



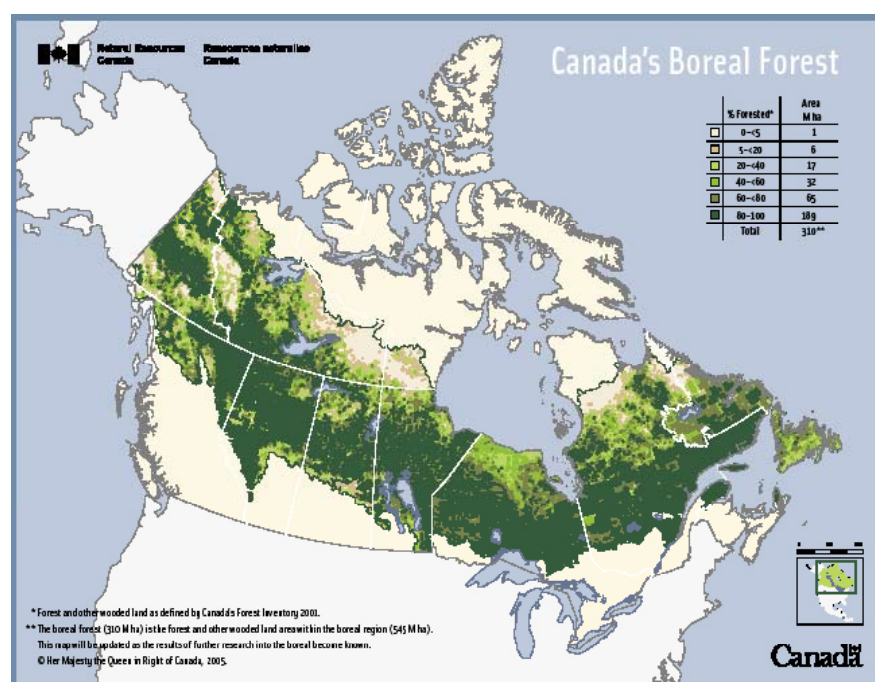
for a living planet[®]

Forest Area Key Facts & Carbon Emissions from Deforestation

Canada's Boreal Forests

Forest location and brief description

Canada is home to approximately 30 per cent of the world's boreal forests. The Canadian boreal forest is one of the largest intact forest and wetland ecosystems remaining on earth. It stretches across the centre of the country, from Newfoundland and Labrador to the Yukon, covering nearly 6 million km² and over 58 per cent of Canada's land mass.



The forest is largely composed of pine, spruce, aspen, poplar, larch, balsam, and fir trees. Thirty per cent of the boreal region is covered by wetlands, consisting of bogs, fens, marshes, an estimated 1.5 million lakes, and some of the country's largest river systems.

Unique qualities of forest area

Canada's boreal region is:

- Canada's largest terrestrial ecosystem, including 90 per cent of the country's remaining large intact forests, and 25 per cent of the world's remaining large intact forests;
- one of the three largest "frontier forests" remaining in the world;

- An estimated 67 billion tonnes of carbon are stored in Canada's boreal region – the equivalent of approximately 303 years of the country's 2002 carbon emissions, or 7.8 years of the world's total carbon emissions in the year 2000.
- Carbon stored in Canada's boreal forests and peat lands is worth up to CAD 3.7 trillion.
- The total non-market value of Canada's boreal ecosystem services is roughly 2.5 times more than the net market value of the region's forestry, hydroelectric, mining, and oil and gas extraction put together.

- a crucial breeding habitat for more than 30 per cent of North America's bird population;
- an important habitat for more than 75 per cent of North America's waterfowl;
- a rich habitat for migratory songbirds. More than one billion birds migrate north to breed after wintering in warmer climates;
- inhabited by some of the world's largest remaining populations of woodland caribou, grey wolves and grizzly bears; and
- home to more than four million people, including more than 600 First Nations communities.

The total non-market value of the Canadian boreal's ecosystem services in 2002, such as water filtration, pest-control services, and carbon storage, is estimated at CAD 3 billion – roughly 2.5 times greater than its net market value of forestry, hydroelectric, mining, and oil and gas extraction put together.

Deforestation data

A recent analysis estimated that the current annual deforestation rate in Canada is approximately 92,500 hectares per year for all types of forests (temperate mixed-wood and hardwood, as well as boreal) out of the country's approximately 400 million hectares of forest area.

