

# Forest sustainability in the province of New Brunswick, Canada

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# 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 New Brunswick, including general condition, management and sustainability assessment.

## 2 New Brunswick forests overview

### 2.1 Location and distribution

New Brunswick is the largest Maritime province of Canada. It covers a total surface area of 73,834 km<sup>2</sup>. The province is bordered by Quebec, Nova Scotia and the United States, and is located under Quebec's Gaspé Peninsula and beside the US state of Maine. The Restigouche River and the Baie des Chaleurs are situated at its northern border. The eastern boundary is entirely coastal.

Figure 1: General map of New Brunswick



Source: <http://geology.com>

New Brunswick is divided in 15 different counties. These divisions are only relevant for the administration of justice. The figure below illustrates the territorial division in 15 counties.

Figure 2: Counties of New Brunswick



Source: Government of New Brunswick

More than 80% of New Brunswick are covered by forests, which are mainly composed of coniferous forest (Table 1). Primary commercial species in New Brunswick includes red spruce, balsam fir, black spruce, yellow birch, eastern white pine, eastern white-cedar, eastern hemlock, poplar and sugar maple<sup>1</sup>.

Table 1. Land cover types of New Brunswick

Land cover category	New Brunswick	
	Area (km <sup>2</sup> )	%age of Province
Coniferous forests	27 000	36.5
Mixed deciduous-coniferous forests	14 000	19
Deciduous forests	13 000	17.6
Shrubland, including regenerating forests	5 300	7.2
Natural shrublands	650	0.9
Aquatic habitats and wetlands	8 500	11.5
Agricultural and cultivated areas	3 000	4.1

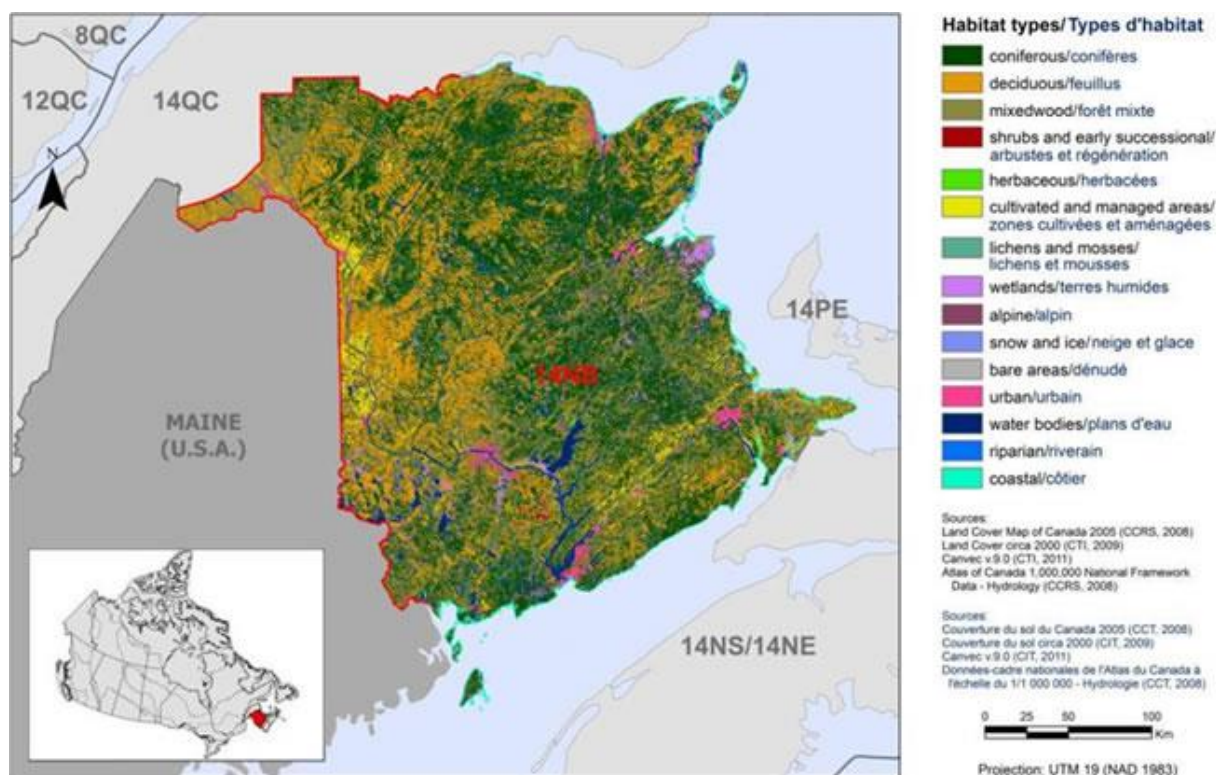
<sup>1</sup> Government of New Brunswick

[https://www.sfmcanada.org/images/Publications/EN/New\\_Brunswick\\_info\\_Provinces\\_and\\_territories\\_EN.pdf](https://www.sfmcanada.org/images/Publications/EN/New_Brunswick_info_Provinces_and_territories_EN.pdf)

Urban, commercial, industrial, mines, etc.	2 384	3.2
<b>Total</b>	<b>73.834</b>	-

Source : Land cover map of Canada 2005 (Government of Canada)

**Figure 3: Land cover in New Brunswick by habitat types**



Source: Land Cover Map of Canada 2005 (Government of Canada)

## 2.2 Ecological zones

New Brunswick possesses a diversified landscape, consisting of highlands, upland plateaus, lowlands and plains. The landscape is the reflection of a complex geology, which is strongly correlated to landform. The underlying formations are made of igneous and sedimentary rocks, which resist surface weathering and the effects of glacial and fluvial erosion<sup>2</sup>.

New Brunswick includes six geomorphologic regions, which are mapped on Figure 4 and described hereunder<sup>2</sup>.

- Edmundston Highlands

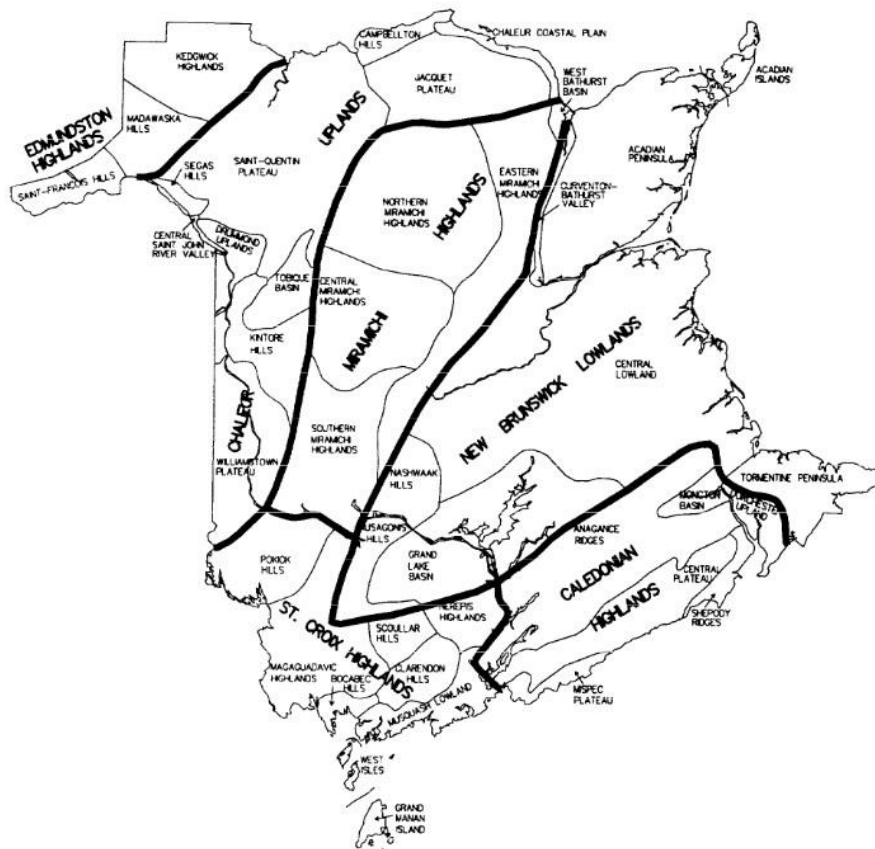
*The Edmundston Highlands are located south of the Gaspé peninsula in the northwest corner of the province. The region is drained by the Restigouche and Saint John river watersheds. The rugged topography is characterized by a strong relief of hills, steep sided ridges, and "V" shaped valleys. Peak elevations range from 580 m in the Kedgwick Highlands to 360 m near the Madawaska River. Local relief varies from 90 m to 240 m and the steepest slopes are found along deeply incised valleys of the major rivers and watercourses.*

<sup>2</sup> Colpitts et al. 1995. Forest soils of New Brunswick.

[http://www2.gnb.ca/content/dam/gnb/Departments/nr-rn/pdf/en/Publications/forest\\_soils\\_of\\_NB-e.pdf](http://www2.gnb.ca/content/dam/gnb/Departments/nr-rn/pdf/en/Publications/forest_soils_of_NB-e.pdf)

The entire area is underlain by medium- to fine-textured metasedimentary rocks, primarily grey micaceous slates, metasiltstones, and metawackes. Because cleavage of the bedrock is vertical, water drains freely, and tree roots often penetrate the bedrock.

Figure 4: Geomorphologic regions of New Brunswick



Geomorphologic Regions of New Brunswick (Bostock 1970; modified by Rampton *et al.*, 1984).

Source: Colpitts *et al.* 1995. Forest soils of New Brunswick

- Chaleur Uplands<sup>2</sup>

The Chaleur Uplands consist of three large plateaus which are deeply dissected by major streams and separated by lesser uplands, hills, and basins. The relief is less rugged and elevations are generally lower than the adjacent Edmundston and Miramichi Highlands. Elevations range from 300 m in the Kintore Hills subregion, to sea level along the Chaleur Coastal Plain subregion. The area is drained by the Restigouche, Saint John, Miramichi and Jacquet rivers.

The Saint Quentin Plateau and Williamstown Plateau are similar, non-contiguous subregions underlain by formations of calcareous sedimentary rocks (argillaceous limestones, sandstones, siltstones, and slates) and non-calcareous metasedimentary rocks (metasandstones, metawackes, metaconglomerates). The eastern half of the Jacquet Plateau subregion is underlain by felsic- and mafic-igneous rocks, whereas the western half is predominantly underlain by calcareous siltstones,



sandstones and slates. The flat and gently sloping surface of the Tobique Basin subregion is primarily underlain by fine-textured formations of slightly calcareous red mudstones, red sandstones and conglomerates.

- **Miramichi Highlands<sup>2</sup>**

The Miramichi Highlands are located north of the Saint John River between the New Brunswick Lowlands and Chaleur Uplands. The topography is rugged and elevations are higher than most adjacent land forms. The deeply dissected Nepisiguit River Valley and Mount Carleton, the tallest summit in the province, are prominent features of this region. The area extends into the watersheds of the Restigouche, Nepisiguit, Miramichi, and Saint John rivers.

