



# State of the Forest Report

# 2019

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## State of the Environment 2019: A Focus on Forests

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# Indicator ranking

## State

(what is the current situation?)



good



fair



poor



unknown

## Trend

(what does trend over time indicate?)



improving



mixed or  
no change



deteriorating



unknown

## Information

(was there adequate information to assess this indicator?)



adequate



partial



inadequate



unknown

**Note:** a subject matter expert makes the decision on the indicator rankings

**Note:** Extent means area of the province to which the indicator was assessed

# Managed forests and human-caused greenhouse gas emissions



### Quick Facts

- Saskatchewan's forests contribute to climate change mitigation and resilience through sustainable harvest practices and management of fire, insects and disease.

**Last updated:** November 2022 (data lags two years due to availability)

**Update frequency:** every two years

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Greenhouse gas (GHG) emissions measure how forest and land management impact climate change. Positive emission scores indicate the forest is a source of GHGs and negative emission scores indicate that the forest is a sink for GHGs. If the forest acts as a GHG sink, forestry management is helping to reduce climate change. If the forest is acting as a source of GHG emissions, it means forests are either over mature or too young, and are not sequestering enough carbon to offset emissions from the disposal of harvested wood products.

## What's happening

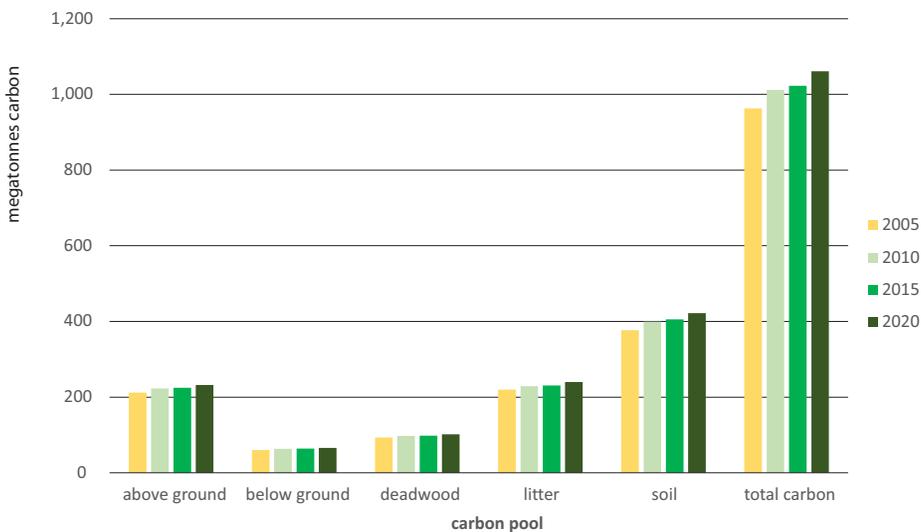
| State    | Trend               | Information | Extent                |
|----------|---------------------|-------------|-----------------------|
| <br>good | <br>mixed/no change | <br>partial | <br>commercial forest |

## What we are doing

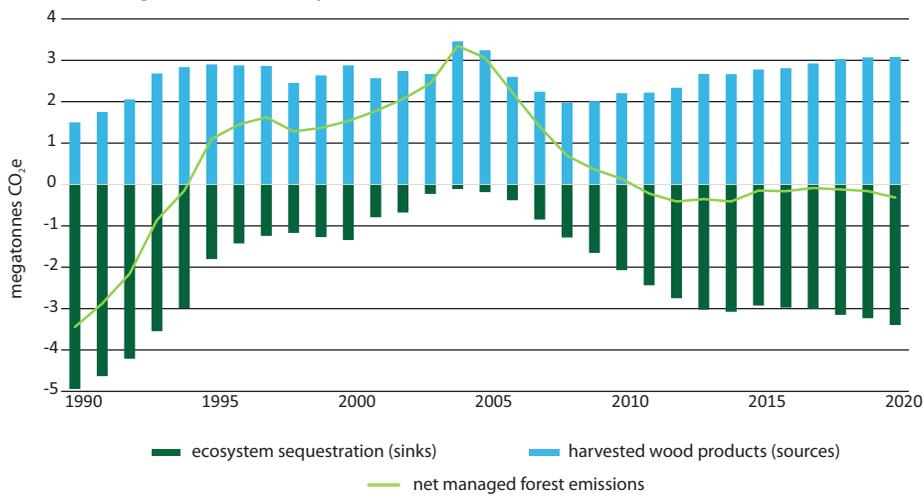
The [National Forest Carbon Monitoring System](#) estimates forest carbon stocks, changes in carbon stocks and emissions of greenhouse gases in managed land and forests. These estimates are based on data from Saskatchewan's forest inventories, growth and yield tables, disturbance monitoring and management activities. The ministry monitors the rate of change in carbon stock and emissions in the forest ecosystem using the federal [carbon budget model](#).

The forest ecosystem contains carbon stock which includes above-ground biomass (i.e. trees), below-ground biomass (i.e. live roots), deadwood, litter and organic soil matter. Carbon quantities change over time due to tree growth, which adds to the carbon stock. Losses from carbon stock occur through decomposition, natural disturbances (e.g. wildfire and insects) and forest harvesting. Forest carbon storage is the total amount of carbon contained in the forest ecosystem at a given time. This is the only analysis representative of the managed forests in Saskatchewan and does not include the far northern part of the provincial forest. There are few human activities in the far north and a general lack of information on forest carbon in this area.

### Accumulated forest carbon stocks by type (anthropogenic partition only)



## Saskatchewan greenhouse gas emissions and carbon sinks related to land use, land-use changes and the forestry sector



\*Note: Does not include wildfire emissions

Saskatchewan's managed forests have been a relatively small greenhouse gas sink since 2010, with net gains of 0.3 megatonnes of CO<sub>2</sub> in 2020. Forest greenhouse gas emissions come from physical disturbances, which include harvesting and land use changes (not a significant factor in Saskatchewan) as well as natural processes such as growth and decay. These figures do not include emissions from natural disturbances such as wildfire, insects and disease. Separating these emissions allows foresters to observe the influence of their management actions, enabling strategies to reduce emissions. This approach aligns with internationally accepted reporting standards.

Harvested wood products, including the use and disposal of products (e.g. paper, lumber, etc.), and forest conversion activities are considered a source of emissions. This is consistent with the reporting criteria established by the [United Nations Framework Convention on Climate Change](#). For more information on how greenhouse gas sources and carbon sinks are calculated for forests in Canada, visit the [Government of Canada](#).

## Why it matters

A forest is considered a carbon sink if it absorbs more carbon from the atmosphere than it releases. The forest stores a significant amount of greenhouse gases in the form of carbon, the building blocks of plants and trees. An increase in stored or sequestered forest carbon can indicate a healthy forest in which the growth exceeds the loss of carbon to human and natural disturbances. Over-mature forests become sources of emissions as they start to die and decay. Managing forest age through sustainable planning and harvest practices is an important part of emissions management.

