



**Forestry Department**

**Food and Agriculture Organization of the United Nations**

**GLOBAL FOREST RESOURCES  
ASSESSMENT 2010**

**COUNTRY REPORT**

**SWITZERLAND**

FRA2010/203

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## The Forest Resources Assessment Programme

Sustainably managed forests have multiple environmental and socio-economic functions important at the global, national and local scales, and play a vital part in sustainable development. Reliable and up-to-date information on the state of forest resources - not only on area and area change, but also on such variables as growing stock, wood and non-wood products, carbon, protected areas, use of forests for recreation and other services, biological diversity and forests' contribution to national economies - is crucial to support decision-making for policies and programmes in forestry and sustainable development at all levels.

FAO, at the request of its member countries, regularly monitors the world's forests and their management and uses through the Forest Resources Assessment Programme. This country report forms part of the Global Forest Resources Assessment 2010 (FRA 2010).

The reporting framework for FRA 2010 is based on the thematic elements of sustainable forest management acknowledged in intergovernmental forest-related fora and includes variables related to the extent, condition, uses and values of forest resources, as well as the policy, legal and institutional framework related to forests. More information on the FRA 2010 process and the results - including all the country reports - is available on the FRA Web site ([www.fao.org/forestry/fra](http://www.fao.org/forestry/fra)).

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The Global Forest Resources Assessment Country Report Series is designed to document and make available the information forming the basis for the FRA reports. The Country Reports have been compiled by officially nominated country correspondents in collaboration with FAO staff. Prior to finalisation, these reports were subject to validation by forestry authorities in the respective countries.

## Contents

1	TABLE T1 – EXTENT OF FOREST AND OTHER WOODED LAND.....	7
2	TABLE T2 – FOREST OWNERSHIP AND MANAGEMENT RIGHTS.....	11
3	TABLE T3 – FOREST DESIGNATION AND MANAGEMENT.....	17
4	TABLE T4 – FOREST CHARACTERISTICS.....	22
5	TABLE T5 – FOREST ESTABLISHMENT AND REFORESTATION.....	26
6	TABLE T6 – GROWING STOCK.....	29
7	TABLE T7 – BIOMASS STOCK.....	35
8	TABLE T8 – CARBON STOCK.....	39
9	TABLE T9 – FOREST FIRES.....	45
10	TABLE T10 – OTHER DISTURBANCES AFFECTING FOREST HEALTH AND VITALITY.....	47
11	TABLE T11 – WOOD REMOVALS AND VALUE OF REMOVALS.....	52
12	TABLE T12 – NON-WOOD FOREST PRODUCTS REMOVALS AND VALUE OF REMOVALS.....	55
13	TABLE T13 – EMPLOYMENT.....	56
14	TABLE T14 – POLICY AND LEGAL FRAMEWORK.....	58
15	TABLE T15 – INSTITUTIONAL FRAMEWORK.....	60
16	TABLE T16 – EDUCATION AND RESEARCH.....	62
17	TABLE T17 – PUBLIC REVENUE COLLECTION AND EXPENDITURE.....	64

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# 1 Table T1 – Extent of Forest and Other wooded land

## 1.1 FRA 2010 Categories and definitions

Category	Definition
Forest	Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds <i>in situ</i> . It does not include land that is predominantly under agricultural or urban land use.
Other wooded land	Land not classified as “Forest”, spanning more than 0.5 hectares; with trees higher than 5 meters and a canopy cover of 5-10 percent, or trees able to reach these thresholds <i>in situ</i> ; or with a combined cover of shrubs, bushes and trees above 10 percent. It does not include land that is predominantly under agricultural or urban land use.
Other land	All land that is not classified as “Forest” or “Other wooded land”.
Other land with tree cover (Subordinated to “Other land”)	Land classified as “Other land”, spanning more than 0.5 hectares with a canopy cover of more than 10 percent of trees able to reach a height of 5 meters at maturity.
Inland water bodies	Inland water bodies generally include major rivers, lakes and water reservoirs.

## 1.2 National data

### 1.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Brändli, U.-B. (Red.) 2010: Schweizerisches Landesforstinventar. Ergebnisse der dritten Aufnahmen 2004-2006. Eidg. Forschungsanstalt für Wald, Schnee und Landschaft, WSL, Birmensdorf. In preparation.  WSL, 2009: Schweizerisches Landesforstinventar LFI. Spezialauswertungen der Erhebungen 1983-85, 1993-95 und 2004-06. März 2009. Ulrich Ulmer. Eidg. Forschungsanstalt für Wald, Schnee und Landschaft (WSL), Birmensdorf.	H	Public owned Forest, private owned forest	2004-2006	Third NFI Switzerland.
Brassel, P; Brändli, U.-B. (Red.) 1999 : Schweizerisches Landesforstinventar.	H	Public owned Forest, private	1993 - 1995	Second NFI Switzerland.

Ergebnisse der Zweitaufnahme 1993-1995. Birmensdorf, Eidgenössische Forschungsanstalt für Wald, Schnee und Landschaft. Bern, Stuttgart, Wien, Haupt. 442 S.		owned forest		
Brassel, P;Lischke, H (eds) 2001: Swiss National Forest Inventory: Methods and Models of the Second Assessment. Birmensdorf, Swiss Federal Research Institute WSL. 336 pp. Eidg. Anstalt forstl. Versuchswes., Ber. (1988): Schweizerisches Landesforstinventar. Ergebnisse der Erstaufnahme 1982-1986.	H	Public owned Forest, private owned forest	1982 - 1986	First NFI Switzerland.
<b>FAOSTAT</b>	H	Inland Water Body, Area of Switzerland		

## 1.2.2 Classification and definitions

National class	Definition
Forest	The Forest Definition depends on three variables derived from thematic airphoto interpretation <b>Width:</b> The width of the stocked part of the interpretation area is at least 25m. The shortest distance across the sample plot center is measured between one forest boundary line to another forest boundary line. The forest boundary line separates the forest area from the non –forest area. It encompasses all stocking elements. <b>Crown coverage:</b> The crown coverage of the stocked part of the interpretation area has to be larger than or equal to 20%. Exceptions are afforestation, regeneration, burned, cut, or storm damaged areas <b>Dominant stand height:</b> The stocking has to have a dominant stand height of 3m. Exceptions to the Rule include: afforestation, regeneration, burned, cut, or storm damaged areas
Shrub-forest	Same conditions as forest, but the crown cover of the interpretation area consists of more or equal to 2/3 of shrub species
Other land with tree cover	Area of land with a tree cover > 10% and not forest according to Swiss NFI definition. The minimum height for trees is 3 m.
Non-forest	All areas that are not forest or shrub forest

### 1.2.3 Original data

National classes	Area (1000 hectares)		
	1983-1985	1993-1995	2004-2006
Forest	1129	1166	1217
Shrub forest	57	58	67
Non-Forest with tree cover > 10%	n.a.	n.a.	384
Non-Forest	2942	2904	2844

## 1.3 Analysis and processing of national data

### 1.3.1 Calibration

Source	Total land area (1000 ha)
FAOSTAT	4000

The national class Non-Forest is divided in the FAO classes land and inland water. Since the estimated country area of Switzerland from our NFI data matches the one from FAOSTAT, we simply split the National class Non-Forest into other land and inland water.  
Non-forest (National class)– inland water (FAOSTAT) = other land

National classes	Area (1000 hectares)		
	1983-1985 (reference year 1984)	1993-1995 (reference year 1994)	2004-2006 (reference year 2005)
Other land	2942 - 128 = 2814	2904 - 128 = 2776	2844 - 128 = 2716

### 1.3.2 Estimation and forecasting

National classes	Area (1000 hectares)					
	1983-1985 (reference year 1984)	1993-1995 (reference year 1994)	2004-2006 (reference year 2005)	1990	2000	2010
Forest	1129	1166	1217	1151.2	1193.8	1240.2
Shrub forest	57	58	67	57.6	62.9	71.1
Other Land	2814	2776	2716	2791.2	2743.3	2688.7
... of which with tree cover	n.a.	n.a.	384	n.a.	n.a.	n.a.

Data for the year 1990 was estimated using linear interpolation of the difference between data from reference date 1984 and reference date 1994. Similarly the data for the year 2000 was estimated using linear interpolation from the reference date 1994 and 2005. The data for the year 2010 were forecasted using the same linear trend.

### 1.3.3 Reclassification into FRA 2010 categories

The class forest of the Swiss NFI is reported as forest. The class shrub forest of the Swiss NFI is reported as other wooded land. There is no information available about other land with tree cover.

## 1.4 Data for Table T1

FRA 2010 categories	Area (1000 hectares)			
	1990	2000	2005	2010
Forest	1151	1194	1217	1240
Other wooded land	58	63	67	71
Other land	2791	2743	2716	2689
...of which with tree cover	n.a.	n.a.	384	n.a.
Inland water bodies	128	128	128	128
<b>Total for country</b>	<b>4128</b>	<b>4128</b>	<b>4128</b>	<b>4128</b>

## 1.5 Comments to Table T1

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Forest	The figures of forest area refer to the forest area definition of the Swiss NFI.	
Other wooded land	The figures of "other wooded land" refer to the area following the definition of the Swiss NFI of Shrub-Forest.	
Other land	Other land = Country area (FAOSTAT) - area of inland water bodies (FAOSTAT) - Forest area - area of other wooded land (shrub forest)	
Other land with tree cover	Area of land with a tree cover > 10% and not forest according to Swiss NFI definition. The minimum height for trees is 3 m.	
Inland water bodies		

### Other general comments to the table

The figures for T1 that were handed in with GFRA2005 have changed due to a change in the estimation procedure.

### Expected year for completion of ongoing/planned national forest inventory and/or RS survey / mapping

Field inventory	Start of a new measuring cycle of the Swiss NFI is in 2009 and will be finished in 2018. Intermediate data will be published before that.
Remote sensing survey / mapping	See above.

## 2 Table T2 – Forest ownership and management rights

### 2.1 FRA 2010 Categories and definitions

Category	Definition
Public ownership	Forest owned by the State; or administrative units of the public administration; or by institutions or corporations owned by the public administration.
Private ownership	Forest owned by individuals, families, communities, private co-operatives, corporations and other business entities, private religious and educational institutions, pension or investment funds, NGOs, nature conservation associations and other private institutions.
Individuals (sub-category of Private ownership)	Forest owned by individuals and families.
Private business entities and institutions (sub-category of Private ownership)	Forest owned by private corporations, co-operatives, companies and other business entities, as well as private non-profit organizations such as NGOs, nature conservation associations, and private religious and educational institutions, etc.
Local communities (sub-category of Private ownership)	Forest owned by a group of individuals belonging to the same community residing within or in the vicinity of a forest area. The community members are co-owners that share exclusive rights and duties, and benefits contribute to the community development.
Indigenous / tribal communities (sub-category of Private ownership)	Forest owned by communities of indigenous or tribal people.
Other types of ownership	Other kind of ownership arrangements not covered by the categories above. Also includes areas where ownership is unclear or disputed.
<b>Categories related to the holder of management rights of public forest resources</b>	
Public Administration	The Public Administration (or institutions or corporations owned by the Public Administration) retains management rights and responsibilities within the limits specified by the legislation.
Individuals/households	Forest management rights and responsibilities are transferred from the Public Administration to individuals or households through long-term leases or management agreements.
Private institutions	Forest management rights and responsibilities are transferred from the Public Administration to corporations, other business entities, private co-operatives, private non-profit institutions and associations, etc., through long-term leases or management agreements.
Communities	Forest management rights and responsibilities are transferred from the Public Administration to local communities (including indigenous and tribal communities) through long-term leases or management agreements.
Other form of management rights	Forests for which the transfer of management rights does not belong to any of the categories mentioned above.

## 2.2 National data

### 2.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
<p>Brändli, U.-B. (Red.) 2010: Schweizerisches Landesforstinventar. Ergebnisse der dritten Aufnahmen 2004-2006. eidg. Forschungsanstalt für Wald, Schnee und Landschaft, WSL, Birmensdorf. In preparation.</p> <p>WSL, 2009: Schweizerisches Landesforstinventar LFI. Spezialauswertungen der Erhebungen 1983-85, 1993-95 und 2004-06. März 2009. Ulrich Ulmer. Eidg. Forschungsanstalt für Wald, Schnee und Landschaft (WSL), Birmensdorf.</p>	H	Public owned Forest, private owned forest	2004-2006	Third NFI Switzerland.
<p>Brassel, P; Brändli, U.-B. (Red.) 1999 : Schweizerisches Landesforstinventar. Ergebnisse der Zweitaufnahme 1993-1995. Birmensdorf, Eidgenössische Forschungsanstalt für Wald, Schnee und Landschaft. Bern, Stuttgart, Wien, Haupt. 442 S.</p>	H	Public owned Forest, private owned forest	1993 - 1995	Second NFI Switzerland.
<p>Brassel, P; Lischke, H (eds) 2001: Swiss National Forest Inventory: Methods and Models of the Second Assessment. Birmensdorf, Swiss Federal Research Institute WSL. 336 pp. Eidg. Anstalt forstl. Versuchswes., Ber. (1988): Schweizerisches Landesforstinventar. Ergebnisse der Erstaufnahme 1982-1986.</p>	H	Public owned Forest, private owned forest	1982 - 1986	First NFI Switzerland.
<p>Jahrbuch Wald und Holz. Bundesamt für Umwelt (BAFU)</p>	H	Forest area for Owner	2006	

## 2.2.2 Classification and definitions

### Forest ownership

National class		Definition
Public ownership	State ownership (Bund)	Forest owned by the state.
	Canton	Forest owned by a canton.
	Political community (Polit. Gemeinde)	Forest owned by a political community (resident people).
	Citizens community (Bürgergemeinde)	Forest owned by a citizens community, school-, church-, poverty-community.
	Corporations (Korporation)	Forest owned by a corporation or cooperative is mostly under public law, even if owned by private persons (which represent only a small part of the corporations).
Individual private ownership (Einzeleigentum)		Same as FRA ...
Private business entities and institutions (Gesellschaft)		Same as FRA ...

