



# The influence of Natura 2000 on Estonian Forestry

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## ABSTRACT

Natura 2000 is an European-wide nature conservation network consisting of habitats and species in need of special care. Estonia, as all the other member states has committed to ensure the favourable conditions of those habitats and species listed in Directives of Natura 2000. Estonia is forest rich country, where forests cover around 51 % of total land area. Besides being fairly rich in biodiversity, Estonian forests are also rather important from economic perspective. The presence of those characteristics of Estonian forests offers great interest to research.

This study aims to find out whether the implementation of Natura 2000 has had impact on Estonian forestry. To be able to fulfil the objectives the study used media content analysis, geo-analysis and interviews.

The forests designated to Natura 2000 cover 18 per cent of total forest area. 42 % of those forests are strictly protected and 58 % are protected with various management restrictions. Around 77 % of Natura forests are state owned and 23 % in private ownership. The biggest impacts of Natura 2000 were found to be the expansion of protected forests area, loss of timber resource, increasing management restrictions, damaging of property rights of private forest owners and increasing power of nature conservation. It was also found that the decision-making power throughout Natura process was in the hands of environmental institutions, such as the Ministry of Environment, the Environmental Board and the Estonian Fund for Nature.

Keywords: Natura 2000; nature conservation; forest protection; Estonian forestry; Habitats Directive

## RESÜMEE

Üleeuroopaline looduskaitse võrgustik Natura 2000 koosneb kaitset vajavatest liikidest ja elupaikadest. Nii nagu teised Euroopa Liidu liikmesriigid on ka Eesti lubanud tagada Natura loodus- ja linnudirektiivis märgitud liikidele ja elupaikadele soodsa seisundi säilimise. Eesti on metsarikas riik, kus mets katab ligi 51% maismaast. Peale rikka loodusliku mitmekesisuse omavad Eesti metsad ka suurt majanduslikku väärtust. Majandusliku ja loodusliku väärtuse tasakaal pakub aga suurt huvi teadusele.

Antud töö eesmärk on selgitada välja kas Natura 2000 rakendamine on mõjutanud Eesti metsandust. Eesmärgini jõudmiseks on töös kasutatud meedia ja geo-analüüsi ning intervjuusid.

Natura 2000 võrgustiku piiresse jäävad metsad moodustavad 18% kogu metsamaast. 42% nendest on rangelt kaitstud metsad ning ülejäänud on kaetud erinevate majanduspiirangutega. Umbest 77% Natura metsadest kuulub riigile ja 23% on eraomandis. Suurimad Naturaga kaasnenud mõjud on kaitstavate metsade osakaalu suurenemine, puiduresursi vähenemine, suurenenud majanduslikud piirangud, erametsaomanike õiguste kahjustamine ja looduskaitsete mõjuvõimu suurenemine. Töö käigus leiti veel, et Natura 2000 protsessi vältel oli otustustamise võim eelkõige keskkonnakaitsete organisatsioonide käes, nagu Keskkonnaministeerium, Keskkonnaamet, ja Eestimaa Looduse Fond.

Võtmesõnad: Natura 2000; looduskaitse; metsakaitse; Eesti metsandus; loodusdirektiiv

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# 1. INTRODUCTION

The environmental concerns and nature conservation have become more and more important topics in all around the world. The “green” messages and statements have entered from headlines of mass media to national and international laws and regulations. The public awareness and sympathy about the destruction of nature has clearly reached to its highest of recent decades. The increasing nature conservation movement however, might have had impact to different fields having to do with natural resources.

To protect Europe’s natural heritage European Union has launched world’s most effective legal instrument concerning biodiversity and nature conservation – Natura 2000 (Weber & Christophersen, 2001). The network aims to preserve big proportion of Europe’s most valuable habitats and species, covering all together approximately 18% of total EU terrestrial area (European Commission, 2010). However the establishment of such an ambitious network included remarkable proportions of forests. And in certain member states, especially in Nordic countries, forests do not only serve environmental objectives, they also play an important role in national economies.

Presuming that the Natura 2000 is a straight forward nature protection network, whereas its ultimate goal is to assure the long-term survival of Europe's most valuable and threatened species and habitats, the nationwide conservation initiative, Natura 2000, might have had impact to national forestry issues of member states of European Union. As there are a lot of studies around the Europe focusing on different aspects of nature conservation in Natura 2000 areas, only very view articles are concerning about the impact of Natura 2000 to the field of forestry.

The main aim of the study is to determine the possible influence of Natura 2000 on Estonian forestry. By using different type of research methods (problem-focussed interviews, content- and geo-analysis) examines the aims of Natura 2000 directives, national laws and strategies. It identifies the involved stakeholders and analyses the available information about the implementation process of Natura 2000 in Estonia. In order to fulfil the main aim, the study focuses on tree objectives:

1. Identification of actors either being involved or influenced throughout the Natura process
2. Analysis of how much forest is designated under Natura 2000
3. Determining the potentially most important influences to Estonian forestry

The study has divided into four main chapters. The first part contains mainly general introductory materials. It describes the nature of Natura 2000, its relation to forests and mentions Estonian Natura process. It also includes introduction to Estonian forests and forest policy. In the second chapter materials and methods will be deeply introduced. It is possible to explore what kind of data was used, from where was it taken and how was it processed. The results are revealed in third chapter. Finally, in the fourth chapter, discussion around the results is presented in a wider perspective.

## 1.1. Natura 2000

Natura 2000 is the centrepiece of EU nature & biodiversity policy. It is an EU-wide network of nature protection areas established under the 1992 Habitats Directive (European Commission, 2010). The aim of the network is to assure the long-term survival of Europe's most valuable and threatened species and habitats and at the same time take account of economic, social, cultural and regional requirements. The underlying idea of Natura 2000 is to preserve nature across the borders because the natural range of habitats and species doesn't follow administrative boundaries. To be able to preserve the vitality and the diversity of Europe's natural surroundings, one should think and act on an international scale.

Natura 2000 consists of Special Areas of Conservation (SAC) designated by Member States under the Habitats Directive, and also Special Protection Areas (SPAs) designate under the 1979 Birds Directive. (European Commission, 2010)

The Birds Directive 79/409/EEC is the EU's oldest piece of nature legislation. It was adopted by the Member States in 1979 as a response to increasing declines of Europe's wild bird populations. (European Commission DG Environment, 2010) It consists of 19 articles and 5 annexes, which determine different species of endangered birds, restrictions and research methods.

The Habitats Directive 92/43/EEC was adopted on 21 of May 1992 for the conservation of natural habitats and of wild fauna and flora (Council Directive 92/43/EEC, 1992). The Special Areas of Conservation (SACs) are selected according to nine biogeographical regions: the Atlantic, Continental, Alpine, Mediterranean, Boreal, the Macaronesian, the Pannonian, the Steppic and the Black Sea region (figure 1).

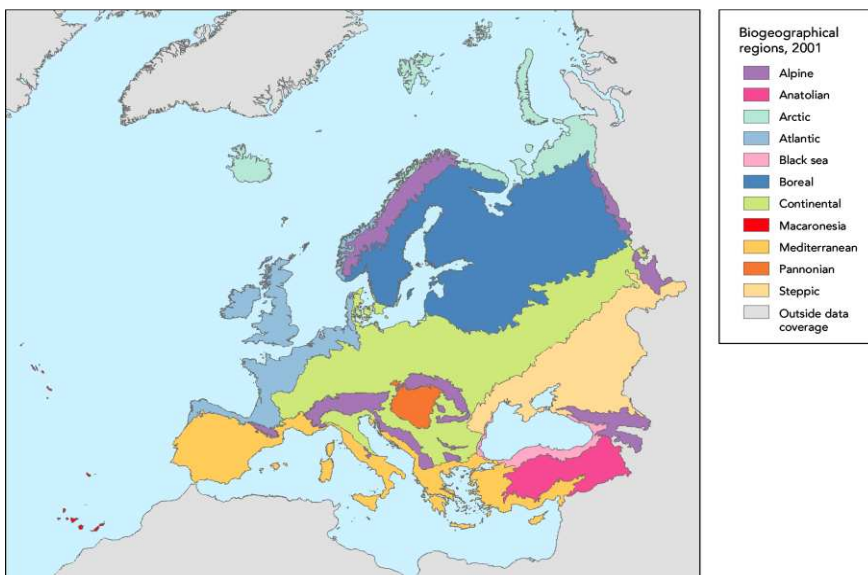


Figure 1: Biogeographical regions, Europe 2001<sup>1</sup>

<sup>1</sup> The Figure is taken from the homepage of European Environment Agency. See: <http://www.eea.europa.eu/data-and-maps/figures/biogeographical-regions-europe-2001>



Due to its similar vegetation, geology and climate conditions Estonia belongs together with Finland, Sweden, Latvia and part of Lithuania, to the Boreal region (figure 1).

The Directive composes of sites hosting the natural habitat types listed in Annex I and habitats of species listed in Annex II. The habitats and species listed in the directive should be maintained or, where appropriate, restored to favourable conservation status in their natural range (Council Directive 92/43/EEC, 1992).

Natura 2000 is not a system of strict nature reserves where all human activities are excluded. Whereas the network will certainly include nature reserves most of the land is likely to continue to be privately owned and the emphasis will be on ensuring that future management is sustainable, both ecologically and economically. The establishment of this network of protected areas also fulfils a Community obligation under the UN Convention on Biological Diversity (European Commission, 2010).

The creation of the Natura 2000 combines of following steps: (Krul & Lomax, 2004)

- The SACs (Special Areas of Conservation) are designated by the Members States:
  - First, the Member States propose Sites of Community Interest (pSCIs) in accordance with the Habitats Directive`s lists of habitats and species of concern
  - Following discussions between Member States and NGOs might create some improvements, that are suggested to Commission
  - The Commission then adopts the national pSCIs as Sites of Community Importance (SCIs)
  - Member States must then implement the Commission`s SCI list by designating Special Areas of Conservation (SACs) based on the SCI list.
- Member States also nominate a list of sites designated as Special Protection Areas (SPAs) in accordance with the Birds Directive.

As the SPAs are enforced immediately after Member States have send a list of designated sites to the Commission, the implementation of SACs is a bit longer process. During the course of the process outlined above, SCI proposals (pSCI) made by Member States are checked by researchers and stakeholders, such as the European Habitats Forum<sup>2</sup> and in two biogeographical seminars (Krul & Lomax, 2004).

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<sup>2</sup> The European Habitat Forum is a loose network of international NGOs involved in the conservation, rehabilitation and sustainable use of species, habitats and landscapes throughout Europe. See: <http://www.ceeweb.org/a4euhabforum/>

## 1.2. Natura 2000 and Forests

Forests are one important part of Natura 2000 network. Over half of all proposed sites for the EU-wide ecological network Natura 2000 will include forest areas (European Commission, 2003). Total fifty-nine forest habitat types of European conservation interest are listed in Annex I of the Habitats Directive because they are rare or residual and/or hosting species of community interest (Krott, et al., 2000). These habitat types cover all naturally occurring forest types in the EU and are grouped in the following categories:

- western taiga
- oak and beech forests
- deciduous Mediterranean forests
- sclerophyllous Mediterranean forests
- Temperate mountain conifer forests
- Mediterranean and macaronesian mountain forests

Without hesitation forests are playing important role in nature conservation. Yet forestry seems to be especially affected by the directive, as European forest habitats are high in biodiversity compared with agricultural or even non-managed sites (Weber & Christophersen, 2001). Numerous areas among Natura 2000 are listed as managed forest, both privately and state owned. This creates a situation where ecological interests oppose with economical ones. Although the concept of Natura 2000 was not to establish a system of strict nature reserves, where no economic activities can take place, a lot of misunderstandings and disapproval arose among the landowners across Europe (European Commission, 2003). Council resolution of 15 December 1998 on a forestry strategy for the European Union<sup>3</sup> states that the establishment of Natura 2000 should take into account economic, social and cultural requirements, regional and local characteristics and the involvement of forest owners.

## 1.3. Natura process in Estonia

The establishment of Natura 2000 began in Estonia at 25 of July 2000, when the government approved national action program "Estonian Natura 2000". The program had two main stages. The purposes of first stage was to assemble the first list of Sites of Community Interests, compile the database and maps and propose them to the Commission (2000). First stage was planned to be carried out between 2000 and 2002. The objectives of first stages where:

- 1) Compilation of the commented translations of Habitats and Bird Directive
- 2) Compilation of the guidelines for Natura 2000 dataset
- 3) Compilation of the interpretation manual of Natura 2000 habitat types
- 4) Preparation of the list of sites of Community Interests
- 5) Compilation of the database of Natura 2000

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<sup>3</sup> Available at: [http://ec.europa.eu/agriculture/fore/index\\_en.htm](http://ec.europa.eu/agriculture/fore/index_en.htm)

- 6) Mapping of the borders of the sites of Natura 2000
- 7) Arrangement of temporary protection regime in sites of Natura 2000
- 8) Cost analyses of protection regime in sites of Natura 2000
- 9) Training
- 10) Publication of objectives of Natura 2000 to public

The objective of second stage was to establish necessary conservation measures by creating special conservation areas, specifying management measures, compiling management plans and implementing other actions to ensure the favourable conservation status of Natura 2000 areas. The second stage was planned to be carried out from 2003 to 2007.

