



## British Columbia Ministry of Forests, Lands and Natural Resource Operations

# Forest Carbon Strategy 2016-2020

British Columbia has vast forests we can use to help fight climate change<sup>i</sup>. Due to trees' ability to absorb and store carbon as they grow, B.C.'s forests can affect atmospheric concentrations of carbon dioxide (CO<sub>2</sub>) and other greenhouse gases (GHGs) that are causing the climate to change.

This strategy outlines current and planned initiatives by the Ministry of Forests, Lands and Natural Resource Operations (FLNRO) to manage forest carbon and improve the sustainability of B.C. forests, communities and industry while mitigating the effects of climate change.

This Forest Carbon Strategy supports the overarching FLNRO Climate Change Strategy 2015-2020<sup>ii</sup> and provides the direction for government and stakeholder actions.

Forest carbon management<sup>iii</sup> options occur within the context of the range of values British Columbians seek from their forests. No single approach is suitable for the diverse forest ecosystems or community needs across the province. The full suite of potential options needs to be considered while maintaining or enhancing other values, including socio-economic values provided by forestry and timber production, as well as other ecological values such as biodiversity, water, fish and wildlife, and more.

Forest carbon management strategies to increase carbon sinks or reduce emissions fall into six broad categories:

1. Increase (or maintain) forest area;
2. Increase stand-level carbon density;
3. Reduce emissions associated with forestry operations<sup>iv</sup>;

4. Increase landscape-level carbon density;
5. Increase the proportion of harvested wood that is used for long-lived products; and,
6. Create forests that are more resilient to changes in climate suitability, pathogens, invasive species, drought, and wildfire (Addressed under the Ministry's adaptation strategies).

### Goal 1: Enhance the capacity of B.C.'s public forests as net carbon sinks.

Our forests cover 60% of the provincial land base and represent 6-7 billion tonnes of above ground carbon-biomass. It is our single greatest carbon resource. Due to the mountain pine beetle outbreak, harvesting response, and recent wildfires, B.C.'s forests have switched from being a net carbon sink to a source. B.C. aims to reverse that trend and over the long term enhance the carbon storage capacity of our forests.

#### OBJECTIVES:

Develop policies and tools to support and enable carbon management for forests, lands and natural resource sector development. FLNRO will promote carbon-friendly forest management options that:

- a) Create synergies between carbon and timber management to take advantage of the carbon storage value of long-term harvested wood products;



- b) Increase or maintain forested area and tree density where climatically suitable; and,
- c) Facilitate forest carbon offset investment opportunities.

**Actions:**

- ◆ **Develop policy to enable carbon management integration with natural resource values**
- ◆ **Reduce wildfire risk through the Forest Enhancement Society of British Columbia<sup>v</sup>**
- ◆ **Guide forest carbon offset investment through the Protocol for the Creation of Forest Carbon Offsets in British Columbia<sup>vi</sup>**
- ◆ **Respond to catastrophic disturbances through Forests For Tomorrow (FFT)<sup>vii</sup>**

**Under Development:**

- ◆ Using Enhanced Basic Silviculture<sup>viii</sup> for forest resiliency.
- ◆ Updating greenhouse gas inventory methods to include forests and forest products as core parts of estimates and mitigation targets.
- ◆ Development of tools to consider forest carbon in decision making.

**Goal 2: Increase the contribution of forest products to mitigating climate change**

Forest products can be used to store carbon for a long time, like in wood-framed homes, and can replace higher emission products like concrete blocks for buildings or coal for energy. Currently, only about 1/3<sup>rd</sup> of the wood harvested from B.C.'s forests are used for long-lived products; increasing that proportion offers a great opportunity to mitigate climate change.

**OBJECTIVES:**

- a) Develop policies and programs that increase the use of harvest residue for products; and,
- b) Develop policies and programs to increase the proportion of harvest used for long-lived and low GHG intensity products.

**Actions:**

- ◆ **Collaborate with FPInnovations (FPI) to support and develop carbon-friendly products<sup>ix</sup>**
- ◆ **Improve fibre utilization through the FLNRO Forestry and Fibre Action Plan<sup>x</sup>**
- ◆ **Encourage increased use of wood through the Wood First Initiative and the Wood First Act (Ministry of Jobs, tourism and Skills Training)<sup>xi</sup>**
- ◆ **Promote the use of B.C. forest products through Forestry Innovation Investment Ltd. (FII)<sup>xii</sup>**

**Under Development:**

- ◆ Develop and fund commercialization programs with a focus on longer-lived wood products that store carbon or reduce greenhouse gas emissions.
- ◆ Collaborate with agency partners and stakeholders to change building codes to allow light industrial buildings to be built with wood, prepare code manuals, and create a demonstration project.

