



Food and Agriculture
Organization of the
United Nations

Global Forest Resources Assessment 2020

Report

Denmark

Rome, 2020



FAO has been monitoring the world's forests at 5 to 10 year intervals since 1946. The Global Forest Resources Assessments (FRA) are now produced every five years in an attempt to provide a consistent approach to describing the world's forests and how they are changing. The FRA is a country-driven process and the assessments are based on reports prepared by officially nominated National Correspondents. If a report is not available, the FRA Secretariat prepares a desk study using earlier reports, existing information and/or remote sensing based analysis.

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Introduction

Report preparation and contact persons

The present report was prepared by the following person(s)

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Introductory text

Place an introductory text on the content of this report

1 Forest extent, characteristics and changes

1a Extent of forest and other wooded land

National data

Data sources

1990	References	Nielsen et al., 2013, Denmark's National Inventory Report 2013. Emission Inventories 1990-2011 - Submitted under the United Nations Framework Convention on Climate Change and the Kyoto Protocol. Aarhus University, DCE – Danish Centre for Environment and Energy, 1202pp. Scientific Report from DCE – Danish Centre for Environment and Energy. www.dmu.dk/Pub/SR56.pdf . Skove og plantager 1990, Skov- og Naturstyrelsen og Danmarks Statistik 1994.
	Methods used	Registers/questionnaires, Full-cover forest/vegetation maps
	Additional comments	Estimation of forest land cover prior to the initiation of the NFI in 2002 based on a questionnaire surveys. The survey in 1990 was a questionnaire survey, where forest owners reported the forest area as well as species and age class distributions. To obtain consistency between the questionnaire surveys and the later NFI for the national carbon reporting, the forest area was mapped using satellite imagery using Landsat 5 data. The reporting is based on this data and that's the reason for the inconsistency with prior reported forest area. Other wooded land area was analyzed from topographic maps and expert opinions.

2000	References	Denmark's National Inventory Report 2013. Emission Inventories 1990-2011 - Submitted under the United Nations Framework Convention on Climate Change and the Kyoto Protocol. Aarhus University, DCE – Danish Centre for Environment and Energy, 1202pp. Scientific Report from DCE – Danish Centre for Environment and Energy. www.dmu.dk/Pub/SR56.pdf . Danmarks Statistik, Skov & Landskab og Skov- og Naturstyrelsen, 2002: Skove og plantager 2000. Danmarks Statistik, Skov & Landskab, Skov- og Naturstyrelsen. København. 171 sider.
	Methods used	Full-cover forest/vegetation maps, Registers/questionnaires
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2005	References	Annual report of the NFI results: Thomas Nord-Larsen, Vivian Kvist Johannsen, Bruno Bilde Jørgensen og Annemarie Bastrup-Birk (2008): Skove og plantager 2006, Skov & Landskab, Hørsholm, 2008. 185 s. ill. (https://ign.ku.dk/samarbejde-raadgivning/myndighedsbetjening/skovovervaagning/skove-og-plantager-2006.pdf) General description of the NFI methods: Nord-Larsen, T & Johannsen, VK 2016, Danish National Forest Inventory: Design and calculations. IGN Report, Department of Geosciences and Natural Resource Management, University of Copenhagen. (http://static-curis.ku.dk/portal/files/164970017/Danish_National_Forest_Inventory.pdf)
	Methods used	National Forest Inventory
	Additional comments	Minor differences to the original publication of results are due to improvements to the database and calculations. Plantation forest is here defined as planted forest of non-indigenous species, as planted forest with indigenous species will, in time, attain characteristics of natural forests.

2006	References	<p>Annual report of the NFI results: Thomas Nord-Larsen, Vivian Kvist Johannsen, Bruno Bilde Jørgensen og Annemarie Bastrup-Birk (2008): Skove og plantager 2006, Skov & Landskab, Hørsholm, 2008. 185 s. ill. (https://ign.ku.dk/samarbejde-raadgivning/myndighedsbetjening/skovovervaagning/skove-og-plantager-2006.pdf)</p> <p>General description of the NFI methods: Nord-Larsen, T & Johannsen, VK 2016, Danish National Forest Inventory: Design and calculations. IGN Report, Department of Geosciences and Natural Resource Management, University of Copenhagen. (http://static-curis.ku.dk/portal/files/164970017/Danish_National_Forest_Inventory.pdf)</p>
	Methods used	National Forest Inventory
	Additional comments	Small differences from the national reports (Skove og plantager 2006) are due to later improvements to data, calculations and definitions. Plantation forest is here defined as planted forest of non-indigenous species, as planted forest with indigenous species will, in time, attain characteristics of natural forests.

2007	References	<p>General description of the NFI methods: Nord-Larsen, T & Johannsen, VK 2016, Danish National Forest Inventory: Design and calculations. IGN Report, Department of Geosciences and Natural Resource Management, University of Copenhagen. (http://static-curis.ku.dk/portal/files/164970017/Danish_National_Forest_Inventory.pdf)</p>
	Methods used	National Forest Inventory
	Additional comments	No national report was made for 2007

2008	References	<p>Annual report of the NFI results: Nord-Larsen, T., Johannsen, V. K., Vesterdal, L., Jørgensen, B. B., & Bastrup-Birk, A. (2009). Skove og plantager 2008. Skov & Landskab, Københavns Universitet. (http://ign.ku.dk/samarbejde-raadgivning/myndighedsbetjening/skovovervaagning/skove-og-plantager-2008.pdf)</p> <p>General description of the NFI methods: Nord-Larsen, T & Johannsen, VK 2016, Danish National Forest Inventory: Design and calculations. IGN Report, Department of Geosciences and Natural Resource Management, University of Copenhagen. (http://static-curis.ku.dk/portal/files/164970017/Danish_National_Forest_Inventory.pdf)</p>
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2009	References	<p>Annual report of the NFI results: Nord-Larsen, T, Bastrup-Birk, A, Thomsen, IM, Jørgensen, BB & Johannsen, VK 2010, Skove & plantager 2009. Skov & Landskab, Københavns Universitet. (http://ign.ku.dk/samarbejde-raadgivning/myndighedsbetjening/skovovervaagning/skove-og-plantager-2009.pdf)</p> <p>General description of the NFI methods: Nord-Larsen, T & Johannsen, VK 2016, Danish National Forest Inventory: Design and calculations. IGN Report, Department of Geosciences and Natural Resource Management, University of Copenhagen. (http://static-curis.ku.dk/portal/files/164970017/Danish_National_Forest_Inventory.pdf)</p>
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2012	References	<p>Annual report of the NFI results: Johannsen, VK, Nord-Larsen, T, Riis-Nielsen, T, Suadicani, K & Jørgensen, BB 2013, Skove og plantager 2012. Skov & Landskab, Københavns Universitet. (http://ign.ku.dk/samarbejde-raadgivning/myndighedsbetjening/skovovervaagning/skove-og-plantager-2012.pdf)</p> <p>General description of the NFI methods: Nord-Larsen, T & Johannsen, VK 2016, Danish National Forest Inventory: Design and calculations. IGN Report, Department of Geosciences and Natural Resource Management, University of Copenhagen. (http://static-curis.ku.dk/portal/files/164970017/Danish_National_Forest_Inventory.pdf)</p>
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2016	References	Annual report of the NFI results: Nord-Larsen, T, Johannsen, VK, Arndal, MF, Riis-Nielsen, T, Thomsen, IM, Suadicani, K & Jørgensen, BB 2017, Skove og plantager 2016: Forest statistics 2016. Frederiksberg (http://ign.ku.dk/samarbejde-raadgivning/myndighedsbetjening/skovovervaagning/skove-og-plantager-2016.pdf) General description of the NFI methods: Nord-Larsen, T & Johannsen, VK 2016, Danish National Forest Inventory: Design and calculations. IGN Report, Department of Geosciences and Natural Resource Management, University of Copenhagen. (http://static-curis.ku.dk/portal/files/164970017/Danish_National_Forest_Inventory.pdf)
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Classifications and definitions

	National class	Definition
1990	Forest	The national forest definition is in line with the FAO definition: 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 in situ. The forest definition include Christmas tree plantations as well as temporarily and permanently unstocked areas necessary for forest managements (fire breaks, forest roads etc.). It does not include land that is predominantly under agricultural or urban land use.
	Other wooded land	The definition is in line with the FAO definition: 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 ; 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.
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2008	National class	Definition
	Forest	The national forest definition is in line with the FAO definition: 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 in situ. The forest definition include Christmas tree plantations as well as temporarily and permanently unstocked areas necessary for forest managements (fire breaks, forest roads etc.). It does not include land that is predominantly under agricultural or urban land use.
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2009	National class	Definition
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	National class	Definition
2010	Forest	The national forest definition is in line with the FAO definition: 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 in situ. The forest definition include Christmas tree plantations as well as temporarily and permanently unstocked areas necessary for forest managements (fire breaks, forest roads etc.). It does not include land that is predominantly under agricultural or urban land use.
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	National class	Definition
2011	Forest	The national forest definition is in line with the FAO definition: 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 in situ. The forest definition include Christmas tree plantations as well as temporarily and permanently unstocked areas necessary for forest managements (fire breaks, forest roads etc.). It does not include land that is predominantly under agricultural or urban land use.
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	National class	Definition
2012	Forest	The national forest definition is in line with the FAO definition: 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 in situ. The forest definition include Christmas tree plantations as well as temporarily and permanently unstocked areas necessary for forest managements (fire breaks, forest roads etc.). It does not include land that is predominantly under agricultural or urban land use.
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2013	National class	Definition
	Forest	The national forest definition is in line with the FAO definition: 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 in situ. The forest definition include Christmas tree plantations as well as temporarily and permanently unstocked areas necessary for forest managements (fire breaks, forest roads etc.). It does not include land that is predominantly under agricultural or urban land use.
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	Other land	All land that is not classified as "Forest" or "Other wooded land"

2014	National class	Definition
	Forest	The national forest definition is in line with the FAO definition: 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 in situ. The forest definition include Christmas tree plantations as well as temporarily and permanently unstocked areas necessary for forest managements (fire breaks, forest roads etc.). It does not include land that is predominantly under agricultural or urban land use.
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	Other land	All land that is not classified as "Forest" or "Other wooded land"

2015	National class	Definition
	Forest	The national forest definition is in line with the FAO definition: 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 in situ. The forest definition include Christmas tree plantations as well as temporarily and permanently unstocked areas necessary for forest managements (fire breaks, forest roads etc.). It does not include land that is predominantly under agricultural or urban land use.
	Other wooded land	The definition is in line with the FAO definition: 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 ; 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"

2016	National class	Definition
	Forest	The national forest definition is in line with the FAO definition: 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 in situ. The forest definition include Christmas tree plantations as well as temporarily and permanently unstocked areas necessary for forest managements (fire breaks, forest roads etc.). It does not include land that is predominantly under agricultural or urban land use.
	Other wooded land	

		The definition is in line with the FAO definition: 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 ; 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"

	National class	Definition
2017	Forest	The national forest definition is in line with the FAO definition: 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 in situ. The forest definition include Christmas tree plantations as well as temporarily and permanently unstocked areas necessary for forest managements (fire breaks, forest roads etc.). It does not include land that is predominantly under agricultural or urban land use.
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Original data and reclassification

	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Forest	Other wooded land	Other land
1990	Forest	531.44	100.00 %	0.00 %	0.00 %
	Other wooded land	136.00	0.00 %	100.00 %	0.00 %
	Other land	3 531.56	0.00 %	0.00 %	100.00 %
	Total	4 199.00	531.44	136.00	3 531.56

	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Forest	Other wooded land	Other land
2000	Forest	571.60	100.00 %	0.00 %	0.00 %
	Other wooded land	136.00	0.00 %	100.00 %	0.00 %
	Other land	3 491.40	0.00 %	0.00 %	100.00 %
	Total	4 199.00	571.60	136.00	3 491.40

2005	Classifications and definitions	FRA classes
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	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Forest	Other wooded land	Other land
	Forest	538.06	100.00 %	0.00 %	0.00 %
	Other wooded land	39.58	0.00 %	100.00 %	0.00 %
	Other land	3 621.35	0.00 %	0.00 %	100.00 %
	Total	4 198.99	538.06	39.58	3 621.35

2006	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Forest	Other wooded land	Other land
	Forest	538.07	100.00 %	0.00 %	0.00 %
	Other wooded land	41.89	0.00 %	100.00 %	0.00 %
	Other land	3 619.04	0.00 %	0.00 %	100.00 %
	Total	4 199.00	538.07	41.89	3 619.04

