

# Forest sustainability in Lithuania

Client:

GDF Suez - Electrabel  
boulevard Simon Bolívar  
B-1000 Bruxelles

Project No.: 130373

August 2015

## CONTENTS

1. Introduction.....	4
2. Lithuania forests overview.....	4
2.1. Location and distribution .....	4
2.2. Ecological zones .....	9
2.3. Forest ownership.....	12
2.4. Competent authorities .....	14
2.5. Overview of wood-related industry.....	16
3. Sustainability of Lithuania forest.....	20
3.1. Evolution of forest area and risk of conversion .....	20
3.2. Living wood volumes and removals .....	23
3.3. Protection of ecosystems and biodiversity.....	25
3.4. Protection of water .....	30
3.5. Protection of soils .....	31
3.6. Protection of carbon stocks.....	31
3.7. Protection of air quality.....	33
3.8. Illegal logging .....	34
3.9. Civil rights and traditional rights .....	35
3.10. Forest certification .....	35
4. Conclusions.....	36

## FIGURES

Figure 1 : General map of Lithuania .....	5
Figure 2 : NTUTS 3 map of Lithuania with municipalities.....	5
Figure 3 : Change in land use during the period 1990-2011 (thousand ha).....	6
Figure 4 : Percentage area of Lithuania by land categories.....	7
Figure 5 : Land cover in Lithuania .....	8
Figure 6 : Ecological zones in Lithuania .....	9
Figure 7 : Natural forest formations in Lithuania .....	10
Figure 8 : Forest stands area by dominant tree species (01.01.2014).....	10
Figure 9 : Distribution of forest species in Lithuania.....	11
Figure 10 : Distribution of forest land area by ownerships categories (2014) .....	12
Figure 11 : Species areas by ownership .....	13
Figure 12 : Forest ownership map (2014) .....	13
Figure 13 : Organisation of the competent authority for forest management.....	14
Figure 14 : Share of forest industry from GDP in 2000–2013 (by current prices) .....	17
Figure 15 : Total net sales and export by forest sectors from 1994-2013.....	17
Figure 16 : Changing of forest land area in 1938–2014 .....	20
Figure 17 : Forest stands by dominant tree species in 1923–2014 .....	22
Figure 18 : Reforestation in Lithuania from 2001 to 2011 .....	23
Figure 19 : Damaged forest stands in Lithuania.....	<b>Error! Bookmark not defined.</b>
Figure 20 : Growing stock in Lithuania forests between 1938 and 2014 .....	24
Figure 21 : Felling volumes in Lithuania forests between 1990 and 2013 .....	24

Figure 22 : Share of roundwood removals under bark by type of ownership (volume in 1000m<sup>3</sup>) **Error!**

**Bookmark not defined.**

Figure 23 : Location of the protected area in Lithuania .....	27
Figure 24 : Location of the Natura 2000 areas in Lithuania .....	28
Figure 25 : Share of protected forests in Lithuania in 2010 .....	28
Figure 26 : Lithuanian total greenhouse gases emissions/removals for the period 1990-2011.....	31
Figure 27 : Lithuanian total greenhouse gases emissions/removals from LULUCF sector for the period 1990-2012, Gg CO2 eqv. ....	32
Figure 28 : Number of forest fires and area burned (ha) in 2001–2011.....	33
Figure 29 : Number of cases of illegal forest felling, 2004–2013 .....	34
Figure 30 : Illegally felled timber, 2004–2013 .....	35

## TABLES

Table 1 : Administrative regions and sub-regions of Lithuania (NUTS I, NUTS II, NUTS III) .....	4
Table 2 : Forested area in Lithuania .....	6
Table 3 : Land fund Republic of Lithuania by land-use categories (2014) .....	7
Table 4 : Forested area in Lithuania.....	11
Table 5 : Export of forest industry products from 2011 to 2013 .....	18
Table 6 : Import of forest industry products from 2011 to 2013 .....	19
Table 7 : Evolution of persons employed in the forestry sector (in thousands) .....	20
Table 8 : Forest area evolution from 1990 to 2010 .....	21
Table 9 : Evolution of wood volume from 1990 to 2010 (volume in 1000m <sup>3</sup> ).....	23
Table 10 : Roundwood removals by type of wood and assortment (volume in 1000m <sup>3</sup> ) .....	<b>Error!</b>
<b>Bookmark not defined.</b>	
Table 11 : Evolution of growing stock volume by the main species (volume in millions m <sup>3</sup> ).....	25
Table 12 : Forest land area by forest groups in protected and other areas important from environmental point of view (2009) .....	25
Table 13 : Identification of the MCPFE Classes.....	29
Table 14 : Forest land dedicated to soil, water and other forest ecosystem functions as per MCPFE class 3 .....	31
Table 15 : Estimated carbon stock in Lithuanian forests between 1990 and 2010 (in million t) .....	32

## 1. Introduction

The combustion of wood for energy purpose is not considered to contribute to the augmentation of greenhouse gases concentration in the atmosphere, as long as the CO<sub>2</sub> emissions released during the combustion of wood are balanced by the growth of new trees. It is therefore essential to investigate if the forests in the region where the wood used for energy purpose are managed in a sustainable way, avoiding resources associated with overexploitation of forests, land use change, depletion of carbon stocks, etc...

In this framework, literature research was carried out to produce a summary of forest management in Lithuania, including general condition, management and sustainability assessment.

## 2. Lithuania forests overview

### 2.1. Location and distribution

Lithuania is the largest and southern most country of the Baltic States with an area of 65,300 km<sup>2</sup>. The country is predominantly flat, with a few low hills in the western uplands and eastern highlands. Lithuania is situated on the eastern shore of the Baltic Sea and borders Latvia on the north, Belarus on the east and south, and Poland and the Kaliningrad region of Russia on the south-west. It has around 99 kilometers of sandy coastline, of which only about 38 kilometers face the open Baltic Sea.

The country can be described on three statistical levels called NUTS (Nomenclature of Territorial Units for Statistics), which have been defined at the European level (see **Error! Not a valid bookmark self-reference.** and Figure 2). The NUTS 3 correspond to county (*Apskritis*). There are 10 counties which can be divided at the lowest level into 60 municipalities or *savivaldybė* (9 city municipalities, 43 district municipalities and 8 municipalities), Each county has its county governor (*apskritis viršininkas*) who was appointed by the central government in Vilnius and who has the responsibility to control if the municipalities obey the laws of Lithuania and the constitution<sup>1</sup>.

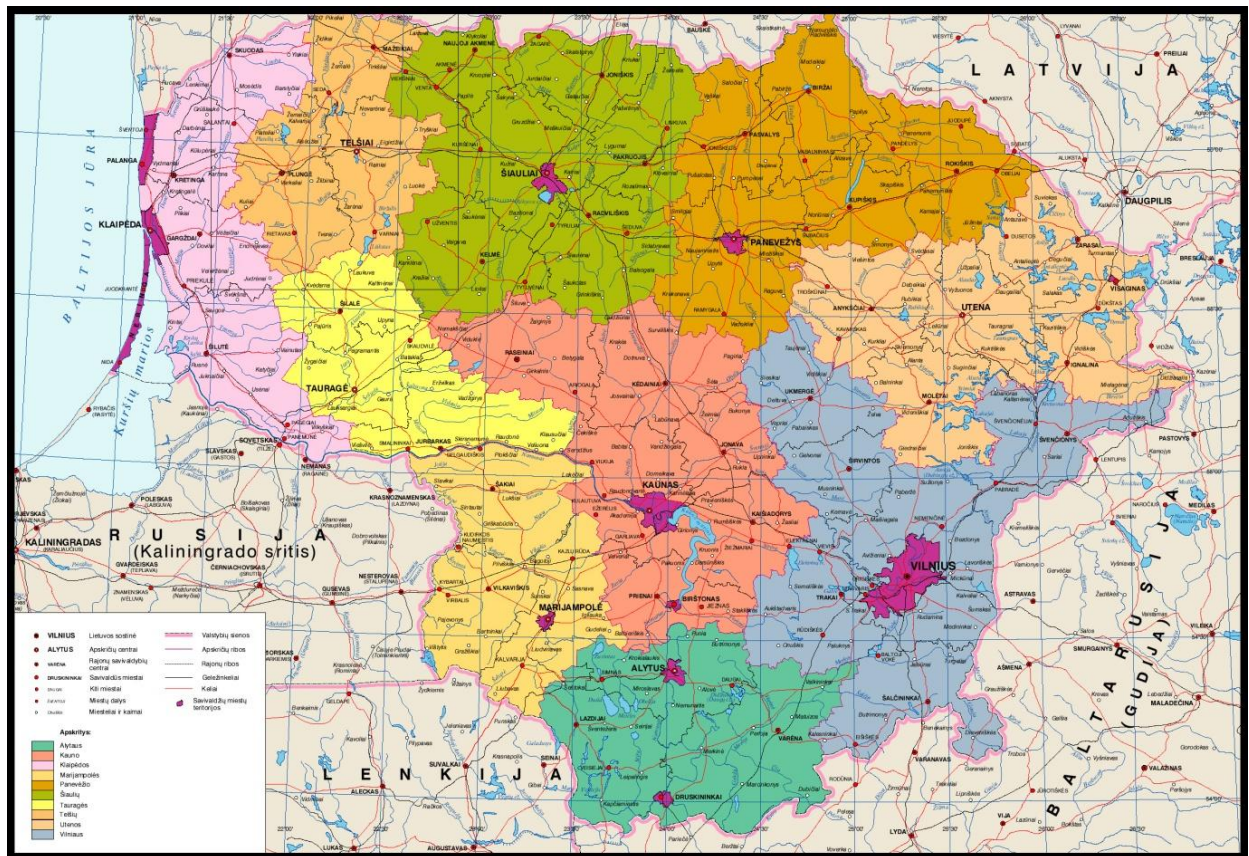
**Table 1 : Administrative regions and sub-regions of Lithuania (NUTS I, NUTS II, NUTS III)**

Level	Subdivisions			
NUTS 1 and 2	The whole country			
NUTS 3	Name (County)	Capital	Area in km <sup>2</sup> (rank)	Population in 2012
LT001	Alytus County	Alytus	5,425 (6)	153,6
LT002	Kaunas County	Kaunas	8,089 (3)	596,2
LT003	Klaipėda County	Klaipėda	5,209 (7)	333,1
LT004	Marijampolė County	Marijampolė	4,463 (8)	157,9
LT005	Panevėžys County	Panevėžys	7,881 (4)	244,3
LT006	Šiauliai County	Šiauliai	8,540 (2)	293,1
LT007	Tauragė County	Tauragė	4,411 (9)	107,2
LT008	Telšiai County	Telšiai	4,350 (10)	148,8
LT009	Utena County	Utena	7,201 (5)	147,4
LT00A	Vilnius County	Vilnius	9,729 (1)	806,1

Source : [http://en.wikipedia.org/wiki/Counties\\_of\\_Lithuania](http://en.wikipedia.org/wiki/Counties_of_Lithuania)

<sup>1</sup> [http://www.nsd.uib.no/european\\_election\\_database/country/lithuania/administrative\\_divisions.html](http://www.nsd.uib.no/european_election_database/country/lithuania/administrative_divisions.html)

Figure 1 : General map of Lithuania



Source: Ezilon.com

Figure 2 : NTUTS 3 map of Lithuania with municipalities



Source: [http://en.wikipedia.org/wiki/Counties\\_of\\_Lithuania](http://en.wikipedia.org/wiki/Counties_of_Lithuania)

According to the last forest national inventory (NFI) and standwise forest inventory (SFI) based on forest resource, forestland covers 2,177,000 ha in 2014 (about 33,3% of Lithuania is forested). These figure included 121,000 ha of other wooded land. The following **Error! Not a valid bookmark self-reference.** shows similar figures estimated by FAO in 2010 from extrapolation<sup>2</sup>.

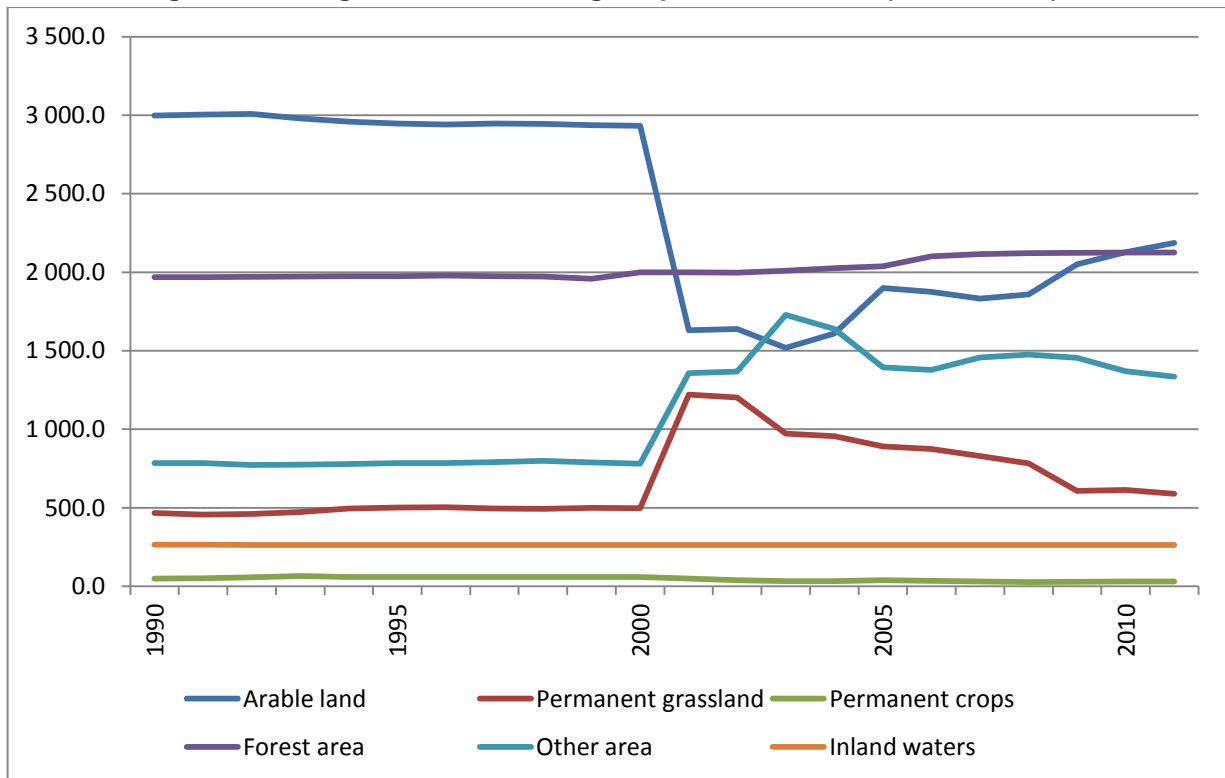
**Table 2 : Forested area in Lithuania**

Area in 1000ha	Lithuania
Forested Area	2,160
Other wooded land	80
Other land	4,028
...of which tree cover	63
Inland water bodies	262
Total area	6,530

Source : GLOBAL FOREST RESOURCES ASSESSMENT 2010. COUNTRY REPORT. LITHUANIA

The following figure presents the change in land use in Lithuania. Forest area has increased by 8% over the last 20 years.

**Figure 3 : Change in land use during the period 1990-2011 (thousand ha)**



Source : Eurostat database, land use – 1000 ha – annual data

After the independence of Lithuania, the agrarian reform caused the decline of arable land was the most significant years before accession to the European Union between 2000 and 2002 (arable land was reduced by 45%).

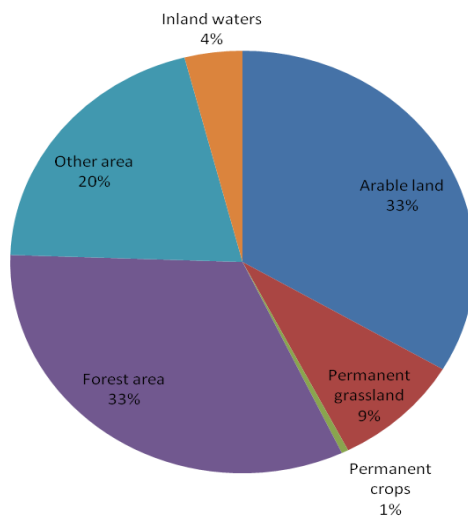
<sup>2</sup> “Forest”, “other wooded land” and “other land with tree cover” for the 2010 is obtained by extrapolation from data of 2005 and 2007.

