State of Ontario's Natural Resources Forests 2021





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Minister's Message

Ontario's forests encompass more than 70 million hectares, 56 million of which are public forests—an area larger than Spain. These vast woodlands support tremendous biodiversity, world-class outdoor recreation, and a forestry sector that has provided well-paying employment and economic activity for generations.

That Ontario's public forests continue to support a thriving forest industry, that their health and productivity remain much the same today as historically, is a testament to our province's rigorous forest management standards.

The Ministry of Northern Development, Mines, Natural Resources and Forestry is responsible for conserving Ontario's public forest resources under the Crown Forest Sustainability Act.

This legislation, and its related policy framework, protect the environment and biodiversity of Ontario's managed forests and ensure that harvested wood is sustainable and renewable. In other words, our laws protect our forests and ensure they will provide as many benefits for future generations as for the present.

This report, the fifth of its kind, is an important exercise in accountability and transparency; it signals a signature commitment for our government and a way for us to maintain public confidence in our work. The ministry analyzed 21 key indicators, including:

- Forest composition, growth, wildlife habitat, and forest carbon
- Harvest and regeneration
- Public engagement and Indigenous involvement in forest management planning
- Forest sector employment and resource revenue sharing with Indigenous communities
- Forest sector products and exports, and
- Forest certification, audits, and compliance

I am pleased to report that *State of Ontario's Natural Resources – Forests 2021* indicates that Ontario's sustainable forest management practices continue to ensure resilient and well-maintained forest resources—resources that can meet Ontarians' economic, social, and environmental needs, both today and for future generations.

Our government will continue to work with forest stakeholders, Indigenous communities, and the public to deliver the sustainable forest management practices that have safeguarded this valuable resource for so many years.

The Hon. Greg Rickford

Minister of Northern Development, Mines, Natural Resources and Forestry

State of Ontario's Natural Resources **Forests 2021**

Introduction

Ontario's public forests are vast and provide many economic, social and environmental benefits. Forests provide biodiversity, wildlife habitat and recreational opportunities while helping address the effects of climate change. Through sustainable management, public forests also support a forest industry that creates jobs and forest products.

The Ministry of Northern Development, Mines, Natural Resources and Forestry is responsible for managing public forests so they remain healthy and continue to meet the needs of Ontarians. Ontario's *Crown Forest Sustainability Act* requires the ministry to report on the state of Ontario's forests at least once every five years.

This is Ontario's fifth report to provide an overview of the state of Ontario's forests and present indicator results. Indicators are simple measures that tell us what is happening over time. These measures help us monitor the well-being of our forest ecosystems, communities and industry. They detect change in things like the amount of forest we have or the level of employment within the forest sector.



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Ontario's Public Forests

About 87% of the province's land mass is made up of public land. More than 95% of northern Ontario is public land. There is little public land in southern Ontario, primarily due to population settlement and resulting development.

Ontario has 70.4 million hectares of forest which is 4.8 hectares of forest for every Ontarian. This represents about 2% of the world's forests and 20% of Canada's forests. Approximately:



= 10 million hectors



1 hectare = 100 m x 100 m 1 hectare = 1.3 soccer fields

56.2 million hectares are public

7.2 million hectares

are within proposed and existing provincial and federal parks, recreation reserves and conservation reserves

7.0 million hectares

are privately-owned, First Nation and federally owned

Under the Crown Forest Sustainability Act public forests are managed in a sustainable manner to ensure long-term forest health and to provide a wide range of environmental, economic, and social benefits to the citizens of Ontario.

The Ministry of Northern Development, Mines, Natural Resources and Forestry does not have jurisdiction on private land: however, there are incentive programs for landowners to encourage the responsible management of private land forests.

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The Managed Forest

The Managed Forest is an area in the middle of the province where forest management occurs on public land. It has a large quantity of productive forest that is suitable for timber production. It spans from Kemptville in the south east to Pikangikum in the north west and includes parts of the Boreal Forest and the Great Lakes St. Lawrence forest, encompassing:



North of the Managed Forest is mostly public land and forests. South of the Managed Forest is mostly private land and little public forest. These forests are less suitable for timber production but support biodiversity, store carbon and regulate air, soil, and water quality.



The map above shows the Managed Forest. In this area, public forests are <u>sustainably managed</u> using Ontario's <u>forest policy framework</u>. The Managed Forest is divided into administrative areas known as <u>management units</u> that range in size from 300,000 to 3.6 million hectares. <u>Forest</u> <u>management plans</u> are prepared and approved for each management unit to determine how much can be harvested, where roads can be built, and how the forest will be regenerated.

Forest management does not occur in parks and protected areas with the exception of a specific zone of Algonquin Provincial Park that permits sustainable forest management.

Detailed information is needed to prepare forest management plans and to meet forest reporting requirements. The Forest Resources Inventory provides detailed information about all areas within the Managed Forest, including the area, type and age of the forests. Less detailed information about forests is available for most area north and south of the Managed Forest.

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A foundation of responsible management: Ontario's forest policy framework

66% of Ontario is forested and almost 90% of these forests are public. The Ministry of Northern Development, Mines, Natural Resources and Forestry manages public forests in partnership with forest industry, and with input from Indigenous communities and the citizens of Ontario.



Sustainable forest management provides for the long-term health of Ontario's forests while providing social, economic and environmental benefits to Ontarians. The long-term sustainability of public forests is a priority for Ontario, and it is embedded in our laws and policies.

Ontario's forest policy framework is an interconnected system of laws, regulations, and policies. It is a robust system, based on the most up-to-date science, continual improvement, and public and Indigenous consultation.

The foundation of the forest policy framework is the <u>Crown Forest</u> <u>Sustainability Act</u>. The *Crown Forest Sustainability Act* defines sustainability as long-term forest health, and requires public forests be managed in a way that conserves ecological processes and biological diversity. This includes using forest practices that emulate natural disturbance, such as fire, while minimizing adverse effects on plants and animals, including species at risk, as well as water, soil, and air. Additional direction and tools in the forest policy framework maintain oversight, protect the environment, and effectively manage public forests.

For example:

- Forest management plans determine sustainable levels of harvesting and renewal. They are prepared by Registered Professional Foresters with input from local citizens, Indigenous communities, stakeholders and the public. A Registered Professional Forester certifies that the plan provides for the sustainability of the Crown forest and each plan is approved by the Ministry of Northern Development, Mines, Natural Resources and Forestry.
- The Forest Management Planning Manual and forest management guides provide direction for preparing plans and practices to conserve biodiversity, wildlife habitat, soil, water and cultural heritage.
- Data and modelling support decision making for forest management plans. Models help to portray the current state of the forest, how it develops through time (i.e. over 100 years) and how it contributes to objectives like forest diversity, wildlife habitat and timber production. They help to weigh options and assess sustainability.
- <u>Compliance and independent forest audit programs</u> monitor forest operations and confirm whether forests are being managed in compliance with regulations.
- Forest trusts provide dedicated funding for renewing forests.
- · Public reporting provides information on the status of forests and forest management.

Generally Sustainable Forest Licence holders manage the forest and have the right to harvest. Sustainable Forest Licences are long-term licences for a management unit. They can be held by a forest sector or Indigenous company, a multi-party company with two or more interests, or an agency.

The Sustainable Forest Licence holders prepare forest management plans, gather forest information, monitor and report on compliance and conduct forest operations. If no Sustainable Forest Licence is in place, the Ministry of Northern Development, Mines, Natural Resources and Forestry manages the forest.

<u>Sustainable Growth: Ontario's Forest Sector Strategy</u> is part of the government's plan to create jobs, reduce administrative burden, and promote economic growth and prosperity across the province, while ensuring responsible stewardship of our natural resources for future generations.

The forest policy framework does not apply to private lands. However, Ontario understands the importance of forests on both public and private lands and encourages the responsible management of private land forests through the <u>Managed Forest Tax Incentive Program</u>.

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Continual improvement: the role of adaptive management

Sustainable forest management in Ontario is rooted in the best available science and founded on adaptive management.

New information, science, and traditional ecological knowledge improve our understanding of the forest environment over time. As polices and plans are implemented, we monitor and evaluate outcomes so they can be incorporated into a subsequent process.



By integrating new information and implementation experience, the adaptive management cycle supports continual improvement.

The steps in adaptive management are plan, implement, monitor, evaluate and adjust. Using this approach, forest policies and plans are regularly revisited, updated and revised. For example:

- The <u>Ontario Tree Seed Transfer Policy</u> was developed to support the long-term success of regeneration activities in a changing climate. The updated policy incorporates the latest science on the potential effects of climate change on forest growing conditions.
- Forest management guides are regularly reviewed and updated to incorporate the latest research on the effectiveness of the guides.
- New forest management plans are prepared every 10 years to account for actual levels of activities, changes in the forest condition and updates to science and policy.

Forest policy development and forest management planning are separate yet interconnected cycles with public and Indigenous consultation key components of both.

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Key components of sustainable forest management

Key Inputs

- Forest inventory
- Forest laws and policies
- Local values
- Science and traditional ecological knowledge
- Indigenous community input
- Public input

Sustainable Forest Management

- Registered Professional
 Foresters
- Forest management plans
- Trained workers (loggers,
- tree planters)Certified compliance
- inspectors
- Independent forest
 auditors

Key Outputs

- Diverse healthy forests
- Diverse ecological systems
- Wildlife habitat
- Sustainable timber supply
- Forest related jobs
- Recreational opportunities
- Cultural opportunities

Below are current topics of interest related to forest management along with some relevant information and/or statistic from select indicators. Refer to the section "What is the State of Ontario's Forests" for conclusions and a summary of indicator results.

Social/Governance

There are many uses and users of Ontario's public forests. All forest uses and users are considered in developing objectives and long-term management direction, and in planning forest operations.

Indigenous community and public consultation are a key component of Ontario's forest policy framework and is required by law.



Ontario continued to work with the public in resource management with approximately 240 opportunities per year to provide input into forest management planning and policy development.



The Forest Management Planning Manual describes how to work with Indigenous communities to support their involvement in the forest management planning process in a manner that respects Aboriginal and treaty rights, and ensures Ontario meets its duty to consult.



93% of plans had Indigenous community participants on the planning team.

Resource revenue sharing agreements share the economic benefits of forestry operations that occur in forests near Indigenous communities.



Under the Agreements, 31 participating communities have received a total of \$19.8 million in shared forestry revenue.

Forest tenure directs who manages and has access to the wood fibre from public forests and evolves to fit local circumstances.



58% of tenure is held by multi-party companies that may have a combination of community, Indigenous, and/or forest industry who govern the company together.

Forest carbon and climate change

Sustainable forest management, supported by Ontario's forest policy framework, maintains healthy and diverse forests that can withstand the impacts and reduce the effects of climate change. A working forest provides a climate solution by capturing carbon in growing trees and storing carbon in forests and forest products.



Trees store carbon in the form of wood. Even when trees are harvested carbon remains stored in the wood. Products created from the harvested wood like lumber, plywood, flooring and furniture lock away carbon in our homes and workplaces for decades.



Public forests stored an estimated 7.2 billion tonnes of carbon.



Wood products from the Managed Forest stored 25.5 million tonnes of carbon. This is comparable to the annual emissions from about 28.6 million passenger vehicles.

Ontario's policy framework legally requires harvested forests to be seeded, planted or naturally regenerated back to a forested state. **The harvested site is regenerated and the new trees growing on the site begin to absorb carbon**.