The first list of Sites of Community Interests designated by Estonia was send to European Commission at the time of joining European Union in 2004. The sufficiency of SACs under the Habitat Directive was evaluated in two biogeographical seminars: first in Boreal region seminar in 2005 and then in Baltic Sea region seminar in 2009. As a result of Boreal region seminar, Estonia had to find additional areas to ensure the favourable conditions to certain species and habitats, including forest habitat types. The shortages will be supplemented with the areas listed in the “shadow list” composed by the NGOs (Möller, 2010). Today, there are 60 different habitat types, 51 animal and plant species and 136 bird species listed in Natura directives in Estonia.

The forest with high biodiversity and conservation value were identified through old-growth forest inventory, key-habitats inventory and through “Estonian Forest Conservation Area Network” inventory (Zingel & Tambets, 2004). Although the inventories were made before the beginning of Estonian Natura process (2000), the selected areas formed an important part of Natura 2000 network. Out of 59 forest habitat types there are 11 forest habitat types in Estonia (table 1).

**Table 1: Forest habitat types in Estonia**

	Natura 2000 code	Forest habitat type
1	9010	<i>Western taiga</i>
2	9020	<i>Fennoscandian hemiboreal natural old broad-leaved deciduous forests</i>
3	9050	<i>Fennoscandian herb-rich forests with Picea abies</i>
4	9060	<i>Coniferous forests on glaciofluvial escers</i>
5	9070	<i>Fennoscandian wooded pastures</i>
6	9080	<i>Fennoscandian deciduous swamp woods</i>
7	9180	<i>Tilio-Acerion forests of slopes, screes and ravines</i>
8	91D0	<i>Bog woodland</i>
9	91E0	<i>Alluvial forests with Alnus glutinosa and Fraxinus excelsior</i>
10	91F0	<i>Riparian mixed forests along the rivers</i>
11	2180	<i>Wooded dunes</i>

## 1.4. Estonian Forests

The Republic of Estonia is located in Northern Europe on the eastern coast of the Baltic Sea (figure 2). The total area of the country is 45.227 square km. The moderate maritime climate is congenial for forest growth, and in natural conditions approximately 85% of the country would be covered in forests (Viilma & Öövel , 2009). Due to the cool climate, evaporation and the slow flow of surface water resulting from the flat relief cause excess moisture in many places (Pärt, 2009).



Figure 2: Location of Estonian Republic

Forests are an important part of the Estonian landscape. According to National forest inventory, NFI 2007, Estonia has 2.213.000 hectares of forest land, which represents approximately half of the country (NFI 2007). Forest land is estimated on the basis of the definition given in the Estonian Forest Act. According to the act, forest land is land listed in the land register as forest and or land of at least 0.1 hectares where woody plants with a height of at least 1.3 m and with crown closure of at least 30% grow (Forest Act, 2007). Around 40 % of Estonian forests are state-owned and 44 % are privately owned (figure 3). However 17% of forest land is without any ownership (NFI 2007).

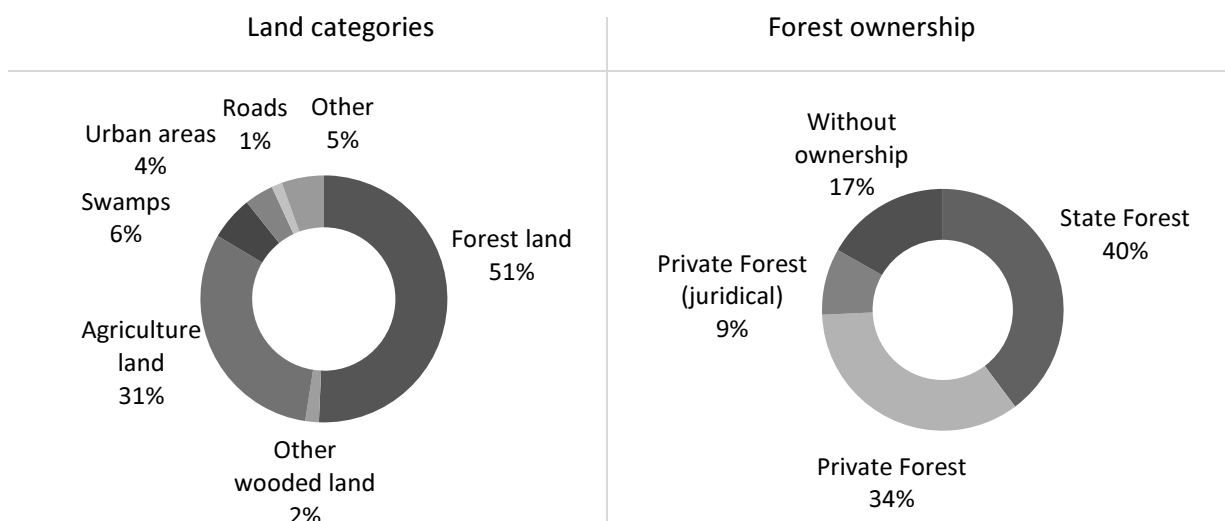


Figure 3: Land categories and forest ownership

Source: NFI 2007

## 1.5. Forest policy and legislation

Like Estonia as a nation, also forestry has been influenced and ruled by different empires, regimes and countries. The first dated act, which regulated forestry activities, is from 1327, when Danish King Erik Menved forbade felling on three small islands in Tallinn Bay in order to maintain them as maritime navigation landmarks (Viilma & Öövel, 2009). As an independent branch of the economy, forestry began to develop at the end of the 18<sup>th</sup> century, when Estonia formed part of the Russian empire. Even though Estonia gained its independence in 1918, the first Estonian Forest Act did not enter force until 1934. In 1940 Soviet order was imposed once again, as was the Russian Forest Act. Interesting is the fact that during the years 1941 to 1944 there were three different Forest Acts valid at the same time: the Estonian Forest Act from 1934 and German and Russian forest laws (Lamp, 2009).

Estonia regained its independence in 1991. Outlining the principles of good management practices, the second forest act was passed by the Riigikogu (the Estonian parliament) in 1993. The third Forest Act, reflecting the new Forest Policy (1997), included the concepts, positions and definitions set out in the Strasbourg, Helsinki and Lisbon resolutions of the Pan-European Ministerial Process of Forest Protection (Lamp, 2009). Even though the new Forest Policy considered both, the ecological and economical values of forests and it relied on international concepts and agreements, it was lacking an integral plan of implementation measures.

To coordinate the implementation of activities defined in the Forest Policy and the allocation of the required resources, the Estonian Forestry Development Programme until 2010 was approved by the Riigikogu (the Estonian parliament) in November 2002. It was based on the Sustainable Development Act and Forestry Act (Lamp, 2009). The fourth version of the Estonian Forest Act was validated in 2007 and its main aim is to ensure the protection and sustainable management of forests as an ecosystem (Forest Act, 2007). In 2009 the last Forest Act 2007 was approved with certain amendments, for example the forest protection categories were removed. Today forests are divided into protection regimes according to the Nature Conservation Act (2004).

## 1.6. Forest Conservation

Conservation of forest communities in Estonia dates back as far as the first millennium A.D. Ancient Estonians believed in the spirits of nature and considered old forests to be sacred. The first nature reserve for forest communities was established in 1924 in Kastre-Peravalla Educational Forest District of Tartu University. In the 1990s the total area of protected forests was 91,300 ha, 31% of protected areas (Viilma & Öövel, 2009).

Estonian forests are fairly rich in species. Because of their structural complexity, Estonian forests provide ideal habitats for a rich array of plants and animals. In comparison to those of many densely populated European countries, Estonian forests still contain populations of animals and plants which have become rare or even extinct in other countries. There are 81 native tree and bush species growing and more than 20,000 species thought to inhabit Estonian forests (Viilma & Öövel, 2009).

Forest protection is regulated mainly by the Nature Conservation Act (2004) and Forest Act (2007). The concept of forest protection and long-term objectives are set out in the Estonian Forestry Development Programme (2002) and in the Estonian Forest Policy (1997). The protection regime of protected areas is broadly determined by the Nature Conservation Act. The total territory of protected areas in Estonia is 782.300 ha<sup>4</sup>, which is some 18% of land area and it is divided into 3 zones:

- Strict nature reserves – no management is allowed; people are not allowed access except for rescue work or with special permits for scientific research
- Special management zone – no commercial forest management
- Limited management zone – forest management is allowed with specific restrictions

The protection regime of habitats of rare and endangered species or key habitats can be brought into line with the protection regime of the special management zone or limited management zone.

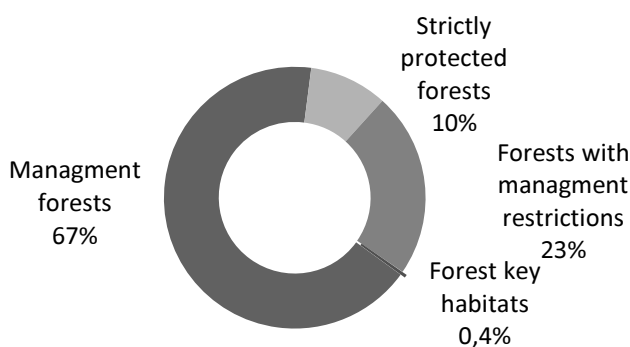


Figure 4: Forest protection categories

According to NFI 2007 the Estonian National Forest Protection system defines three types of forest protection categories: protected forest, protection forest and woodland key habitats (figure 4). However after the last update of Forestry Act (2009) protected forests are categorized according to protection regimes (described above) determined by Nature Conservation Act. In total, there are 782.300 ha forests under one or another kind of management bans. Of these, 214.110 ha are strictly protected, 506.300 ha are forest with less strict management restrictions and 9200 ha are protected key habitats (figure 4) (Viilma & Öövel , 2009).

<sup>4</sup> Estonian Nature Information System, ENIS; available at: <http://loodus.keskkonnainfo.ee/w5/index.php?lang=eng>

## 1.7. Stakeholders related to Estonian Forestry

Estonian forestry is connected with different stakeholders and institutions that are in one or another way connected with forests or wood. In common they are all interested of forest either as a source for raw material, as a ground for recreation or berry picking, as an employer or as place for biodiversity. In this study seven main stakeholders connected to forestry were observed (figure 5).



**Figure 5: The stakeholders related to Estonian forestry**

### 1.7.1. The State Forest Management Centre – RMK

The RMK is a governmental profit-making institution, which is operating under the Ministry of Environment. The institution was founded in 1999 and employs more than 800 people. It is responsible for the management of majority of Estonians public forests, accounting up to 817.000 hectares (Tönnisson, 2009). Its status means that on one hand it has to earn income for the state through logging and selling of timber, while on the other hand it is charged with tasks that do not generate any direct revenue but which are useful for everyone: maintaining the unique natural landscape of forests, organising environmentally friendly forest work and developing recreational possibilities that are free for all. (Lamp, 2009)

### 1.7.2. The Estonian Forest Industries Association

The Estonian Forest Industries Association is a non-profit association founded in 1996 and it is based upon voluntary membership. It connects companies and organizations engaged in acquisition of forests,

chemical and mechanical processing of wood as well as marketing (EMTL, 2010). Today the union consists of 43 members, whereas 3 of them are educational institutions. The main objective of the association is to protect and represent interests of its members, to support legal and economic conditions needed for the development of mechanical and chemical forest industries in Estonia.

### 1.7.3. The Ministry of Environment

Within the Ministry there are two units responsible for the field of forestry: the Forest Department and less directly, the Nature Conservation Department. The main tasks for the Forestry Department are to implement Forest Policy, to co-ordinate Forestry Development Programme, to prepare and finance different forestry programmes and to develop strategies, including hunting. The department is also involved in the development of forest- and hunting-related legal acts and legislation (Lamp, 2009). The Nature Conservation Department coordinates the development and implementation of nature conservation policy.

### 1.7.4. Estonian Fund for Nature

Estonian Fund for Nature is a non-governmental organisation (NGO), which was established in 1991 by biologists and conservationists in close co-operation with WWF (World Wide Fund for Nature). The main objective is to preserve the entire Estonian nature and its diversity in cooperation with individuals, companies, organisations and state institutions. EFN has 10 employees and hires additionally some 50 temporary staff for short-term tasks each year.

### 1.7.5. The Private Forest Centre

The foundation Private Forest Centre (PFC) was established on the 23rd of March in 1999. It ensures the fulfilment of the duties of the state towards private forest owners offering advices, trainings and facilitating the application for state support (Private Forest Centre, 2010). The foundation rights lay in the hand of the Ministry of Environment. The main task for the Private Forest Centre is to increase sustainable, environmentally friendly and efficient forest management practices in Estonian forests among private forest owners (Lamp, 2009).

### 1.7.6. The Estonian Private Forest Union

The Estonian Private Forest Union (EPFU) is founded in 1992 as an umbrella organization to 37 private forest owners' local organizations. However, only 2500 (5 %) out of 50000 private forest owners in Estonia, are members of local forest owners association. Through active participation in forest policy making and in the legislative process its goal is to represent the interests of private forest owners. The EPFUs main partner is Private Forest Centre and it is a member of the Confederation of European Forest Owners (CEPF).



### 1.7.7. The Environmental Board

The Environmental Board is a government office under the jurisdiction of the Ministry of Environment which exercises executive power and state supervision and enforces the power of the state where legally applicable. Its area of operations is the implementation of the state's policies, programmes and action plans related to environmental protection, nature conservation, the use of natural environment and radiation safety (Lamp, 2009). Environmental Board was established in 2009 as an incorporation of regional environmental services, National Conservation Centre and the Radiation Centre.