2007	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Forest	Other wooded land	Other land
	Forest	553.73	100.00 %	0.00 %	0.00 %
	Other wooded land	44.27	0.00 %	100.00 %	0.00 %
	Other land	3 601.00	0.00 %	0.00 %	100.00 %
	Total	4 199.00	553.73	44.27	3 601.00

2008	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Forest	Other wooded land	Other land
	Forest	573.20	100.00 %	0.00 %	0.00 %
	Other wooded land	47.66	0.00 %	100.00 %	0.00 %
	Other land	3 578.14	0.00 %	0.00 %	100.00 %
	Total	4 199.00	573.20	47.66	3 578.14

2009	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Forest	Other wooded land	Other land
	Forest	581.37	100.00 %	0.00 %	0.00 %
	Other wooded land	48.18	0.00 %	100.00 %	0.00 %
	Other land	3 569.45	0.00 %	0.00 %	100.00 %
	Total	4 199.00	581.37	48.18	3 569.45

2010	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Forest	Other wooded land	Other land
	Forest	586.49	100.00 %	0.00 %	0.00 %
	Other wooded land	46.90	0.00 %	100.00 %	0.00 %
	Other land	3 565.61	0.00 %	0.00 %	100.00 %
	Total	4 199.00	586.49	46.90	3 565.61

2011	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Forest	Other wooded land	Other land
	Forest	600.57	100.00 %	0.00 %	0.00 %
	Other wooded land	44.32	0.00 %	100.00 %	0.00 %
	Other land	3 554.11	0.00 %	0.00 %	100.00 %
	Total	4 199.00	600.57	44.32	3 554.11

2012	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Forest	Other wooded land	Other land
	Forest	608.51	100.00 %	0.00 %	0.00 %
	Other wooded land	45.37	0.00 %	100.00 %	0.00 %
	Other land	3 545.12	0.00 %	0.00 %	100.00 %
	Total	4 199.00	608.51	45.37	3 545.12

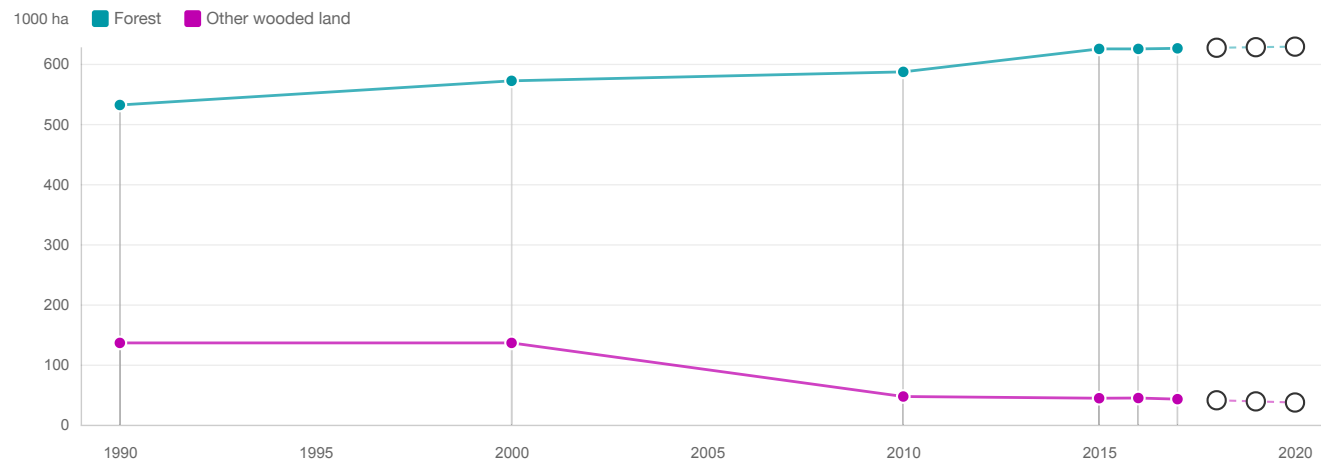
2013	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Forest	Other wooded land	Other land
	Forest	615.57	100.00 %	0.00 %	0.00 %
	Other wooded land	43.63	0.00 %	100.00 %	0.00 %
	Other land	3 539.80	0.00 %	0.00 %	100.00 %
	Total	4 199.00	615.57	43.63	3 539.80

2014	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Forest	Other wooded land	Other land
	Forest	620.63	100.00 %	0.00 %	0.00 %
	Other wooded land	42.65	0.00 %	100.00 %	0.00 %
	Other land	3 535.72	0.00 %	0.00 %	100.00 %
	Total	4 199.00	620.63	42.65	3 535.72

2015	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Forest	Other wooded land	Other land
	Forest	624.68	100.00 %	0.00 %	0.00 %
	Other wooded land	44.08	0.00 %	100.00 %	0.00 %
	Other land	3 530.24	0.00 %	0.00 %	100.00 %
	Total	4 199.00	624.68	44.08	3 530.24

2016	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Forest	Other wooded land	Other land
	Forest	624.66	100.00 %	0.00 %	0.00 %
	Other wooded land	44.39	0.00 %	100.00 %	0.00 %
	Other land	3 529.95	0.00 %	0.00 %	100.00 %
	Total	4 199.00	624.66	44.39	3 529.95

	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Forest	Other wooded land	Other land
2017	Forest	625.60	100.00 %	0.00 %	0.00 %
	Other wooded land	42.53	0.00 %	100.00 %	0.00 %
	Other land	3 530.87	0.00 %	0.00 %	100.00 %
	Total	4 199.00	625.60	42.53	3 530.87



FRA categories	Area (1000 ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Forest (a)	531.44	571.60	586.49	624.68	624.66	625.60	626.56	627.50	628.44
Other wooded land (a)	136.00	136.00	46.90	44.08	44.39	42.53	40.67	38.81	36.95
Other land (c-a-b)	3 531.56	3 491.40	3 565.61	3 530.24	3 529.95	3 530.87	3 531.77	3 532.69	3 533.61
Total land area (c)	4 199.00	4 199.00	4 199.00	4 199.00	4 199.00	4 199.00	4 199.00	4 199.00	4 199.00

The FAOSTAT land area figure for the year 2015 is used for all reference years

Climatic domain	% of forest area 2015	Override value
Boreal	0.00	
Temperate	100.00	
Sub-tropical	0.00	
Tropical	0.00	

Comments

1b Forest characteristics

National data

Data sources

1990	References	Nielsen et al., 2013, Denmark's National Inventory Report 2013. Emission Inventories 1990-2011 - Submitted under the United Nations Framework Convention on Climate Change and the Kyoto Protocol. Aarhus University, DCE – Danish Centre for Environment and Energy, 1202pp. Scientific Report from DCE – Danish Centre for Environment and Energy. www.dmu.dk/Pub/SR56.pdf . Skove og plantager 1990, Skov- og Naturstyrelsen og Danmarks Statistik 1994.
	Methods used	Registers/questionnaires, Full-cover forest/vegetation maps
	Additional comments	Estimation of forest land cover prior to the initiation of the NFI in 2002 based on a questionnaire surveys. The survey in 1990 was a questionnaire survey, where forest owners reported the forest area as well as species and age class distributions. To obtain consistency between the questionnaire surveys and the later NFI for the national carbon reporting, the forest area was mapped using satellite imagery using Landsat 5 data. The reporting is based on this data and that's the reason for the inconsistency with prior reported forest area. Other wooded land area was analyzed from topographic maps and expert opinions.
2000	References	Denmark's National Inventory Report 2013. Emission Inventories 1990-2011 - Submitted under the United Nations Framework Convention on Climate Change and the Kyoto Protocol. Aarhus University, DCE – Danish Centre for Environment and Energy, 1202pp. Scientific Report from DCE – Danish Centre for Environment and Energy. www.dmu.dk/Pub/SR56.pdf . Danmarks Statistik, Skov & Landskab og Skov- og Naturstyrelsen, 2002: Skove og plantager 2000. Danmarks Statistik, Skov & Landskab, Skov- og Naturstyrelsen. København. 171 sider.
	Methods used	Full-cover forest/vegetation maps, Registers/questionnaires
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2005	References	Annual report of the NFI results: Thomas Nord-Larsen, Vivian Kvist Johannsen, Bruno Bilde Jørgensen og Annemarie Bastrup-Birk (2008): Skove og plantager 2006, Skov & Landskab, Hørsholm, 2008. 185 s. ill. (https://ign.ku.dk/samarbejde-raadgivning/myndighedsbetjening/skovovervaagning/skove-og-plantager-2006.pdf) General description of the NFI methods: Nord-Larsen, T & Johannsen, VK 2016, Danish National Forest Inventory: Design and calculations. IGN Report, Department of Geosciences and Natural Resource Management, University of Copenhagen. (http://static-curis.ku.dk/portal/files/164970017/Danish_National_Forest_Inventory.pdf)
	Methods used	National Forest Inventory
	Additional comments	Minor differences to the original publication of results are due to improvements to the database and calculations. Plantation forest is here defined as planted forest of non-indigenous species, as planted forest with indigenous species will, in time, attain characteristics of natural forests.
2006	References	

		<p>Annual report of the NFI results: Thomas Nord-Larsen, Vivian Kvist Johannsen, Bruno Bilde Jørgensen og Annemarie Bastrup-Birk (2008): Skove og plantager 2006, Skov & Landskab, Hørsholm, 2008. 185 s. ill. (https://ign.ku.dk/samarbejde-raadgivning/myndighedsbetjening/skovovervaagning/skove-og-plantager-2006.pdf)</p> <p>General description of the NFI methods: Nord-Larsen, T & Johannsen, VK 2016, Danish National Forest Inventory: Design and calculations. IGN Report, Department of Geosciences and Natural Resource Management, University of Copenhagen. (http://static-curis.ku.dk/portal/files/164970017/Danish_National_Forest_Inventory.pdf)</p>
	Methods used	National Forest Inventory
	Additional comments	Small differences from the national reports (Skove og plantager 2006) are due to later improvements to data, calculations and definitions. Plantation forest is here defined as planted forest of non-indigenous species, as planted forest with indigenous species will, in time, attain characteristics of natural forests.

2007	References	<p>General description of the NFI methods: Nord-Larsen, T & Johannsen, VK 2016, Danish National Forest Inventory: Design and calculations. IGN Report, Department of Geosciences and Natural Resource Management, University of Copenhagen. (http://static-curis.ku.dk/portal/files/164970017/Danish_National_Forest_Inventory.pdf)</p>
	Methods used	National Forest Inventory
	Additional comments	No national report was made for 2007

2008	References	<p>Annual report of the NFI results: Nord-Larsen, T., Johannsen, V. K., Vesterdal, L., Jørgensen, B. B., & Bastrup-Birk, A. (2009). Skove og plantager 2008. Skov & Landskab, Københavns Universitet. (http://ign.ku.dk/samarbejde-raadgivning/myndighedsbetjening/skovovervaagning/skove-og-plantager-2008.pdf)</p> <p>General description of the NFI methods: Nord-Larsen, T & Johannsen, VK 2016, Danish National Forest Inventory: Design and calculations. IGN Report, Department of Geosciences and Natural Resource Management, University of Copenhagen. (http://static-curis.ku.dk/portal/files/164970017/Danish_National_Forest_Inventory.pdf)</p>
	Methods used	National Forest Inventory
	Additional comments	Small differences from the national reports (Skove og plantager 2008) are due to later improvements to data, calculations and definitions.

