classified to a specific FSC Principle, and as such were excluded from the figure as they could not be converted to a meta-category.

The meta-category with the greatest number of CARs is *Environmental* with a total of 1159 CARs of which 1019 were minor CARs and 140 were major CARs. *Social* CARs accounted for the second highest section of non-conformities with a total of 654 CARs identified. *Economic, legal and transparency* had the lowest number of CARs associated with it totalling 307 CARs, however, this meta-category has the highest ratio of major CARs with 16.6% being classified as major non-conformities. Moreover, the results highlighted through Figure 5 shows the significant of environmental non-conformities across the companies identified within this research. It is interesting to note that while SFM is deemed as an important aspect for the FSC there are still such large levels of non-compliance and these are specifically clustered within environmental non-conformities. Again, this raises the questions of why there are not more severe repercussions for environmental non-conformities considering it is the most common category of non-compliance.

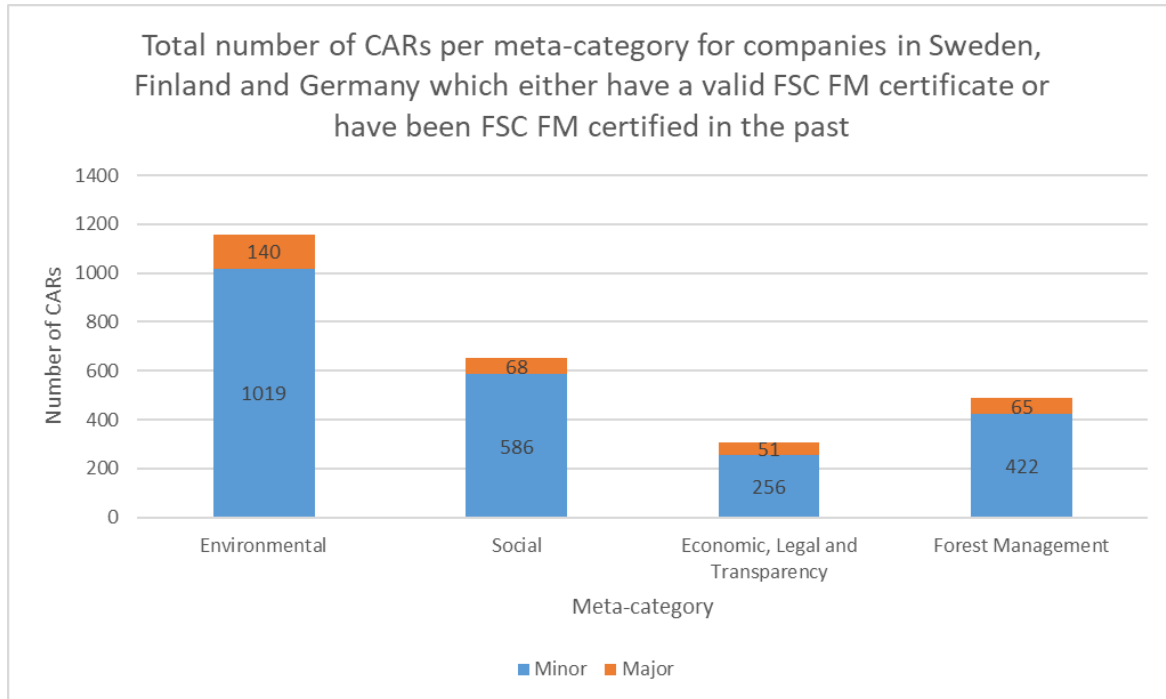


Figure 5: Figure to show the number of CARs per meta-category for FSC forest management certified companies in Sweden, Finland and Germany between 2005 and 2020. Data was collected from audits which are available through the FSC database.

Figure 6 then breaks this information down even further by examining the distribution of CARs by meta-category for the ten companies with the greatest number of CARs available. This allows for an oversight of how the CARs per meta-category are distributed for the companies which have the greatest number of non-conformities. Firstly, the trends identified in the previous figure are reinforced here with *environmental* CARs accounting for the majority of CARs. However, it is also interesting to note that *Landesforsten Rheinland-Pfalz* has 10.1% of the total non-conformities in the *social* meta-category. This shows that *Landesforsten Rheinland-Pfalz* has a consistent issue with social non-conformities and requires audits which place a greater focus on these issues. Another interesting note from Figure 6 is that there are only two companies that have more CARs in a meta-category which is not *environmental*. These companies are *Landeszentrum Wald*, *Betreuungsforstamt Naumburg* and *Stadtforstbetrieb Hörter [in Vertretung der Gruppe Ostwestfalen-Lippe]* who have more *economic, legal and transparency* and *social* CARs respectively. This suggests that while there are some deviations in the reasons as to why CARs are issued, in general the most frequent type of non-compliance within logging companies is related to environmental issues. Additionally, while the CABs highlight and report these issues, out of the top 10 companies for CARs only *Stadtforstbetrieb Hörter [in Vertretung der Gruppe Ostwestfalen-Lippe]* has had their FSC certification terminated. Consequently, the effectiveness of FSC certification must be questioned due to the continued certification that is being provided to these companies even though they have such a significant number of CARs.