Carbon in the form of trees provides the raw material for the forest industry. Healthy forests that sequester carbon also provide a sustainable supply for the forest industry. In Saskatchewan, timber harvest levels are currently below the sustainable limit, indicating that this type of disturbance is not significantly impacting carbon stocks.

Sustainable forest management plays a crucial role in balancing GHG emissions, supporting the economy, and creating a healthy, diverse forest. Harvesting is an important tool which influences overall emissions from the forest. The main source of harvesting-related emissions is the disposal and decay of harvested wood products. Climate smart forestry has the potential to reduce these emissions through long-lived wood products, innovative biomass products, and renewable energy. Foresters are also developing new strategies for increasing sequestration in the forest through improved forest management practices, such as planting trees in previously unmanaged areas, increasing tree growth, and utilizing more of the wood in harvested trees. For more information on climate-smart forestry, please visit the Canadian Council of Forest Ministers.

# Natural forest disturbance



Natural disturbances such as fire, wind, flood, insects and disease outbreaks are an important part of the natural life cycle of forests, especially the boreal forest. These disturbances change the environment by changing the amount and distribution of forest stand types across the landscape, diversify the age class distribution of forest stands and facilitate the renewal of the forest.

## What's happening

| State    | Trend               | Information | Extent               |
|----------|---------------------|-------------|----------------------|
| <br>good | <br>mixed/no change | <br>partial | <br>entire province* |

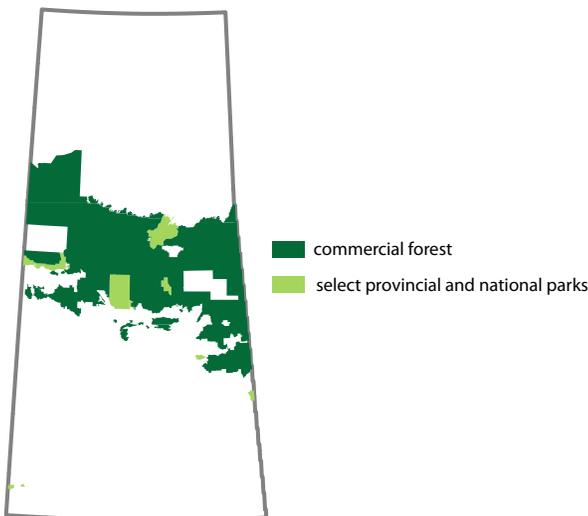
## What we are doing

Disturbances influence forest structure, composition and function and are important in maintaining biological diversity, forest dynamics and regeneration. Sustainable forest management is successful when management strategies emulate natural processes. The ministry conducts annual aerial surveys to monitor insects, diseases and weather events that cause major forest disturbances to assess the health of Saskatchewan's forest.

The three main natural native insect disturbance agents tracked by aerial survey across the commercial forest and select provincial parks\* are spruce budworm, jack pine budworm and forest tent caterpillar. Other damaging agents monitored during the annual aerial surveys include:

- eastern larch beetle;
- spruce beetle;
- aspen leaf spot disease;
- large aspen tortrix
- spruce needle rust; and
- abiotic damage from wind, floods and drought.

### Survey extent for insect and abiotic disturbances



\*The survey extent for insects, diseases and abiotic disturbances includes the commercial forest, Prince Albert National Park, Lac La Ronge Provincial Park, Meadow Lake Provincial Park, Great Blue Heron Provincial Park, Narrow Hills Provincial Park, Greenwater Lake Provincial Park, Duck Mountain Provincial Park and Cypress Hills Provincial Park.

Spruce budworm, jack pine budworm, forest tent caterpillar and large aspen tortrix are all cyclic in their outbreak behaviour. Generally, populations of these insects increase and reach outbreak levels within expected and predictable timeframes. These pests feed on tree foliage and may cause tree mortality after repeated annual attacks during outbreaks.

The spruce budworm cycle is relatively long, and peak outbreaks are expected to occur roughly 35 years apart. A spruce budworm outbreak that peaked in 2002 poses no current threat to sustainable forest management.

### Quick Facts

- Compared to natural disturbances such as wildfire and insect damage, forest harvesting is a relatively small landscape disturbance within Saskatchewan's commercial forest zone.
- The largest disturbance type in the commercial forest zone is from native insects and diseases.
- A 10,000-hectare wildfire in the commercial forest burns roughly enough wood to build almost 10,000 homes.
- Large wildfires have been the norm in the boreal forest for thousands of years. On average, a given area of forest will burn every 70 years in natural boreal systems.
- Every year, about half of Saskatchewan wildfires are started by human activity. These include campfires, industrial activity, clean-up projects that get away, vehicle and ATV exhaust and arson.

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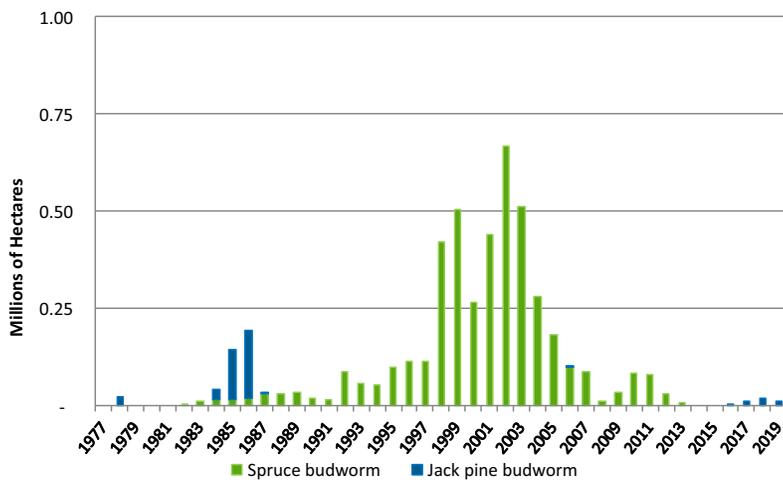
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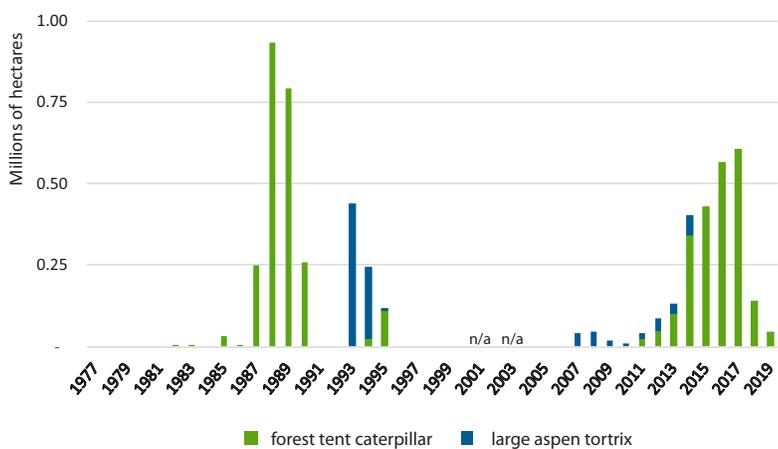
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### Defoliation from spruce budworm and jack pine budworm 1977 to 2019