## 2. MATERIALS AND METHODS

### 2.1. Choice of methods

The reason for choosing following methods was to collect and analyse necessary information and to be able to fulfil the objectives of present thesis. Due to the lack of research and therefore no published scientific literature nor the related studies elsewhere in Europe, the information collection was hindered. However to gather preliminary information about the Estonian Natura process media content analysis was used. The method is commonly used by scholars dealing with media and communication (Berger, 2000). It enabled to analyse the dynamics of Natura process as reflected in mass media as well as to determine the involved stakeholders related to Estonian forestry.

Still as the full extent of Natura 2000 in Estonian forests remained unclear from the media analysis and no officially published results indicating the area of Natura forests was found, geo-analysis was brought into use. The method enabled to determine the magnitude of Natura 2000 in Estonian forests, which is crucial because it defines the initial source of possible influence.

To be able to confirm the information found from previous methods, as well as to find answers to the questions raised during the media and geo-analysis, the interviews with relevant stakeholder were drawn. The interviews enabled to rely on the knowledge of representatives from different stakeholders being involved in the Natura process.

### 2.2. Media content analysis

Media analysis was conducted in the early stage of the study. It took approximately 4 weeks to go through all the chosen sources and 1 week for analysing stage.

For the analysis three different media sources were selected: newspaper "Metsaleht", journal "Eesti Mets" and journal "Eesti Loodus". The newspaper "Metsaleht" (translated: "Forest newspaper") reveals every Thursday as a part of the public daily newspaper called "Maaleht" (trans. "Land newspaper"). The target group is the general public with a special focus to country people. The newspaper was chosen, because it is neutral, serving nobody's interests and everybody have equal change to say out their opinion. The journal "Eesti mets" (trans. "Estonian Forest") is a public journal writing mainly on issues about forests and forestry. It is directed towards people who are interested about forests, recreation or forestry. It is published by the same publisher as the journal "Eesti Loodus" (trans. "Estonian Nature"). "Eesti Loodus" was chosen to cover all possible information around the topic as well as to equalize the representation with mainly forestry orientated journal "Eesti mets".

All those three publications were searched with special focus on articles which included topics related to Natura 2000 and either to forests, forest protection or forestry. The time span was from 2000 to 2009.<sup>5</sup>

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<sup>5</sup> due to no availability, it was not possible to search "Eesti mets" and "Metsaleht" years between 2000-2001

All the articles found were reviewed and added to the excel database (appendix 3). As it is shown in figure 6, the information saved in the database was the source, headline, date, short summary about main message, web-address and the author.

	Source	Headline	Date	Summary	web-address	Author	Speaker	Message
75	<i>Journal "Eesti Mets"</i>	Metsaomanikke ähvard	II/2003	Metsandus arengukava koh	<a href="http://www.loodusaj.ee">http://www.loodusaj.ee</a>	EMTL/Äripäev	Forest industry	laienemine
76	<i>Journal "Eesti Mets"</i>	Eesti kaitsealade haldu	I/2004	Eesti looduskaitsealade pin	<a href="http://www.loodusaj.ee">http://www.loodusaj.ee</a>	Andres Onemar, kairmk		laienemine
77	<i>Journal "Eesti Mets"</i>	Rannu ja Puhja valla ma	I/2004	Kümned Rannu ja Puhja val	<a href="http://www.loodusaj.ee">http://www.loodusaj.ee</a>	Postimees	forest owners	laienemine
78	<i>Journal "Eesti Mets"</i>	Riik hakkab hüvitama k	II/2006	Valitsus kiitis 11. mail heak	<a href="http://www.loodusaj.ee">http://www.loodusaj.ee</a>	Keskkonnaministee	administration	kompensatsioon
79	<i>Journal "Eesti Mets"</i>	Eesti metsaliigid Euroo	II/2006	Euroopa Liidu liikmesmaane	<a href="http://www.loodusaj.ee">http://www.loodusaj.ee</a>	Hanno Zingel, Keskk	administration	EU ja LK tähsus

Figure 6: Excel database of content analyse

### 2.3. Geo-analysis

Geo-analysis is a qualitative research method used for analysing data by geographical area or other form of spatial referencing. The analyses use the spatial data (points, lines, areas) and non-spatial attributes in the database to answer questions about the real world. Results of geographic analysis can be illustrated with the help of maps. Using overlay operations, new spatial elements were created by the overlaying of different map layers.

GIS overlay operations were used to find out forest areas under Natura 2000 areas in Estonia. The main aim of Geo-analysis was to find answers:

1. How much forest in Estonia has designated under Natura 2000?
2. What is the ownership pattern in those forests?
3. How Natura forests are divided into protection regimes?

The calculations were needed to understand the alignment between nature protection network Natura 2000 and forests, as well as determining potential influence of Natura 2000 to Estonian forestry.

A total of 10 different GIS vector layers were used, namely: the layer of Special Protection Areas, the layer of Sites of Community Importance, the layer of "forest mask", the layer of Estonian basic map, the layer of forest register, the layer of forest key-habitats, the layer of nature reserves, the layer of special management zone, the layer of limited management zone, the layer of special conservation areas. The data is projected in the Estonian national grid L-EST97. Multiple database queries were made for statistics.

In order to find how much forest in total has been designated under Natura 2000, three different calculations were made (figure 7). First of all to be able to calculate the area of Natura forests it is crucial to know the extent of whole Estonian forests. The official data of the forest area is published by the National Forest Inventory, NFI. The data is calculated using sample plots spread out all around the country. Also the information from forest registry is used in their calculations. Another possibility is to calculate the forest area according to Estonian basic map, which includes different land categories including forestland. Then there is possible to calculate the forest area according to so-called "Forest

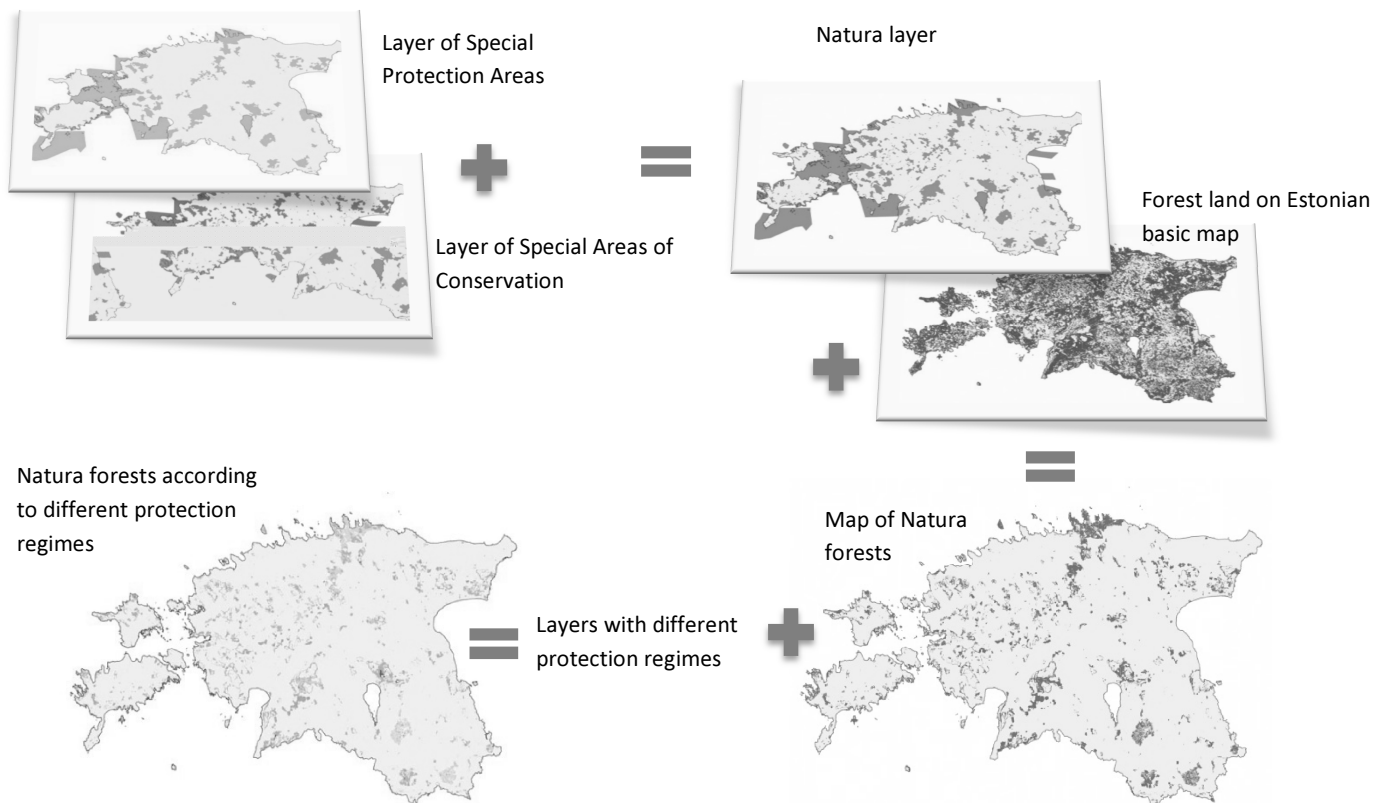
mask”, which is GIS-layer of Estonian forests calculated from satellite pictures by U. Peterson (2003). Using only the forest register, some forest areas without forest management plans will be missed.

Another difficulty is to calculate the overlay of forestland with Natura 2000 areas. There is no common Natura map-layer where all the areas designated to Natura network are included. In some statistics only forest habitat types are considered as Natura forests. But in addition to forest habitat types there are different sites hosting other habitats and species, which also might be located in Estonian forests. This is the reason why both, SAC`s from Habitats Directive and SPA`s from Birds Directive were united to find the absolute forest area situated in the territory of Natura 2000.

The operation was made by using application of mapping and geographic analysis - Mapinfo Professional and the process consists of following steps:

- At first Estonian basic map was used as a ground layer
- Then the layer of Special Protection Areas, SPA`s (linnualad) and the layer of Special Areas of Conservation, SAC`s (loodusalad) were united and with using Mapinfo commands “combine” and “disaggregate”, the overlaps between them were excluded. As a result new NATURA layer was created
- Then an inquiry under the layer of NATURA and basic map was made to find out those forest areas which are located within NATURA, either whole or in part
- Forest areas which were only partly located under NATURA, were cut away using commands - Split and Erase Outside
- The presence of overlapping areas were double-checked
- Finally new surface areas were calculated and summed

To find out how Natura forests were divided into protection regimes the overlap between NATURA layer and Estonian basic map was found. After determining the Natura forests, they were compared with layers of different protection regimes. Namely - with strict nature reserve layer, with special management zone layer, with limited management zone layer, with forest key-habitats layer and with special conservation areas layer. Each time the overlap of certain protection layer and Natura forest was summed.



**Figure 7: The process of calculating Natura forests**

The data used in the analysis was requested from the Estonian Environment Information Centre and Centre of Forest Protection and Silviculture between December and April 2009/2010. The analysis was conducted from April to May. As the spatial queries were great in volume, covering all terrestrial territory of Estonia, they took totally around 5 full working days to complete. To ensure the trustworthiness of the analysis an additional assistance from Regio<sup>6</sup> GIS – specialist was used.

<sup>6</sup> Regio – Estonian mapping company; Extra information available in <http://www.regio.ee/?setlang=eng>

## 2.4. Interviews

In order to gather information and find answers to the questions emerged before, nine qualitative problem focused interviews with different stakeholders were drawn. Interviews covered eight different stakeholders:

- Ministry of Environment – Nature conservation department
- Ministry of Environment – Forestry department
- Environmental Board
- Estonian Fund for Nature – (NGO)
- Private Forest Centre
- Estonian Private Forest Union
- State Forest Management Centre
- Estonian Forest Industries Association

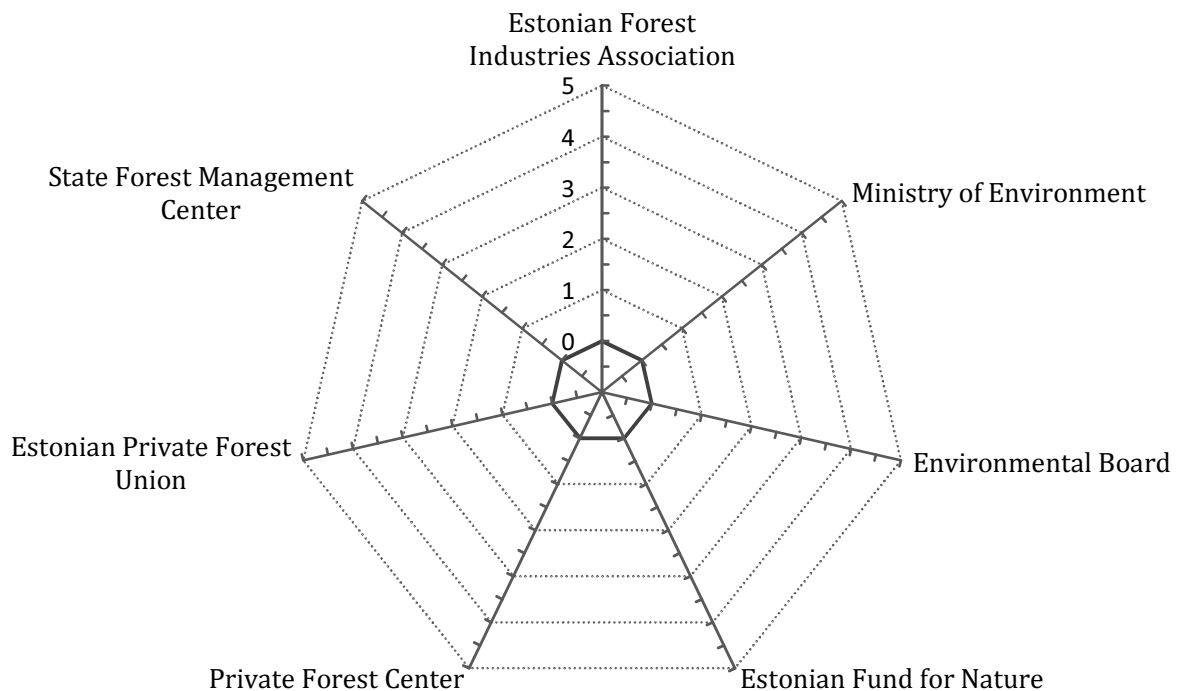
In total there was nine people interviewed:

- Kadri Möller – councilor of Nature Conservation Department
- Kadi Kõiv – specialist of Forestry Department
- Kaili Viilma – leading specialist of Environmental Board
- Andres Onemar – head of Environmental Board, former Council President of State Forest Management Centre
- Kaupo Kohv – forest specialist in Estonian Fund for Nature
- Eve Rebane – board member of Private Forest Centre, responsible for EU compensations
- Ants Varblane – managing director of Estonian Private Forest Union
- Urmas Roht – head of RMKs Nature Conservation Department
- Ott Otsman – head of Estonian Forest Industries Association

Different stakeholders and their representatives were deliberately chosen according to media analyse conducted before. Important was to cover all stakeholder with most informed representatives. During the time span 2000-2009 different representatives had been working in different positions. It means some of them had been connected with Natura process since the beginning meanwhile others have involved later.