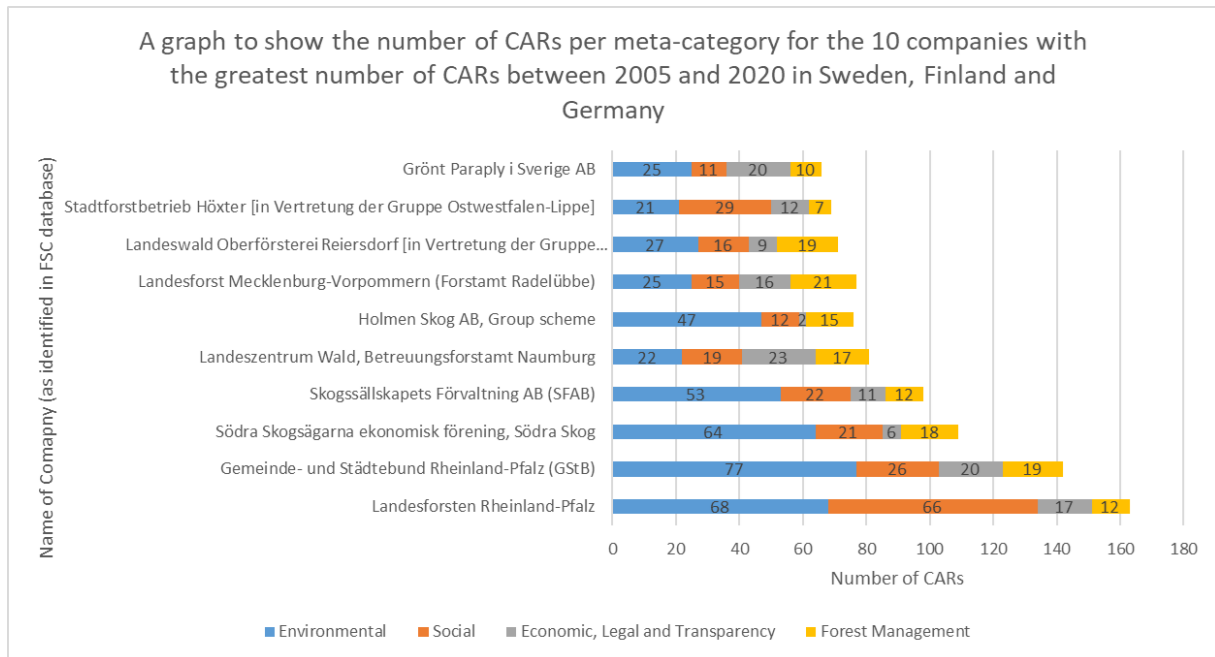


Figure 6: Figure to show the number of CARs per meta-category for the 10 companies with the greatest number of CARs based on FSC forest management audits between 2005 and 2020 in Sweden, Finland and Germany. Data was collected from audits which are available through the FSC database.

The results have highlighted that across logging companies in Sweden, Finland and Germany there has been a total of 2625 CARs issued for non-conformities related to the FSC's standards in the last 15-year period. The trends identified in Figure 2 highlight that the number of CARs is not decreasing, and in fact in recent years they are increasing. Combine this with the fact that 36.4% of CARs can be attributed to just 10 companies, and of these only one company is no longer FSC certified and it raises serious questions about the ability of the FSC to enforce their standards in a meaningful way. If companies can continue to have these number of CARs and operate under the banner of the FSC then it not only reduces the validity of FSC certification, but it also calls into question NSMD systems on the wider scale, as similar trends might be experienced elsewhere. Figures 5 and 6 also show that the number of CARs are not reducing, and especially in the case of *environmental* non-conformities there are the majority of non-conformities yet companies remain certified. Furthermore, through the lack of change in terms of a reduction of CARs it suggests that the FSC does not have effective mechanisms in place to enforce its standards and to prevent non-compliance in a meaningful way.

## Discussion

This section will bring together the results and present the information in relation to the literature identified within this thesis to create a wider understanding of what this research means in terms of the ability for the FSC to enforce regulations that are based on voluntary standards. Firstly, the 'bare minimum' will be discussed and the issues of ambiguity and poor enforcement will be highlighted. Secondly, trends identified through the CAR analysis will be related back to existing literature to contextualise their meaning. Thirdly, the effectiveness of the FSC will be discussed, and issues within its operations will be linked to literature and the results. Finally, the debate surrounding the effectiveness of the FSC will be applied to the wider context of NSMD systems.

While this thesis aims to answer the research question of how effective the FSC is at enforcing its standards, this cannot be properly understood without effectively framing the foundations on which the FSC attempts to build upon. This is done by identifying what the legal 'bare minimum' means for Sweden, Finland and Germany. As highlighted in the results, European legislation is extensive in its reach with regulation not only affecting countries within the EU but also countries who wish to trade with the European market. The findings show that the EU has a key focus on achieving SFM through the implementation of the FLEGT AP. Within this action plan there are two main strategies employed which aim to prevent illegal timber from entering the EU market. While the VPAs attempt to do this by focussing on the exporting country outside of the EU, the EUTR is the primary EU regulation that influences Sweden, Finland and Germany. On paper, the EUTR is a clear regulation that prevents illegal timber from entering the EU market. However, claims by ClientEarth (2018) illustrate that there are still pitfalls with this regulation, as while the law might be clear it is not effectively enforced. It is also interesting to note that the EUTR specifically allows for third-party certification schemes to be used in determining if timber complies with national legislation. As the FSC is one of the organisations with compatible standards for EUTR regulation it provides a significant opportunity for the FSC to increase the number of companies who rely on FSC certification to ensure legal products. However, this also increases the need for the FSC to effectively enforce their standards. As the literature shows, there are cases of NSMD systems having minimal influence on the operations of companies, however, they remain certified (FAO, 2015; Raft, 2020a). Consequently, if similar scenarios are occurring, and continue to occur, within the European context then this could result in illegal timber entering the EU market due to failures within NSMD systems to enforce their own standards.

On the other hand, regulation at the national level is less clear. While the targets of the national legislation are broader than those set out within European legislation there is a greater level of ambiguity present. The risks associated with a lack of clarity in law are highlighted by Schane (2002) and Farnsworth *et al.* (2010) who note the potential for multiple conclusions to be drawn from the same piece of legislation due to ambiguity in law. This means that uniform interpretations of laws cannot be achieved and this cause laws to not be fully effective and is also highlighted by Barents (2009). This can potentially help to explain some of the CARs within meta-category 3 which includes legal non-conformities, such as "*angemessener Frist*" (Bundesamt für Justiz, 1975: p.3) which translates to 'reasonable time'. Within the Federal Forest Act this timeframe is not specified, and as such can lead people to draw different conclusions about what a 'reasonable time' is depending on their subjective standpoint. If companies and the CAB which is conducting an audit have different interpretations of what a specific law is then it can lead to a company being deemed to not comply with FSC standards. While the issue here lies with ambiguity within national legislation, it is still important to note this as it means that from the outset the FSC is working from a baseline which is inherently unclear.