## 2.2.3 Original data

### Forest ownership

National classes	Area (1000 hectares)		
	1983-1985 (1984)	1993-1995 (1994)	2004-2006 (2005)
Public ownership	763.7	791.6	828.0
Individuals	325.6	332.9	337.7
Private business entities and institutions	39.4	41.7	51.5
Total forest area	1128.7	1166.2	1217.2

### Holder of management rights of public forests

National classes	Area (1000 hectares)		
	1990	2000	2005
State ownership (Bund)	n.a.	n.a.	9
Canton (Staatswald)	n.a.	n.a.	50
Political community (Polit. Gemeinden)	n.a.	n.a.	345
Citizens community (Bürgergemeinden)	n.a.	n.a.	295
Private institutions (Übrige Öffentliche)	n.a.	n.a.	134
Other (Öffentliche gemischt)	n.a.	n.a.	58
Öffentlicher Wald Total			891

## 2.3 Analysis and processing of national data

### 2.3.1 Calibration

#### Holder of management rights of public forests

The data about the holder of management rights comes from a different source than the forest ownership. The data is calibrated the following: Calibrated data = original data / public forest from original data \* correct total of public forest.

National classes	Area (1000 hectares)	
	2005 original data	2005 calibrated data
State ownership (Bund)	9	$9/891 * 827 = 8$
Canton (Staatswald)	50	$50/891 * 827 = 46$
Political community (Polit. Gemeinden)	345	$345/891 * 827 = 321$
Citizens community (Bürgergemeinden)	295	$295/891 * 827 = 274$
Private institutions (Übrige Öffentliche)	134	$134/891 * 827 = 124$
Other (Öffentliche gemischt)	58	$58/891 * 827 = 54$
<b>Public forest Total</b>	<b>891</b>	<b>827</b>

### 2.3.2 Estimation and forecasting

National classes	Area (1000 hectares)				
	1983-1985 (1984)	1993-1995 (1994)	2004-2006 (2005)	1990	2000
Public ownership	763.7	791.6	828.0	780.4	811.5
Individuals	325.6	332.9	337.7	330.0	335.5
Private business entities and institutions	39.4	41.7	51.5	40.8	47.1

Data for the year 1990 was estimated using linear interpolation of the difference between data from reference date 1984 and reference date 1994. Similarly the data for the year 2000 was estimated using linear interpolation from the reference date 1994 and 2005.

### 2.3.3 Reclassification into FRA 2010 categories

#### Holder of management rights of public forests

National classes	FRA classes	Area (1000 hectares) 2005
State ownership (Bund)	Public administration	$8 + 46 = 54$
Canton (Staatswald)		
Political community (Polit. Gemeinden)	Communities	$321 + 274 = 595$
Citizens community (Bürgergemeinden)		
Private institutions	Private corporations	124

(Übrige Öffentliche)	and institutions	
Other (Öffentliche gemischt)	Other	54
<b>Public forest Total</b>		<b>827</b>

## 2.4 Data for Table T2

Table 2a - Forest ownership

FRA 2010 Categories	Forest area (1000 hectares)		
	1990	2000	2005
Public ownership	780	811	827
Private ownership	371	383	390
...of which owned by individuals	330	336	338
...of which owned by private business entities and institutions	41	47	52
...of which owned by local communities	0	0	0
...of which owned by indigenous / tribal communities	0	0	0
Other types of ownership	0	0	0
<b>TOTAL</b>	<b>1151</b>	<b>1194</b>	<b>1217</b>

Note: If other types of ownership is reported, please specify details in comment to the table.

Does ownership of trees coincide with ownership of the land on which they are situated?	<input checked="" type="checkbox"/>	Yes
	<input type="checkbox"/>	No
If <b>No</b> above, please describe below how the two differ:		

Table 2b - Holder of management rights of public forests

FRA 2010 Categories	Forest area (1000 hectares)		
	1990	2000	2005
Public Administration	n.a.	n.a.	54
Individuals	n.a.	n.a.	0
Private corporations and institutions	n.a.	n.a.	124
Communities	n.a.	n.a.	595
Other	n.a.	n.a.	54
<b>TOTAL</b>	n.a.	n.a.	<b>827</b>

## 2.5 Comments to Table T2

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Public ownership	The categories "State ownership", "canton", "political community", "citizens community" and "corporations" of the Swiss NFI were assigned to "public ownership", because these ownerships are all either owned by the public administration or are subject to a public legal status (according to the Swiss forest act).	The changes of this category are mostly due to natural expansion of forest.
Private ownership	<p>The categories "individual private ownership" and "private business entities and institutions" of the Swiss NFI were assigned to "private ownership", whereas the first is assigned to be "owned by individuals" and the latter to be "owned by private business entities and institutions".</p> <p>The FRA ownership category "owned by local communities" is depending on the legal status assigned to the Swiss NFI category of "private business entities and institutions", "citizens community" or "corporations". Therefore no forest area is under this category.</p>	See above.
Other types of ownership		
Management rights		

### Other general comments to the table

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### 3 Table T3 – Forest designation and management

#### 3.1 FRA 2010 Categories and definitions

Term	Definition
Primary designated function	The primary function or management objective assigned to a management unit either by legal prescription, documented decision of the landowner/manager, or evidence provided by documented studies of forest management practices and customary use.
Protected areas	Areas especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means.
<b>Categories of primary designated functions</b>	
Production	Forest area designated primarily for production of wood, fibre, bio-energy and/or non-wood forest products.
Protection of soil and water	Forest area designated primarily for protection of soil and water.
Conservation of biodiversity	Forest area designated primarily for conservation of biological diversity. Includes but is not limited to areas designated for biodiversity conservation within the protected areas.
Social services	Forest area designated primarily for social services.
Multiple use	Forest area designated primarily for more than one purpose and where none of these alone is considered as the predominant designated function.
Other	Forest areas designated primarily for a function other than production, protection, conservation, social services or multiple use.
No / unknown	No or unknown designation.
<b>Special designation and management categories</b>	
Area of permanent forest estate (PFE)	Forest area that is designated to be retained as forest and may not be converted to other land use.
Forest area within protected areas	Forest area within formally established protected areas independently of the purpose for which the protected areas were established.
Forest area under sustainable forest management	To be defined and documented by the country.
Forest area with management plan	Forest area that has a long-term (ten years or more) documented management plan, aiming at defined management goals, which is periodically revised.

#### 3.2 National data

##### 3.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
NFI Switzerland Brändli, U.-B. (Red.) 2010: Schweizerisches Landesforstinventar. Ergebnisse der dritten Aufnahmen 2004-2006. eidg. Forschungsanstalt für Wald, Schnee und Landschaft, WSL,	H	primary designated function	2004-2006	Third NFI Switzerland.

Birmensdorf. In preparation.				
WSL, 2009: Schweizerisches Landesforstinventar LFI. Spezialauswertungen der Erhebungen 1983-85, 1993-95 und 2004-06. März 2009. Ulrich Ulmer. Eidg. Forschungsanstalt für Wald, Schnee und Landschaft (WSL), Birmensdorf.				

### 3.2.2 Classification and definitions

The category “Conservation of biodiversity” is identical with Switzerland’s natural forest reserves.

### 3.2.3 Original data

National classes (English)	National classes (German)	Area (1000 hectares)
		2004-2006 (2005)
No	keine Vorrangfunktion	81
Production	Holzproduktion	483
Agriculture	landwirtschaftliche Nutzung	39
Protection from Wind	Windschutz	0
Protection of water	Trinkwasserschutz	10
Protection from natural hazards (BSF)	Schutz vor Naturgefahren (BSF)	230
Protection from natural hazards (not BSF)	Schutz vor Naturgefahren (nicht BSF)	213
Protection of nature	Naturschutz	88
Protecion of landscape	Landschaftsschutz	33
Protecion of wildlife	Wildschutz	7
Recreation	Erholung	30
Army	Militär	2
<b>Total</b>		<b>1217</b>

FRA 2010 Categories	Area (1000 hectares)			
	1990	2000	2005	2010
Area of permanent forest estate	1151	1194	1217	1240
Forest area under sustainable forest management	1151-40 =1111	1194 - 40 = 1154	1217 - 40 = 1177	1240 - 40 = 1200

The forest area under sustainable forest management is calculated in this report as the total forest area in Switzerland reduced by the area of primary forest.

National classes (English)	Area (1000 hectares)		
	1983-1985 (1984)	1993-1995 (1994)	2004-2006 (2005)
Forest area with management plan	n.a.	678	637

### 3.3 Analysis and processing of national data

#### 3.3.1 Estimation and forecasting

##### Primary designated function:

Only data from the inventory 2004 to 2006 is available. We adjusted the figures for 1990, 2000 and 2010 by the forest area given in T1.

National classes (English)	Area (1000 hectares)			
	1990	2000	2004-2006 (2005)	2010
No	76.6	79.5	81	82.5
Production	456.8	473.9	483	492.1
Agriculture	36.9	38.3	39	39.7
Protection from Wind	0	0	0	0
Protection of water	9.5	9.8	10	10.2
Protection from natural hazards (BSF)	217.5	225.7	230	234.4
Protection from natural hazards (not BSF)	201.4	209	213	217.0
Protection of nature	83.2	86.3	88	89.7
Protection of landscape	31.2	32.4	33	33.6
Protection of wildlife	6.6	6.9	7	7.1
Recreation	28.4	29.4	30	30.6
Army	1.9	2	2	2.0
<b>Total</b>	<b>1151</b>	<b>1194</b>	<b>1217</b>	<b>1240</b>

##### Special designation and management categories:

Data for the year 2000 was estimated using linear interpolation of the difference between data from reference date 1994 and reference date 2005. The data for the year 2010 were forecasted using the same linear trend.

National classes	Area (1000 hectares)					
	1983-1985 (reference year 1984)	1993-1995 (reference year 1994)	2004-2006 (reference year 2005)	1990	2000	2010
Forest area with management plan	n.a.	678	637	n.a.	656	618

#### 3.3.2 Reclassification into FRA 2010 categories

National classes (English)	FRA classes
No	No / unknown
Production	Production
Agriculture	Other
Protection from Wind	Other
Protection of water	Protection of soil and water
Protection from natural hazards (BSF)	Other
Protection from natural hazards (not BSF)	Other
Protection of nature	Conservation of biodiversity
Protection of landscape	Social services
Protection of wildlife	Other
Recreation	Social services
Army	Other

### 3.4 Data for Table T3

**Table 3a – Primary designated function**

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Production	457	474	483	492
Protection of soil and water	10	10	10	10
Conservation of biodiversity	83	86	88	90
Social services	60	62	63	64
Multiple use	0	0	0	0
Other (please specify in comments below the table)	464	482	491	500
No / unknown	77	80	81	83
<b>TOTAL</b>	<b>1151</b>	<b>1194</b>	<b>1217</b>	<b>1240</b>

**Table 3b – Special designation and management categories**

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Area of permanent forest estate	1151	1194	1217	1240
Forest area within protected areas	83	86	88	90
Forest area under sustainable forest management	1111	1154	1177	1200
Forest area with management plan	n.a.	656	637	618

### 3.5 Comments to Table T3

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Production	Same definition as FRA.	Since there is only data from one point in time, the figures were only adjusted to the area given in T1.
Protection of soil and water	The Swiss NFI only collects data on protection of water.	dito
Conservation of biodiversity	Same definition as FRA.	dito
Social services	Includes area designated primarily for recreation and for protection of special manmade landscape.	dito
Multiple use	Every sample plot in the Swiss NFI has a primary designated function if there is at least one specific function. General functions of a forest like "air-cleaning, regulating climate etc." are not reported as function (s. under "No / unknown designation)	dito

Other	"Other" includes forest primarily designated for military use, protection of wildlife and game, protection from natural hazards (such as avalanches, water etc.), protection from wind, agricultural use.	dito
No / unknown designation	Forest without primary designated function, but with general functions like "air-cleaning, regulating climate, production of oxygen, reduction of CO <sub>2</sub> etc."	dito
Area of permanent forest estate	According to Swiss forest act clearing of forest is not allowed. If clearing has to be done, the same area has to be afforested elsewhere as compensation.	
Forest area within protected areas	Same definition as FRA and is concerning the same area as the area of "conservation of biodiversity".	
Forest area under sustainable forest management	According to Swiss forest act the forest has to be managed sustainable. In this report the total forest area in Switzerland is reduced by the area of primary forest.	
Forest area with management plan	Forest area with management plan and/or within natural reserves with management plan. Forest area that has none of the two above, but regional planning is not shown.	

**Other general comments to the table**

In the third Swiss NFI the first time reliable data on forest functions were collected. Therefore data given in earlier reports might have changed.