In fact, the arable land was affected by 93-100% conversion to grasslands and up 4% in forest land. According to Marcinkonis 2014<sup>3</sup>, “agrarian soils in Lithuania affected by renaturalization/self restoration processes estimated about 1 million ha”.

This trend appears to be reversing since 2003 until 2011 because the area of grasslands has decreased by more than twice compared with arable land that increased more than 40%. Since Lithuania join EU in 2014 land use conversions became more dynamic, adapting to new political and economic conditions.

Following Eurostat, the percentage of area occupied by the different land uses is represented on the Figure 4.

**Figure 4 : Percentage area of Lithuania by land categories**



Source : Eurostat database, land use – 1000 ha – annual data

Figures from National Land Service of the Republic of Lithuania are presented in the following table.

**Table 3 : Land fund Republic of Lithuania by land-use categories (2014)**

Land use	Area	
	1000 ha	%
<i>Agricultural land</i>	3 461.9	53
<i>Forest land</i>	2 130.2	32.6
<i>Other wooded land (bushes)</i>	99.4	1.5
<i>Roads</i>	131.4	2
<i>Urban territory</i>	182	2.8
<i>Water</i>	262.5	4
<i>Swamps (bogs)</i>	113.2	1.7
<i>Other land</i>	149.4	2.3
<b>Total</b>	<b>6 530.0</b>	<b>100</b>

Source : National Land Service under the Ministry of Agriculture of the Republic of Lithuania, State Enterprise Centre of Registers

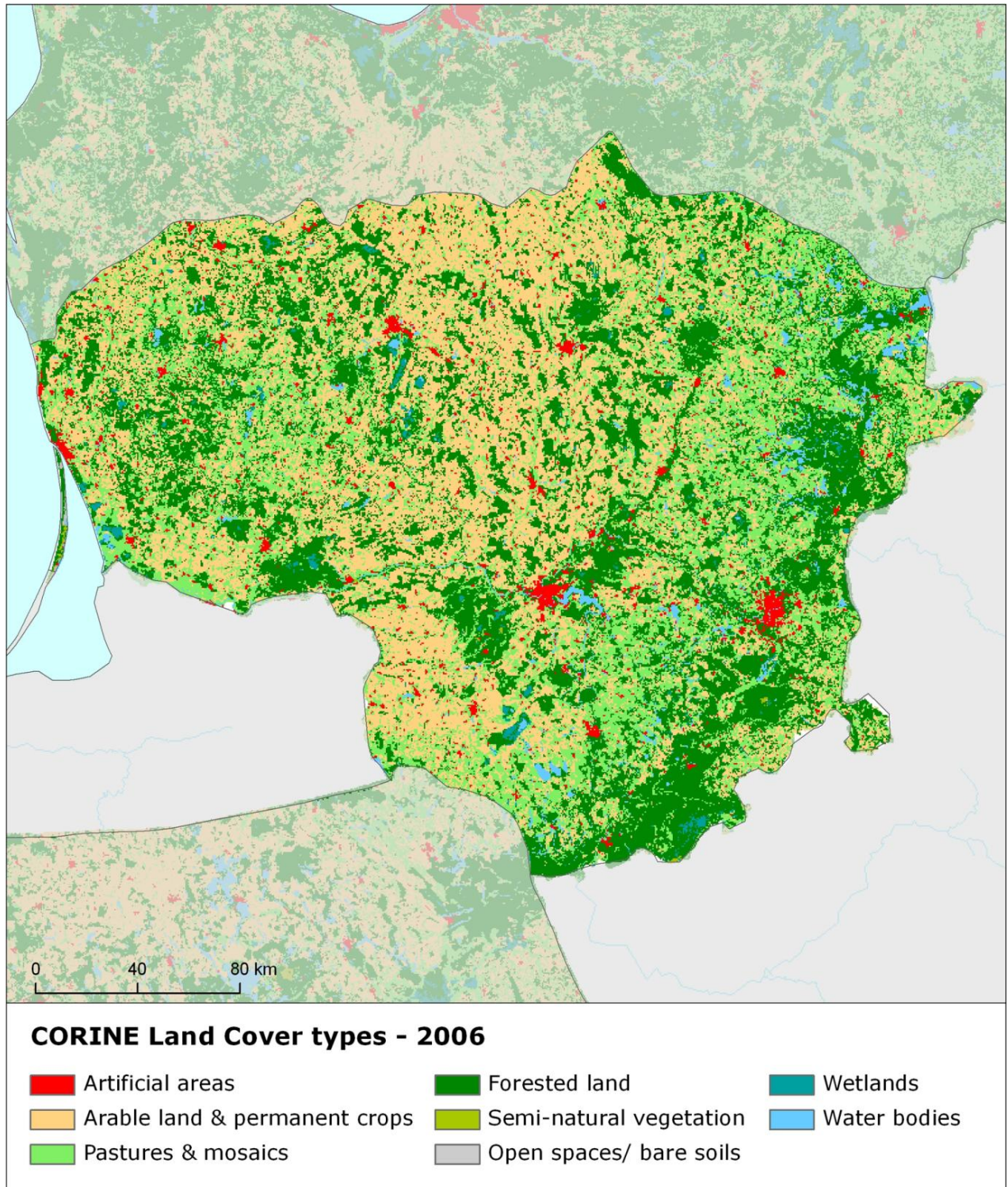
Figure 5 **Error! Reference source not found.** presents the generalised continental land cover. As can be seen on this map, forests are distributed uniformly over the whole country. Pastures are

<sup>3</sup> Marcinkonis S., 2014. Agrarian land use change in Lithuania after regaining independence. Conference paper. Global vegetation monitoring and modeling, At Avignon, France.



located mainly in the southern part, unlike arable lands and permanent crops which are presents in the north.. This map also shows the dominance of forested areas mainly in the eastern part of the country and arable land in the centre.

**Figure 5 : Land cover in Lithuania**



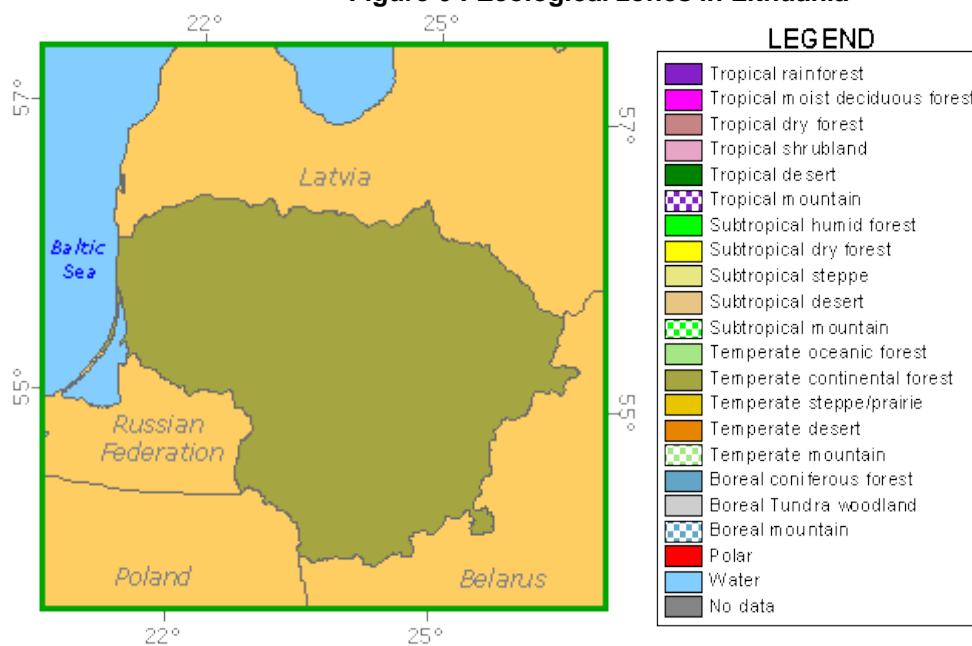
Source: <http://www.eea.europa.eu/data-and-maps/figures/land-cover-2006-and-changes/lithuania>



## 2.2. Ecological zones

The Lithuanian climate is transitional between maritime and continental, wet, with moderate summer and winter weather conditions. Annual average temperature is approximately 6° C with average January temperature of -4.8° C, and average July temperature of +17.2° C. Rainfall is around 600 mm per year (most rain falls in summer) and varies from 540 mm in the Middle Lowlands, to over 930 mm on the southwest slopes of the Zemaitija Uplands. The growing season varies from 169 to 202 days with the shortest in Eastern Lithuania and the longest at the coast.

Figure 6 : Ecological zones in Lithuania



Source : <http://www.fao.org/forestry/country/19971/en/est/>

According to FAO, the entire territory of Lithuania is characterized by a unique type of ecological zone: temperate continental forest zone.

The ecological zone “temperate continental forest” is as its name indicates naturally adapted to forest vegetation that are present there spontaneously. As this area is also well suited to agriculture, a part of it has long been cleared for agriculture, which explains that the forest represent about one third of the area of the country.

According to the biogeographical delineation, Lithuanian forests represent the transitional Boreal (south taiga) – Nemoral zone of mixed and coniferous and broadleaved deciduous forests<sup>4</sup>.

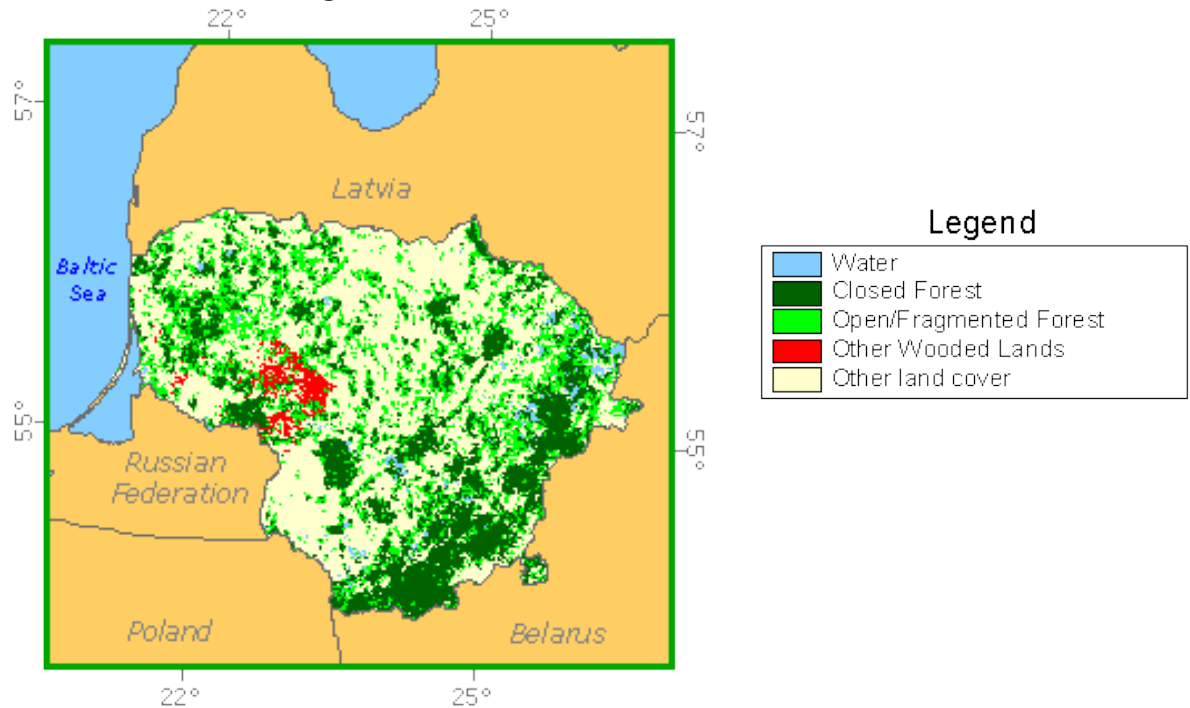
Coniferous stands dominate the Lithuanian forests with 1,152,400 ha (56.1% of the forest stand area). Forest is also occupied by soft hardwood forests (40.3% of the total forest stand area i.e. 827,500 ha). Hard hardwood forests occupy 75,800 ha (3.7%)<sup>5</sup>.

<sup>4</sup> BELOVA O., KARAZIJA S. & SAUDYTE S., 2005: Country report : Lithuania. In : Latham, J., Frank, G., Fahy, O., Kirby, K., Miller, H. and Stiven, R. (Eds), COST Action E27 - Protected Forest Areas in Europe - Analysis and Harmonisation (PROFOR) - Reports of Signatory States. Federal Research and Training Centre for Forests, Natural Hazards and Landscape (BFW), Vienna, 211-232.

<sup>5</sup> Forest Inventory and Management Institute. <http://www.amvmt.lt>

As shown in the Figure 7, the closed forests are mainly located in the southeastern part of the country. The remaining land is dotted with open forests and small closed forests

**Figure 7 : Natural forest formations in Lithuania**



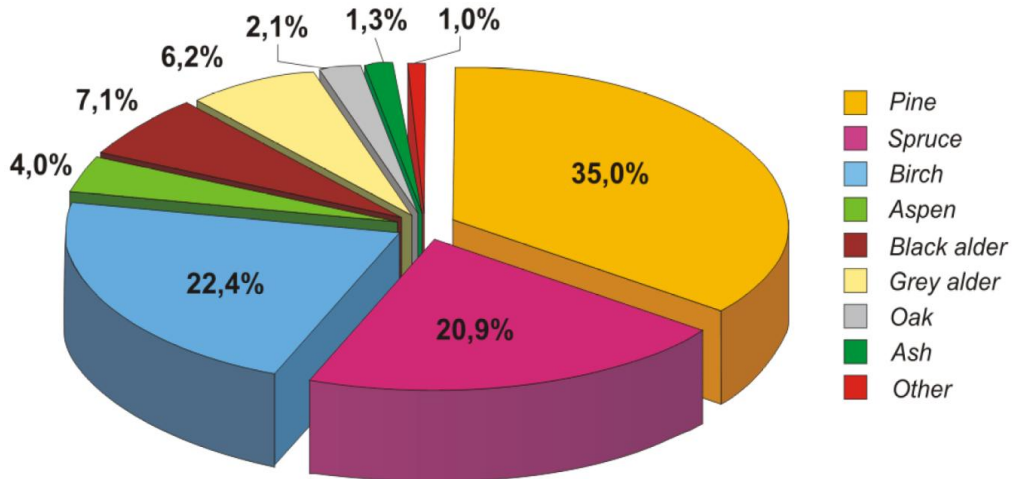
Source: <http://www.fao.org/forestry/country/18314/en/ltu/>

The repartition of the main tree species throughout the country is presented on Figure 8 and mapped on

Pine is dominant in the southern part of the country but mixed pine-spruce stands are encountered in the southeast. Mixed spruce stands are observed in the northwest and mixed deciduous-spruce stands in the centre of the Lithuania (**Error! Not a valid bookmark self-reference.**).

Figure 9. Three major tree species and formations are found in Lithuanian forests: pines, birch and spruce with respectively 720,300 ha, 459,700 ha and 429,600 ha. Each of those species covers about 35.0%, 22.4% and 20.9 % of the total forested area.