Due to the subjective nature of law which is highlighted in the previous section it means that the FSC, and NSMD systems more broadly, have uncertain foundations regarding the 'bare minimum' on which they try to build. Nonetheless, Principle 1 displays that companies must comply with relevant legislation. While some countries, including all three identified in this thesis, have their own national FSC standards (identified in Table 2) these do not provide further information to clarify these areas of ambiguity. This suggests room for the FSC to further improve not only clarity on their standards but national laws for companies who choose to become FSC certified. As briefly touched upon above, beyond the coercive regulations set in place by legislative institutions there are also the 10 principles set in place by the FSC. These goals are indeed commendable, they clearly display the focus across multiple areas of sustainable forest management to give a holistic standard which seeks to improve forestry practices. However, there are boundaries to the extent to which these standards can be enforced, and this is where the limitations of NSMD governance systems start to become visible.

Figure 4 illustrates that the number of CARs is not declining, and instead has been increasing since 2015. This is in line with research by Buliga and Nichiforel (2019) who also identified the increasing number of CARs. Moreover, this points towards the idea that companies are not taking voluntary standards seriously. The data displayed in Table 7 shows that *Södra Skogsägarna ekonomisk förening, Södra Skog* has 110 CARs in only 3 audits. This data identifies that companies can have a significant number of minor non-conformities and remain FSC certified. While the FSC themselves do not require perfection of companies to be certified (FSC, 2015a), it is concerning to see that a company with so many CARs can still hold valid FSC certification. This suggests that the FSC is slow in issuing meaningful ramifications for non-compliance. Similar examples of slow enforcement have been mentioned in the literature such as the example of *Holzindustrie Schweighofer GmbH* where the WWF conducted a two-year investigation into the company before the FSC acted and terminated their certification (Vaughn, 2015; FSC, 2017). During this time *Holzindustrie Schweighofer GmbH* were illegally harvesting forests in Romania's virgin forests and still passing audits on behalf of the FSC. Combine this with the allegations put forward by Auriga Nusantara regarding environmental violations of two FSC certified companies where despite reports highlighting offences for over 2 months no action was taken (Greenpeace, 2019b; Jong, 2019). This helps to identify a pattern of how the FSC can be slow to act upon information which allows companies to continue violating their standards and engaging in activities which have negative environmental and social. This displays the limitations that NSMD standard setting mechanisms have when it comes enforcing rules and regulations (Cashore, 2002). This issue is not just limited to the FSC but is a wider problem of all non-legally binding systems which attempt to set standards within. While this cannot be investigated within this thesis, it provides an interesting opportunity for further research.

However, the FSC as they are not the organisation that conduct the certification audits. These are done by 2-4 people from third-party companies who have history in a relevant field (Hermudananto, 2017). Moreover, the question is raised as to why auditors continue to certify companies even though there are consistent levels of CARs. Therefore, the failing of CABs to find these issues suggests that there is a flaw with the audit process. Beyond the simple limitations of audits only being over a short period of time, it suggests that a new process to audits is required to provide a greater level of detail into company performance – and this will most likely result in a greater number of CARs.

Another important aspect of the FSC's certification system which needs to be highlighted is the types of non-conformities which are most frequent. Figure 3 identifies a clear difference in the number of minor CARs compared to major CARs, with a total of 2291 of the former. While it is positive to see that there are significantly less major non-conformities which are fundamental, systemic, failures of a company to comply with FSC standards (FSC, 2016) it does not deter from the number of CARs

identified. The sheer number of CARs suggests that the FSC is not having strict enough repercussions to deter companies from not complying with standards. Out of the 2625 CARs 1159 of them were for *environmental* non-conformities. This suggests that almost 50% of CARs were related to problems connected to environmental issues. Again, this is a serious concern for an organisation that has the objective of achieving “*environmentally appropriate, socially beneficial, and economically viable management of the world’s forests*” (FSC, 2002: p.1). Moreover, this trend is also seen by Romero and Putz (2018) who used this meta-category method to analyse CARs in Indonesia and identified *environmental* non-conformities as the reason for non-compliance. The results of this research are also in line with those of Rametsteiner and Simula (2003) who identified *environmental* non-conformities as the most common cause for CARs to be issued, and while they found *forest management* issues to be the second most common problem this research identified it as the third most common meta-category for non-compliance. However, Blackman *et al.* (2013) and Hermudananto (2017) both identified *social* issues as the greatest reason for CARs. Blackman *et al.* (2013) focussed their research in Mexico while Hermudananto (2017) and Romero and Putz (2018) concentrated on the Indonesian context. Thus, there is a significant geographic diversity which brings with it a variety of social, political and economic differences. Consequently, this can help account to why there is a variation seen within the most common type of CAR meta-category. Nonetheless, similar trends are seen across different countries in different geographic, social and political contexts. Therefore, questions regarding the effectiveness of FSC certification to enforce their voluntary standards are again raised, with companies consistently flaunting environmental and social standards.

Additionally, even though CABs are externally monitored by ASI to ensure that FSC standards are upheld questions can be asked as to whether this NSMD system is effective. If issues such as those identified within the FSC are indeed representative of NSMD systems in general, then there is the problem that there might be some auditing companies that are not effectively comply with FSC certification. This leads to questions surrounding auditors overlooking non-conformities or marking them as minor when they should be more severe in order to keep business (Van der Heijden, 2017; Van der Ven *et al.*, 2018). Again, as NSMD systems are not legally binding there are limits to how hard standards can be enforced.

More generally, the findings in this thesis can also be applied to the wider discussion related to the effectiveness of NSMD systems. Through the analysis of the FSC it has become apparent that there are indeed limitations of NSMD systems in terms of being able to enforce standards. This predominantly is linked to the fact that NSMD systems are ultimately voluntary and rely on political legitimacy given by the market. Research by Van der Ven *et al.* (2018) have also identified similar problems such as regulatory loopholes, lax enforcement of regulations and the ability for producers to shop for the most lenient NSMD certification scheme. This in turn erodes upon the FSC’s ability to effectively ensure that companies comply with their certification standards because there is no coercive power associated with the organisation. Companies can swap to another NSMD certification system that is more lenient in terms of regulation and retain an environmental certification. These issues also extend beyond just SFM to the wider NSMD governance debate, with research by Fortin and Richardson (2013) also noting the tendency for companies to choose certification schemes that are the most favourable for their business operations. For effective governance to be achieved, and loopholes to be closed, there needs to be a greater level of unity between different certification schemes within specific markets. By preventing the option for companies to shop for the most lenient certificate it therefore helps to ensure that companies must change their operations more significantly. This in turn helps to achieve the key characteristics of NSMD systems by ensuring that certificates can create enforceable rules and regulations. In the current state of forestry certification due to the availability of more lenient standards it makes it hard for organisations to change the status

quo of a market, and this is seen as an important aspect of a NSMD system by Bernstein and Cashore (2007). Moreover, as illustrated through the slow reaction times of the FSC, an increasing number of CARs per audit, as well issues within the audit process itself, the results suggest that the FSC cannot effectively enforce its standards. This in turn means that the FSC cannot achieve the 5<sup>th</sup> key principle of a NSMD standard as identified by Bernstein and Cashore (2007). Again, this highlights the fact that changes are needed to the way the FSC ensures compliance with standards, with the main issue being linked to the lack of visible repercussions.