2009	References	<p>Annual report of the NFI results: Nord-Larsen, T, Bastrup-Birk, A, Thomsen, IM, Jørgensen, BB & Johannsen, VK 2010, Skove & plantager 2009. Skov & Landskab, Københavns Universitet. (http://ign.ku.dk/samarbejde-raadgivning/myndighedsbetjening/skovovervaagning/skove-og-plantager-2009.pdf)</p> <p>General description of the NFI methods: Nord-Larsen, T & Johannsen, VK 2016, Danish National Forest Inventory: Design and calculations. IGN Report, Department of Geosciences and Natural Resource Management, University of Copenhagen. (http://static-curis.ku.dk/portal/files/164970017/Danish_National_Forest_Inventory.pdf)</p>
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2010	References	<p>Annual report of the NFI results: Nord-Larsen, T, Johannsen, VK, Riis-Nielsen, T & Jørgensen, BB 2012, Skove og plantager 2010. Skov & Landskab, Københavns Universitet. (http://ign.ku.dk/samarbejde-raadgivning/myndighedsbetjening/skovovervaagning/skove-og-plantager-2010.pdf)</p> <p>General description of the NFI methods: Nord-Larsen, T & Johannsen, VK 2016, Danish National Forest Inventory: Design and calculations. IGN Report, Department of Geosciences and Natural Resource Management, University of Copenhagen. (http://static-curis.ku.dk/portal/files/164970017/Danish_National_Forest_Inventory.pdf)</p>
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2011	References	<p>Annual report of the NFI results: Nord-Larsen, T, Johannsen, VK, Riis-Nielsen, T, Suadicani, K & Jørgensen, BB 2013, Skove og plantager 2011. Skov & Landskab, Københavns Universitet. (http://ign.ku.dk/samarbejde-raadgivning/myndighedsbetjening/skovovervaagning/skove-og-plantager-2011.pdf)</p> <p>General description of the NFI methods: Nord-Larsen, T & Johannsen, VK 2016, Danish National Forest Inventory: Design and calculations. IGN Report, Department of Geosciences and Natural Resource Management, University of Copenhagen. (http://static-curis.ku.dk/portal/files/164970017/Danish_National_Forest_Inventory.pdf)</p>
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2012	References	<p>Annual report of the NFI results: Johannsen, VK, Nord-Larsen, T, Riis-Nielsen, T, Suadicani, K & Jørgensen, BB 2013, Skove og plantager 2012. Skov & Landskab, Københavns Universitet. (http://ign.ku.dk/samarbejde-raadgivning/myndighedsbetjening/skovovervaagning/skove-og-plantager-2012.pdf)</p> <p>General description of the NFI methods: Nord-Larsen, T & Johannsen, VK 2016, Danish National Forest Inventory: Design and calculations. IGN Report, Department of Geosciences and Natural Resource Management, University of Copenhagen. (http://static-curis.ku.dk/portal/files/164970017/Danish_National_Forest_Inventory.pdf)</p>
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2013	References	<p>Annual report of the NFI results: Nord-Larsen, T, Johannsen, VK, Riis-Nielsen, T, Thomsen, IM, Larsen, K & Jørgensen, BB 2014, Skove og plantager 2013. Skov & Landskab, Københavns Universitet. (http://ign.ku.dk/samarbejde-raadgivning/myndighedsbetjening/skovovervaagning/skove-og-plantager-2013.pdf)</p> <p>General description of the NFI methods: Nord-Larsen, T & Johannsen, VK 2016, Danish National Forest Inventory: Design and calculations. IGN Report, Department of Geosciences and Natural Resource Management, University of Copenhagen. (http://static-curis.ku.dk/portal/files/164970017/Danish_National_Forest_Inventory.pdf)</p>
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2014	References	Annual report of the NFI results: Nord-Larsen, T, Johannsen, VK, Riis-Nielsen, T, Thomsen, IM, Schou, E, Suadicani, K & Jørgensen, BB 2015, Skove og plantager 2014. Skov & Landskab. (http://ign.ku.dk/samarbejde-raadgivning/myndighedsbetjening/skovovervaagning/skove-og-plantager-2014.pdf) General description of the NFI methods: Nord-Larsen, T & Johannsen, VK 2016, Danish National Forest Inventory: Design and calculations. IGN Report, Department of Geosciences and Natural Resource Management, University of Copenhagen. (http://static-curis.ku.dk/portal/files/164970017/Danish_National_Forest_Inventory.pdf)
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	Methods used	National Forest Inventory
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2016	References	Annual report of the NFI results: Nord-Larsen, T, Johannsen, VK, Arndal, MF, Riis-Nielsen, T, Thomsen, IM, Suadicani, K & Jørgensen, BB 2017, Skove og plantager 2016: Forest statistics 2016. Frederiksberg (http://ign.ku.dk/samarbejde-raadgivning/myndighedsbetjening/skovovervaagning/skove-og-plantager-2016.pdf) General description of the NFI methods: Nord-Larsen, T & Johannsen, VK 2016, Danish National Forest Inventory: Design and calculations. IGN Report, Department of Geosciences and Natural Resource Management, University of Copenhagen. (http://static-curis.ku.dk/portal/files/164970017/Danish_National_Forest_Inventory.pdf)
	Methods used	National Forest Inventory
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2017	References	General description of the NFI methods: Nord-Larsen, T & Johannsen, VK 2016, Danish National Forest Inventory: Design and calculations. IGN Report, Department of Geosciences and Natural Resource Management, University of Copenhagen. (http://static-curis.ku.dk/portal/files/164970017/Danish_National_Forest_Inventory.p)

	Methods used	National Forest Inventory
	Additional comments	Plantation forest is here defined as planted forest of non-indigenous species, as planted forest with indigenous species will, in time, attain characteristics of natural forests.

Classifications and definitions

	National class	Definition
1990	Forest	The national forest definition is in line with the FAO definition: 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 in situ. The forest definition include Christmas tree plantations as well as temporarily and permanently unstocked areas necessary for forest managements (fire breaks, forest roads etc.). It does not include land that is predominantly under agricultural or urban land use.
	Other wooded land	The definition is in line with the FAO definition: 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 ; 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"

	National class	Definition
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	National class	Definition
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	Other wooded land	

		The definition is in line with the FAO definition: 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 ; 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.
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	National class	Definition
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	Other land	All land that is not classified as "Forest" or "Other wooded land"

2013	National class	Definition
	Forest	The national forest definition is in line with the FAO definition: 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 in situ. The forest definition include Christmas tree plantations as well as temporarily and permanently unstocked areas necessary for forest managements (fire breaks, forest roads etc.). It does not include land that is predominantly under agricultural or urban land use.
	Other wooded land	The definition is in line with the FAO definition: 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 ; 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"

2014	National class	Definition
	Forest	The national forest definition is in line with the FAO definition: 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 in situ. The forest definition include Christmas tree plantations as well as temporarily and permanently unstocked areas necessary for forest managements (fire breaks, forest roads etc.). It does not include land that is predominantly under agricultural or urban land use.
	Other wooded land	The definition is in line with the FAO definition: 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 ; 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"

2015	National class	Definition
	Forest	The national forest definition is in line with the FAO definition: 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 in situ. The forest definition include Christmas tree plantations as well as temporarily and permanently unstocked areas necessary for forest managements (fire breaks, forest roads etc.). It does not include land that is predominantly under agricultural or urban land use.
	Other wooded land	The definition is in line with the FAO definition: 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 ; 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"

2016	National class	Definition
	Forest	The national forest definition is in line with the FAO definition: 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 in situ. The forest definition include Christmas tree plantations as well as temporarily and permanently unstocked areas necessary for forest managements (fire breaks, forest roads etc.). It does not include land that is predominantly under agricultural or urban land use.
	Other wooded land	

		The definition is in line with the FAO definition: 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 ; 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"

	National class	Definition
2017	Forest	The national forest definition is in line with the FAO definition: 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 in situ. The forest definition include Christmas tree plantations as well as temporarily and permanently unstocked areas necessary for forest managements (fire breaks, forest roads etc.). It does not include land that is predominantly under agricultural or urban land use.
	Other wooded land	The definition is in line with the FAO definition: 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 ; 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"

Original data and reclassification

1990	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Naturally regenerating forest	Plantation forest	Other planted forest
	Forest	531.44	%	%	%
	Total	531.44	–	–	–

2000	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Naturally regenerating forest	Plantation forest	Other planted forest
	Forest	571.60	%	%	%
	Total	571.60	–	–	–

2005	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Naturally regenerating forest	Plantation forest	Other planted forest
	Forest	538.06	20.67 %	49.55 %	29.78 %
	Total	538.06	111.22	266.61	160.23

Plantation forest	Area (1000 ha)	...of which introduced
Forest	266.61	100.00 %
Total	266.61	266.61

2006	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Naturally regenerating forest	Plantation forest	Other planted forest
	Forest	538.07	20.74 %	50.03 %	29.23 %
	Total	538.07	111.60	269.20	157.28

Plantation forest	Area (1000 ha)	...of which introduced
Forest	269.20	100.00 %
Total	269.20	269.20

2007	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Naturally regenerating forest	Plantation forest	Other planted forest
	Forest	553.73	21.08 %	49.59 %	29.32 %
	Total	553.73	116.73	274.59	162.35

Plantation forest	Area (1000 ha)	...of which introduced
Forest	274.59	100.00 %
Total	274.59	274.59

2008	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Naturally regenerating forest	Plantation forest	Other planted forest
	Forest	573.20	21.90 %	48.16 %	29.94 %
	Total	573.20	125.53	276.05	171.62

Plantation forest	Area (1000 ha)	...of which introduced
Total	276.05	276.05

Plantation forest	Area (1000 ha)	...of which introduced
Forest	276.05	100.00 %
Total	276.05	276.05

2009	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Naturally regenerating forest	Plantation forest	Other planted forest
	Forest	581.37	23.07 %	47.16 %	29.77 %
	Total	581.37	134.12	274.17	173.07

Plantation forest	Area (1000 ha)	...of which introduced
Forest	274.17	100.00 %
Total	274.17	274.17

2010	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Naturally regenerating forest	Plantation forest	Other planted forest
	Forest	586.49	23.79 %	46.54 %	29.67 %
	Total	586.49	139.53	272.95	174.01

Plantation forest	Area (1000 ha)	...of which introduced
Forest	272.95	100.00 %
Total	272.95	272.95

2011	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Naturally regenerating forest	Plantation forest	Other planted forest
	Forest	600.57	24.28 %	45.99 %	29.72 %
	Total	600.57	145.82	276.20	178.49

Plantation forest	Area (1000 ha)	...of which introduced
Total	276.20	276.20

Plantation forest	Area (1000 ha)	...of which introduced
Forest	276.20	100.00 %
Total	276.20	276.20

2012	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Naturally regenerating forest	Plantation forest	Other planted forest
	Forest	608.51	24.55 %	45.54 %	29.91 %
	Total	608.51	149.39	277.12	182.01

Plantation forest	Area (1000 ha)	...of which introduced
Forest	277.12	100.00 %
Total	277.12	277.12

2013	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Naturally regenerating forest	Plantation forest	Other planted forest
	Forest	615.57	25.32 %	44.72 %	29.96 %
	Total	615.57	155.86	275.28	184.42

Plantation forest	Area (1000 ha)	...of which introduced
Forest	275.28	100.00 %
Total	275.28	275.28

2014	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Naturally regenerating forest	Plantation forest	Other planted forest
	Forest	620.63	26.05 %	43.90 %	30.05 %
	Total	620.63	161.67	272.46	186.50

Plantation forest	Area (1000 ha)	...of which introduced
Total	272.46	272.46

Plantation forest	Area (1000 ha)	...of which introduced
Forest	272.46	100.00 %
Total	272.46	272.46

2015	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Naturally regenerating forest	Plantation forest	Other planted forest
	Forest	624.68	26.37 %	43.67 %	29.96 %
	Total	624.68	164.73	272.80	187.15

Plantation forest	Area (1000 ha)	...of which introduced
Forest	272.80	100.00 %
Total	272.80	272.80

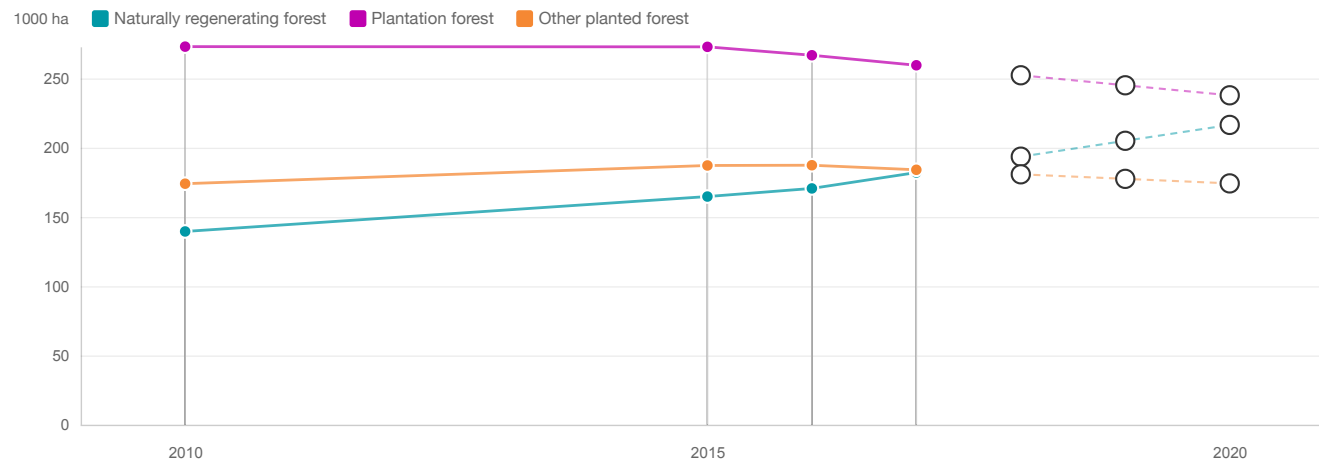
2016	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Naturally regenerating forest	Plantation forest	Other planted forest
	Forest	624.66	27.31 %	42.70 %	29.99 %
	Total	624.66	170.59	266.73	187.34

Plantation forest	Area (1000 ha)	...of which introduced
Forest	266.73	100.00 %
Total	266.73	266.73

2017	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Naturally regenerating forest	Plantation forest	Other planted forest
	Forest	625.60	29.10 %	41.48 %	29.42 %
	Total	625.60	182.05	259.50	184.05

Plantation forest	Area (1000 ha)	...of which introduced
Total	259.50	259.50

Plantation forest	Area (1000 ha)	...of which introduced
Forest	259.50	100.00 %
Total	259.50	259.50



FRA categories	Forest area (1000 ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest (a)			139.53	164.73	170.59	182.05	193.52	204.98	216.44
Planted forest (b)	–	–	446.96	459.95	454.07	443.55	433.06	422.55	412.04
Plantation forest			272.95	272.80	266.73	259.50	252.28	245.05	237.82
...of which introduced species			272.95	272.80	266.73	259.50	252.28	245.05	237.82
Other planted forest			174.01	187.15	187.34	184.05	180.78	177.50	174.22
Total (a+b)	–	–	586.49	624.68	624.66	625.60	626.58	627.53	628.48
Total forest area	531.44	571.60	586.49	624.68	624.66	625.60	626.56	627.50	628.44

Comments

1c Primary forest and special forest categories

National Data

Data sources + type of data source eg NFI, etc

Temporarily unstocked areas in 1990 and 2000 are provided from Larsen and Johannsen (2002, table 1.1)

Estimates of primary forest are not available for 1990 and 2000.