The bedrock geology of the region is complex and varied. The Northern Miramichi Highland subregion forms a high undulating plateau of rounded peaks, broad ridges, and hills. Average elevation exceeds 600 m and changes in relief from 150 m to 250 m are common. The core of the Highlands Region is underlain by acid igneous bedrock and many of the higher peaks are composed of hard, resistant felsic volcanic bedrock. Elevation and relief decrease gradually moving southward from the Central Miramichi Highlands to the Southern Miramichi Highland subregion where extensive granitic intrusions occur. The Eastern Miramichi Highlands subregion is underlain by locally calcareous and non-calcareous metasedimentary rocks, and acts as a transition zone between the highlands of the interior and the New Brunswick Lowlands Region to the east. Smaller pockets of mafic-volcanic and sedimentary rocks are found locally throughout the Miramichi Highlands Region.

- **St. Croix Highlands<sup>2</sup>**

Located in the southwestern corner of the province, the St. Croix Highlands form a broad “V” shape around the western tip of the New Brunswick Lowlands. The topography is varied and includes landscapes of rugged hills, steep-walled ridges, undulating plains, and coastal cliffs. Elevations generally range from 400 m in the Pokiok Hills subregion, to sea level near the Musquash Lowlands subregion on the Bay of Fundy coast. Relief varies from about 100 m in the highland areas, to 10 to 20 m in the Magaguadavic Highlands subregion. The Magaguadavic, Lepreau, St. Croix, and Saint John rivers drain the area.

The flat terrain of the Magaguadavic Highlands has developed on formations of calcareous sedimentary rock containing sandstones, siltstones, and slates, and from non-calcareous rocks (i.e. metawacke). Farther to the west, the rugged topography of the Pokiok Hills subregion is primarily underlain by granite. The subregions in the eastern half of the St. Croix Highlands are underlain by hard, and resistant felsic volcanic and granitic rocks, with lesser amounts of metasedimentary and igneous rocks occurring locally.

- **Caledonian Highlands<sup>2</sup>**

The Caledonian Highlands lie east of the Saint John River, bordered on the south by the Bay of Fundy and on the north by the New Brunswick Lowlands. The topography and geology of the area are complex and varied. The area is drained by the rivers of the East Fundy watershed, and the Saint John and Petitcodiac rivers.

The rounded hills and gently rolling surface of the Central Plateau subregion are underlain primarily by interbedded felsic and mafic rock. Elevations range from 150 m along coastal cliffs to 400 m in the northwest, and local relief ranges from 60 to 90 m. The parallel valley and ridge topography of the Anagance Ridges subregion are primarily underlain by siliclastic sedimentary rocks composed of slightly calcareous red mudstones, red sandstones, and conglomerates. Ridge-top elevations average 250m. The remaining subregions are underlain by non-calcareous sedimentary rocks including red mudstones, and grey lithic to feldspathic sandstones.

- **New Brunswick Lowlands<sup>2</sup>**

The New Brunswick Lowlands form a large, triangular, gently, sloping plain, bordering the Northumberland Strait. The region is drained by the Miramichi, Nepisiguit, and Saint John rivers, and the Gulf of Saint Lawrence and Northumberland Strait watersheds. Elevations range from sea level to just over 200 m where the lowlands merge with the Eastern Miramichi Highland subregion. Relief of the region is low, and organic soils are prevalent along the central and northern shores of Northumberland Strait.



*The eastern two-thirds of the Central Lowlands subregion and parts of the Acadian Peninsula subregion are underlain by non-calcareous grey-green sandstone interbedded with some reddish, fine-textured, sandstone, siltstone, and conglomerate, and because of the flat topography, drainage is often impeded. The western one-third of the New Brunswick Lowlands from Oromocto Lake to the Northwest Miramichi River is primarily underlain by formations of grey lithic and feldspathic sandstones. These rock types also occur on the central part of the Acadian Peninsula subregion. The broad, flat area of the Tormentine Peninsula is underlain by slightly calcareous red mudstones and feldspathic sandstones.*

Climate of New Brunswick is mainly determined by the elevation. Cool temperatures, short growing season and high precipitation correspond to high-elevation regions. In those regions, precipitation is more important than in lowlands areas, because of the orographic effect. (The orographic effect is defined by the tendency of elevated landscape to force moving air masses upwards. It provokes water condensation and fall as precipitation in highland regions).

New Brunswick is bordered by the Atlantic waters of the Bay of Fundy, which provide a strong cooling effect along the southern areas of the province.

There are wide fluctuations in seasonal and daily temperatures, due to the complex interaction of the previously presented factors. There is also a wide range of growing conditions during growing seasons, generally characterized by cool and wet springs and autumns, and warm, rainy and infrequently droughty summers.

New Brunswick includes four climatic regions, which are mapped on Figure 5 and described hereunder<sup>2</sup>. These climatic regions are based on the number of annual growing degree-days (DD) above 5°C, and subregions are based on total precipitation from May to September.

- Climate Region 1

*Climate Region 1 encompasses the Grand Lake Basin of the New Brunswick Lowlands. The region is affected by the waters of the Saint John River and the Grand Lake system, which moderate the climate and prolong growing seasons. The warmest temperatures and highest total growing degree-days (DD > 1800) in the province combined with moderate levels of precipitation (400-500 mm) are experienced in this area. The relatively flat topography and low elevation are a result of the high weatherability of the underlying formations of coarse textured quartzose sandstones and fine-textured red siltstones of Carboniferous origin. Tolerant hardwoods and red spruce are common on zonal sites (moist, well drained), whereas black spruce and eastern larch dominate the wetter sites. In bottomland areas and along rivers, butternut, basswood, bur oak, and silver maple are common.*

- Climate Region 2

*Climate Region 2 encompasses most of the southern part of the province including the Central and Southern New Brunswick Lowlands, the Williamstown Plateau and parts of the St. Croix Highlands. The climate of this region is characterized by warmer temperatures, higher total growing degree-days (DD = 1600-1800), and lower precipitation levels than in Climate Regions 3 and 4 to the north. Most of the region receives moderate amounts of precipitation (400-450 mm) during the growing season. The topography and bedrock geology of Climate Region 2 is varied. Granites and calcareous, and non-calcareous sedimentary materials dominate western higher elevations. Tolerant hardwoods are common on middle and upper slopes and their presence is strongly correlated with increasing calcareousness of the bedrock. Spruces and balsam fir are prevalent on lower landscape positions. In the Lowlands in the eastern part of the region, non-calcareous quartzose sandstones and red siltstones are prominent and forests are dominated by mainly coniferous species, such as black spruce and eastern larch.*

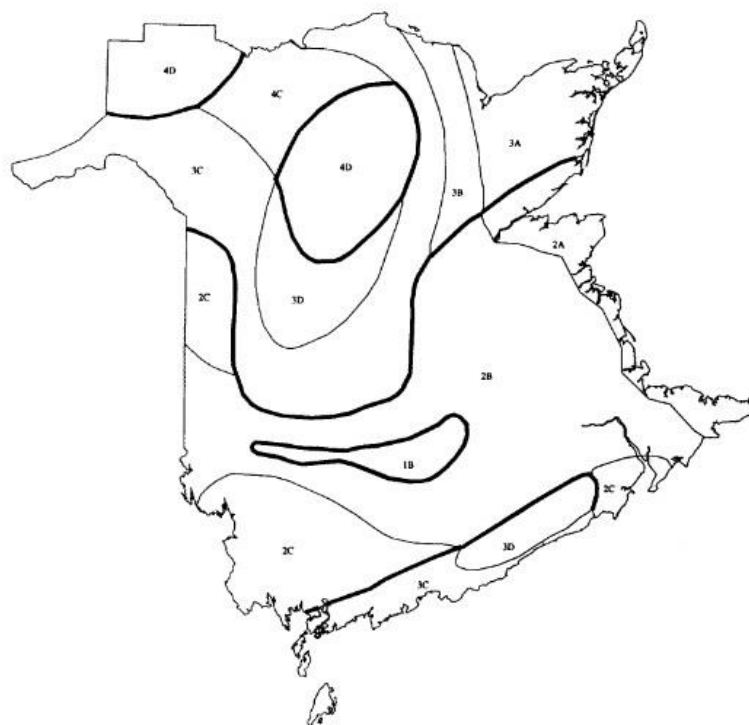
- Climate Region 3

*The cool temperatures of Climate Region 3 (DD = 1400-1600) form a transitional zone between the higher elevations, colder temperatures and shorter growing seasons of Climate Region 4, and the slightly warmer temperatures and longer growing seasons associated with Climate Region 2. Climate Region 3 encompasses much of the northern half of the province and a wide coastal belt along the Bay*

of Fundy where cold Atlantic waters reduce the number of growing degree-days. Seasonal precipitation levels are greatest (500-550 mm) at higher elevations in the central Miramichi Highlands and the Central Plateau of the Caledonia Highlands (Subregion 3D). In contrast, the Acadian Peninsula in the northeast (Subregion 3A) is in the rain shadow of the Miramichi Highlands and receives substantially lower amounts of precipitation (350-400 mm). There is considerable variation in topography and bedrock geology of Climate Region 3. Elevations range from sea level along the Bay of Fundy and Northumberland Strait to over 500 m in the Highlands. In the strongly rolling topography of the northwest, tolerant hardwoods are common on soils derived from calcareous sedimentary bedrock. Coniferous species (spruce and fir) grow on shallow soils over felsic volcanic and granitic bedrock in the Central and Southern Miramichi Highlands and along the Fundy Coast, with tolerant hardwoods increasing as the soil becomes deeper. The Acadian Peninsula (Subregion 3A) in the northeast is underlain by quartzose sandstones and red siltstones, and coniferous forests of black spruce and larch are common on wet sites whereas jack pine is common on the better-drained sandy soils in this zone.

- Climate region 4

The lowest total growing degree days ( $DD = 1200-1400$ ) and highest amounts of rainfall from May to September (500-550 mm) occur in Climate Region 4D, which encompasses the Kedgwick and Northern Miramichi Highland Regions. The non-calcareous metasedimentary nature of the Kedgwick Region and igneous nature of the Northern Miramichi Region have given rise to distinctly rugged topography with elevations in excess of 600 m. This cold climate and the generally shallow, coarse soils have resulted in pure coniferous stands of balsam fir and spruce and predominantly boreal ground vegetation.

**Figure 5: Climate regions and subregions of New Brunswick****Legend:**

Annual DD > 5° C	May - Sept. rain (mm)
1. >1800	A 350-400
2. 1600-1800	B 400-450
3. 1400-1600	C 450-500
4. 1200-1400	D 500-550

Climate Regions  
Climate Subregions



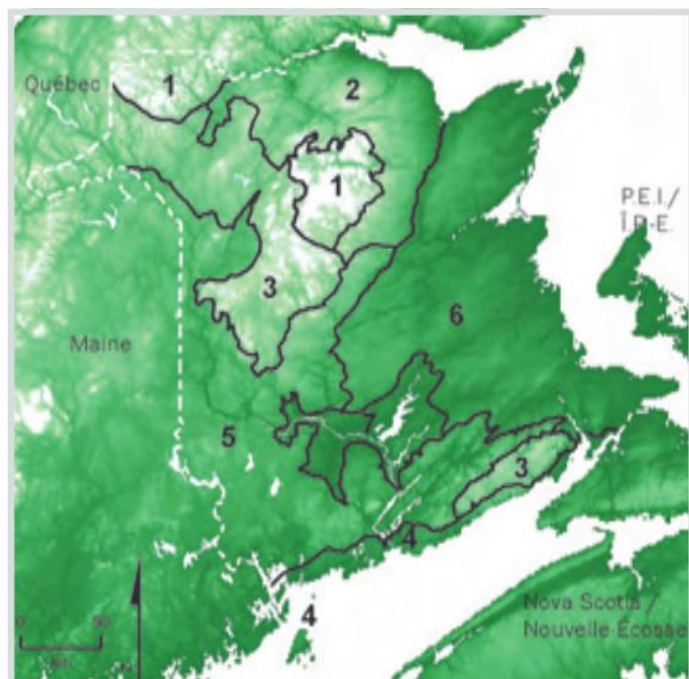
Climate Regions and Subregions of New Brunswick (after Dzikowski *et al.* 1984).