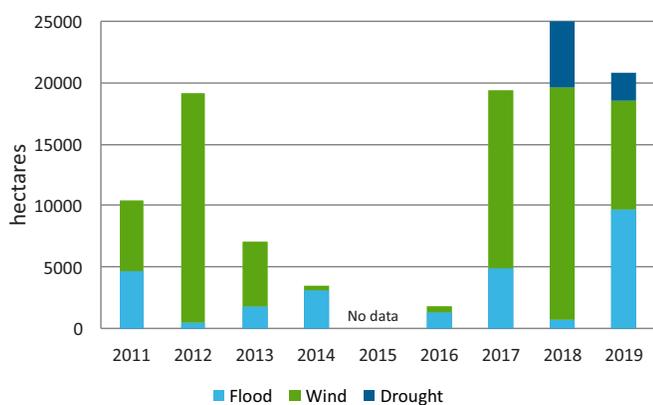
Hardwood defoliation is primarily caused by forest tent caterpillar cycles approximately every 10 to 12 years, with outbreaks lasting three to five years. The pattern has been quite regular with outbreaks occurring in 2001 to 2007 and again from 2013 to 2017. The outbreak in the early 2000s was not aerially mapped (and does not appear on the graph below); however, disturbed areas are documented in a separate report produced by BioForest Technologies in 2015. The current outbreak that reached a peak in 2017 has now generally collapsed throughout the province.

### Defoliation from forest tent caterpillar and large aspen tortrix 1977 to 2019



Along with fire, insect and disease disturbances, physical (abiotic) disturbances including drought, flooding and extreme wind events result in tree mortality which leads to stand-level and landscape-level changes in the forest ecosystem. Abiotic disturbances shape forest structure, composition and function and also contribute to maintaining a biologically diverse and healthy forest. It is only more recently that abiotic disturbances are being monitored at the same time as the insect and disease aerial survey. Although more recently, areas have been affected by drought, events such as blowdown and flooding are the more prevalent cause of abiotic disturbances.

### Area of abiotic forest disturbances 2011 to 2019

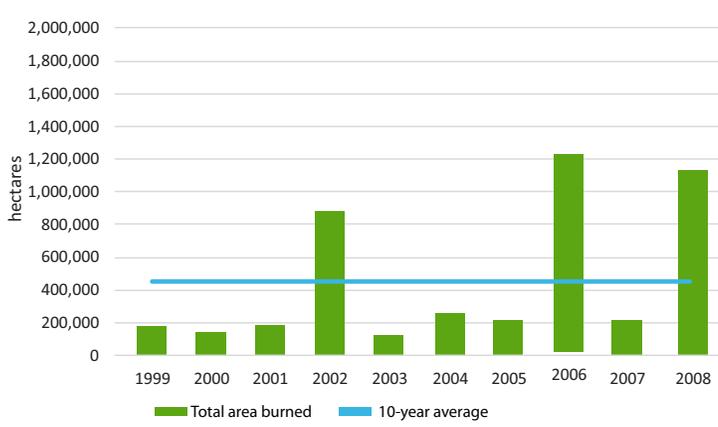


The boreal forest ecosystem is driven by natural disturbances. Boreal species have evolved over time to cope with, and even require, periodic disturbance as part of their natural life cycles. Forest fires are a natural part of the forest ecosystem. The area burned from year to year varies and is significantly affected by weather. Autumn and spring rains and winter snowfall will significantly reduce wildfires and limit their spread.

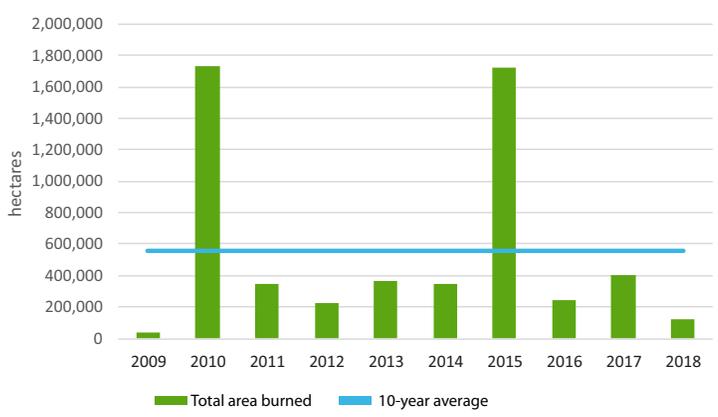
While the number and size of catastrophic wildfires in some North American jurisdictions has increased over the last five years, 20 years of available data do not show any statistically significant increasing trend in Saskatchewan.

The Saskatchewan Government uses modern systems and has dedicated resources to help promote [FireSmart](#) principles, monitoring fire starts and the suppression of wildfires. Wildfires that threaten human life and communities are always the government's top priority, followed by protection of critical public infrastructure, major industrial infrastructure, commercial timber, remote structures and natural resources. Wildfires in low-value timber areas and non-commercial northern forests are considered for initial attack and sustained action based on an assessment of values and estimated financial cost, with the intent to allow some wildfires to act as a necessary and natural process on the landscape.