A forest that has been harvested remains a forest. There is no change in land use. It is regenerated to be similar to a natural unmanaged forest and to meet long term management goals.



90% of the area surveyed annually met standards for successful regeneration. The remaining area is still regenerating and forest managers determine if it may need additional treatments (e.g., tending) or simply additional time to grow before it meets standards.

The Ministry of Northern Development, Mines, Natural Resources and Forestry works with research partners to better understaneflect this improved understanding to ensure the long-term health of Ontario's public forests.



The <u>Ontario Tree Seed Transfer Policy</u> was updated to incorporate the latest science on the potential effects of climate change on forest growing conditions.





Forest biodiversity

Ontario maintains oversight and protects the environment and biodiversity across the Managed Forest, an area in the middle of the province where forest management occurs on public land, using its forest policy framework.

Ontario's forest sector operates under the requirements of the framework to conserve the ecological processes and biological diversity of our forests while providing for economic opportunities.

Forest managers must maintain a mix of forest types and ages that ensure forest landscapes remain healthy and diverse to support natural ecological systems and preserve biodiversity over the long term. This diversity of ecosystem conditions provides habitat for all species.

Forest managers also take steps to prevent or minimize any effects from forest operations on other values. For example, operations may be modified or excluded in a specific area to protect habitat features like decaying trees, bird nests, streams, wetlands and lakes.



In addition, 10.7% of Ontario is conserved through protected areas or other conservation measures, covering approximately 11.5 million hectares of land and water.

The Ministry of Northern Development, Mines, Natural Resources and Forestry supports the Ontario Biodiversity Council in producing the <u>State of Ontario's Biodiversity Report</u>.





Profile: managing species at risk in sustainable forest management

Forest management plans establish long-term objectives for the forest by considering all forest uses and values, such as species at risk habitat.

Plans identify the available harvest area and the forest management activities that will take place like where and how trees will be harvested, where roads can be built, how the forest will be regenerated.

The Forest Management Planning Manual guides the planning process, and ecological forest management guides are used to conserve biodiversity including species at risk. The guides provide implementation and operational direction based on these principles:

- emulate natural disturbance
- conserve biodiversity
- protect sensitive habitat features such as bird nests, dens, species at risk
- minimize adverse effects on plant and animal life, water, soil, and air

Landscape guides direct **the amount and arrangement of different types and ages of forest** on the management unit. This helps **forest managers find a balance of habitat for all life forms** (wildlife, birds, fish, plants) and meet any needs for specific species. These guides are the <u>Forest Management Guide for Boreal Landscapes</u> (Boreal Landscape <u>Guide</u>) and the <u>Forest Management Guide for Great Lakes-St. Lawrence Landscapes</u>.

Another guide called the <u>Forest Management Guide for</u> <u>Conserving Biodiversity at the Stand and Site Scales (Stand</u> <u>and Site Guide)</u> gives direction on **modifying forest operations to retain special features such as decaying trees and fallen logs, protect sensitive habitats such as bird nests and woodland pools, and ensure the conservation of water and soil resources**.

Using these approaches, the direction in forest management guides considers habitat for all wildlife including the special habitat needs of species at risk. If direction for a species is not in a forest management guide, the planning team must develop direction to apply where the species is present.



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An example species at risk: Forest dwelling woodland caribou

Forest dwelling woodland caribou are found in the boreal forest including some parts of the Managed Forest. They are listed as threatened in Ontario, meaning they are not endangered but are likely to become endangered if steps are not taken to address factors that threaten them.

Habitat deterioration or loss is one of these threats. Ideal caribou habitat is large areas of mature conifer forests of spruce and jack pine, thousands of hectares in size and rich in lichen. This is what would occur in natural unmanaged forests where forest fires are the main type of disturbance.

Ontario's Forest Management Guide for Boreal Landscapes provides the direction for how forest managements plans must consider and maintain caribou habitat.

The map below shows the management units and a line running east to west which is the southern limit of caribou distribution. For management units above this line, the guide requires forest managers to:

- Develop a long-term plan (i.e., 100+ years) for providing large, interconnected patches of caribou habitat across the entire management unit. This is called a Dynamic Caribou Habitat Schedule. It must consider existing habitat, area that will become habitat over time, calving areas, nursery areas, wintering areas and travel corridors.
- Use science-based estimates of the amount of habitat that would naturally occur in an unmanaged landscape to develop habitat targets in the forest management plan with the objective to sustain caribou.

The guide also provides best practices for regenerating the forest to conifer forests that will provide caribou habitat in the future and for decommissioning and regenerating roads back to conifer forests.

Management units and the southern limit of caribou distribution in the boreal forest



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What is the State of Ontario's forests?

Forest indicators are measures that tell us what is happening over time. These measures help us monitor the well-being of our forest ecosystems, communities and industry. Indicators reflect the ecological, social, and economic pillars of sustainability.

Indicator results demonstrate that under Ontario's robust forest policy framework:

- Sustainable forest management continues to provide for the long-term health of Ontario's public forests.
- Public forests remain diverse and resilient, and the wood we harvest from them is sustainably sourced.

The summary below provides an overview of indicator results. For complete indicators refer to the next section.

Indicator summary



FOREST COMPOSITION

Changes in the area of forest types and ages was minimal. The diversity of forest types and ages were maintained.



FOREST GROWTH

Forest growth was relatively stable. The total volume of the forest was 4.7 billion cubic metres and annual growth was 39–49 million per year.



HABITAT FOR WILDLIFE

Habitat availability was within the range of natural variation for most selected species such as moose and snowshoe hare.



NATURAL FOREST DISTURBANCES

The area of forests fires, weather events, insects and diseases remained within past ranges. These events disturbed large amounts of forest in some years and little in others.





AFFORESTATION/DEFORESTATION

From 2008–2018 afforestation rates were stable. Deforestation rates increased; however, they remained small relative to the total amount of forest in the province. Estimated net loss was 38,000 hectares or 0.05% of Ontario's forest area.



FOREST CARBON

Ontario's forests stored 7.2 billion tonnes of carbon. Forest products from the Managed Forest stored 25.5 million tonnes.



RESOURCE REVENUE SHARING

Ontario continued to support economic development opportunities for Indigenous communities, sharing over \$19 million in forestry revenue with 31 communities.



NATURAL RESOURCES EMPLOYMENT

Ontario's public forests provide over 46,000 direct forest sector jobs in communities across Ontario.



FOREST HARVESTED

Harvesting was within approved levels. On average 121,000 hectares was harvested per year resulting in 13 million cubic metres of wood. This is 44% of the approved area and volume that was available to harvest.



FOREST REGENERATION

Regeneration has kept pace with harvesting. 90% of the area surveyed annually met standards for successful regeneration.



FOREST GOVERNANCE

There was a diversity in the types of companies holding long-term tenure on management units. 85% of management units are managed under a Sustainable Forest Licence and 15% are managed directly by the Ministry of Northern Development, Mines, Natural Resources and Forestry.



INDIGENOUS INVOLVEMENT IN FOREST MANAGEMENT PLANNING

Ontario continued to work with Indigenous communities. Representatives of Indigenous communities participated on planning teams for most of the forest management plans that were prepared.



PUBLIC ENGAGEMENT

Ontario continued to work with the public in resource management with over 240 opportunities to provide input into forest management planning and policy development.





TAX INCENTIVE PROGRAMS

The Managed Forest Tax Incentive Program supports responsible management of private forests. It continued to be of interest to private landowners, with over 750,000 hectares enrolled.



FOREST COMPLIANCE

Forest operations followed approved forest management plans and operational prescriptions. From 2014–2018 the average compliance rate was 97% for over 14,000 forest operations inspections conducted.



INDEPENDENT FOREST AUDITS

Forests continued to be sustainably managed. 94% of audits demonstrated forest managers followed legislation, regulations and policies.



FOREST CERTIFICATION

74% of management units in the province continue to voluntarily be certified to an internationally recognized standard.



FOREST PRODUCTS

The volume of harvested wood flowing into forest product sectors remained lower than it was historically. The sawmill, composite, and pulp sectors used over 90% of the total harvest.



FOREST STUMPAGE REVENUE

Consumer demand has helped revenues recover from the 2008 economic downturn, with over \$112 million in annual revenue recently generated.



FOREST SECTOR EXPORTS

Demand helped exports recover from the 2008 economic downturn, with recent annual exports valued at over \$6.5 billion.



FOREST SECTOR GROSS DOMESTIC PRODUCT

The forest sector continued to contribute to Ontario's economy generating over \$4 billion in gross domestic product.



Forest indicators

Forest indicators are measures that tell us what is happening over time. These measures help us monitor the well-being of our forest ecosystems, communities and industry.

The geographic extent is specified for each indicator. Most relate to the Managed Forest which is the area in the middle of the province where forest management occurs on public land. It has a large quantity of productive forest that is suitable for timber production. Some indicators may include southern Ontario or are province wide.

Indicators are adapted from national and international forest reporting such as the Montreal Process. We continue to evolve our approach to focus the report on forest conditions and how we conduct forest management. Some indicators are new, and some are no longer being reported or were merged with other indicators. In some cases, better data also provides more accurate results; therefore, direct comparisons to previous reports are not always possible.



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How much forest do we have in Ontario?

Ontario is 66% forested and has 70.5 million hectares of forest which is about 4.8 hectares of forest for every citizen. This represents about 2% of the world's forests and 20% of Canada's forests.

Ontario has four main <u>forest regions</u>, each with unique characteristics: the Hudson Bay Lowlands in the Far North, the Boreal Forest in northern Ontario, the Great Lakes–St. Lawrence Forest in southern and central Ontario, and the Deciduous Forest in southern Ontario. Each forest region is characterized by its climate, forest ecosystems, and wildlife species.

The Managed Forest is an area in the middle of the province where forest management occurs on public land. It has a large quantity of productive forest that is suitable for timber production.

Black spruce is the most common tree in Ontario and is primarily found in the Boreal Forest region. It represents about 33% of Ontario's Managed Forest. Sugar maple is the most common tree in the Great Lakes–St Lawrence and Deciduous Forest regions. It represents about 3% of Ontario's Managed Forest.



The indicators below provide more information on:

- forest composition
- forest growth
- habitat for wildlife
- afforestation and deforestation
- natural forest disturbances

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FOREST COMPOSITION



This indicator tracks changes to the area, type and age of Ontario's forests.

Why it's important

Forests cover nearly two-thirds of Ontario and provide important ecosystem services such as carbon storage and biodiversity.

Ontario's public forests are managed to maintain a diversity of forest types and ages to provide conditions required for the long-term health of forest ecosystems.

How we monitor

To monitor the composition of Ontario's forests we track:

 eight forest types with common tree species and ecological characteristics

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five age groupings or seral stages

We use <u>Forest Resources Inventory</u> data for the Managed Forest to determine forest type and age. We do not include southern Ontario or the Far North as we lack forest inventory data in these areas.

The age and duration of seral stages varies by forest type depending on how fast the trees grow and how long they live. For example, short-lived poplar reaches the late successional stage at 95 years old. For long-lived lowland conifer, like black spruce, this stage is reached at 135 years old.

Forest types and seral stages are further described in the Forest Resources of Ontario report.

Results

A diversity of forest types and ages continue to be maintained across Ontario. Like previous reports, small changes in the abundance of forest types and ages were observed.