The invitations for respondents were sent one month before the interviews, via email. In case of no answer, the invitations were sent for the second time after 5 working days. Five days before interviews representatives were informed about the subject and objectives of the coming meeting. No questions were sent in advance. All the interviews were held during four days of visit to Estonia (05.04 – 08.04.10).

All the interviews were kept rather open than in a strict question-answer like form. At the beginning of the interviews the background of representatives and their connectedness to Natura process was determined. Then the respondents were asked to evaluate the potential neg. influence of Natura process (2000-2009). The question was presented in a excel graph like form (figure 8).



**Figure 8: Structure of the question**

At first the representatives had to mark in scale zero to five, the influence or impact which the establishment of Natura 2000 had done for their institution and then estimate the potential influence to other stakeholders. Example the respondent from State Forest Management Centre was asked to evaluate the impact to State Forest Management Centre and then estimate the potential impact to all the other institutions shown in the figure 8. The scale was divided into six categories:

- 0 - Interests are rather favoured than harmed
- 1 - Influence isn't remarkable
- 2 - Little effect
- 3 - Clear impact, interests are in conflict
- 4 - Strong influence, interests are harmed
- 5 - Direct impact, interests are ruined

However one should note that the intention of those categories is to reflect only the negative influence of Natura 2000 on Estonian Forestry. The results according to those categories should be regarded with caution, because the distances between scale items are not equal.

While filling in the figure, a discussion and reasoning by the representative was told at the same time, which tended to be very useful information in latter analysing stage.

Another but same type of question was asked about opportunity and power of different stakeholders to be involved and to be able to speak up throughout the implementation process of Natura 2000. Again the representatives had at first to evaluate the power and the opportunity of their organisation to be involved in Natura process and then estimate how much other stakeholders have been able to speak up during the Natura process. Using the graph as shown in figure 8, the representatives had to mark their estimations according to following criteria:

- 0 – Any kind of participation is missing
- 1 – Small opportunity to be involved
- 2 – Opportunity but no power
- 3 – Power and opportunity
- 4 – Strong power to influence decisions
- 5 – Dominant power to decide

The purpose of those graph-like questions was to bind different interviews together and get best average estimates how the representatives of different institutions evaluate themselves (specialist opinion) and each other (average opinion).

As follows the interviews were lead as problem-focused discussions by stopping on points and arguments found from content analyse. The main focus was on:

- possible impacts and influences of Natura process to Estonian forestry
- rising or decreasing conflict between forestry and conservation in relation to Natura process
- relationships and communication between the triangle of European Commission – Ministry of Environment – forest owners
- mistakes, shortages, confusion and reasons which accompanied with the implementation process

The average length of the interviews was 1.5 hours. All the interviews were recorded. However the recordings were typed to a document and send back to the respondents for review. The reviewed information was used for further analyse.



## 3. RESULTS

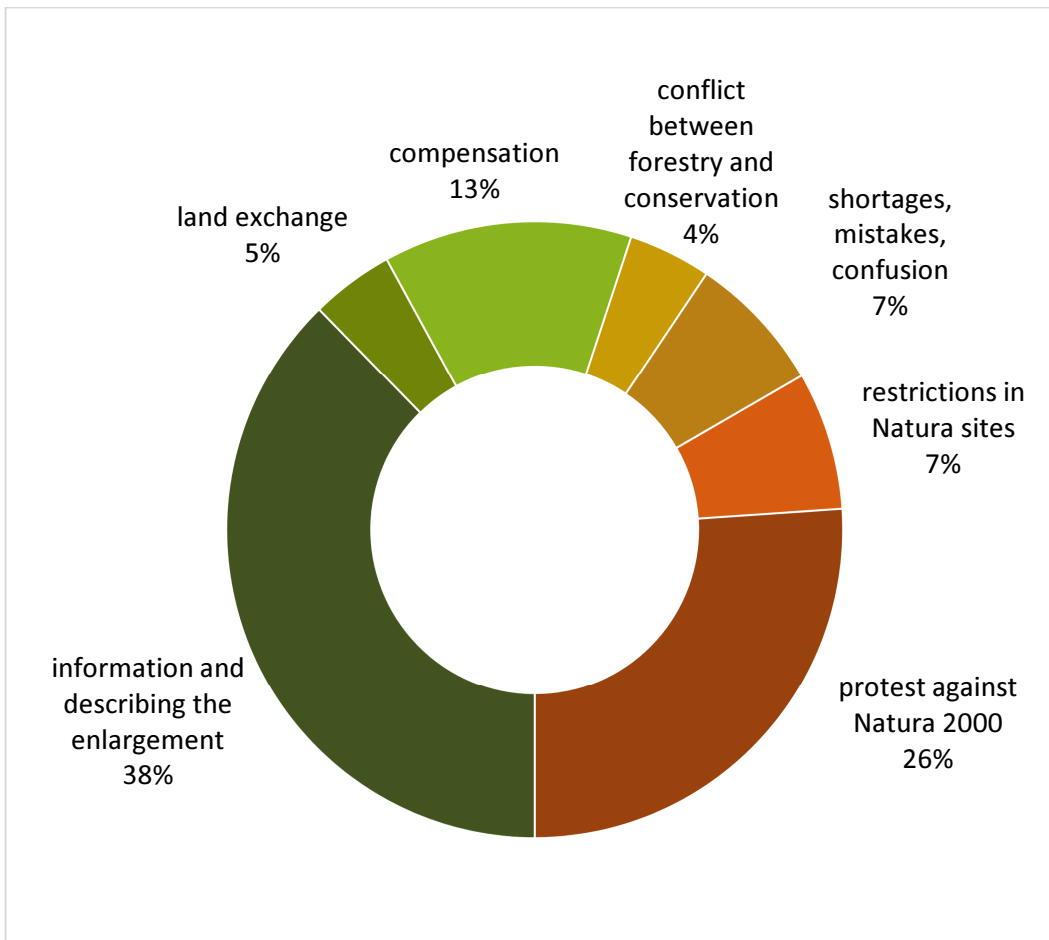
### 3.1. Media content analysis

During the media search two public journals, “Eesti Mets” (Estonian Forest), and “Eesti Loodus” (Estonian Nature) and one newspaper “Metsaleht” (Forest newspaper) were reviewed. Totally 73 articles which were related to Natura 2000 and connected either with forestry or forest protection was found. Sixteen of them were in journal “Eesti Mets”, 17 in “Eesti Loodus” and 40 articles in newspaper “Metsaleht”.

Articles found were sorted by the speaker and by the main message. In order to determine the speaker, seven different categories were established: private forest union/centre; forest manager, forest owner, specialist, conservationist, administration, media/third party (figure 11). The speaker was designated according to the author and interest group the author represents. If the author was unknown or there was no special interest group, the article was signed under category media/third party. The distribution according to most prevailing messages was also set into seven groups, articles:

1. which included some sort of protest against Natura 2000
2. which were either describing or complaining about management restrictions
3. where different types of shortages, mistakes or confusion was mentioned
4. in which a conflict between forestry and conservation was described
5. which were informational and describing the Natura process
6. which informed about the land exchange system
7. written about Natura 2000 compensation for private forestland

Constructed database (see appendix 3) enabled to form inquiries accordingly by speaker, message, and date or by combining different categories.



**Figure 9: Main messages of articles**

As it is shown in figure 9, the biggest share of articles (38%) was describing the implementation and enlargement process of Natura 2000. The main purpose was to provide information for different stakeholders and for general public. Those articles were written mainly by administration officials or specialists and they were evenly spread throughout Natura process (2000-2009) (figure 11). Additionally there were 4 articles describing the land exchange. There was possibility for the private owners whose land was designated under Natura 2000, to sell their land for the State or to change it with other state-owned forest land. Third group marked in green in the figure 9 includes articles which were concerned about Natura 2000 compensation mechanism for private forest owners. Those articles came out between 2006 and 2009. As the compensation started 2008, the earlier articles considered statements expressing the need of compensation, whereas the latter articles were more specific announcements how the application process will work. As the articles in those three groups were more like announcements and information provision by administration officials and specialists, the remaining groups considered the negative side which accompanied with the establishment and implementation of Natura 2000.

The main reason of dissatisfaction in 26% of total articles was the protest of forest owner against their land been designated under Natura 2000 network. They felt their property rights have been injured,

different and changing restriction regimes are spreading confusion, management restrictions will harm the forest management which will have an impact to incomes. Additionally 5 articles (7%) were written mainly by administration officials explaining present and possible upcoming restrictions. Also the conflict between forestry and nature conservation was mentioned in four per cent of the articles. The mistakes and shortages which occurred with Natura process were covered by 5 articles published either by state audit office, media or administration.

In order to know when different type of articles during the time span of 2000 – 2009 emerged, they were sorted between different years. Before 2004, when Estonia hadn't joined the EU, there was very little written about Natura 2000 (figure 10). In average 2 or 3 articles per year with a main focus on general description of Natura 2000 and the possibility of joining it in the future. As it is shown on figure 11 they were written mainly either by specialists or administration officials due to their profession or by media. The year 2004, when Estonia accessed to the EU and officially implemented Natura 2000 the amount of articles published in this subject clearly increased (figure 10, 11). Obviously the prevailing message in half of the articles was information about enlargement of Natura 2000, written by administration officials (mainly by Ministry of Environment). Another half described possible management restrictions or complained about. As it is shown in figure 11, also the foresters and forest owners started to waken up.