**Goal 3: Increase collaboration with First Nations, communities and stakeholders**

Share knowledge and better inform First Nations, stakeholders, consumers, markets, and resource managers of the benefits and potential trade-offs of carbon management options to help provide the best local solutions.





## OBJECTIVES:

Improve knowledge and capacity, and develop new policies and practices that:

- a) Identify carbon opportunities at a landscape level for defined traditional areas and collaborate with First Nations as partners in the Forest Carbon Partnership Program or through other forest carbon initiatives;
- b) Increase awareness of forest carbon sinks, and the storage and management of forest carbon under a changing climate; and,
- c) Integrate forest carbon management with climate change adaptation work<sup>xiii</sup> to support resilient ecosystems and enhance long-term carbon potential through:
  - i. collaborative work with stakeholders to align carbon values with other economic and environmental values
  - ii. promotion of forest carbon management options suited to local conditions and opportunities

## Actions:

- ♦ **Integration of climate change into FLNRO's daily operations, including implementation of work unit climate action plans, extension, outreach and capacity building**
- ♦ **Development of guidance documents and ongoing communications with regional and district staff, industry and First Nations regarding the storage and management of forest carbon**
- ♦ **Work with First Nations on climate change impacts to forests and other natural resources<sup>xiv</sup>**

## Under Development:

- ♦ Establishment of rural bio-energy facilities.

## Goal 4: Research to inform policy development

New research into forest carbon dynamics and climate change impacts provides evidence for the integrated decision making model for natural resource management.

## OBJECTIVES:

Improve knowledge through research and development that:

- a) Increases understanding of forest carbon sinks, and of storage and management under a changing climate; and,
- b) Increases understanding of harvested wood products for carbon storage.

## Actions:

- ♦ **Collaboration with the Canadian Forest Service, Natural Resources Canada<sup>xv</sup>, Pacific Institute for Climate Solutions<sup>xvi</sup>, and the Pacific Climate Impacts Consortium<sup>xvii</sup>**
- ♦ **Simulation modelling of forest carbon and natural resource values and assessment of management options with a changing climate**
- ♦ **Development of extension notes on the management of forest carbon<sup>xviii</sup>**

## Under Development:

- ♦ Methods to evaluate alternative forest management, fibre use options and economic flows if an economic value for forest carbon was fully realized.





## Contact Information

For more information please contact staff at the Competitiveness and Innovation Branch in the Ministry of Forests, Lands and Natural Resource Operations.

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Goal	Further Actions and Items Under Development
1. Return B.C.'s forests to a net carbon sink	<p><b>Actions:</b></p> <ul style="list-style-type: none"> <li>♦ Development of policy to enable forest carbon offsets in B.C.<sup>xix</sup> (Objective C)</li> <li>♦ Development and provision of agreements to enable carbon management on Crown lands (Objective C)</li> <li>♦ Climate-Based Seed Transfer (Objectives A and B)</li> <li>♦ Development of BC Forest Carbon Offset Investment Opportunities Information booklet<sup>xx</sup></li> </ul> <p><b>Under Development:</b></p> <ul style="list-style-type: none"> <li>♦ Considering forest carbon or climate change as a value in the <i>Forest and Range Practices Act</i> (Objectives A and C)</li> <li>♦ Including forest carbon as a value within environmental assessments (Objective A)</li> <li>♦ Tracking forest carbon stocks as a natural capital asset within ministry service plan performance measures (Objectives A and C)</li> <li>♦ Ensuring that lifecycle greenhouse gas emissions only decrease when harvesting for bioenergy, particularly with green tree harvesting (Objectives A and C)</li> </ul>
2. Increase the contribution of forest products to mitigating climate change	<p><b>Actions:</b></p> <ul style="list-style-type: none"> <li>♦ Development of a carbon calculator for harvested wood products<sup>xxi</sup> (Objectives A and B)</li> </ul> <p><b>Under Development</b></p> <ul style="list-style-type: none"> <li>♦ Coordinate with BC's Forest Sector Innovation Strategy to ensure carbon opportunities for forest products and companies (Objectives A and B)</li> <li>♦ Monitoring of wood-based bioenergy as a forest product</li> <li>♦ Tracking wood in the built environment as an asset (Objective B)</li> <li>♦ Developing capacity on life cycle assessments (estimating carbon footprints) for B.C.'s wood products to increase premium wood product markets (Objective B)</li> <li>♦ Conducting forest carbon life-cycle analysis (Objective B)</li> <li>♦ Lead collaborative research models to enhance research on longer-lived wood products including that based on sawmill and harvest residues (Objectives A and B)</li> <li>♦ Encouraging the adaptation, retrofitting or upgrade of existing heritage wood structures rather than replacing them (Objective B)</li> <li>♦ Promoting the development of bio-oils for transportation (Objective A)</li> </ul>