Area by forest type

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From 2006 to 2021, there were small changes in the area of most forest types. Since 2016 there was:

- an increase in the area of red and white pine, conifer upland, and mixedwood forest
- a decrease in the amount of poplar and white birch forest

From 2006 to 2021, there has been little change in the area of forest by seral stage. Since 2016, there was:

- a decrease in the amount of pre-sapling forest
- an increase in the amount of immature and mature forest

Small changes in forest type and seral stage are a normal characteristic of forest ecosystems. Natural disturbances can result in short-term fluctuations in the amount and age of forest types.

<u>Forest management guides</u> are applied during forest management planning to maintain a diversity of forest types and ages on the landscape that would emulate natural forest conditions. Advancements in data collection also contribute to observed changes. New forest inventories use higher quality digital imagery and describe the forest more accurately. This can cause forest composition results to shift even when there have been no actual changes to the forest.

In addition, since 2016, another management unit was added to the reporting data, likely contributing to some of the observed change.

Metadata

Geographic extent: Managed Forest Indicator last updated: February 2021 Data source(s): Forest resources inventory analysis results



FOREST GROWTH



This indicator tracks the volume and growth rate of public forests in Ontario.

Why it's important

Forests cover nearly two-thirds of Ontario and provide important ecosystem services such as carbon storage and biodiversity. Forests also provide a sustainable source of timber to support a forest industry that creates jobs and the forest products that society needs.

We <u>manage Ontario's public forests</u> to maintain forest productivity for the long-term health of forest ecosystems. We track changes in the volume and growth rate of Ontario's forests to monitor forest productivity.

How we monitor

We monitor forest growth and volume using two measures:

- gross total volume which is the total biomass of living trees
- annual growth which is the volume each year

These measures are estimated using growth and yield models and Forest Resources Inventory data for the <u>Managed Forest</u>. We do not estimate forest growth for southern Ontario or the Far North as we lack forest inventory data in these areas.

Forest growth and volume are further described in the <u>Forest Resources of Ontario</u> report.

Results

Gross total volume and current annual increment have remained relatively stable.

Gross total volume in the forest has remained relatively constant ranging from 4.4 to 4.8 billion cubic metres.

Wood volume should remain relatively stable if growth is keeping pace with depletions from harvesting and natural disturbances, such as insect infestations, diseases and forest fires.

Annual growth has ranged from 39 to 49 million cubic metres per year.

Some natural fluctuation in forest volume and growth is expected as the type and age of forests change. As forests age, their growth fluctuates. In general, younger trees grow more quickly than older trees. While increasing forest age is neither positive nor negative, it can lead to declines in productivity.



Gross Total Volume

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Advancements in data collection also contribute to observed changes. New forest inventories use higher quality digital imagery and describe the forest more accurately. This can cause volume and growth results to shift even when there have been no actual changes to the forest.

A productive forest may not equate to a healthy diverse forest. A productive forest could lack entire species or age classes. Forest management guides are applied during forest management planning to maintain a diversity of forest types and ages on the landscape that would emulate natural forest conditions. This indicator combined with the Forest composition indicator demonstrates that Ontario forests are both productive and diverse.

Metadata

Geographic extent: Managed Forest Indicator last updated: February 2021 Data source(s): <u>Forest Resources Inventory</u>



WILDLIFE HABITAT



This indicator assesses habitat availability for select wildlife species in Ontario.

Why it's important

Providing an abundant supply of suitable habitat helps to support robust wildlife populations. Maintaining or enhancing wildlife habitat is an objective of sustainable forest management in Ontario.

Forest management guides are used to develop forest management plans. They direct the amount and arrangement of different types and ages of forest on the landscape. This helps forest managers balance habitat for all wildlife, including species at risk. They also provide direction on modifying forest operations to retain specific habitat features like decaying trees, and protect sensitive features like bird nests, lakes, streams, and wetlands.

We assess the availability of wildlife habitat for a variety of species to see how our managed forests are supporting wildlife.

How we monitor

We compare current habitat availability to the range of natural variation for six wildlife species: moose, marten, snowshoe hare, least flycatcher, white-throated sparrow, and ovenbird.

These six species require a broad range of forest types and ages to meet their habitat needs.

- Moose prefer a mosaic of wetlands, young forest, and old forest to provide food and cover throughout the year.
- Marten prefer mature conifer forest.
- Snowshoe hares prefer a mix of young forest with a dense understory and old forest with canopy openings.
- Least flycatchers prefer hardwood and mixedwood forest with dense understory vegetation.

- White-throated sparrows inhabit young forest after disturbances and prefer edge habitats.
- Ovenbirds prefer large patches of mature hardwood or mixedwood forest.

We estimate habitat availability using Ontario's Landscape Tool and Forest Resources Inventory data for the <u>Managed Forest</u>. We do not estimate habitat availability for southern Ontario or the Far North as we lack forest inventory data in these areas.

The <u>Ontario Landscape Tool</u> analyzes how current forest conditions meet habitat needs. It also simulates natural disturbances and forest development to determine ranges of natural variation. Ranges of natural variation estimate the habitat availability we would expect in a natural forest. It is used as a benchmark to assess the current status of wildlife habitat.

The habitat preferences of the six species change depending on their location in the province, therefore we estimate habitat availability within distinct geographic areas known as <u>Landscape Guide Regions</u>. Landscape Guide Regions are like <u>ecoregions</u> and are characterized by common climate and ecosystem conditions. There are six Landscape Guide Regions that are commonly grouped into the boreal northwest (3S/4S, 3W, 4W), the boreal northeast (3E) and the Great Lakes–St.Lawrence (4E, 5E).





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This indicator cannot be readily compared to previous reports because of the revised data and modelling used. Instead, this is a point-in-time assessment relative to benchmark values.

Results

Current habitat availability falls within the range of natural variation for most selected species.

(Current habitat availability relative to the range of natural variation for six wildlife species by
L	_andscape Guide Region

	Species	Boreal Northeast 3E	Boreal Northwest 3S/4S	Boreal Northwest 3W	Boreal Northwest 4W	Great Lakes- St. Lawrence 4E/5E
*	Moose	Above	Above	Above	Above	Below
	Marten	Within	Within	Within	Within	Below
· J	Snowshoe hare	Below	Within	Within	Within	Below
6	Least flycatcher	Within	Within	Within	Above	N/A
	White- throated sparrow	Above	Within	Within	Within	N/A
	Ovenbird	Within	Within	Within	Within	N/A

When current habitat availability falls within the range of natural variation, this shows that it is similar to what we would expect under natural conditions.

Current habitat availability is:

- within the range of natural variation for most species
- above the range of natural variation in a few cases, such as for moose in the boreal northeast and boreal northwest
- below the range of natural variation for species in the Great Lakes–St. Lawrence

The Great Lakes–St. Lawrence region has been settled and developed for over 150 years and the forest is not as close to natural levels when compared to the boreal regions. Consequently, levels of habitat for indicator species are below the range of natural variation.

When outside of the natural range of variation, planning teams may consider strategies to move towards the range of natural while balancing a unique set of objectives in the forest management plan. The charts below provide an example of how we compare current habitat availability to the range of natural variation. The black dot represents the current amount of suitable habitat and the coloured bar represents the range of natural variation. Habitat availability is measured as:

- carrying capacity for moose, which is the number of moose per square kilometre that could be supported by the available habitat
- amount of suitable habitat for marten and snowshoe hare
- mean probability of habitat occupancy for least flycatcher, white-throated sparrow, and ovenbird











Metadata

Geographic extent: Managed Forest Indicator last updated: February 2021 Data source(s): Administrative data – Ontario's Landscape Tool modeled results



AFFORESTATION AND DEFORESTATION



This indicator estimates the amount of afforestation and deforestation in Ontario.

Why it's important

Forests provide many benefits such as carbon storage, wildlife habitat, and regulating air, soil, and water quality.

Minimizing forest loss from deforestation and establishing new forests through afforestation can help maintain the values from our forests and mitigate climate change.

How we monitor

Deforestation is the permanent conversion of forest to other land uses such as agriculture and mining. Afforestation is the establishment of forest on land that has not been forested for at least 50 years.

Forest harvesting and renewal are not considered deforestation or afforestation because there is no change in land use. As part of sustainable forest management, the trees are re-established.

We estimate afforestation on private lands using tree planting records from Forests Ontario. Afforestation occurs primarily in southern Ontario. Forest gained from natural sources, such as the transition of old fields to forest, is not included.

We estimate the area of deforestation by analyzing:

- data from Canada's National Deforestation Monitoring System that uses satellite imagery to identify conversion of forest to other land uses
- Ministry of Northern Development, Mines, Natural Resources and Forestry data of forest cleared to construct permanent forest access roads

We supplement data from the National Deforestation Monitoring System with provincial data to better capture the extent of permanent forest access roads narrower than 20 meters.

Permanent forest access roads include primary and branch roads. Primary roads provide principal access to an area where forest management takes place. Branch roads provide access to, through or between areas of forest management operations. Temporary forest access roads, called operational roads, are not included in the estimate of deforestation.

Estimates of afforestation and deforestation do not include the Far North as we lack data for this area. This indicator cannot be readily compared to previous reports because of the revised data sources and methods used.

Results

Afforestation rates have remained stable over the last 10 years. Although the annual area deforested in the province is small relative to the total amount of forest, overall deforestation has been increasing, driven largely by agriculture in southern Ontario.

The annual area afforested has remained relatively constant from 2008 to 2018, whereas deforestation has increased.

- An average of 1,276 hectares of forest was gained per year through afforestation compared to an average of 4,731 ha per year lost to deforestation.
- A total of 14,038 hectares of new forest was established through afforestation while 52,041 ha was lost through deforestation.
- There was a net loss of 38,003 hectares of forest or 0.05% of Ontario's total forest area.





The increase in deforestation since 2008 was driven primarily by agriculture. Deforestation was relatively stable across other industrial sectors.



Area deforested in northern and southern Ontario



Average annual area deforested from 2008–2018 in northern and southern Ontario by industrial sector



From 2008 to 2018, the annual area deforested in northern Ontario remained relatively constant, while deforestation in southern Ontario increased.

- Northern Ontario averaged 2,079 hectares of deforestation per year.
- Southern Ontario averaged 2,652 hectares of deforestation per year, an increase from 1,382 hectares in 2008 to 3,674 in 2018.

From 2008 to 2018, forest access roads and mines together accounted for 54% of deforestation in northern Ontario and agriculture accounted for 75% of deforestation in southern Ontario.

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Metadata

Geographic extent: Southern Ontario, Managed Forest

Indicator last updated: February 2021

Data source(s): <u>Forests Ontario</u>, Natural Resources Canada, Canadian Forest Service, National Deforestation Monitoring System, special tabulation of data from NDMS: DD2021–R05f. December 16, 2020.

NATURAL FOREST DISTURBANCES



This indicator report tracks the amount of forest affected by fire, insects and disease and extreme weather.

Why it's important

A natural forest disturbance is when trees are killed or damaged from wildland fire, insects, disease, or weather. Natural disturbances occur throughout the life cycle of a forest.

Measuring the area of these disturbances allows us to estimate impacts on forest health and productivity.

How we monitor

Annual surveys under the <u>forest health monitoring</u> <u>program</u> determine the general area of insect, disease and weather related disturbance. Yearly fire data is collected by our <u>wildland fire manage-</u> <u>ment program</u>. We use information from the forest resources inventory to estimate volume losses.