Source: Colpitts et al. 1995. Forest soils of New Brunswick

Seven ecoregions have been defined in New Brunswick. Ecoregions are areas that have distinctive, recurring patterns of vegetation and soil development, that are determined and controlled by local climate and geology.

**Figure 6: Ecoregions of New Brunswick:**

1. Highlands, 2. Northern Uplands, 3. Central Uplands, 4. Fundy Coast, 5. Valley lowlands, 6. Eastern lowlands, 7. Grand Lake. Higher elevation land is denoted by lighter shades



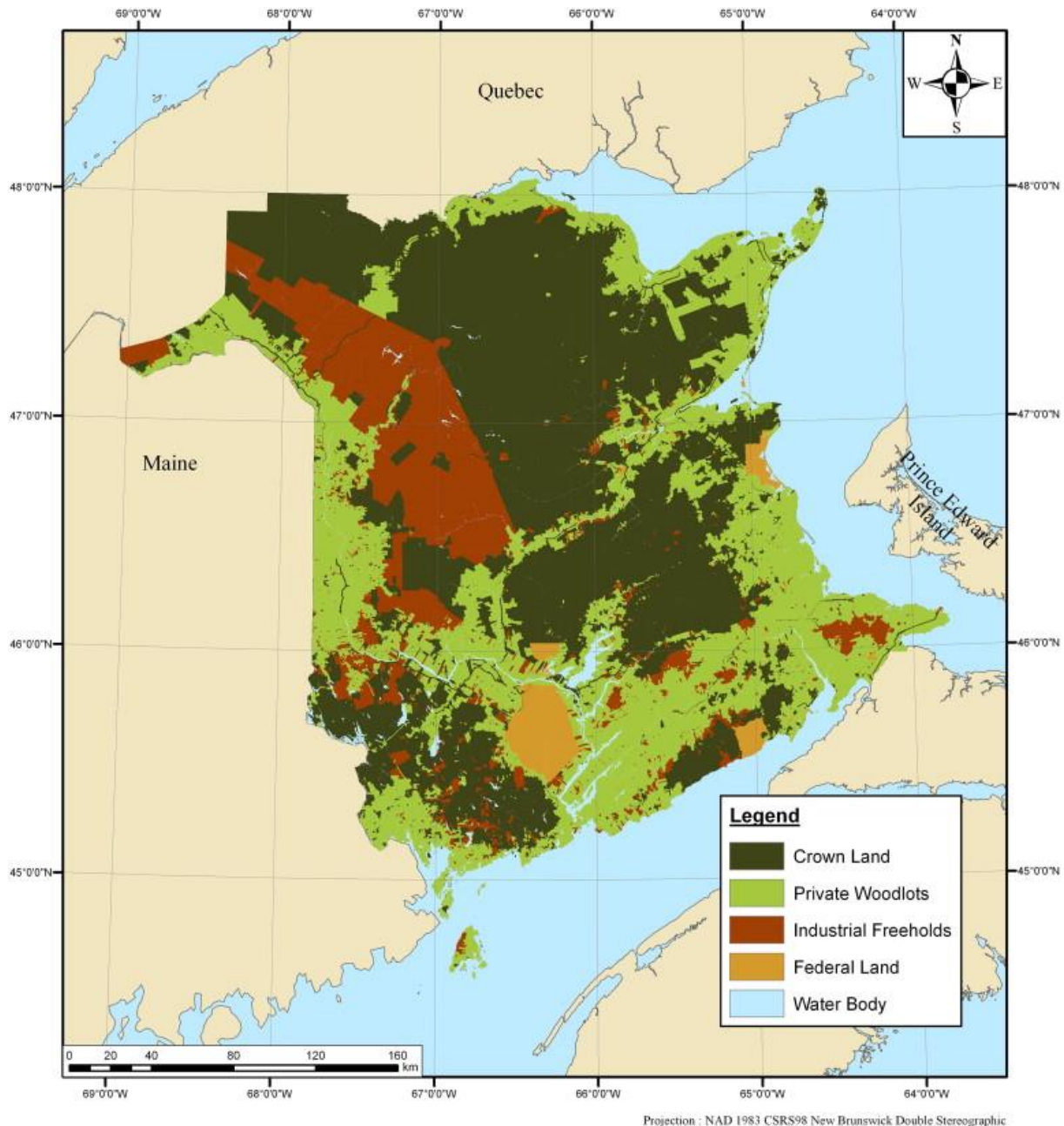
**Table 2: Main characteristics of each ecoregion**

<b>Ecoregions</b>	<b>General description</b>	<b>Topography</b>	<b>Land area</b>	<b>Vegetation</b>
<b>Highlands</b>	Mountainous area with characteristics of the boreal forest	Mount Carleton (820m) is the tallest peak in the Maritimes, average elevation is 500m	<ul style="list-style-type: none"> <li>- Over 95% forested</li> <li>- Several major rivers originate in this area, few lakes, limited wetlands</li> </ul>	Dominated by balsam fir, white birch, black spruce, and white spruce
<b>Northern Uplands</b>	Geologically diverse with a mixture of species with northern and southern affiliations	Elevations average 150 to 300m (up to 522m)	<ul style="list-style-type: none"> <li>- Most districts are covered by forest over 90% of their surface</li> <li>- One district covered at 75% of forests</li> </ul>	<ul style="list-style-type: none"> <li>- Tolerant hardwoods – sugar maple, yellow birch at lower elevations</li> <li>- Coniferous cover at higher elevations – balsam fir, black spruce, white spruce</li> <li>- Northern range limit of red spruce, hemlock and beech</li> </ul>
<b>Central Uplands</b>	Two geographically separate areas, both with mixed forests and characterized by trees with southern affinities	Elevations vary between regions, Caledonia Uplands average 300m (up to 400m)	Covered over 90% by forests	<ul style="list-style-type: none"> <li>- Trees with more southern affinities (rather than northern coniferous)</li> <li>- Hardwood and mixed forest stands – with well-developed understory vegetation (mountain maple, striped maple and hobblebush)</li> <li>- Lower slopes and valleys support red, white and black spruce and balsam fir and hardwoods on upper slopes, ridges and hilltops</li> <li>- Cedar in swamps along little main Restigouche and Grand River watersheds</li> </ul>
<b>Fundy Coast</b>	Coastal climate, primarily coniferous	Primarily under 100m although coastal cliffs can be upwards of 300m	76% covered by forests	Dominated by red spruce but also balsam fir, black spruce, white spruce and tamarack
<b>Valley Lowlands</b>	Defining characteristic is diversity	Elevations vary; 572m at mount Cameron but elevations drop to 100m at ecoregion border (approaching Grand Lake Lowlands ecoregion)	Variable forest cover between ecodistricts: from 62 to 95% coverage	<ul style="list-style-type: none"> <li>- Many plants with southern affinities</li> <li>- Mainly tolerant hardwoods and red spruce</li> </ul>
<b>Eastern Lowlands</b>	Coastal area, marshes and extensive peatlands	Elevation range of 150m to sea level	<ul style="list-style-type: none"> <li>- Ecoregion presenting the largest extent of wetland in NB</li> <li>- Variable forest cover between ecodistricts: from 70 to 95</li> </ul>	<ul style="list-style-type: none"> <li>- Boreal-like species</li> <li>- Fire-tolerant species (trembling aspen, red, white and jack pine plus black spruce)</li> </ul>
<b>Grand Lakes Lowlands</b>	Warm climate and widespread alluvial floodplains	Elevation range of 150 m to sea level	Covered at 70% by forests	<ul style="list-style-type: none"> <li>- Heat-loving trees – ash, oak, silver maple, ironwood, basswood</li> <li>- Low relief implies few tolerant hardwood ridges</li> <li>- Red maple, red spruce, hemlock, beech, sugar maple, white ash</li> <li>- White pine near eastern lowlands</li> </ul>

## 2.3 Forest ownership

Among the 6.1 million hectares of forest in the province of New Brunswick, 3.2 million are public (mainly Crown land), and 2.9 million are private<sup>3</sup>. Private forests represent nearly half the forest area of New Brunswick, unlike in the other provinces of Eastern Canada where private forests account for a much smaller proportion. About 40% of the private land is owned by forest industry firms and the remaining 60% is owned by non-industrial private owners<sup>4</sup>. The distribution of land ownership in New Brunswick is illustrated hereunder.

**Figure 7: Major land ownerships in the province of New Brunswick**



Source: <https://www.sciencedirect.com/science/article/pii/S0961953413001463>

<sup>3</sup> [https://www.sfmcanada.org/images/Publications/EN/New\\_Brunswick\\_info\\_Provinces\\_and\\_territories\\_EN.pdf](https://www.sfmcanada.org/images/Publications/EN/New_Brunswick_info_Provinces_and_territories_EN.pdf)

<sup>4</sup> <http://www2.gnb.ca/content/dam/gnb/Departments/nr-rn/pdf/en/ForestsCrownLands/2011SnapshotOfNB-NonIndustrialForestOwners.pdf>

The main part of the Crown land is in the central, Northern and North-Eastern parts of New Brunswick. Industrial freeholds are mainly in the west part of the province.

Forest landowners can be considered in terms of size classes: small (<30 ha), medium (30-99.9 ha), and large (100 ha and more). The following table presents the different types of ownership that can be found in the province.

**Table 3 : Private forest in New Brunswick by size and type of private owner**

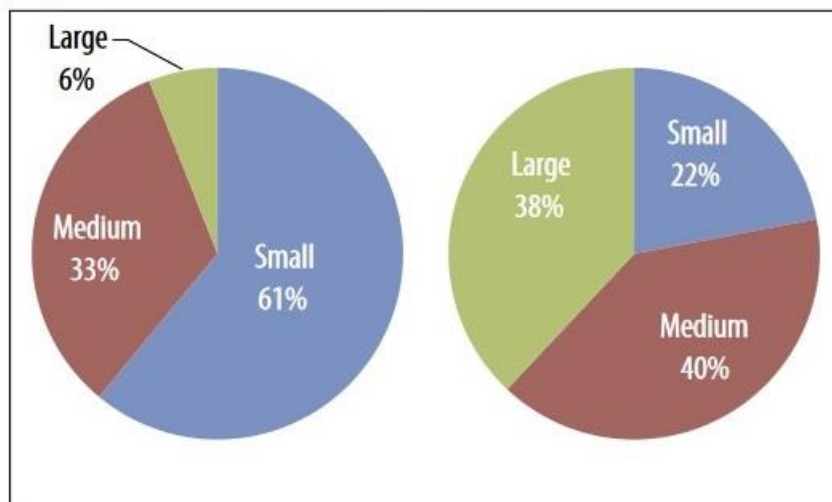
	Size of Ownership (%)			Total (%)
	Small	Medium	Large	
Individual ownership	58	53	42	56
Joint	39	39	34	39
Other	2	2	6	2
Formal partnership agreement	0	3	4	1
Forestry company	0	0	6	1
Non forestry company	0	2	5	1
Not stated	1	1	2	1

Source: <http://www2.gnb.ca/content/dam/gnb/Departments/nr-rn/pdf/en/ForestsCrownLands/2011SnapshotOfNB-NonIndustrialForestOwners.pdf>

Forests are mainly owned by individuals or jointly with by a group of individuals. Companies and partnerships mostly own large forest land plots.