**Saskatchewan area burned by wildfire 1999 to 2008**

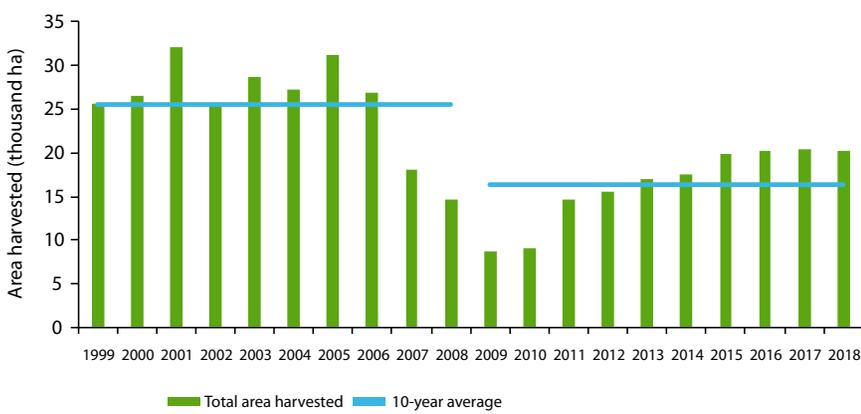


**Saskatchewan area burned by wildfire 2009-2018**

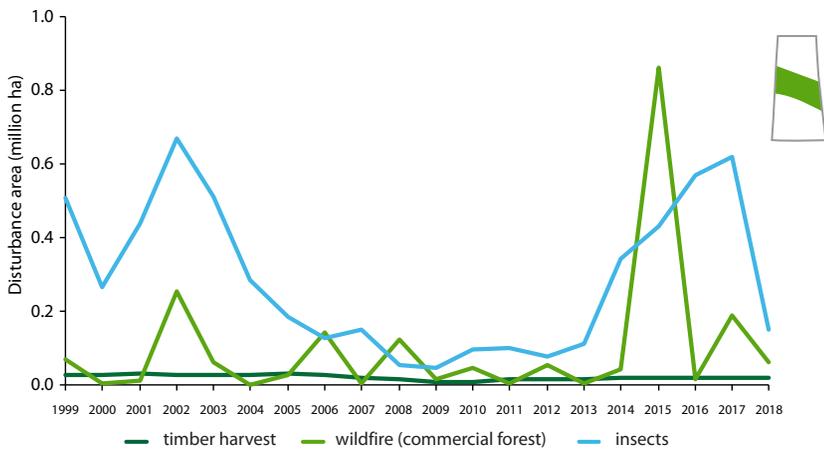


Forest harvesting for commercial use of timber products is a human disturbance impacting an average of 16,330 hectares per year between 2009 and 2018. On average, less than a quarter of one percent (0.21 per cent) of forested lands within Saskatchewan's commercial forest zone are harvested each year. Forest managers work to ensure timber harvesting resembles natural forest disturbance patterns. In the commercial forest zone, wildfires are the second largest disturbance type, with approximately 128,370 hectares burned per year on average between 2009-2018. The largest disturbance type in the commercial forest zone was from insects at 253,739 hectares per year on average during the same period.

**Area harvested (commercial forest)**



**Commercial forest zone disturbance by harvest, wildfire and insects 1999 to 2018**



The stress on forest ecosystems caused by natural disturbances such as wildfire and native insects and diseases are still within the range of what can be considered normal. The level of abiotic disturbance is not a concern at this time. The area of forest being harvested is well within sustainable limits.

## Why it matters

All natural disturbance types are unpredictable and can have a significant effect on sustainable forest management. While natural disturbances are essential to forest health and renewal, they can have a negative impact on communities and businesses that reside in or rely on forests. Wildfires threaten human safety, property and infrastructure, and smoke often becomes a public health concern. All natural disturbances can damage and reduce the supply of timber and impact the socio-economic well-being of communities and citizens.

Although these disturbances are natural forces shaping the boreal forest, there is a need to maintain and protect forests and other values found within the forest. There is a cost to deploying resources to protect the forest from wildfire and insects and diseases, and there is a cost to lost timber for forest products. Unpredictable disturbances create uncertainties in terms of forest product availability, and can have a significant effect on sustainable forest management.

The provincial forest management planning standard requires the owner of a forest management plan to describe how the risks of natural disturbances including fire, insects, diseases and wind could affect the timber supply. Forest management plans must be revisited when the projected sustainable timber targets and other management objectives over the planning period are no longer achievable due to natural disturbance.

---

**Last updated:** February 2020

**Update frequency:** annually

**Source:** Forest Service Branch, Ministry of Environment

**Keywords:** disturbance, insect, disease, wildfire, wind, frost, flood, harvest

**References:**

BioForest Technologies, 2015. Services to aid in monitoring and assessing forest health in Crown forests in Saskatchewan - 2015 Final Report. Consultant's report to Saskatchewan Ministry of Environment Forest Service Branch. 95 pp.

2008 Wildfire Statistics (internal report). Saskatchewan Ministry of Environment

2018 Wildfire Statistics (internal report). Saskatchewan Ministry of Environment

Natural Resources Canada. ["The State of Canadas Forests Annual Report 2017."](#)

[Wildfires in Saskatchewan infographic](#)

# Deforestation in Saskatchewan



Deforestation is the permanent conversion of forests to other land uses through human activity. The loss of forest area through deforestation reduces biodiversity, decreases wildlife habitat and impacts soil and water quality. Increasing forest area through afforestation helps to offset these losses. Canada's deforestation rate is among the lowest in the world.

## What's happening

| State      | Trend           | Information | Extent          |
|------------|-----------------|-------------|-----------------|
|            |                 |             |                 |
| mixed/fair | mixed/no change | partial     | entire province |

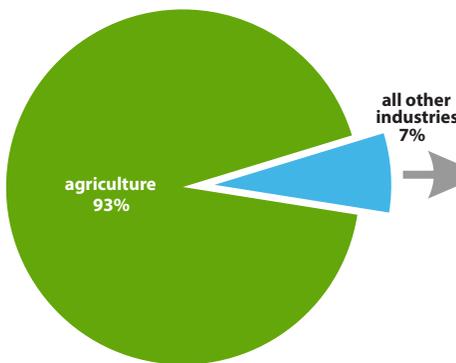
## What we are doing

Monitoring deforestation provides a means of tracking land conversion, trends and assessing human impacts on ecosystem health. Understanding the rate of deforestation also supports the federal target to cut forest loss in half by 2020, and reduce net deforestation to zero by 2030.

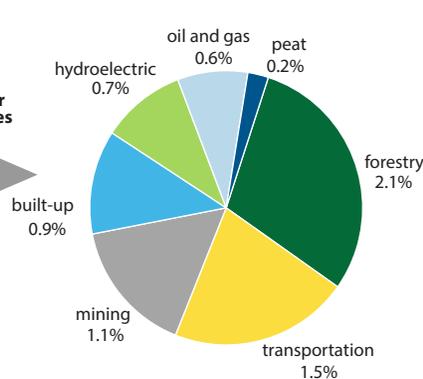
Afforestation was not measured during this reporting period. However, afforestation activities in Saskatchewan include planting agriculture lands with trees for shelterbelts and agroforestry purposes.

Deforestation in Saskatchewan is primarily calculated by extracting provincial data from summaries supplied by the [National Deforestation Monitoring System \(NDMS\)](#) of Natural Resources Canada. Supplemental information about larger disturbances in the north was incorporated to calculate the total provincial deforested area.

### Deforestation by industry type



### Deforestation by all other industries (detail)



**Natural disturbances such as wildfire, and human-caused disturbances such as harvesting, do not result in deforestation because a new forest will grow back in its place.**

### Quick Facts

- Canada's deforestation rate is among the lowest in the world. Canada's 348 million hectares of forest represents nine per cent of the world's forest cover but accounts for only 0.3 per cent of global deforestation.
- Over the last 10 years, the provincial rate of deforestation has remained fairly constant at 1,700 hectares per year.