Each year we monitor:

 the amount of area disturbed by <u>insects</u>, <u>disease</u>, <u>weather</u>, and wildland fire

- the number of, and area burned by, wildland fires
- volume loss within management units

The area disturbed is the gross area within which disturbances occurred including all forest and ownership categories and all severities of disturbance.

Not all disturbances have the same effect. Tree mortality and volume loss vary depending on the type of disturbance and the type of forest where the disturbance occurs.

Wildland fire and extreme weather can destroy trees and cause higher tree mortality and volume loss. Insects and disease damage trees and reduce their growth, however, it may not result in significant mortality or volume loss. If insect or disease infestations recur over several years, it can affect tree survival. Wildland fires in areas with young forest or minimal forest cover result in low volume loss.

Most disturbances are a natural part of forest ecosystems, however non-native insects and diseases can be detrimental.

Results

The status is assessed as good as recent disturbance levels fall within ranges observed since 2002. Different types of disturbances affect large amounts of forest in some years and little in others. This variability creates a mixed trend.



Area disturbed by insects and disease, weather and wildland fire

Insects continue to be the predominant type of natural forest disturbance. From 2015–2019:

- there was an increase in the area disturbed by insects; however, this is not unexpected given their naturally recurring cycles
- the overall area disturbed was 9.2 million hectares which is approximately 13% of the province's total forest area
- insect infestations included forest tent caterpillar at 5.2 million hectares, jack pine budworm at

1.7 million hectares, and spruce budworm at just under 900,000 hectares

- where tree mortality occurred within the Managed Forest, total volume losses were approximately 4.1 million cubic metres from all types of disturbance including 1 million cubic metres from these three insects
- weather, specifically snow damage, affected a significant area in 2013



Number of fires and area burned 10-year average





The number of wildland fires is highly variable from year to year. Between 2015 to 2019 there was a steady increase in the area of forest burned annually by wildfire.

- A total of 3,889 fires burned approximately 774,279 hectares.
- The volume loss from wildland fire was approximately 2.3 million cubic metres.

Because the number and extent of wildland fires is highly variable year to year, a 10-year average is used to show a trend in the number of fires and area burned. Since 2002, this shows:

- an overall declining trend in the number of fires
- the area burned declined until 2011 when significant fires caused it to increase, then it was steady from 2013–17 before beginning to increase again in 2018

Although most fires occur within the Managed Forest, they account for only 19% per cent of the area burned. There are fewer fires in the Far North, however they account for 81% of the area burned.

In Ontario, <u>forest management plans</u> are updated every 10 years, the updates account for the impacts of natural disturbances and volume losses.

Many forests depend on periodic fires. Without wildland fires, forests can become more susceptible

to disease and insect infestation. Ontario's <u>wildland</u> fire management program seeks to balance the ecological role of wildland fire in maintaining healthy forests with ensuring public safety and protecting infrastructure.

Every wildland fire is assessed to determine the appropriate response according to the circumstances and condition of the fire. Under this approach, wildland fires that occur in areas with a low density of values (communities and infrastructure) or resources, may receive a modified response and the fire may burn. This allows the fire to fulfill its role in a natural environment to renew the forest. However, if a wildland fire is an immediate threat to assets or resources, a full response may be needed to minimize damages and disruption.

Metadata

Geographic extent: Managed Forest, Far North Indicator last updated: February 2021 Data source(s): spatial data from the Forest Health program and Ontario's wildland fire management program, forest resources inventory to estimate volume in the Managed Forest



How do forests benefit Ontarians?

Ontario's forests are vast and provide many economic, social and environmental benefits. Forests provide biodiversity and wildlife habitat while helping address the effects of climate change.

Forests also offer recreational opportunities like hunting, fishing, camping, hiking, and berry picking. Forests are culturally significant to many Indigenous communities.

Through sustainable harvesting, public forests support a forest industry that creates jobs and forest products. Beyond the forest industry, forests also support jobs in resource-based tourism, equipment manufacturing, transportation, trapping and retail and service industries.

<u>Sustainable Growth: Ontario's Forest Sector Strategy</u> is part of the government's plan to create jobs, reduce administrative burden, and promote economic growth and prosperity across the province while ensuring responsible stewardship of our natural resources for future generations.

The following indicators provide more information on:

- natural resources employment
- resource revenue sharing
- Forest Carbon





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NATURAL RESOURCES EMPLOYMENT



This indicator tracks employment in several natural resource sectors including forestry, aggregates, oil and gas, aquaculture, fishing, hunting and trapping.

Why it's important

Ontario's natural resource sectors provide employment in many communities across Ontario, especially in northern and rural communities where the Natural resources sector is one of the largest employers.

Small changes to employment can shift the well-being of these communities. We monitor employment in the natural resource sectors to better understand the sustainability of our natural resource management and well-being of remote and rural communities.

How we monitor

We track the annual employment in the extraction and processing of natural resources for each major sector including:

- forestry
- aggregates (including related processing subsectors)
- aquaculture, fishing, hunting and trapping (commercial operations only)
- oil and gas

We use labour statistics data from the System of National Accounts of Statistics Canada. This system includes full-time, part-time and self-employment jobs.

The System of National Accounts is preferred over other employment data (e.g. Labour Force Survey and Survey of Employment, Payroll and Hours) because it has greater accuracy and less year over year fluctuation. It also allows easier comparisons with other statistics generated from the System of National Accounts, such as industry output or gross domestic product (GDP).




Related North American Industry Classification System industries and codes by Sector

Sector	Industries and codes						
Forest	logging and forestry [113]						
	support activities for forestry [1153]						
	wood product manufacturing [321]						
	paper manufacturing [322]						
Aggregates	stone mining and quarrying [21231]						
	• sand, gravel, clay and ceramic refractory minerals mining and quarrying [21232]						
	Other non-metallic mineral mining & quarrying (not diamond and potash) [21239A]						
	cement and concrete product manufacturing [3273]						
	non-metallic mineral product manufacturing (except cement and concrete						
	products) [327A]						
Aquaculture,	• aquaculture [1125]						
fishing, hunting	fishing, hunting and trapping [114]						
and trapping							
Oil and gas	oil and gas extraction [211]						
	• support activities for oil and gas extraction [21311].						

Natural resources employment (2010 to 2019)



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Results

Forest sector employment has been relatively stable since 2009 despite an increase in the harvest volume. This is due to an increase in productivity. Similarly, employment in aggregates and aquaculture, fishing, hunting and trapping sectors have largely remained stable, while the oil and gas sector has declined. In 2019, there were 73,695 jobs in Ontario's natural resource sectors. This is a 5 per cent decrease from 2010 when there were 77,330, but about the same as 2015 employment.

Aggregates sector employment has been relatively stable. Aggregate resources (e.g., stone, sand and gravel) are necessary for the construction of roads, bridges, buildings and other infrastructure. The average number of jobs from 2010 to 2014 in aggregates-related sectors was 26,981. From 2015 to 2019, the average number of jobs increased to 27,010.

Employment in oil and gas-related sector has stabilized from 2010 to 2014 average of 1410 jobs to a 2015–2019 average of 752 jobs. This reflects lower production in the province.

Aquaculture, fishing, hunting and trapping employment has been relatively stable, with aquaculture employment averaging 297 jobs annually, while fishing, hunting and trapping have averaged 806. These fishing, hunting and trapping values are for commercial operations only and do not include related jobs in tourism (e.g. northern tourism outfitters).

The forest sector has been quite stable, with total wood harvested from Crown forests increasing from a low of 9.7 million cubic metres in 2009 to 13.7 million cubic metres in 2019. The average number of jobs from 2010 to 2014 was 45,832. This is slightly more than 2015 to 2019 when there was an average of 44,572 jobs.

This slight decrease is likely related to increased automation. Automation increases labour productivity and impacts primary and secondary processing industries. In addition, some facilities in the pulp and paper industry in northern Ontario have moved the production of value-added products to the United States. As such, employment has not kept pace with increases in output or forest sector GDP.

Metadata

Geographic extent: Province-wide Indicator last updated: April 2021 Data source(s): <u>Statistics Canada, labour statistics</u> <u>consistent with the System of National Accounts by</u> <u>job category and industry</u>



RESOURCE REVENUE SHARING



This indicator measures the number of First Nation communities participating in resource revenue sharing and the amount of forestry revenue that is shared annually.

Why it's important

<u>Resource revenue sharing</u> represents one of Ontario's commitments to advance reconciliation, improve socio-economic conditions and support economic development opportunities for Indigenous communities to build healthy and prosperous communities across Ontario's north.

Resource revenue sharing agreements share the economic benefits of forestry operations that occur in forests near First Nation communities.

In April 2018, Ontario negotiated and signed three Resource Revenue Sharing Agreements with First Nations organizations: Grand Council Treaty #3, Wabun Tribal Council, and Mushkegowuk Council. The agreements commit Ontario to annual sharing of 45 per cent of net forestry stumpage revenues

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from eligible forest management units. Although the agreements also share mining tax and royalties, this indicator only reports on the amount of shared forestry revenue.

How we monitor

Under the current agreements, there are 39 First Nation communities that are currently able to receive a share of forestry revenues. We monitor resource revenue sharing by tracking the participation rate in Resource Revenue Sharing Agreements. We use the annual amount of eligible forestry revenue to calculate the amount to be shared with First Nations.

Results

In 2018, 31 First Nation communities in Northern Ontario have Resource Revenue Sharing Agreements. Participation in resource revenue sharing increased in 2020 by about 13 per cent with the addition of four First Nation communities. As of 2020, 35 First Nation communities are sharing in forestry revenue. Overall, 90 percent of the 39 communities that are currently able to share revenue under the existing agreements are receiving revenue.





Under the Agreements, 31 participating communities have received a total of \$19.8 million in shared forestry revenue. First Nations that joined in 2020 will be a part of the third revenue sharing payment, scheduled to be made before December 31, 2021.

The amount of annual forestry revenue shared with First Nations varies yearly due to fluctuations in the eligible revenue the government receives, which is based on forestry activities. The total amount of forestry revenue shared will also vary depending on the number of participating First Nation communities.

Forestry revenue shared (2019 to 2020) (as indicated in Public Accounts)

Date	Amount Shared	Based on Revenue from Fiscal Year	
December 2019	\$11,169,588.43	2018/19	
December 2020	\$8,693,152.76	2019/20	

Metadata

Geographic extent: Managed Forest Indicator last updated: February 2021 Data source(s): Administrative data





FOREST CARBON



This indicator estimates the carbon stored in forests and wood products.

Why it's important

Forests and wood products contain carbon. Much of this carbon is stored and kept out of the atmosphere, helping to reduce the effects of climate change. In the long term, maintaining or increasing the amount of carbon stored in forests and in wood products can provide for important greenhouse gas emission mitigation benefits while also maintaining other environmental, social and economic services.

How we monitor

Forest carbon can be estimated using parameters like forest age, tree species, dead organic matter, soils and conversion into wood products. The amount of carbon stored in forests and wood products is called a carbon stock.

We estimate carbon stocks in productive forests in Ontario, including the Managed Forest, private forests, forests in large parks and productive forests north of the Managed Forest (northern productive forests).

Confidence in forest carbon estimates is greatest for the Managed Forest due to the availability of data and information to support forest carbon analyses. Less data is available for other forest areas in Ontario (e.g., forests on private land, in parks, and northern productive forests), resulting in greater estimate uncertainty. As data and methods are refined over time, estimates are revised.