## 4 Table T4 – Forest characteristics

### 4.1 FRA 2010 Categories and definitions

Term / category	Definition
Naturally regenerated forest	Forest predominantly composed of trees established through natural regeneration.
Introduced species	A species, subspecies or lower taxon, occurring <u>outside</u> its natural range (past or present) and dispersal potential (i.e. outside the range it occupies naturally or could occupy without direct or indirect introduction or care by humans).
<b>Characteristics categories</b>	
Primary forest	Naturally regenerated forest of native species, where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed.
Other naturally regenerated forest	Naturally regenerated forest where there are clearly visible indications of human activities.
Other naturally regenerated forest of introduced species (sub-category)	Other naturally regenerated forest where the trees are predominantly of introduced species.
Planted forest	Forest predominantly composed of trees established through planting and/or deliberate seeding.
Planted forest of introduced species (sub-category)	Planted forest, where the planted/seeded trees are predominantly of introduced species.
<b>Special categories</b>	
Rubber plantations	Forest area with rubber tree plantations.
Mangroves	Area of forest and other wooded land with mangrove vegetation.
Bamboo	Area of forest and other wooded land with predominant bamboo vegetation.

### 4.2 National data

#### 4.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
SAEFL. Leaflets "Forest and wood in Switzerland"	H	Primary, modified natural	1995/1999	
SAEFL, Swiss forest report	H	Primary, modified natural	2005	
NFI Switzerland Brändli, U.-B. (Red.) 2010: Schweizerisches Landesforstinventar. Ergebnisse der dritten Aufnahmen 2004-2006. eidg. Forschungsanstalt für Wald, Schnee und Landschaft, WSL,	H	Part of neophytes, type of stand establishment, Not accessible forest by	2004-2006	Third NFI Switzerland.

Birmensdorf. In preparation.		fieldworkers		
WSL, 2009: Schweizerisches Landesforstinventar LFI. Spezialauswertungen der Erhebungen 1983-85, 1993-95 und 2004-06. März 2009. Ulrich Ulmer. Eidg. Forschungsanstalt für Wald, Schnee und Landschaft (WSL), Birmensdorf.				

#### 4.2.2 Classification and definitions

National class	Definition
Primary	Same as FRA.
Natural regeneration	Same as FRA.
Artificial regeneration (planted)	Same as FRA.
Mixed regeneration (natural and artificial)	Both regeneration types occur in the stand.
Introduced species	Robinia pseudoacacia, Pinus nigra, Pinus strobus, Pseudotsuga menziesii, other introduced coniferous species, Quercus rubra, Populus sp (but not P. nigra, alba and tremula), Aesculus hippocastanum, Liriodendron tulipifera which occur in the Swiss NFI are classified as introduced species.

#### 4.2.3 Original data

National classes	Area (1000 hectares)
	2004-2006
Primary forest	40
Naturally regenerated (including primary forest)	970
...of which of introduced species	1.98
Artificial regeneration	97
...of which of introduced species	2.61
Mixed regeneration	142
...of which of introduced species	1.61
Unknown	8
<b>Total forest area</b>	<b>1217</b>

### 4.3 Analysis and processing of national data

#### 4.3.1 Estimation and forecasting

Only data from the inventory 2004 to 2006 is available. We adjusted the figures for 1990, 2000 and 2010 by the forest area given in T1. Only the area of primary forest was considered stable. The above given "total" area of naturally regenerated forest was reduced by the area of primary forest.

National classes	Area (1000 hectares)			
	1990	2000	2004-2006 (2005)	2010
Primary forest	40	40	40	40
Naturally regenerated	877	912	930	948
...of which of introduced species	1.9	1.9	2.0	2.0
Artificial regeneration	92	95	97	99
...of which of introduced species	2.5	2.6	2.6	2.7
Mixed regeneration	134	139	142	145
...of which of introduced species	1.5	1.6	1.6	1.6
Unknown	8	8	8	8
<b>Total</b>	<b>1151</b>	<b>1194</b>	<b>1217</b>	<b>1240</b>

#### 4.3.2 Reclassification into FRA 2010 categories

"Mixed regeneration" covers theoretically stands with a percentage of naturally regenerated forest from 1 to 99%. Therefore we assign half of the area of "mixed regeneration" to "naturally regenerated" forest. Forest where the origin of the trees is unknown is listed under "other naturally regenerated forest".

FRA classes	Area (1000 hectares)			
	1990	2000	2004-2006 (2005)	2010
Other naturally regenerated forest	$877+67+8=952$	$912+69+8=989$	$930+71+8=1009$	$948+72+8=1028$
...of which of introduced species	$1.9+1.5/2=2.65$	$1.9+1.6/2=2.7$	$2.0+1.6/2=2.8$	$2.0+1.6/2=2.8$
Planted forest	$92+67=159$	$95+70=165$	$97+71=168$	$99+73=172$
...of which of introduced species	$2.5+1.5/2=3.25$	$2.6+1.6/2=3.4$	$2.6+1.6/2=3.4$	$2.7+1.6/2=3.5$

#### 4.4 Data for Table T4

Table 4a

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Primary forest	40	40	40	40
Other naturally regenerated forest	952	989	1009	1028
...of which of introduced species	3	3	3	3
Planted forest	159	165	168	172
...of which of introduced species	3	3	3	4
<b>TOTAL</b>	<b>1151</b>	<b>1194</b>	<b>1217</b>	<b>1240</b>

Table 4b

FRA 2010 Categories	Area (1000 hectares)			
	1990	2000	2005	2010
Rubber plantations (Forest)	0	0	0	0
Mangroves (Forest and OWL)	0	0	0	0
Bamboo (Forest and OWL)	0	0	0	0

#### 4.5 Comments to Table T4

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Primary forest	There are three known areas with primary forest: Bödmerenwald, Derborence and Scatlé. Additionally to these the area of forest which is not accessible by NFI fieldworkers was added.	The area of primary forest was considered to be stable in Switzerland.
Other naturally regenerating forest	The area of naturally regenerated forest, the area of forest, where the origin of the stand is unknown and half of the forest area, with mixed regeneration.	Since there is only data from one point in time, the figures were only adjusted to the area given in T1.
Planted forest	Forests with planted trees and half of the area of forest, with mixed regeneration.	See above.
Rubber plantations	Due to the central European climate, there are no rubber plantations in Switzerland.	
Mangroves	Due to the central European climate, there are no mangroves in Switzerland.	
Bamboo	Due to the central European climate, there are no bamboo forests in Switzerland.	

Other general comments to the table
The figures about primary forest provided in previous reports was revised and has therefore changed.

## 5 Table T5 – Forest establishment and reforestation

### 5.1 FRA 2010 Categories and definitions

Term	Definition
Afforestation	Establishment of forest through planting and/or deliberate seeding on land that, until then, was not classified as forest.
Reforestation	Re-establishment of forest through planting and/or deliberate seeding on land classified as forest.
Natural expansion of forest	Expansion of forests through natural succession on land that, until then, was under another land use (e.g. forest succession on land previously used for agriculture).

### 5.2 National data

#### 5.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Brändli, U.-B. (Red.) 2010: Schweizerisches Landesforstinventar. Ergebnisse der dritten Aufnahmen 2004-2006. eidg. Forschungsanstalt für Wald, Schnee und Landschaft, WSL, Birmensdorf. In preparation.  WSL, 2009: Schweizerisches Landesforstinventar LFI. Spezialauswertungen der Erhebungen 1983-85, 1993-95 und 2004-06. März 2009. Ulrich Ulmer. Eidg. Forschungsanstalt für Wald, Schnee und Landschaft (WSL), Birmensdorf.	H	Forest-Non-forest decision, development class, intervention since previous NFI	2004-2006	Third NFI Switzerland.
Brassel, P: Brändli, U.-B. (Red.) 1999 : Schweizerisches Landesforstinventar. Ergebnisse der Zweitaufnahme 1993-1995. Birmensdorf, Eidgenössische Forschungsanstalt für Wald, Schnee und Landschaft. Bern, Stuttgart, Wien, Haupt. 442 S.	H	Forest-Non-forest decision, development class, intervention since previous NFI	1993 - 1995	Second NFI Switzerland.

Brassel, P;Lischke, H (eds) 2001: Swiss National Forest Inventory: Methods and Models of the Second Assessment. Birmensdorf, Swiss Federal Research Institute WSL. 336 pp. Eidg. Anstalt forstl. Versuchswes., Ber. (1988): Schweizerisches Landesforstinventar. Ergebnisse der Erstaufnahme 1982-1986.	H	Forest-Non-forest decision	1982 - 1986	First NFI Switzerland.+
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## 5.2.2 Classification and definitions

National class	Definition
Afforestation	Same as FRA.
Reforestation	Same as FRA.
Natural expansion of forest	Same as FRA.

## 5.2.3 Original data

National class	Inventory 1 (1984) to Inventory 2 (1994)	Inventory 2 (1994) to Inventory 3 (2005)
Zunahme Normalwald	37'641 ha	50'809 ha
Vegetationsperioden	10.10 years	10.98 years
Anteil Pflanzung an der Normalwaldzunahme in Prozent	n.a.	1.63 %
Anteil Pflanzung seit letzter Inventur an Normalwaldfläche	n.a.	0.624%

## 5.3 Analysis and processing of national data

### 5.3.1 Calibration

Afforestation and natural expansion of forest was calculated the following:

Increase of forest area between two inventories divided by the average time between the inventories (years) times the part of that area that was planted respectively expanded naturally.

For the reforestation the total forest area (from T1) was multiplied by the proportion of planting since the last inventory and then divided by average time between the inventories (years).

National class	Annual forest establishment between 1984 and 1994 (hectares / year)	Annual forest establishment between 1994 and 2005 (hectares / year)
Afforestation	$37641 / 10.10 * 0.0163 = 60.8$	$50809 / 10.98 * 0.0163 = 75.4$
Reforestation	$1166000 / 10.10 * 0.00624 = 720.4$	$1217000 / 10.98 * 0.00624 = 691.6$
Natural expansion of forest	$37641 / 10.10 * (1-0.0163) = 3666.1$	$50809 / 10.98 * (1-0.0163) = 4552.0$

### 5.3.2 Estimation and forecasting

For the year 1990 the values from the inventory cycle between 1984 and 1994 were taken, for the years 2000 and 2005 the values from the inventory cycle between 1994 and 2005 were taken.

### 5.4 Data for Table T5

FRA 2010 Categories	Annual forest establishment (hectares/year)			...of which of introduced species <sup>1)</sup> (hectares/year)		
	1990	2000	2005	1990	2000	2005
Afforestation	61	75	75	n.a.	n.a.	n.a.
Reforestation	720	692	692	n.a.	n.a.	n.a.
...of which on areas previously planted	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Natural expansion of forest	3666	4552	4552	n.a.	n.a.	n.a.

Note: The figures for the reporting years refer to the averages for the 5-year periods 1988-1992, 1998-2002 and 2004-2006 respectively.

### 5.5 Comments to Table T5

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Afforestation		
Reforestation		
Natural expansion of forest		

Other general comments to the table

## 6 Table T6 – Growing stock

### 6.1 FRA 2010 Categories and definitions

Category	Definition
Growing stock	Volume over bark of all living trees more than X cm in diameter at breast height (or above buttress if these are higher). Includes the stem from ground level or stump height up to a top diameter of Y cm, and may also include branches to a minimum diameter of W cm.
Growing stock of commercial species	Growing stock (see def. above) of commercial species.

### 6.2 National data

#### 6.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Brändli, U.-B. (Red.) 2010: Schweizerisches Landesforstinventar. Ergebnisse der dritten Aufnahmen 2004-2006. eidg. Forschungsanstalt für Wald, Schnee und Landschaft, WSL, Birmensdorf. In preparation.  WSL, 2009: Schweizerisches Landesforstinventar LFI. Spezialauswertungen der Erhebungen 1983-85, 1993-95 und 2004-06. März 2009. Ulrich Ulmer. Eidg. Forschungsanstalt für Wald, Schnee und Landschaft (WSL), Birmensdorf.	H	Growing stock, growing stock composition	2004-2006	Third NFI Switzerland.
Brassel, P; Brändli, U.-B. (Red.) 1999 : Schweizerisches Landesforstinventar. Ergebnisse der Zweitaufnahme 1993-1995. Birmensdorf, Eidgenössische Forschungsanstalt für Wald, Schnee und Landschaft. Bern, Stuttgart, Wien, Haupt. 442 S.	H	Growing stock, growing stock composition	1993 - 1995	Second NFI Switzerland.
Brassel, P; Lischke, H (eds) 2001: Swiss National Forest Inventory: Methods and Models of the Second Assessment. Birmensdorf, Swiss Federal Research Institute WSL. 336 pp. Eidg. Anstalt forstl. Versuchswes., Ber. (1988): Schweizerisches Landesforstinventar. Ergebnisse der Erstaufnahme 1982-1986.	H	Growing stock, growing stock composition	1982 - 1986	First NFI Switzerland.

## 6.2.2 Classification and definitions

National class	Definition
Growing stock	Volume over bark of all living trees more than 12 cm in diameter at breast height. Includes the stem from ground level up to a top diameter of 0 cm. Branches are not included.
Growing stock of commercial species	Same as growing stock.