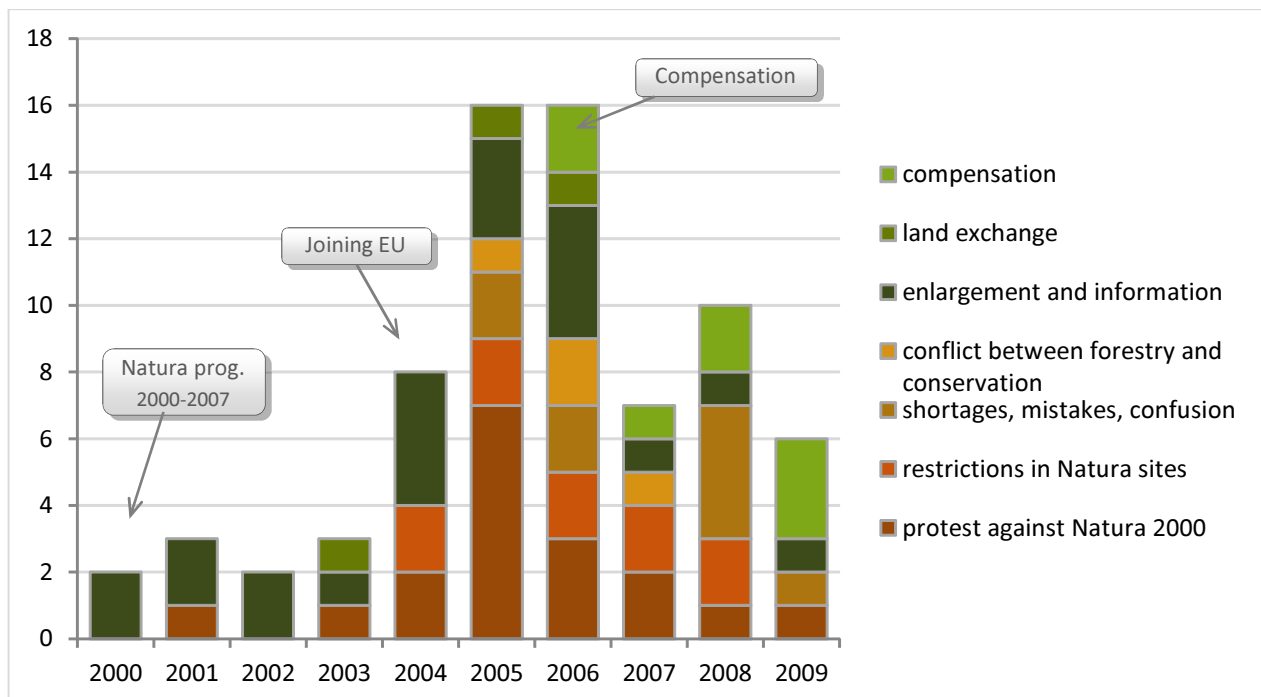
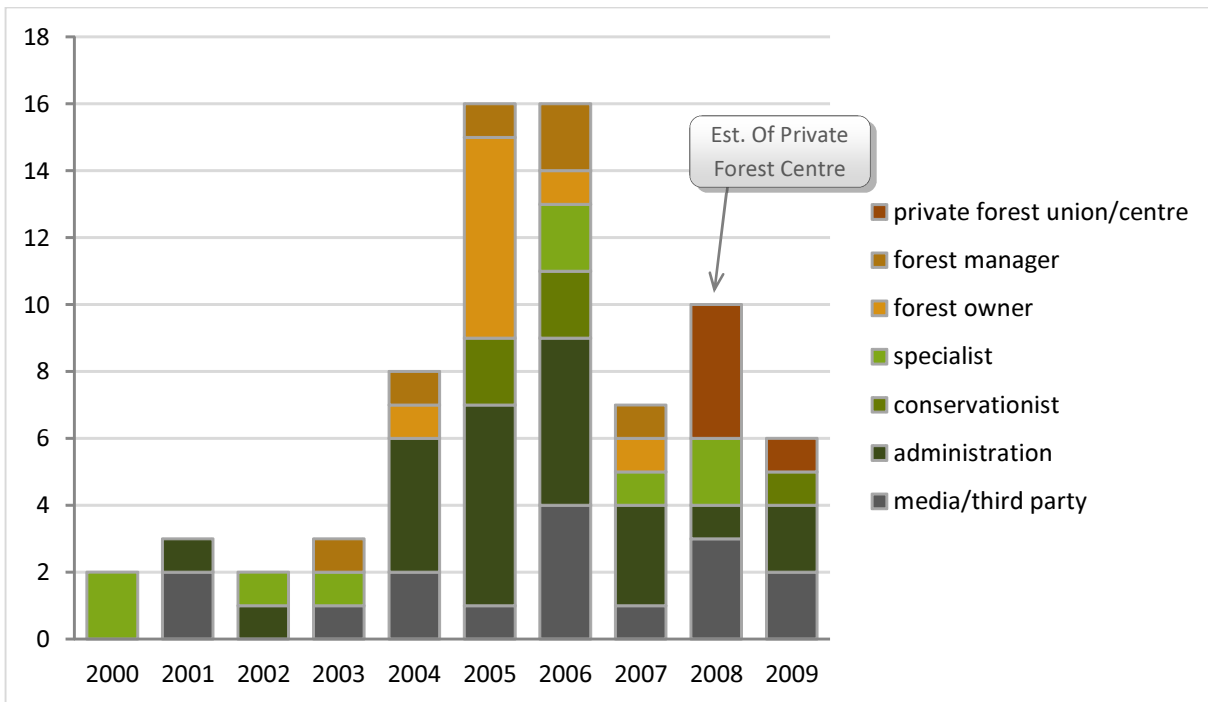


Figure 10: Articles distributed by the main message



**Figure 11: Dynamics of articles by the speaker**

After Estonia had designated and established Natura 2000 areas in 2004, the total number of articles in following years increased remarkably (figure 11). Compared to earlier years (2000-2004) the voice of forest owners and foresters appeared to the media (figure 11). As it is shown in figure 10, the protest against Natura 2000 seemingly increased after Estonia approved the sites and restrictions of Natura 2000 at 2004. In 2005 the amount of articles holding messages connected either with protest, restrictions, mistakes, confusion or conflict was significantly highest during the period from 2000 to 2009 (figure 10).

Green colours in figures 9, 10 and 11 indicate the articles which had to do either some kind of information provision or with possible compensation mechanism like land exchange or Natura 2000 compensation for private forestland. The author considered them as articles which reflected positive influence towards Estonian forestry or are neutral. However orange colours illustrate the dissatisfaction of forest owners or foresters and they are considered as articles which reflected negative impact.

As it is shown on the figure 10 the protest against Natura has continuously decreased since 2006. It will be explained with the fact that the overall awareness about Natura 2000 had increased and also possible compensation mechanisms like land exchange and Natura support to private forestland started to work. First articles written about possible compensation for private forest land started to appear from 2006 (figure 9). However the compensation started not until 2008 when the Private Forest Centre was established. Important fact is shown in figure 11, were the voice of Private Forest Union and Private Forest Centre entered to public discussion only until 2008. It reflects the weakness of private forest sector foregoing period (2000-2007).



As it was shown in the figure 9, around 44 % of reviewed articles expressed some kind of dissatisfaction. The problems causing most of the debate were increasing area of protected forest and management restrictions. A lot of forest owners felt themselves been “attacked” by the conservation officials. The dissatisfaction was caused because forest owners discovered their forest being united to Natura 2000 without any further discussion; and even if they knew about their forest being united to the network, they were not aware about severe restrictions which were established in all Natura forest areas after 2004. Also the big forest companies and the State Forest Managing Centre revealed their dissatisfaction about increasing management restrictions in the media.

## 3.2. Geo-analysis

### 3.2.1. Natura forests

As it was said under the section of materials and methods, to calculate the area of Natura forest one should know the area of total forests. According to National Forest Inventory (NFI) the total area of forestland is 2.212.700 ha (NFI 2007). Unfortunately NFI doesn’t provide GIS layer, which is crucial for geo-analysis and overlay operations. This is the reason why different options were considered. As shown in the table 2, the forest areas in Estonian basic map, Forest register and forest mask, was calculated and compared with officially published number by NFI.

**Table 2: Different options for calculating the forest area**

Source	Scale illustrating the difference	Forest area
NFI 2007		2.212.700 ha
Basic map		2.286.349 ha
Forest registry		1.905.816 ha
Forest mask		2.368.258 ha

Those differences occur due to various reasons. NFI calculates the forest area by combining forest register and sample plot method covering the whole Estonia. Basic map divides Estonia to different land categories, separating also the forestland. Forest register includes only forest compartments which have valid management plans. Forest mask is a GIS layer of Estonian forests calculated from satellite pictures by U. Peterson (2003).

Depending on which method is used in analysis, the result indicating the area of Natura forest will vary as well. In the table 3 the three different results according to basic map, forest registry and forest mask, are illustrated. To be able to compare the results from geo-analyse with the official data, the coverage of Natura forests was requested from The Estonian Environment Information Centre (EEIC). The requested number (not publicly available) showed that according to analyse made in 04.2009 the total area of Natura forests is 353.968 hectares.

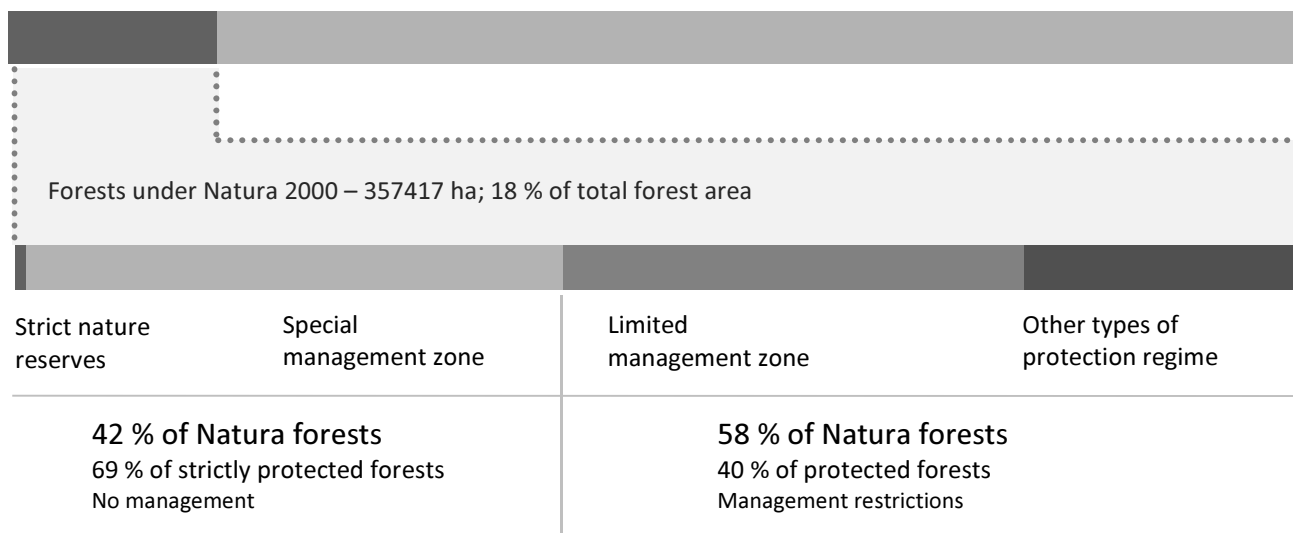
**Table 3: The area of Natura forests calculated with different methods**

Source	Scale illustrating the difference	Natura forest area
EEIC 2009		353.968 ha
Basic map		357.417 ha
Forest registry		437.705 ha
Forest mask		396.046 ha

The calculation using the forest register showed the biggest area of Natura forests. This is because the forest register also includes some parts of swamps and small lakes. As it is shown in the figure above, the result from the calculation where basic map was used is rather similar to official number calculated by the Environmental Information Centre. It is because basic map was also used as a ground layer by EEIC and that is the reason why the method with basic map was used for further analyse.

According to analysis, the forest area inside the Natura 2000 network is 357.417 ha, which is around 18 per cent of total forest area in Estonia (figure 12). As it is illustrated in the figure, 42 % of “Natura forests” are strictly protected, where no management is allowed and 58 % is under less strict regimes where the management activities are limited by various types of restriction.

Total forest area; 2.286.349 ha

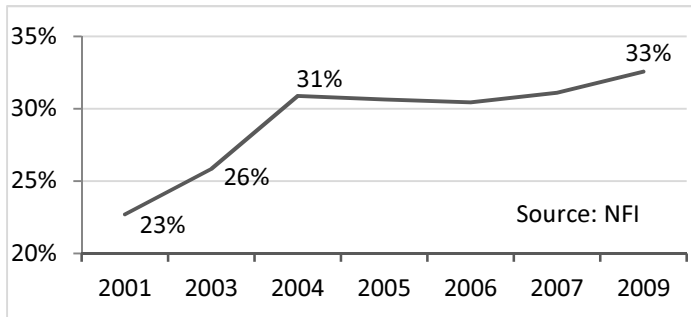


**Figure 12: The extent of Natura forests and distribution to protection regimes**

### 3.2.2. Increase of protected forests

According the geo-analysis it was not possible to calculate exactly how much the establishment of Natura 2000 has increased the area of protected forests. However, if looking at the official yearly statistic published by the Centre of Forest Protection and Silviculture, it is possible to draw a parallel between the increasing amount of protected forests and the Natura process (2000-2009). As shown in the figure 13, the total number of forests under different kind of protection regimes has increased from 23 % to 33 %

of total forest area during the last decade and it is obvious from the graph that the biggest increase took place in 2004, when Natura 2000 was officially implemented.

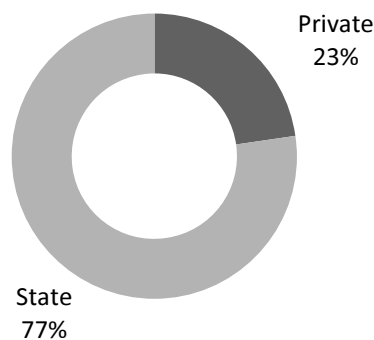


**Figure 13: Increased percentage of protected forest areas**

The influence of Natura 2000 is also visible if looking only the increase of strictly protected forests. Before the Estonian Natura process was officially started (2000), the share of strictly protected forests from total forest area had increased from 3 % to 6.7%. This was achieved mainly due to forest key-habitats inventory and “Estonian Forest Conservation Area Network” inventory. Even though those inventories were not directly connected to Natura process, they still contributed to the implementation process of Natura substantially, because the areas selected during the inventories were later automatically designated to Natura 2000. However the increase of strictly protected forests from 6.7 % to 10 % was in majority achieved due to the implementation of Natura 2000.

### 3.2.3. The ownership

Due to no response for the information request from the Land Board it was unfortunately impossible to deeply analyse the ownership distribution. Instead using the overlap operation between Natura forests and cadastral layer, the approximation was calculated by using the results from analyse conducted to calculate private ownership among Natura forests. This analyse was ordered by the Private Forest Centre and made by the Land Board. As the total area of Natura forests was known from present analyse, the area of private Natura forests was separated and the share of state Natura forests was calculated.



**Figure 14: Ownership of Natura forests**

As shown on the figure 14, the majority of “Natura forests” are state-owned. The manager for more than three hundred thousand hectares of forest is RMK (State Forest Management Centre). Around 90.000 hectares of Natura forests are privately owned.

#### 3.2.4. Economic estimation

The economic impact of Natura 2000 wasn't directly calculated in this study. However one way to estimate the economic impact is to analyse the Natura 2000 support for private forestland. The objective of the support is to compensate the private forest owner for the loss of profit incurred in forest management in Natura 2000 area (Private Forest Centre, 2010). In 2010 the total amount of support provided to private forestland was more than 5.3 million euros. The compensation for strictly protected Natura forests is 110 EUR/ha and in other types of protected Natura forests 60 EUR/ha.