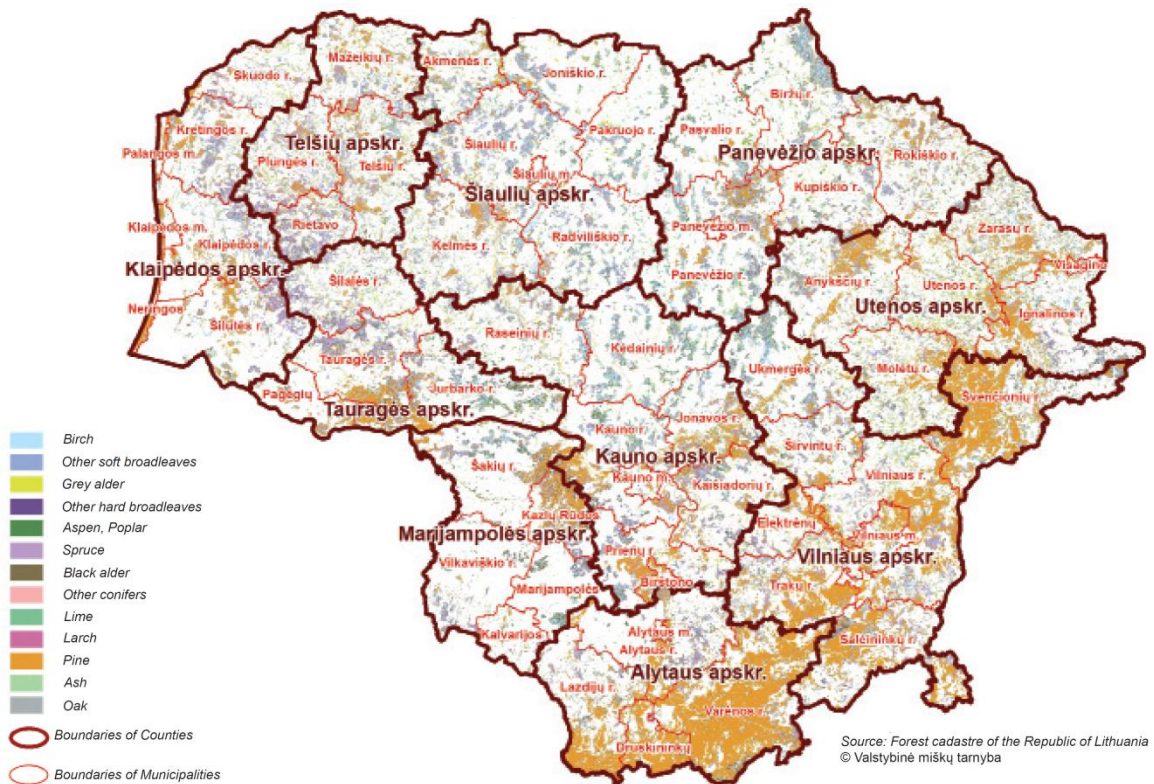
Figure 8 : Forest stands area by dominant tree species (01.01.2014)



Source : State Forest Service (SFI)

Pine is dominant in the southern part of the country but mixed pine-spruce stands are encountered in the southeast. Mixed spruce stands are observed in the northwest and mixed deciduous-spruce stands in the centre of the Lithuania (Error! Not a valid bookmark self-reference.).

Figure 9 : Distribution of forest species in Lithuania



Source : Forest cadastre of the Republic of Lithuania © Valstybinė miškų tarnyba

Source : Forest cadastre of the of the Republic of Lithuania

According to FAO in 2007, the forest is composed very largely by naturally regenerated forest (75.3%), planted forest (23.5%) and with a lower proportion by primary forest (1.2 %).

**Table 4 : Forested area in Lithuania**

<b>Categories</b>	<b>Area (thousand hectare)</b>	<b>Percentage of the total forested area</b>
Primary forest	26	1.2%
Other naturally regenerated forest	1,614	75.3%
...of which of introduced species	0	0.0%
Planted forest	503	23.5%
...of which of introduced species	3	0.1%
<b>Total forest land area</b>	<b>2,143</b>	<b>100.0%</b>

Source: Global Forest Resources Assessment 2010

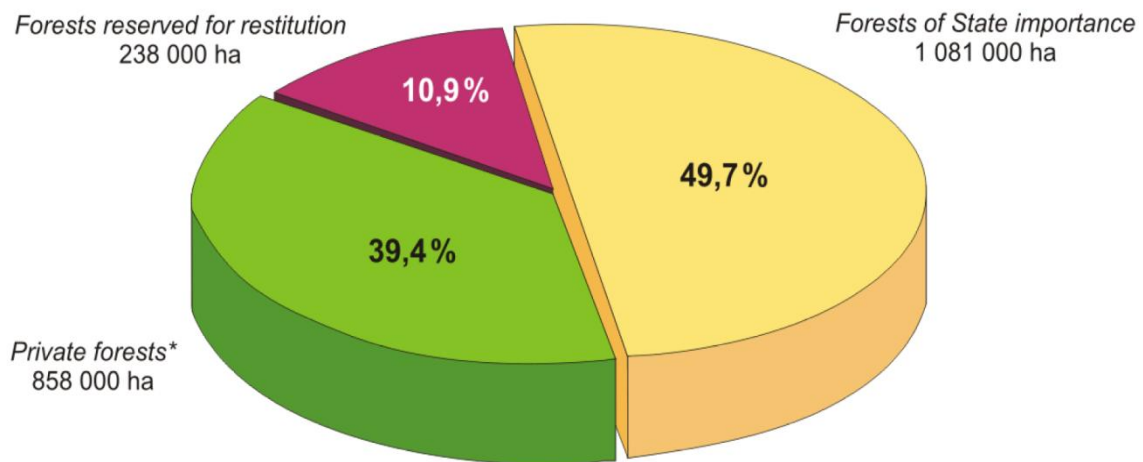


### 2.3. Forest ownership

Prior to 1920, 65 percent of Lithuania's forest was privately owned. Under land reform in the 1920s, nationalization of part of the land reduced the share of privately owned forest to 32 percent. Under soviet rule, from 1940 to 1991, Lithuanian farmland was nationalized and farm forests became the property of the state (until 100 percent of the forest was State owned). At the time of Soviet Union's dissolution in 1991, Lithuania regained independence and forestlands had been re-privatized. Although the restitution process is not yet complete it has already restored ownership rights to many thousands of people, with a variety of forms of ownership<sup>6</sup>.

When we see the Figure 10, the State now owns about half the forest area (I.E. 1,081,000 ha). As of 1 January 2014, private forests accounted for 39.4 percent of total forests (858,000 ha), and 10.9 percent of forest area was reserved for restitution (238,000 ha). In fact, 824,000 ha of private forests were registered in the State Enterprise Centre of Registers. After intersection of layers of all forests and private holdings the estimated area of private forests was 858,100 ha<sup>7</sup>.

**Figure 10 : Distribution of forest land area by ownerships categories (2014)**



\* Data was obtained after layer of forests was intersected with layer of private holdings

Source : State Forest Service

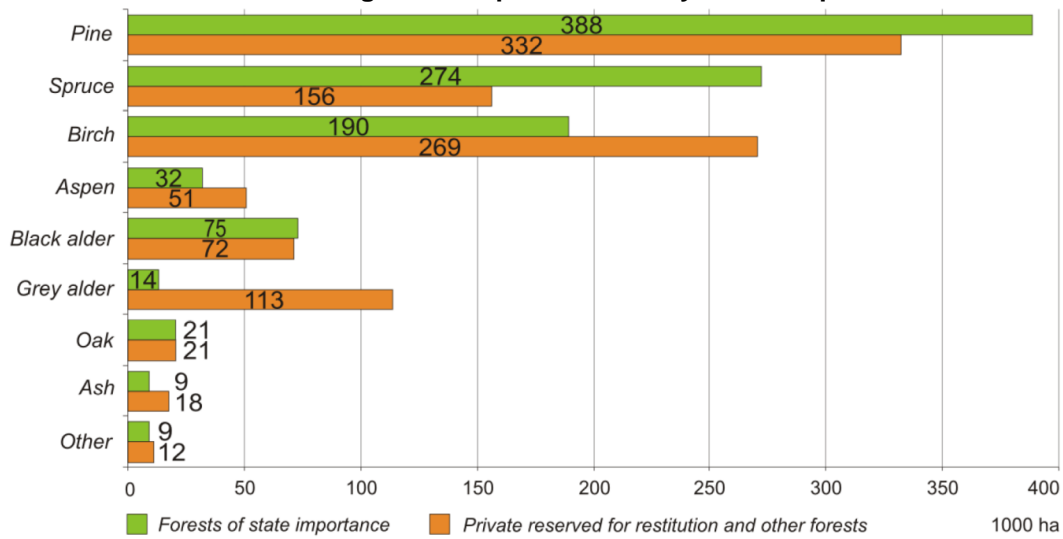
The average size of the private forest properties is about 3.3 ha (not exceeding 7,000 ha max) with a number of private forest owners amounted to almost 247,000 (situation at 1st January 2014)<sup>6</sup>. The situation presents a very fragmented division of forest estates.

In state-owned, conifers constitute more than 65% of the area and the pine is the dominant species (Figure 11). Private forests show a 50/50 ratio of broadleaves and conifers in the forest areas but pine is the first most species encountered (31,8%) following by birch (25,8%) and spruce (14,9%). In addition, grey and black alder are important on private land.

<sup>6</sup> <http://www.fao.org>

<sup>7</sup> Forest Inventory and Management Institute. <http://www.amvmt.lt>

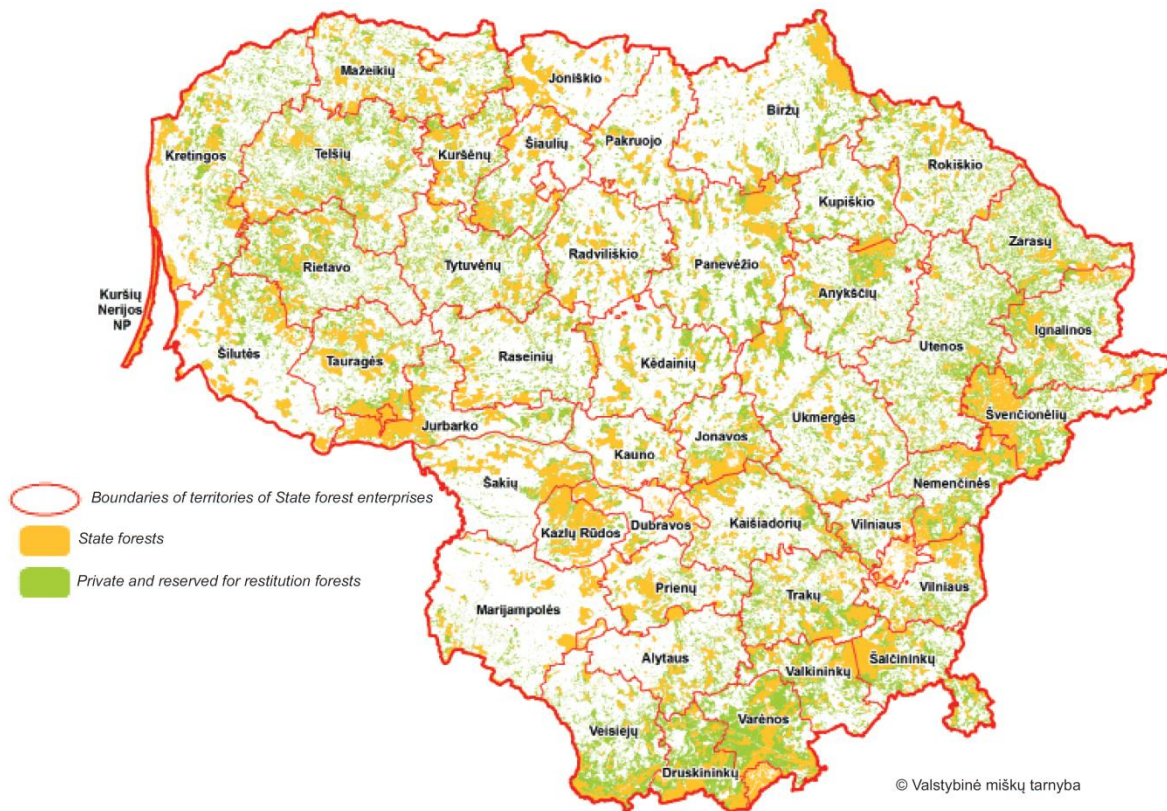
**Figure 11 : Species areas by ownership**



Source : State Forest Service

Figure 12 shows the distribution of state forests and other in Lithuania.

**Figure 12 : Forest ownership map (2014)**



Source: Forest cadastre of the of the Republic of Lithuania

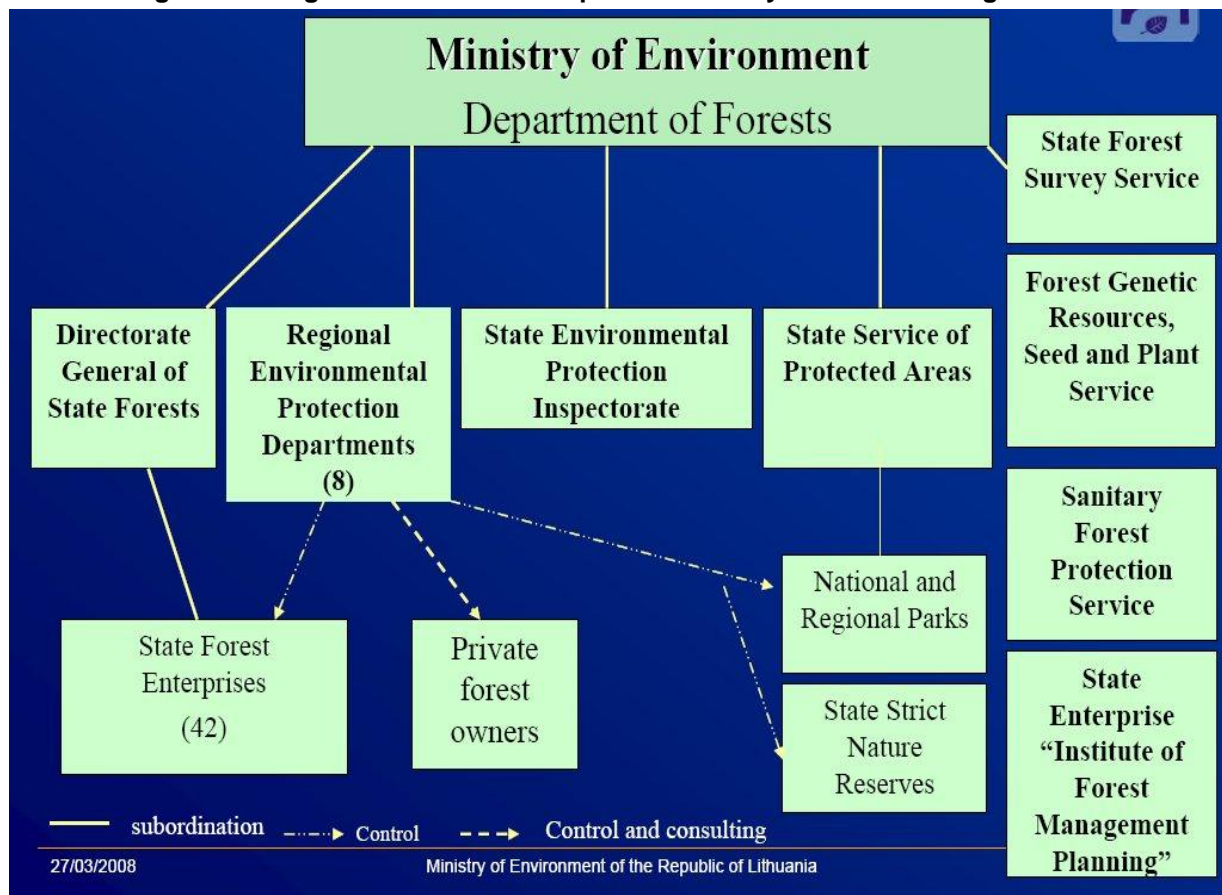
## 2.4. Competent authorities

### Institution

The Ministry of Environment is the government body responsible for forestry matters in Lithuania. Other competent authorities are present like:

- The Forestry Department : responsible for formulation and implementation of Forest policy and strategy
- General state forest enterprise : responsible for management of state forests;
- State environmental inspections Forest control divisions: responsible for control of state and private forests, extension and consultation of private forest owners.