The distribution of the non-industrial forest owners in New Brunswick is shown on Figure 9 both in terms of number of owners and in terms of area owned.

**Figure 8: Number of non-industrial forest owners in New Brunswick by size class (n = 41,909) and proportion of forest land owned by size class (total = 1.7 million ha)**



Source: <http://www2.gnb.ca/content/dam/gnb/Departments/nr-rn/pdf/en/ForestsCrownLands/2011SnapshotOfNB-NonIndustrialForestOwners.pdf>



Only 18% of owners generate income from their woodlots<sup>5</sup>. Only 13% have a formal forest management plan, and 13% conduct management activities for which they have received financial support (from the provincial government or regional marketing board).

The province of New Brunswick has seven regional wood marketing boards. They provide services to woodlots owners.

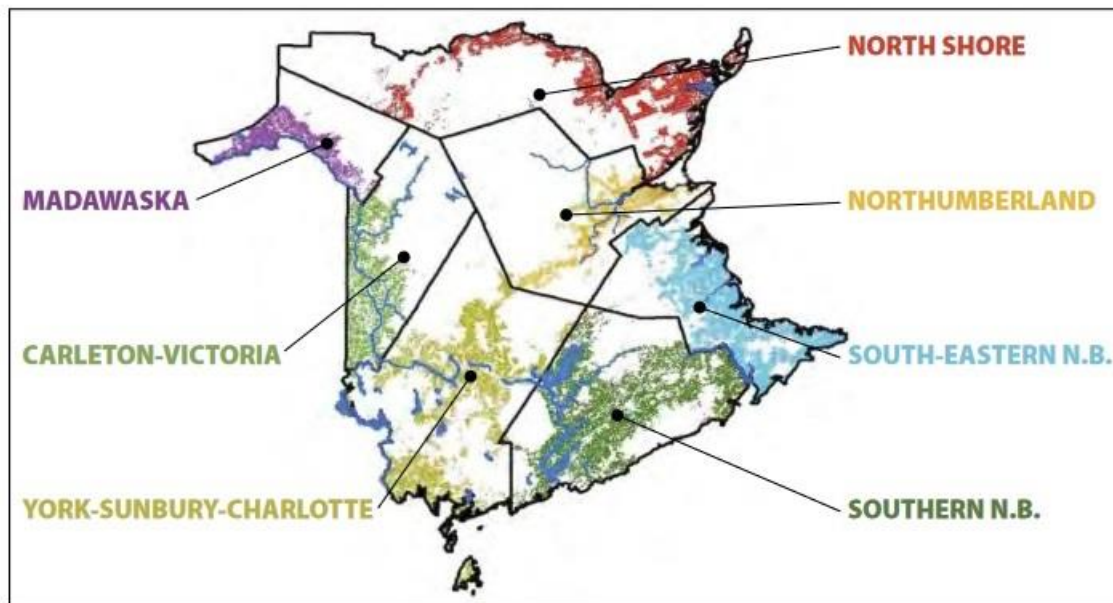
**Table 4: New Brunswick wood marketing boards**

Marketing board	Area (ha)	Average property size (ha)	Median property size (ha)	Properties (n)	Woodlot owners (n)	Woodlot owners (%)
Carleton-Victoria	154,293	21	18	7,482	3,337	8
Madawaska	96,127	23	21	4,343	1,999	5
North Shore	275,840	17	13	16,583	8,858	21
Northumberland	133,433	22	18	5,715	3,429	8
Southeastern N.B.	284,888	18	14	15,652	8,547	20
Southern New Brunswick	428,321	26	21	16,118	8,628	21
York-Sunbury-Charlotte	326,563	25	19	12,899	7,109	17
Unknown	52	13	13	4	2	0
<b>Total</b>	<b>1,699,517</b>	<b>22</b>	<b>17</b>	<b>78,796</b>	<b>41,909</b>	<b>100</b>

Source: <http://www2.gnb.ca/content/dam/gnb/Departments/nr-rn/pdf/en/ForestsCrownLands/NewApproachesForPrivateWoodlots.pdf>

The localizations of the different marketing boards are presented in the following figure.

<sup>5</sup> <http://www2.gnb.ca/content/dam/gnb/Departments/nr-rn/pdf/en/ForestsCrownLands/NewApproachesForPrivateWoodlots.pdf>

**Figure 9: Extent of New Brunswick's seven forest product marketing boards**

Source: <http://www2.gnb.ca/content/dam/gnb/Departments/nr-rn/pdf/en/ForestsCrownLands/FutureTimberSupplyPotentialAndForestDynamicsAppendixC-2012.pdf>  
(Coloured areas reflects private forest landplots).

**Table 5: Ownership summary of private woodlot areas by size class and board (2014-2015)**

Marketing Board	# Properties	# Owners	Productive Forest Area by Size Class			Total Area
			1-30 ha	30-100 ha	100+ ha	
<i>Carleton-Victoria</i>	9,400	5,100	30,900	65,200	62,000	158,100
<i>Madawaska</i>	5,400	2,800	16,600	41,100	43,300	101,000
<i>North-Shore</i>	21,200	13,800	96,200	71,500	106,700	274,400
<i>Northumberland</i>	7,700	5,200	34,300	42,700	56,700	133,700
<i>South East N.B.</i>	15,400	13,100	91,800	85,100	110,900	287,800
<i>Southern N.B.</i>	10,200	14,300	77,600	183,900	164,700	426,200
<i>York-Sunbury-Charlotte</i>	13,900	12,000	69,000	162,200	127,500	358,700
<i>Provincial Totals</i>	83,100	66,400	416,400	651,700	671,800	1,739,900

Source: <http://www2.gnb.ca/content/dam/gnb/Departments/nr-rn/pdf/en/ForestsCrownLands/FutureTimberSupplyPotentialAndForestDynamicsAppendixC-2012.pdf>

The marketing boards possessing the biggest area are Southern New Brunswick and York-Sunbury-Charlotte.

## 2.4 Competent authorities

Forest management in Canada is essentially at the level of the provinces. At the federal level, the authorities in charge in each province cooperate with the Canadian Council of Forest Ministers, which

is more a discussion platform than a decision-making entity. The decision power is at the level of the provinces.

In New Brunswick, the *Crown Lands and Forests Act* is the legal foundation of public forest management<sup>6</sup>. It is administered by the Department of Energy and Resource Development (ERD) since 1982 and divide the Crown land of New Brunswick into ten timber licenses. Those are forest management units which are administered by five Licensees (forestry companies) for management and harvesting. Each licensee is allocated annual volumes of Crown timber products through an assigned number of sub-licensee. Management goals and objectives are assigned by the New Brunswick government, and Licensees performance are estimated by ERD and third-party auditors. Presently, the ten Crown licenses are directed by six Licensees and have each a designated number of sub-licensee mills. Those mills have been assigned annual volumes of Crown timber products.

Private land can be organized in two categories:

(1) Industrial Freehold (private land owned by forestry companies)

*Industrial Freehold is managed on a commercial scale and most companies have had their lands certified by one of the recognized third-party sustainable forest management (SFM) certification programs. Private lands must conform to the Clean Water Act. Under the Crown Lands and Forests Act, the ERD Minister has from time to time requested summary details of the management strategy for Industrial Freehold forest operations.*

(2) Private Woodlots.

*Private woodlots in New Brunswick are held by more than 40,000 separate owners. They are free to manage their woodlots as they deem appropriate and must only conform to the Clean Water Act. There are seven Forest Product Marketing Boards in the Province that offer services to private woodlots owners. The New Brunswick Federation of Woodlot Owners Inc. (NBFWO) acts as the liaison between the provincial government and the seven regional Boards. Woodlot owners are subject to Board levies on the sale of forest products and owners may choose to belong to woodlot owner co-operatives, if available. ERD and the NBFWO periodically cooperate to update the provincial private wood supply to help manage long term sustainability.*

All timber from Crown or private lands transferred within the province of New Brunswick requires a Transportation Certificate (TC). ERD and the New Brunswick Forest Products Commission can verify woodlot TC's under legislation. The Commission is an independent body that supervise the marketing relationships implying the forest industries (pulp mills and saw mills), Forest Products Marketing Boards (private woodlot owners and producers) and the provincial government.

The provincial government settles operational standards, policies and guidelines for forest management on public lands. ERD monitors and periodically assesses Crown land forest operations under the Result-Based Forestry system. It evaluates Licensee forest management performance as well at five-year intervals.

The New Brunswick's Crown forest land is guided by a several acts and regulations. The most important acts are the following:

- *Crown Lands and Forests Act*
- *Forest Fire Act*
- *Forest Products Act*
- *Clean Water Act*
  - *Watercourse and Wetland Alteration Regulation – Clean Water Act*
  - *Wellfield Protected Area Designation Order – Clean Water Act*
  - *Watershed Protected Area Designation Order – Clean Water Act*
- *Transportation of Primary Forest Products Act*

<sup>6</sup> [https://www.sfmcanada.org/images/Publications/EN/New\\_Brunswick\\_info\\_Provinces\\_and\\_territories\\_EN.pdf](https://www.sfmcanada.org/images/Publications/EN/New_Brunswick_info_Provinces_and_territories_EN.pdf)

The New Brunswick's private lands are also guided by a several acts and regulations. The most important acts are the following:

- *Clean Water Act*
- *Forest Products Act: established the Forest Products Commission and governs the powers, duties and activities of the Commission including the oversight and general supervision of the Forest Products Marketing Boards.*
- *Natural Products Act: the underlying objective of both the Forest Products Act and the Natural Products Act (with respect to farm products and the forest) is the control and regulation of primary forest products coming from private woodlots in New Brunswick.*

## 2.5 Overview of wood-related industry

The largest industry in New Brunswick is forestry<sup>7</sup>. It contributes over 1.45 billion dollars to the province and sustains about 40 mills throughout rural New Brunswick (including six pulp mills). Forestry employs over 22,000 people. The forest industry has grown rapidly during the 90's<sup>8</sup>. The core of the forestry was then the pulp and paper sector, before a diversification of the sector by using new processes allowing the creation of more advanced products.

In 2016, total forest product export sales were 1.7 billion dollars. The United States represent more than three quarters of the New Brunswick's exportations.