Estimates of primary forest for 2010 and 2015 are based on observations with the Danish NFI

Larsen PH and Johannsen VK (eds.) 2002. Skove og plantager 2000. Danmarks Statistik, Skov & Landskab, Skov- og Naturstyrelsen. Copenhagen. <https://www.dst.dk/da/Statistik/Publikationer/VisPub?cid=3132>

National classification and definitions

The national definition is in line with the definition of the FAO

Original data

Temporarily unstocked areas in 1990 and 2000:

Larsen PH and Johannsen VK (eds.) 2002. Skove og plantager 2000. Danmarks Statistik, Skov & Landskab, Skov- og Naturstyrelsen. Copenhagen. <https://www.dst.dk/da/Statistik/Publikationer/VisPub?cid=3132>

Calculations of temporarily unstocked and primary forest areas:

http://static-curis.ku.dk/portal/files/164970017/Danish_National_Forest_Inventory.pdf

Definitions of temporarily unstocked and primary forest areas:

http://static-curis.ku.dk/portal/files/185871055/NFI_instruks_rapport_web_2.pdf

Analysis and processing of national data

Estimation and forecasting

Estimation of primary forest and temporarily stocked areas was made using ratio estimators for different forest categories.

Forecasting of primary forest and temporarily stocked areas in 2020 is based on data collected with the NFI in 2013-2017, assuming no change in the primary and unstocked forest areas.

Reclassification into FRA 2020 categories

No reclassification was necessary.

FRA categories	Area (1000 ha)				
	1990	2000	2010	2015	2020
Primary forest			27.93	22.09	21.14
Temporarily unstocked and/or recently regenerated	6.00	5.00	10.89	16.25	17.74
Bamboos	0.00	0.00	0.00	0.00	0.00
Mangroves	0.00	0.00	0.00	0.00	0.00
Rubber wood	0.00	0.00	0.00	0.00	0.00

Comments

1d Annual forest expansion, deforestation and net change

National Data

Data sources + type of data source eg NFI, etc

Forest area change 1990-2000 is based on satellite imagery and other data sources in relation to the national carbon accounting (Nielsen et al. 2016, below).

Forest area change 2000-2010 is based partly on the Danish NFI and partly on the national carbon accounting (Nielsen et al. 2016, below). Specifically, the forest area in 2010 is estimated from the NFI, whereas the forest area in 2000 is based on the carbon reporting. Deforestation 2000-2010 is based on the carbon accounting and finally afforestation calculated as the sum of net change and deforestation. It should be noted that the estimates are not consistent with the carbon accounting as this is based on information from the national cadastre to yield a consistent land-use matrix across all landuses.

Forest area change 2010-2015 is based partly on the Danish NFI and partly on the national carbon accounting (Nielsen et al. 2016, below). Specifically, the forest area in 2010 and 2015 is estimated from the NFI. Deforestation 2010-2015 is based on the carbon accounting and finally afforestation calculated as the sum of net change and deforestation. It should be noted that the estimates are not consistent with the carbon accounting as this is based on information from the national cadastre to yield a consistent land-use matrix across all landuses.

Forest area change 2015-2020 is based partly on the Danish NFI and partly on the national carbon accounting (Nielsen et al. 2016, below). Specifically, the forest area in 2015 is estimated from the NFI and the forest area in 2020 is extrapolated using the mechanism in the FRA2020. Deforestation 2015-2020 is based on the average deforestation in the ten-year period 2006-2015 in the carbon accounting. Finally afforestation calculated as the sum of net change and deforestation. It should be noted that the estimates are not consistent with the carbon accounting as this is based on information from the national cadastre to yield a consistent land-use matrix across all landuses.

In the estimates of deforestation we opted for the estimates in the carbon accounting. The reason is that deforestation is rare and therefore NFI based estimates would be highly uncertain and could further only be obtained for permanent plots, monitored during 2002-2017 (i.e. estimates of deforestation/afforestation could only be obtained for 2010-2015).

Nielsen, O.-K., Plejdrup, M.S., Winther, M., Nielsen, M., Gyldenkærne, S., Mikkelsen, M.H., Albrektsen, R., Thomsen, M., Hjelgaard, K., Fauser, P., Bruun, H.G., Johannsen, V.K., Nord-Larsen, T., Vesterdal, L., Callesen, I., Schou, E., Suadicani, K., Rasmussen, E., Petersen, S.B., Baunbæk, L. & Hansen, M.G. 2016. Denmark's National Inventory Report 2015 and 2016. Emission Inventories 1990-2014 - Submitted under the United Nations Framework Convention on Climate Change and the Kyoto Protocol. Aarhus University, DCE –Danish Centre for Environment and Energy, 943pp. Scientific Report from DCE – Danish Centre for Environment and Energy. <http://dce2.au.dk/pub/SR189.pdf>

National classification and definitions

Definitions are in line with the FAO forest definitions. Natural expansion is very rare in Denmark and therefore set to 0.

Original data

Forest areas in 1990 and 2000 was based on the national carbon accounting (Nielsen et al. 2016).

Forest areas in 2005, 2010, and 2015 were based on estimates from the Danish NFI.

Deforestation was based on the national carbon accounting (Nielsen et al. 2016).

Analysis and processing of national data

Estimation and forecasting

Annual change was estimated as the average annual change between subsequent inventories. Deforestation was estimated as part of the national carbon accounting based on observed changes in the national cadastre. To obtain consistent estimates, afforestation was estimated as the sum of annual deforestation and annual change.

Forecasting of the forest area in 2020 is extrapolated using the mechanism in the FRA2020. Deforestation 2015-2020 is based on the average deforestation in the ten-year period 2006-2015 in the carbon accounting.

Reclassification into FRA 2020 categories

No reclassification was done

FRA categories	Area (1000 ha/year)			
	1990-2000	2000-2010	2010-2015	2015-2020
Forest expansion (a)	4.05	1.67	7.90	1.37
...of which afforestation	4.05	1.66	7.90	1.37
...of which natural expansion	0.00	0.00	0.00	0.00
Deforestation (b)	0.03	0.18	0.26	0.62
Forest area net change (a-b)	4.02	1.49	7.64	0.75

Comments

1e Annual reforestation

National Data

Data sources + type of data source eg NFI, etc

Annual reforestation in 1990-2000 was based on the national forest survey 2000 (Larsen and Johannsen 2002, table 1.3).

Annual reforestation in 2000-2010 and 2010-2015 was estimated from the records of the Danish NFI collected in 2010 and 2015.

Annual reforestation in 2015-2020 was estimated as the average reforestation in 2012-2017 based on data collected in 2017

Larsen PH and Johannsen VK (eds.) 2002. Skove og plantager 2000. Danmarks Statistik, Skov & Landskab, Skov- og Naturstyrelsen. Copenhagen. <https://www.dst.dk/da/Statistik/Publikationer/VisPub?cid=3132>

National classification and definitions

National classification and definitions are in line with FAO definitions of forest land

Original data

Forest survey 2000:

Larsen PH and Johannsen VK (eds.) 2002. Skove og plantager 2000. Danmarks Statistik, Skov & Landskab, Skov- og Naturstyrelsen. Copenhagen. <https://www.dst.dk/da/Statistik/Publikationer/VisPub?cid=3132>

Description of the NFI and related calculations:

http://static-curis.ku.dk/portal/files/164970017/Danish_National_Forest_Inventory.pdf

Analysis and processing of national data

Estimation and forecasting

Annual reforestation in 2015-2020 was estimated as the average reforestation in 2012-2017 based on data collected in 2017

Reclassification into FRA 2020 categories

No reclassification was carried out

FRA categories	Area (1000 ha/year)			
	1990-2000	2000-2010	2010-2015	2015-2020
Reforestation	4.29	3.47	3.44	3.58

Comments

1f Other land with tree cover

National Data

Data sources + type of data source eg NFI, etc

Areas with tree orchards were collected from Statistics Denmark: Statistikbanken.dk/table AFG07: Det dyrkede areal

National classification and definitions

We defined tree orchards as areas with agricultural production of apples, pears and cherries.

Original data

No corrections were done to the original data

Analysis and processing of national data

Estimation and forecasting

We assumed an unchanged area of tree orchards from 2017 to 2020

Reclassification into FRA 2020 categories

No reclassification was done

FRA categories	Area (1000 ha)				
	1990	2000	2010	2015	2020
Palms (a)	0.00	0.00	0.00	0.00	0.00
Tree orchards (b)	7.00	8.00	3.78	2.88	2.67
Agroforestry (c)	0.00	0.00	0.00	0.00	0.00
Trees in urban settings (d)					
Other (specify in comments) (e)	0.00	0.00	0.00	0.00	0.00
Total (a+b+c+d+e)	7.00	8.00	3.78	2.88	2.67
Other land area	3 531.56	3 491.40	3 565.61	3 530.24	3 533.61

Comments

2 Forest growing stock, biomass and carbon

2a Growing stock

National Data

Data sources + type of data source eg NFI, etc

Forest survey 1990:

Simonsen B, Jørgensen HC, Mikkelsen L (eds.) 1990. Skove og plantager 1990. Skov- og Naturstyrelsen, Danmarks Statistik, Copenhagen. <http://www.dst.dk/Site/Dst/Udgivelser/GetPubFile.aspx?id=4813&sid=skov1990>

Forest survey 2000:

Larsen PH and Johannsen VK (eds.) 2002. Skove og plantager 2000. Danmarks Statistik, Skov & Landskab, Skov- og Naturstyrelsen. Copenhagen. <https://www.dst.dk/da/Statistik/Publikationer/VisPub?cid=3132>

Description of the NFI and related calculations:

http://static-curis.ku.dk/portal/files/164970017/Danish_National_Forest_Inventory.pdf

National classification and definitions

Registrations on NFI plots included the species type of trees:

1) Foreign

2) Indigenous

Registrations on NFI plots included the origin of the stand:

1) Planted

2) Planted 1. generation

3) Planted not 1. generation

4) Sown

5) Sown, 1. generation

6) Sown, not 1. generation

7) Planted under shelter

8) Natural regeneration, overholders

9) Natural regeneartion, succession

10) Natural regeneartion, unevenaged

11) Sprouting

12) Unknown origin

13) Auxillary areas

Original data

FOREIGN	origin_name	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017

FOREIGN	Planted	45,786	45,667	46,514	47,127	37,858	28,526	19,502	10,853					
	Planted, 1 gen					783	1,405	2,132	3,283	4,137	4,507	4,975	5,207	5,218
	Planted, not 1 gen	76	63	42	40	8,413	17,497	27,142	35,193	45,137	44,486	44,383	43,125	42,065
	Sown	18	14	13	4									
	Sown, 1 gen					18	30	29	41	47	29	74	75	70
	Sown, not 1 gen					75	75	77	149	191	121	141	184	109
	Planted under shelter	45	34	32	0	5	5	4	7	7	3	3	3	
	Natregen under shelter	205	235	380	423	518	542	595	528	544	583	619	624	579
	Natregen, succession	594	635	694	688	587	473	333	240	315	351	343	366	441
	Natregen unevenaged	139	126	147	246	335	474	703	944	967	993	908	779	561
	Coppice	4	3	3	3	1	2	5	10	17	29	40	38	40
	Unknown	382	410	360	354	434	658	931	1,094	1,600	2,032	2,522	3,044	3,763
	Auxillary areas	70	101	94	62	59	47	21	21	35	35	35	25	27
INDIGENOUS	Planted	35,858	35,331	36,629	39,271	31,771	23,680	16,963	9,136					
	Planted, 1 gen					581	1,001	1,371	2,207	3,270	3,644	4,588	5,499	6,012
	Planted, not 1 gen	81	71	27	29	6,656	14,458	21,520	28,734	37,897	38,505	37,974	37,023	35,471
	Sown	538	412	353	240	119								
	Sown, 1 gen					35	35	35	36	43	13	15	15	36
	Sown, ej 1 gen					101	100	190	269	386	323	328	237	265
	Planted under shelter		0	48	46	61	60	60	17	17				
	Natregen under shelter	7,312	7,246	8,391	9,341	10,940	10,856	11,426	11,174	11,736	11,289	11,425	11,202	11,999
	Natregen, succession	5,033	5,099	5,668	5,490	4,655	3,432	2,566	1,739	1,540	1,571	1,567	1,663	1,810
	Natregen unevenaged	1,996	1,742	1,367	2,075	3,173	4,717	6,149	8,273	8,798	9,448	8,738	8,048	6,982
	Coppice	429	500	526	379	475	552	586	669	786	740	911	930	851
	Ukendt	9,376	8,786	7,294	7,160	6,571	7,397	8,053	8,598	8,560	9,622	10,536	12,399	14,682
	Auxillary areas	173	133	137	35	44	35	34	17	15	5	59	68	63
UNKNOWN	Planted	616	534	507	439	362	146	94	49					
	Planted, 1 gen					25	45	49	70	78	66	58	70	76
	Planted, not 1 gen	3	2			26	176	219	315	407	426	300	422	349
	Sown	2	1											
	Sown, 1 gen					0	0	0	0	0	0	0	0	
	Sown, not 1 gen									14	14	14	14	14

	Natregen under shelter	4	10	29	36	46	56	62	43	54	66	70	78	83
	Natregen, succession	317	344	352	341	305	243	176	114	92	105	135	121	159
	Natregen unevenaged	12	9	17	53	85	130	173	200	212	197	153	124	104
	Coppice	15	11	4	0	15	17	16	16	16	1			
	Unknown	37	37	39	58	71	67	70	122	136	122	250	297	271
	Auxillary areas	1	1	1	1	0								

Analysis and processing of national data

Estimation and forecasting

Total forest growing stock in 1990 and 2000 was estimated from standard yield tables and knowledge on the area distribution to species and age classes from the two forest surveys in 1990 and 2000. The average volume per hectare was subsequently upscaled with the satellite based forest area.

Total growing stock in forests and other wooded land in 2010 and onwards was estimated from the registrations with the Danish NFI

Forecasting was done assuming unchanged growing stock per unit area and using the projections from FRA2020

Reclassification into FRA 2020 categories

Naturally regenerating forest was defined as forest that originated from natural seeding or sprouting from stumps.

Planted forest was defined as forest originating from planting or sowing.

Plantation forest was defined as planted forest of non-native tree species

FRA categories	Growing stock m ³ /ha (over bark)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest			154.02	151.22	140.51	129.69	122.16	115.52	109.59
Planted forest			213.53	231.00	237.19	244.59	250.89	257.53	264.49
...of which plantation forest			178.35	193.40	196.68	200.23	206.28	212.69	219.49
...of which other planted forest			268.78	285.86	294.87	307.14	313.14	319.44	325.91
Forest	123.93	160.16	199.37	209.96	210.80	211.16	211.15	211.16	211.14
Other wooded land	27.21	27.21	23.03	10.21	9.91	10.35	10.33	10.31	10.28

FRA categories	Total growing stock (million m ³ over bark)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest			21.49	24.91	23.97	23.61	23.64	23.68	23.72
Planted forest			95.44	106.25	107.70	108.49	108.65	108.82	108.98
...of which plantation forest			48.68	52.76	52.46	51.96	52.04	52.12	52.20
...of which other planted forest			46.77	53.50	55.24	56.53	56.61	56.70	56.78
Forest	65.86	91.55	116.93	131.16	131.68	132.10	132.30	132.50	132.69
Other wooded land	3.70	3.70	1.08	0.45	0.44	0.44	0.42	0.40	0.38

Comments

2b Growing stock composition

National Data

Data sources + type of data source eg NFI, etc

Total forest growing stock in 1990 and 2000 was estimated from standard yield tables and knowledge on the area distribution to species and age classes from the two forest surveys in 1990 and 2000.

Total growing stock in forests and other wooded land in 2010 and onwards was estimated from the registrations with the Danish NFI

Forest survey 1990:

Simonsen B, Jørgensen HC, Mikkelsen L (eds.) 1990. Skove og plantager 1990. Skov- og Naturstyrelsen, Danmarks Statistik, Copenhagen. <http://www.dst.dk/Site/Dst/Udgivelser/GetPubFile.aspx?id=4813&sid=skov1990>

Forest survey 2000:

Larsen PH and Johannsen VK (eds.) 2002. Skove og plantager 2000. Danmarks Statistik, Skov & Landskab, Skov- og Naturstyrelsen. Copenhagen. <https://www.dst.dk/da/Statistik/Publikationer/VisPub?cid=3132>

Description of the NFI and related calculations:

http://static-curis.ku.dk/portal/files/164970017/Danish_National_Forest_Inventory.pdf

National classification and definitions

National classification is in line with FAO classification and definitions

Original data

Forest survey 1990:

Simonsen B, Jørgensen HC, Mikkelsen L (eds.) 1990. Skove og plantager 1990. Skov- og Naturstyrelsen, Danmarks Statistik, Copenhagen. <http://www.dst.dk/Site/Dst/Udgivelser/GetPubFile.aspx?id=4813&sid=skov1990>

Forest survey 2000:

Larsen PH and Johannsen VK (eds.) 2002. Skove og plantager 2000. Danmarks Statistik, Skov & Landskab, Skov- og Naturstyrelsen. Copenhagen. <https://www.dst.dk/da/Statistik/Publikationer/VisPub?cid=3132>

Description of the NFI and related calculations:

http://static-curis.ku.dk/portal/files/164970017/Danish_National_Forest_Inventory.pdf

Analysis and processing of national data

Estimation and forecasting

Total forest growing stock in 1990 and 2000 was estimated from standard yield tables and knowledge on the area distribution to species and age classes from the two forest surveys in 1990 and 2000. The average volume per hectare was subsequently upscaled with the satellite based forest area.

Total growing stock in forests and other wooded land in 2010 and onwards was estimated from the registrations with the Danish NFI

Forecasting was done assuming no changes in the growing stock per unit area and the extrapolation of the forest area in FRA2020.

Reclassification into FRA 2020 categories

A few tree species were registered at the genus-level (denoted sp. in the table).

- 1) *Betula* sp. will mainly consist of *Betula pendula*, but includes some *Betula pubescens*
- 2) *Populus* sp. will mainly consist of *Populus canescens* but also include many other species and hybrids
- 3) *Salix* sp. is almost exclusively *Salix caprea* as this is the only common *Salix* species considered a tree, but may include a range of other introduced species.
- 4) *Larix* sp. consists of *Larix decidua*, *Larix kaempferi* and their hybrid

FRA categories	Scientific name	Common name	Growing stock in forest (million m ³ over bark)				
			1990	2000	2010	2015	2020
Native tree species							
#1 Ranked in terms of volume	Fagus sylvatica	European beech	20.64	21.47	29.02	34.78	34.64
#2 Ranked in terms of volume	Quercus robur	Pedunculate oak	4.30	5.68	11.66	12.43	13.64
#3 Ranked in terms of volume	Acer pseudoplatanus	Sycamore maple	0.95	1.42	4.97	6.91	6.79
#4 Ranked in terms of volume	Betula sp.	Birch			4.39	5.87	6.37
#5 Ranked in terms of volume	Fraxinus excelsior	Ash	1.19	1.52	5.43	4.62	4.06
#6 Ranked in terms of volume	Alnus glutinosa	Common alder			3.19	2.84	3.04
#7 Ranked in terms of volume	Populus sp.	Poplar			1.03	1.39	1.34
#8 Ranked in terms of volume	Populus tremula	Aspen			0.89	0.92	1.16
#9 Ranked in terms of volume	Salix sp.	Willow			0.79	0.91	0.99
#10 Ranked in terms of volume	Querus rubra	Red oak			0.36	0.67	0.79
Remaining native tree species			1.43	4.09	2.88	3.32	3.59
Total volume of native tree species			28.51	34.18	64.61	74.66	76.41
Introduced tree species							
#1 Ranked in terms of volume	Picea abies	Norway spruce	22.55	29.57	21.49	23.76	23.09
#2 Ranked in terms of volume	Picea sitchensis	Sitka spruce	5.85	7.73	7.63	8.06	8.31
#3 Ranked in terms of volume	Pinus sylvestris	Scots pine			4.42	5.15	6.00
#4 Ranked in terms of volume	Larix sp.	Larch			3.86	4.29	4.37
#5 Ranked in terms of volume	Abies alba	Silver fir	3.70	5.18	3.75	3.49	3.50

FRA categories	Scientific name	Common name	Growing stock in forest (million m ³ over bark)				
			1990	2000	2010	2015	2020
Native tree species							
Remaining introduced tree species			5.25	14.88	11.17	11.75	11.01
Total volume of introduced tree species			37.35	57.36	52.32	56.50	56.28
Total growing stock			65.86	91.54	116.93	131.16	132.69

Comments

2c Biomass stock

National Data

Data sources + type of data source eg NFI, etc

Data on biomass in 1990 and 2000 was estimated from the national carbon accounting (Nielsen et al. 2016), assuming an average carbon content of 0.47 gC/g.

Data on biomass from 2010 was estimated based on results from the Danish NFI (Nord-Larsen and Johannsen 2016). Smaller differences to the national carbon accounting may be due to updated methods and databases.

National inventory report:

Nielsen, O.-K., Plejdrup, M.S., Winther, M., Nielsen, M., Gyldenkærne, S., Mikkelsen, M.H., Albrektsen, R., Thomsen, M., Hjelgaard, K., Fauser, P., Bruun, H.G., Johannsen, V.K., Nord-Larsen, T., Vesterdal, L., Callesen, I., Schou, E., Suadicani, K., Rasmussen, E., Petersen, S.B., Baunbæk, L. & Hansen, M.G. 2016. Denmark's National Inventory Report 2015 and 2016. Emission Inventories 1990-2014 - Submitted under the United Nations Framework Convention on Climate Change and the Kyoto Protocol. Aarhus University, DCE –Danish Centre for Environment and Energy, 943pp. Scientific Report from DCE – Danish Centre for Environment and Energy. <http://dce2.au.dk/pub/SR189.pdf>

General description of the NFI methods:

Nord-Larsen, T & Johannsen, VK 2016, Danish National Forest Inventory: Design and calculations. IGN Report, Department of Geosciences and Natural Resource Management, University of Copenhagen. (http://static-curis.ku.dk/portal/files/164970017/Danish_National_Forest_Inventory.pdf)

National classification and definitions

National classification and definitions are in line with those of the FAO

Original data

Original data of C-stocks may be found in Nielsen et al. 2016

Analysis and processing of national data

Estimation and forecasting

Data on biomass in 1990 and 2000 was estimated from the national carbon accounting (Nielsen et al. 2016), assuming an average carbon content of 0.47 gC/g.

Forecasting was done using NFI data from 2017 and the forecasted forest area from FRA2020, assuming an unchanged carbon stock per hectare

Reclassification into FRA 2020 categories

No reclassification was done

FRA categories	Forest biomass (tonnes/ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Above-ground biomass	100.74	100.47	106.86	112.15	112.38	112.58	112.76	112.93	113.10
Below-ground biomass	21.49	21.53	23.61	24.77	24.83	24.83	24.87	24.91	24.94
Dead wood	1.44	1.53	1.77	1.99	1.82	1.59	1.60	1.60	1.60

Comments

2d Carbon stock

National Data

Data sources + type of data source eg NFI, etc

Data on carbon stocks in 1990 and 2000 was collected from the national carbon accounting (Nielsen et al. 2016)

Data on carbon stocks from 2010 was estimated based on results from the Danish NFI (Nord-Larsen and Johannsen 2016). Smaller differences to the national carbon accounting may be due to updated methods and databases.