## 6.2.3 Original data

National classes	Volume (cubic meters over bark per hectare)		
	Forest		
	1983-1985 (reference year 1984)	1993-1995 (reference year 1994)	2004-2006 (reference year 2005)
Growing stock hectare	328	350	347
... of which coniferous	239	248	238
... of which broadleaved	89	102	109

National classes	Volume (cubic meters over bark per hectare)		
	Other wooded land		
	1983-1985 (reference year 1984)	1993-1995 (reference year 1994)	2004-2006 (reference year 2005)
Growing stock hectare	n.a.	n.a.	8.6
... of which coniferous	n.a.	n.a.	7.7
... of which broadleaved	n.a.	n.a.	0.8

FRA 2010 category / Species name			Growing stock in forest (cubic meters per hectare)		
Rank	Scientific name	Common name	1983-1985 (reference year 1984)	1993-1995 (reference year 1994)	2004-2006 (reference year 2005)
1 <sup>st</sup>	<i>Picea abies</i>	Norway spruce	161	164	153
2 <sup>nd</sup>	<i>Fagus sylvatica</i>	Common Beech	56	62	63
3 <sup>rd</sup>	<i>Abies alba</i>	Silver Fir	48	51	51
4 <sup>th</sup>	<i>Larix decidua</i>	European Larch	15	17	19
5 <sup>th</sup>	<i>Fraxinus excelsior</i>	Common Ash	8	11	13
6 <sup>th</sup>	<i>Pinus sylvestris</i>	Scotch Pine	11	11	10
7 <sup>th</sup>	<i>Acer pseudoplatanus</i>	Common Maple	6	8	9
8 <sup>th</sup>	<i>Castanea sativa</i>	Spanish chestnut	3	4	4
9 <sup>th</sup>	<i>Quercus petraea</i>	Sessile Oak	4	4	4
10 <sup>th</sup>	<i>Quercus robur</i>	Common Oak	3	3	3
Remaining			13	15	18
<b>TOTAL</b>			<b>328</b>	<b>350</b>	<b>347</b>

The given data were collected on accessible plots on the Swiss NFI Grid.

## 6.3 Analysis and processing of national data

### 6.3.1 Calibration

To get the total volume in million cubic meters over bark the hectare-value is multiplied with the area given in T1 (in million ha). It was assumed that the not accessible forest plots, according to a remote sensing decision, contain in average the same growing stock as the accessible plots.

National classes	Volume (million cubic meters over bark)		
	Forest		
	1983-1985 (reference year 1984)	1993-1995 (reference year 1994)	2004-2006 (reference year 2005)
Growing stock hectare	328 * 1.129 = 370	350 * 1.166 = 408	347 * 1.217 = 422
... of which coniferous	239 * 1.129 = 270	248 * 1.166 = 289	238 * 1.217 = 290
... of which broadleaved	89 * 1.129 = 100	102 * 1.166 = 119	109 * 1.217 = 133

National classes	Volume (million cubic meters over bark)		
	Other wooded land		
	1983-1985 (reference year 1984)	1993-1995 (reference year 1994)	2004-2006 (reference year 2005)
Growing stock hectare	n.a.	n.a.	8.6 * 0.067 = 0.57
... of which coniferous	n.a.	n.a.	7.7 * 0.067 = 0.52
... of which broadleaved	n.a.	n.a.	0.8 * 0.067 = 0.05

FRA 2010 category / Species name			Growing stock in forest (million cubic meters over bark)		
Rank	Scientific name	Common name	1983-1985 (reference year 1984)	1993-1995 (reference year 1994)	2004-2006 (reference year 2005)
1 <sup>st</sup>	<i>Picea abies</i>	Norway spruce	161 * 1.129 = 182	164 * 1.166 =192	153 * 1.217 =185
2 <sup>nd</sup>	<i>Fagus sylvatica</i>	Common Beech	56 * 1.129 =63	62 * 1.166 =72	63 * 1.217 =77
3 <sup>rd</sup>	<i>Abies alba</i>	Silver Fir	48 * 1.129 =54	51 * 1.166 =59	51 * 1.217 =62
4 <sup>th</sup>	<i>Larix decidua</i>	European Larch	15 * 1.129 =17	17 * 1.166 =20	19 * 1.217 =23
5 <sup>th</sup>	<i>Fraxinus excelsior</i>	Common Ash	8 * 1.129 = 9	11 * 1.166 =13	13 * 1.217 =16
6 <sup>th</sup>	<i>Pinus sylvestris</i>	Scotch Pine	11 * 1.129 = 12	11 * 1.166 =13	10 * 1.217 =12
7 <sup>th</sup>	<i>Acer pseudoplatanus</i>	Common Maple	6 * 1.129 =7	8 * 1.166 =9	9 * 1.217 =11
8 <sup>th</sup>	<i>Castanea sativa</i>	Spanish chestnut	3 * 1.129 = 3	4 * 1.166 =5	4 * 1.217 =5
9 <sup>th</sup>	<i>Quercus petraea</i>	Sessile Oak	4 * 1.129 = 5	4 * 1.166 =5	4 * 1.217 =5
10 <sup>th</sup>	<i>Quercus robur</i>	Common Oak	3 * 1.129 = 3	3 * 1.166 =3	3 * 1.217 =4
Remaining			13 * 1.129 = 15	15 * 1.166 =17	18 * 1.217 =22
<b>TOTAL</b>			328 * 1.129 = <b>370</b>	350 * 1.166 <b>=408</b>	347 * 1.217 <b>=422</b>

### 6.3.2 Estimation and forecasting

Data for the year 1990 was estimated using linear interpolation of the difference between data from reference date 1984 and reference date 1994. Similarly the data for the year 2000 was estimated using linear interpolation from the reference date 1994 and 2005. The data for the year 2010 were forecasted using the same linear trend.

#### Growing stock in forest

National classes	Volume (million cubic meters over bark)					
	Forest					
	1983-1985 (reference year 1984)	1993-1995 (reference year 1994)	2004-2006 (reference year 2005)	1990	2000	2010
Growing stock hectare	370	408	422	392	416	428
... of which coniferous	270	289	290	281	290	290
... of which broadleaved	100	119	133	111	127	139

**Growing stock in other wooded land**

National classes	Volume (million cubic meters over bark)					
	Other wooded land					
	1983-1985 (reference year 1984)	1993-1995 (reference year 1994)	2004-2006 (reference year 2005)	1990	2000	2010
Growing stock hectare	n.a.	n.a.	0.57	n.a.	n.a.	n.a.
... of which coniferous	n.a.	n.a.	0.52	n.a.	n.a.	n.a.
... of which broadleaved	n.a.	n.a.	0.05	n.a.	n.a.	n.a.

**Growing stock of the 10 most common species**

FRA 2010 category / Species name		Growing stock in forest (million cubic meters over bark)				
Rank	Scientific name	1983-1985 (reference year 1984)	1993-1995 (reference year 1994)	2004-2006 (reference year 2005)	1990	2000
1 <sup>st</sup>	<i>Picea abies</i>	182	192	185	188	188
2 <sup>nd</sup>	<i>Fagus sylvatica</i>	63	72	77	68	74
3 <sup>rd</sup>	<i>Abies alba</i>	54	59	62	57	61
4 <sup>th</sup>	<i>Larix decidua</i>	17	20	23	19	22
5 <sup>th</sup>	<i>Fraxinus excelsior</i>	9	13	16	11	15
6 <sup>th</sup>	<i>Pinus sylvestris</i>	12	13	12	13	12
7 <sup>th</sup>	<i>Acer pseudoplatanus</i>	7	9	11	8	10
8 <sup>th</sup>	<i>Castanea sativa</i>	3	5	5	4	5
9 <sup>th</sup>	<i>Quercus petraea</i>	5	5	5	5	5
10 <sup>th</sup>	<i>Quercus robur</i>	3	3	4	3	4
Remaining		15	17	22	16	20
<b>TOTAL</b>		<b>370</b>	<b>408</b>	<b>422</b>	<b>392</b>	<b>416</b>

**6.4 Data for Table T6****Table 6a – Growing stock**

FRA 2010 category	Volume (million cubic meters over bark)							
	Forest				Other wooded land			
	1990	2000	2005	2010	1990	2000	2005	2010
Total growing stock	392	416	422	428	n.a.	n.a.	0.57	n.a.
... of which coniferous	281	290	290	290	n.a.	n.a.	0.52	n.a.
... of which broadleaved	111	127	133	139	n.a.	n.a.	0.05	n.a.
Growing stock of commercial species	392	416	422	428	n.a.	n.a.	0.57	n.a.

**Table 6b – Growing stock of the 10 most common species**

FRA 2010 category / Species name			Growing stock in forest (million cubic meters)		
Rank	Scientific name	Common name	1990	2000	2005
1 <sup>st</sup>	<i>Picea abies</i>	Norway spruce	188	188	185
2 <sup>nd</sup>	<i>Fagus sylvatica</i>	Common Beech	68	74	77
3 <sup>rd</sup>	<i>Abies alba</i>	Silver Fir	57	61	62
4 <sup>th</sup>	<i>Larix decidua</i>	European Larch	19	22	23
5 <sup>th</sup>	<i>Fraxinus excelsior</i>	Common Ash	11	15	16
6 <sup>th</sup>	<i>Pinus sylvestris</i>	Scotch Pine	13	12	12
7 <sup>th</sup>	<i>Acer pseudoplatanus</i>	Common Maple	8	10	11
8 <sup>th</sup>	<i>Castanea sativa</i>	Spanish chestnut	4	5	5
9 <sup>th</sup>	<i>Quercus petraea</i>	Sessile Oak	5	5	5
10 <sup>th</sup>	<i>Quercus robur</i>	Common Oak	3	4	4
Remaining			16	20	22
<b>TOTAL</b>			<b>392</b>	<b>416</b>	<b>422</b>

Note: Rank refers to the order of importance in terms of growing stock, i.e. 1<sup>st</sup> is the species with the highest growing stock. Year 2000 is the reference year for defining the species list and the order of the species.

**Table 6c – Specification of threshold values**

Item	Value	Complementary information
Minimum diameter (cm) at breast height <sup>1</sup> of trees included in growing stock (X)	12	
Minimum diameter (cm) at the top end of stem for calculation of growing stock (Y)	0	
Minimum diameter (cm) of branches included in growing stock (W)		Not included
Volume refers to “above ground” (AG) or “above stump” (AS)	AG	

## 6.5 Comments to Table T6

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Total growing stock		
Growing stock of broadleaved / coniferous		
Growing stock of commercial species	The Swiss NFI includes all trees (woody plants) with a diameter of 12 cm over bark. From this size on all woody plants in Switzerland can be commercialised (at least as energy wood).	

<sup>1</sup> Diameter at breast height (DBH) refers to diameter over bark measured at a height of 1.30 m above ground level or 30 cm above buttresses if these are higher than 1 m.

Growing stock composition		
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**Other general comments to the table**

The data was collected on accessible plots. It was assumed that the not accessible forest has in average the same stands and so the same growing stock as the accessible forest. Although additional evaluations have shown that the growing stock on not accessible plots might be less than on accessible plots. Due to a change in the calculation procedure of the NFI data there are changes in the figures provided in previous reports.

## 7 Table T7 – Biomass stock

### 7.1 FRA 2010 Categories and definitions

Category	Definition
Above-ground biomass	All living biomass above the soil including stem, stump, branches, bark, seeds, and foliage.
Below-ground biomass	All biomass of live roots. Fine roots of less than 2mm diameter are excluded because these often cannot be distinguished empirically from soil organic matter or litter.
Dead wood	All non-living woody biomass not contained in the litter, either standing, lying on the ground, or in the soil. Dead wood includes wood lying on the surface, dead roots, and stumps larger than or equal to 10 cm in diameter or any other diameter used by the country.

### 7.2 National data

#### 7.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Brändli, U.-B. (Red.) 2010: Schweizerisches Landesforstinventar. Ergebnisse der dritten Aufnahmen 2004-2006. eidg. Forschungsanstalt für Wald, Schnee und Landschaft, WSL, Birmensdorf. In preparation.  WSL, 2009: Schweizerisches Landesforstinventar LFI. Spezialauswertungen der Erhebungen 1983-85, 1993-95 und 2004-06. März 2009. Ulrich Ulmer. Eidg. Forschungsanstalt für Wald, Schnee und Landschaft (WSL), Birmensdorf.	H	Volume of trees > 12 cm DBH, Volume of lying wood.	2004-2006	Third NFI Switzerland.
Brassel, P; Brändli, U.-B. (Red.) 1999 : Schweizerisches Landesforstinventar. Ergebnisse der Zweitaufnahme 1993-1995. Birmensdorf, Eidgenössische Forschungsanstalt für Wald, Schnee und Landschaft. Bern, Stuttgart, Wien, Haupt. 442 S.	H	Volume of trees > 12 cm DBH, Volume of lying wood.	1993 - 1995	Second NFI Switzerland.
Brassel, P; Lischke, H (eds) 2001: Swiss National Forest Inventory: Methods and Models of the Second Assessment. Birmensdorf, Swiss Federal Research Institute WSL. 336 pp. Eidg. Anstalt forstl. Versuchswes., Ber. (1988): Schweizerisches Landesforstinventar. Ergebnisse der Erstaufnahme 1982-1986.	H	Volume of trees > 12 cm DBH, Volume of lying wood.	1982 - 1986	First NFI Switzerland.
Thürig, E., T. Palosuo, et al. (2005). "The impact of windthrow on carbon sequestration in Switzerland: a model-	H	Biomass functions for branches,	2005	

based assessment." <i>_Forest Ecology and Management_</i> *210*: 337-350.		twigs and leaves.		
Wirth, C., J. Schumacher, et al. (2004). "Generic biomass functions for Norway spruce in Central Europe-a meta-analysis approach toward prediction and uncertainty estimation." <i>_Tree Physiology_</i> *24*: 121-139.	H	Functions for coarse roots (coniferous trees)	2004	
Wutzler, T., C. Wirth, et al. (2008). "Generic biomass functions for Common beech ( <i>Fagus sylvatica</i> ) in Central Europe: predictions and components of uncertainty." <i>_Canadian Journal of Forest Research-Revue Canadienne De Recherche Forestiere_</i> *38*(6): 1661-1675.	H	Functions for coarse roots (deciduous trees)	2008	

## 7.2.2 Classification and definitions

National class	Definition
Above-ground biomass	All living biomass above the soil including stem, stump, branches, bark, seeds, and foliage of trees measuring at least 12 cm at breast height.
Below-ground biomass	All biomass of live roots of trees measuring at least 12 cm at breast height. Fine roots of less than 2mm diameter are excluded because these often cannot be distinguished empirically from soil organic matter or litter.
Dead wood	All non-living woody biomass not contained in the litter, either standing, lying on the ground. Dead wood includes wood lying on the surface, dead roots, and stumps larger than or equal to 7 cm in. If the dead wood is standing, the diameter of the trees is measuring more than 12 cm at breast height.
Stock of dead wood	Volume over bark of all dead trees measuring at least 12 cm in diameter at breast height. Includes the stem from ground level up to a top diameter of 0 cm. Branches are not included.