**Table 6: Importation and exportation of forest resources (dollars, 2016)**

	Domestic exports value	Imports value
<b>Primary wood products</b>	42,953,918	65,158,350
<b>Pulp and paper products</b>	1,046,525,096	150,467,100
<b>Wood-fabricated materials</b>	634,068,915	60,051,265
<b>Total</b>	1,723,547,929	275,676,715
<b>Trade balance (total exports)</b>	1,447,871,214	

Source: <http://scf.rncan.gc.ca/profilstats/apercu/nb>

The main exported forest resource in New Brunswick is wood-fabricated materials. This resource is more exported than imported in the province. On the contrary, primary wood products and pulp and paper products are more imported than exported. The trade balance is widely positive.

**Table 7: Forest management (2015)**

<b>Harvest</b>	Harvested area (ha)	83,343
	Harvested volume (m <sup>3</sup> )	9,363,000
<b>Regeneration</b>	Planted area (ha)	17,956
	Seeded area (ha)	- Not available -

Source: <http://scf.rncan.gc.ca/profilstats/apercu/nb>

83,343 hectares were harvested in 2015 in New Brunswick. It represents 9,363,000 m<sup>3</sup> of wood material. 17,956 hectares are planted to allow regeneration. About three quarters of the Crown lands' harvested

<sup>7</sup> [http://www2.gnb.ca/content/dam/gnb/Departments/nr-rn/pdf/en/ForestsCrownLands/GNBForestryBrochure\\_EN.pdf](http://www2.gnb.ca/content/dam/gnb/Departments/nr-rn/pdf/en/ForestsCrownLands/GNBForestryBrochure_EN.pdf)

<sup>8</sup> <http://leg-horizon.gnb.ca/e-repository/monographs/300000000043978/300000000043978.pdf>

areas regenerate fully and naturally<sup>9</sup>. The remaining 25% need to be replanted. In 2015 about 21.54% of the harvested area have been replanted.

**Table 8: Income from manufactured forest products (2015)**

Type of forest products	Income (dollars)
Forestry and logging	564,766,000
Pulp and paper products manufacturing	1,827,036,000
Wood products manufacturing	- Not available -
Total income	- Not available -

Source: <http://scf.rncan.gc.ca/profilstats/apercu/nb>

The main income from manufactured forest products is pulp and paper products manufacturing. It represents more than 3.2 times the income from forestry and logging.

The different industries are defined hereunder<sup>10</sup>:

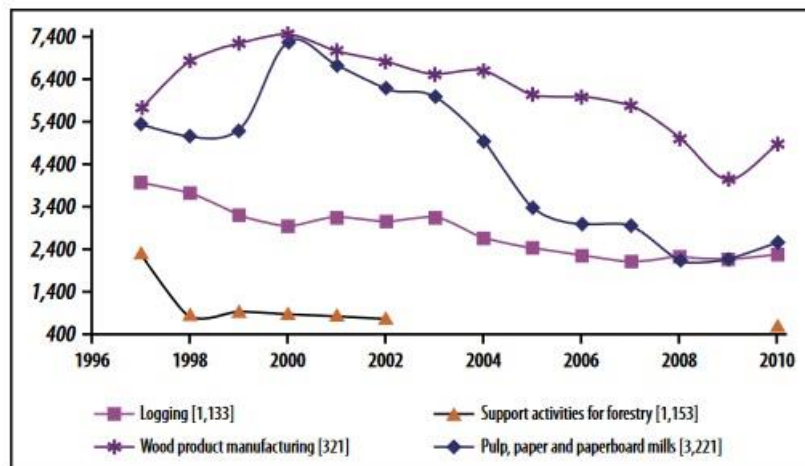
- Forestry and logging: *firms and workers primarily engaged in growing and harvesting timber on a long production cycle (of ten years or more). This industry includes commercial timber tract operations and forest nurseries. Logging – firms and workers engaged in cutting timber, producing round wood, and producing wood chips in the forest – is an important activity of this sector.*
- Wood Products: *firms and workers principally engaged in manufacturing products from wood. It is composed of three main sub-sectors:*
  - *Sawmills: these mills saw log into lumber and similar products.*
  - *Mills and manufacturers that improve the natural characteristics of wood: These include structural wood products such as I-joists, veneer and plywood mills; particle board and fiberboard mills; and waferboard and oriented strandboard (OSB) mills.*
  - *Other wood product manufacturers: These include those making wooden doors and window frames; railing, flooring and panels; boxes, crates and barrels; and mobile homes and prefabricated buildings. Firms making wooden furniture, such as kitchen cabinets and office chairs and desks, are not included in this sector.*
- Pulp and paper: *firms and workers engaged in manufacturing pulp, paper and paper products. It includes pulp, newsprint, paper (such as coated paper, fine paper and tissue paper stock), and paperboard mills. It also includes manufacturers of paper and paperboard products such as boxes, containers, bags, stationary products and sanitary paper products.*

<sup>9</sup> [http://www2.gnb.ca/content/dam/gnb/Departments/nr-rn/pdf/en/ForestsCrownLands/GNBForestryBrochure\\_EN.pdf](http://www2.gnb.ca/content/dam/gnb/Departments/nr-rn/pdf/en/ForestsCrownLands/GNBForestryBrochure_EN.pdf)

<sup>10</sup> Descriptions by the Atlantic Provinces Economic Council  
<http://leg-horizon.gnb.ca/e-repository/monographs/30000000043978/30000000043978.pdf>



**Figure 10: Evolution of direct employment in New Brunswick forest sector between 1997 and 2010**



Source: <http://www2.gnb.ca/content/dam/gnb/Departments/nr-rn/pdf/en/ForestsCrownLands/NewApproachesForPrivateWoodlots.pdf>

There is a decrease since 2000 in the number of workers in wood product manufacturing and pulp, paper and paperboard mills. Logging workers are slowly decreasing between 1997 and 2006, and then stabilizing until 2010. Support activities for forestry are sharply decreasing between 1997 and 1998, before a stabilization. Globally, the number of workers is following this order:

- 1- Wood product manufacturing
- 2- Pulp, paper and paperboard mills
- 3- Logging
- 4- Support activities for forestry

In 2010, forestry in New Brunswick was employing about 10,000 people, half of the workforce employed 10 years earlier.

### 3 Sustainability of New Brunswick forest

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

Over the past 25 years, the forest area in Canada has remained stable losing 1.2 million ha (0,34%). The main cause for this decrease is the clearing of forest land for new, non-forest land uses, for example: agriculture, road and hydroelectric developments. Over the next 10 to 20 years, the overall forest area is expected to remain stable.

**Table 9: Estimated area (millions of hectares) of forest in Canada**

Year	1990	1995	2000	2005	2010	2015
Forest area	348.3	348.0	347.8	347.6	347.3	347.1

Source: The state of Canada's Forests – Annual Report 2017

It is very difficult to find reliable figures about the net loss of forest surfaces in New Brunswick. This parameter is not subject to a specific monitoring, and the forest areas lost annually are so small compared to the vast forest areas that the comparison of estimated forest areas year to year is more likely to reflect changes in the methodology and the accuracy of the survey, rather than the land use change.

The New Brunswick forest covers about 6,1 M hectares and about 1% is harvested every year. It is estimated that 67 % of harvested forest are naturally regenerated and 33% are artificially regenerated.

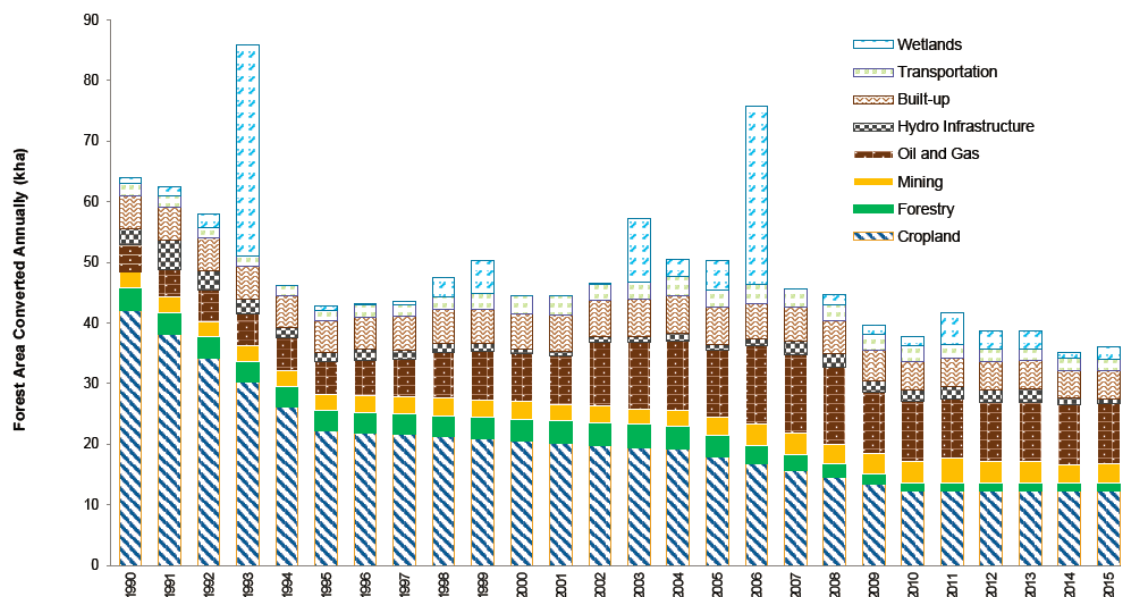
The FSC risk assessment platform ([www.globalforestregistry.org](http://www.globalforestregistry.org)) considers that Canada (as a whole) is at unspecified risk in terms of conversion of forest to other land uses, because the following criterion is verified at the country level:

- 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.

On Figure 11 hereunder, we can see the estimated forest conversion per year between 1990 and 2015, with indication of the new land use after conversion, for Canada as whole. In this period, the yearly forest areas lost to other land uses was between 35,000 and 85,000 ha per year: that is between 0.010% and 0.025% of Canada's huge forest areas. Some of those conversions has been partially compensated by the plantation of new forests (in particular at the expense of marginal agricultural land), as some provinces have an active afforestation policy. Note that 2006 and 1993 have seen a particularly large forest area converted to wetlands, because of the creation of large reservoirs.

Unfortunately, similar statistics in terms of forest conversion are not available specifically for New Brunswick.



**Figure 11: Annual forest conversion in Canada per end land use (1990-2015)**

Source : National Inventory Report 1990–2015: Greenhouse Gas Sources and Sinks in Canada

### 3.2 Standing trees volumes and removals

It is extremely difficult to provide an estimation of the volume of standing trees in New Brunswick, as this parameter is not monitored as such, despite various inventory programmes both in public and private forest.

Despite an intensive research, the only figures we have been able to put forward are rather old, as they date back to 2001.