National inventory report:

Nielsen, O.-K., Plejdrup, M.S., Winther, M., Nielsen, M., Gyldenkærne, S., Mikkelsen, M.H., Albrektsen, R., Thomsen, M., Hjelgaard, K., Fauser, P., Bruun, H.G., Johannsen, V.K., Nord-Larsen, T., Vesterdal, L., Callesen, I., Schou, E., Suadicani, K., Rasmussen, E., Petersen, S.B., Baunbæk, L. & Hansen, M.G. 2016. Denmark's National Inventory Report 2015 and 2016. Emission Inventories 1990-2014 - Submitted under the United Nations Framework Convention on Climate Change and the Kyoto Protocol. Aarhus University, DCE –Danish Centre for Environment and Energy, 943pp. Scientific Report from DCE – Danish Centre for Environment and Energy. <http://dce2.au.dk/pub/SR189.pdf>

General description of the NFI methods:

Nord-Larsen, T & Johannsen, VK 2016, Danish National Forest Inventory: Design and calculations. IGN Report, Department of Geosciences and Natural Resource Management, University of Copenhagen. (http://static-curis.ku.dk/portal/files/164970017/Danish_National_Forest_Inventory.pdf)

National classification and definitions

National classification and definitions are in line with those of the FAO

Original data

Original data of C-stocks may be found in Nielsen et al. 2016

Analysis and processing of national data

Estimation and forecasting

Data on carbon stocks in 1990 and 2000 was collected from the national carbon accounting (Nielsen et al. 2016).

Forecasting was done using NFI data from 2017 and the forecasted forest area from FRA2020, assuming an unchanged carbon stock per hectare

Reclassification into FRA 2020 categories

No reclassification was made.

FRA categories	Forest carbon (tonnes/ha)									
	1990	2000	2010	2015	2016	2017	2018	2019	2020	
Carbon in above-ground biomass	47.35	47.22	50.22	52.71	52.82	52.91	52.91	52.91	52.91	52.91
Carbon in below-ground biomass	10.10	10.12	11.10	11.64	11.67	11.67	11.67	11.67	11.67	11.67
Carbon in dead wood	0.68	0.72	0.89	0.99	0.91	0.80	0.80	0.80	0.80	0.80
Carbon in litter	11.43	10.97	11.46	11.27	11.00	11.00	11.00	11.00	11.00	11.00
Soil carbon	171.83	173.29	174.47	174.82	174.85	174.85	174.85	174.85	174.85	174.85

Soil depth (cm) used for soil carbon estimates	100.00
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Comments

3 Forest designation and management

3a Designated management objective

National Data

Data sources + type of data source eg NFI, etc

The data used for estimation of areas with different designated management include the Danish NFI and an evaluation of the effort for protection of biodiversity in Danish forests 1992-2012 (Johannsen et al. 2013).

References:

Johannsen, V. K., Dippel, T. M. , Møller, P. F. , Heilmann-Clausen, J., Ejrnæs, R., Larsen, J. B., Raulund-Rasmussen, K., Rojas, S. K., Jørgensen, B. B., RiisNielsen, T., Bruun, H. H. K., Thomsen, P. F., Eskildsen, A., Fredshavn, J., Kjær, E. D., Nord-Larsen, T., Caspersen, O. H., Hansen, G. K. (2013): Evaluering af indsatsen for biodiversiteten i de danske skove 1992 - 2012. 90 s. ill.. <https://ign.ku.dk/formidling/publikationer/rapporter/filer-2013/evaluating-biodiversitet-1992-2012.pdf>

Nord-Larsen, T., & Johannsen, V. K. (2016). Danish National Forest Inventory: Design and calculations. Department of Geosciences and Natural Resource Management, University of Copenhagen. IGN Report. http://static-curis.ku.dk/portal/files/164970017/Danish_National_Forest_Inventory.pdf

National classification and definitions

PRODUCTION

Forest where the management objective is production of wood, fibre, bio-energy and/or **non wood forest products**. *For the Danish case most forest management aims at production of multiple goods, where production of wood, fibre and non-wood forest products are only some of the products. In this context we reported production as the designated management objective wherever no other objective is explicitly stated.*

PROTECTION OF SOIL AND WATER

Forest where the management objective is protection of soil and water. *For the Danish case, production of drinking water is an important function of forests. However, although forests are in many cases included in important water catchment areas (in Danish: særlige drikkevandsinteresser), this does not have implications for forest management. Hence we reported no areas designated for protection of soil and water.*

CONSERVATION OF BIODIVERSITY

Forest where the management objective is conservation of biological diversity. Includes but is not limited to areas designated for biodiversity conservation within the **protected areas**. *Conservation of biodiversity is an important function of many Danish forests. However, forest areas designated management for conservation of biodiversity in this context includes solely: strictly protected nature reserves (in Danish: fredede arealer) and protected nature reserves with untouched forest and ancient management forms (in Danish: urørt skov og areal udlagt til gamle driftsformer). The definition does not include forest nature types in Natura 2000 areas, as these may still be managed for forest products.*

SOCIAL SERVICES

Forest where the management objective is social services. *All Danish forests play a major role for recreation. However, few forests are managed solely for the recreative use. Exeptions may include Jægersborg Dyrehave and Århus Kommuneskove.*

MULTIPLE USE

Forest where the management objective is a combination of several purposes and where none of them is significantly more important than the other. *In reality all Danish forests are managed for multiple objectives including wood production, hunting, other recreation, biodiversity, landscape esthetics etc. However, such goals are seldom stated as the designated objective in management plans etc. However, the state forests are specifically managed with a stated objective of producing multiple goods. Hence, stateforests are here reported as having multiple use as a designated objective, except for those areas set aside for protection of biodiversity.*

Original data

Not applicable

Analysis and processing of national data

Estimation and forecasting

For the projection of areas designated for biodiversity conservation, we included recent assignment of 13.300 ha's of state forest as untouched forest and other biodiversity forest (<https://naturstyrelsen.dk/media/244781/endelig-udpegning-af-skov-til-biodiversitetsformaal-12-09-2018.pdf>).

Reclassification into FRA 2020 categories

Not applicable

Primary designated management objective

FRA 2020 categories	Forest area (1000 ha)				
	1990	2000	2010	2015	2020
Production (a)	417.32	453.53	470.41	502.17	504.25
Protection of soil and water (b)	0.00	0.00	0.00	0.00	0.00
Conservation of biodiversity (c)	0.37	18.41	21.35	21.37	31.91
Social Services (d)	0.00	0.00	0.00	0.00	0.00
Multiple use (e)	113.75	99.66	94.73	101.14	92.28
Other (specify in comments) (f)	0.00	0.00	0.00	0.00	0.00
None/unknown (g)	0.00	0.00	0.00	0.00	0.00
Total forest area	531.44	571.60	586.49	624.68	628.44

Total area with designated management objective

FRA 2020 categories	Forest area (1000 ha)				
	1990	2000	2010	2015	2020
Production	531.07	553.19	565.13	603.31	596.53
Protection of soil and water	0.00	219.96	227.57	242.19	247.22
Conservation of biodiversity	0.37	18.41	21.35	21.37	31.91
Social Services	114.01	114.01	109.10	110.78	109.33
Other (specify in comments)	0.00	0.00	0.00	0.00	0.00

Comments

According to the forest law, almost all Danish forest are managed for multiple use (forest Law §1: <https://www.retsinformation.dk/Forms/r0710.aspx?id=186419#ide1bc1530-7505-4b98-8556-1eccc6a4e211>). This is more evident for the state forests (<http://naturstyrelsen.dk/media/228912/naturstyrelsens-maal-og-resultatplan-2018.pdf>). However, as the overall objectives are not specific to individual areas we have not regarded multiple use as a primary designation although this may be argued to be the case for the majority of the forest area.

Many forests in Denmark were established between 1850-1950 with the objective of protecting against sand drift. However, this is no longer a designated objective.

3b Forest area within protected areas and forest area with long-term management plans

National Data

Data sources + type of data source eg NFI, etc

The data used for estimation forest area within protected areas include an evaluation of the effort for protection of biodiversity in Danish forests 1992-2012 (Johannsen et al. 2013) and mapping of forest habitat nature types.

Forest management planning was assessed in the forest survey in 2000 (Larsen and Johannsen 2002). The number of forest owners with a management plan was assessed in a questionnaire survey in 2012 (Nord-Larsen et al 214). However, this study did not evaluate the area under management plans but only the number of estates.

References:

Johannsen, V. K., Dippel, T. M., Møller, P. F., Heilmann-Clausen, J., Ejrnæs, R., Larsen, J. B., Raulund-Rasmussen, K., Rojas, S. K., Jørgensen, B. B., RiisNielsen, T., Bruun, H. H. K., Thomsen, P. F., Eskildsen, A., Fredshavn, J., Kjær, E. D., Nord-Larsen, T., Caspersen, O. H., Hansen, G. K. (2013): Evaluering af indsatsen for biodiversiteten i de danske skove 1992 - 2012. 90 s. ill.. <https://ign.ku.dk/formidling/publikationer/rapporter/filer-2013/evaluering-biodiversitet-1992-2012.pdf>

Thomas Nord-Larsen, Vivian Kvist Johannsen, Torben Riis-Nielsen, Iben M. Thomsen, Karsten Larsen og Bruno Bilde Jørgensen (2014): Skove og plantager 2013, Skov & Landskab, Frederiksberg, 2014. 65 s. ill.

National classification and definitions

Ia Strict Nature Reserve: Category **Ia** are strictly protected areas set aside to protect biodiversity and also possibly geological/geomorphical features, where human visitation, use and impacts are strictly controlled and limited to ensure protection of the conservation values. Such protected areas can serve as indispensable reference areas for scientific research and monitoring. *Include areas such as Suserup Forest and Strødam Reservatet that both are included in a specific conservation act.*

Ib Wilderness Area: Category **Ib** protected areas are usually large unmodified or slightly modified areas, retaining their natural character and influence without permanent or significant human habitation, which are protected and managed so as to preserve their natural condition. *Included areas set aside for untouched forest or ancient management forms.*

II National Park: Category **II** protected areas are large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible, spiritual, scientific, educational, recreational, and visitor opportunities. *National parks in Denmark do not necessarily include large natural or near-natural forests and the status of National park does not necessarily support development towards such conditions. The definition therefore does not include Danish National parks.*

III Natural Monument or Feature: Category **III** protected areas are set aside to protect a specific natural monument, which can be a landform, sea mount, submarine cavern, geological feature such as a cave or even a living feature such as an ancient grove. They are generally quite small protected areas and often have high visitor value. [more...](#)

IV Habitat/Species Management Area: Category **IV** protected areas aim to protect particular species or habitats and management reflects this priority. Many Category IV protected areas will need regular, active interventions to address the requirements of particular species or to maintain habitats, but this is not a requirement of the category. *Include forest habitats within N2000 areas*

Management plans: A plan is defined as a long term plan reaching 5-20 years into the future. The plan usually include a forest map, a list of management units (stands) and a plan detailing (expected) future action. The area under forest management plan was assessed in the 2000 questionnaire survey and again by Statistics Denmark and Forest and Landscape/University of Copenhagen in 2012. We have assumed that the area under forest management plan in 1990 and 2005 is unaltered and that forests included in the 2000 survey include all those likely to have a management plan. To our knowledge there are no formal registration of management plans in Denmark.

Original data

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Analysis and processing of national data

Estimation and forecasting

In the estimation of protected areas, we included 1) known forests with strict nature protection (Suserup Forest and Strødam Forest Reserve), 2) areas set aside for protection of biodiversity including untouched forests and areas set aside for ancient management forms, and 3) forest habitat types within Natura 2000 areas. Due to the use of different data sources there will be some overlaps of areas included in the different categories. To avoid overlaps we used the protected area of oak scrubs from Johannsen et al. (2013) excluded mapped oak scrub forest habitat types.

Forest management plans were assessed in 2000 and again in 2012. Between 1990 and 2000 we assumed no change. The 2012 study included only the number of forest estates - not the area covered by the management plans. We assumed an even distribution of forests with management plans within each forest size class and assumed that the area of forest under management plan does not change in from 2010 to 2020.