We assess how the Managed Forest and wood products from the Managed Forest may help keep more carbon out of the atmosphere during 2020–2100 using two measures:

- projected carbon stocks for each decade, and
- projected change in carbon stocks per decade (a rate that tracks how forest carbon changes through time)

Projections of carbon stocks in the Managed Forest and in wood products from the Managed Forest are estimated using the Ontario forest carbon budget model FORCARB-ON2 (Chen *et al.* 2018). Projected estimates are based on simulations of future forest condition documented in approved forest management plans and calculated using historical harvest rates.

Wood product carbon stocks are projected using Life Cycle Analysis. Since our 2016 report, we extend our analysis and reporting to include the following components:

- carbon stocks in wood products in use and in landfills
- energy and emissions from manufacturing these products
- emissions from decomposition of wood products in landfills
- substitution of non-wood products with wood products

Estimates of emission reductions from substituting wood products for more emission-intensive materials in construction are presented as potential substitution benefits, separately from estimates of net carbon stocks for all other wood product components.

Results

Managed Forest carbon stocks are projected to be maintained or increase during the 21st century, helping to reduce the effects of climate change. Since our 2016 report, projected Managed Forest carbon stocks have increased, in part due to updated information and methodologies.

2020 productive forest carbon stocks in Ontario

Metric	Total Productive Forest	Managed Forests	Northern Productive Forest	Private Land	Large Parks
Area (million hectares)	44.7	29.4	8.3	5.3	1.7
Carbon stocks (million tonnes)	7,229	4.719	1,376	857	277

In 2020, productive forests in Ontario stored an estimated 7.2 billion tonnes of carbon and Managed Forests stored the largest portion at 4.7 billion tonnes of carbon. Wood products from the Managed Forest stored an additional 25.5 million tonnes of carbon, while substitution was estimated to account for 19.3 million tonnes of carbon. For the period 2020–2100, predicted carbon stocks increase by 138 million tonnes in Managed Forests and by 67 million tonnes of carbon in wood products from the Managed Forest. Wood product substitution for more emission-intensive construction materials, if realized, can provide greenhouse gas emission mitigation benefits up to 128 million tonnes of carbon.



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Projected changes in forest carbon stocks per decade



Combined, these estimates suggest that the Managed Forest in Ontario could contribute up to an average 4.1 million tonnes of carbon per year toward emissions reductions, if historical harvest rates and historical trends in wood product use and manufacturing continue over the next 80 years.

Managed Forests are predicted to store more carbon per decade during most of the current century due to changes in natural factors and forest management. For example, Managed Forest carbon stocks are predicted to increase by 2.1 million tonnes during 2020–2030 and then by 12.8 million tonnes during 2030–2040. Total carbon stocks for forests and wood products from the Managed Forest are predicted to grow by 33 to 48 million tonnes of carbon per decade.

Fluctuations in forest carbon are expected given the dynamic nature of forests and forest management. Over the next 80 years, Ontario's Managed Forest is predicted to store more carbon in forests and wood products, keeping carbon out of the atmosphere and helping to reduce the effects of climate change.

Metadata

Geographic extent: Province–wide Indicator last updated: February 2021 Data source(s): 41 Forest Management Plans; 10-year plan start ranges from 2005–2013 Related links: Chen Jiaxin, Ter-Mikaelian Michael T., Ng Peter Q., and Colombo Stephen J. <u>Ontario's</u> managed forests and harvested wood products contribute to greenhouse gas mitigation from 2020 to 2100. The Forestry Chronicle. 94(03): 269-282. DOI:10.5558/tfc2018-040, <u>Managed forest and climate</u> change, The Forest Resources of Ontario 2021.



How are Ontario's forests managed?

Ontario's public forests are <u>sustainably managed</u> using Ontario's <u>forest</u> policy framework.

A <u>forest management plan</u> is prepared for a 10-year period for each <u>management unit</u> in the province. The plan is approved when the Ministry of Northern Development, Mines, Natural Resources and Forestry is satisfied that it provides for the sustainability of the forest.

A plan is prepared by a Registered Professional Forester, with assistance from an interdisciplinary planning team and a Local Citizens' Committee. Several consultation opportunities are provided during the planning process so the public, Indigenous communities and stakeholders can influence how the forest is managed.

All forest uses and values are considered to create a variety of social, economic and environmental objectives for the forest. Each plan outlines the long-term objectives for the management unit and what forest operations will be completed during the 10-year period. They determine the available harvest area, where roads can be built, and how the forest will be regenerated.

Forest information and models help planning teams portray the current state of the forest, how it develops through time and how it contributes to objectives like forest diversity, wildlife habitat and timber production. This understanding is used to weigh options, assess sustainability and plan operations.

The following indicators provide more information on:

forest harvest

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- forest regeneration
- forest governance
- Indigenous involvement in forest management planning
- public engagement
- tax incentive programs

FOREST HARVEST

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This indicator tracks how much public forest is harvested relative to the approved levels.

Why it's important

Forests in Ontario are vast and provide many benefits to our society including biodiversity, wildlife habitat, and recreational opportunities. Forests store carbon and regulate air, soil, and water quality.

Through sustainable harvesting, our public forests also support a forest industry that provides jobs and forest products.

Harvesting within the approved level shows we are sustainably managing our forest resources. Low levels of harvesting could indicate that we are not realizing the economic value of our forests and could impact forest sustainability over the long term.

How we monitor

In Ontario, we use responsible forestry practices and a <u>forest management planning system to sus-</u> <u>tainably manage public forests</u>. Forest management plans determine an approved level of harvesting by considering objectives for wildlife habitat and biodiversity as well as for the supply of wood.

We monitor:

- available harvest area and volume
- area and volume harvested

The available harvest area and the associated volumes are the approved levels from forest management plans.

The area harvested is <u>compiled from management</u> <u>unit annual reports</u>. Each year, forest managers submit these reports summarizing operations on each management unit.

The volume harvested is tracked through Ontario's wood measurement system. This system measures the amount of wood entering a mill and uses this information to determine <u>how much to charge for the wood</u>.



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Forest volume available and harvested



Results

Results show we are harvesting within approved levels. Recent harvest levels were steady but remained lower than they have been historically.

Since 2009 we have harvested an average of:

- 44% of the available area and volume per year
- 121,000 hectares and 13 million cubic metres per year

Forest management planning is conducted in an adaptive management cycle. Every 10 years a new forest management plan is prepared to account for:

- actual levels of activities
- changes in the forest condition
- updates to science and policy

Through this recurring cycle, forest managers continually re-establish harvest levels and consider any impacts of under-harvesting. Forest harvesting fluctuates with market conditions and demand for wood fibre. <u>Sustainable Growth:</u> <u>Ontario's Forest Sector Strategy</u> is part of the government's plan to create jobs, reduce administrative burden, and promote economic growth and prosperity across the province while ensuring responsible stewardship of our natural resources for future generations.

Metadata

Geographic extent: Managed Forest Indicator last updated: February 2021 Data source(s): Management unit annual reporting, Timber Resource Evaluation System (TREES)



FOREST REGENERATION



This indicator tracks the amount of public forest regenerated and the success of regeneration.

Why it's important

Forest regeneration means growing back the forest after harvesting trees. Forests also regenerate following natural disturbances, such as fire, insect infestation, disease outbreaks and weather events.

The amount of forest regenerated, and the success of that regeneration, tells us how well the forest is being renewed and is an indication of <u>forest</u> <u>sustainability</u>.

How we monitor

Each year, forest managers submit management unit annual reports summarizing the previous year's operations on each management unit. We compile the data from these reports to provide a <u>provincial</u> <u>overview</u> of:

- area of renewal activities (site preparation, regeneration, and tending)
- the number of trees planted and seeds spread
- the results of regeneration surveys
- the status of regeneration by harvest year

<u>Regeneration</u> can be done through seeding and tree planting, or through natural methods like natural seeding or sprouting. Tending activities may be required to improve the survival, growth and quality of a regenerating forest.

Forest managers monitor the status of regenerating forest areas by surveying them and reporting results in management unit annual reports. The ministry then verifies a sample of the assessed areas.

Once an area has regenerated, it is classified as established (previously called free-to-grow). This means the regenerating trees meet standards (species composition, height and site occupancy) and are healthy and free from competing vegetation. The results also show if the area met its targeted forest type or the standards for a different forest type.

The status of regeneration by harvest year is a new measure. It analyses and reconciles several years of spatial harvest, renewal and assessment data. It shows us how much of the area that was harvested each year has regenerated, or if it is still regenerating. It categorizes the area into:

- Regenerated established
- Regenerating treatment complete ready for regeneration survey
- Regenerating treatment required

Results

Overall, regeneration activities are keeping pace with harvesting. Standards for successful regeneration are being achieved as demonstrated by regeneration assessments. The status of regenerating area is as expected.

The area of renewal activities varies from year to year because it is based on how much area is harvested. From 2014–2018 the level of renewal activity has been stable.

- Natural regeneration was used for 50% of the area renewed which is consistent with historic levels.
- Tree planting was the main method of assisted regeneration. On average we planted 53% spruce and 38% jack pine.

Following harvest, forest regeneration and renewal activities are ongoing. It can take 15 years or more after harvest for regenerating areas to be established.

The time required to establish new forest is reflected in the pattern we see. As we would expect, there is more established area in earlier harvest years and more area requiring treatment in recent harvest years. The area that is regenerating with treatment complete is ready to be surveyed to determine its status.









As regeneration surveys continue and more years of data are added, we expect to see an increase in the amount of regenerated area and a decrease in the areas ready for survey.

Regeneration survey results from 2004 to 2018 show that on average:

- 90% of the area surveyed annually was classified as established
- 67% of the established area also meets the target forest type

When an area is classified as not yet established, forest managers determine why it hasn't reached targeted standards and if it requires retreatment. This also informs future decisions on regeneration treatments. These areas are reassessed in the future.

State of Ontario's Natural Resources Forests 2021

Regeneration assessment results

Year of assessment	Area that is established (hectares)	Area not yet established (hectares)	Total area assessed (hectares)	Proportion of regenerating area assessed that is established	Proportion of established area meeting the target forest type
2004	171,258	23,554	194,812	88%	52%
2005	195,795	31,372	227,167	86%	55%
2006	140,042	17,063	157,105	89%	64%
2007	150,503	15,079	165,582	91%	78%
2008	138,504	11,086	149,590	93%	64%
2009	126,753	9,996	136,749	93%	68%
2010	171,773	18,656	190,429	90%	71%
2011	135,561	22,317	157,877	86%	65%
2012	120,191	8,768	128,959	93%	68%
2013	159,548	9,877	169,425	94%	69%
2014	74,189	8,216	82,405	91%	70%
2015	111,357	13,470	124,827	89%	73%
2016	150,859	24,559	175,418	86%	72%
2017	84,838	17,410	102,248	83%	65%
2018	138,392	8,086	146,478	94%	67%

Metadata

Geographic extent: Managed Forest Indicator last updated: February 2021 Data source(s): Management unit annual reports



FOREST GOVERNANCE



This indicator tracks the status of forest tenure across Ontario's managed forests.

Why it's important

Public forests in Ontario provide recreation, biodiversity, and habitat for wildlife. They also support the forest industry, which creates jobs and forest products. Ontario's forest industry is critical to the provincial economy and to many northern and rural communities.