Figure 13 : Organisation of the competent authority for forest management



Source : <http://www.rm.k.ee/organisation/publications-by-rmk/annual-reports-of-rmk>

### Legal Framework

The main legislation governing forest management in Lithuania is the law on forest implemented in 1994 and updated in 1996 and 1999. In 2001 the new Forest law was approved by Parliament. Its main objective is to establish a legal framework for forest management and for each type of ownership in principles of sustainable management. It establishes the rights and duties of all forest owners. It covers all the important topics related to the forest such as regeneration, cuts, property, economic regulation, etc.

The Lithuanian Forest Policy and Strategy statement as the separate document was approved in 2002. The state takes the responsibility to form and implement a rational forestry development policy, which would ensure ecologically, economically and socially balanced development of the forestry sector<sup>8</sup>. This is comprehended as:

- Ensuring of the stability of the forest ecosystems, preservation of the biodiversity, increase of the forest productivity, improvement of their quality and healthiness.
- Preservation of the valuable forest genetic fund by using the national forest genetic resources for the establishing and creating of new objects of forest seed basis.
- Increase of the forest cover of Lithuania by planting forests on uncultivated and poor-quality soils as well as other non-used land areas where forest planting would contribute to the formation of the Lithuanian natural carcass.
- Ensuring of the variety of forest ownership forms and the efficiency of forestry state regulation.
- Ensuring of meeting of the general forest-related social needs of the society.
- Creation of a favourable legal, economic and institutional environment for the effective and competitive functioning of the forest economy, wood industry and a variety of forest business enterprises in a free market.
- Encouraging of innovations, competitiveness, development of markets and establishment of working places.
- Ensuring of the maintenance of the scientific potential and its rational application as well as the preparation of high-qualification forestry specialists.

The Lithuanian forestry policy has been formed in compliance to the policies of other branches of the economy of the country, based on the traditions of the country and requirements of the European Union legal norms, international conventions, resolutions, agreements, programmes, and national legal acts<sup>7</sup>.

The major objectives in relation to forestry are:

- Preservation and increase of the forest resources;
- Ensuring of the forest ownership variety;
- Participation of the society in the solution of the major forestry issues;
- Informing of the society about the forests of the country, their condition and management;
- Development of forest research and forest education;
- Strengthening and development of international relations;
- Rational, sustainable and continuous use of the forest resources and increase of the forest productivity;
- Improvement of the economic efficiency of forestry;
- Ensuring of sustainability of forest ecosystems;
- Preservation of the biodiversity and improvement of forest healthiness;
- Satisfying of the general forest-related society needs;
- Development of state and private forestry in the context of the general rural development.

---

<sup>8</sup> Global Water Partnership. Integrated Drought Management in Central and Eastern Europe



Many other laws and regulations were added :

- Regulations on Final Forest Felling

*The Regulations on Final Forest Felling were updated in 2001. Regulations have been updated by including measures for biodiversity conservation and implementing principles of sustainable forest management in more details.*

- State Program on Forest Sanitary Protection

*The State Program on Forest Sanitary Protection has been prepared and approved in 2002. The main goal of this program is to ensure the stability and health of forest ecosystems. The measures for forest sanitary protection have been set up till the year 2012.*

- State Program on Forest Protection Against Fires

*The State Program on Forest Protection Against Fires has been prepared and approved in 2002. The main goals, principals and measures for forest protection against fires have been set up in more details.*

- State Program on Afforestation of Abandoned Agricultural Land

*Afforestation and increase of forest coverage are among the main objectives of Lithuanian forest and environmental policies. Lithuania has ratified UN Convention on Climate Change and has signed Kyoto protocol, where the role of forests as the carbon sink has been emphasised affirming that global warming could be slowed down establishing new forests. The State Program on Afforestation of Abandoned Agricultural Land is under preparation and discussions at the moment. The measures for increase of forest coverage by afforestation of abandoned agricultural land and etc. have been drafted in this program. It is planned that this program will be approved at the end of 2002.*

Priorities of the further development of private forest sector are fixed in the Forest Policy and Its Implementation Strategy approved in 2002. There are set of the main long-term goals:

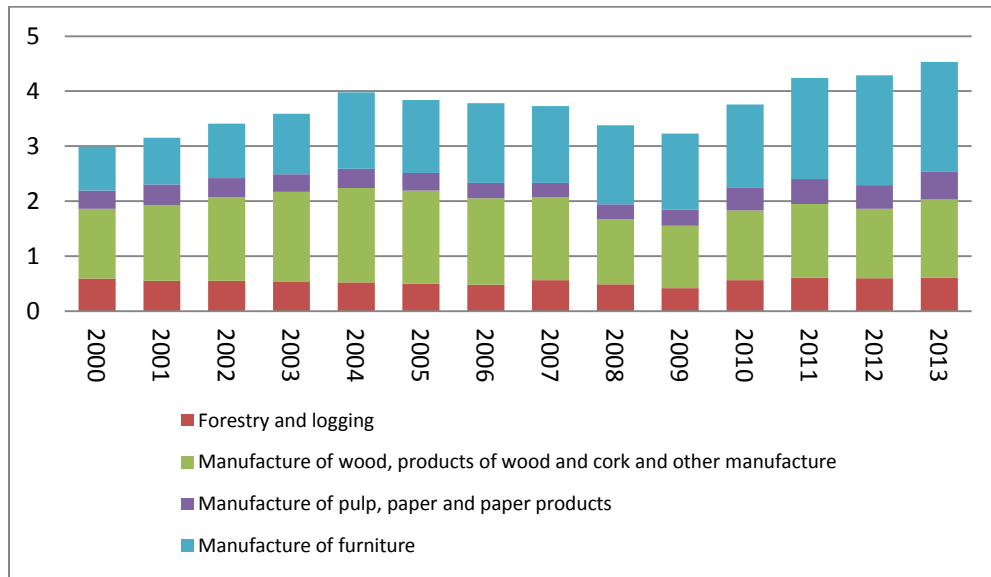
- Managing of forest resources according to sustainable development principle.
- Preserve and increase forest resources and improve their quality and their rational use.
- Preserve and enhance the sustainability of forest ecosystems.

## **2.5. Overview of wood-related industry**

According to Ministry of Environment of the Republic of Lithuania (Forest statistics for 2014) forestry sector contributes to 4.5% of the Gross domestic product<sup>9</sup> (in current prices). This contribution has declined from 2004 to 2009. After the crisis, share of GDP taken by forest sector has increased to its current value. Lithuania has significantly less contribution to GDP in manufacture of paper and pulp compared with the level of manufacture of wood processing or furniture (Figure 14)

<sup>9</sup>contribution of forest sector to GDP indicated as gross value added of forestry in percentage of total gross value added.

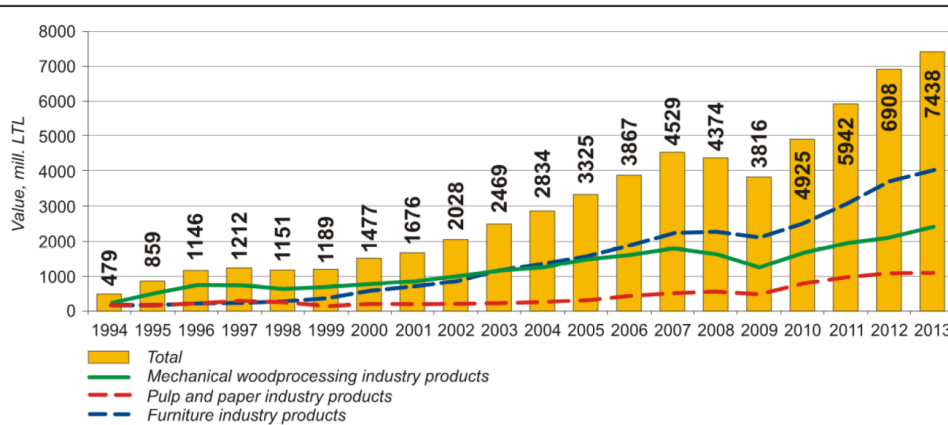
**Figure 14 : Share of forest industry from GDP in 2000–2013 (by current prices)**



Source : From Ministry of Environment of the Republic of Lithuania (Forest statistics for 2014 - Forest Sector Economy), <http://www.amvmt.lt/2014/ST2014.aspx?&MID=0&AMID=863>

The total and exportation incomes following the forestry activities are presented in the Figure 15. These financial indicators have increased in all sectors since the crisis. This industry has had the quickest recovery from the global economic crisis. The total forest exportation reaches about 7438 million LTL<sup>10</sup> in 2013 (about 2154 million €).

**Figure 15 : Total net sales and export by forest sectors from 1994-2013**



Source : From Ministry of Environment of the Republic of Lithuania (Forest statistics for 2014 - Forest Industry), <http://www.amvmt.lt/2014/ST2014.aspx?&MID=0&AMID=863>

Note : The irrevocably fixed exchange rate is €1= LTL 3.45280.

In 2013, the revenues from exportation can be summarized on the Table 5. More than 54% of the net sales and exportations came from furniture industry products and main activities following “furniture” are “paper, paperboard and their products”, “builder’s joinery and carpentry of wood” and “sawnwood” with respectively 13,3%, 8,9% and 5,8% of the total export. The other sectors are less represented.

<sup>10</sup> Litas Lituanie (LTL). Lithuania joined the euro area on 1 January 2015. On that day the euro replaced the litas at the fixed exchange rate of €1= LTL 3.45280. The irrevocably fixed exchange rate is €1= LTL 3.45280.

**Table 5 : Export of forest industry products from 2011 to 2013**

Product	Unit	Quantity			Value in thousand EUR		
		2011	2012	2013	2011	2012	2013
<b>Wood products and furniture industry</b>	-	-	-	-	1,441,728	1,683,177	1,841,122
<b>sawnwood</b>	1000 m <sup>3</sup>	584	621	634	116,325	119,164	123,891
<i>coniferous</i>	1000 m <sup>3</sup>	386	425	448	74,036	78,035	84,307
<i>non-coniferous</i>	1000 m <sup>3</sup>	198	196	186	42,289	41,129	39,585
<b>wood in chips or particles*</b>	1000 t	415	455	478	49,874	53,594	66,406
<b>veneers</b>	1000 m <sup>3</sup>	93	86	90	15,607	17,136	18,030
<b>plywood</b>	1000 m <sup>3</sup>	8	7	8	4,193	4,228	5,055
<b>particle board</b>	1000 m <sup>3</sup>	108	147	199	20,233	26,994	32,155
<b>fibreboard</b>	1000 t	54	53	54	19,200	21,667	23,343
<b>prefabricated wooden houses</b>	1000 t	45	47	55	53,286	57,492	76,455
<b>wooden wrapping and packing equipment</b>	1000 t	265	276	292	75,573	75,706	79,229
<b>builder's joinery and carpentry of wood</b>	1000 t	69	74	79	149,805	173,522	191,370
<b>other wood products</b>	-	-	-	-	52,587	58,029	66,747
<b>furniture</b>	-	-	-	-	885,045	1,075,646	1,158,442
<b>Pulp and paper industry</b>	1000 t	307	331	321	279,171	317,557	312,968
<b>wood pulp</b>	1000 t	34	41	32	18,388	22,245	17,097
<i>mechanical pulp</i>	1000 t	0	0	0	7	2	5
<i>semi-chemical pulp</i>	1000 t	1	2	1	555	1,048	645
<i>chemical pulp</i>	1000 t	33	39	31	17,826	21,196	16,448
<b>other fibre pulp</b>	1000 t	0	1	1	367	586	959
<b>recovered paper</b>	1000 t	56	75	78	9,156	9,858	10,025
<b>paper, paperboard and their products</b>	1000 t	217	215	211	251,261	284,868	284,887
<i>graphic papers</i>	1000 t	8	10	10	7,595	9,708	10,451
<i>sanitary and household papers</i>	1000 t	2	3	4	1,365	2,042	2,809
<i>packaging materials</i>	1000 t	123	112	96	76,917	70,175	68,617
<i>other paper, paperboard and products</i>	1000 t	84	89	100	165,384	202,943	203,010
<b>Total</b>	-	-	-	-	1,720,900	2,000,734	2,154,090

Source : From Ministry of Environment of the Republic of Lithuania (Forest statistics for 2014 - Forest Industry),

The countries of European Union countries are the export markets of Lithuania (55% of the total export in 2013). By sectors, statistics report that:

- the Lithuanian wood and wood products export markets were mainly Russia, Germany, Sweden and Norway.
- the main areas for furniture exportation remained the EU countries (Sweden, Germany and Norway) and Russia.
- the main markets paper, paperboard and their products were Russia and Ukraine, where 32% and 13% of this production were sold respectively. Share of Latvia was 8%.
- the main foreign traders for sawnwood exports were Germany, France and Denmark

More than 54% of the net sales and exportations came from furniture industry products and main activities following "furniture" are "paper, paperboard and their products", "builder's joinery and carpentry of wood" and "sawnwood" with respectively 13,3%, 8,9% and 5,8% of the total export. The other sectors are less represented.

The imports of forest industry products are presented in the Table 6. Imports of wood industry products reached EUR 940 millions in 2013. The main import partners were Poland, Germany, Sweden and Latvia.

Paper, paperboard and their products were the main imported wood industry products. The important share of them was 45% in 2013 compared with sawn wood (share of 10%) or furniture (share of 16%).

**Table 6 : Import of forest industry products from 2011 to 2013**

Product	Unit	Quantity			Value in thousand EUR		
		2011	2012	2013	2011	2012	2013
<b>Wood products and furniture industry</b>	-	-	-	-	394,322	430,525	482,974
<i>sawnwood</i>	1000 m <sup>3</sup>	331	354	386	75,648	84,703	92,766
<i>coniferous</i>	1000 m <sup>3</sup>	248	254	287	43,272	43,688	49,583
<i>non-coniferous</i>	1000 m <sup>3</sup>	83	100	99	32,375	41,016	43,183
<b>wood in chips or particles*</b>	1000 t	483	302	317	22,756	14,111	18,877
<b>veneers</b>	1000 m <sup>3</sup>	21	22	23	18,426	20,592	20,195
<b>plywood</b>	1000 m <sup>3</sup>	47	48	52	21,293	21,251	23,699
<b>particle board</b>	1000 m <sup>3</sup>	218	300	334	48,012	59,194	64,984
<b>fibreboard</b>	1000 t	95	116	105	40,681	49,275	46,857
<b>prefabricated wooden houses</b>	1000 t	1	1	2	752	985	1,830
<b>wooden wrapping and packing equipment</b>	1000 t	24	24	29	8,547	7,994	10,410
<b>builder's joinery and carpentry of wood</b>	1000 t	17	18	19	22,874	24,921	28,299
<b>other wood products</b>	-	-	-	-	19,208	19,211	24,930
<b>furniture</b>	-	-	-	-	116,124	128,287	150,127
<b>Pulp and paper industry</b>	1000 t	465	536	493	430,732	471,173	457,030
<b>wood pulp</b>	1000 t	49	86	42	25,757	41,355	18,950
<i>mechanical pulp</i>	1000 t	0	-	0	1	-	0
<i>semi-chemical pulp</i>	1000 t	1	4	2	555	1,701	808
<i>chemical pulp</i>	1000 t	48	82	40	25,202	39,654	18,141
<b>other fibre pulp</b>	1000 t	0	0	0	284	324	347
<b>recovered paper</b>	1000 t	100	103	85	14,036	11,759	10,399
<b>paper, paperboard and their products</b>	1000 t	316	348	366	390,655	417,735	427,334
<i>graphic papers</i>	1000 t	87	90	96	67,828	69,445	74,160
<i>sanitary and household papers</i>	1000 t	2	1	5	1,649	636	5,243
<i>packaging materials</i>	1000 t	120	146	158	106,326	114,639	123,753
<i>other paper, paperboard and products</i>	1000 t	107	111	107	214,852	233,014	224,177
<b>Total</b>	-	-	-	-	825,054	901,698	940,004

Source : From Ministry of Environment of the Republic of Lithuania (Forest statistics for 2014 - Forest Industry),

Lithuania as an integral value chain of wood processing from forestry and logging to wood processing, production of wood products, production of paper and paper products and furniture production, which consists of about 2028 enterprises in 2014<sup>11</sup>. In Lithuania dominate small private forest holdings, also small private forest holdings, weak cooperation of forest owners, lack knowledge about forestry stopped the development of private forestry<sup>12</sup>.