## Conclusion

This research aimed to identify the effectiveness of the FSC at enforcing sustainable forest management practices within Europe. Public policy analysis was utilised to identify the 'bare minimum' in regard to EU and national policy within Sweden, Finland and Germany. Following this, CAR analysis was then used to investigate the how logging companies in these countries comply with FSC standards to determine the effectiveness of the FSC to enforce rules. The results of this thesis illustrate that while the FSC's Principles and Criteria are clear in theory, when it comes to the application of these standards there is significant room for improvement. The ambitions of the FSC are commendable, however, due to the nature of NSMD governance they lack the authority to effectively enforce companies to comply with rules and regulations. Instead it was noted that companies can fail to meet multiple standards across various Principles for extended periods of time and still maintain FSC certification.

The results from the public policy analysis have identified that at the national level there are policies in place which attempt to ensure SFM practices, however through ambiguous language there is uncertainty created over how the law should be applied. This in turn means that multiple understandings of the same policy can occur and, as such, limits the effectiveness of the policy. At the EU level the FLEGT AP was identified as the predominant policy which is utilised to promote SMF through preventing illegal timber from entering the EU market. While the legislation related to this is clearly identified, there were issues identified with the repercussions for non-compliance of this legislation, with research by ClientEarth (2018) suggesting that competent authorities were not doing enough to ensure companies comply with the regulation. Consequently, there is room for improvement for both EU legislation as well as national laws in order to increase the clarity and effectiveness of each.

To assess the effectiveness of the FSC at enforcing their standards CAR analysis was used. A total of 2625 CARs across 97 companies were identified during this research. The results from the data identify that even though companies are FSC certified they are still frequently not complying with the standards set out by the FSC, while retaining certification. Specifically, issues related to environmental non-compliance were seen as the most prominent reason for CARs to be issued and trends suggested that in recent years non-compliance with FSC standards was increasing. This again highlights the issues associated with the current certification system set by the FSC as they are unable to effectively enforce their regulations.

This research has added to the existing literature surrounding NSMD system governance and has helped to identify trends within the FSC in the European context which have been lacking in comparison to other regions globally. This research also adds to the wider body of research linked to the appropriateness of NSMD systems for setting regulation. The conclusions of this thesis fall in line with this body of literature and highlights that while NSMD systems are gaining popularity and are helping to increase standards for private companies to adhere to, they lack the ability to meaningfully enforce regulation. Moreover, while the FSC has made progress to ensure SFM practices are met by private companies there are still inherent limitations of NSMD systems which limits further progress. Finally, the results of this research illustrate the shortcomings of NSMD certification schemes. As NSMD governance continues to grow in popularity it results in a greater importance for more research to focus upon this area in order to provide solutions on how NSMD governance can have more impact on enforcing standards.

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## Appendix

Country Name	Company Name	Certificate Code	Year of First Certification	Year of Termination (if applicable)	Valid Certificate?	Number of Audits Available
Finland	Ålands Skogsvårdsförening	<b>DNV-FM/COC-001385</b>	2016		Valid	4
Sweden	Bergs Timber Production AB	<b>DNV-FM/COC-001787</b>	2019		Valid	2
Sweden	BillerudKorsnäs Skog & Industri AB	<b>SA-FM/COC-006912</b>	2014		Valid	2
Sweden	BillerudKorsnäs Skog & Industri AB	<b>DNV-FM/COC-001532</b>	1997		Valid	3
Sweden	Boliden Mineral AB	<b>DNV-FM/COC-000122</b>	2009		Valid	2
Germany	Briestsche Forstverwaltung GbR	<b>GFA-FM/COC-001767</b>	2009	2019	Terminated	10
Sweden	Eskilstuna kommun	<b>DNV-FM/COC-000175</b>	2009	2018	Terminated	5
Sweden	Eskilstuna kommun	<b>DNV-FM/COC-001703</b>	2018		Valid	2
Finland	Family Jalas' Forest	<b>SW-FM/COC-000163</b>	2001	2010	Terminated	1
Germany	FBG Nürnberger Land w. V.	<b>GFA-FM/COC-002051</b>	2011		Valid	10
Finland	FINSILVA OYJ	<b>BV-FM/COC-139460</b>	2018		Valid	3
Germany	Forst Baden-Württemberg AöR	<b>TUVDC-FM/COC-300011</b>	2014		Valid	6
Germany	Forstbetriebsleitung Adelsheim	<b>GFA-FM/COC-001945</b>	2009	2014	Terminated	4
Germany	Freie und Hansestadt Hamburg, Behörde für Wirtschaft, Verkehr und Innovation	<b>GFA-FM/COC-001128</b>	2004		Valid	14
Germany	Freiherr von Rotenhan'sche Forstverwaltung	<b>GFA-FM/COC-001413</b>	2006	2014	Terminated	5
Germany	Gemeinde- und Städtebund Rheinland-Pfalz (GStB)	<b>GFA-FM/COC-002585</b>	1999		Valid	9
Germany	Gemeinde Wehrheim	<b>GFA-FM/COC-001199</b>	2005	2010	Terminated	1
Germany	Gemeindeforstamt Aachen	<b>SGS-FM/COC-001421</b>	2003	2013	Terminated	1
Germany	Gemeindevverwaltung Schlangenbad	<b>GFA-FM/COC-002240</b>	2011		Valid	10
Germany	Gräflich von Bernstorff'sche Betriebe	<b>GFA-FM/COC-002019</b>	2001	2014	Terminated	4
Sweden	Grönt Paraply i Sverige AB	<b>SA-FM/COC-001104</b>	2006		Valid	21
Germany	Gruppe Bad Vilbel-Karben	<b>GFA-FM/COC-002201</b>	2011	2012	Terminated	2
Germany	Gut Hohenhaus	<b>GFA-FM/COC-001193</b>	2005		Valid	5
Germany	Hatzfeldt-Wildenburg'sche Verwaltung	<b>GFA-FM/COC-001946</b>	2009	2019	Valid	11
Sweden	Holmen Skog	<b>DNV-FM/COC-000043</b>	2008		Valid	10