**Table 10: growing stock in Canada in 2001 (millions m<sup>3</sup>)**

volume soft wood	352
volume hard wood	180
total	532

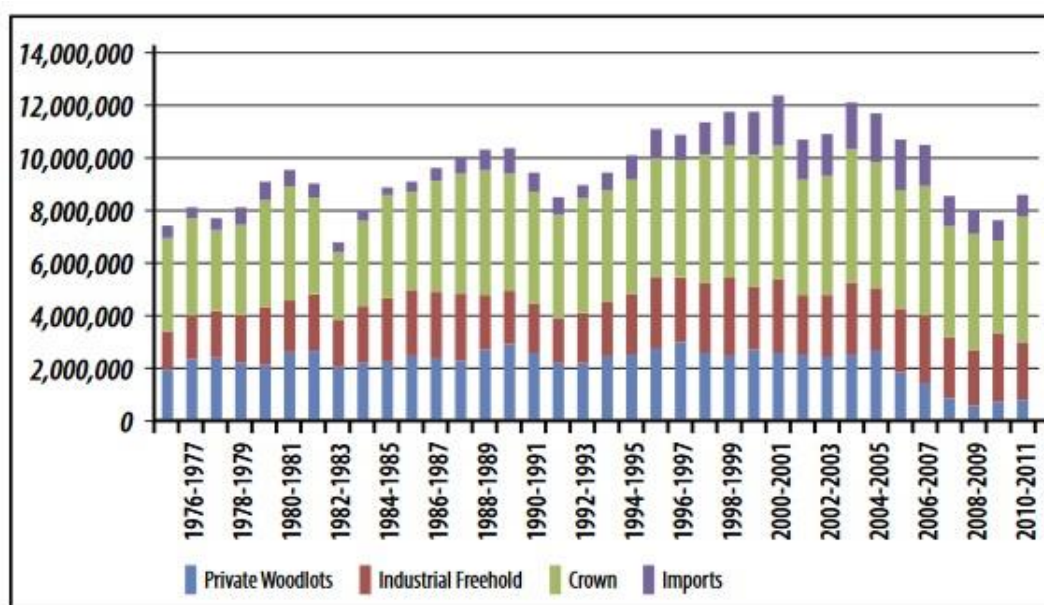
Source : NFI statistics cited by FP Innovation, 2010<sup>11</sup>

Another estimation was provided by the Energy and Resource Development department of New Brunswick, but it only covers Crown Land. According to this department the current growing stock on Crown land is 335 million m<sup>3</sup> as per 2017. Estimations are provided for the expected evolution of this growing stock in years to come, based on the expectations in terms of future forest management. A continuous increase of those volumes is expected, with an anticipated 18% increase of growing stocks on Crown land over the next 20 years. Unfortunately, no monitoring of the evolution of the growing stock on Crown land in past years is available.

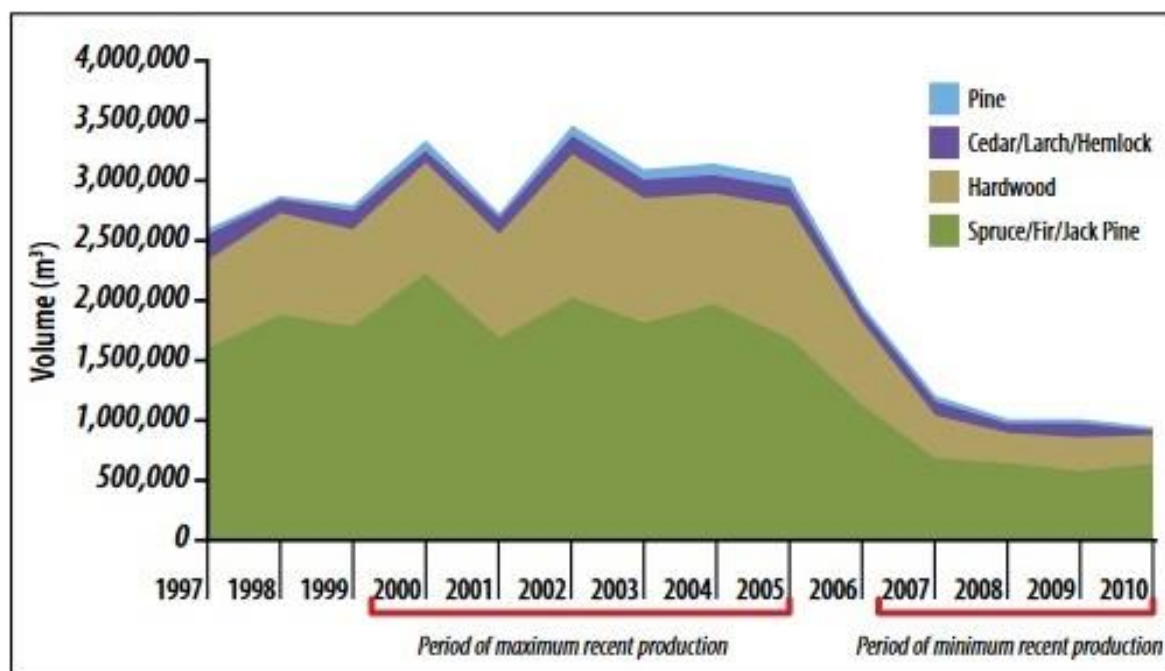
<sup>11</sup> <https://fpinnovations.ca/products-and-services/market-and-economics/Documents/2010-wood-market-statistics-in-canada.pdf>

below shows the evolution of industrial roundwood harvested in and imported into New Brunswick. The second graph indicates that the level of wood production level of wood was at its highest between 2000 and 2005, and collapsed between 2005 and 2007, because of the global economic crisis. Harvests from private woodlots reached a high of 3.11 million m<sup>3</sup>/year between 2000 and 2005. In 2006 there is a downturn in the industry, followed by a sharp decline in wood volume produced and sold by the marketing boards. The annual production declined from 3.11 million m<sup>3</sup> per year down to 1.04 million m<sup>3</sup>/year, which represent a drop of 67%.

**Figure 12: Evolution (m<sup>3</sup>) of industrial Roundwood harvested and consumed in New Brunswick, 1976/77 – 2010/11, by ownership type**



Source: <http://www2.gnb.ca/content/dam/gnb/Departments/nr-rn/pdf/en/ForestsCrownLands/NewApproachesForPrivateWoodlots.pdf>

**Figure 13: Total production estimate by species on private woodland for the 1997-2010 period.**

Source: <http://www2.gnb.ca/content/dam/gnb/Departments/nr-rn/pdf/en/ForestsCrownLands/FutureTimberSupplyPotentialAndForestDynamicsAppendixC-2012.pdf>

### 3.3 Protection of ecosystems and biodiversity

In New Brunswick, terrestrial protected areas cover 338,450 hectares<sup>12</sup>, which is 4.7% of the province. It includes 290,300 hectares protected by the province as Provincial Parks or Protected Natural Areas. The rest of the protected areas are National Parks, federal protected areas and privately-owned conservation areas.

Natural areas (including forests) are protected by a network of two national parks, five national wildlife areas, three migratory bird sanctuaries, 34 provincial parks and 61 protected natural areas. Concretely, one-third of Crown land is under special management.

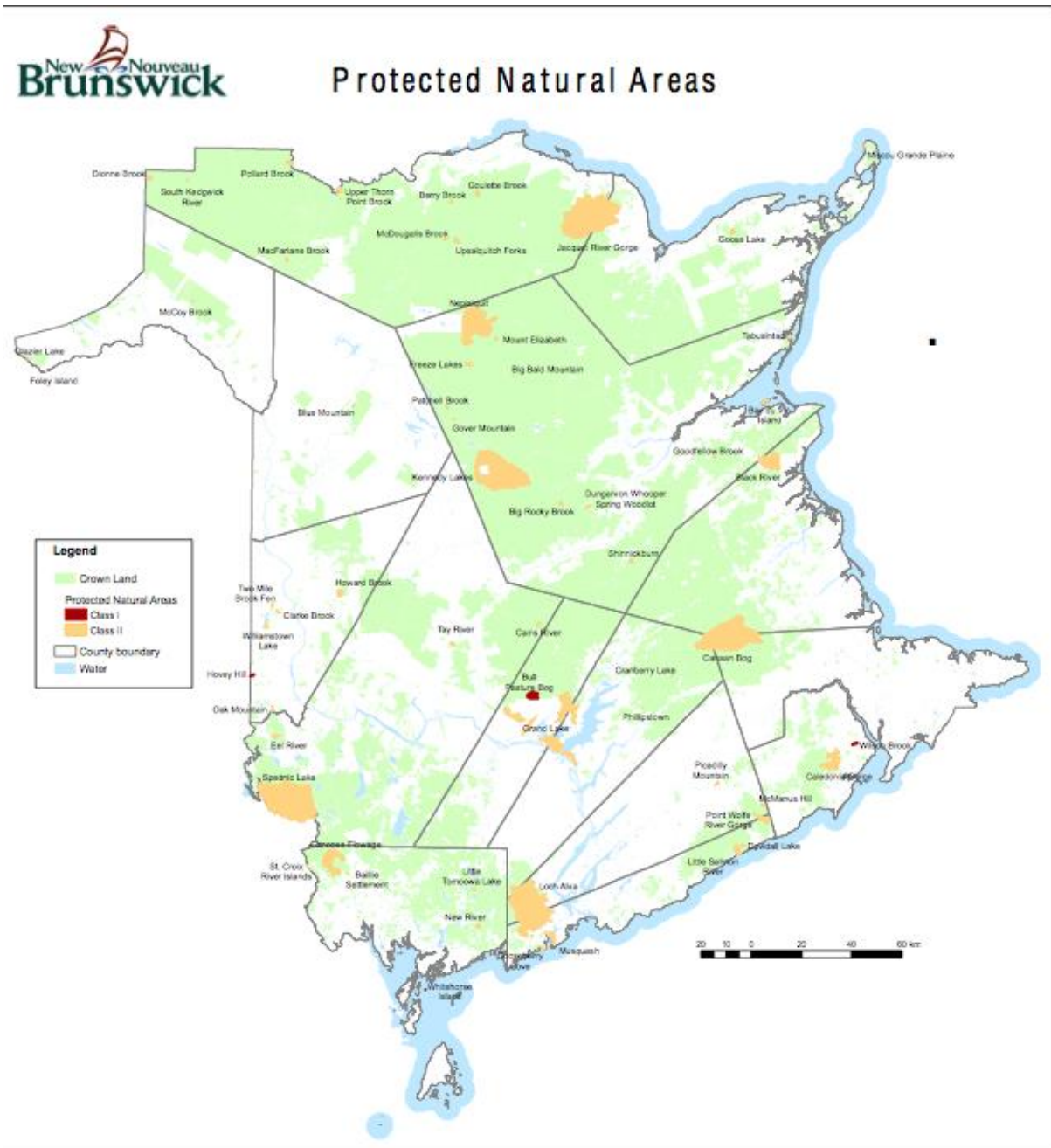
The main acts and regulations which are governing parks and protected areas in New Brunswick are the following:

- *Parks Act*
- *Protected Natural Areas Act*
  - *Establishment of Protected Natural Areas Regulation – Protected Natural Areas Act*
  - *General Regulation – Protected Natural Areas Act*

Some provincial legislation applying to forest management activities are including the Heritage Conservation Act and Species at Risk Act.

<sup>12</sup> [https://www.sfmcanada.org/images/Publications/EN/New\\_Brunswick\\_info\\_Provinces\\_and\\_territories\\_EN.pdf](https://www.sfmcanada.org/images/Publications/EN/New_Brunswick_info_Provinces_and_territories_EN.pdf)

### Figure 14: New Brunswick's Protected Natural Areas



Source: [http://www2.unb.ca/~www2ggegjs/GLM/en/map/map\\_hist\\_overlay\\_en.php](http://www2.unb.ca/~www2ggegjs/GLM/en/map/map_hist_overlay_en.php)

### 3.4 Protection of water

In New Brunswick, several legal provisions aim to ensure that the quality of surface water and groundwater is appropriately protected. This is covered by the provincial *Clean Water Act* and its various regulations<sup>13</sup>.