As we see on Table 7 **Error! Reference source not found.**, the total number of employed was 60,130 persons in forestry in 2013 and corresponded to a rate of 4.65% the total employment in

<sup>11</sup> From Ministry of Environment of the Republic of Lithuania (Forest statistics for 2014 - Forest Sector Economy), <http://www.amvmt.lt/2014/ST2014.aspx?&MID=0&AMID=863>

<sup>12</sup> Global Water Partnership. Integrated Drought Management in Central and Eastern Europe



Lithuania. This level has risen from 2000 until 2006 to reach a rate of 4.70% and then decreased until 2010 (3.45%) increased again until 2013.

The main sector of employment is the furniture industry that represents a percentage of 39.9% of the employment in forest sector following by manufacture of wood and of products (35.2%) and forestry and logging (18.6%). Paper industry is the lower sector of employment with 6.3%. Before 2010 the sector of the manufacture of wood and of products was greater than that of furniture industry and forestry.

**Table 7 : Evolution of persons employed in the forestry sector (in thousands)**

Year	Forestry and logging	Manufacture of wood and of products of wood and cork and other manufacture	Manufacture of paper and paper products	Manufacture of furniture	Total of employment in forestry	Total employment
2000	11.1	23.8	3.4	11.9	50.1	1,399
2001	10.5	25.5	3.2	12.9	52.1	1,346
2002	9.7	28.0	3.2	14.8	55.7	1,395
2003	9.6	28.9	2.8	18.6	59.9	1,426
2004	9.6	29.2	2.8	20.4	62.0	1,425
2005	9.9	30.5	2.8	23.0	66.1	1,461
2006	10.1	32.0	3.0	24.8	69.9	1,487
2007	10.1	31.0	3.4	24.4	69.0	1,529
2008	9.8	26.5	3.3	24.5	64.1	1,519
2009	8.6	20.9	2.8	19.4	51.7	1,415
2010	9.0	19.5	3.3	19.4	51.1	1,247
2011	10.3	20.6	3.3	21.4	55.5	1,253
2012	11.0	20.8	3.5	23.5	58.8	1,275
2013	11.2	21.1	3.8	24.0	60.1	1,293

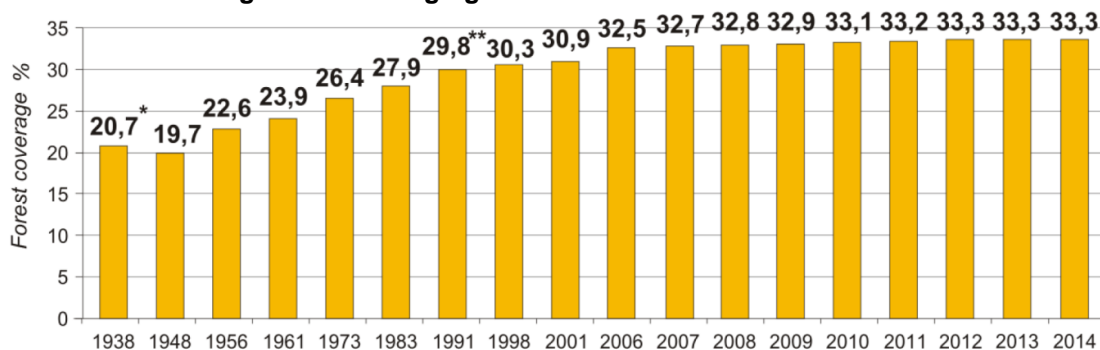
Source : **Employment in forestry sector** : Ministry of Environment of the Republic of Lithuania (Forest statistics for 2014 – Labour Force and Education). **Total employment in Lithuania**: <https://www.conference-board.org/data/economydatabase>.

### 3. Sustainability of Lithuania forest

#### 3.1. Evolution of forest area and risk of conversion

Between 1948 and 2014, forest area in Lithuania has increased 1.7 times (about 1290 thousand ha in 1948 and about 2180 thousand ha in 2014). After 2006, the increase rate is lower than previously and the area of forests remains stable until now (Figure 16).

**Figure 16 : Changing of forest land area in 1938–2014**



\* Expert estimation, including Vilnius region forests

\*\* Global Forest Resources Assessment (FRA 2005)

Source : From Ministry of Environment of the Republic of Lithuania (Forest statistics for 2014 - Forest Resources), <http://www.amvmt.lt/2014/ST2014.aspx?&MID=0&AMID=863>

YPEF gives a short description of the forest area evolution: "According to the data of 1914 woodland in Lithuania amounted to 19.5 percent. During World War II in 1941-1944 due to the rise in cuttings and low planting the number of coniferous decreased and the woodland of Lithuania totaled only 16.5 percent in 1945. After World War II, forest administration began to take care of forests. A special attention was given to forest protection and forest planting in 1944-1990. Due to forests planting by 6-8 thousand ha annually woodland in Lithuania started to increase: in 1948 it was 19.7 percent, in 1961 – 23.9, in 1983 – 27.9 and in 1998 – 30.3 percent (Fig. 1). Following Lithuanian Republic afforestation program approved in 2003 it is foreseen to increase the woodland area by 3 % in the nearest 20 years. While implementing the program woodland in Lithuania amounted to 31.3 percent in 2003, 31,7 in 2004 and 32 percent in 2005. According to 1st January 2010 data, the total forest land area was 2 159 800 ha, covering 33.1 % of the country's territory"<sup>13</sup>.

Comparison with FAO gives a comparable tendency (Table 8) :

- between 1990 and 2000, Lithuania gained about 75,000 ha of forest a year (+0.39%/year).
- between 2000 and 2005 the forest's increase was greater and reached 1.00%/year.
- between 2005 and 2010, we observe of 0.37%/year is observed.

**Table 8 : Forest area evolution from 1990 to 2010**

Area (1000 hectares)	Period			
	1990	2000	2005	2010
Forest	1,945	2,020	2,121	2,160
Other wooded land	80	83	73	80
Total area	6,530	6,530	6,530	6,530
Percentage of forested area	29.79%	30.93%	32.48%	33.08%
Evolution of forest area (between period)	/	75	101	39
Annual change	/	7.5	20.2	7.8
Annual rate change	/	0,39%	1,00%	0,37%

Source : Calculated from FAO (Global Forest Resources Assessment 2010)

The detail of the species area evolution between 1998 and 2012 is described on Figure 17.

The total area of softwood deciduous forest land in Lithuania increased by 120,100 ha over the last nine years but the area of hardwood deciduous has decreased by 8 800 ha and coniferous forest by 6 800 ha.

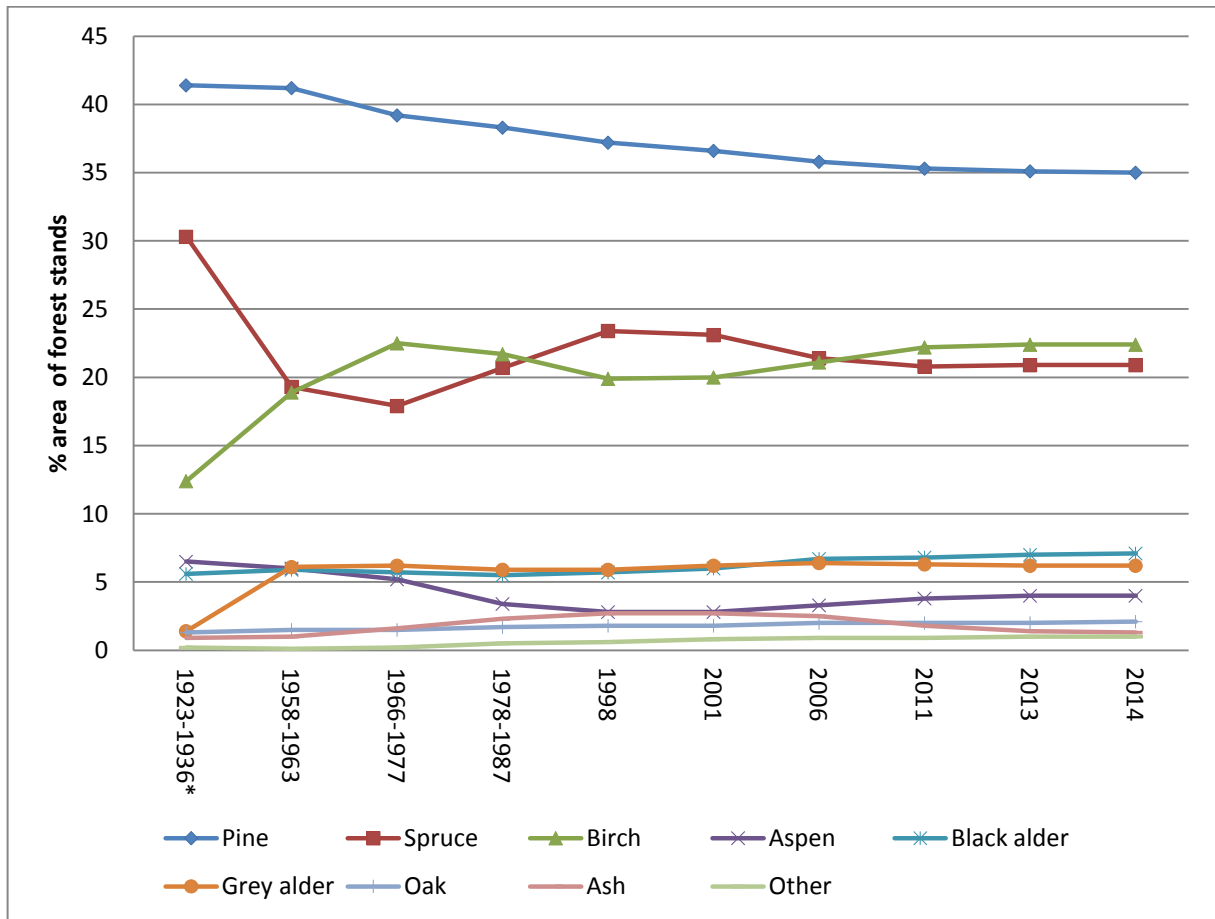
Scots pine occupies the largest share in the Lithuanian forests. However since 1923 a large decrease is observed, but during the last five years, this decrease is lower than in previous years. The Norway spruce showed a significant reduction in the period 1923-1977 (more than 12 % decrease), followed by a 5.5% increase from 1977 to 1998 and a further decline after the 2000s.

Birch stands cover the largest area among deciduous trees and contrast can be done with Norway spruce because the trend is opposite to that observed for this species.

Area black and grey alder is nearly constant over the last fifty years and is around 6%. Aspen stands had a constant decline before the 2000s and subsequently increased to 4 % of the current forest area. Oak areas have steadily increased over the years compared with the ash areas that fluctuate with time.

<sup>13</sup> Lithuania - YPEF Young People in European Forests. <http://ypef.eu/files/booklet/ang/lithuania.pdf>

Figure 17 : Forest stands by dominant tree species in 1923–2014



Source : From Ministry of Environment of the Republic of Lithuania (Forest statistics for 2014 - Forest Resources), <http://www.amvmt.lt/2014/ST2014.aspx?&MID=0&AMID=863>

According to FAO website<sup>14</sup>, “In the 1950s, 1960s and 1970s, reforestation and afforestation were very intensive with initial stocking of 10 000 trees and more per hectare. This high degree of stocking was practiced in order to get high-quality logs. However, the maintenance of these stands has been poor and there are now large areas with over-stocked stands facing problems of instability, snow-break and wind hazard. These stands, together with the lack of markets for small-sized logs, create one of the major problems in Lithuanian forestry today.”

Recent reforestation and afforestation statistics are presented on Figure 18. The annual surfaces for reforestation works, natural expansion and afforested area have generally been increasing from 2001 to 2006 (an additional 10,000 hectares per year). However there was a decline from 2006 to 2009 (7,000 hectares per year less compared to 2006) followed by a new period of increase.

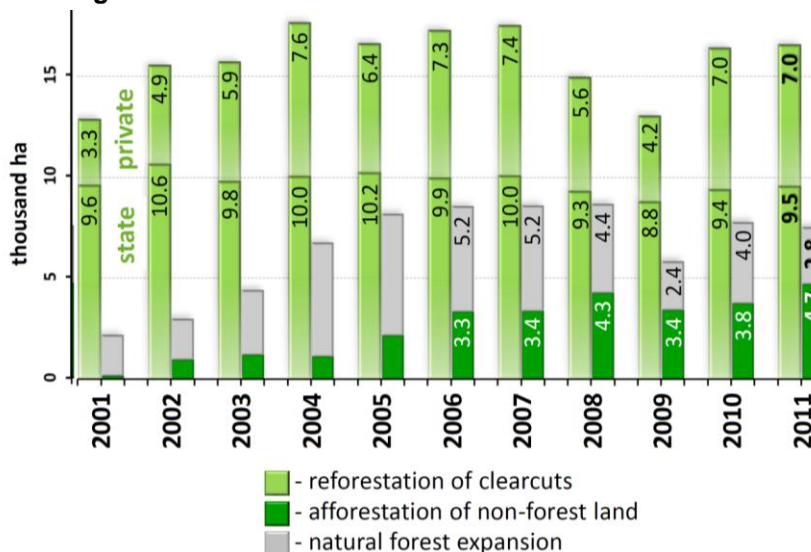
Each year State Forest Enterprises reforest 9,000 to 10,000 ha of clear-cuts<sup>15</sup> compared with 4,000 to 7,000 ha for private owners (depending on areas of clear-cuts). During last 10 years new forests overgrew naturally or after planting (about 65,000 ha of non-forest land).

<sup>14</sup> <http://www.fao.org/docrep/w3722e/w3722e22.htm>

<sup>15</sup> According to Forest Law clear-cut areas should be reforested within 3 years after cutting.

After the restoration of Lithuania's independence in 1990 natural forest expansion was very rapid (2,000 to 6,000 ha/year) and was preconditioned by abandonment of large agricultural areas.

**Figure 18 : Reforestation in Lithuania from 2001 to 2011**



Source : Forests and Forest Management in Lithuania (<http://www.amvmt.lt>.)

The FSC risk assessment platform [www.globalforestregistry.org](http://www.globalforestregistry.org) considers that Lithuania is at low risk in terms of conversion of forest to other land uses, because the following criterion is verified at the country level:

- There is no net loss AND no significant rate of loss (> 0.5% per year) of natural forests and other naturally wooded ecosystems such as savannahs taking place in the eco-region in question.

### 3.2. Living wood volumes and removals

Table 9 shows the evolution volume of live trees in Latvia (1990 to 2010).

**Table 9 : Evolution of wood volume from 1990 to 2010 (volume in 1000m<sup>3</sup>)**

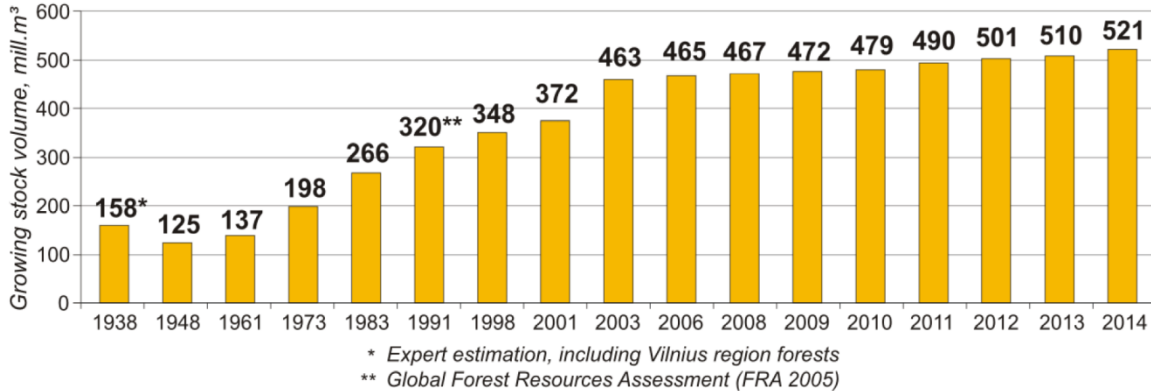
	1990	2000	2005	2010
Growing stock in forests and on other wooded land	415,400	451,990	466,790	481,898
Growing stock of forests	413,000	449,500	464,600	479,378
Growing stock of other wooded land	2,400	2,490	2,190	2,520
Growing stock in forests available for wood supply	359,915	391,594	397,952	408,022
Increment in forests available for wood supply	8,240	8,966	10,870	10,750
Felling in forests available for wood supply	3,780	6,343	9,040	8,600
Felling in percent of net increment	45.87%	70.75%	83.16%	80.00%
Felling in percent of net increment for EU 28	56.10%	61.00%	65.00%	62.70%

Source : <http://epp.eurostat.ec.europa.eu>

According to the available data, the growing stock volume has consistently increased between 1990 and 2010. The growing stock in other wooded lands remains small compared to the growing stock in forests and remained stable since 1990. Since 1990, increment in forests available for wood supply increase and on the other hand the felling in forests available for wood supply largely increased from 1990 to 2005 and decreased after 2005 to 2010. Therefore the felling in percent of net increment

increased by 34.13% for the period 1990-2010 and stabilised 20% above the European value. We can see that even with an important felling in percent of net increment, these felling are compensated by a large growing stock of forests.