Forest tenure directs who manages and has access to the wood fibre from public forests. It is the allocation and licensing of timber through legal arrangements that define the rights and responsibilities assigned to forestry companies and other resource users. Forest tenures support a strong and diverse forest industry while maintaining a healthy and productive forest.

Forest tenure evolves to fit local circumstances. The variety of forest tenures and tenure holders (licensees) across management units reflects this.

How we monitor

We track the type of tenure in place for each management unit.

The primary type of forest tenure is a <u>Sustainable</u> <u>Forest Licence</u>. A Sustainable Forest Licence holder is assigned responsibility for <u>managing the forest</u> and has the right to harvest. They must prepare forest management plans, gather forest information, monitor and report on compliance and conduct forest operations.

Sustainable Forest Licences are long-term licences granted for up to 20 years that are established under the authority of the *Crown Forest Sustainability Act.* Each one is reviewed every 5 years and may be extended. If no Sustainable Forest Licence is in place, the Ministry of Northern Development, Mines, Natural Resources and Forestry is directly responsible for managing the forest. The ministry may issue licences to harvest for up to 10 years and enter into agreements with service providers or licensees to carry out forest management responsibilities.

Sustainable Forest Licences are held by different types of companies including:

- Multi-party company: a company with two or more interests such as a combination of community, Indigenous, and/or forest industry who govern the company together, such as on a board of directors.
- Single-entity company: a company representing single business interest, often a forest sector company or an Indigenous company.
- Agency: a corporation, established in unique circumstances with the authority of the *Ontario Forest Tenure Modernization Act* or the *Algonquin Forestry Authority Act*.

Although it is not technically a Sustainable Forest License, we include the Algonquin Forestry Authority because it is a long-term agreement to carry out forest management responsibilities including the right to harvest.





Status of forest tenure in 2020



Results

Most management units are managed under long-term Sustainable Forest Licences and there is a diversity in the types of companies holding this tenure. This is the first time reporting on this indicator, so a trend is not available.

- 85% or 34 of 40 management units are managed under a Sustainable Forest Licence.
- 15% or 6 of 40 management units are managed directly by theMinistry of Northern Development, Mines, Natural Resources and Forestry but not under a Sustainable Forest Licence.

Metadata

Geographic extent: Managed Forest Indicator last updated: February 2021 Data source(s): Ministry of Northern Development, Mines, Natural Resources and Forestry administrative data

INDIGENOUS INVOLVEMENT IN FOREST MANAGEMENT PLANNING



This indicator tracks the involvement of Indigenous communities in forest management planning.

Why it's important

The province of Ontario is a world leader in <u>sustainable</u> forest management. To be sustainable, forests must be maintained in a healthy state and the value of the forest to all users must be considered.

There is a significant role for <u>Ontarians</u>, <u>Indigenous</u> communities, and <u>stakeholders</u> in the <u>forest</u> <u>management planning</u> process. Involving these parties helps balance the economic, social and environmental objectives for managing our forests.

The Forest Management Planning Manual describes the approach for working with Indigenous communities to support their involvement in the forest management planning process in a manner that respects Aboriginal and treaty rights, and that assists the Crown in addressing its duty to consult obligations.

How we monitor

There is a diverse approach to involving Indigenous communities in forest management planning.

Forest management plans are prepared by a plan author (registered professional forester) who is assisted by a planning team and a local citizens' committee.

A planning team is a group of people with different areas of expertise that participate directly in preparing the plan. A local citizens' committee is an advisory team representing a range of interests that assists the plan author, the planning team and the ministry with preparing and implementing the plan.

When a forest management plan is prepared, Indigenous communities who are within or near the management unit are invited to participate in the planning process. Invited communities are generally those that have interests in, or traditionally use forests and may be affected by management activities.

Opportunities for Indigenous communities to participate in forest management planning include:

- having a representative on the planning team and the local citizens' committee
- working with the ministry and the plan author to develop a customized approach to consultation
- participating in the desired forest and benefits meeting to share their interest in the management of the forest
- identifying values for protection and participating in the development and review of related reports
- reviewing and commenting on components of a plan during its preparation and implementation

During the planning process, the ministry and planning teams work with Indigenous communities to identify current and traditional uses, values (social, cultural and spiritual), and forest management related concerns within the management unit. This information is documented in an Indigenous background information report.

This information informs planning and helps determine how to prevent or lessen the impact on these values when forest operations are conducted. A report on protection of identified Indigenous values describes and documents how values will be protected during forest operations.

For each forest management plan prepared, objectives are developed for the sustainability of the forest, including objectives for indigenous community participation and involvement. To determine how these objectives are achieved, we measure participation through:

- participation on the planning team and local citizens' committee
- input into reports on values identification and protection

In our results, participation is considered to be achieved when at least one community participated or provided input in the process.



Results

Representatives of Indigenous communities participated on planning teams for most of the forest management plans that were prepared.

For the 43 forest management plans prepared from 2014–2018, communities within or near these management units were invited to participate in the forest management planning process. The number of communities invited to participate ranged from 1–18 per plan. Some communities were invited to participate in more than one forest management plan as their traditional areas overlap multiple management units.

Compared to previous years, participation on planning teams was steady and participation on local citizens committees declined slightly.

- 93% of plans had Indigenous community participants on the planning team.
- 44% of plans had Indigenous community participants on the local citizens' committee.

Reports on Indigenous background information and on protection of identified Indigenous values were produced for all 43 plans. Indigenous communities provided input on:

- 33 or 77% of the background reports
- 16 or 37% of values reports

The planning team encourages involvement at any time during the development or implementation of a forest management plan. If communities did not provide input into reports, or participate on planning teams or local citizens' committees, they may have participated in the planning process in other ways including:

- working with the ministry to develop a customized consultation approach
- identifying values or important ecological features they want protected
- reviewing and commenting on the plan while it is being prepared
- reviewing and commenting on annual work schedules to identify any new values that are of importance to the Indigenous communities that may be affected by forest operations

Indigenous communities may have different views about the level and quality of involvement.

We continue to work with Indigenous communities to improve how we incorporate values and traditional knowledge into forest management planning.

Metadata

Geographic extent: Northern Ontario Indicator last updated: February 2021 Data source(s): Forest management planning survey



Proportion of plans with Indigenous participants on local citizens' committees and planning teams

State of Ontario's Natural Resources Forests 2021

PUBLIC ENGAGEMENT IN NATURAL RESOURCE MANAGEMENT



This indicator assesses opportunities for the public to get involved in natural resource management in Ontario.

Why it's important

As stewards of natural resources in Ontario, we seek public input before making decisions about natural resource policies. Engaging the public provides Ontarians opportunities to input on resource management plans, land use policies, licences and permits, and informs decisions being made. It also helps improve public knowledge about our natural resources, how they are managed and how they can be used sustainably.

Monitoring our public engagement opportunities helps us to assess how often we are engaging the public.

How we monitor

We track the number of engagements held each year including:

- presentations
- training sessions
 mail-outs

notices published to

- workshops
- meetings
- open housesconferences
- the <u>Environmental</u> Registry

This information has been broken out by:

- aggregates and petroleum
- fish and wildlife (including invasive species)
- forestry
- lands and water
- general (events or postings that address multiple business areas)

These numbers do not reflect single client inquiries, internal consultation, or sessions with other ministries, agencies, or the federal government. They also do not include engagement activities with Indigenous communities, which are reported on separately, or engagement activities led by industry (for example, aggregates).

Results

In 2019–20, we engaged the public 591 times. This is 27 more opportunities than the previous year. The number of annual engagement opportunities are expected to vary depending on policy priorities, where policies are in their development process, level of public interest and resource planning efforts.

Under the Environmental Bill of Rights, the public has the right to comment on activities that might affect the environment. Notices of activities are posted to the Environmental Registry of Ontario so the public can review and share comments on actions that could affect the environment.

In 2019–20, there were 146 notices posted to the Environmental Registry for public comment. This is an increase of 102 from the previous year. In 2018–19 the number of postings were lower due in part to the provincial election. In an election year it is common for the number of postings to be lower due to the writ period, and transition to a new government. There has been an average of 135 postings per year from 2016 to 2020.

Since 2016–17, Ontarians had over 2,792 opportunities to provide input on how we manage natural resources.

This shows a consistent commitment to providing Ontarians with opportunities to provide input on how natural resource management policies are developed and implemented.





Number of engagement sessions by business area

Business Area	April 201– March 2017	April 201– March 2018	April 2018– March 2019	April 2019– March 2020
Aggregates and petroleum	35	32	45	71
Fish and wildlife	162	240	178	162
Forestry	182	170	235	242
Lands and water	79	101	42	70
General	56	37	64	46
Total	514	580	564	591

Number of Environmental Registry postings by business area



Metadata

Geographic extent: Province-wide Indicator last updated: February 2021 Data source(s): Administrative files



TAX INCENTIVE PROGRAMS



This indicator report tracks the number of properties enrolled and the eligible area of properties enrolled in the Managed Forest Tax Incentive Program and Conservation Land Tax Incentive Programs.

Why it's important

Many natural areas are located on private property, particularly in southern Ontario. Economic incentives encourage landowners to responsibly manage forests, maintain biodiversity and protect natural heritage features on their properties. These incentive programs recognize the importance of private land in maintaining healthy ecosystems. Participation in these programs helps demonstrate the level of forest, biodiversity and natural heritage stewardship occurring on private land within the province.

We currently offer two voluntary tax incentive programs to eligible private landowners:

the Managed Forest Tax Incentive Program

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the Conservation Land Tax Incentive Program

Under the <u>Managed Forest Tax Incentive Program</u>, landowners prepare and follow managed forest plans. Once their forests are classified as 'Managed Forest', they pay reduced property taxes.

Under the <u>Conservation Land Tax Incentive</u> <u>Program</u>, portions of private property that have eligible provincially important natural heritage features may qualify for a 100 per cent property tax exemption. In addition, lands owned by conservation authorities or eligible charitable conservation organizations that have a primary objective of natural heritage conservation, may also qualify for a property tax exemption under the Community Conservation Lands category.

How we monitor

We compile administrative data annually from the Managed Forest and the Conservation Land Tax Incentive Programs, namely the number of properties enrolled and the total eligible area enrolled in each program. This allows us to identify trends in participation and the total eligible area of private lands that may contribute to sustainable forest management, the conservation of biodiversity and the protection of eligible natural heritage features (including community conservation lands). Note that program data is approximate as data management and collection processes have evolved over the history of the program.



Land area and participation in the Managed Forest Tax Incentive Program (2002 to 2020)

Results

Our tax incentive programs are showing an increasing trend in participation rates.

Between 2002 and 2020, the number of properties participating in the Managed Forest and the Conservation Land Tax Incentive Programs increased over time starting with 23,714 properties to a current total of 43,850 properties.

Between 2002 and 2020, the area of the properties enrolled in the program fluctuated, with an overall increase of about 6 per cent (from 708,900 hectares in 2002 to 751,100 hectares in 2020). The decreases seen in 2010 and 2018 were largely due to the sale of large land holdings which may have no longer met program eligibility, making the overall increase smaller. In years such as 2009, there was a general upward trend in the total enrolled eligible area.

Enrollment also fluctuates year to year under this voluntary program. Overall, enrollment increased from 9,899 participating properties in 2002 to 18,95 participating properties in 2020.