Sweden	Holmen Skog AB, Group scheme	<b>DNV-FM/COC-000044</b>	2008		Valid	11
Finland	Innofor Finland Ltd	<b>GFA-FM/COC-004091</b>	2019		Valid	2
Finland	Innofor Finland Oy	<b>SW-FM/COC-004291</b>	2009	2014	Terminated	5
Germany	Kommunalwald der Stadt Chemnitz	<b>TUVDC-FM/COC-300016</b>	2002		Valid	9
Finland	Koskis Gård	<b>DNV-FM/COC-000672</b>	2013	2017	Terminated	5
Germany	Kreisstadt Hofheim am Taunus	<b>GFA-FM/COC-002822</b>	2016		Valid	5
Germany	Landesbetrieb Hessen-Forst, Forstamt Dieburg	<b>TUVDC-FM/COC-300018</b>	2008		Valid	11
Germany	Landesbetrieb Hessen-Forst, Forstamt Dieburg (STAATSWALD)	<b>GFA-FM/COC-002158</b>	2011	2015	Terminated	5
Germany	Landesbetrieb Wald und Holz Nordrhein-Westfalen	<b>GFA-FM/COC-002246</b>	2011		Valid	9
Germany	Landesforst Mecklenburg-Vorpommern (Forstamt Radelübbe)	<b>GFA-FM/COC-001211</b>	2005		Valid	10
Germany	Landesforsten Rheinland-Pfalz	<b>GFA-FM/COC-002381</b>	2012		Valid	10
	Landeshauptstadt Stuttgart					
	Garten,- Friedhofs- und Forstamt // Abteilung Forsten und Service Betriebe Landeswald	<b>TUVDC-FM/COC-300026</b>	2019		Valid	1
Germany	Oberförsterei Reiersdorf [in Vertretung der Gruppe „Waldzertifizierung Uckermark“]	<b>GFA-FM/COC-002025</b>	2001		Valid	10
Germany	Landeszentrum Wald, Betreuungsförstamt Naumburg	<b>GFA-FM/COC-002047</b>	2002		Valid	9
Germany	Landratsamt Heilbronn, Kreisforstamt Landratsamt Schwäbisch Hall,	<b>GFA-FM/COC-004012</b>	2009		Valid	1
Germany	Forstamt (für die Zertifizierungsgruppe Schwäbisch Hall)	<b>GFA-FM/COC-002033</b>	2002	2018	Terminated	9
Finland	METSÄ GROUP	<b>BV-FM/COC-006964</b>	2012		Valid	8
Finland	Metsänomistajan Sertifiointiryhmä, CareliaForest Oy	<b>BV-FM/COC-155171</b>	2020		Valid	1
Sweden	Nacka Community Forests OY	<b>SCS-FM/COC-00022N</b>	2000	2015	Terminated	4
Finland	STOCKFORS AB	<b>DNV-FM/COC-001411</b>	2017		Valid	4
Sweden	Pancert AB	<b>DNV-FM/COC-001516</b>	2011		Valid	3
Sweden	Sala Kommun	<b>SA-FM/COC-001064</b>	2005		Valid	13
Sweden	SCA SKOG AB	<b>DNV-FM/COC-001886</b>	1999		Valid	1

Sweden	SCA Skog AB	<b>SGS-FM/COC-000518</b>	2000	2005	Terminated	1
Sweden	SCA Skog AB, Virke	<b>SCS-FM/COC-004109</b>	2012	2017	Terminated	6
Germany	Schleswig- Holsteinische Landesforsten (AöR)	<b>GFA-FM/COC-001048</b>	2005		Valid	12
Sweden	Skogscertifiering Prosilva AB	<b>SCS-FM/COC-00153G</b>	2011		Valid	11
Sweden	Skogssällskapet Förvaltning AB (SFAB)	<b>DNV-FM/COC-000045</b>	2008		Valid	9
Sweden	Skogsutveckling Syd AB	<b>DNV-FM/COC-000049</b>	2008		Valid	8
Sweden	Södra Skogsägarna ekonomisk förening, Södra Skog	<b>DNV-FM/COC-000170</b>	2009		Valid	3
Germany	Stadt Aachen Fachbereich Umwelt	<b>TUVDC-FM/COC- 300017</b>	2013		Valid	7
Germany	Stadt Bad Vilbel	<b>GFA-FM/COC-001200</b>	2005	2010	Terminated	1
Germany	Stadt Duisburg Umweltamt	<b>GFA-FM/COC-001086</b>	2003		Valid	10
Germany	Stadt Eltmann (stellvertretend für "Gruppe Franken")	<b>GFA-FM/COC-002823</b>	2010		Valid	5
Germany	Stadt Erkrath	<b>GFA-FM/COC-002420</b>	2018		Valid	8
Germany	Stadt Essen, Fachbereich 67 Grün und Gruga	<b>GFA-FM/COC-001371</b>	2006		Valid	11
Germany	Stadt Frankfurt am Main - Grünflächenamt - Abteilung StadtForst	<b>TUVDC-FM/COC- 300010</b>	2014		Valid	5
Germany	Stadt Furtwangen	<b>GFA-FM/COC-001442</b>	2007		Valid	9
Germany	Stadt Hofheim am Taunus	<b>GFA-FM/COC-001239</b>	2005	2010	Terminated	1
Germany	Stadt Kehl	<b>GFA-FM/COC-001412</b>	2006		Valid	7
Germany	Stadt Kelkheim	<b>GFA-FM/COC-001240</b>	2005	2010	Terminated	1
Germany	Stadt Köln, Amt für Landschaftspfleg e und Grünflächen	<b>GFA-FM/COC-001031</b>	2001		Valid	11
Germany	Stadt Leipzig Amt für Stadtgrün und Gewässer	<b>IC-FM/COC-100001</b>	2013	2015	Terminated	1
Germany	Stadt Lychen	<b>GFA-FM/COC-001360</b>	2009	2018	Terminated	6
Germany	Stadt Münster - Amt für Grünflächen, Umwelt und Nachhaltigkeit	<b>GFA-FM/COC-001212</b>	2005		Valid	13
Germany	Stadt Pfullingen	<b>GFA-FM/COC-001318</b>	2006		Valid	10
Germany	Stadt Rastatt	<b>GFA-FM/COC-001409</b>	2007		Valid	11
Germany	Stadt Rosbach v.d. Höhe	<b>GFA-FM/COC-001408</b>	2007	2012	Terminated	3
Germany	Stadt Templin	<b>GFA-FM/COC-001367</b>	2006	2020	Terminated	12
Germany	Stadtforstamt Leipzig	<b>SGS-FM/COC-002490</b>	2006	2011	Terminated	1
Germany	Stadtforstbetrieb Höxter [in Vertretung der Gruppe	<b>GFA-FM/COC-001389</b>	2007	2018	Terminated	9