The economic impact of enlarging the area of protected forest was calculated by Sirgmets et. al (2007). They estimated that if changing the status of commercial forests into the strictly protected from 7.7 % to 10 % of the total forest area, the annual net revenue from forest management decreases about 6.8 million euros per year. Similar study was conducted also by Leppänen et. al (2005) where the study identifying the lost income in Southern Finland due to Natura 2000 and revealed that during the next decade the state have to compensate 1 billion euros per 1 % of the total forest area turned form commercial forests into protected ones.



### 3.3. Interviews

#### 3.3.1. Influences and reasons

As a result of nine interviews ten influential factors were determined (table 4). These factors listed in the table below were divided into two categories: direct and indirect influences. The most important impacts which have influenced Estonian Forest Cluster were claimed to be the increasing area of strictly protected forests, loss of timber resource, management restrictions and limitations to property rights. The factors that were not directly measurable but which could have influenced forest cluster were defined as indirect influences.

**Table 4: Factors which have influenced Estonian Forest Cluster**

Direct	Increased number of strictly protected forests
	Loss of timber resource
	Management restrictions
	Limitations to property rights
	Nationalization of protected private forests
Indirect	Disruption of the fulfilment of the Estonian Forest Development Programme
	Nature Conservation as a whole got more attention and money
	Rising power of nature conservation movement
	Increased power of NGO`s and Conservation officials
	Increasing conflict between forestry and nature conservation

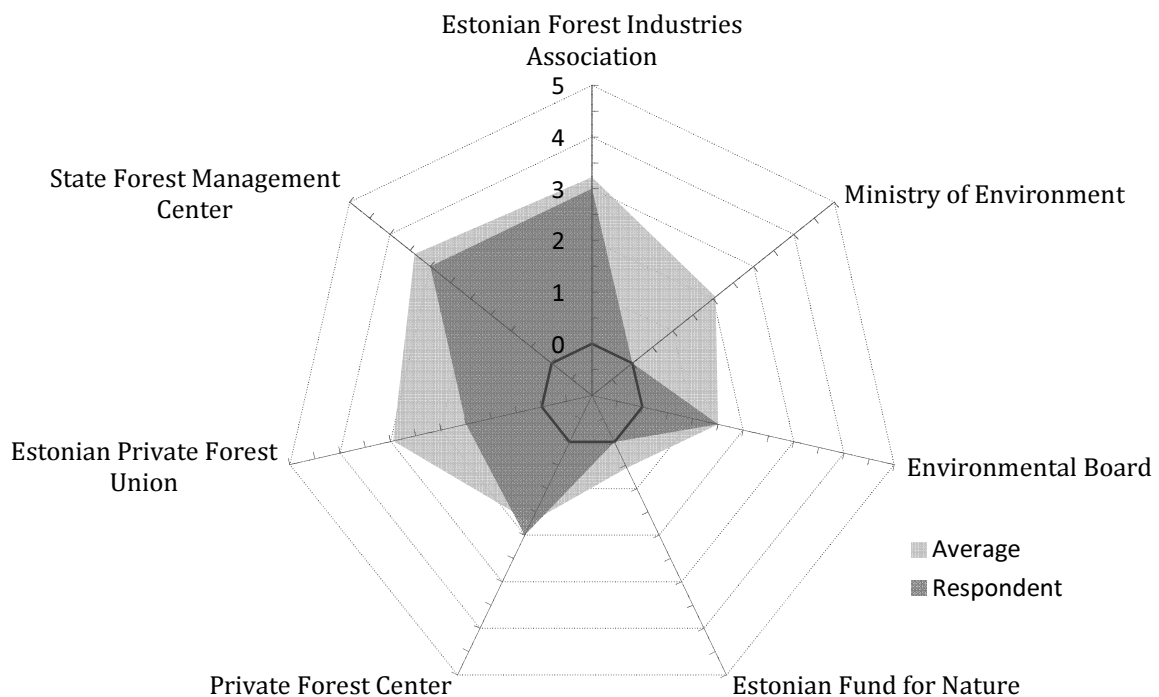
In addition to the influential factors shown above, potential reasoning for impacts, mistakes and problems occurring throughout the implementation process was also drawn (table 5). The reasons found during the interviews were roughly divided into three categories. Firstly the reasons which occurred in state level and were not caused by any institution observed in this study. Secondly the reasons connected to the work of Ministry of Environment and finally the stakeholder level. The reasons are not directly linked to influences shown in table 4. The influences and reasons presented in tables 4 and 5 will be elaborated under the discussion section.

**Table 5: Potential reasoning for found influences**

	State
Inadequacy of directives to Estonian conditions	
Natura 2000 as a precondition for accessing EU	
Enforced and hastened time plan for the Ministry of Environment	
Lack of money and time for successful implementation	
	Ministry
Bad communication between Estonia and Commission	
Bad communication between forest owners and the Ministry officials	
No social contracts between different interest groups	
Lack of harmonized methods and experts throughout designation process	
Other mistakes and deficits	
Bureaucracy and delay for compensation	
Private forestry unorganized	Stakeholder

### 3.3.2. Scale of influence

To illustrate the scale and relation of potential influence of Natura 2000 on Estonian forestry, a graph-like figure was drawn. The figure 15 illustrates the possible negative impact to different stakeholders. The inner area (dark grey) in the figure shows how the representatives of each interest group evaluated the potential influence to their institution. For example how the respondent from Ministry assessed the impact on the Ministry of Environment (score 1) and how the director of Private Forest Owner Union assessed the influence on private owners (score 3). However the light grey area in the figure indicates the average of how different representatives have evaluated possible impact to other stakeholders.

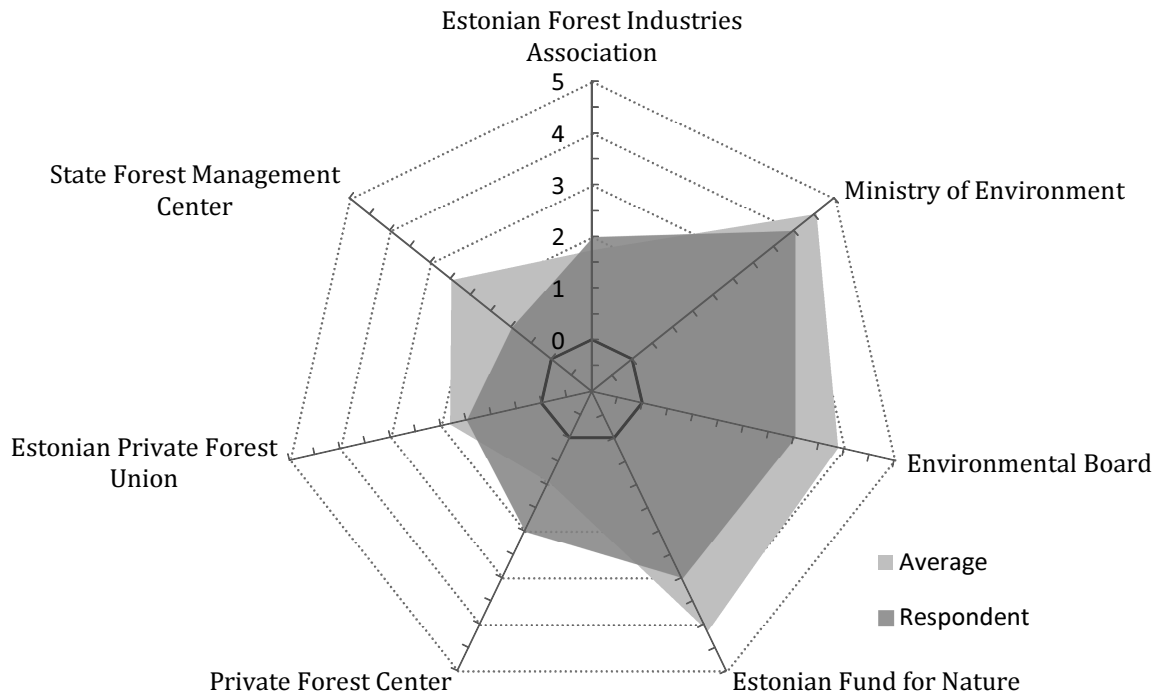


- 0 - interests are rather favoured than harmed
- 1 – Influence isn't remarkable
- 2 – Little effect
- 3 - Clear impact, interests are in conflict
- 4 – Strong influence, interests are harmed
- 5 – Direct impact, interests are ruined

**Figure 15: Influence of Natura process to stakeholders**

It is clear from the figure that the potential impact from Natura process has affected the stakeholders either dealing with forest management or depending on timber as raw material. Thus the institutions

whose main concern is to secure the preservation of biodiversity and who don't have economic interests involved, seemed to be less affected or even favoured by the Natura process.



- 0 – Any kind of participation is missing
- 1 – Small opportunity to be involved
- 2 – Opportunity but no power
- 3 – Power and opportunity
- 4 – Strong power to influence decisions
- 5 – Dominant power to decide

**Figure 16: Opportunity and power to participate in decision making**

Figure 16 illustrates the opportunity and power of different stakeholders to be involved and to be able to speak up throughout the implementation process of Natura 2000, the result is slightly moved to opposite side of the figure. The dark grey area illustrates how the representatives from different institutions estimated their power in the decision-making process. The light grey shows how different representatives have estimated the opportunity and power to speak up by others. It is obvious from the figure that the power of decision-making has been more in the hands of the institutions dealing with environmental concerns. Whereas the more into forestry organisations (on the left side of the figure 16), evaluated their opportunities and capabilities rather weak.

## 4. DISCUSSION

### 4.1. Increase of protected forests

The most influential factor among the others is the increasing amount of protected forests throughout the Natura process (2000-2009). Total amount of protected forests increased more than 10% (figure 13). Whereas the number of strictly protected forests increased up to 10% of total forest area. One could argue that the high increase of protected areas would have happened also without Natura due to the inventories conducted before. Namely the Key-habitats inventory and most importantly the inventory made while the “Estonian Forest Conservation Area Network” project. From the interviews it turned out that although the “Estonian Forest Conservation Area Network” wasn’t officially directed towards Natura 2000, it made a remarkable contribution increasing strictly protected forest area from 3% to circa 6.7% of total forest area (Environmental Board, 2010). However the increase of strictly protected forests from 6.7% to 10%, which was stated in the Forest Development Plan 2002-2010, was all achieved due to Natura process (ELF, 2010).

One of the reasons why Natura 2000 wasn’t established in former protected areas is the fact that the directives of Natura 2000 designated also the habitats and species which were common in Estonia but endangered elsewhere in Europe, i.e. forest-dependent species like bears, wolves and lynxes. The imperfect correspondence of Natura directives to Estonian conditions was also addressed in some other occasions. Another reason for expansion of protected areas is claimed to be the over ambitiousness of the Ministry officials in designating the sites to the Natura network. The respondent from Ministry of Environment said that it was because of strong pressure from Environmental NGO’s, which forced to enlarge Natura 2000 also outside the former protected areas.

### 4.2. Loss of timber resource

Another factor which accompanies with the previous one is the loss of forest area used for timber production. When more forests will be protected then less timber will be available for harvesting. As it was discussed under the results, the economic impact to private owners could reach millions of euros. Also the State Forest Management Centre admitted that the expansion of nature protection areas had an impact to annual cutting rates (Viilup, 2006). But even if cutting rates had somewhat decreased (appendix 4) due to expansion of protected forest areas, the Estonian forest industry was not found to be notably influenced by Natura process. If discussing about possible impact to timber harvesting one should still note that the majority of Natura network was established in former protected areas and big share of forests within Natura borders have poor quality and low economic value. Though the impact will get sharper if more forest will be protected to fulfil the shortages of some certain forest habitat types, which are the most economically valuable forest types. (Environmental Board, 2010) The geo-analysis revealed that around a half of the Natura forests are strictly protected, where no management

activities are allowed. These forests are directly excluded from forest management. However another half of Natura forests are partially manageable holding various management restrictions.

### 4.3. Management restrictions

The management restrictions are limiting the rights of private owners and hampering the forestry activities. Even if forest management isn't totally forbidden in the area, the management restrictions make the harvesting operations economically nearly impossible. It is widely believed that restrictions in Natura sites have been established and enforced through directives and regulation by the Commission. According to Habitats Directive the member states were expected to ensure the favourable conditions for the habitats and species of Community interests (Council Directive 92/43/EEC, 1992). In order to not ruin member states sovereignty, the authority of decision to choose protection regimes in Natura sites, was left to member states. Hereby the concrete restrictions and management limits were established by the ministry of Environment in Estonia (Private Forest Centre, 2010).

From interviews it appeared that one of the reasons for rather strict restrictions in Natura 2000 areas was the fundamental principle of nature conservation: "that if the knowledge is insufficient, you will be more cautious and protect potential values stronger and as the knowledge about these protected values is growing the owner's freedom in his activities will be increased" (Environmental Board, 2010). This kind of approach is grounded only if any kind of freedom really is restored. Thus the respondent from Forestry Department admitted that it is rather complicated or in some cases even impossible to lower or to completely remove the restrictions from the forest area designated under protection regime afterwards (Forestry Department, 2010).

If enforcing restrictions there is unfairness between state and private forests. If establishing restrictions in private forests, property rights and other interests will be considered and compensated, but in state forest almost everything is allowed and accepted (RMK, 2010). Around 70% of Natura forests are managed by State Forest Management Centre (RMK). As the RMK is governmental profit-making institution operating under the Ministry of Environment, it actually can't express its interests as forest manager and therefore doesn't constitute any opposition to restrictions. Whereas the private forest owners seem to be the only group whose interests are directly involved.