## 7.2.3 Original data

Calculation of Biomass was done with country specific, single tree biomass expansion functions. For branches, twigs and leaves, functions cited in Thürig et al. (2005) were used. For coarse roots, functions from Wirth et al. (2004) (coniferous trees) and Wutzler et al. (2008) (deciduous trees) were used.

FRA 2010 category	Biomass (metric tonnes per hectare, oven-dry weight)		
	Forest		
	1983-1985 (1984)	1993-1995 (1994)	2004 - 2006 (2005)
Above-ground biomass	172.7	186.2	187.7
Below-ground biomass	49.8	53.1	55.7
Dead wood	n.a.	n.a.	13.7

FRA 2010 category	Biomass (metric tonnes per hectare, oven-dry weight)		
	Other wooded land		
	1983-1985 (1984)	1993-1995 (1994)	2004 - 2006 (2005)
Above-ground biomass	n.a.	n.a.	4.6
Below-ground biomass	n.a.	n.a.	2.1
Dead wood	n.a.	n.a.	1.2

Swiss NFI Category	Biomass (cubic meters per hectare)		
	Forest		
	1983-1985 (1984)	1993-1995 (1994)	2004 - 2006 (2005)
Stock of dead wood	3.4	10.3	17.9

### 7.3 Analysis and processing of national data

#### 7.3.1 Calibration

To get the total Biomass in the forest area the hectare-value is multiplied with the area given in T1 (in million ha). It was assumed that the not accessible forest (other wooded land) plots, according to a remote sensing decision, contain in average the same biomass as the accessible plots.

Swiss NFI Category	Stock (million cubic meters)		
	Forest		
	1983-1985 (1984)	1993-1995 (1994)	2004 - 2006 (2005)
Stock of dead wood	$3.4 * 1.129 = 3.8$	$10.3 * 1.166 = 12.0$	$17.9 * 1.217 = 21.8$

FRA 2010 category	Biomass (million metric tonnes oven-dry weight)		
	Forest		
	1983-1985 (1984)	1993-1995 (1994)	2004 - 2006 (2005)
Above-ground biomass	$172.7 * 1.129 = 195.0$	$186.2 * 1.166 = 2171$	$187.7 * 1.217 = 228.4$
Below-ground biomass	$49.8 * 1.129 = 56.2$	$53.1 * 1.166 = 619$	$55.7 * 1.217 = 67.8$
Dead wood	n.a.	n.a.	$13.7 * 1.217 = 16.7$

FRA 2010 category	Biomass (million metric tonnes oven-dry weight)		
	Other wooded land		
	1983-1985 (1984)	1993-1995 (1994)	2004 - 2006 (2005)
Above-ground biomass	n.a.	n.a.	$4.6 * 0.067 = 0.31$
Below-ground biomass	n.a.	n.a.	$2.1 * 0.067 = 0.14$
Dead wood	n.a.	n.a.	$1.2 * 0.067 = 0.08$

#### 7.3.2 Estimation and forecasting

Data for the year 1990 was estimated using linear interpolation of the difference between data from reference date 1984 and reference date 1994. Similarly the data for the year 2000 was estimated using linear interpolation from the reference date 1994 and 2005. The data for the year 2010 were forecasted using the same linear trend.

To estimate and forecast the biomass of dead wood in the forest, where there is only data available from one point in time, the development of the stock of dead wood is used to estimate the amounts of biomass of dead wood in other points of time.

National classes	Stock (million cubic meters)					
	Forest					
	1983-1985 (reference year 1984)	1993-1995 (reference year 1994)	2004-2006 (reference year 2005)	1990	2000	2010
Stock of dead wood	3.8	12	21.8	8.7	17.3	26.3

National classes	Biomass (million metric tonnes oven-dry weight)					
	Forest					
	1983-1985 (reference year 1984)	1993-1995 (reference year 1994)	2004-2006 (reference year 2005)	1990	2000	2010
Above-ground biomass	195	217.1	228.4	208.3	223.3	233.5
Below-ground biomass	56.2	61.9	67.8	59.6	65.1	70.4
Dead wood	2.9	9.2	16.7	6.7	13.3	20.1

#### 7.4 Data for Table T7

FRA 2010 category	Biomass (million metric tonnes oven-dry weight)							
	Forest				Other wooded land			
	1990	2000	2005	2010	1990	2000	2005	2010
Above-ground biomass	208	223	228	234	n.a.	n.a.	0.31	n.a.
Below-ground biomass	60	65	68	70	n.a.	n.a.	0.14	n.a.
Dead wood	7	13	17	20	n.a.	n.a.	0.08	n.a.
<b>TOTAL</b>	<b>275</b>	<b>301</b>	<b>313</b>	<b>324</b>	<b>n.a.</b>	<b>n.a.</b>	<b>0.53</b>	<b>n.a.</b>

#### 7.5 Comments to Table T7

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Above-ground biomass	The above-ground biomass is derived from the measurement of living trees with a minimum diameter of 12 cm at breast height.	
Below-ground biomass		
Dead wood		The forecast of dead wood might be to high. Because between the three measuring cycles of the Swiss NFI two larger storms affected Swiss forests. Because of these there was a strong increase of dead wood. The future trend is not clear, the volume of dead wood could be stable or could increase because of another storm.

Other general comments to the table

## 8 Table T8 – Carbon stock

### 8.1 FRA 2010 Categories and definitions

Category	Definition
Carbon in above-ground biomass	Carbon in all living biomass above the soil, including stem, stump, branches, bark, seeds, and foliage.
Carbon in below-ground biomass	Carbon in all biomass of live roots. Fine roots of less than 2 mm diameter are excluded, because these often cannot be distinguished empirically from soil organic matter or litter.
Carbon in dead wood	Carbon in all non-living woody biomass not contained in the litter, either standing, lying on the ground, or in the soil. Dead wood includes wood lying on the surface, dead roots, and stumps larger than or equal to 10 cm in diameter or any other diameter used by the country.
Carbon in litter	Carbon in all non-living biomass with a diameter less than the minimum diameter for dead wood (e.g. 10 cm), lying dead in various states of decomposition above the mineral or organic soil.
Soil carbon	Organic carbon in mineral and organic soils (including peat) to a specified depth chosen by the country and applied consistently through the time series.

### 8.2 National data

#### 8.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Assmann, E., 1961: Waldertragskunde. BLV, München-Bonn-Wien, 490 S.	H	Wood density	1961	
Brändli, U.-B. (Red.) 2010: Schweizerisches Landesforstinventar. Ergebnisse der dritten Aufnahmen 2004-2006. eidg. Forschungsanstalt für Wald, Schnee und Landschaft, WSL, Birmensdorf. In preparation.  WSL, 2009: Schweizerisches Landesforstinventar LFI. Spezialauswertungen der Erhebungen 1983-85, 1993-95 und 2004-06. März 2009. Ulrich Ulmer. Eidg. Forschungsanstalt für Wald, Schnee und Landschaft (WSL), Birmensdorf.	H	Volume of trees > 12 cm DBH, Volume of lying wood.	2004-2006	Third NFI Switzerland.
Brassel, P; Brändli, U.-B. (Red.) 1999 : Schweizerisches Landesforstinventar. Ergebnisse der Zweitaufnahme 1993-1995. Birmensdorf, Eidgenössische Forschungsanstalt für Wald, Schnee und Landschaft. Bern, Stuttgart, Wien, Haupt. 442 S.	H	Volume of trees > 12 cm DBH, Volume of lying wood.	1993 - 1995	Second NFI Switzerland.
Brassel, P; Lischke, H (eds) 2001: Swiss National Forest Inventory: Methods and Models of the Second Assessment. Birmensdorf, Swiss Federal Research Institute WSL. 336 pp. Eidg. Anstalt forstl. Versuchswes., Ber. (1988): Schweizerisches Landesforstinventar. Ergebnisse der Erstaufnahme 1982-1986.	H	Volume of trees > 12 cm DBH, Volume of lying wood.	1982 - 1986	First NFI Switzerland.

FOEN 2008: Switzerland's Greenhouse Gas Inventory 1990–2006, National Inventory Report and CRF tables 2008. Submission of 15 April 2007 to the United Nations Framework Convention on Climate Change. Federal Office for the Environment, Bern. Published on <a href="http://www.climatereporting.ch">http://www.climatereporting.ch</a>	H	Soil carbon	2008	
Kaufmann, E., 2001: Estimation of standing timber, growth and cut. Pages 162-196 in Brassel, P. and Lischke, H., (eds.): Swiss National Forest Inventory: Methods and Models of the Second Assessment. Swiss Federal Research Institute WSL, Birmensdorf. 162-196.	H	Volume of trees > 12 cm DBH		First, second and third NFI
Lüscher, P., Rigling, A., Walthert, L., Zimmermann, S. 1994: Waldzustandsinventur 1993 - Bodenkundliche Erhebungen. Bodenkundliche Gesellschaft der Schweiz 18: 69-76.	H	Soil carbon	1993	
Moeri, A.C. 2007: Kohlenstoffvorräte in Schweizer Waldböden mit besonderer Berücksichtigung der organischen Auflage. Diplomarbeit bei der Eidgenössischen Forschungsanstalt für Wald, Schnee und Landschaft (WSL). Geographisches Institut der Universität Zürich. <a href="http://www.environment-switzerland.ch/climatereporting/00545/01913/index.html?lang=en">http://www.environment-switzerland.ch/climatereporting/00545/01913/index.html?lang=en</a>	H	Carbon in litter	2007	
Perruchoud, D., Walthert, L., Zimmermann, S., Lüscher, P. 2000: Contemporary carbon stocks of mineral forest soils in the Swiss Alps. Biogeochemistry 50: 111-136. <a href="http://dx.doi.org/10.1023/A:1006320129112">http://dx.doi.org/10.1023/A:1006320129112</a> [09.04.2008]	H	Function for leaves	2000	
Wirth, C., J. Schumacher, et al. (2004). "Generic biomass functions for Norway spruce in Central Europe- a meta-analysis approach toward prediction and uncertainty estimation." <i>_Tree Physiology_</i> *24*: 121-139.	H	Functions for coarse roots (coniferous trees)	2004	
Wutzler, T., C. Wirth, et al. (2008). "Generic biomass functions for Common beech ( <i>Fagus sylvatica</i> ) in Central Europe: predictions and components of uncertainty." <i>_Canadian Journal of Forest Research- Revue Canadienne De Recherche Forestiere_</i> *38*(6): 1661-1675.	H	Functions for coarse roots (deciduous trees)	2008	

## 8.2.2 Classification and definitions

National class	Definition
Carbon in above-ground biomass	Carbon in all living trees above the soil measuring at least 12 cm at breast height, including stem, stump, branches, bark, seeds, and foliage.
Carbon in below-ground biomass	Carbon in all roots of living trees measuring at least 12 cm at breast height. Coniferous trees: Norway spruce: Function from Wirth et al. (2004) is based on root samplings from 19 different studies. The threshold for root sampling varies between "not determined" and 5 mm. Deciduous trees: Common beech: Function from Wutzler et al. (2008) is based on root samplings from 13 studies. Only coarse roots, but no threshold given.

Carbon in dead wood	Carbon of all non-living woody biomass not contained in the litter, either standing, lying on the ground. Dead wood includes wood lying on the surface, dead roots, and stumps larger than or equal to 7 cm in. If the dead wood is standing, the diameter of the trees is measuring more than 12 cm at breast height.
Carbon in litter	Carbon in litter is the sum of carbon in the soil horizons L (litter), F (fermentation) and H (humus).
Soil carbon	Organic carbon in mineral soils to a depth of 30 cm.

### 8.2.3 Original data

The Data for "Carbon in above-ground biomass", "carbon in below-ground biomass" and the "carbon in dead wood" is taken from Table T7.