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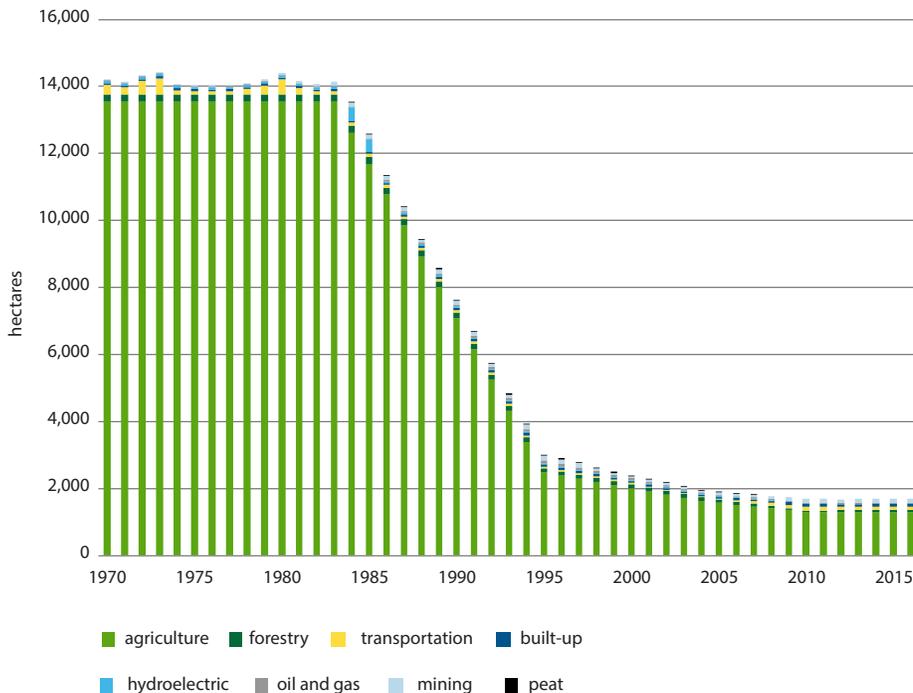
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## Deforestation by industry type



Most of the deforestation in Saskatchewan between 1970 and 2016, about 314,495 hectares (94 per cent), can be attributed to agricultural practices. This deforestation occurs within the Prairie and the Boreal Plain ecozones. Agriculture-related deforestation in these ecozones has decreased significantly since 1970, to 1,299 hectares per year in 2016.

The greatest amount of deforestation in a single ecozone has occurred in the Boreal Plain. While most commercial forest activities occur within this ecozone, agriculture has been the primary cause of deforestation. Since 1970, an estimated 213,544 hectares have been deforested within this ecozone, accounting for 63 per cent of the overall area deforested in Saskatchewan. Deforestation rates in the Boreal Plain have significantly declined in the past decade, down to 1,246 hectares per year in 2016, and are expected to continue on a downward trend.

Urban and industrial development make up 17,122 hectares (3.5 per cent) of deforestation in the province. This includes: transportation, hydroelectric infrastructure and reservoirs; oil and gas; mining; and recreational, industrial, institutional and commercial development.

The forestry sector's contribution to deforestation is limited to the construction of permanent access roads. All area harvested is required to be reforested, and is surveyed to confirm that regrowth is occurring at the rate expected. The majority of forest access roads are temporary and are reclaimed (brought back to forest). The remaining permanent access roads account for two per cent of the overall deforestation in Saskatchewan between 1970 and 2016.

Peat harvesting represents a small fraction of deforestation in Saskatchewan, with typical levels of less than 30 hectares per year. Recent environmental impact assessments indicate a renewed interest in peat mining projects within the provincial forest. The annual deforestation levels expected from these new developments are not likely to exceed normal amounts.

## Why it matters

The annual rate of deforestation across the entire province has drastically declined since the 1970s and has remained fairly constant in the last 10 years at 1,721 hectares per year. It is important that deforestation is limited in the provincial forest to ensure a sustainable forest industry with wildlife habitat protection, ecosystem stability and carbon storage.

Forests in Saskatchewan are important for recreation and tourism opportunities, provide raw materials to the forest industry and host mining and oil and gas industries, all of which are important contributors to the provincial economy. The conversion of forested land for agriculture, mining, forest roads and other industrial use provides economic opportunities for residents of Saskatchewan, but must be managed in a sound and sustainable manner to help ensure the long-term use and function of the provincial forest.

**Last updated:** January 2019  
**Update frequency:** every five or 10 years  
**Source:** Forest Service Branch, Ministry of Environment  
**Keywords:** deforestation, industry, reclaim, afforestation  
**References:**  
 Dyk, Andrew. 2018. Deforestation Mapping in Saskatchewan.

National Forest Inventory (NFI). 2016.  
<https://nfi.nfis.org/en/>.

Natural Resources Canada. 2017. The State of Canada's Forests: Annual Report 2017.

United Nations. 2014. Forests Action Statements and Action Plans.

United Nations Framework Convention on Climate Change. 2013. Afforestation and Reforestation Projects under the Clean Development Mechanism: A Reference Manual.

World Resources Institute. Global Forest Watch.  
<https://www.globalforestwatch.org>.

# Watershed health within the greater commercial forest



Forest disturbance from timber harvesting or wildfire may impact aquatic environments by increasing soil erosion, stream flow and nutrient loading through watershed systems.

## What's happening

| State                                                                                             | Trend                                                                                                  | Information                                                                                    | Extent                                                                                                                 |
|---------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| <br>mixed/fair | <br>mixed/no change | <br>partial | <br>greater commercial forest zone* |

\*The greater commercial forest zone includes the commercial forest zone, Cold Lake Air Weapons Range and federal and provincial parks within and adjacent to the commercial forest zone.

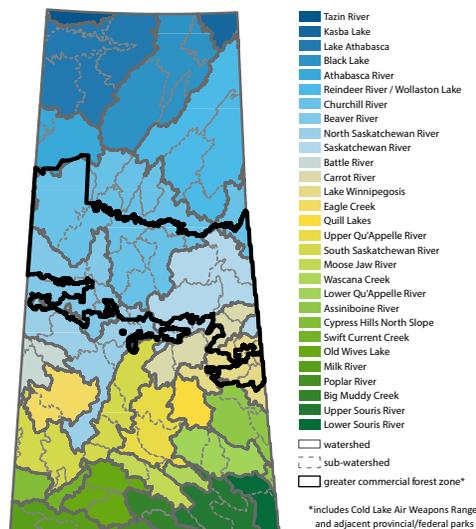
## What we are doing

Equivalent clearcut area (ECA) is a measure of the relative loss and recovery of hydrologic function for a forest canopy. Hydrologic function concerns the condition of water, including the quality, the quantity, when and how quickly water moves through a watershed. Typically, the greater the ECA, the greater the potential for changes to the natural hydrology of an area.