Estimated rates of forest loss in Canada's boreal vary widely. According to Natural Resources Canada, the total area of boreal forest in Canada is neither shrinking nor expanding significantly. However, several conservation organizations suggest that in some regions of the boreal, forest is being lost at rates similar to those in tropical rainforests. At issue is whether the intensity of human activity in some areas, such as the tar sands of Alberta, is effectively converting forest land (i.e. deforestation) rather than allowing these landscapes to regenerate.



In Canada, logging alone removes on average 33 Megatonnes (Mt) of carbon from forest landscapes each year. This is equivalent to 122 Mt of carbon dioxide (Mt CO₂), which, if released into the atmosphere each year, would comprise 16 per cent of Canada's total greenhouse gas emissions.

According to the current Intergovernmental Panel on Climate Change (IPCC) 2003 methodology, emissions from forest management comprise all the CO₂-C contained in harvested roundwood and harvest residues. All carbon transferred out of managed forests as wood products is deemed an immediate emission. IPCC recognizes inaccuracies of this approach. For example, absorption of carbon from the atmosphere as a result of forest growth should be taken into account. Also, not all carbon from timber harvesting enters the atmosphere since forest products retain some of the carbon. Further guidance is required from the UN Climate Convention Parties to select an approach to more properly consider the carbon flows associated with forest landscapes, forestry activities and forest products.

Source: Environment Canada. National Inventory Report, 1990-2004 - Greenhouse Gas Sources and Sinks in Canada. The Canadian Government's Submission to the UN Framework Convention on Climate Change. April 2006.

Key threats

Key threats to Canada's boreal include the industrial footprints of forestry, mining, oil and gas, and hydro-electric developments. Road building and agricultural development are also impacting the ecological integrity of these forests.

Oil and gas exploration has resulted in a significant loss of boreal forest in some regions. Across Alberta, more trees are removed from the boreal forest every year for agricultural purposes and for oil and gas exploration than for timber harvest.

In Eastern Canada, over the past 40 years, about 900,000 hectares of peat lands and other lowland ecosystems within the boreal region have been lost to flooding for hydro-electric reservoirs. According to Environment Canada, current reservoir proposals could affect another one million hectares by the year 2010.

Global warming is another major threat to Canada's boreal forest. Scientists predict that parts of the forest will become much warmer because of climate change, leading to increased frequency and severity of forest fires and also insect infestations.

Protection status

Nearly 10 per cent of Canada's boreal is protected from industrial development. Approximately 5.6 per cent is permanently protected from industrial activity, and 3.6 per cent is under temporary protection.

Forests Facts:

Canada's boreal forest publicly owned:	94 %
Boreal forests allocated to industry:	more than 30 %
Clear-cutting logging in Canada's boreal forest:	90 %
Boreal region within a kilometer of a road:	30 %

Source: Canadian Geographic. www.canadiangeographic.ca.

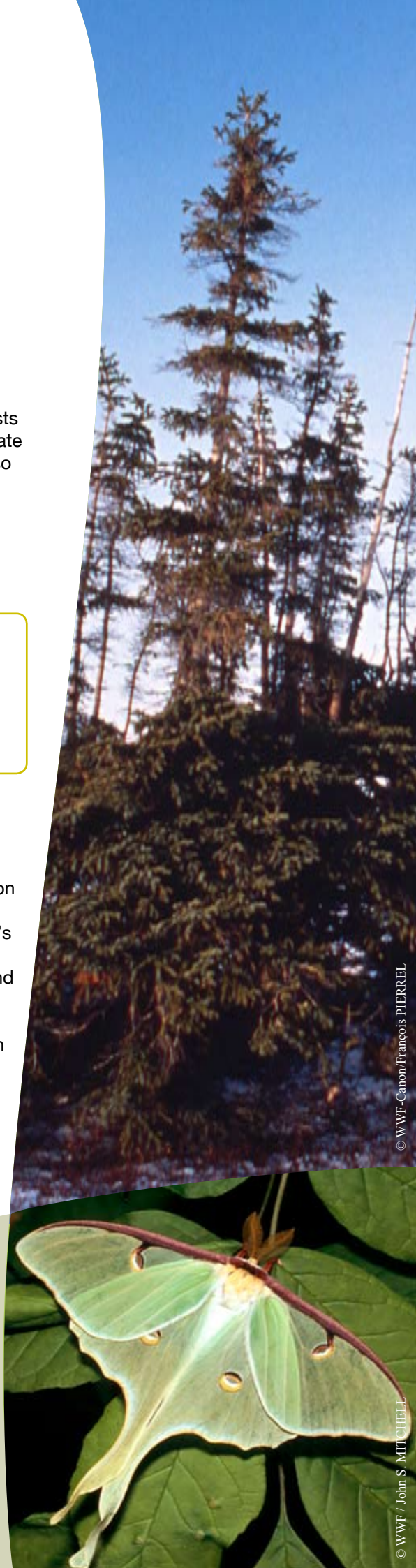
Carbon emissions from deforestation

Boreal forests function as the largest terrestrial storehouses of carbon on Earth. They store one-third of all carbon in land-based ecosystems.