	NFI Production region				
	Jura	Central Plateau	Pre-Alps	Alps	Southern Alps
Carbon in litter [t C ha <sup>-1</sup> ]	9.7	9.5	17.4	33.4	22.3
Organic carbon of mineral topsoil [t C ha <sup>-1</sup> ]	75	62.6	75.3	72.1	109.0

		Area (1000 hectares)				
		Jura	Central Plateau	Pre-Alps	Alps	Southern Alps
Forest	1983-1985 (1984)	197	231	212	356	139
	1993-1995 (1994)	201	232	221	366	146
	2004-2006 (2005)	203	232	225	391	165
Other wooded land	1983-1985 (1984)	0	0	3	32	24
	1993-1995 (1994)	0	0	3	33	22
	2004-2006 (2005)	0	0	3	45	18

## 8.3 Analysis and processing of national data

### 8.3.1 Calibration

To get the total of carbon in litter the production regions of Switzerland the area of forest respectively of other wooded land in each production region is multiplied with carbon in litter per hectare.

		Carbon in litter (1000 metric tonnes)					
		Jura	Central Plateau	Pre-Alps	Alps	Southern Alps	Total
Forest	1983-1985 (1984)	197 * 9.7 =1911	231 * 9.5 =2195	212 * 17.4 =3689	356 * 33.4 =11890	139 * 22.3 =4643	24328
	1993-1995 (1994)	201 * 9.7 =1950	232 * 9.5 =2204	221 * 17.4 =3845	366 * 33.4 =12224	146 * 22.3 =4876	25135
	2004-2006 (2005)	203 * 9.7 =1969	232 * 9.5 =2204	225 * 17.4 =3915	391 * 33.4 =13059	165 * 22.3 =5511	26658
Other wooded land	1983-1985 (1984)	0 * 9.7 = 0	0 * 9.5 = 0	3 * 17.4 =52	32 * 33.4 =1069	24 * 22.3 =802	1023
	1993-1995 (1994)	0 * 9.7 = 0	0 * 9.5 = 0	3 * 17.4 =52	33 * 33.4 =1102	22 * 22.3 =735	1889
	2004-2006 (2005)	0 * 9.7 = 0	0 * 9.5 = 0	3 * 17.4 =52	45 * 33.4 =1503	18 * 22.3 =601	2156

The soil carbon is calculated in the same way as the carbon in litter.

		Soil carbon (1000 metric tonnes)					
		Jura	Central Plateau	Pre-Alps	Alps	Southern Alps	Total
Forest	1983-1985 (1984)	197 * 75 =14775	231 * 62.6 = 14461	212 * 75.3 =15964	356 * 72.1 =25668	139 * 109 = 15151	86019
	1993-1995 (1994)	201 * 75 = 15075	232 * 62.6 =14523	221 * 75.3 =16641	366* 72.1 = 26389	146 * 109 = 15914	88542
	2004-2006 (2005)	203 * 75 = 15225	232 * 62.6 =14523	225 * 75.3 =16943	391* 72.1 = 28191	165 * 109 = 17985	92867
Other wooded land	1983-1985 (1984)	0 * 75 = 0	0 * 62.6 = 0	3 * 75.3 =226	32* 72.1 = 2307	24 * 109 = 2616	5149
	1993-1995 (1994)	0 * 75 = 0	0 * 62.6 = 0	3 * 75.3 = 226	33* 72.1 = 2379	22 * 109 = 2398	5003
	2004-2006 (2005)	0 * 75 = 0	0 * 62.6 = 0	3 * 75.3 = 226	45* 72.1 = 3245	18 * 109 = 1962	5433

### 8.3.2 Estimation and forecasting

Data for the year 1990 was estimated using linear interpolation of the difference between data from reference date 1984 and reference date 1994. Similarly the data for the year 2000 was estimated using linear interpolation from the reference date 1994 and 2005. The data for the year 2010 were forecasted using the same linear trend.

National classes	Carbon (million metric tonnes)					
	Forest					
	1983-1985 (reference year 1984)	1993-1995 (reference year 1994)	2004-2006 (reference year 2005)	1990	2000	2010
Carbon in litter	24.328	25.135	26.658	24.81	25.97	27.35
Soil carbon	86.019	88.542	92.867	87.53	90.90	94.83

National classes	Carbon (million metric tonnes)					
	Other wooded land					
	1983-1985 (reference year 1984)	1993-1995 (reference year 1994)	2004-2006 (reference year 2005)	1990	2000	2010
Carbon in litter	1.023	1.889	2.156	1.54	2.03	2.28
Soil carbon	5.149	5.003	5.433	5.06	5.24	5.63

The carbon in above-ground biomass, in below-ground biomass and in dead wood was taken from Table T7 and multiplied by 0.47 (Carbon fraction as proposed in FRA Guidelines 2010 Final Draft).

FRA 2010 Category	Carbon (Million metric tonnes)							
	Forest				Other wooded land			
	1990	2000	2005	2010	1990	2000	2005	2010
Carbon in above-ground biomass	208.3 * 0.47 = 97.90	223.3 * 0.47 = 104.95	228.4 * 0.47 = 107.35	233.5 * 0.47 = 109.75	n.a.	n.a.	0.31 * 0.47 = 0.146	n.a.
Carbon in below-ground biomass	59.6 * 0.47 = 28.01	65.1 * 0.47 = 30.6	67.8 * 0.47 = 31.87	70.4 * 0.47 = 33.09	n.a.	n.a.	0.14 * 0.47 = 0.07	n.a.
Carbon in dead wood	6.7 * 0.47 = 3.15	13.3 * 0.47 = 6.25	16.7 * 0.47 = 7.85	20.1 * 0.47 = 9.45	n.a.	n.a.	0.08 * 0.47 = 0.04	n.a.

#### 8.4 Data for Table T8

FRA 2010 Category	Carbon (Million metric tonnes)							
	Forest				Other wooded land			
	1990	2000	2005	2010	1990	2000	2005	2010
Carbon in above-ground biomass	98	105	107	110	n.a.	n.a.	0.15	n.a.
Carbon in below-ground biomass	28	31	32	33	n.a.	n.a.	0.07	n.a.
<b>Sub-total: Living biomass</b>	<b>126</b>	<b>135</b>	<b>139</b>	<b>143</b>	<b>n.a.</b>	<b>n.a.</b>	<b>0.22</b>	<b>n.a.</b>
Carbon in dead wood	3	6	8	9	n.a.	n.a.	0.04	n.a.
Carbon in litter	25	26	27	27	2	2	2.16	2
<b>Sub-total: Dead wood and litter</b>	<b>28</b>	<b>32</b>	<b>35</b>	<b>36</b>	<b>2</b>	<b>2</b>	<b>2.20</b>	<b>3</b>
Soil carbon	89	91	93	95	5	5	5.43	6
<b>TOTAL</b>	<b>243</b>	<b>258</b>	<b>267</b>	<b>274</b>	<b>n.a.</b>	<b>n.a.</b>	<b>7.85</b>	<b>n.a.</b>

Soil depth (cm) used for soil carbon estimates	30
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## 8.5 Comments to Table T8

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Carbon in above-ground biomass		
Carbon in below-ground biomass		
Carbon in dead wood		
Carbon in litter		
Soil carbon	<p>Soil carbon is also reported as in the Swiss Greenhouse Gas Inventory (FOEN 2008, page 207, Table 137). Perruchoud et al. (2000) interpolated 136 forest soil samples from the “Waldzustandsinventar 1993 - Bodenkundliche Erhebungen” (Lüscher et al. 1994). According to this study an average carbon stock of mineral forest soils of 76 t C ha<sup>-1</sup> in 0-30 cm topsoil is assumed. These soil samples were stratified for the five NFI production regions. There are only stock estimates available but no changes over the years.</p>	

Other general comments to the table

## 9 Table T9 – Forest fires

### 9.1 FRA 2010 Categories and definitions

Category	Definition
Number of fires	Average number of vegetation fires per year in the country.
Area affected by fire	Average area affected by vegetation fires per year in the country.
Vegetation fire (supplementary term)	Any vegetation fire regardless of ignition source, damage or benefit.
Wildfire	Any unplanned and/or uncontrolled vegetation fire.
Planned fire	A vegetation fire regardless of ignition source that burns according to management objectives and requires limited or no suppression action.

### 9.2 National data

#### 9.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
OFEFP, Annuaire 2003, La forêt et le bois	H	Fire	2003	1988-1992 average 1998-2002 average
OFEFP, Annuaire 2008, La forêt et le bois	H	Fire	2008	2003-2006 average
swissfire database	H	Fire	2008	2003-2006 average

OFEFP = Office fédéral de l'environnement, des forêts et du paysage (=SAEFL)

#### 9.2.2 Classification and definitions

National class	Definition
Number of fires	Same as FRA.
Area affected by fire	Same as FRA.

#### 9.2.3 Original data

The original data, collected by SAEFL (Swiss Agency for the Environment, Forests and Landscape) and published in “Annuaire 2004, La forêt et le bois” are listed below

Year	Fire (ha)	Year	Fire (ha)	Year	Fire (ha)
1988	183	1998	249	2003	564
1989	213	1999	9	2004	20
1990	1102	2000	36	2005	47
1991	148	2001	37	2006	101
1992	52	2002	410	2007	230
<b>Average</b>	<b>340</b>	<b>Average</b>	<b>148</b>	<b>Average</b>	<b>192</b>

### 9.3 Data for Table T9

**Table 9a**

FRA 2010 category	Annual average for 5-year period					
	1990		2000		2005	
	1000 hectares	number of fires	1000 hectares	number of fires	1000 hectares	number of fires
Total land area affected by fire	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
... of which on forest	0.3	138	0.1	55	0.2	93
... of which on other wooded land	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
... of which on other land	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

**Table 9b**

FRA 2010 category	Proportion of forest area affected by fire (%)		
	1990	2000	2005
Wildfire	100	100	100
Planned fire	0	0	0

Note: The figures for the reporting years refer to the averages of annually affected areas for the 5-year periods 1988-1992, 1998-2002 and 2004-2006 respectively

### 9.4 Comments to Table T9

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Area affected by fire		
Number of fires		
Wildfire / planned fire	planned fires = rough expert estimate	

Other general comments to the table

## 10 Table T10 – Other disturbances affecting forest health and vitality

### 10.1 FRA 2010 Categories and definitions

Term	Definition
Disturbance	Damage caused by any factor (biotic or abiotic) that adversely affects the vigour and productivity of the forest and which is not a direct result of human activities.
Invasive species	Species that are non-native to a particular ecosystem and whose introduction and spread cause, or are likely to cause, socio-cultural, economic or environmental harm or harm to human health.
Category	Definition
Disturbance by insects	Disturbance caused by insect pests.
Disturbance by diseases	Disturbance caused by diseases attributable to pathogens, such as bacteria, fungi, phytoplasma or virus.
Disturbance by other biotic agents	Disturbance caused by biotic agents other than insects or diseases, such as wildlife browsing, grazing, physical damage by animals, etc.
Disturbance caused by abiotic factors	Disturbances caused by abiotic factors, such as air pollution, snow, storm, drought, etc.

### 10.2 National data

#### 10.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
OFEFP, Dégâts provoqués par la tempête de 1990 dans les forêts en Suisse	H	Other disturbance : storm	1994	1988-1992 average
OFEFP, Lothar. Der Orkan 1999. Ereignisanalyse	H	Other disturbance : storm	2001	1998-2002 average
Brändli, U.-B. (Red.) 2010: Schweizerisches Landesforstinventar. Ergebnisse der dritten Aufnahmen 2004-2006. eidg. Forschungsanstalt für Wald, Schnee und Landschaft, WSL, Birmensdorf. In preparation.  WSL, 2009: Schweizerisches Landesforstinventar LFI. Spezialauswertungen der Erhebungen 1983-85, 1993-95 und 2004-06. März 2009. Ulrich Ulmer. Eidg. Forschungsanstalt für Wald, Schnee und Landschaft (WSL), Birmensdorf.	H	Area affected by woody invasive species	2004-2006	Third NFI Switzerland.
Waldschutz aktuell, Phytosanitärer Beobachtungs- und Meldedienst, PBMD WSL, 8903 Birmensdorf, 2001 - 2008.	H	Amount of wood affected by insects.	2001 - 2008	www.waldschutz.ch

OFEFP = Office fédéral de l'environnement, des forêts et du paysage (=SAEFL)

## 10.2.2 Classification and definitions

National class	Definition
Disturbance	Same as FRA.
Invasive species	Same as FRA.
Storm damaged area	80% or more of standing volume is damaged on areas exceeding 0,2 hectares.
Disturbance by insects	Same as FRA.
Disturbance by diseases	Same as FRA.

## 10.2.3 Original data

### Disturbances

Year	Storm (ha)	Year	Storm (ha)	Year	Storm (ha)
1988	0	1998	0	2003	0
1989	0	1999	20000	2004	0
1990	5000	2000	0	2005	0
1991	0	2001	0	2006	0
1992	0	2002	0	2007	100
<b>Average</b>	<b>1000</b>	<b>Average</b>	<b>4000</b>	<b>Average</b>	<b>20</b>

Data of storm 2003 to 2007 = rough expert estimation.