### 4.4. Property rights

Even though Natura forests form 18% of total forest area and majority of it was established on former nature protection areas, they also included some small amount (4% of total forest land) of private forest land. The most prevailing influence of Natura 2000 toward private owners was the impairment of property rights. Private owners whose land happened to fall under Natura 2000 lost their opportunity to decide whether they would like to protect or to manage their forests. It was done for them by the conservation officials. As it was shown in the media analyse the forest owners were rather dissatisfied and expressed their reluctance against the restrictions their land being assigned with. For compensation the state started in year 2003 to offer the possibility for land exchange.

The private owners whose land was designated under Natura network had an opportunity to change their land with equivalent state-owned land or sell their property to the state. It was a relief to some owners, but in many cases it still wasn't a good solution. In case of buying up the forests, the state didn't have enough resources which created a long queue stretching to years of waiting. Also the land exchange created problems connected with equality and personal values. During the restitution process many Estonians got back their land, which had been occupied from their grandparents or relatives during the establishment of Soviet Union in 1940. Besides the economic value, the regained land had also personal and symbolic meaning, which was unchangeable.

The situation for private owners eased not until 2008, when the compensation mechanism for private forestland finally started. Even though the application process included some bureaucracy it satisfied most of the owners. The results from media analysis also indicated less protest against Natura 2000 (figure 10).

The nationalisation of protected private forests wasn't also good solution in the opinion of the representative from Private Forest Centre: "It creates an image like the private owners are not willing or capable to protect the biodiversity located in their forest". The nationalisation process could also lead to monopolization of nature conservation (Estonian Private Forest Union, 2010). As the majority of protected forests are state owned, whereas the State Forest Management Centre, RMK has to follow regulations concerning nature conservation formed by Ministry of Environment, it creates a situation where the implementation of conservation policy is one-sided approach, overruling other stakeholder's involvement.

The expansion of Natura network to private forestland could be explained with a fact that the Estonian Private Forest Union was not strong enough to formulate proper standpoints either in forest policy or nature protection policy (Estonian Private Forest Union, 2010) . The fact that common voice of private owners didn't reach to the decision making was also revealed from the interviews.

#### 4.5. Strengthening of nature conservation

There was also indirect influence of Natura 2000 to Estonian forest cluster. As the main aim of Natura 2000 was to preserve biodiversity, it offered a clear and powerful platform for conservationists as well as brought "green message" to society and increased the awareness of nature protection in general public. The ideas and activities of conservationists were supported by Brussels (Environmental Board, 2010). In case of designating managed forest into protection areas, the ultimate argumentation of conservation officials was the importance of the site to Natura 2000 network (RMK, 2010). As it was illustrated in the figure 18, the decision-making power was overwhelmingly on the hands of the Ministry of Environment, Environmental Board and Environmental NGO's.

The representative from the Estonian Fund for Nature (NGO) admitted that the establishment of Natura 2000 offered quite a clear support for the fulfilment of the conservation objectives. As at the beginning of Natura process there was close cooperation between NGOs and the Ministry of Environment, it was possible in the designation process to rely only on Natura argument bypassing all further reasoning. (ELF, 2010)The strong influence of non-governmental organisations and their close co-operation with DG

Environment throughout the establishment of Natura 2000 in European level was also observed by Weber and Christophersen (2001).

The strengthened position of nature conservation also deepened the conflict between nature conservation and forestry. The forest owners and foresters who felt their interests and rights being threatened by conservation officials, started to blame them for unreasonable restrictions, too little negotiation and bad communication.

One of the reasons for insufficient communication of the Ministry of Environment with other stakeholders was the time trouble. Natura 2000 was basically one precondition of accessing to European Union. That's why the implementation of Natura 2000 was like a supreme objective for the government, which had to be fulfilled for a given period of time (ELF, 2010). The Ministry of Environment just had to cope with it and therefore the establishing process was done in a hurry, it was enforced and no social contracts between stakeholders were agreed. And if no social contracts are agreed, conflicts are inevitable (Environmental Board, 2010).

Another reason resulting poor communication work and to some extent related to previous one is how the Ministry officials handled the Natura process. Compared with the intense designation and inventory work by Ministry of Environment the communication and negotiation with private forest owners was with no doubt receded to the background (Forestry Department, 2010). However the communication between the Commission and the Ministry of Environment seemed to be more successful than the regional communication towards forest owners. It seemed to be that ministry officials were more afraid of conflicts with Commission than conflicts with landowners (Private Forest Centre, 2010). The soviet-era way of thinking could also be one of the reasons why Estonian officials took the directives as an order and considered it as a top-down approach also throughout further implementation process.

#### 4.6. Concluding remarks

As it was revealed in the study, besides preserving the richness of Estonian forests, the establishment of Natura 2000 had also an impact on the Estonian forestry. Covering around 18 % of total forest area the network increased the total area of protected forests which in turn resulted in loss of timber resources. Severe management restrictions in Natura forests hampered forestry activities and damaged property rights of private forest owners. These impacts can partly be explained by the fact that the whole Natura process in Estonia was done hastily. Another contributing factor is the strong influence of nature conservationism in the decision making-process.

This study is author's individual Master project without formal or informal dependencies on the Natura process or affiliation to any stakeholders. The study is intended to give a neutral assessment of impacts by a forestry student.

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Environmental Information Centre, 2010. GIS layer of Special Protection Areas (28.04.2010)

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Environmental Information Centre, 2010. GIS layer of limited management zone (28.04.2010)

Environmental Information Centre, 2010. GIS layer of special conservation areas(28.04.2010)

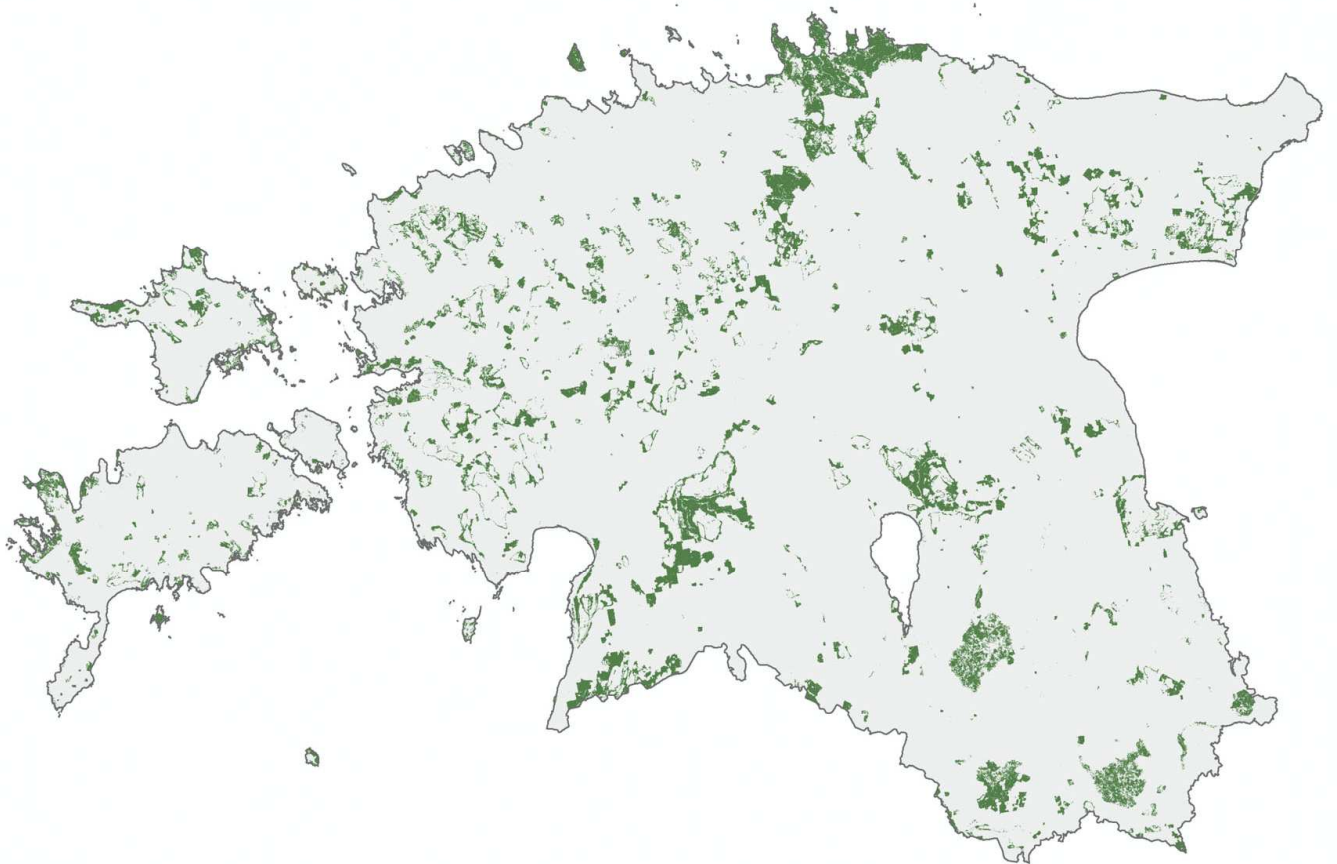
Environmental Information Centre, 2008. GIS layer of Estonian forests according to Estonian basic map - 2008 OF-A4 nr 01734 © Land Board (28.04.2010)

Centre of Forest Protection and Silviculture, 2010. Forest register and corresponding GIS layer (18.02.2010)

Peterson, U., 2003. GIS layer of forest areas in Estonia composed by satellite images, called: "forest mask"

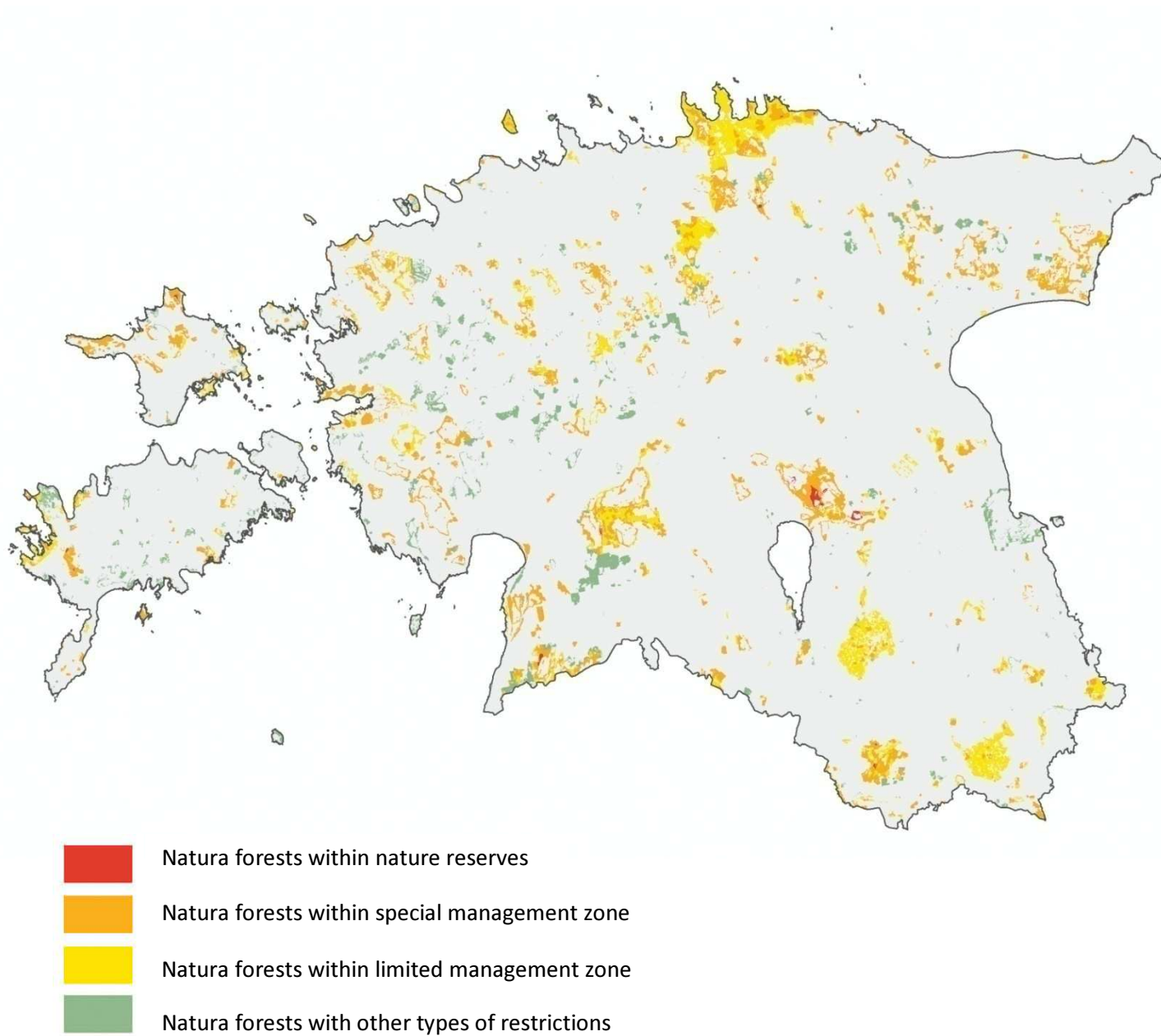
## APPENDIX 1

“Natura forests”