3. Increase collaboration with First Nations, communities and stakeholders

**Actions:**

- ♦ Production of the ClimateNews newsletter<sup>1</sup> (Objective B)
- ♦ FLNRO work unit climate action plans incorporate mitigation strategies using forest carbon (Objectives B and C)
- ♦ Development of land use agreements (Objective A)

4. Research to Inform Policy

**Actions:**

- ♦ Carbon sequestration in managed temperate coniferous forests under climate change
- ♦ Applying resilience concepts in forest management: a retrospective simulation approach (Kamloops Timber Supply Area)
- ♦ Diversifying managed forests to increase resilience (Merritt Timber Supply Area)
- ♦ Fibre use, net calorific value, and consumption of forest-derived bioenergy in British Columbia, Canada
- ♦ Damaged forests provide an opportunity to mitigate climate change
- ♦ Life cycle sustainability analysis sub-project of the Woody Biomass Innovative Project: a preliminary assessment
- ♦ Forest carbon in North America: annual storage and emissions from British Columbia's harvest, 1965-2065
- ♦ Our logs' story from truck to product
- ♦ A New Model For Simulating Climate Change and Carbon Dynamics in Forested Landscapes
- ♦ Criteria and guidance considerations for sustainable tree stump harvesting in British Columbia
- ♦ Uncertainty of 21st century growing stocks and GHG balance of forests in British Columbia, Canada resulting from potential climate change impacts on ecosystem processes
- ♦ The Carbon Conundrum – Fire and Fuel Management in Fire-prone Forests
- ♦ Forests in a carbon-constrained world

**Under Development**

- ♦ Management options for climate change mitigation and adaptation in the Copper-Pine Creek Valley
- ♦ Climate change impacts on water risk, socio-economic values, timber supply and carbon in the Penticton Creek watershed

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<sup>1</sup> <https://www.for.gov.bc.ca/het/climate/knowledge/index.htm>





<sup>i</sup> For background informing this strategy go to:

<https://www.for.gov.bc.ca/het/climate/carbon/ClimateMitigationPotentialofBritishColumbianForests.pdf>

<sup>ii</sup> For the FLNRO Climate Change Strategy go to:

[https://www.for.gov.bc.ca/het/climate/strategy/climate\\_change\\_strat\\_2015-20.pdf](https://www.for.gov.bc.ca/het/climate/strategy/climate_change_strat_2015-20.pdf)

<sup>iii</sup> Forest carbon management refers to actions or practices aimed at increasing the carbon sinks of the forest ecosystem or reducing or avoiding emissions from the forestry sector.

<sup>iv</sup> Reducing emissions associated with forestry operations refers both to fossil fuel and forest emissions. Reducing the number of trips to a site; upgrading the diesel engines on equipment to be more efficient or use lower-emitting fuels; and, reducing tree damage during partial harvesting or thinning, the amount of logging waste that must be burned, soil damage and on-site erosion, are all important considerations.

<sup>v</sup> The primary focus of the Forest Enhancement Society of British Columbia will be the reduction of wildfire risk. In the Interior, this focus will align with salvage harvesting of dead timber; enhancement of reforestation efforts; and wildlife habitat restoration in stands severely impacted by wildfires and mountain pine beetle. On the Coast, the wildfire risk reduction will align with high priority stands close to developed areas.