Year	Insects (cubic meter)	Year	Insects (cubic meter)	Year	Insects (cubic meter)
1988	160980	1998	78403	2003	2067463
1989	109832	1999	85749	2004	1349985
1990	60301	2000	161808	2005	1015438
1991	200832	2001	1310313	2006	726793
1992	450178	2002	1167571	2007	284626

### Major outbreaks of insects and diseases affecting forest health and vitality

Description / name	Tree species or genera affected (scientific name)	Year(s) of latest outbreak	Volume affected (1000 cubic meter)	Area affected (1000 hectares)
Ips typographus	<i>Picea Abies</i>	2003	5529	
Ips typographus	<i>Picea Abies</i>	2001	2725	
Ips typographus	<i>Picea Abies</i>	1995	729	
Ips typographus	<i>Picea Abies</i>	1991	1460	
Lymantria dispar	<i>Hardwood</i>	1992		0.5
Pityokteines curvidens	<i>Abies Alba</i>	2003		0.25
Pityogenes chalcographus	<i>Picea Abies</i>	2003		0.25

### Area affected by woody invasive species

National classes	Percentage of total forest area
	2004-2006

Dominated by invasive species	0.1010
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### 10.3 Analysis and processing of national data

#### 10.3.1 Calibration

##### Disturbance

Year	Insects (hectare)	Year	Insects (hectare)	Year	Insects (hectare)
1988	160.980/401=0.40	1998	78.403/401 =0.20	2003	2067.463/401 =5.16
1989	109.832/401 =0.27	1999	85.749/401 =0.21	2004	1349.985/401 =3.37
1990	60.301/401 =0.15	2000	161.808/401 =0.40	2005	1015.438/401 =2.53
1991	200.832/401 =0.50	2001	1310.313/401 =3.27	2006	726.793/401 =1.81
1992	450.178/401 =1.12	2002	1167.571/401 =2.91	2007	284.626/401 =0.71
<b>Average</b>	<b>0.5</b>	<b>Average</b>	<b>1.4</b>	<b>Average</b>	<b>2.7</b>

To obtain the area affected by insects the cubic meter (in 1000) are divided by the average hectare-volume of picea abies in Switzerland (according to Swiss NFI). Because picea abies is mainly affected by insects.

##### Major outbreaks of insects and diseases affecting forest health and vitality

Description / name	Tree species or genera affected (scientific name)	Year(s) of latest outbreak	Volume affected (1000 cubic meter)	Area affected (1000 hectares)
Ips typographus	<i>Picea Abies</i>	2003	5529	5529/401 = 14
Ips typographus	<i>Picea Abies</i>	2001	2725	2725/401 = 7
Ips typographus	<i>Picea Abies</i>	1995	729	729/401 = 2
Ips typographus	<i>Picea Abies</i>	1990	1460	1460/401 = 4

Where only cubic meters of forest affected by insects and diseases were available the cubic meters were divided by the average hectare-volume of picea abies in Switzerland (according to Swiss NFI).

##### Area affected by woody invasive species

National classes	forest area (1000 hectares)
	2004-2006 (2005)
Dominated by invasive species	1217*0.00101 = 1.2

The forest area affected by woody invasive species results from the multiplication of the total forest area from T1 and the percentage of forest area dominated by invasive species.

## 10.4 Data for Table T10

**Table 10a – Disturbances**

FRA 2010 category	Affected forest area (1000 hectares)		
	1990	2000	2005
Disturbance by insects	0.5	1.4	2.7
Disturbance by diseases	n.a.	n.a.	n.a.
Disturbance by other biotic agents	n.a.	n.a.	n.a.
Disturbance caused by abiotic factors	1.0	4.0	0
<b>Total area affected by disturbances</b>	<b>n.a.</b>	<b>n.a.</b>	<b>n.a.</b>

Notes: The figures for the reporting years refer to the averages of annually affected areas for the 5-year periods 1988-1992, 1998-2002 and 2004-2006 respectively.

The total area affected by disturbances is not necessarily the sum of the individual disturbances as these may be overlapping.

**Table 10b – Major outbreaks of insects and diseases affecting forest health and vitality**

Description / name	Tree species or genera affected (scientific name)	Year(s) of latest outbreak	Area affected (1000 hectares)	If cyclic, approx. cycle (years)
Ips typographus	<i>Picea Abies</i>	2003	14	
Ips typographus	<i>Picea Abies</i>	2001	6	
Ips typographus	<i>Picea Abies</i>	1995	2	
Ips typographus	<i>Picea Abies</i>	1990	4	
Lymantria dispar	<i>Hardwood</i>	1992	0.5	
Pityokteines curvidens	<i>Abies Alba</i>	2003	0.25	
Pityogenes chalcographus	<i>Picea Abies</i>	2003	0.25	

Note: Area affected refers to the total area affected during the outbreak.

**Table 10c – Area of forest affected by woody invasive species**

Scientific name of woody invasive species	Forest area affected 2005 (1000 hectares)
<i>Robinia Pseudoacacia</i>	1
<b>Total forest area affected by woody invasive species</b>	<b>1</b>

Note: The total forest area affected by woody invasive species is not necessary the sum of the values above, as these may be overlapping.

### 10.5 Comments to Table T10

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Disturbance by insects	The data given is the area of picea abies forest, that is affected by insects. This is the only tree species that has large areas disturbed by insects.	
Disturbance by diseases		
Disturbance by other biotic agents		
Disturbance caused by abiotic factors	Data of storm 2003 to 2007 are a rough expert estimation.	
Major outbreaks		
Invasive species	The area given is the area of forest, where woody invasive species dominate the other trees regarding the stock.	

Other general comments to the table

## 11 Table T11 – Wood removals and value of removals

### 11.1 FRA 2010 Categories and definitions

Category	Definition
Industrial roundwood removals	The wood removed (volume of roundwood over bark) for production of goods and services other than energy production (woodfuel).
Woodfuel removals	The wood removed for energy production purposes, regardless whether for industrial, commercial or domestic use.

### 11.2 National data

#### 11.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Jahrbuch Wald und Holz, 2008. Bundesamt für Umwelt (BAFU)	M	sawlogs, pulpwood, woodfuel	Yearly data available	Sawlogs + Pulpwood = Industrial roundwood
Forstwirtschaftliche Gesamtrechnung. Bundesamt für Statistik (BFS)	H	Removals, Receipts from sale wood	Yearly data available	<a href="http://www.agr.bfs.admin.ch/ReportFolders/ReportFolders.aspx">http://www.agr.bfs.admin.ch/ReportFolders/ReportFolders.aspx</a>

#### 11.2.2 Classification and definitions

National class	Definition
Sawlogs	Logs used for the production of sawnwood and veneer sheets; Volume under bark
Pulpwood	Wood for mechanical or chemical processing; Volume over bark
Woodfuel	Wood for energy production purposes; Volume over bark
Other Industrial roundwood	Other secondary products

#### 11.2.3 Original data

Wood removal:

Year	Sawlogs (1000 m <sup>3</sup> )	Mean of 5 year period	Pulpwood (1000 m <sup>3</sup> )	Mean of 5 year period	Woodfuel (1000 m <sup>3</sup> )	Mean of 5 year period	Other Industrial roundwood	Mean of 5 year period
1988	2793	3214.4	809	806.2	893	843.2	NA	NA
1989	2887		842		813		NA	
1990	4488		895		879		NA	
1991	2987		764		786		NA	
1992	2917		721		845		NA	
1998	3386	4089.4	460	574.4	1000	1144	NA	NA
1999	3294		462		981		NA	
2000	6801		811		1626		NA	
2001	3920		619		1122		NA	

2002	3046		520		991		NA	
2003	3501	3525.0	513	596.2	1107	1250.2	NA	25.0
2004	3425		561		1147		28	
2005	3421		584		1251		29	
2006	3630		634		1417		20	
2007	3648		689		1329		23	

Original data on the quantity of removals wood and receipts from sale of wood in Public Forest:

Year	Removals			Receipts from sale wood			Unit value		
	Sawlogs m <sup>3</sup>	Pulpwood m <sup>3</sup>	Woodfuel m <sup>3</sup>	Sawlogs (1000 CHF)	Pulpwood (1000 CHF)	Woodfuel (1000 CHF)	Sawlogs CHF/m <sup>3</sup>	Pulpwood CHF/m <sup>3</sup>	Woodfuel CHF/m <sup>3</sup>
1988	NA	NA	NA	NA	NA	NA	NA	NA	NA
1989	NA	NA	NA	NA	NA	NA	NA	NA	NA
1990	6027397.21	1391066.27	966126.79	581207.81	74865.46	52701.19	96.43	53.82	54.55
1991	1710288.10	966153.88	759482.08	206516.94	53252.59	42338.22	120.75	55.12	55.75
1992	2742481.90	1036424.69	745927.29	300699.06	62247.17	39951.41	109.64	60.06	53.56
Mean of 3 year period							<b>108.94</b>	<b>56.33</b>	<b>54.62</b>
1998	3530524.05	1171171.68	582882.22	327714.49	58027.68	23694.76	92.82	49.55	40.65
1999	3340831.65	1200558.21	558892.80	314169.62	59113.28	22782.03	94.04	49.24	40.76
2000	9120566.86	2066112.15	1089660.69	468722.86	66030.53	35987.93	51.39	31.96	33.03
2001	2457804.67	1160025.27	587570.23	188829.13	56953.47	22582.60	76.83	49.10	38.43
2002	2671211.88	1229637.62	607459.98	200136.82	57367.36	22663.77	74.92	46.65	37.31
Mean of 5 year period							<b>78.00</b>	<b>45.30</b>	<b>38.04</b>
2003	3474542.57	1480369.07	646853.47	239390.38	58276.80	22427.75	68.90	39.37	34.67
2004	3545492.70	1471972.18	782563.44	253271.56	55113.71	29265.17	71.43	37.44	37.40
2005	3616484.49	1576510.15	842322.46	250992.07	64410.28	34515.56	69.40	40.86	40.98
2006	3838418.60	1789759.70	942506.05	300896.80	88244.59	45103.27	78.39	49.31	47.85
2007	3340046.12	1398703.93	1312767.76	331595.31	83401.74	76268.52	99.28	59.63	58.10
Mean of 5 year period							<b>77.48</b>	<b>45.32</b>	<b>43.80</b>

The unit value for Industrial roundwood is given from the medium value for sawlog and pulpwood in proportion on their volume of removals.

### 11.3 Analysis and processing of national data

#### 11.3.1 Estimation and forecasting

FRA 2010 Category	Industrial roundwood (1000 m3)	Woodfuel (1000 m3)
1990	4406	843
2000	5154	1144
2005	4544	1250
2010	4600	1600

The forecasting for 2010 are an estimation made from national experts.

#### 11.3.2 Reclassification into FRA 2010 categories

Industrial Wood removal = Sawlogs \*1.12 (conversion to over bark volume<sup>1</sup>) + pulpwood  
 Woodfuel removal = Woodfuel

<sup>1</sup>Data from the second national forest inventory (NFI2-1995), research institute WSL.

### 11.4 Data for Table T11

FRA 2010 Category	Industrial roundwood removals			Woodfuel removals		
	1990	2000	2005	1990	2000	2005
Total volume (1000 m <sup>3</sup> o.b.)	4406	5154	4544	843	1144	1250
... of which from forest	4406	5154	4544	843	1144	1250
Unit value (local currency / m <sup>3</sup> o.b.)	96	70	68	55	38	44
Total value (1000 local currency)	423007	360817	309006	46376	43472	55009

Note: The figures for the reporting years refer to the averages of annually affected areas for the 5-year periods 1988-1992, 1998-2002 and 2004-2006 respectively.

	1990	2000	2005
Name of local currency	Swiss Franc (CHF)	Swiss Franc (CHF)	Swiss Franc (CHF)

### 11.5 Comments to Table T11

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Total volume of industrial roundwood removals		
Total volume of woodfuel removals		
Unit value		
Total value		

Other general comments to the table

## **12 Table T12 – Non-wood forest products removals and value of removals**

No data available for reporting regarding Non-wood forest product (NWFP).

## 13 Table T13 – Employment

### 13.1 FRA 2010 Categories and definitions

Category	Definition
Full-time equivalents (FTE)	A measurement equal to one person working full-time during a specified reference period.
Employment	Includes all persons in paid employment or self-employment.
Paid employment	Persons who during a specified reference period performed some work for <u>wage or salary</u> in cash or in kind.
Self-employment	Persons who during a specified reference period performed some work for <u>profit or family gain</u> in cash or in kind (e.g. employers, own-account workers, members of producers' cooperatives, contributing family workers).

### 13.2 National data

#### 13.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Eidg. Betriebszählung, Bundesamt für Statistik	H	Employees in forest enterprises, independent contractors in forestry	1985, 1996, 2000, 2005	Roughly every five years
Bundesamt für Umwelt (BAFU), 2008: Jahrbuch Wald und Holz 2007	H		2007	

#### 13.2.2 Classification and definitions

National class	Definition
Employees in forest enterprises	The national class employees in forest enterprises matches the FRA class primary production of goods.

#### 13.2.3 Original data

National class	Employment (person-years)			
	1985	1996	2000	2005
Employees in forest enterprises	6899	5272	4282	3302
Independent contractors in forestry	2405	1710	1748	1576

### 13.3 Analysis and processing of national data

#### 13.3.1 Estimation and forecasting

National class	Employment (person-years)			
	1990	1996	2000	2005
Employees in forest enterprises	6085	5272	4282	3302
Independent contractors in forestry	2057	1710	1748	1576
<b>TOTAL</b>	<b>8142</b>	<b>6982</b>	<b>6030</b>	<b>4878</b>

Data for the years 1990 was estimated using linear interpolation of the difference between data from 1985 and 1996. The data for the years 2000 and 2005 could be used directly.

#### 13.3.2 Reclassification into FRA 2010 categories

It is assumed, that the national class employees in forest enterprises matches the FRA class primary production of goods.