Experimental watershed studies indicate that flow increases are minimized when the equivalent clearcut area is limited to no more than 20 to 25 per cent in aspen-dominated watersheds, and 30 per cent in coniferous dominated watersheds. Hardwood forest stands can take up to 15 years, and softwood forests 35 years, to regain full evapo-transpiration and interception capacity following the harvest of cutblock.

Of the 29 watersheds in Saskatchewan, nine are found within Saskatchewan's greater commercial forest zone. Within those nine watersheds, 36 sub-watersheds intersect the commercial forest zone.

### Saskatchewan watersheds



### Quick Facts

- On average, the impacts of harvest and wildfire in the greater commercial forest account for an annual clearcut equivalent of 17 per cent.

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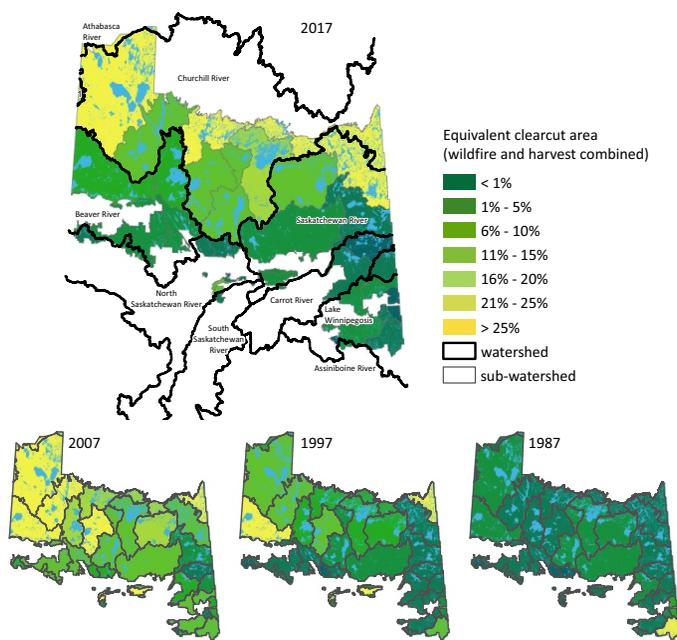
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As of 2017, the equivalent clearcut area across the greater commercial forest zone averaged 17 per cent when wildfire and harvest area were considered. For the three preceding 10-year periods (2007, 1997 and 1987), equivalent clearcut area averaged 12 per cent, 12 per cent, and 5 per cent, respectively.

As of 2017, of the 36 sub-watersheds in the greater commercial forest zone, all but eight were below the 20 per cent equivalent clearcut area threshold for flow increases. Five of these eight sub-watersheds had the majority of their area outside of the commercial forest zone. In these cases, it is difficult to assess the true equivalent clearcut area because data for the majority of these sub-watersheds is incomplete.

The three remaining sub-watersheds had equivalent clearcut areas above the 20 per cent threshold and may actually see increases in flows. These three sub-watersheds are found within the Churchill River watershed and the Saskatchewan River watershed. In all of these cases, wildfire was the greatest contributor to equivalent clearcut areas. Harvesting contributed one per cent or less to the overall equivalent clearcut area.

### The equivalent clearcut area in the greater commercial forest zone: harvested and wildfire areas



When forest harvest disturbances are considered on their own, equivalent clearcut area is considerably less. As of 2017, the equivalent clearcut area within the greater commercial forest zone averaged two per cent when the harvest area alone was considered. For the three preceding 10-year periods (2007, 1997, and 1987), equivalent clearcut area averaged two per cent, two per cent and one per cent, respectively. Of the 36 sub-watershed within the commercial forest zone, none exceeded a 10 per cent equivalent clearcut area.

Roads and water crossings were not considered in this analysis, though they are an important forest disturbance. Currently, year of construction and year of reclamation data for roads within the commercial forest zone is incomplete.

## Why it matters

The impacts of wildfire suppression strategies and the occurrence of large and frequent wildfires in recent years are apparent in the northern reaches of the commercial forest zone. For the 10-year period ending in 2017, sub-watershed equivalent clearcut areas show an increasing trend as one moves northward towards the commercial forest zone's northern boundary. This trend is less pronounced when the equivalent clearcut area is considered for 10-year periods ending in 2007, 1997, and 1987.

When wildfire and harvest areas are combined, the watershed health trend appears to be deteriorating based on an equivalent clearcut area analysis. As of 2017, the equivalent clearcut area within Saskatchewan's greater commercial forest zone averaged 17 per cent when wildfire-burned and harvested areas were considered. However, when harvest areas alone are considered, the watershed health trend appears to be more stable based on this equivalent clearcut area analysis. As of 2017, the equivalent clearcut area within Saskatchewan's greater commercial forest zone averaged two per cent when harvested areas alone were considered. This indicates that forest harvest practice, in the greater commercial forest zone, is consistently below the industry threshold of 20 per cent equivalent clearcut area. This implies that forestry harvest practices are a low threat to the natural flow within these watersheds.

**Last updated:** January 2019  
**Update frequency:** every 10 years  
**Source:** Forest Service Branch, Ministry of Environment  
**Keywords:** hydrology, equivalent clearcut area, nutrients, erosion, stream flow  
**References:**

SMLP (Saskfor MacMillian Limited Partnership). 1997. Twenty-year Forest Management Plan and Environmental Impact Statement for the Pasquia-Porcupine Forest Management Area.

## Cumulative impacts from linear features



Understanding current disturbance levels within the provincial forest is important for assessing the cumulative impacts of human-caused disturbances. The ministry is establishing a baseline measurement of non-permanent and permanent linear features such as roads, transmission lines, railways, seismic lines, cut-lines and firebreaks in the provincial forest.

### What's happening

| State                       | Trend                    | Information | Extent                           |
|-----------------------------|--------------------------|-------------|----------------------------------|
| new indicator - no baseline | new indicator - no trend | partial     | provincial and commercial forest |

### What we are doing

Cumulative impacts are changes in an environment caused by multiple human activities and natural processes across space and over time. In addition to documenting linear features in an area, it is important to track road construction and reclamation by forestry licence holders. More stringent management of construction and reclamation activities will reduce the disturbance footprint of non-permanent and permanent roads associated with a variety of developments.

High levels of linear features in an area may require higher levels of mitigation to manage new development, and a greater need to reclaim features to maintain landscape integrity. The ministry is currently working on a mitigation framework that will determine how to reduce cumulative impacts in Saskatchewan. The economic impact to industry development in regions with a high linear density needs to be evaluated.