**Figure 19 : Growing stock in Lithuania forests between 1938 and 2014**

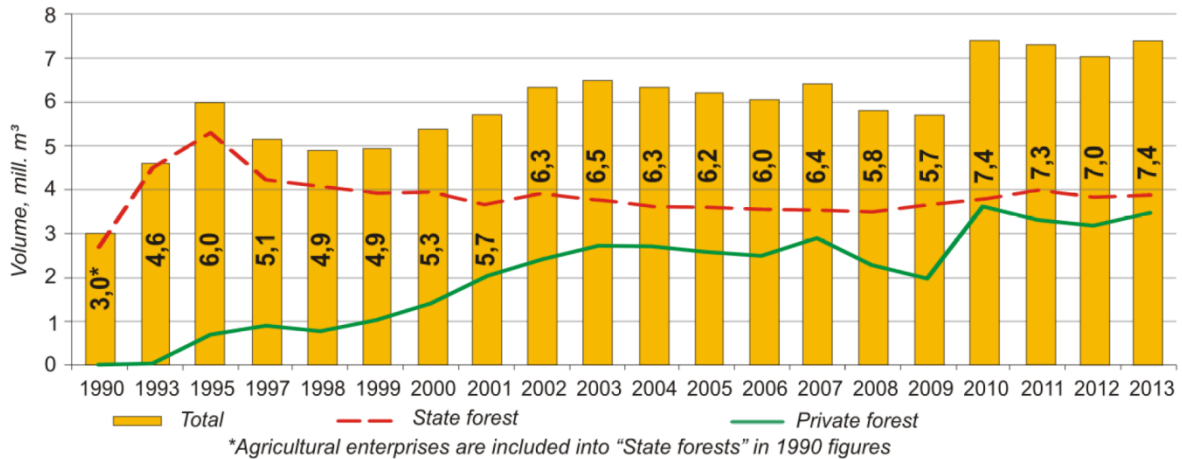


Source : From Ministry of Environment of the Republic of Lithuania (Forest statistics for 2014 - Forest Resources), <http://www.amvmt.lt/2014/ST2014.aspx?&MID=0&AMID=863>

The growing stock in Lithuania has always been growing since 1948 but the importance of this growth is lower since 2003 (Figure 19).

Felling evolution by types for state and private forests can be founded on the Figure 20.

**Figure 20 : Felling volumes in Lithuania forests between 1990 and 2013**



Source : From Ministry of Environment of the Republic of Lithuania (Forest statistics for 2014 – Roundwood Procurement), <http://www.amvmt.lt/2014/ST2014.aspx?&MID=0&AMID=863>

In state forest volume of felling was stable between 1997 and 2013 around 4 million m<sup>3</sup>. There is one peak in cuttings in 1995 with 5.6 million m<sup>3</sup>. The majority of the felling comes from regeneration felling. In private forest felling increased from 1993 (considered as the beginning of private forest ownership in Lithuania) to 2013 and reached the value of 3.5 million m<sup>3</sup>. A major decrease is observed between 2007 and 2010. Increase in forest felling in 1995 has been caused by spruce (*Picea abies* (L.) Karst.) dieback and increased number in sanitary felling<sup>16</sup>. Increase in forest felling

<sup>16</sup> Lithuanian statistical yearbook of forestry 2001



in year 2000 could be caused by the fact that Lithuania and two other Baltic States have taken major steps in the transition from centralised to market economies<sup>17</sup> and wood consumption rates began to increase steadily. Between 2003 and 2009, removals has decreased and remained stable. The roundwood export to neighbour countries due to reduced round-wood prices continued to slow down. Increase in felling in 2010 was mainly caused by increased intermediate felling<sup>18</sup>. Intermediate felling volume increased by 16% up to 1.3 million m<sup>3</sup>. This is the consequence of salvage and selective sanitary felling followed after the storm that has damaged Lithuanian forests in 2010.

Since 2003 we note a positive net change of forested volume for all the main species except for ash (Table 10) The three species showed the most significant increase are pine (32.85 million m<sup>3</sup>), black alder (9.43 million m<sup>3</sup>) and birch (7.66 million m<sup>3</sup>). Unfortunately since 2003, there are a decrease of ash (-4.57 million m<sup>3</sup>).

**Table 10 : Evolution of growing stock volume by the main species (volume in millions m<sup>3</sup>)**

Dominant tree species	2003	2014	Net change (2003-2013)
<b>Pine</b>	180.02	212.87	+32.85
<b>Spruce</b>	75.80	82.37	+6.57
<b>Birch</b>	78.83	86.49	+7.66
<b>Aspen</b>	34.00	35.44	+1.44
<b>Black alder</b>	37.74	47.17	+9.43
<b>Grey alder</b>	21.60	21.89	+0.29
<b>Oak</b>	11.25	11.45	+0.20
<b>Ash</b>	9.60	5.03	-4.57
<b>Other</b>	4.56	7.54	+2.98
<b>Total</b>	453.39	510.24	+56.85

Source : From Ministry of Environment of the Republic of Lithuania (Forest statistics for 2014 - Forest Resources), <http://www.amvmt.lt/2014/ST2014.aspx?&MID=0&AMID=863>

### 3.3. Protection of ecosystems and biodiversity

According to Forest act, forest areas are divided into four groups (Table 11) :

- I – strict reserves forests (all types of cuttings are prohibited);
- II – forests of special purpose (clear cuttings are prohibited while thinning and sanitary cuttings are allowed);
- III – protective forests (clear cuttings up to 5 ha allowed);
- IV – economic (commercial) forests (clear cuttings up to 8 ha allowed).

**Table 11 : Forest land area by forest groups in protected and other areas important from environmental point of view (2009)**

Protected and other valued areas	Forest groups				Total
	I	II	III	IV	
Strict reserves (nature, small)	13,8	-	-	-	13,8
reserves and municipal reserves	0,1	71,9	28,9	1,3	102,2
national parks	4,8	28,0	38,0	26,4	97,2
regional parks	4,3	93,9	73,8	51,9	224,0
biosphere reserve	3,3	2,0	1,2	1,0	7,5

<sup>17</sup> Pivoriūnas, A., Lazdinis, M. 2004. Needs of private forest owners in the context of changing political systems: Lithuania as a case study. Small – scale Forest Economics, Management and policy, 2004, Nr: 3(2), p191 – 202.

<sup>18</sup> Mickevičius, Karolis, 2013. *Economy and policy of pre-commercial thinnings in Lithuanian private forestry*. Second cycle, A2E. Alnarp: SLU, Southern Swedish Forest Research Centre

<i>biosphere polygons</i>	-	11,1	15,6	129,4	156,1
<i>-biosphere polygons areas out of other protected areas</i>	-	0,4	11,1	129,3	140,7
<i>buffer zones around state parks</i>	-	0,6	17,3	3,1	21,0
<i>-Areas of buffer zones around state parks out of other protected areas</i>	-	0,6	17,2	3,1	20,9
<i>Special Protected Areas (SPA) of natura 2000 network</i>	21,1	66,5	76,3	174,4	338,4
<i>Proposed Sites of Community Interest (pSCI) of natura 2000 network</i>	25,2	109,4	83,9	188,9	407,5
<i>-overlapping area of SPA and pSCI of natura 2000 network</i>	25,8	121,0	98,4	260,6	505,8
<i>-natura 2000 areas out of other protected areas</i>	-	1,8	22,1	206,0	229,9
<i>Woodland key habitat (WKH)</i>	1,2	6,6	2,1	7,7	17,6
<i>-WKH areas out of other protected areas</i>	-	1,0	1,1	7,3	9,3
<i>Protected zones of "red data book of Lithuania" objects</i>	0,5	7,3	3,0	15,9	26,8
<i>-Protected zones of "red data book of Lithuania" objects out of other PA</i>	-	0,4	1,2	14,3	16,0
<b>Total protected and important areas (overlapping areas not evaluated)</b>	<b>53,8</b>	<b>342,4</b>	<b>278,3</b>	<b>497,3</b>	<b>1172,0</b>
<b>Total of protected and important areas (evaluating overlapping areas)*</b>	<b>26,1</b>	<b>198,4</b>	<b>177,4</b>	<b>305,6</b>	<b>707,5</b>

Source : From Ministry of Environment of the Republic of Lithuania (Forest statistics for 2014 – Protected areas and Biodiversity), <http://www.amvmt.lt/2014/ST2014.aspx?&MID=0&AMID=863>

According Lithuanian statistical yearbook of forestry 2014, the total area under protection is 1,026,100 hectares, which represents 15.7% of the total area<sup>19</sup>. Lithuania had in 2014 a total amount of 1,274 protected natural sites<sup>20</sup>:

- 6 strict reserves;
- 285 reserves;
- 112 municipal reserves;
- 802 protected nature heritage objects;
- 3 recreational areas
- 5 national parks;
- 30 regional parks
- 1 biosphere reserve
- 30 biosphere polygons

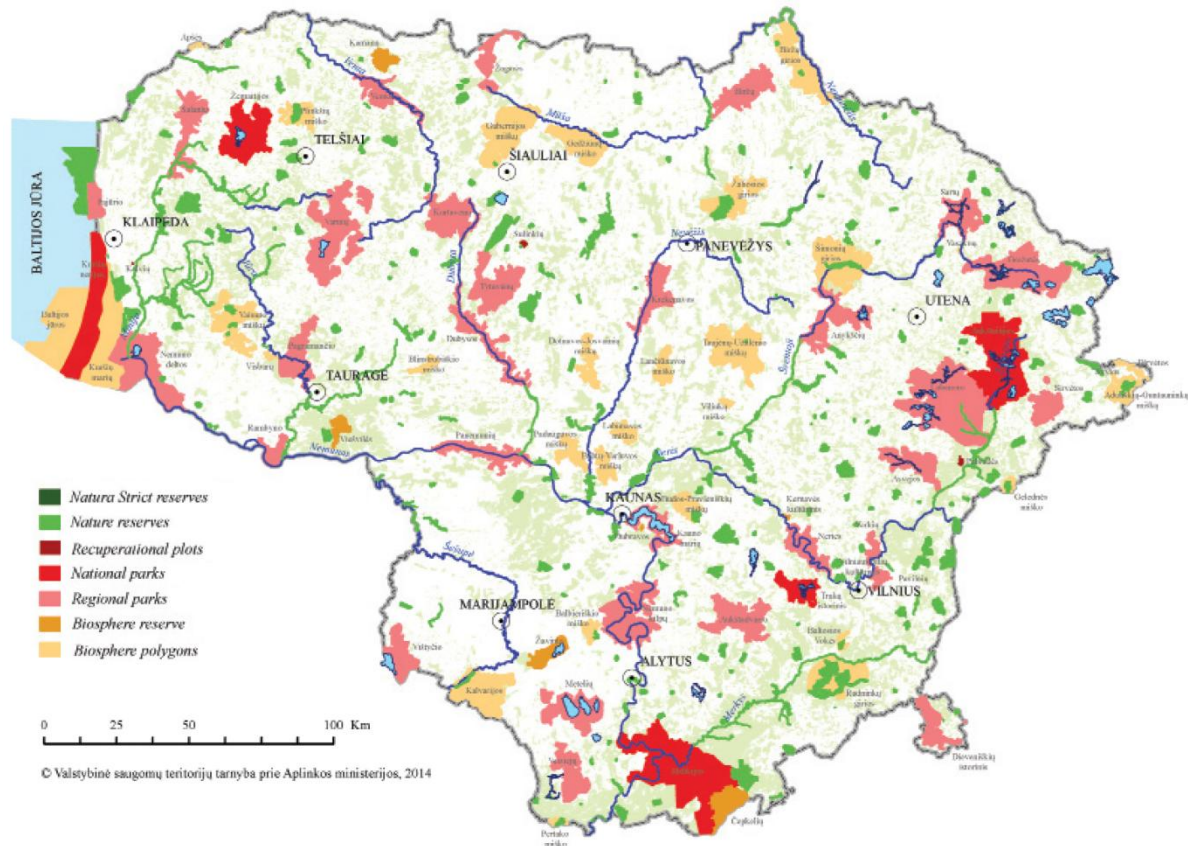
At the beginning of 2014 and according to Lithuanian statistical yearbook of forestry, the Natura 2000 network covered 811,800 ha<sup>2</sup>, or 12.4% of the country's territory<sup>19</sup>.

The main locations are given at the following figures.

<sup>19</sup> From Ministry of Environment of the Republic of Lithuania (Forest statistics for 2014 – Protected areas and Biodiversity)

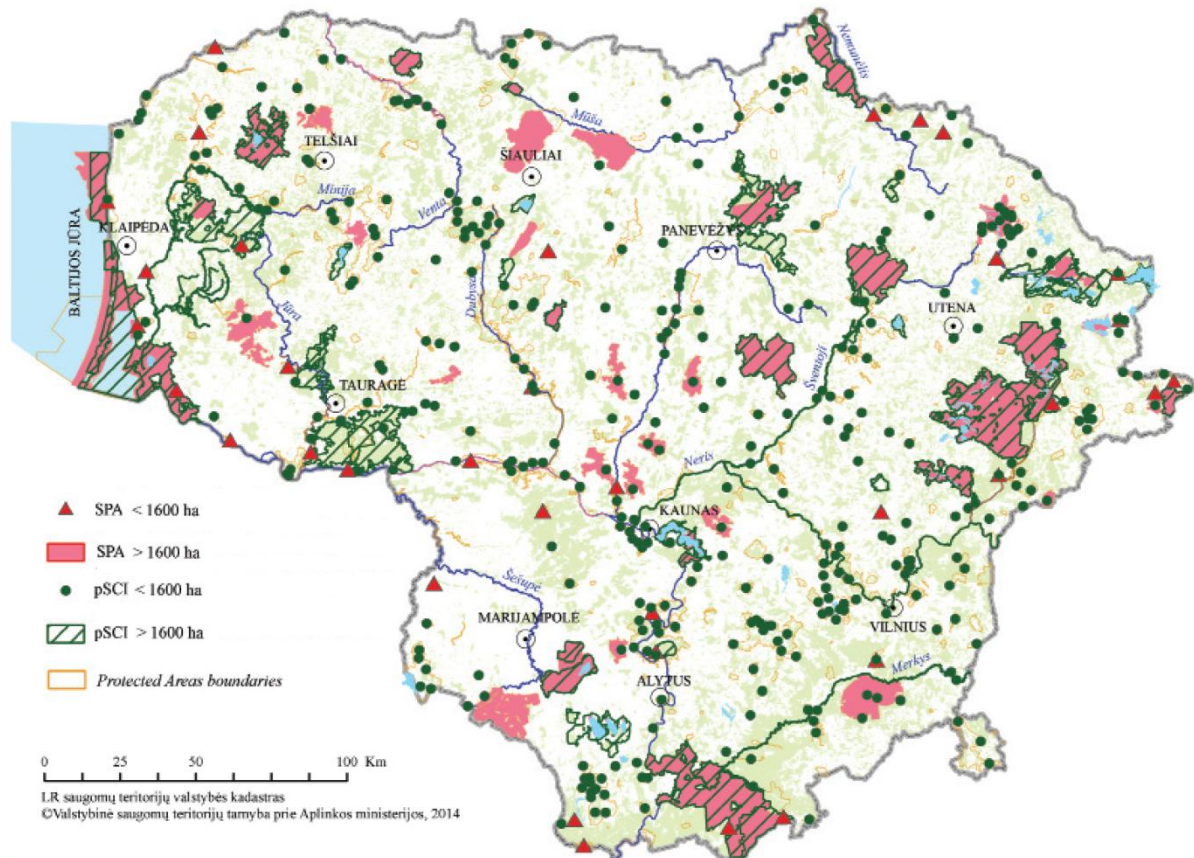
<sup>20</sup> Sea was excluded from the total of protected areas

