# Growing trees and capturing carbon:

How sustainable forest management helps to mitigate climate change

#### Product substitution

Wood products can replace emissions-intensive products and materials. For example, bioenergy can replace fossil fuels such as coal and diesel to reduce net emissions.

CO,

sustainable forest management

CO,

### Wood products

After harvest, carbon is transferred out of the forest and stored in wood products. Long-lived wood products like

lumber for housing store carbon for decades while short-lived products like paper or tissue release carbon quickly.

## Forest regeneration

CO,

In Canada, all forests harvested on public land must be regenerated. Regeneration can happen naturallyor with the help of humans (e.g. tree planting). While tree seedlings actively sequester carbon, they can only store small amounts due to their small size.

#### **Young forest**

CO,

Young forests grow quickly. They are very efficient at **sequestering carbon**—removing carbon from the atmosphere.

Carbon sequestered is stored in tree biomass (wood, roots, leaves) as well as in dead wood and soil organic matter.

#### Timber harvest

Harvesting causes emissions from equipment use and decomposing biomass left on site (stumps, branches, leaves).

Foresters can tailor harvesting to help reduce forest susceptibility to wildfire, insects, and disease.

#### Mature forest

As trees age, theirgrowth slows. Some trees die from various stressors like competition or disease. As trees die, they decay and decompose. This process transfers carbon and nutrients into forestsoils and slowly emits carbon backinto the atmosphere.

Mature forests **store** a lot of carbon but **sequester** it much more slowly than younger forests. e forest managem<sub>ent</sub>

CO,

Ċ

Sustainable

**Sustainable forest management** aims to maintain and enhance the environmental, social and economic values of forests for the benefit of present and future generations. It involves ensuring a long-term sustainable supply of woodbased products and ecosystem services while conserving biodiversity and protecting forest health. Canadian forests are managed under the guiding principles of sustainable forest management.

From regeneration to harvesting, Canada's managed forests sequester and store significant amounts of atmospheric carbon as they grow. Generally, mature forests that were previously harvested store less carbon than primary forests—or forests that have never been harvested. However, harvesting in the right way and at the right time can store carbon in wood products. Wood products provide an added benefit when they replace other less environmentally- and climate-friendly products and materials such as diesel, plastics and concrete. **Sustainable forest management can contribute to Canada's low-carbon future.** 

#### Legend:



Sequestration

 Avoided emissions



Carbon storage

Emissions

## Natural disturbance

Forests are susceptible to wildfires, insect outbreaks and disease.

Wildfires cause immediate emission of stored carbon as trees burn. Fires can create favourable conditions for forest regeneration.

CO,