**Table 11: New Brunswick water quality legislation**

Act or Regulation	Principal Features
Clean Water Act, C-6.1	Provides authority to regulate water quality and quantity and make related regulations. Allows Minister to issue orders to protect water quality, and control use of water supplies. Prohibits the contamination of water. Provides authority to designate water supply protected areas by order.
Potable Water Regulation, 93-203	Regulates the voucher system for testing of new private/domestic wells, the tagging of wells, and the testing of municipal water supplies.
Wellfield Protected Area Designation Order, 2000-47	Controls land-use activities in the vicinity of water supply wells for selected wellfields.
Water Well Regulation, 90-79	Regulates the drilling of water supply wells via licensing of well drillers and contractors, water well location, construction, testing, and distance from potential sources of contamination.
Water Classification, 2002-13	Defines standards for classifying surface waters and maintaining their water quality and other characteristics, such as trophic status, and defines a public process for setting water quality goals.
Fees for Industrial Approvals, 93-201	Regulates how major sources of water pollution are managed through a system of permits.
Clean Environment Act	Provides authority to control contaminants in the environment, and to make regulations in respect of the management of substances or operations which may affect water quality.
Watershed Protected Area Designation Order, 2001-83	Controls many activities in designated watersheds, to protect public drinking water supplies.
Water Quality Regulation, 82-126	Sets the framework for issuing approvals to operate industrial facilities, typically setting limits for the discharge of contaminants to the environment.
Health Act, H-2	Provides the authority for issuing boil orders or closing down a water supply.
Health Act-General Regulation, 88-200	Regulates private sewage disposal systems to protect groundwater.

Source: <http://www2.gnb.ca/content/dam/gnb/Departments/env/pdf/Water-Eau/KnowYourH2O.pdf>

<sup>13</sup> <http://www2.gnb.ca/content/dam/gnb/Departments/env/pdf/Publications/AirLandWater.pdf>



Over 302,000 hectares of buffer zones are in place for the protection of water quality in every waterway in the province<sup>14</sup>.

New Brunswick has not published any indicator about the state of water quality in forests and/or the actual enforcement of the provisions of the clean water act, neither on Crown land nor on private land.

### **3.5 Protection of soils**

The above cited provincial *Clean Water Act* of New Brunswick also contains provisions meant to avoid soil erosion, in particular near water bodies, in order to avoid deterioration of water quality<sup>15</sup>: Buffer zones are defined along streams, where a canopy cover must remain at all times, even though partial harvesting is allowed.

New Brunswick has not published any indicator about the state of forest soils and/or the actual enforcement of the provisions of the clean water act, neither on Crown land nor on private land.

### **3.6 Protection of carbon stocks**

According to the Energy and Resource Development department of New Brunswick, the above ground carbon stocks in living trees on crown land forest is estimated to 178 million tons carbon. Similarly to the estimated growing stocks, those amounts of carbon are expected to increase in future years.

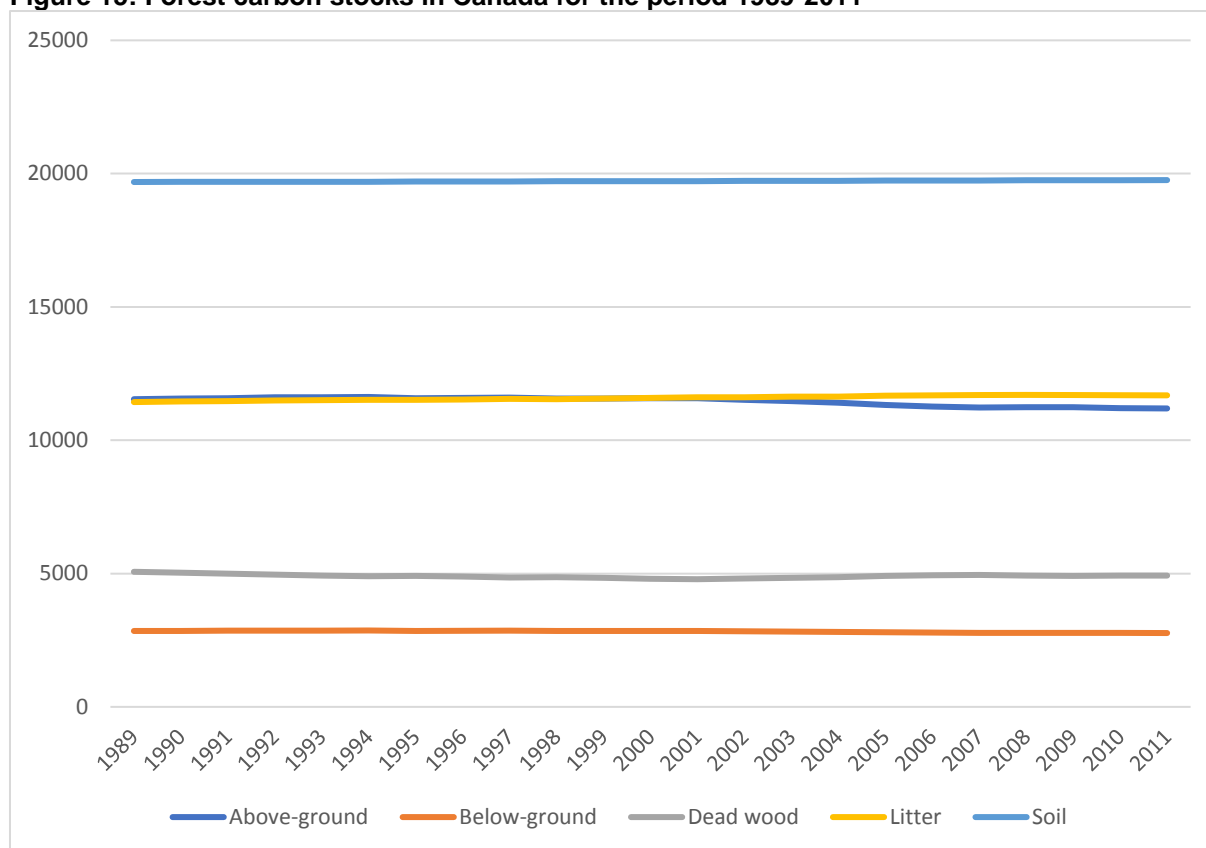
Unfortunately, a similar estimation is not available on private forest land and the evolution of carbon stocks in past years has not been assessed. We don't have any indication of the carbon stocks in other compartments of New Brunswick either (dead wood, litter, soil carbon).

In Canada as a whole such estimations have been assessed in the framework of the Kyoto protocol though. An estimation is provided for the period 1989 to 2011 on Figure 16.

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<sup>14</sup> [http://www2.gnb.ca/content/dam/gnb/Departments/nr-rn/pdf/en/ForestsCrownLands/GNBForestryBrochure\\_EN.pdf](http://www2.gnb.ca/content/dam/gnb/Departments/nr-rn/pdf/en/ForestsCrownLands/GNBForestryBrochure_EN.pdf)

<sup>15</sup> Source: Strategic Management Plan Summary for License 7 – Province of New Brunswick, Gouvernement Nouveau-Brunswick 2014 “Manuel d'aménagement forestier pour les terres de la Couronne du Nouveau – Brunswick : Foresterie axée sur les résultats »

**Figure 15: Forest carbon stocks in Canada for the period 1989-2011**

We can see on Figure 16 that the carbon stock in forest has been quite stable during this period in each of the respective compartments. The carbon in above-ground biomass, below ground biomass and dead wood is thought to have decreased by about 3%. At the same time the estimated carbon stock in litter has increased by 3% while the carbon has increased by 2% and the estimates carbon stock in soil, the largest compartment, has increased by 0.4%. In total, there is a loss of carbon stock of 0.5% between 1989 and 2011, as the total carbon stock decreased from 50.57 billion tons C, down to 50.32 billion tons C. Even though it is a tiny proportion of the total stocks, it represents in average a yearly release of 11 million tons CO<sub>2</sub> over a period of 22 years.

### 3.7 Protection of air quality

The main impact of forestry 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).

The provincial *Clean Air Act* aims to ensure that the air quality is appropriately protected in New Brunswick<sup>16</sup>. It provides the requirements and principles that must be followed by the Minister of the Environment and Local Governments to reach fair air quality. The authority to establish Air Quality Objectives belongs to the Minister, in conjunction with the Minister of Health and Wellness. Permits and air quality approvals are the primary tools for regulating air emissions.

Under the *Air Quality Regulation*, an open fire of any kind requires written permission from the Ministry of Natural Resources. There are 4 categories of fire:

<sup>16</sup> <http://www2.gnb.ca/content/dam/gnb/Departments/env/pdf/Publications/AirLandWater.pdf>



*Category 1: Campfires & burning woody material such as:*

- Piles three metres in diameter or smaller.
- Piles no more than two metres high.
- Burning within 60 metres of forestland.
- No more than four piles burning at one time.
- Multiple piles must be at least 10 metres apart.

*Category 2 – Larger Fires includes:*

*Large fires other than prescribed burning and blueberry fields.*

- Piles more than three metres in diameter.
- Piles more than two metres high.
- Burning within 100 metres of forestland.
- More than four piles burning at one time.

*Category 3 – Blueberry Fields fires are any fire that treats existing blueberry fields.*

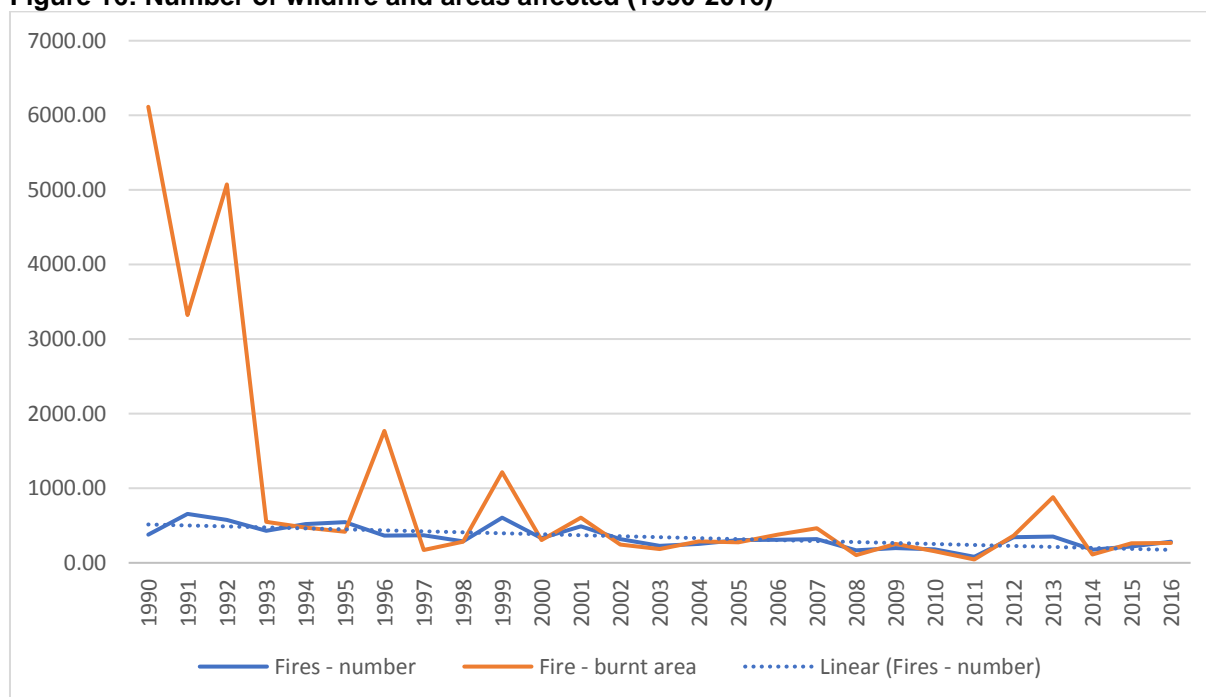
*Category 4 Prescribed Burning*

*This is the knowledgeable application of fire to a piece of land for a specific forest management or other land use. (Includes grass fires)*

Category 1 only requires a permission by telephone. Category 2-3-4 requires a written authorisation from the Ministry and involve a preliminary inspection of the site.