Figure 21 : Location of the protected area in Lithuania



Source : From Ministry of Environment of the Republic of Lithuania (Forest statistics for 2014 – Protected areas and Biodiversity), <http://www.amvmt.lt/2014/ST2014.aspx?&MID=0&AMID=863>

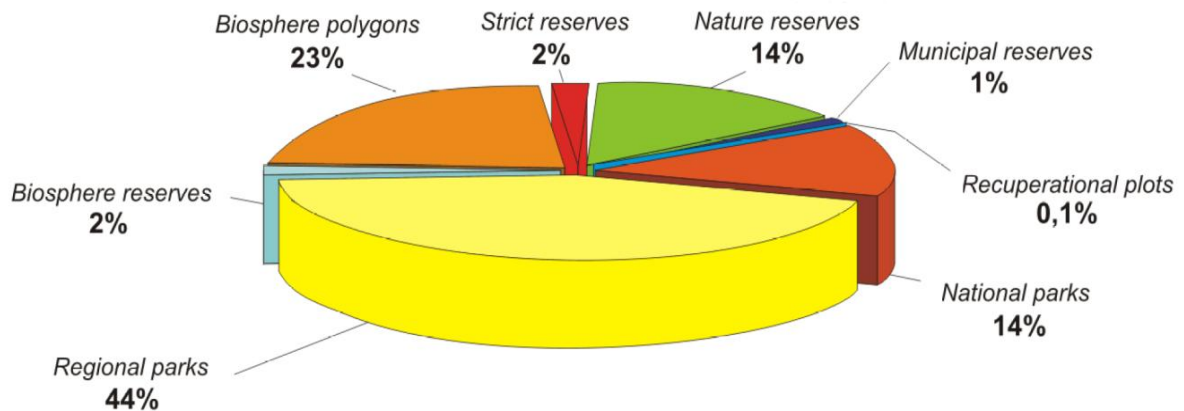
Figure 22 : Location of the Natura 2000 areas in Lithuania



Source : From Ministry of Environment of the Republic of Lithuania (Forest statistics for 2014 – Protected areas and Biodiversity), <http://www.amvmt.lt/2014/ST2014.aspx?&MID=0&AMID=863>. Note : SPA = Special Protected Areas pSCI= Proposed Sites of Community Interest

As we can see on Figure 23, the largest area is represented by regional parks.

Figure 23 : Share of protected forests in Lithuania in 2010



Source : From Ministry of Environment of the Republic of Lithuania (Forest statistics for 2014 – Protected areas and Biodiversity), <http://www.amvmt.lt/2014/ST2014.aspx?&MID=0&AMID=863>

The MCPFE (Ministerial Conference on the Protection of Forests in Europe) has produced Assessment Guidelines for Protected and Protective Forest and Other Wooded Land in Europe. The total extend of forested protected area in Lithuania recorded by MCPFE in 2010 is around 375,000 ha (classes 1.1.-1.3 & 2.)<sup>21</sup>. This is about 17.2% of the forest land. This figure is lower than protection areas presented by Lithuanian statistical yearbook of forestry 2014.

**Table 12 : Identification of the MCPFE Classes**

1. Main Management Objective "Biodiversity"	1.1: "No Active Intervention"
	1.2: "Minimum Intervention"
	1.3: "Conservation Through Active Management"
2. Main Management Objective: "Protection of Landscapes and Specific Natural Elements"	
3. Main Management Objective : "Protective Functions"	

Source: MCPFE assessment guidelines for protected and protective forest and other wooded land in Europe

When we compared by source provided by EU-27 DG Environment Natura 2000 network covers 491,000 ha of forests (i.e. about 22.6% of the country forests). This figure is lower than Natura 2000 areas presented by Lithuanian statistical yearbook of forestry 2014.

### National strategies and programs

The State Service for Protected Areas – Valstybinė saugomų teritorijų tarnyba – under the Ministry of Environment is the main body implementing state policy on protected areas, including Natura 2000 areas, and directly responsible for the conservation of natural values, landscape and biological diversity, set-up and maintenance of visitor centers' and fulfilling educational activities. At present, all strict reserves, national and regional parks and biosphere reserve have been assigned with administrations, which activities are coordinated by the State Service for Protected Areas<sup>22</sup>.

The condition and prospects of management of a specific protected area are defined in strategic planning documents prepared specially for that territory – plans for nature protection. Since 2007 the state forest enterprises have organised the implementation of 31 plans for nature protection in the territories important to the protection of birds and their habitats within their competence and implement necessary measures seeking to protect the existing natural habitats and to restore the damaged natural habitats, and the populations of protected species and animals to a favourable condition<sup>23</sup>.

According to Kestutis N. (2010)<sup>24</sup>, *"the need to develop the system of protected areas is mentioned in several long-term strategic documents: Lithuanian Long-Term Development Strategy, Lithuanian Environmental Strategy, National Sustainable Development Strategy.*

<sup>21</sup> The State of Mediterranean Forests 2013

<sup>22</sup> <http://www.europarc-nb.org/>

<sup>23</sup> Directorate General of State forests at the Ministry of Environment Republic Lithuania. <http://www.gmu.lt>

<sup>24</sup> Kestutis N., 2010. .Analysis of the legal basis for the establishment of protected areas in Lithuania and European level. Identification of shortcomings and gaps. European Greenbelt.



*The main principles of the development of protected areas network in Lithuania are reflected in The National Sustainable development strategy (2009). The document sets a long-term objective in the field of Landscape and Biological Diversity “to preserve landscape and biological diversity, nature and cultural heritage values, promote restoration of damaged natural elements and ensure rational use of landscape and biological diversity.”*

*The main legal act describing regulative measures of protected areas in Lithuania is the Law on protected areas (1993, No I-301, lastly amended in 2001 – No IX-628).*

- The main purpose of the Law: to specify the public relations related to protected areas, the system of protected areas, the legal basis for the establishment, protection, management and control of protected areas as well as regulates the carrying out of activities therein.*
- According to the Law a protected area is a clearly defined area of dry land and/or water that is of scientific, ecological, cultural or some other value that has a set regime for its protection and use.*
- Protected areas are established with a view to preserving territorial complexes and objects (properties) of natural and cultural heritage, landscape and biological diversity, ensuring the ecological balance of landscape, well-balanced use and restoration of natural resources, providing conditions for cognitive tourism, scientific research and monitoring of the condition of the environment, promoting territorial complexes and objects (properties) of natural and cultural heritage.”*

### **3.4. Protection of water**

The MCPFE (Ministerial Conference on the Protection of Forests in Europe) has defined a quantitative indicator to assess the performances of the reporting countries in terms of conservation of the forests' protective functions, especially regarding soil and water (MCPFE class 3 as per Table 12). It is based on the surface of forest land specifically dedicated to protective functions, as defined by the following criteria<sup>25</sup>:

- The management is clearly directed to protect soil and its properties or water quality and quantity or other forest ecosystem functions, or to protect infrastructure and managed natural resources against natural hazards*
- Forests and other wooded lands are explicitly designated to fulfil protective functions in management plans or other legally authorised equivalents*
- Any operation negatively affecting soil or water or the ability to protect other ecosystem functions, or the ability to protect infrastructure and managed natural resources against natural hazards is prevented*

---

<sup>25</sup> MCPFE assessment guidelines for protected and protective forest and other wooded land in Europe  
<http://www.unece.org/fileadmin/DAM/timber/publications/2002-guidelines-protected-forest.pdf>

**Table 13 : Forest land dedicated to soil, water and other forest ecosystem functions as per MCPFE class 3**

Year	Land dedicated to soil, water and other forest ecosystem functions (1000 ha)	Percentage of the forest land
2010	167	7.7%
2005	145	6.7%
2000	128	5.9%
1990	n.a.	n.a.

Source : Full State of Europe's Forests 2011 Report, by the Ministerial Conference on the Protection of Forests in Europe

### 3.5. Protection of soils

As described in the previous section, the MCPFE (Ministerial Conference on the Protection of Forests in Europe) has defined a quantitative indicator of to assess the performances of the reporting countries in terms of conservation of the forests' protective functions, especially regarding soil and water (MCPFE class 3 as per Table 12). The conservation areas are presented on Table 13.

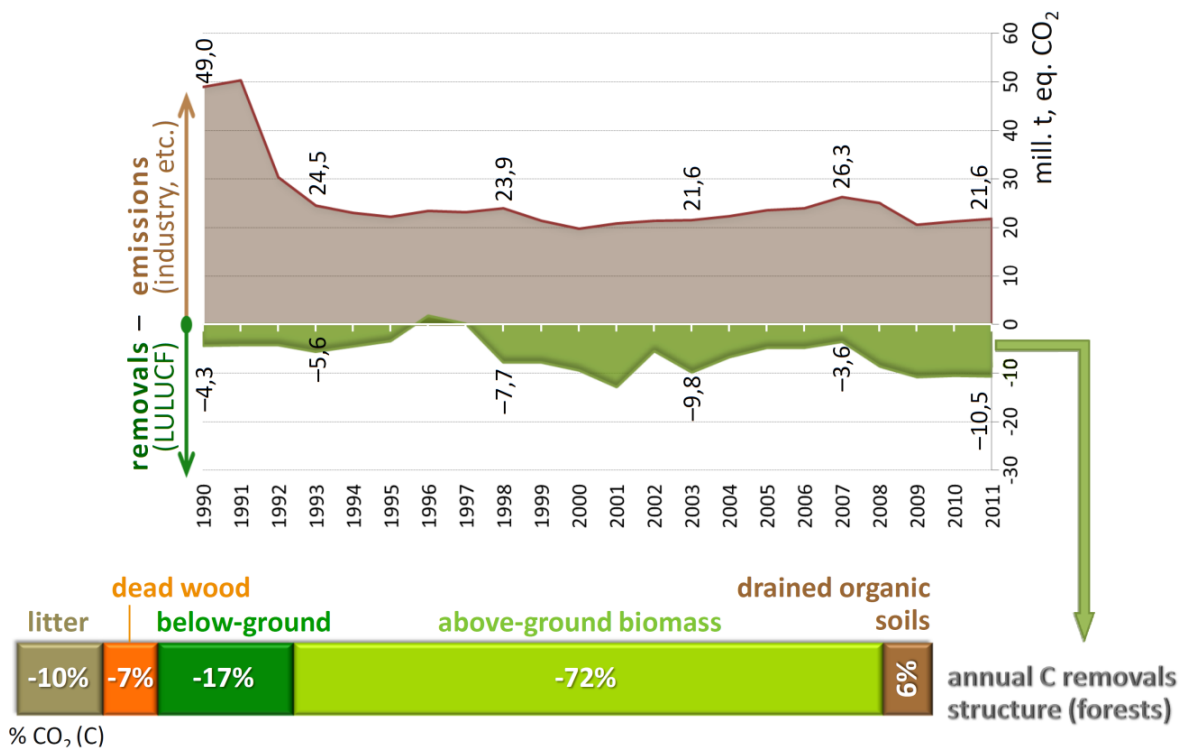
### 3.6. Protection of carbon stocks

In forest land the carbon stocks mainly includes:

- living above ground and below ground woody biomass,
- soil organic carbon,
- carbon in litter.

Carbon emission and removals are shown on Figure 24.

**Figure 24 : Lithuanian total greenhouse gases emissions/removals for the period 1990-2011**



Source : Forests and Forest Management in Lithuania (<http://www.amvmt.lt>)

Forests sequester nearly 25% of the total Lithuania's energy, industry, transport emissions. Afforestation/reforestation activities have increased the forest area by 28,000 ha (1,300 ha/yr.) and increased forest coverage adding about 0.5% during 1990-2011. Annually forests accumulate an average of 1.8 million tons of carbon (0.8 tons/ha or 6,5 million tons of CO<sub>2</sub> equivalent) and total Lithuanian forests has stored about 375 million tons of carbon.

Other data were in the Global Forest Resources Assessment 2010 in Lithuania. We can see a constant augmentation of carbon stock between 1990 and 2010 (Table 14).

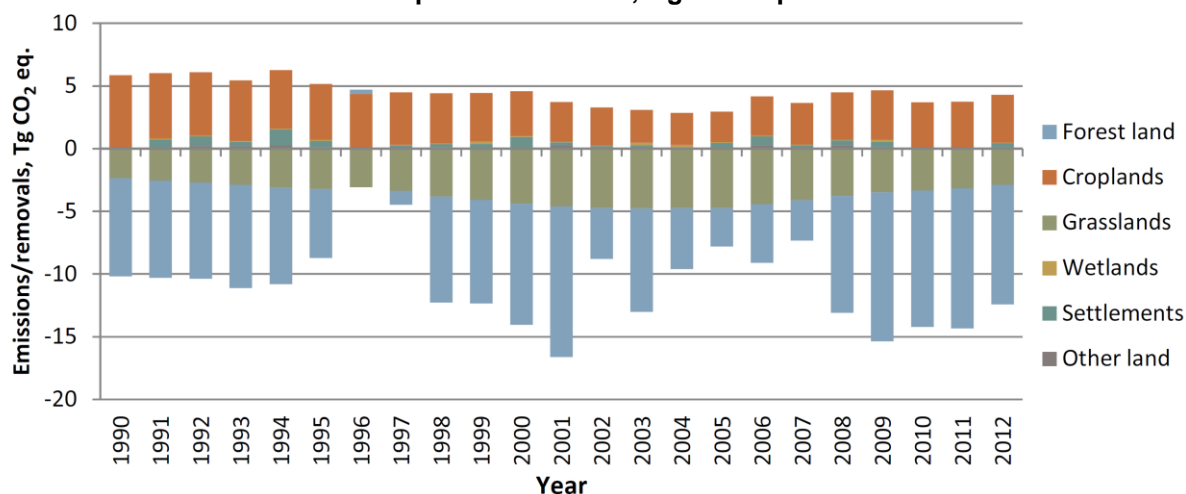
**Table 14 : Estimated carbon stock in Lithuanian forests between 1990 and 2010 (in million t)**

FRA 2010 Category	Carbon (Million metric tonnes)							
	Forest				Other wooded land			
	1990	2000	2005	2010	1990	2000	2005	2010
Carbon in above-ground biomass	109.0	118.6	122.6	124.0	0.65	0.65	0.6	0.65
Carbon in below-ground biomass	25.1	27.0	28.2	28.5	0.15	0.15	0.15	0.15
<b>Sub-total: Living biomass</b>	<b>134.1</b>	<b>145.6</b>	<b>150.8</b>	<b>152.5</b>	<b>0.8</b>	<b>0.8</b>	<b>0.75</b>	<b>0.8</b>
Carbon in dead wood	9.8	10.2	10.6	10.8	0.05	0.05	0.05	0.05
Carbon in litter	46.7	48.5	50.9	52.2	1.9	2.0	1.8	2.0
<b>Sub-total: Dead wood and litter</b>	<b>56.5</b>	<b>58.7</b>	<b>61.5</b>	<b>63.0</b>	<b>2.0</b>	<b>2.1</b>	<b>1.9</b>	<b>2.1</b>
Soil carbon	140.0	145.4	152.7	155.5	5.8	6.4	5.3	6.0
<b>TOTAL</b>	<b>330.6</b>	<b>349.7</b>	<b>365.0</b>	<b>371.0</b>	<b>8.6</b>	<b>9.3</b>	<b>7.95</b>	<b>8.9</b>

Source : FRA2010 Lithuania

Forests have always been a carbon sink between 1990 and 2012 except in 1995-1996 when there were an increase in forest felling in 1995 caused by spruce (*Picea abies* (L.) Karst.) dieback and an increased sanitary felling (Figure 25).