Germany	Ostwestfalen-Lippe] Städtische Forstverwaltung Bamberg Stadtwald Gladbeck	<b>SGS-FM/COC-000559</b>	2005	2005	Terminated	1
Germany	Ingenieuramt – Abt. Stadtgrün Stadtwald	<b>GFA-FM/COC-002214</b>	2011	2014	Terminated	3
Germany	Heidelberg Stadtwald	<b>GFA-FM/COC-001863</b>	2009		Valid	11
Germany	Meiningen/ Gemeindewald Untermaßfeld	<b>GFA-FM/COC-001732</b>	2009	2019	Terminated	9
Sweden	Statens Fastighetsverk Stiftens	<b>SA-FM/COC-001156</b>	2000		Valid	11
Sweden	Egendomsförvaltnings Förening STORA ENSO OYJ WOOD SUPPLY	<b>DNV-FM/COC-000046</b>	2008		Valid	7
Finland	FINLAND Stora Enso Skog AB	<b>DNV-FM/COC-000805</b>	2014		Valid	1
Sweden	AB Sveaskog	<b>DNV-FM/COC-000066</b>	2008		Valid	4
Sweden	Förvaltnings AB Sveaskog	<b>DNV-FM/COC-000736</b>	2005	2019	Terminated	7
Sweden	Förvaltnings AB Svenska Skogsföretagare s	<b>BV-FM/COC-008344</b>	2009		Valid	2
Sweden	Certifieringsgruppen	<b>DNV-FM/COC-000047</b>	2008	2019	Terminated	2
Sweden	Sydved AB	<b>BV-FM/COC-015573</b>	2008		Valid	8
Germany	Thomas Weber (Gruppe Mittelbrandenburg)	<b>GFA-FM/COC-002009</b>	2000		Valid	10
Finland	Tornator Oyj	<b>DNV-FM/COC-000986</b>	2014		Valid	1
Germany	Universitätsforstamt Sailershausen	<b>GFA-FM/COC-001307</b>	2006	2011	Terminated	1
Germany	Universitätsstadt Gießen	<b>TUVDC-FM/COC-300027</b>	2014		Valid	1
Germany	Universitätsstadt Tübingen - Stadtwald	<b>TUVDC-FM/COC-300025</b>	2003		Valid	3
Finland	UPM-Kymmene Corporation	<b>DNV-FM/COC-001705</b>	2011		Valid	9
Finland	UPM-Kymmene Corporation - FM Group Scheme	<b>DNV-FM/COC-001706</b>	2012		Valid	9
Sweden	Vida Skog AB	<b>DNV-FM/COC-000279</b>	2010	2020	Terminated	7
Germany	Wald und Grundbesitz GmbH	<b>NC-FM/COC-030258</b>	2018		Valid	3

Appendix A: List of all companies that were used for CAR analysis in this research, information includes country of company, company name, FSC certification code, year of certification, year of termination, validity of FSC certification and the number of audits.

Country Name	Company Name	Certificate Code	Year of First Certification	Year of Termination (if applicable)	Valid Certificate?	Number of Audits Available
Sweden	Bergvik Skog Väst AB	<b>SGS-FM/COC-010295</b>	2008	2019	Terminated	0
Germany	Stadt Rosbach v. d. Höhe	<b>IMO-FM/COC-110638</b>	2012	2017	Terminated	0