The largest wildfires occurred between 1990 and 1993, with a mean of 10 burnt ha per fire. After this period, there is a decreasing trend in the number of fires, while the number of burnt ha per fire remained relatively stable with a mean of 1.22 ha burnt by fire (Figure 20).

**Figure 16: Number of wildfire and areas affected (1990-2016)**



Source: National Forestry Database. Forest fires – National tables.

### 3.8 *Illegal logging*

The FSC risk assessment platform ([www.globalforestregistry.org](http://www.globalforestregistry.org)) considers that Canada is 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>17</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>18</sup>
- There is little or no evidence or reporting of illegal harvesting in the district of origin<sup>19</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>20</sup>

### 3.9 *Civil rights and traditional rights*

The FSC risk assessment platform ([www.globalforestregistry.org](http://www.globalforestregistry.org)) considers that Canada is 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 labour 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.

The Province of New Brunswick has a duty to consult with First Nations when contemplating an action or a decision that may infringe upon proven or asserted Aboriginal and treaty rights<sup>21</sup>. The New Brunswick Duty to Consult Policy provides direction to the provincial government for engagement and consultation with Aboriginal peoples in New Brunswick. The Crown's duty to consult applies to resource management activities including licensing, leasing, permitting or regulating access to fish, wildlife, forests, minerals or other Crown resources. Additionally, the duty to consult policy extends to the creation, amendment or implementation of regulations, policies or procedures, including strategic and operating plans, which may have the potential to negatively impact the traditional use of Crown land and resources by First Nations.

### 3.10 *Forest certification*

The main forest certification schemes used in New Brunswick are<sup>22</sup>:

<sup>17</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>18</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>19</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>20</sup> <http://www.transparency.org/cpi2012/results>

<sup>21</sup> Canadian Council of forest ministers

[https://www.sfmcanada.org/images/Publications/EN/New\\_Brunswick\\_info\\_Provinces\\_and\\_territories\\_EN.pdf](https://www.sfmcanada.org/images/Publications/EN/New_Brunswick_info_Provinces_and_territories_EN.pdf)

<sup>22</sup> Canadian Council of forest ministers

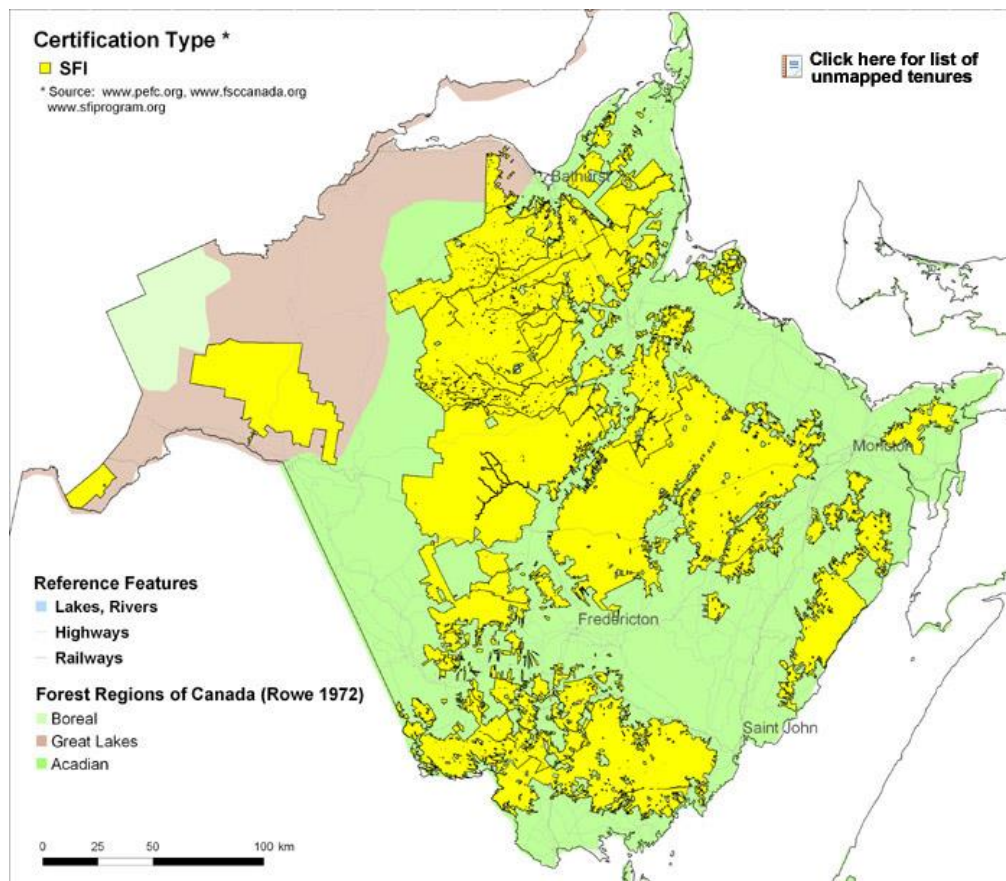
[https://www.sfmcanada.org/images/Publications/EN/New\\_Brunswick\\_info\\_Provinces\\_and\\_territories\\_EN.pdf](https://www.sfmcanada.org/images/Publications/EN/New_Brunswick_info_Provinces_and_territories_EN.pdf)

- CSA (Canadian Standards Association - Group Sustainable Forest Management System<sup>23</sup>) which is endorsed by PEFC (Programme for the Endorsement of Forest Certification)
- SFI (Sustainable Forestry Initiative<sup>24</sup>), which is endorsed by PEFC (Programme for the Endorsement of Forest Certification)
- FSC (Forest Stewardship Council<sup>25</sup>), which is specifically suitable for small private owners.

In 2016, all Crown lands managed by Licensees and Industrial freehold lands controlled or harvested by the Licensees were certified under SFI. This represents 4.2 million hectares of New Brunswick.

Even though no statistics has been found, it seems that forest certification is not popular in New Brunswick's private forests and it remains very marginal<sup>26</sup>.

**Figure 17: Certified forest land in New Brunswick (2016)**



Source: <http://certificationcanada.org/index.php/maps-en/provincial/nb>

<sup>23</sup> <http://www.csasfmforests.ca/>

<sup>24</sup> <http://www.sfi-program.org>

<sup>25</sup> [www.fsc.org](http://www.fsc.org)

<sup>26</sup> <http://www2.gnb.ca/content/dam/gnb/Departments/nr-rn/pdf/en/ForestsCrownLands/NewApproachesForPrivateWoodlots.pdf>

## 4 Conclusions

New Brunswick has a large forest land (about 6 million ha), which represents about 83% of the province's land area. The province is very diverse in terms of ecological conditions, and the forest is present in most of them (coast, hills, interior plains). Seven different ecoregions are observed in New Brunswick.

Approximately 51% of New Brunswick's forest land area is Crown land administered and controlled by the provincial Ministry of Energy and Resources Development. Federal land represents 2% and Private ownerships accounts for the remaining 47%. The private land is divided in two categories: non-industrial owners (29%) and forest industry firms owners (18%). Crown land is divided in ten licensees assigned to 6 large forest companies (Crown Timber Licenses). Each has its own Annual Allowable Cut (AAC).

Conifers predominate largely in New Brunswick and the more frequent species are: Spruce, Fir, Western Thuya and American White Pine. The most common hardwood species are: Red Maple, Sugar Maple, Yellow Birch, White Birch, American Beech, etc.

The forest area of New Brunswick is not systematically monitored in terms of surface on a yearly basis and no statistics in terms of conversion of forest into another land use is available at provincial level. For Canada as a whole, according to the national UNFCCC monitoring between 1990 and 2015, the yearly forest areas lost to other land uses was between 35,000 and 85,000 ha per year: that is between 0.010% and 0.025% of Canada's forest area.

The standing trees volume is not monitored at the provincial level. The only available figures are 532 million m<sup>3</sup> for private and public land together (2001) and 335 million m<sup>3</sup> for Crown Land only (2017). No estimation of the evolution of those volumes throughout time is available in New Brunswick.

The total harvested wood in New-Brunswick was of 9,5 million cubic meters in 2012. This is in the range of 1.5-2% of the estimated volume of standing trees. The volume of harvested wood in Crown lands was about 5,8 million cubic meters per year in 2015-2016 and has remained relatively stable, in recent years, with just a slight decrease during the wood market crisis in years 2005-2010. On private land, the yearly harvested volumes have dramatically dropped from over 3 million m<sup>3</sup> per year in 2005 down to less than 1 million m<sup>3</sup> per year in 2010, then the annual cut on private land increased again when the market conditions improved again.

Terrestrial protected areas cover 338,450 hectares<sup>27</sup> in New Brunswick, i.e.4.7% of the province land area.

In New-Brunswick, several provisions of the Clean Water Act aim at protecting soil and water quality in forests, in particular through creation of buffer zones along water bodies and avoidance of erosion during harvesting. However, no indicator has been published to evaluate the actual enforcement of those provisions in practice and the quality of soil and water in managed forests.

Even though controlled fires are regularly used in forest management practices in New Brunswick, the use of fire is subject to permit and carefully monitored in order to preserve air quality. After several seasons of severe wildfire in the early years 2000, efforts have been made to avoid any excessive accumulation of fuel in the forests. In 2012, the burnt area was of 886 ha and number of fires was of 356<sup>28</sup>.

The FSC risk assessment platform considers that Canada is at low risk in terms of violation of illegal logging and in terms of violation of traditional and civil rights.

<sup>27</sup> [https://www.sfmcanada.org/images/Publications/EN/New\\_Brunswick\\_info\\_Provinces\\_and\\_territories\\_EN.pdf](https://www.sfmcanada.org/images/Publications/EN/New_Brunswick_info_Provinces_and_territories_EN.pdf)

<sup>28</sup> <http://cfs.nrcan.gc.ca/entrepotpubl/pdfs/35714.pdf>

The forest certification systems have strongly developed in New Brunswick. In 2016, all Crown lands managed by Licensees and Industrial freehold lands controlled or harvested by the Licensees were certified under SFI. This represents 4.2 million hectares. Forest certification is much less popular in private forests of New Brunswick, even though no figures are available to illustrate this.

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