<sup>vi</sup> The Protocol for the Creation of Forest Carbon Offsets in British Columbia is a director- approved process for managing and accounting for carbon under forest management approaches. As with all activity on Crown forest, the protocol and carbon management adhere to relevant legislation governing use of the forest resource.

<sup>vii</sup> Forests For Tomorrow, established in 2005 is a provincially funded silviculture program created in response to catastrophic disturbance. It is focused on improving future timber supply, and addressing risks to other forest values through the re-establishment of young forests on land that would otherwise remain under-productive. See: <http://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/land-based-investment/forests-for-tomorrow>

<sup>viii</sup> Enhanced Basic Silviculture (also known as Building Economic Pathways to Stand Level Investment) is exploring ways to incentivize forest management practices that will establish and maintain resilient forests.

<sup>ix</sup> B.C. and FPInnovations are co-funding research into new uses of wood for energy and a wide variety of products offer great potential for shifting the economy from dependence on fossil fuels to an economy based on renewable raw materials and energy sources. See: <https://fpinnovations.ca/products-and-services/technologies/Pages/default.aspx#>

<sup>x</sup> New tenure tools are being made available to make residual fibre available to secondary users. This reduces the amount of carbon emissions from burning of slash piles. <https://www.for.gov.bc.ca/hth/timber-tenures/fibre-recovery.htm>

<sup>xi</sup> The overall purpose of the Wood First Initiative is to encourage a cultural shift toward viewing wood as the first choice for construction, interior design and daily living. Wood is durable, cost-effective and climate friendly. Using more wood will help strengthen the province's forest-dependent communities and assist in meeting our climate change goals. See: <http://www2.gov.bc.ca/gov/content/industry/forestry/supporting-innovation/wood-first-initiative>

<sup>xii</sup> Forestry Innovation Investment is a Crown agency that works with the forestry industry and government to develop materials and tools to help promote B.C.'s forest products and develop new markets. They promote the sustainability of wood. See: <http://www.bcfii.ca/>

<sup>xiii</sup> Forest carbon management needs to integrate climate change adaptation strategies and practices as the forests that are planted today will grow and mature in changed future climates. Planning for the future climates through such activities as adjusting seed sources, alternative species choices, planting additional density and harvest risk planning increases the likelihood of success.

<sup>xiv</sup> FLNRO is working with First Nations to incorporate forest carbon values into land use agreements.

<sup>xv</sup> Canadian Forest Service of Natural Resources Canada examines issues of common interest related to forest carbon by conducting analyses and facilitating ongoing discussion among federal, provincial and territorial governments. See: <http://www.nrcan.gc.ca/forests/climate-change/carbon-accounting/13087>

<sup>xvi</sup> The mission of the Pacific Institute for Climate Solutions is to partner with governments, the private sector, other researchers and civil society, in order to undertake research on, monitor, and assess the potential impacts of climate change and to assess, develop and promote viable mitigation and adaptation options to better inform climate change policies and actions. For more information, see: <http://pics.uvic.ca/>

<sup>xvii</sup> Pacific Climate Impacts Consortium (PCIC) is a regional climate service centre at the University of Victoria that conducts quantitative studies on the impacts of climate change and climate variability in the Pacific and Yukon region. Results from this work provide regional climate stakeholders with the information they need to develop plans for reducing the risks associated with climate variability and change. In this way, PCIC plays an important bridging function between climate research and the practical application of that knowledge by decision makers. For more information on the Pacific Climate Impacts Consortium visit <http://www.pacificclimate.org/>

<sup>xviii</sup> For more information on ongoing forest carbon research visit: <http://www.for.gov.bc.ca/het/climate/carbon/index.htm>

<sup>xix</sup> This booklet provides information about forest carbon projects on B.C.'s forest lands and includes information on available land, potential gains from projects, the forest carbon investment process and more. This booklet is currently being revised and updated. Some information here on forest offsets and program contacts is outdated at this time.

[http://www.for.gov.bc.ca/ftp/HET/external/publish/Web/climate/carbon\\_investment\\_opportunities\\_info\\_book.pdf](http://www.for.gov.bc.ca/ftp/HET/external/publish/Web/climate/carbon_investment_opportunities_info_book.pdf)

<sup>xxi</sup> This carbon calculator is simple spreadsheet that you can use to determine the carbon footprint of your wood products or a whole project. In addition to the emissions of carbon, you can see the storage of carbon in different products over time.