Reclassification into FRA 2020 categories

Ia Strict Nature Reserve: Category **Ia** are strictly protected areas set aside to protect biodiversity and also possibly geological/geomorphical features, where human visitation, use and impacts are strictly controlled and limited to ensure protection of the conservation values. Such protected areas can serve as indispensable reference areas for scientific research and monitoring. *Include areas such as Suserup Forest and Strødam Reservatet that both are included in a specific conservation act.*

Ib Wilderness Area: Category **Ib** protected areas are usually large unmodified or slightly modified areas, retaining their natural character and influence without permanent or significant human habitation, which are protected and managed so as to preserve their natural condition. *Included areas set aside for untouched forest or ancient management forms.*

II National Park: Category **II** protected areas are large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible, spiritual, scientific, educational, recreational, and visitor opportunities. *National parks in Denmark do not necessarily include large natural or near-natural forests and the status of National park does not necessarily support development towards such conditions. The definition therefore does not include Danish National parks.*

III Natural Monument or Feature: Category **III** protected areas are set aside to protect a specific natural monument, which can be a landform, sea mount, submarine cavern, geological feature such as a cave or even a living feature such as an ancient grove. They are generally quite small protected areas and often have high visitor value. *The category does not apply to nature protection in Denmark.*

IV Habitat/Species Management Area: Category **IV** protected areas aim to protect particular species or habitats and management reflects this priority. Many Category IV protected areas will need regular, active interventions to address the requirements of particular species or to maintain habitats, but this is not a requirement of the category. *Include forest habitats within N2000 areas*

FRA categories	Area (1000 ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Forest area within protected areas	0.37	18.41	41.69	41.85	41.85	41.85	41.85	52.39	52.39
Forest area with long-term forest management plan	254.00	254.00	311.00	311.00	311.00	311.00	311.00	311.00	311.00
...of which in protected areas									

Comments

4 Forest ownership and management rights

4a Forest ownership

National Data

Data sources + type of data source eg NFI, etc

Data on forest area according to ownership was collected in the two questionnaire surveys conducted in 1990 and 2000. However, due to uncertainty regarding the actual forest definition applied and inconsistencies in total forest area, the forest area was reestimated from satellite imagery as part of the National carbon inventory.

After initiation of the Danish NFI information on forest ownership is collected on sample plots and the area estimated as part of the Danish NFI.

Forest survey 1990:

Simonsen B, Jørgensen HC, Mikkelsen L (eds.) 1990. Skove og plantager 1990. Skov- og Naturstyrelsen, Danmarks Statistik, Copenhagen. <http://www.dst.dk/Site/Dst/Udgivelser/GetPubFile.aspx?id=4813&sid=skov1990>

Forest survey 2000:

Larsen PH and Johannsen VK (eds.) 2002. Skove og plantager 2000. Danmarks Statistik, Skov & Landskab, Skov- og Naturstyrelsen. Copenhagen. <https://www.dst.dk/da/Statistik/Publikationer/VisPub?cid=3132>

National Inventory report 2016:

Nielsen, O.-K., Plejdrup, M.S., Winther, M., Nielsen, M., Gyldenkærne, S., Mikkelsen, M.H., Albrektsen, R., Thomsen, M., Hjelgaard, K., Fauser, P., Bruun, H.G., Johannsen, V.K., Nord-Larsen, T., Vesterdal, L., Callesen, I., Schou, E., Suadicani, K., Rasmussen, E., Petersen, S.B., Baunbæk, L. & Hansen, M.G. 2016. Denmark's National Inventory Report 2015 and 2016. Emission Inventories 1990-2014 - Submitted under the United Nations Framework Convention on Climate Change and the Kyoto Protocol. Aarhus University, DCE –Danish Centre for Environment and Energy, 943pp. Scientific Report from DCE – Danish Centre for Environment and Energy. <http://dce2.au.dk/pub/SR189.pdf>

Description of the NFI and related calculations:

Nord-Larsen, T & Johannsen, VK 2016, Danish National Forest Inventory: Design and calculations. IGN Report, Department of Geosciences and Natural Resource Management, University of Copenhagen. (http://static-curis.ku.dk/portal/files/164970017/Danish_National_Forest_Inventory.pdf)

National classification and definitions

The national classification generally follows the FAO definitions. However, as churches part of the national church are owned by the state/Ministry of Church, this category is reported as publically owned.

Original data

Row Labels	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Privat, person	307,334	310,989	324,771	347,605	361,029	368,031	373,311	375,852	367,711	366,054	362,082	356,290	351,019
Privat, selskab	31,176	35,173	40,439	39,874	40,961	42,101	47,541	50,954	63,129	65,222	71,887	75,827	79,968
Fond eller stiftelse	22,836	23,452	25,197	22,317	23,605	22,663	22,002	22,452	26,280	27,425	28,297	28,240	29,766
Skov- og Naturstyrelsen	131,414	125,918	120,275	115,214	108,636	109,103	110,775	109,334	111,782	114,702	113,887	115,518	117,194
Anden statslig	8,363	7,461	6,384	5,506	5,706	5,469	7,186	7,502	8,038	7,996	8,301	7,312	8,322
Anden offentlig	32,897	30,102	30,076	29,429	27,449	24,746	25,080	26,807	27,438	27,289	27,394	27,659	26,671
Ukendt	4,045	4,975	6,589	13,260	13,988	14,376	14,680	15,608	11,191	11,944	12,836	13,815	12,663

Analysis and processing of national data

Estimation and forecasting

Data on forest area according to ownership was collected in the two questionnaire surveys conducted in 1990 and 2000. The forest area of these surveys is inconsistent with later interpretation of Landsat5satellite images and hence total forest area in 1990 and 2000 was derived from satellite imagery. Despite of the shortcomings of the questionnaire based surveys it is expected that assessment of especially the publicly owned forest area would be relatively precise. Hence, we reported the publically owned forest area from the two questionnaire surveys conducted in 1990 and 2000, and distributed the residual forest area to private owner categories according to the distribution derived from NFI data in 2005.

Reclassification into FRA 2020 categories

The national classification generally follows the FAO definitions. However, as churches part of the national church are owned by the state/Ministry of Church, this category is reported as publically owned.

FRA categories	Forest area (1000 ha)			
	1990	2000	2010	2015
Private ownership (a)	391.67	433.60	432.79	462.27
...of which owned by individuals	333.13	368.79	368.03	362.08
...of which owned by private business entities and institutions	58.55	64.81	64.76	100.18
...of which owned by local, tribal and indigenous communities	0.00	0.00	0.00	0.00
Public ownership (b)	139.77	138.00	139.32	149.58
Unknown/other (specify in comments) (c)	0.00	0.00	14.38	12.83
Total forest area	531.44	571.60	586.49	624.68

Comments

Data on forest area according to ownership was collected in the two questionnaire surveys conducted in 1990 and 2000. The forest area of these surveys is inconsistent with later interpretation of satellite images and hence total forest area in 1990 and 2000 was derived from satellite imagery. Despite of the shortcomings of the questionnaire based surveys it is expected that assessment of especially the publicly owned forest area would be relatively precise. Hence, we reported the publically owned forest area from the two questionnaire surveys conducted in 1990 and 2000, and distributed the residual forest area to private owner categories according to the distribution derived from NFI data in 2005.

4b Holder of management rights of public forests

National Data

Data sources + type of data source eg NFI, etc

Forest ownership is collected as part of the Danish NFI initiated in 2002.

Data on forest area according to ownership was collected in the two questionnaire surveys conducted in 1990 and 2000. However, due to uncertainty regarding the actual forest definition applied and inconsistencies in total forest area, we used the ratios of different ownership categories observed in NFI data collected in 2002-2005 together with the total forest area obtained from satellite imagery on Landsat5 data in the respective years.

National classification and definitions

Management rights to public forest land in Denmark lies with the public authorities.

Original data

See Table 4a

Analysis and processing of national data

Estimation and forecasting

No other estimation than what is described in relation to table 4a was done.

Reclassification into FRA 2020 categories

No reclassification was done

FRA categories	Forest area (1000 ha)			
	1990	2000	2010	2015
Public Administration (a)	139.77	138.00	139.32	149.58
Individuals (b)	0.00	0.00	0.00	0.00
Private business entities and institutions (c)	0.00	0.00	0.00	0.00
Local, tribal and indigenous communities (d)	0.00	0.00	0.00	0.00
Unknown/other (specify in comments) (e)	0.00	0.00	0.00	0.00
Total public ownership	139.77	138.00	139.32	149.58

Comments

5 Forest disturbances

5a Disturbances

National Data

Data sources + type of data source eg NFI, etc

Only limited information on forest damage is available before the initiation of the NFI in 2002. Consequently, reported figures for forest damage in 2000 include only information of the area affected by the hurricane on December 3rd 1999.

After 2002 information on forest damage is collected on NFI sample plots.

Forest survey 2000:

Larsen PH and Johannsen VK (eds.) 2002. Skove og plantager 2000. Danmarks Statistik, Skov & Landskab, Skov- og Naturstyrelsen. Copenhagen. <https://www.dst.dk/da/Statistik/Publikationer/VisPub?cid=3132>

Description of the NFI and related calculations:

Nord-Larsen, T & Johannsen, VK 2016, Danish National Forest Inventory: Design and calculations. IGN Report, Department of Geosciences and Natural Resource Management, University of Copenhagen. (http://static-curis.ku.dk/portal/files/164970017/Danish_National_Forest_Inventory.pdf)

National classification and definitions

Damage was recorded when affecting more than 10% of the area or resulting in a productivity loss greater than 10%. Damage was recorded according to the following categories:

Insects
Fungi
Vind
Abiotic
Human
Mammals
Plants
Other

Original data

reason	dam_age	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Insekter	<=1 year	2,834	2,791	3,129	3,582	3,592	3,502	4,122	4,422	4,030	3,805	3,912	3,327	2,860
Svampe	<=1 year	236	181	381	901	1,813	2,737	3,644	4,267	4,675	4,617	4,220	4,374	3,996
Vind	<=1 year	10,199	8,083	7,531	6,747	6,332	650	429	340	243	2,818	3,295	3,732	4,003
Abiotisk	<=1 year	2,271	2,309	2,049	2,247	2,215	1,859	1,659	1,659	1,278	1,002	1,105	1,343	1,466
Menneske	<=1 year	3,374	2,808	2,695	1,936	1,038	725	536	210	245	185	185	185	185
Pattedyr	<=1 year	4,330	3,903	3,374	3,088	2,583	2,052	2,440	2,408	2,190	2,054	2,616	2,031	2,499
Planter	<=1 year	331	254	236	224					106	106	106	106	106
Andet	<=1 year	496	381	472	335	214	106	226	119	226	227	227	275	314

Analysis and processing of national data

Estimation and forecasting

Estimation was made by ratio estimators with the Danish NFI, except for year 2000.

Reclassification into FRA 2020 categories

In the estimation the following reclassifications were made:

- 1) Fungi was reclassified to Diseases
- 2) Vind and Abiotic was reclassified to Severe weather events as Abiotic damage other than Vind is often flooding
- 3) Damage by Human, Mammals, Plants and Other was reclassified to Other.

FRA categories	Area (1000 ha)																	
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Insects (a)						2.83	2.79	3.13	3.58	3.59	3.50	4.12	4.42	4.03	3.81	3.91	3.33	2.86
Diseases (b)						0.24	0.18	0.38	0.90	1.81	2.74	3.64	4.27	4.68	4.62	4.22	4.37	4.00
Severe weather events (c)	20.00					12.47	10.39	9.58	8.99	8.55	2.51	2.09	2.00	1.52	3.82	4.40	5.07	5.47
Other (specify in comments) (d)						8.53	7.35	6.78	5.58	3.83	2.88	3.20	2.74	2.77	2.57	3.13	2.60	3.10
Total (a+b+c+d)	20.00	–	–	–	–	24.07	20.71	19.87	19.05	17.78	11.63	13.05	13.43	13.00	14.82	15.66	15.37	15.43
Total forest area	571.60	–	–	–	–	538.06	538.07	553.73	573.20	581.37	586.49	600.57	608.51	615.57	620.63	624.68	624.66	625.60

Comments

Damage by Human, Mammals, Plants and Other was reclassified to Other.

5b Area affected by fire

National Data

Data sources + type of data source eg NFI, etc

Data on fire are collected by Beredskabsstyrelsen (<http://brs.dk>) and are accessible through a web-based service. Further, forest damage is recorded by the Danish NFI. No damage by fire has been registered by the NFI. According to Beredskabsstyrelsen an average of 1536 fires have occurred on open land during 2008-2017 (http://brs.dk/viden/publikationer/Documents/Redningsberedskabets%20i%20tal%202017_rev.pdf), however there is no information on the area affected. According to personal contact to Beredskabsstyrelsen, only the fire in Stenbjerg Klitplantage 2004, that affected a total area of 155 ha, may be classified as a forest fire.

National classification and definitions

There are no national definitions or classifications related to fire.