Between 2002 and 2020, the area enrolled in the Conservation Land Tax Incentive Program increased by 43 per cent (from 201,980 hectares in 2002 to 289,200 hectares in 2020). Data for 2002 and 2003 included some properties that were subsequently deemed ineligible, artificially inflating the data.

Enrollment also fluctuates year to year under this voluntary program. Overall, enrollment increased from 13,800 participating properties in 2002 to 24,900 participating properties in 2020.

For the 2020 tax year, approximately 18 per cent (52,000 hectares of the lands enrolled in the Conservation Land Tax Incentive Program) are protected as Community Conservation Lands. This enrollment represents a one per cent increase in enrollment from 2018.

Metadata

Geographic extent: Province-wide Indicator last updated: February 2021 Data source(s): Conservation Land Tax Incentive Program and Managed Forest Tax Incentive Program administrative data



Land area and participation in the Conservation Land Tax Incentive Program (2002 to 2020)

State of Ontario's Natural Resources Forests 2021



How do we ensure forests are sustainably managed?

Monitoring and oversight are important components of Ontario's forest policy framework.

The forest operations compliance program determines whether forest operations are following approved forest management plans. Forest industry must carry out self-monitoring, train and educate their workers, and report their inspection results.

The Ministry of Northern Development, Mines, Natural Resources and Forestry monitors and audits operations and sets policy for the forest operations compliance program. Copies of compliance inspection reports are available at the ministry's local district offices.

Every 10–12 years, an Independent Forest Audit takes place on each management unit to examine the performance of both the Sustainable Forest Licence holder and the ministry in meeting their forest management responsibilities.

In addition to following Ontario's rigorous forest policy framework, much of Ontario's forest industry uses internationally recognized third-party forest certification systems. Regardless of the choice to voluntarily certify to an independent standard, Ontario's public forests are <u>sustainably managed</u> using Ontario's forest policy framework.

The following indicators provide more information on:

- independent forest audits
- compliance
- forest certification

COMPLIANCE



This indicator tracks the inspection and compliance rates for forest operations.

Why it's important

Ontario's public forests are <u>sustainably managed</u> using Ontario's <u>forest policy framework</u>. Forest operations compliance is a key component of <u>forest monitoring</u>.

Forest operations are regularly inspected to verify that management activities follow approved forest management plans and operational prescriptions. They are required to be conducted in ways that retain special features, protect sensitive habitats such as bird nests and woodland pools, and ensure the conservation of water and soil resources.

The level of monitoring and compliance provides an indication of how well we are implementing sustainable forest operations.

How we monitor

In Ontario, compliance monitoring occurs in partnership between the Ministry of Northern Development, Mines, Natural Resources and Forestry and the forest industry. Forest operations monitored for compliance include timber harvesting, road construction, water crossings and forest renewal.

Certified forest compliance inspectors perform the inspections and record results in inspection reports. These reports are entered into the provincial Forest Operations Information Program database.

We track and analyze trends in:

- the number of inspections
- inspections relative to harvest area
- the average rate of compliance

If an operation is found to be non-compliant, warnings, orders, administrative penalties and offence charges may be applied. Activities such as training, communication, planning, inspecting and reporting encourage appropriate operating and compliance.



Number of inspections and total harvest area



Results

Compliance rates were high and stable.

Results show that forest operations are complying with the rules and standards designed to protect the forest ecosystem. From 2014–2018:

- Approximately 14,456 inspections of forest operations were conducted by ministry and industry compliance inspectors, averaging 2,891 inspections annually.
- There was an average of 22 inspections per 1,000 hectares.
- The compliance rate remained steady averaging 97%.

The number of inspections generally varies with the total harvest area. As harvest levels decrease so do the number of inspections. The forest compliance program has also evolved to focus inspection efforts on operations that are higher risk (e.g., water crossings). This contributes to a decrease in inspections relative to harvest area.

Metadata

Geographic extent: Managed Forest Indicator last updated: February 2021 Data source(s): Forest Operations Information Program database



INDEPENDENT FOREST AUDITS



This indicator tracks the results of independent forest audits.

Why it's important

Independent forest audits are an important part of sustainable forest management in Ontario. They provide an independent assessment of whether public forests are being managed sustainably.

Independent forest audits contribute to improving the management of Ontario public forests through adaptive management.

How we monitor

Independent forest audits are required by the *Crown Forest Sustainability Act* and by <u>Sustainable</u> <u>Forest Licences</u>. They are conducted on each of the province's management units, at least once every 10–12 years, to assess whether the forest is being sustainably managed in compliance with legislation, regulations and policies, and with the terms and conditions of the Sustainable Forest Licence.

Audits examine the performance of the Sustainable Forest Licence holder and the Ministry of Northern Development, Mines, Natural Resources and Forestry in meeting their forest management responsibilities. They assess a broad range of activities on each management unit including:

- forest management planning
- operational activities like harvesting, renewal and road construction
- achievement of desired outcomes
- responses to previous audits
- compliance with licence conditions

We track the number of independent forest audits conducted and their results. Auditors conclude whether a forest is being managed:

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• in compliance

- in compliance but with exceptions or conditions
- not in compliance

Forests identified as 'in compliance' and 'in compliance with exceptions' are considered managed sustainably.

The conclusions and findings are documented in <u>audit reports</u>. The licensee and/or the ministry create action plans to specify how they will address audit findings.

Results

Most audits showed that forests were managed in compliance and the level of audits in compliance remained high and steady.



Independent forest audit results for 1999 to 2019

Year	Number of audits	In compliance	In compliance with exceptions	Not in compliance
1999	11	8	2	1
2000	16	11	5	0
2001	19	18	0	1
2002	9	6	1	2
2003	6	6	0	0
2004	8	6	2	0
2005	11	8	0	3
2006	15	14	1	0
2007	9	9	0	0
2008	5	4	1	0
2009	7	6	1	0
2010	11	8	2	1
2011	12	9	1	2
2012	9	8	1	0
2013	3	3	0	0
2014	5	3	1	1
2015	6	4	2	0
2016	12	8	2	2
2017	12	11	1	0
2018	4	4	0	0
2019	5	5	0	0



The compliance rates include forests that were found in compliance and in compliance with exceptions.

- From 2015–2019 two of the 39 forests audited were found not in compliance.
- From 1999–2019 the proportion of forests audits in compliance averaged 94%.

Forest managers address any exceptions or conditions to bring management of the forest into full compliance with all requirements.

Metadata

Geographic extent: Managed Forest Indicator last updated: February 2021 Data source(s): Independent forest audit reports

FOREST CERTIFICATION



This indicator tracks the certification status of Ontario's public forests.

Why it's important

The forest industry may voluntarily certify their managed forests to an independent certification system to help market their products domestically and internationally. Forest certification recognizes that forest management practices have met standards set by an independent certification organization.

Regardless of the choice to certify to an independent standard, Ontario's public forests are <u>sustainably</u> <u>managed</u> using Ontario's <u>forest policy framework</u>.

How we monitor

We track the amount of the forest area certified under each certification system using provincial forest inventory data. The area certified calculation includes all public land and water. Non-forested area is included as it contributes to sustainable forest management objectives and to meeting the forest certification standards.

The forest certification systems in Ontario include:

- the Canadian Standards Association
- the Forest Stewardship Council
- the Sustainable Forestry Initiative

Each system has its own standards. Some forests may be certified to more than one system.

Forest certification organizations are independent of government and the forest industry and their websites provide information about the companies and lands they have certified. We use this information to determine the certification status for each management unit.

Results

Many of the management units in the province continue to be certified to an internationally recognized standard. Although the area certified shows slight annual fluctuation, it has remained steady over the longer term.





Because Ontario requires public forests to be managed sustainably, forest industry in Ontario is well positioned to meet the standards required by independent forest certification systems.

Changes in market demand may influence whether forest companies seek certification.

The chart shows the history of forest certification in Ontario and how the area certified under the different systems has changed over time. The area certified increased substantially from 2002 to 2008 because the Forest Products Association of Canada required their members to become certified. Since then, levels have remained steady.

As of December 2020, 29 out of 39 management units in the province were certified covering a

Certification status of management units in 2020

total of 26.1 million hectares. This equates to 77 per cent of the public lands and waters within management units.

- 13 are certified to Forest Stewardship Council
- 9 are certified to Sustainable Forestry Initiative
- 6 have dual Forest Stewardship Council and Sustainable Forestry Initiative certification
- 1 is certified to Canadian Standards Association

Metadata

Geographic extent: Managed Forest Indicator last updated: February 2021 Data source(s): <u>Forest Stewardship Council</u>, <u>Sustainable Forestry Initiative</u>, <u>Canadian</u> <u>Standards Association</u>



State of Ontario's Natural Resources **Forests 2021**







How does the forest industry contribute to Ontario's economy?

Through sustainable harvesting, Ontario's public forests support a forest industry that provides jobs and forest products. Forest industry operates under the requirements of Ontario's forest policy framework to conserve the ecological processes and biological diversity of our forests while providing for economic opportunities.

For Ontario's forest industry to remain strong and vibrant in the long term, we need to ensure that our public forests remain healthy, diverse, and productive. <u>Sustainable Growth: Ontario's Forest Sector Strategy</u> is part of the government's plan to create jobs, reduce administrative burden, and promote economic growth and prosperity across the province, while ensuring responsible stewardship of our natural resources for future generations.

The following indicators provide more information on:

- forest products
- forest sector exports
- forest sector GDP
- forest stumpage revenue







FOREST PRODUCTS



This indicator tracks how the wood harvested from public forests contributes to various forest product sectors.

Why it's important

Forests in Ontario are vast and provide many benefits to our society including biodiversity, wildlife habitat, and recreational opportunities. Forests store carbon and regulate air, soil, and water guality.

Wood is the only major building material that grows naturally and comes from a renewable source. Through sustainable harvesting, our public forests also support a forest industry that provides jobs and forest products like lumber and paper.

Monitoring the flow of harvested wood volume helps us assess how public forests are supplying the industry and various product sectors.

How we monitor

The amount of wood that enters a wood processing facility (mill) is tracked through Ontario's wood measurement system. Each mill manufactures

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different types of forest products. We track the volume of wood going to the following eight forest product sectors:

- pulp: hardwood and/or softwood market pulp, containerboard and kraft paper
- veneer: production of veneer, plywood and/or laminated veneer lumber
- sawmill: hardwood and/or softwood dimensional lumber, posts, beams, poles and log home construction timber
- · composite: panels such as particleboard, medium density fibreboard, oriented strand board and/or engineered wood products other than laminated veneer lumber
- paper: newsprint, supercalendered, coated and uncoated free sheet or rolled paper and bleached bristol board
- commercial fuelwood: cut to length hardwoods and softwoods in round or split form for domestic and commercial retail markets
- bioproduct: chemicals and materials, energy from the combustion of wood or biogas, liquid fuels and solid fuels for commercial or industrial use. For example, cellulose, food/feed additives, lignin, methanol, pharmaceuticals and plastics, methane, ethanol, biodiesel and lubricants, wood pellets, briquettes and hog fuel



Wood volume by product sector



Proportion of wood volume by product sector

 other: product that does not fit into other product definitions such as bedding for animals, landscape materials, commercial Christmas trees

Results

The volume of harvested wood flowing into the forest product sectors remains lower than it has been historically. The proportion of wood volume going to the province's most significant sectors shows a general increase, but there have also been declines in some sectors.