As a condition of their operating plans, forest licensees are required to reclaim forestry road access associated with forest harvest activities. The kilometres of forestry road access (class 1, 2 and 3 roads) constructed and reclaimed annually is used as base information for future road construction and reclamation activity reporting.

| Forest resource roads constructed or reclaimed up to March 31, 2017, in the commercial forest |                               |             |
|-----------------------------------------------------------------------------------------------|-------------------------------|-------------|
|                                                                                               | Road Class                    | Length (km) |
|                                                                                               | Class 1: forest resource road | 872         |
|                                                                                               | Class 2: improved bush road   | 3,496       |
|                                                                                               | Class 3: bush road            | 23,890      |

#### Linear feature density in the provincial forest

Linear feature density in the provincial forest is the total length of line features per square kilometre. Linear features include roads, trails, transmission lines, railways, seismic lines, cut-lines and firebreaks.

#### Quick Facts

- There are 28,257 km of class 1, 2 and 3 forest roads identified within the commercial forest. That's three times the length of the Canada-United States border, the longest international border in the world.

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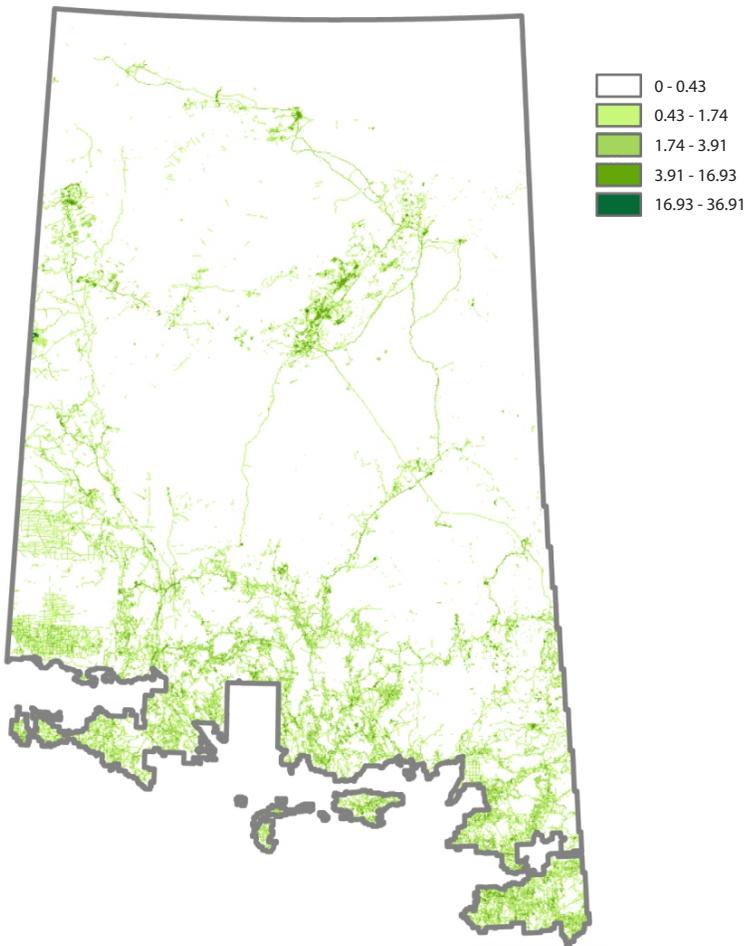
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### Linear feature density in the provincial forest (km/km<sup>2</sup>)



### Why it matters

Disturbances within the forest may have an impact on timber and non-timber values. Increased road and trail access can increase recreational opportunities for the community, but also increase access to the forested areas for other users. Disturbance levels can indicate levels of commercial or non-commercial forest use as well as indicate an amount of disturbance within ecosystems. Disturbances affect the amount and quality of habitat available for different forest species.

Measuring linear feature density on a landscape is important because linear features can result in forest loss, fragmentation and degradation. Linear density is a common measurement of cumulative impacts across different ecosystems and jurisdictions, and is tracked over time.

Anecdotal evidence suggests that recreational use of Saskatchewan forests increases where roads are available. Forest users have reported reduced wildlife sightings in areas where they also reported increased numbers of hunters using forest access roads.

---

**Last updated:** March 31, 2017

**Update frequency:** every five years

**Source:** Cumulative Impacts Branch, Ministry of Environment

**Keywords:** linear, cumulative, corridor, density, reclamation

**References:**

Environment Canada. 2012. Recovery strategy for the woodland caribou, boreal population (*Rangifer tarandus caribou*) in Canada. Species at Risk Act Recovery Strategy Series. Environment Canada, Ottawa, ON. xi+138 pp.

Learner, J. 2018. Review of cumulative effects management concepts and international frameworks. Prepared for Government of Canada, Ottawa, ON. <http://www.tc.gc.ca/eng/review-cumulative-effects-management-concepts-international-frameworks.html>

## Regeneration of timber harvest area



An important indicator of long-term forest productivity and sustainable forest management practices is the area of harvested forest land that is sufficiently regenerated according to a measurable [standard](#). Forests that are regenerated successfully are essential to a long-term sustainable flow of wood products and ecosystem productivity.

### What's happening

| State | Trend    | Information | Extent            |
|-------|----------|-------------|-------------------|
| good  | improved | partial     | commercial forest |

### What we are doing

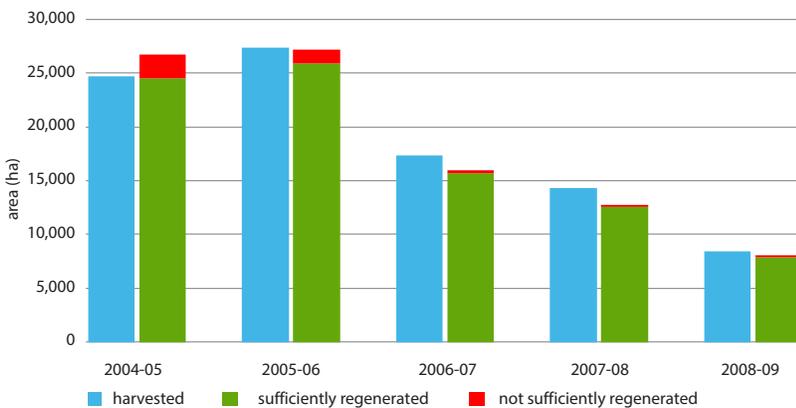
Every major licensee (forest management agreement and area-based term supply licence holders) that harvests forest products in the province has a legal obligation to ensure that the licence area has also been renewed.