## APPENDIX 2

### Natura forests in different protection regimes



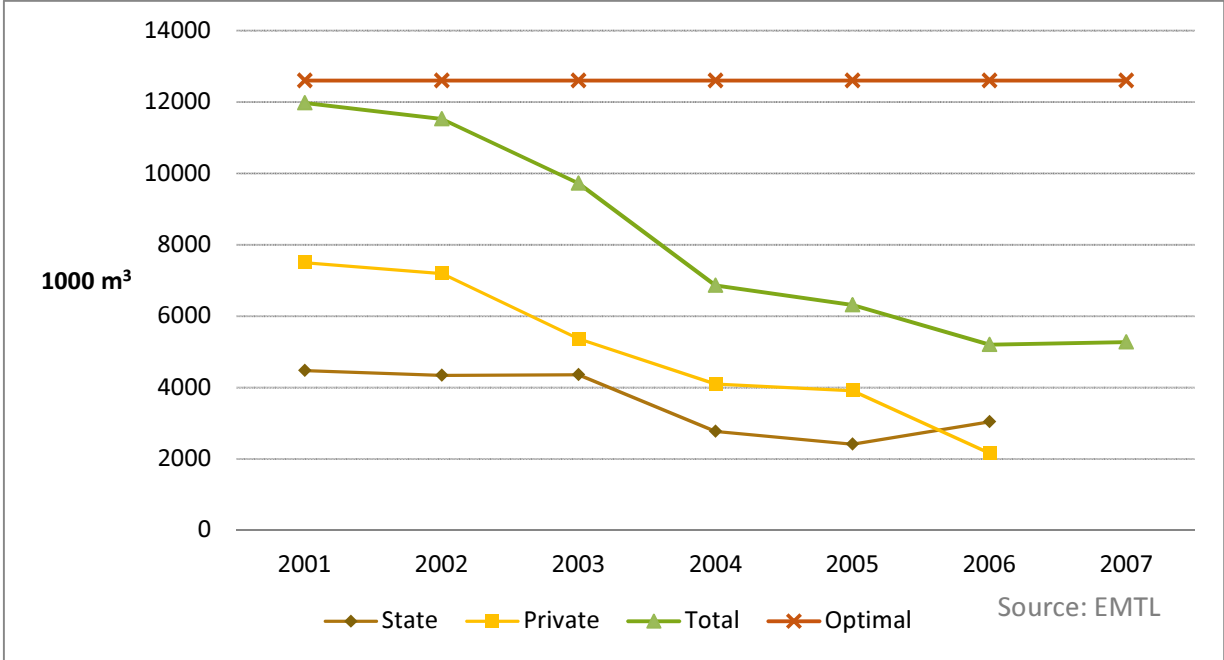
## APPENDIX 3

### Database of reviewed media sources

	Source	Headline	Date	Summary	web-	Author	Speaker	Message
1	Journal	"Eesti Me	MIS ON SAANUD	IV/2002	Metsakaitsealade võrg	<a href="http://www.loodi">http://www.loodi</a>	Kaili Viilma, Mets specialist	emkv
2	Journal	"Eesti Me	Looduskaitse esir	I/2003	LIFE-Nature metsaelu	<a href="http://www.loodi">http://www.loodi</a>	Kaili Viilma, Mets specialist	maadevahetus
3	Journal	"Eesti Me	Metsaomanikke	ä II/2003	Metsandus arengukav	<a href="http://www.loodi">http://www.loodi</a>	EMTL/Äripäev Forest industry	laienemine
4	Journal	"Eesti Me	Eesti kaitsealade	I/2004	Eesti looduskaitsealac	<a href="http://www.loodi">http://www.loodi</a>	Andres Onemar, rmk	laienemine
5	Journal	"Eesti Me	Rannu ja Puhja val	/2004	Kümned Rannu ja Puh	<a href="http://www.loodi">http://www.loodi</a>	Postimees forest owners	laienemine
6	Journal	"Eesti Me	Riik hakkab hüvit	II/2006	Valitsus kiitis 11. mail	<a href="http://www.loodi">http://www.loodi</a>	Keskonnaminist administration	kompensatsioon
7	Journal	"Eesti Me	Eesti metsaliigid	III/2006	Euroopa Liidu liikmesr	<a href="http://www.loodi">http://www.loodi</a>	Hanno Zingel, Ke administration	EU ja LK tähsus
8	Journal	"Eesti Me	Kaitsealuste liikic	III/2006	Keskonnainspektioc	<a href="http://www.loodi">http://www.loodi</a>	Valgamaalane media	piirangud
9	Journal	"Eesti Me	Euroliidu metsan	III/2006	Tänavu juuni keskpaig	<a href="http://www.loodi">http://www.loodi</a>	Erik Kosenkraniu: administration	EU ja metsandus
10	Journal	"Eesti Me	Keskonnaminist	IV/2006	17. novembril tegi kes	<a href="http://www.loodi">http://www.loodi</a>	Keskonnaminist administration	maadevahetus
11	Journal	"Eesti Me	Meie metsades le	II/2007	Kadri Mölleri põhjalik	<a href="http://www.loodi">http://www.loodi</a>	Kadri Möller, Kes administration	natura kirjeldus
12	Journal	"Eesti Me	Kaljukohtaste kai	III/2007	Keskonnaministeeri	<a href="http://www.loodi">http://www.loodi</a>	Postimees media	piirangud
13	Journal	"Eesti Me	Hoiumetsade laie	III/2007	Rangelit kaitstavate m	<a href="http://www.loodi">http://www.loodi</a>	Risto Sirgmet, Et specialist	piirangud
14	Journal	"Eesti Me	Erametsakeskus	ç II/2008	Sihtasutus Erametsake	<a href="http://www.loodi">http://www.loodi</a>	Annika Jordanov, erametsakeskus	kompensatsioon
15	Journal	"Eesti Me	Toetused Natura	II/2009	Juba teist aastat said r	<a href="http://www.loodi">http://www.loodi</a>	Keskonnaminist administration	kompensatsioon
16	Journal	"Eesti Me	Kas loodusmetsa	II/2010	SMI (statistiline mets	<a href="http://www.loodi">http://www.loodi</a>	Kaupo Kohv, Ann environmentalis	elustiku kaitse
17	Journal	"Eesti Loo	Eesti looduskaitse	1.08.2000	Tekst eesti looduskait	<a href="http://www.loodi">http://www.loodi</a>	Kalev Sepp, EPMI specialist	Natura teavitus
18	Journal	"Eesti Loo	Eesti looduskaitse	1.09.2000	Üha aktuaalsemaks m	<a href="http://www.loodi">http://www.loodi</a>	Kalev Sepp, EPMI specialist	Natura teavitus
19	Journal	"Eesti Loo	Euroopa Liidu hu	1.02.2001	Päev-päevalt räägime	<a href="http://www.loodi">http://www.loodi</a>	Riinu Rannap media	Natura teavitus
20	Journal	"Eesti Loo	Kui palju on Eesti	1.04.2001	Nüüd, XXI sajandi haki	<a href="http://www.loodi">http://www.loodi</a>	Uudo Timm, Kaire administration	Natura teavitus
21	Journal	"Eesti Loo	Natura-alade esm	1.05.2002	1. aprilliks sai keskkon	<a href="http://www.loodi">http://www.loodi</a>	Keskonnaminist administration	Natura teavitus
22	Journal	"Eesti Loo	Natura-alal on so	1.10.2004	Kadri Möller kirjeldab	<a href="http://www.loodi">http://www.loodi</a>	Kadri Möller, Kes administration	Natura teavitus
23	Journal	"Eesti Loo	Kas Natura kõlbal	1.12.2004	Toomas Kukkel selgitab	<a href="http://www.loodi">http://www.loodi</a>	Toomas Kukkel media	Natura teavitus
24	Journal	"Eesti Loo	Looduskaitse mu	1.12.2004	Hanno Zingel ja Jaak T:	<a href="http://www.loodi">http://www.loodi</a>	Hanno Zingel, Jae administration	Natura teavitus
25	Journal	"Eesti Loo	Hoiualad - uut tüü	1.05.2005	Artikkel hoiualadest n	<a href="http://www.loodi">http://www.loodi</a>	Uudo Timm, kesk administration	Natura teavitus
26	Journal	"Eesti Loo	Eesti jõgede Natu	1.05.2005	Zooloog ja keskkonnar	<a href="http://www.loodi">http://www.loodi</a>	Jaak Tambets, loc environmentalis	Natura teavitus
27	Journal	"Eesti Loo	Järvelja loodusk	1.07.2006	Artikkel räägib järvelj	<a href="http://www.loodi">http://www.loodi</a>	loodusajakiri.ee/eesti media	muu
28	Journal	"Eesti Loo	Loodus versus ma	1.08.2006	Artikkel räägib loodus	<a href="http://www.loodi">http://www.loodi</a>	Hannes Veinla environmentalis	konflikt
29	Journal	"Eesti Loo	Miks on Suurupi l	1.11.2007	Artikkel räägib Suurup	<a href="http://www.loodi">http://www.loodi</a>	Rita Annus, kesk administration	laienemine/conflict
30	Journal	"Eesti Loo	Riigikontroll: Nat	1.07.2008	Riigikontroll auditeeri	<a href="http://www.loodi">http://www.loodi</a>	Riigikontroll riigikontroll	puudujäägid natura loomi
31	Journal	"Eesti Loo	Loodusdirektiivi r	1.08.2008	Väga hea ja põhjalik al	<a href="http://www.loodi">http://www.loodi</a>	Anneli, Palo; Rair specialist	metsaelupaikades halb se
32	Journal	"Eesti Loo	Kuidas jõuab teav	1.08.2008	Lühike artikkel seletat	<a href="http://www.loodi">http://www.loodi</a>	Uudo Timm, kesk administration	muu
33	Journal	"Eesti Loo	Loodusdirektiivi r	1.11.2008	Artikkel annab küllaltk	<a href="http://www.loodi">http://www.loodi</a>	Anneli Palo specialist	Natura teavitus
34	Metsaleht	Soome metsaom: #####	Artikkel Soome metsa	<a href="http://paber.maal">http://paber.maal</a>	Viio Aitsam media	Natura teavitus		
35	Metsaleht	Mida toob Eesti nr #####	ELi "Natura 2000" prog	<a href="http://paber.maal">http://paber.maal</a>	Andres Onemar, rmk	laienemine		
36	Metsaleht	Oma metsa minel #####	Saaremaal Kaarma vall	<a href="http://paber.maal">http://paber.maal</a>	Viio Aitsam owner	piirangud		
37	Metsaleht	EL looduskaitse ki #####	Kadri Möller kirjeldab	<a href="http://paber.maal">http://paber.maal</a>	Kadri Möller, Kes administration	piirangud		
38	Metsaleht	Lahtised otsad Næ	1.08.2004	Üle Eesti käib jälle Nat	<a href="http://paber.maaleht.ee/?page=27">http://paber.maaleht.ee/?page=27</a>	administration	piirangud	
39	Metsaleht	Viimane vint ehk	1.01.2005	Erametsaomaniku üle:	<a href="http://paber.maal">http://paber.maal</a>	Vello Talmet, väi owner	piirangud	
40	Metsaleht	Vääriselupaik kai	1.01.2005	Erametsaomank Eero i	<a href="http://paber.maal">http://paber.maal</a>	Eero Parktaal, er; owner	piirangud	
41	Metsaleht	Üleskutse neile, k	1.01.2005	Erametsaomaniku üle:	<a href="http://paber.maal">http://paber.maal</a>	Jaan Salm, teadla owner	piirangud	
42	Metsaleht	Maadevahetus lai	1.03.2005	Looduskaitse alla võet	<a href="http://paber.maal">http://paber.maal</a>	Viivi Torn, maaor owner	maadevahetus	
43	Metsaleht	Kui metsa jõuab l	1.03.2005	Piirangutele olemasol	<a href="http://paber.maal">http://paber.maal</a>	Ülle Haraks, kesk administration	piirangud	
44	Metsaleht	Maaomanik vajab	1.04.2005	Metsaomanik Ando Ee	<a href="http://paber.maal">http://paber.maal</a>	Ando Eelmaa, me owner	piirangud	
45	Metsaleht	Metsis kipub maj:	1.05.2005	Taheva metsaülem Tõ	<a href="http://paber.maal">http://paber.maal</a>	Tõnis Kask, mets: rmk	kaitseala loomine	
46	Metsaleht	Vääriselupaigale	1.05.2005	Keskonnaminister Vi	<a href="http://paber.maal">http://paber.maal</a>	Villu Reiljan, kes administration	vääriselupaiga leping	
47	Metsaleht	700 soovi maad v:	1.05.2005	Seoses väljaspool kait	<a href="http://paber.maal">http://paber.maal</a>	Klaev Kangur, ma administration	maadevahetus	
48	Metsaleht	Kanakull ja lendo	1.05.2005	Keskonnaministeeri	<a href="http://paber.maaleht.ee/?page=27">http://paber.maaleht.ee/?page=27</a>	administration	piirangud	
49	Metsaleht	Mets kuivab küla	1.07.2005	Pärnumaal Soometsa l	<a href="http://paber.maal">http://paber.maal</a>	Hiie Iainela, koh; owner	piirangud	
50	Metsaleht	Vääriselupaikade	1.08.2005	Riigiga vääriselupaiga	<a href="http://paber.maal">http://paber.maal</a>	Olav Etverk, Looc administration	vääriselupaiga leping	
51	Metsaleht	Kaitsealade ja vab:	1.08.2005	Info sellest kui palju o	<a href="http://paber.maal">http://paber.maal</a>	RMK, aastaraama media	rmk loodukaiste kohustu	

# APPENDIX 4

## Decreasing cutting rates during the period of 2001-2007



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Last Saved On: 26/08/2010 17:10:00  
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