**Figure 25 : Lithuanian total greenhouse gases emissions/removals from LULUCF sector for the period 1990-2012, Gg CO<sub>2</sub> eq.**



Source : INFORMATION ON LULUCF ACTIONS IN LITHUANIA (2015).

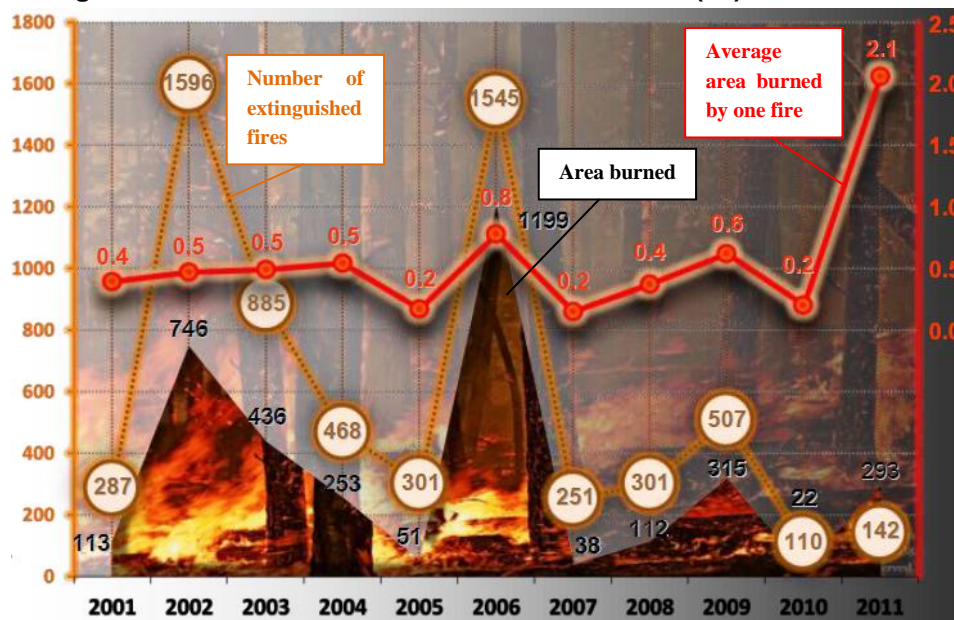
[http://www.am.lt/VI/files/File/Klimato%20kaita/aTASKAITA/Information\\_on\\_LULUCF\\_actions\\_in\\_Lithuania\\_pursuant\\_to\\_MMR\\_Art\\_10.pdf](http://www.am.lt/VI/files/File/Klimato%20kaita/aTASKAITA/Information_on_LULUCF_actions_in_Lithuania_pursuant_to_MMR_Art_10.pdf)

### 3.7. Protection of air quality

Concerning forests, the main impact on air quality relates to fire. It includes wild fire (which are unintended) and prescribed fire (which is used as part of forest management under controlled conditions).

According to Global Water Partnership (Integrated Drought Management in Central and Eastern Europe), “Lithuania operates uniform fire prevention and forest health protection system, which currently provides fire and sanitary forest protection. The system is designed and adapted to large-scale forest managers - forest enterprises. With increasing small-scale private forest estates the system may not be sufficiently effective to ensure protection of all forms of ownership of forest.” In fact, fire management is through a forest monitoring system, prevention and protection which covers all fire hazard forests. The system consists of early fire warnings and monitoring that covers approximately 30,000 km<sup>2</sup> of forests and non-forest. This management is implemented by General Directorate of Sates Forests, State Forest Enterprises and State park administrations together with Municipalities<sup>26</sup>.

Figure 26 : Number of forest fires and area burned (ha) in 2001–2011



Source : Forests and Forest Management in Lithuania (<http://www.amvmt.lt>.)

Number of extinguished forest fires, total area burned and average area burned by one fire can be seen on Figure 26. Forest fires impact on Lithuanian forests is less important compared with other factors like storms but the record of fires was registered in the year 2006 which was extremely droughty. Then the foresters extinguished 1545 fires, 1.2 thousand ha were destroyed and the average area of one fire was 0.78 ha. In 2012, as many as 81 forest fires in the area of 20,29 ha were registered in Lithuania (the average area of a forest fire was 0,25 ha)<sup>27</sup>.

<sup>26</sup> Forests and Forest Management in Lithuania (<http://www.amvmt.lt>.)

<sup>27</sup> [http://www.gmu.lt/forest\\_protection/](http://www.gmu.lt/forest_protection/)

Prescribed burning is an important and useful silvicultural tool which can have different objectives:

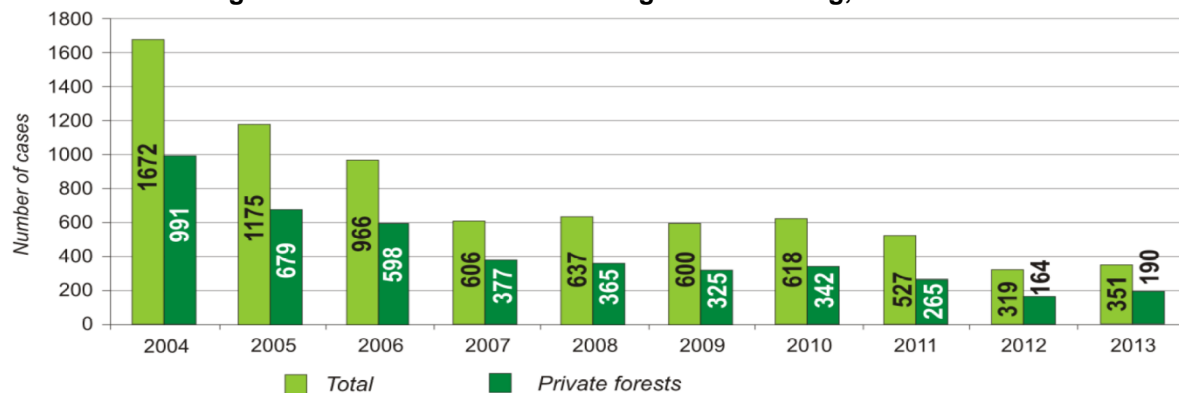
- Prepare sites before seeding and planting
- Reduce hazardous fuels under tree stands to prevent wildfires
- Improve wildlife habitat
- Improve forage for grazing (through changes in underbush vegetation)
- Manage competing vegetation
- Control insects and disease
- Enhance appearance (refresh forest appearance, improve flowering....)
- Improve access (clear underbush before harvesting or other operations)

In Lithuania, prescribed burning can be used for landscape management and has recently been permitted. However, this practice is not fully adopted because farmers illegally burn their fields and fire usually escapes from their control<sup>28</sup> and can lead to forest fire<sup>29</sup>. Unfortunately figures on prescribed fire are not available.

### 3.8. *Illegal logging*

Illegal logging is not a serious problem in Lithuania<sup>30</sup>. In 2003, an estimated 0.7% of domestic timber production was illegal ([UNECE/FAO 2004](#)). Lithuania's imports of timber and timber products are subject to the requirements of the EU Timber Regulation which came into force in March 2013. The two following figures show the general trend towards a reduction of illegal logging.

**Figure 27 : Number of cases of illegal forest felling, 2004–2013**



Source : From Ministry of Environment of the Republic of Lithuania (Forest statistics for 2014 – Forest protection).  
<http://www.amvmt.lt/2014/ST2014.aspx?&MID=0&AMID=863>

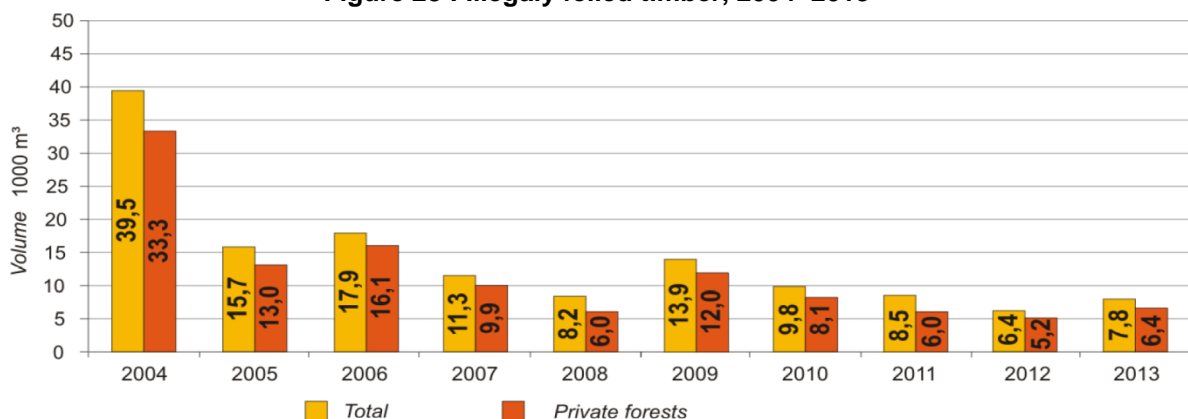
<sup>28</sup> Pereira P, Mierauskas P, Novara A. 2014b. Stakeholders perception about fire impact in Lithuanian protected areas. Land Degradation and Development. DOI: 10.1002/ldr.2290.

<sup>29</sup> Peleckas R., 2004. Forest fire in Lithuania. International Forest Fire News No. 30, 99-102

<sup>30</sup> <http://www.illegal-logging.info/regions/lithuania>



Figure 28 : Illegally felled timber, 2004–2013



Source : From Ministry of Environment of the Republic of Lithuania (Forest statistics for 2014 – Forest protection).  
<http://www.amvmt.lt/2014/ST2014.aspx?&MID=0&AMID=863>

The FSC risk assessment platform [www.globalforestryregistry.org](http://www.globalforestryregistry.org) considers Lithuania as at low risk in terms of illegal logging, because the following criteria are all verified:

- Evidence of enforcement of logging related laws in the district <sup>31</sup>
- There is evidence in the district demonstrating the legality of harvests and wood purchases that includes robust and effective system for granting licenses and harvest permits <sup>32</sup>
- There is little or no evidence or reporting of illegal harvesting in the district of origin <sup>33</sup>
- There is a low perception of corruption related to the granting or issuing of harvesting permits and other areas of law enforcement related to harvesting and wood trade <sup>34</sup>

### 3.9. Civil rights and traditional rights

The FSC risk assessment platform [www.globalforestryregistry.org](http://www.globalforestryregistry.org) considers Lithuania as at low risk in terms of violation of civil and traditional rights, because the following criteria are all verified:

- There is no UN Security Council ban on timber exports from the country concerned
- The country or district is not designated a source of conflict timber (e.g. USAID Type 1 conflict)
- There is no evidence of child labor or violation of ILO Fundamental Principles and Rights at work taking place in forest areas in the district concerned
- There are recognized and equitable processes in place to resolve conflicts of substantial magnitude pertaining to traditional rights including use rights, cultural interests or traditional cultural identity in the district concerned
- There is no evidence of violation of the ILO Convention 169 on Indigenous and Tribal Peoples taking place in the forest areas in the district concerned

### 3.10. Forest certification

The main forest certification schemes used in Lithuania are:

<sup>31</sup> [www.illegal-logging.info](http://www.illegal-logging.info) ; [www.eia-international.org](http://www.eia-international.org) ; <http://www.ahec-europe.org/>

<sup>32</sup> [www.illegal-logging.info](http://www.illegal-logging.info) ; [www.eia-international.org](http://www.eia-international.org) ; <http://www.ahec-europe.org/>

<sup>33</sup> [www.illegal-logging.info](http://www.illegal-logging.info) ; [www.eia-international.org](http://www.eia-international.org) ; <http://www.ahec-europe.org/>

<sup>34</sup> <http://www.transparency.org/cpi2012/results>

- PEFC (Programme for the Endorsement of Forest Certification), a global certification system that ensures sustainable forest management
- FSC (Forest Stewardship Council<sup>35</sup>), which is specifically suitable for small private owners

The Lithuanian PEFC council formation was initiated by the Lithuanian private forest owners association in 2002<sup>36</sup>, but the process didn't gain a support from private forest owners. Currently there are 7 Chain of Custody (CoC) PEFC certificate holders and no forest management units have been certified against this scheme<sup>37</sup>.

Almost 1,068,353 hectares of forests are certified according FSC certification scheme in November 2014 (167 Global FSC chain of custody certificates)<sup>38</sup>. It is about 49% of the forestland in the country.

## 4. Conclusions

Lithuania's forest land is estimated to cover more than 2.177 million hectares, which is about 33.3% of the country land area. Pine is dominant in the southern part of the country and broadleaves in other parts.

In 2014, as much as 39% of the forest land is private and 11% are reserved for restitution, while about 50% of the forest land is public. In state forests the conifers predominate, while in private forests the proportion of broadleaves and conifers is almost the same.

According to FAO's Global Forest Resources Assessment, there has been an average annual increase of the forest in percentage of the total forested area of 0.39%/year between 1990 and 2000, 1.00%/year from 2000 until 2005 and 0.7% from 2005 to 2010. Overall, the average annual increase over the 20 years preceding 2010 is 0.55 % per year.

The estimated volume of standing trees has increased since 1990 to reach more than 521,200,000 m<sup>3</sup> in 2014. Even with an important felling in percent of net increment (above the EU average of felling) after the 2000's, these felling are compensated by a large growing stock of forests. Even with important sanitary feeling caused by windstorm and spruce dieback like in 1995-1996, forest volume continued to grow.

Because of the augmentation of the volume of live trees, an increased of the estimated carbon stock in forests has been recorded. In fact, forests accumulate an average of 1.8 million tons of carbon annually. To confirm this trend, the Lithuanian forests have been a significant carbon sink between 1990 and 2010 excepted in 1995-1996 due to the reason cited above.

Lithuania has various types of conservation lands dedicated to the protection of biodiversity, including reserves, parks, parks, protected nature heritage, Natura 2000 and other protection status. According to the Ministerial Conference on the Protection of Forests in Europe, about 17.2% of the Lithuanian forests have a protection status in terms of biodiversity (MCPFE Classes 1.1-1.3 and Class 2). Protected areas as Natura 2000 have been accounted by EU-27 DG Environment and covers 491,000 ha of forests (i.e. about 22.6% of the country forests).

---

<sup>35</sup> [www.fsc.org](http://www.fsc.org)

<sup>36</sup> PEFC Lithuanian (In Lithuanian, PEFC Lietuva). [http://www.forest.lt/pefc/PEFC\\_Lietuva.htm](http://www.forest.lt/pefc/PEFC_Lietuva.htm)

<sup>37</sup> [http://www.pefc.org/images/documents/PEFC\\_Global\\_Certificates\\_-\\_December\\_2014.pdf](http://www.pefc.org/images/documents/PEFC_Global_Certificates_-_December_2014.pdf)

<sup>38</sup> <https://ic.fsc.org/facts-figures.839.htm>

According to the Ministerial Conference on the Protection of Forests in Europe, forest land specifically dedicated to soil, water and other forest ecosystem functions (in accordance with MCPFE class 3 definition) covers about 7.7% of the forests in Lithuania.

The damages from fire remain very punctual and small compared with the other causes. Prescribed fire is allowed in Lithuania but are often made illegally. Unfortunately figures on prescribed fire are not available.

The FSC risk assessment platform [www.globalforestregistry.org](http://www.globalforestregistry.org) considers Lithuania is at low risk in terms of violation of illegal logging and in terms of violation of traditional and civil rights.

The forest certification FSC are largely developed in Lithuania, with 49.0% of the forest land certified. PEFC is underrepresented because no forest management is certified PEFC (only 7 Chain of Custody PEFC certificate holders).

### **Disclaimer**

*This document is issued by the Company under its General Conditions of Service accessible at [http://www.sgs.com/terms\\_and\\_conditions.htm](http://www.sgs.com/terms_and_conditions.htm) . Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.*

*Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.*