### 13.4 Data for Table T13

FRA 2010 Category	Employment (1000 years FTE)		
	1990	2000	2005
Employment in primary production of goods	8.142	6.030	4.878
...of which paid employment	8.142	6.030	4.878
...of which self-employment	n.a.	n.a.	n.a.
Employment in management of protected areas	n.a.	n.a.	n.a.

### 13.5 Comments to Table T13

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Employment in primary production of goods	In the reported data, no clear line may be drawn between the percentage of employment in primary production of goods and other activities such as education or activities related to biodiversity...	Employment in forestry decreases clearly. This trend concerns the total employment (-19%), as well as both classes “enterprises” (-23%) and contractors (-19%). This decrease is also the result of the increasing efforts to gain more efficiency and enhance economic results. (The average area managed by an enterprises rises.) For the same reason we observe a shift from employment in enterprises to contractors.
Paid employment / self-employment	The data reported refers to paid employment. Self-employment of private forest owners only plays a minor role in Switzerland, as private owners more often engage forest enterprises or independent contractors.	The little self-employment that exists and doesn't show in the statistics is even declining as more and more private forest owners tend to live in cities or suburban areas.
Employment in management of protected areas	No official data exists	

#### Other general comments to the table

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## 14 Table T14 – Policy and legal framework

### 14.1 FRA 2010 Categories and definitions

Term	Definition
Forest policy	A set of orientations and principles of actions adopted by public authorities in harmony with national socio-economic and environmental policies in a given country to guide future decisions in relation to the management, use and conservation of forest and tree resources for the benefit of society.
Forest policy statement	A document that describes the objectives, priorities and means for implementation of the forest policy.
National forest programme (nfp)	A generic expression that refers to a wide range of approaches towards forest policy formulation, planning and implementation at national and sub-national levels. The national forest programme provides a framework and guidance for country-driven forest sector development with participation of all stakeholders and in consistence with policies of other sectors and international policies.
Law (Act or Code) on forest	A set of rules enacted by the legislative authority of a country regulating the access, management, conservation and use of forest resources.

### 14.2 Data for Table T14

Indicate the existence of the following (2008)			
<b>Forest policy statement with national scope</b>		Yes	
	X	No	
If Yes above, provide:	Year of endorsement		
	Reference to document		
<b>National forest programme (nfp)</b>	X	Yes	
		No	
If Yes above, provide:	Name of nfp in country	Swiss National Forest Programme (Swiss NFP)	
	Starting year	2004	
	Current status		In formulation
		X	In implementation
			Under revision
Reference to document or web site	<a href="http://www.bafu.admin.ch/wald/01152/01154/index.html?lang=en">http://www.bafu.admin.ch/wald/01152/01154/index.html?lang=en</a>		
<b>Law (Act or Code) on forest with national scope</b>	X	Yes, specific forest law exists	
		Yes, but rules on forests are incorporated in other (broader) legislation	
		No, forest issues are not regulated by national legislation	
If Yes above, provide:	Year of enactment	1991	
	Year of latest amendment	2008	
	Reference to document	<a href="http://www.admin.ch/ch/f/rs/c921_0.html">http://www.admin.ch/ch/f/rs/c921_0.html</a> (Federal Law on Forests) <a href="http://www.admin.ch/ch/f/rs/c921_01.html">http://www.admin.ch/ch/f/rs/c921_01.html</a> (Ordinance on Forests)	

<b>In case the responsibility for forest policy- and/or forest law-making is decentralized, please indicate the existence of the following and explain in the comments below the table how the responsibility for forest policy- and law-making is organized in your country.</b>	
<b>Sub-national forest policy statements</b>	<input type="checkbox"/> Yes
	<input checked="" type="checkbox"/> No
If Yes above, indicate the number of regions/states/provinces with forest policy statements	
<b>Sub-national Laws (Acts or Codes) on forest</b>	<input checked="" type="checkbox"/> Yes
	<input type="checkbox"/> No
If Yes above, indicate the number of regions/states/provinces with Laws on forests	26

### 14.3 Comments to Table T14

<b>Variable / category</b>	<b>Comments related to data, definitions, etc.</b>
Forest policy statement with national scope	Main elements of forest policy in Switzerland: Constitution (article 77 on Forests): (1) The Federation provides for the fulfillment of the forest's protective, economic and welfare functions. (2) The Federation establishes principles for the protection of forest. (3) The Federation furthers measures for the preservation of forest. National Law on Forests and Ordinance on Forests National forest programme (nfp)
National forest programme (nfp)	The nfp forms the basis for the orientation of the Swiss Confederation's forest policy from 2004 to 2015 (but is not legally binding)
Law (Act or Code) on forest with national scope	National Law on Forests Ordinance on Forests
Sub-national forest policy statements	
Sub-national Laws (Acts or Codes) on forest	Each of the 26 Cantons (sub-national level) has its own Law on Forests within the range of the National Law.

<b>Other general comments to the table</b>

## 15 Table T15 – Institutional framework

### 15.1 FRA 2010 Categories and definitions

Term	Definition
Minister responsible for forest policy-making	Minister holding the main responsibility for forest issues and the formulation of the forest policy.
Head of Forestry	The Head of Forestry is the Government Officer responsible for implementing the mandate of the public administration related to forests.
Level of subordination	Number of administrative levels between the Head of Forestry and the Minister.
University degree	Qualification provided by University after a minimum of 3 years of post secondary education.

### 15.2 Data for Table T15

Table 15a – Institutions

FRA 2010 Category	2008
Minister responsible for forest policy formulation : please provide full title	Moritz Leuenberger, Head of Department of Environment, Transport, Energy and Communications (DETEC) and Federal Councillor.
Level of subordination of Head of Forestry within the Ministry	1 <sup>st</sup> level subordination to Minister
	X 2 <sup>nd</sup> level subordination to Minister
	3 <sup>rd</sup> level subordination to Minister
	4 <sup>th</sup> or lower level subordination to Minister
Other public forest agencies at national level	None
Institution(s) responsible for forest law enforcement	Cantons (at sub-national level, 26 units)

Table 15b – Human resources

FRA 2010 Category	Human resources within public forest institutions					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Total staff	n.a.	n.a.	n.a.	n.a.	360	15%
...of which with university degree or equivalent	n.a.	n.a.	n.a.	n.a.	300	n.a.

Notes:

1. Includes human resources within public forest institutions at sub-national level
2. Excludes people employed in State-owned enterprises, education and research, as well as temporary / seasonal workers.

**15.3 Comments to Table T15**

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Minister responsible for forest policy formulation		
Level of subordination of Head of Forestry within the Ministry	Reorganisation in 2006 changed the level of subordination of Head of Forestry from 1 <sup>st</sup> level to 2 <sup>nd</sup> level subordination to Minister.	
Other public forest agencies at national level		
Institution(s) responsible for forest law enforcement	The Confederation supervises the implementation of the forest law and implements the aspects he is directly responsible for. The Cantons shall implement the forest law and draw up necessary regulations (except direct Confederation aspects).	
Human resources within public forest institutions	No proper data available (estimation)	In the last years a diminution of the number of human resources can be observed.

Other general comments to the table

## 16 Table T16 – Education and research

### 16.1 FRA 2010 Categories and definitions

Term	Definition
Forest-related education	Post-secondary education programme with focus on forests and related subjects.
Doctor's degree (PhD)	University (or equivalent) education with a total duration of about 8 years.
Master's degree (MSc) or equivalent	University (or equivalent) education with a total duration of about five years.
Bachelor's degree (BSc) or equivalent	University (or equivalent) education with a duration of about three years.
Technician certificate or diploma	Qualification issued from a technical education institution consisting of 1 to 3 years post secondary education.
Publicly funded forest research centers	Research centers primarily implementing research programmes on forest matters. Funding is mainly public or channelled through public institutions.

### 16.2 National data

#### 16.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Forestry Training Centre, Lyss, Switzerland	H	Graduation of students in forest-related education	2000, 2005, 2008	
Forestry Training Centre, Maienfeld, Switzerland	H	Graduation of students in forest-related education	2000, 2005, 2008	
Bern applied University Swiss collage of agriculture SCA	H	Graduation of students in forest-related education	2000, 2005, 2008	
Swiss Federal Institute of technology, FIT	H	Graduation of students in forest-related education, Professionals working in publicly funded forest research centres	2000, 2005, 2008	
Swiss Federal Institute for Forest, Snow and Landscape Research, WSL	H	Professionals working in publicly funded forest research centres	2000, 2005, 2008	

**16.2.2 Original data****16.3 Analysis and processing of national data****16.3.1 Estimation and forecasting****16.4 Data for Table T16**

FRA 2010 Category	Graduation <sup>1)</sup> of students in forest-related education					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Master's degree (MSc) or equivalent	43	23	39	18	4	75
Bachelor's degree (BSc) or equivalent	n.a.	n.a.	n.a.	n.a.	59	32.2
Forest technician certificate / diploma	41	0	46	2.2	35	2.9
FRA 2010 Category	Professionals working in publicly funded forest research centres <sup>2)</sup>					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Doctor's degree (PhD)	62.2	4.0	56.8	10.6	50.8	11.0
Master's degree (MSc) or equivalent	121.5	28.1	105.5	31.3	119.2	34.1
Bachelor's degree (BSc) or equivalent	9.0	0.0	10.0	0.0	12.0	0.0

Notes:

1. Graduation refers to the number of students that have successfully completed a Bachelor's or higher degree or achieved a certificate or diploma as forest technician.
2. Covers degrees in all sciences, not only forestry.

**16.5 Comments to Table T16**

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Graduation of students in forest-related education		Due to the end of the Forest Science curriculum in 2007 and the beginning of a new Environmental Science Curriculum with a Major in Forest and Landscape Management, student numbers declined for some time but are recovering again.
Professionals working in public forest research centres		

**Other general comments to the table**

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## 17 Table T17 – Public revenue collection and expenditure

### 17.1 FRA 2010 Categories and definitions

Category	Definition
Forest revenue	All government revenue collected from the domestic production and trade of forest products and services. For this purpose, forest products include: roundwood; sawnwood; wood-based panels; pulp and paper; and non-wood forest products. As far as possible, this should include revenue collected by all levels of government (i.e. central, regional/provincial and municipal level), but it should exclude the income of publicly owned business entities.
Public expenditure	All government expenditure on forest related activities (further defined below).
Operational expenditure (sub-category to Public expenditure)	All government expenditure on public institutions solely engaged in the forest sector. Where the forest administration is part of a larger public agency (e.g. department or ministry), this should only include the forest sector component of the agency's total expenditure. As far as possible, this should also include other institutions (e.g. in research, training and marketing) solely engaged in the forest sector, but it should exclude the expenditure of publicly owned business entities.
Transfer payments (sub-category to Public expenditure)	All government expenditure on direct financial incentives paid to non-government and private-sector institutions, enterprises communities or individuals operating in the forest sector to implement forest related activities.
Domestic funding	Public expenditure funded from domestic public financial resources, including: retained forest revenue; forest-related funds; and allocations from the national budget (i.e. from non-forest sector public revenue sources).
External funding	Public expenditure funded from grants and loans from donors, non-governmental organisations, international lending agencies and international organisations, where such funds are channelled through national public institutions.

### 17.2 National data

#### 17.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
FOEL, Federal office for the environment: "Annuaire 2008, La forêt et le bois Jahrbuch Wald und Holz 2008"	H			
Intern annual reports: Federal Office for the Environment FOEN, Forest Division	H			
Federal Database ARAMIS: The ARAMIS information system contains information regarding research projects and assessments that are either run or funded by the Federal Administration.	H			The ARAMIS Web site: <a href="http://www.aramis.admin.ch">www.aramis.admin.ch</a>

## 17.2.2 Classification and definitions

National class	Definition
Domestic funding	Same as FRA.
External funding	Same as FRA.

## 17.3 Analysis and processing of national data

Not necessary.

## 17.4 Data for Table T17

Table 17a - Forest revenues

FRA 2010 Categories	Revenues (1000 local currency)	
	2000	2005
Forest revenue	n.a.	n.a.

Table 17b - Public expenditure in forest sector by funding source

FRA 2010 Categories	Domestic funding (1000 local currency)		External funding (1000 local currency)		Total (1000 local currency)	
	2000	2005	2000	2005	2000	2005
Operational expenditure	3 400	3 200	0	0	3 400	3 200
Transfer payments	252 900	134 400	0	0	252 900	134 400
<b>Total public expenditure</b>	256 300	137 600	0	0	256 300	137 600
If transfer payments are made for forest management and conservation, indicate for what specific objective(s) - Please tick all that apply.	<input checked="" type="checkbox"/>	Reforestation				
	<input checked="" type="checkbox"/>	Afforestation				
	<input checked="" type="checkbox"/>	Forest inventory and/or planning				
	<input checked="" type="checkbox"/>	Conservation of forest biodiversity				
	<input type="checkbox"/>	Protection of soil and water				
	<input checked="" type="checkbox"/>	Forest stand improvement				
	<input checked="" type="checkbox"/>	Establishment or maintenance of protected areas				
	<input checked="" type="checkbox"/>	Other, specify below				
	Protection against natural hazard					

### 17.5 Comments to Table T17

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Forest revenue		
Operational expenditure	Data includes only the expenditure from the Federal Office for the Environment FOEN	
Transfer payments	Data includes only the transfer payments from the Federal Office for the Environment FOEN	

Other general comments to the table