The market demand for forest products influences how much wood is harvested from year to year and how that wood flows to the various forest product sectors.

Recent results show:

- Sawmill, composite, and pulp are the most significant forest product sectors in Ontario, consuming over 90 per cent of the total harvested wood.
- The sawmill sector is the largest forest product sector in Ontario, representing approximately 60% of the wood harvested in the province.

Bioproduct is an emerging sector. This sector provides a renewable energy alternative and helps

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sawmills in Ontario stay competitive by using sawmill residues.

The demand for lumber from the sawmill sector is mainly driven by housing construction in the United States. Since its decline in 2008, the sawmill sector has been steadily recovering given the growing demand for lumber.

Since 2013 the share of total volume going to the pulp sector has declined. This reflects the interdependence of the pulp and sawmill sectors. With the sawmill sector's recovery, pulp and paper mills take advantage of cost-effective sawmill residues (wood chips, sawdust, shavings) to supply their mills.

The wood volume going to the paper sector declined over the past 10 years as the sector has been impacted by the decline in demand for newsprint.

Metadata

Geographic extent: Managed Forest Indicator last updated: February 2021 Data source(s): Timber Resource Evaluation System (TREES)

FOREST STUMPAGE REVENUE



This indicator tracks the revenue generated from Ontario's timber charges (often referred to collectively as stumpage).

Why it's important:

Fees are paid to the government for every cubic metre of timber harvested from public land. Timber charges are calculated to ensure that the province receives a fair return for the resource and can fund <u>sustainable forest management</u>.

How we monitor:

We monitor revenue from <u>Ontario's timber charges</u>. These charges have 3 main components:

- stumpage price (made up of a minimum price and a residual value price)
- Forest Renewal Trust charge
- Forestry Futures Trust charge

The minimum price component generates a secure and stable level of revenue to the province regardless of market conditions. This price is adjusted for inflation annually.

The residual value price component ensures that the government shares in the financial rewards when industry profits are good. The residual value price increases or decreases as market prices change. When forest product prices are low, the residual value price can drop to zero. In times of strong market prices for forest products, the pricing system triggers higher fees. This price is adjusted monthly.

Funds received from stumpage (minimum price and residual value price) flow to the province's Consolidated Revenue Fund.

The Forest Renewal Trust charge provides dedicated funding for forest renewal. This charge, which is set annually, varies depending upon anticipated renewal costs. These funds flow to a dedicated Forest Renewal Trust account.



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The Forestry Futures Trust charge provides funding to renew forest areas affected by natural disturbances like fire, blowdown or disease, or in the event that a licensee becomes insolvent. These funds flow to the Forestry Futures Trust account.

Results

Revenue from timber charges has recovered to levels seen before the economic downturn of 2008.

Ontario's forest industry is mainly dependent on the demand for forest products from the United States' housing sector. Low demand reduces the amount of timber harvested and results in lower revenues.

- In 2009 revenue reached a low of \$65.9 million then steadily increased until 2019.
- In 2019 revenue was \$112.9 million. Although the volume harvested increased by 4% in 2019, stumpage revenue decreased because lower market prices for forest products reduced residual value price contributions.

Metadata

Geographic extent: Managed Forest Indicator last updated: February 2021 Data source(s): Timber Resource Evaluation System (TREES)





FOREST SECTOR GROSS DOMESTIC PRODUCT



This indicator measures the value of forest products and services produced annually by the forest sector.

Why it's important

Forests in Ontario provide a wide variety of products and services. Timber, which is one of the key products provided by forests, is used by the forest sector to produce:

- lumber
- pulp and paper
- structural panels
- other wood products

Healthy and <u>sustainably managed forests</u> help support a strong and competitive forest sector that supports Ontario's economy through jobs and income.

The forest sector contributes billions of dollars to Ontario's economy annually, measured by gross domestic product.

How we monitor

Gross domestic product (GDP) refers to the total dollar value of recorded economic production within a geographic region. It measures the final value of all goods and services produced. The GDP of a sector is the value that it has added to the economy. This is based on its sales minus the costs of goods or services purchased from other industries.

We use Statistics Canada data on real GDP in what are called chained (2012) dollars. This data is based on a method of adjusting current dollar amounts for inflation. Adjusting for inflation allows us to more effectively compare results from different years and assess trends over time. The forest sector includes establishments in four subsectors:

- forestry and logging
- support activities for forestry
- wood product manufacturing (e.g., lumber, structural panels)
- paper manufacturing, including pulp manufacturing

Results

In 2019 Ontario's forest sector GDP totaled \$4.2 billion, representing 0.6 per cent of total provincial GDP. Of the total forest sector GDP:

- paper manufacturing subsector accounted for 51.3 per cent
- wood product manufacturing accounted for 35.9 per cent
- forestry and logging accounted for 8.2 per cent
- support activities for forestry accounted for 4.7 per cent

From 2010 to 2019 the forest sector GDP stayed relatively stable with some minor fluctuations:

- saw a slight decrease for four years from 2011 to 2014
- grew steadily from 2015 to 2017
- decreased slightly from 2018 to 2019

Within the forest sector, the wood product manufacturing subsector was the only subsector that experienced significant growth (34 per cent) in GDP between 2010 and 2019. This subsector includes:

- lumber
- structural panels
- millwork
- engineered wood products

The demand for wood products is mostly driven by the housing markets in the United States and Canada. The growing housing market in both the United States and Canada in recent years benefited the wood product manufacturing subsector.

GDP by subsector (billions of chained [2012] dollars)



The paper manufacturing subsector GDP decreased by 15 per cent between 2010 and 2019. The paper manufacturing subsector is mostly affected by changing demands for the different paper products.

- The demand for newsprint has steadily declined due to the rise of electronic media.
- The demand for paperboard and paperboard containers has increased due to the growing need of packaging material in North America, mainly driven by the expanding online retail economy.
- Overall, the paper manufacturing sector has been on a downward trajectory during the last ten years.

The support activities for forestry subsectors, which is a relatively small subsector, decreased by 3 per cent, while the forestry and logging subsector had the same GDP in 2019 as 2010.

Metadata

Geographic extent: Province-wide Indicator last updated: February 2021 Data source(s): <u>Statistics Canada</u>


FOREST SECTOR EXPORTS



This indicator tracks the value of domestic exports and total exports of Ontario's forest products.

Why it's important

Ontario has a vast area of forests that are <u>sustainably managed</u> and provide a wide range of forest products and services. Timber harvested from Ontario forests is used to produce lumber, pulp and paper, panel boards and several other wood products.

The market for these products in Ontario is relatively small, therefore, exporting is crucial for the development of the forest sector in the province. By <u>exporting forest products</u>, Ontario's forest sector meets the needs of consumers, mainly in North America, while also contributing significantly to Ontario's economy. Understanding exports helps assess the sustainability of the forest sector.

How we monitor

We track the value of domestic and total exports of forest products by each forest subsector in Ontario.

Domestic exports are the products grown, produced or manufactured in Ontario that are sold to other countries. They include products imported from other countries that have been significantly changed or enhanced in value before being exported.

We also look at the total exports which include domestic exports and re-exports. Re-exports are products that entered Ontario from other countries that are exported in the same condition without substantially adding any value. The value of total exports signifies the strength and importance of forest sector industries in the province's economy.

The value of domestic exports is a better measure of the economic benefits derived from the managed forests in Ontario because it excludes goods and services produced outside the province. We use Industry Canada trade data on exports of forest products collected for each industry. Exports of forest products are reported in four subsectors. Wood furniture manufacturing is also included when assessing exports. In other economic indicators such as Forest Gross Domestic Products (GDP) it is not included as Statistics Canada does not provide GDP data for wood furniture manufacturing.

Subsector	Related North American Industry Classification System Industries and Codes
Forestry and logging	 Timber tract operations [1131] Forest nurseries and gathering of forest products [1132] Logging [1133]
Wood product manufacturing	 Sawmills and wood preservation manufacturing [3211] Veneer, plywood and engineered wood product manufacturing [3212] Other wood product manufacturing [3219]
Paper manufacturing	 Pulp, paper and paperboard mills [3221] Converted paper product manufacturing [3222]
Wood furniture manufacturing	 Wood kitchen cabinet and countertop manufacturing [337110] Other wood household furniture manufacturing [337123] Wood office furniture manufacturing [337213]



🗱 Paper Wood Product Manufacturing Manufacturing Wood Furniture 💋 Forestry and Logging Manufacturing 7.0 6.0 5.0 \$ CDN billions 4.0 3.0 2.0 1.0 0.0 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020

Value of domestic exports of Ontario's forest products

Results

The value of domestic exports has consistently been around 95 per cent of the total exports of Ontario's forest sector with re-exports representing about 5 per cent. Paper manufacturing makes up about 50 per cent of the Ontario forest sector total exports with about 97 per cent based on domestic exports. Domestic exports make up about 90 per cent of wood product manufacturing, forestry and logging have about 90 per cent and wood furniture manufacturing has about 95 per cent.

Thus, Ontario forest sector exports are mainly driven by the domestic exports. The re-exports result from a highly integrated North American market and geographic location of the province.

The value of total exports started to increase in 2013, rising to \$6.49 billion in 2020. There has been a consistent recovery since the low of \$4.64 billion in 2012. After reaching \$6.76 billion in 2016, the value of total exports has been stable except for

some minor fluctuations due to the fluctuation in commodity prices and currency exchange rates.

In 2020 forest product subsectors contributed the following to the total export value:

- pulp and paper products (53 per cent)
- wood products (36 per cent)
- wood furniture (10 per cent)
- forestry and logging (1 per cent)

The export value of Ontario wood product manufacturing has been increasing since 2012 and reached \$2.33 billion in 2020. The value of Ontario wood product exports is primarily driven by the demand in the United States housing market. The improved housing market in the United States has helped Ontario wood product exports maintain a sustained increase since 2012 despite trade-related restrictions on Canadian softwood lumber export to the U.S.





Value of total exports of Ontario's forest products

The export value of Ontario pulp and paper products declined from \$3.31 billion in 2011 and bottomed at \$2.85 billion in 2013. The value of pulp and paper exports has increased from 2013 to 2016 as a result of high pulp and paper prices and a depreciating Canadian dollar. In 2020, the value of pulp and paper product exports reached \$3.42 billion.

The export value of wood furniture has increased consistently from \$0.62 billion in 2012 to \$1.21 billion in 2017. In 2020, the value of wood furniture was \$0.68 billion. In recent years, the share of offshore imports in the U.S. furniture market has increased. Since the U.S. is the main export destination for Ontario wood furniture, Ontario manufacturers may have lost some of their share. The value of forestry and logging has steadily risen from \$0.03 billion in 2012 to \$0.06 billion in 2020. Most of Ontario's forest product exports (96 per cent) are to the United States. As exports are sold in U.S. dollars, the export value is significantly affected by the exchange rate. Similarly, since the values of exports are measured in current dollars, the values are also affected by the forest product prices in a year. The continuous depreciation of the Canadian dollar against the U.S. dollar from 2010 to 2020 helped improve the competitiveness of Canadian forest products in the United States and increased the value of exports in Canadian dollars.

Metadata

Geographic extent: Province-wide Indicator last updated: April 2021 Data source(s): <u>Industry Canada Search by Industry</u> (NAICS codes) – Trade Data Online

For additional information about sustainable forest management in Ontario, visit: <u>ontario.ca/forests</u>

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