Germany	Miller Forest Investment AG	GFA-FM/COC-002434	N/A	2015	Terminated	0
Sweden	Billerud Skog AB	SGS-FM/COC-009767	2013	2013	Terminated	0
Sweden	Stenvalls Skogar AB	SGS-FM/COC-001830	2004	2013	Terminated	0
Germany	Forstamt Paderborn	GFA-FM/COC-001368	2006	2010	Terminated	0
Germany	GELSENWASSER AG	GFA-FM/COC-001095	2005	2010	Terminated	0
Germany	Group Waren-Müritz	GFA-FM/COC-001217	2005	2010	Terminated	0
Germany	Stadt Karben	GFA-FM/COC-001197	2005	2010	Terminated	0
Finland	Stora Enso Wood Supply Finland	SCS-FM/COC-00086G	2005	2010	Terminated	0
Germany	Hatzfeldt- Wildenburg'sche Verwaltung	SGS-FM/COC-000259	1999	2009	Terminated	0
Germany	Landratsamt Forstbetriebsleitung Adelsheim	SGS-FM/COC-001954	2004	2009	Terminated	0
Germany	Berliner Forsten	IMO-FM/COC-022060	2002		Valid	0
Germany	Stadt Meiningen / Gemeinde Untermassfeld	SGS-FM/COC-001665	2004	2009	Terminated	0
Sweden	Svea Skog AB	SGS-FM/COC-000110	2000	2009	Terminated	0
Sweden	AssiDomän Skog & Trä AB - Hedemora Region	SGS-FM-000141	1998	2008	Terminated	0
Sweden	AssiDomän Skog & Trä AB - Kalix Region	SGS-FM-000083	1997	2008	Terminated	0
Sweden	AssiDomän Skog & Trä AB - Östersund Region	SGS-FM-000130	1998	2008	Terminated	0
Sweden	AssiDomän Skog & Trä AB - Växjö Region	SGS-FM-000131	1998	2008	Terminated	0
Sweden	AssiDoman Wood Supply North	SGS-FM-000584	2000	2008	Terminated	0
Germany	Beckum-Ahlen Klosterfonds	SGS-FM/COC-001045	2002	2008	Terminated	0
Germany	ForestFinest Consulting GmbH	GFA-FM/COC-004132	2019		Valid	0
Germany	Forstamt Langen	IMO-FM/COC-140236	2014		Valid	0
Sweden	Bergvik Skog	SA-FM/COC-001392	2004	2008	Terminated	0
Sweden	Eskilstruna Kommun	SA-FM/COC-001234	2003	2008	Terminated	0
Germany	Forstbetrieb der Stiftung Juliusspital	IMO-FM/COC-025218	2005		Valid	0
Germany	Freiburg i. Br Städtisches Forstamt	IMO-FM/COC-009998	1999		Valid	0
Germany	Forest management operations of the city of Kehl on the Rhine, state of Baden-Württemberg, Germany:	SGS-FM/COC-002278	2005	2008	Terminated	0
Germany	Gemeinde und Städtebund Rheinland-Pfalz (GStB)	GFA-FM/COC-002107	2004	2008	Terminated	0
Germany	Hessen Forest Dieburg Forestry Office	SGS-FM/COC-001300	2003	2008	Terminated	0
Germany	Gemeinde Heidenrod	IMO-FM/COC-150228	2004		Valid	0
Sweden	Holmen Skog AB	SGS-FM/COC-000533	1998	2008	Terminated	0

Sweden	Holmen Skog AB	SA-FM/COC-001309	2003	2008	Terminated	0
Sweden	Holmen Skog Group Scheme	SA-FM/COC-001346	2005	2008	Terminated	0
Germany	Hospital Foundation Bamberg	SGS-FM/COC-000560	2000	2008	Terminated	0
Sweden	Kristianstad Kommun	SGS-FM/COC-000878	2001	2008	Terminated	0
Germany	Ministerium für Landwirtschaft, Forsten und Fischerei Mecklenburg-Vorpommern	GFA-FM/COC-001103	2004	2008	Terminated	0
Germany	Münster Forestry Office Studienfonds	SGS-FM/COC-001044	2002	2008	Terminated	0
Germany	Heiliggeistspitalstiftung, Freiburg i.Br	IMO-FM/COC-024067	2004		Valid	0
Germany	Münster Forestry Office, State Forestry Enterprise	SGS-FM/COC-001043	2002	2008	Terminated	0
Germany	RH Int. Holzkontor GmbH	GFA-FM/COC-001161	2004	2008	Terminated	0
Sweden	Skogssällskapet Förvaltning AB	SA-FM/COC-001057	1999	2008	Terminated	0
Sweden	Stora Enso Wood Supply Sweden	CU-FM/COC-805235	2007	2008	Terminated	0
Sweden	SUSAB	SA-FM/COC-001421	2005	2008	Terminated	0
Sweden	Svenska Kyrkans FSC-förening	SA-FM/COC-001072	2001	2008	Terminated	0
Sweden	Svenska Skogsforetagares Certifieringsgrupp (SSCG)	SA-FM/COC-001273	2003	2008	Terminated	0
Sweden	Sydved AB	SA-FM/COC-001384	2004	2008	Terminated	0
Germany	Landesbetrieb HessenForst	GFA-FM/COC-004279	2015		Valid	0
Germany	Besitzgemeinschaft Lungstras Nölle	IMO-FM/COC-024002	2004	2007	Terminated	0
Germany	City of Lychen	SGS-FM/COC-0597	2001	2007	Terminated	0
Germany	Mainau GmbH	IMO-FM/COC-024034	2004		Valid	0
Germany	City of Templin	SGS-FM/COC-0596	2001	2007	Terminated	0
Germany	Forstamt Mettmann	IMO-FM/COC-021209	2001	2007	Terminated	0
Germany	Furtwangen Municipal Forest of the City of Furtwangen	SGS-FM/COC-1067	2002	2007	Terminated	0
Germany	Hürtgenwald State Forest Enterprise of the Hürtgenwald State Forestry Office	SGS-FM/COC-0998	2002	2007	Terminated	0
Finland	Mr. Aimo Saxalas Forestry Operation	SW-FM/COC-178	UNSPECIFIED	2007	Terminated	0
Sweden	Scaninge Timber AB	SA-FM/COC-1085	1999	2007	Terminated	0
Germany	Naturland - Verband für ökologischen Landbau e.V., Naturland Waldbetriebe	IMO-FM/COC-009887	1998		Valid	0
Germany	Staatliches Forstamt Bad Driburg	SGS-FM/COC-0593	2001	2007	Terminated	0
Germany	Staatliches Forstamt Bergisch Gladbach - Königsforst	IMO-FM/COC-021198	2001	2007	Terminated	0