An estimated 67 billion tonnes of carbon is stored in Canada's boreal region (including forests and peat-lands). This is equivalent to approximately 303 years of Canada's total carbon emission in 2002, or 7.8 years of the world's total carbon emissions. According to a study by the Pembina Institute and the Canadian Boreal Initiative, carbon stored in Canada's boreal forests and peat-lands is worth up to CAD 3.7 trillion (CAD 55.42 per tonne of carbon).

Deforestation, defined here as conversion of forests to other land use such as urban settlements, cropland and wetlands, and estimated at 92,500 hectares a year, is a significant source of emissions. The highest rates of forest conversion, primarily to cropland and settlement, have occurred in the Boreal Plains and the Boreal Shield East zones. Forest conversion within these two zones accounts for 33 to 71 per cent of the total forest area converted between 1990 and 2004. It is estimated that forest conversion in the Boreal Shield East and the Boreal Plains alone resulted in 12.8 Mt of CO₂ emissions in 2005.

carbon cycle of boreal forests. Climate models suggest that global warming may shift the boreal forest further north from its present location by 300 to 500 km, and that a good portion of the existing boreal forest may be replaced by a temperate forest characteristic of southern Ontario and the northern United States. Much of what is now the central boreal may have climatic conditions similar to those of the prairie grasslands.





WWF Forest Activities

WWF has been helping to transform forestry in Canada. Today more than 20 million hectares of forests across the country have been certified to the Forest Stewardship Council's (FSC) rigorous social and environmental standards, protecting wildlife habitat, and supporting local communities. Canada has more hectares certified by the FSC than any other country in the world.

WWF is also pioneering the High Conservation Value Forests (HCVF) approach in Canada to help forestry companies identify the most valuable areas of biodiversity within their tenures. This will help to protect important areas of Canadian forest, safeguard examples of the boreal forest, coastal rainforest, and northern taiga and give species such as woodland caribou, wolves and migratory birds the habitat they need.

WWF is also engaged in protected areas planning with local communities in the Mackenzie Valley, work with the mining sector, and research for key boreal species such as the woodland caribou.

Sources/References

1. Canada's National Forest Inventory.
2. Natural Resources Canada, The State of Canada's Forests. 2004-2005.
3. Canadian Forest Service
4. Greenhouse Gas Division, Environment Canada.
5. Canadian Boreal Initiative.
6. International Boreal Conservation Campaign
7. Boreal Songbird Initiative.
8. Lee, P. Boreal Canada: State of the Ecosystem, State of Industry, Emerging Issues and Projections (Report to the National Round Table on the Environment and the Economy). Ottawa, 2004.
9. Bryant, D., Nielsen, D., and Tangley, L. The Last Frontier Forests: Ecosystems and Economies on the Edge. World Resources Institute in collaboration with the World Conservation Monitoring Center and the World Wildlife Fund, 1997.
10. Anielski, M. and Wilson, S. Counting Canada's Natural Capital: Assessing the Real Value of Canada's Boreal Ecosystems, Pembina Institute and Canadian Boreal Initiative, Ottawa, 2006.
11. Forest Ethics, Robbing the Carbon Bank: Global Warming and Ontario's Boreal Forests, 2006 (http://www.forestethics.org/downloads/globalwarming_2.pdf)

Notes

- S. Wilson notes that further research indicates that peat land carbon storage may actually be much higher than reported in the study "Counting Canada's Natural Capital: Assessing the Real Value of Canada's Boreal Ecosystems".
- Data on CO₂ emissions for the Boreal Shield East and the Boreal Plains is derived from the GHG Division AFOLU Database tracking land conversion from the following categories: forest land to cropland, forest land to wetlands, and forest land to settlement. These estimates include CO₂ and nitrous oxide (N₂O) emissions from deforestation occurring up to 20 years prior to the actual inventory year.



for a living planet™

For further information, please visit:

www.wwf.ca
www.panda.org