Original data

Not applicable

Analysis and processing of national data

Estimation and forecasting

No estimation has been done

Reclassification into FRA 2020 categories

No reclassification has been done

FRA categories	Area (1000 ha)																	
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total land area affected by fire																		
...of which on forest	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Comments

5c Degraded forest

Does your country monitor area of degraded forest		No
If "yes"	What is the national definition of "Degraded forest"?	
	Describe the monitoring process and results	

Comments

Historically, almost all of the forest in Denmark was felled at the time of the first forest law (1805). The remaining forest (3-4% of the land area) was degraded by grazing and excessive use. Afforestation was after 1805 used as one of the means to regain productivity of agricultural lands, heathers, and moors among other things by hindering sand drift.

Based on the past 200 years of forest history one may, depending on point of view, argue that all Danish forests are degraded forest or the opposite.

6 Forest policy and legislation

6a Policies, Legislation and national platform for stakeholder participation in forest policy

National Data

Data sources + type of data source eg NFI, etc

Policies supporting SFM:

Danish National Forest Programme (<http://naturstyrelsen.dk/publikationer/2008/dec/danmarks-nationale-skovprogram/>)

Legislations and regulations supporting SFM:

Danish forest law (<https://www.retsinformation.dk/Forms/r0710.aspx?id=186419>)

Nature protection law (<https://www.retsinformation.dk/forms/r0710.aspx?id=175785>)

Order on reporting according to the Nature protection law§ 19 b and the Danish forest law§ 17(<https://www.retsinformation.dk/Forms/R0710.aspx?id=182078>)

Platform that promotes or allows for stakeholder participation in forest policy development

The forest council (<http://mst.dk/erhverv/skovbrug/lovgivning/skovraadet/>)

Traceability system(s) for wood products:

Sector agreement on sustainable biomass (https://ens.dk/sites/ens.dk/files/Bioenergi/141204brancheaftale_biomasse_de_dffpdf.pdf)

EUTR, Regulation (EU) No 995/2010 of the European Parliament and of the Council of 20 October 2010 laying down the obligations of operators who place timber and timber products on the market Text with EEA relevance (<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32010R0995&from=EN>)

National classification and definitions

Not applicable

Original data

Not applicable

Indicate the existence of	Boolean (Yes/No)	
	National	Sub-national
Policies supporting SFM	Yes	No
Legislations and regulations supporting SFM	Yes	No
Platform that promotes or allows for stakeholder participation in forest policy development	Yes	No
Traceability system(s) for wood products	Yes	No

Comments

6b Area of permanent forest estate

National Data

Data sources + type of data source eg NFI, etc

Area of permanent forest estate ("Fredskov" in Danish) is estimated from NFI data collected in 2002-2017 and a spatial overlay with the national cadastre containing information on the legal status.

National classification and definitions

Area of permanent forest estate in 1990 and 2000 are unknown and we used figures calculated from NFI data collected in 2002-2005. We assume an unchanged area of permanent forest estate from 2017 to 2020.

Original data

Row Labels	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Ej fredsko	117,153	119,988	131,900	140,958	154,601	158,993	167,197	171,986	175,794	174,027	178,388	180,731	185,685
Fredskov	420,912	418,081	421,830	432,246	426,773	427,494	433,378	436,523	439,775	446,604	446,296	443,930	436,396

FRA 2020 categories	Forest area (1000 ha)					
	Applicable?	1990	2000	2010	2015	2020
Area of permanent forest estate	Yes	420.91	420.91	427.49	446.30	436.40

Comments

Area of permanent forest estate is the area of "Fredskov", according to national law. Area of permanent forest estate in 1990 and 2000 are unknown and we used figures calculated from NFI data collected in 2002-2005. We assume an unchanged area of permanent forest estate from 2017 to 2020.

7 Employment, education and NWFP

7a Employment in forestry and logging

National Data

Data sources + type of data source eg NFI, etc

Data is provided by Statistics Denmark (statistikbanken.dk). For years 2008-2015 we used the table ATR118: Working Time Account on national accounts industrial classification (year) by socioeconomic status, type, sector, industry (DB07), sex and time. For years 1990-2008 we used the table ATR11: Working Time Account on national accounts industrial classification (year) by socioeconomic status, type, sector, industry (DB07), sex and time (terminated).

Full time employments were calculated using an assumed 1650 hrs annual work.

National classification and definitions

The national classification did not allow distinction between forestry and logging.

Original data

ATR118: Working Time Account on national accounts industrial classification (year) by socioeconomic status, type, sector, industry (DB07), sex and time																
Præsteret tid (1000 timer)																
02000 Skovbrug	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017						
I alt	8146	7565	8552	8920	8756	8758	8531	8313	8113	8140						
Mænd	7059	6489	7329	7718	7562	7537	7297	7144	6986	6985						
Kvinder	1087	1076	1223	1202	1194	1221	1234	1169	1127	1155						

ATR11: Working Time Account on national accounts industrial classification (year) by socioeconomic status, type, sector, industry (DB07), sex and time (terminated)																
Præsteret tid (1000 timer)																
02000 Skovbrug	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
I alt	5909	6132	6031	5926	6271	7007	6882	6725	6469	6909	6980	6927	7580	7756	7774	7829
Mænd	4928	5135	5031	4955	5290	5867	5730	5618	5438	5825	5877	5832	6366	6457	6445	6468
Kvinder	981	996	999	970	982	1140	1152	1107	1031	1084	1103	1095	1214	1298	1329	1360

FRA 2020 categories	Full-time equivalents (1000 FTE)											
	1990			2000			2010			2015		
	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male
Employment in forestry and logging	3.58	0.59	2.99	4.07	0.66	3.41	5.06	0.71	4.35	5.04	0.71	4.33
...of which silviculture and other forestry activities												
...of which logging												
...of which gathering of non wood forest products												
...of which support services to forestry												

Comments

Numbers were constructed using three year averages of the time consumption and an average working year of 1650 hrs. Except for the year 1990, which was estimated based on data from 1990.

7b Graduation of students in forest-related education

National Data

Data sources + type of data source eg NFI, etc

Data on education has been collected mainly from Statistics Denmark at statistikbanken.dk, including tables:

Technician certificate/diploma:

EUD4X: FULDFØRTE PÅ EUD-UDDANNELSER EFTER OMRÅDE, UDDANNELSE, ALDER, UDDANNELSESFORM, HERKOMST OG KØN, (AFSLUTTET)

UDDAKT34: UDDANNELSESAKTIVITET PÅ ERHVERVSFAGLIGE UDDANNELSER EFTER UDDANNELSE, ALDER, HERKOMST, NATIONAL OPRINDELSE, KØN, STATUS OG UDDANNELSESEDEL

Bachelor degree:

U36: Fuldførte elever, mellemlange videregående uddannelser efter national oprindelse, herkomst, alder, uddannelse, køn og tid

U37: FULDFØRTE ELEVER, BACHELORUDDANNELSER EFTER UDDANNELSE, ALDER, HERKOMST, NATIONAL OPRINDELSE OG KØN (AFSLUTTET)

UDDAKT60: UDDANNELSESAKTIVITET PÅ BACHELORUDDANNELSER EFTER UDDANNELSE, ALDER, HERKOMST, NATIONAL OPRINDELSE, KØN OG STATUS

Master degree:

U38: FULDFØRTE ELEVER, LANGE VIDEREGÅENDE UDDANNELSER EFTER UDDANNELSE, ALDER, HERKOMST, NATIONAL OPRINDELSE OG KØN (AFSLUTTET)

UDDAKT70: UDDANNELSESAKTIVITET PÅ LANGE VIDEREGÅENDE UDDANNELSER EFTER UDDANNELSE, ALDER, HERKOMST, NATIONAL OPRINDELSE, KØN OG STATUS

Due to changes in educational structure, not all data was available from Statistics Denmark and additional data was collected from:

University of Copenhagen (<https://kUNET.ku.dk/fakultet-og-institut/science/uddannelse/uddannelsesstatistik/produktion/Sider/default.aspx>)

Larsen and Johannsen 2002. Skove og Plantager 2000.

National classification and definitions

National definitions are in line with FAO definitions. "Skovtekniker" is viewed as a BSc education.

Original data

Not applicable

FRA 2020 categories	Number of graduated students											
	1990			2000			2010			2015		
	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male
Doctoral degree												
Master's degree	18.00	3.00	14.00	23.00	6.00	17.00	23.00	8.00	15.00	23.00	12.00	11.00
Bachelor's degree	27.00	3.00	24.00	80.00	14.00	66.00	79.00	43.00	37.00	86.00	36.00	50.00
Technician certificate / diploma	61.00	4.00	57.00	118.00	12.00	106.00	58.00	3.00	55.00	104.00	9.00	95.00
Total	105.00	10.00	95.00	221.00	32.00	189.00	161.00	54.00	107.00	213.00	57.00	156.00

Comments

Doctoral degrees in forest science have been obtained during 1990. However, due to the variability of subjects its not possible to isolate those specifically associated with forest.

7c Non wood forest products removals and value 2015

National Data

Data sources + type of data source eg NFI, etc

Removals:

Nord-Larsen, T., Johannsen, V. K., Riis-Nielsen, T., Thomsen, I. M., Suadicani, K., Vesterdal, L., ... Jørgensen, B. B. (2016). Skove og plantager 2015: Forest statistics 2015. Institut for Geovidenskab og Naturforvaltning, Københavns Universitet.

Value:

Statistics Denmark, statistikbanken.dk, Table [LBF11](#): Gross domestic product at factor cost for agriculture by type and time

National classification and definitions

Greenery is produced from mainly *Abies procera* and *Abies nordmaniana* but also other species.

Statistics Denmark provide the value sum of removals of Christmas trees and greenery together. The far largest part of the values stems from removals of Christmas trees and we hence provided the total value for this product.

Original data

-

	Name of NWFP product	Key species	Quantity	Unit	Value (1000 local currency)	NWFP category
#1	Christmas trees	Abies nordminiana	10 800 000	trees	876 000	6 Ornamental plants
#2	Greenery	Abies procera	32 000	tons		6 Ornamental plants
#3	Game (forest dwelling)	Roe deer	109 625	number		12 Wild meat
#4	Game (forest dwelling)	Red deer	9 789	number		12 Wild meat
#5	Game (forest dwelling)	Sika deer	558	number		12 Wild meat
#6	Game (forest dwelling)	Fallow deer	8 338	number		12 Wild meat
#7	Game (forest dwelling)	Fox	30 528	number		12 Wild meat
#8	Game (forest dwelling)	Woodcock	40 078	number		12 Wild meat
#9	Berries					1 Food
#10	Mushrooms					1 Food
All other plant products						
All other animal products						
Total					876 000	

Name of currency	Danish crowns
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Comments

Statistics Denmark provide the value sum of removals of Christmas trees and greenery together. The far largest part of the values stems from removals of Christmas trees and we hence provided the total value for this product.

8 Sustainable Development Goal 15

8a Sustainable Development Goal 15

SDG Indicator 15.1.1 Forest area as proportion of total land area 2015

Indicator	Percent							
	2000	2010	2015	2016	2017	2018	2019	2020
Forest area as proportion of total land area 2015	13.61	13.97	14.88	14.88	14.90	14.92	14.94	14.97

Name of agency responsible	The Danish Environmental Protection Agency
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SDG Indicator 15.2.1 Progress towards sustainable forest management

Sub-Indicator 1	Percent						
	2000-2010	2010-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
Forest area annual net change rate	0.26	1.27	-0.00	0.15	0.15	0.15	0.15

Name of agency responsible	The Danish Environmental Protection Agency
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Sub-Indicator 2	Forest biomass (tonnes/ha)							
	2000	2010	2015	2016	2017	2018	2019	2020
Above-ground biomass stock in forest	100.47	106.86	112.15	112.38	112.58	112.76	112.93	113.10

Name of agency responsible	The Danish Environmental Protection Agency
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Sub-Indicator 3	Percent (2015 forest area baseline)							
	2000	2010	2015	2016	2017	2018	2019	2020
Proportion of forest area located within legally established protected areas	2.95	6.67	6.70	6.70	6.70	6.70	8.39	8.39

Name of agency responsible	The Danish Environmental Protection Agency
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Sub-Indicator 4	Percent (2015 forest area baseline)							
	2000	2010	2015	2016	2017	2018	2019	2020
Proportion of forest area under long-term forest management plan	40.66	49.79	49.79	49.79	49.79	49.79	49.79	49.79

Name of agency responsible	The Danish Environmental Protection Agency
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Sub-Indicator 5	Forest area (1000 ha)							
	2000	2010	2015	2016	2017	2018	2019	2020
Forest area under independently verified forest management certification schemes	0.04	229.94	260.87	262.64	265.56	268.94	–	–