Germany	Staatliches Forstamt Bonn	<b>IMO-FM/COC-021199</b>	2001	2007	Terminated	0
Germany	Rostock Stadtforstamt	<b>IMO-FM/COC-099157</b>	2000		Valid	0
Germany	SaarForst Landesbetrieb	<b>IMO-FM/COC-099161</b>	2000		Valid	0
Germany	Staatliches Forstamt Eitorf	<b>IMO-FM/COC-021193</b>	2001	2007	Terminated	0
Germany	Staatliches Forstamt Kleve	<b>IMO-FM/COC-21219</b>	2001	2007	Terminated	0
Germany	Staatliches Forstamt Paderborn	<b>SGS-FM/COC-0592</b>	2001	2007	Terminated	0
Germany	Staatliches Forstamt Wesel	<b>IMO-FM/COC-021210</b>	2001	2007	Terminated	0
Germany	Stadt Rastatt	<b>SGS-FM/COC-0921</b>	2002	2007	Terminated	0
Germany	State Forest Enterprise of Bad Münstereifel Forestry Office of the Agriculture Chamber Rhineland	<b>SGS-FM/COC-0930</b>	2002	2007	Terminated	0
Germany	State Forest Enterprise of the Arnsberg Forestry Office	<b>SGS-FM/COC-0929</b>	2002	2007	Terminated	0
Germany	State Forest Enterprise of the Attendorn Forestry Office	<b>SGS-FM/COC-0926</b>	2002	2007	Terminated	0
Germany	State Forest Enterprise of the Hilchenback Forestry Office	<b>SGS-FM/COC-0927</b>	2002	2007	Terminated	0
Germany	State Forest Enterprise of the Olpe Forestry Office	<b>SGS-FM/COC-0952</b>	2007	2007	Terminated	0
Germany	State Forest Enterprise of the Schleiden State Forestry Office	<b>SGS-FM/COC-0939</b>	2002	2007	Terminated	0
Germany	State Forest Enterprise of the Schmallenberg Forestry Office	<b>SGS-FM/COC-0924</b>	2002	2007	Terminated	0
Germany	Stadt Kenzingen	<b>IMO-FM/COC-021082</b>	2001		Valid	0
Germany	Stadt Leipzig, Abt. Stadtförsten	<b>IMO-FM/COC-213223</b>	2019		Valid	0
Germany	State Forest Enterprises of the Minden Forestry Office	<b>SGS-FM/COC-0925</b>	2002	2007	Terminated	0
Germany	State Forest Enterprise of the Eschweiler Forestry Office of the Agriculture Chamber Rhineland	<b>SGS-FM/COC-0951</b>	2002	2007	Terminated	0
Sweden	Stora Enso Skog Group	<b>SCS-FM/COC-00025G</b>	2000	2007	Terminated	0
Germany	Städtische Forstverwaltung Emmendingen	<b>IMO-FM/COC-020117</b>	2000		Valid	0
Germany	Städtische Forstverwaltung Lohr	<b>IMO-FM/COC-002057</b>	2000		Valid	0
Germany	United Foundations Geseke Keppel	<b>SGS-FM/COC-0928</b>	2002	2007	Terminated	0
Germany	VVS Naturpark Siebengebirge	<b>GFA-FM/COC-1083</b>	2003	2007	Terminated	0
Germany	Z-COM Gemeindeförstamtsverband Willebadessen	<b>SGS-FM/COC-0618</b>	2001	2007	Terminated	0
Germany	Z-COM Gruppe OWL	<b>SGS-FM/COC-0616</b>	2001	2007	Terminated	0

Germany	Z-COM Privatwald mit eigener Forstverwaltung	<b>SGS-FM/COC-0617</b>	2001	2007	Terminated	0
Germany	Freiherr von Rotenhahn, Germany	<b>SGS-FM/COC-0385</b>	1999	2006	Terminated	0
Germany	Gruen und Gruga Essen, StaedtischeForstverwaltung Essen	<b>SGS-FM/COC-1597</b>	2003	2006	Terminated	0
Germany	Mölln, Stadtwald	<b>IMO-FM/COC-99138</b>	2000	2006	Terminated	0
Sweden	Grönt Paraply I Sverige AB	<b>SA-FM/COC-1104</b> withdrawn	1999	2005	Terminated	0
Germany	Stadt Friedrichsdorf	<b>GFA-FM/COC-001198</b>	2005	2005	Terminated	0
Sweden	Stockholm Vatten	<b>SA-FM/COC-001065</b>	1999	2005	Terminated	0
Sweden	Stora Enso Wood Supply Sweden	<b>SCS-FM/COC-00028N</b>	2000	2005	Terminated	0
Germany	City of Heidelberg	<b>SGS-FM/COC-001856</b>	2004	2004	Terminated	0
Sweden	Holmen Skog AB	<b>SGS-FM/COC-0534</b>	1999	2004	Terminated	0
Sweden	Skogsutveckling Syd AB	<b>SGS-FM/COC-0345</b>	1999	2004	Terminated	0
Sweden	Sveaskog Förvaltnings AB, Group Certification Scheme	<b>SW-FM/COC-285</b>	2003	2004	Terminated	0
Sweden	Sydved AB	<b>SGS-FM/COC-0267</b>	1999	2004	Terminated	0
Sweden	AssiDomän Forest and Timber	<b>SGS-FM-0269</b>	1999	2003	Terminated	0
Sweden	AssiDomän Skog & Trä AB	<b>SGS-FM/COC-0073</b>	2000	2003	Terminated	0
Sweden	AssiDomän Skog & Trä AB (North)	<b>SGS-FM/COC-0082</b>	2000	2003	Terminated	0
Sweden	AssiDoman Wood Supply North	<b>SGS-FM/COC-0584</b>	2001	2003	Terminated	0
Sweden	Bothnia Industrier AB	<b>SGS-FM/COC-0981</b>	2002	2003	Terminated	0
Germany	Gemeinde- und Städtebund Rheinland-Pfalz (GStB) Mainz	<b>SKAL-FM/COC-008560</b>	1999	2003	Terminated	0
Germany	Gemeinde-und Städtebund Rheinland-Pfalz (GStB) Region rechtsrheinisch	<b>IMO-FM/COC-9804</b>	1999	2003	Terminated	0
Germany	Ökologische Forst- und Landwirtschaft	<b>SKAL-FM/COC-008521</b>	1998	2003	Terminated	0
Germany	Waldzertifizierungsgruppe Herzogtum Lauenburg	<b>IMO-FM/COC-099137</b>	2000		Valid	0
Germany	Waldzertifizierungsgruppe Saarland	<b>IMO-FM/COC-023302</b>	2003		Valid	0
Germany	Reinhard Wester-Ebbinghaus	<b>GFA-FM/COC-1001</b>	2000	2003	Terminated	0
Germany	Landesforstverwaltung Schleswig-Holstein	<b>SKAL-FM/COC-013479</b>	2001	2002	Terminated	0
Sweden	STORA, Syd District	<b>SCS-FM-00019</b>	1998	2001	Terminated	0

Appendix B: List of all companies that were excluded from CAR analysis in this research. Information includes country of company, company name, FSC certification code, year of certification, year of termination, validity of FSC certification and the number of audits.