Regeneration assessments provide assurance that the achievement of the desired forest condition is likely. There are two timeframes when regeneration is assessed:

1. Establishment: four to seven years post-harvest; and
2. Free-to-grow: eight to 14 years post-harvest.

The area harvested does not always match the area surveyed by year of harvest because of the changing sources of the harvest and survey data. The area harvested is reported by industry within 18 months of the harvest activity being completed. While every effort is made to ensure the data sets are correct at time of reporting, there can be discrepancies. The reporting time period includes harvest years 2004-05 to 2008-09 because this is the most complete data available from industry.

**Sufficiently regenerated area at establishment survey**  
(four to seven years post-harvest)



The establishment surveys show that the forest industry is on track to maintain a sustainable forest industry based on the results of the establishment surveys. The amount of area reported as not sufficiently regenerated (NSR) at establishment for the reported time period is five per cent.

Forest companies are required to re-treat any NSR areas that they report, and it is expected that the NSR reported at establishment would be sufficiently regenerated (SR) by the free-to-grow (FTG) survey. It is also expected that if a block is SR at establishment it will continue to be SR at FTG. There are a number of reasons why this may not be the case. A block that was SR at establishment may experience an insect infestation that can cause a plantation failure, a fire may destroy a regenerating area, ungulate browsing can damage recent growth on trees and cause them to be under-height at FTG, and excessive drought or flooding can lead to plantation failure.

#### Quick Facts

- Ninety-five per cent of the area harvested from 2004-05 to 2008-09 is sufficiently re-stocked with healthy growing trees.

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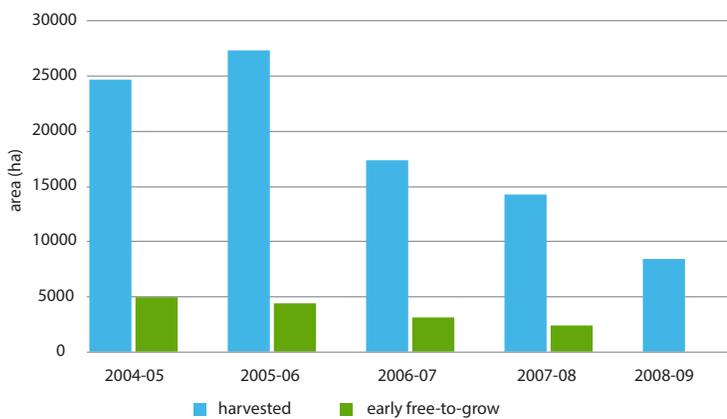
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### Sufficiently regenerated area at free-to-grow survey (eight to 14 years post-harvest)



The [forest regeneration assessment standard](#) applies to blocks harvested after 2004 and the first free-to-grow surveys were completed by industry in 2018. These datasets will be submitted to government for review and audit and presented for this indicator in the future. The blocks that have met the free-to-grow stocking and height requirements at the establishment survey stage (four to seven years post-harvest) are presented above.

## Why it matters

Successful regeneration of harvested areas is an important indicator of anticipated long-term forest productivity and sustainable forest management practices.

---

**Last updated:** November 2018  
**Update frequency:** annually  
**Source:** Forest Service Branch, Ministry of Environment  
**Keywords:** regenerated, not sufficiently regenerated, planting, free-to-grow,  
**References:**  
<http://publications.gov.sk.ca/documents/66/86809-Forestper cent20Regenerationper cent20Assessmentper cent20Chapter.pdf>  
<http://publications.gov.sk.ca/documents/66/86845-Forestper cent20Regenerationper cent20Assessmentper cent20Standard.pdf>

# Mountain pine beetle detection and prevention



## Why we measure this

The mountain pine beetle (MPB), or *Dendroctonus ponderosae*, is a small bark beetle about 4.0 to 7.5 mm in length – approximately the size of a grain of rice. MPB is the most significant pest threat to pine forests in North America. MPB can colonize and kill jack pine trees, posing a threat to pine forest ecosystems and sustainable development of the forest industry in Saskatchewan and across Canada.

Saskatchewan could be the MPB's gateway to Canada's boreal forest. If MPB spreads across Saskatchewan, the rate of spread will likely increase substantially because the distribution and density of pine forests increases in eastern forests. Confirming MPB (presence or absence) in the northern boreal is a significant measure, helping to guide the Ministry of Environment's risk assessment policies and subsequent response actions.

The MPB outbreak in British Columbia infested over 18 million hectares and killed 731 million cubic metres, or 54 per cent, of the province's merchantable lodgepole pine. Those losses impacted forest-dependent communities.

Forestry is the largest industry in Saskatchewan's north. The forest industry depends on a sustainable supply of forest products. On average, one third to one half of all softwood manufactured in Saskatchewan annually is jack pine. Saskatchewan's Ministry of Energy and Resources reported that the forest industry supported nearly 8,000 direct and indirect jobs and sold over \$1.2 billion worth of in forest products in 2023, 70 per cent of which are exported internationally. Losses of pine inventory would interrupt the long-term sustainable wood supply to mills, resulting in reduced mill productivity, manufacturing and ultimately job loss.

Many of Saskatchewan's most visited provincial parks (Cypress Hills, Meadow Lake, La Ronge, Narrow Hills, Candle Lake and Makwa Lake) have large pine forests that, if killed by the beetle, would have serious implications on visitation, experience and public safety from increased fire risk, and dead and falling trees.

The beetle has been designated under *The Forest Resources Management Act*, which makes it illegal to import, transport and store pine logs and pine forest products with bark attached if they originate from British Columbia, Alberta, an area in southwestern Saskatchewan around Cypress Hills Interprovincial Park, and the United States.

## What is happening

| State    | Trend         | Information | Extent              |
|----------|---------------|-------------|---------------------|
| <br>good | <br>improving | <br>partial | <br>entire province |

Since crossing the Rocky Mountains in two mass dispersal events in 2006 and 2009, MPB has spread into lodgepole pine and jack pine forest ecosystems in central and eastern Alberta, where the beetle had not been found before. Monitoring and early detection of the presence and severity of insect and disease conditions in the forest helps ensure timely detection and response.

**Currently, no mountain pine beetles have been detected in the boreal monitoring area.**

The overall trend is improving. The risk of eastern spread through Alberta has declined. Since reaching a peak in 2019, populations in Alberta have collapsed by 94 per cent in 2022. The decline can be attributed to sustained early and aggressive control efforts and climatic events that created unfavorable conditions for beetle development and survival. Extreme cold winters experienced in 2018/19, 2020/21 as well as a cool wet summer in 2019, slowed population growth. Large populations of MPB that had been building in the Jasper and Hinton areas in western Alberta and in east-central Alberta have now collapsed.

### Quick Facts

- Mountain pine beetles prefer lodgepole pine but can attack and kill all the pine species found in Canada.
- Mountain pine beetles affect pine trees by laying eggs under the bark. The beetles introduce a blue stain fungus into the sapwood that prevents the tree from repelling and killing the attacking beetles. The fungus also restricts movement of water and nutrients in the tree. If you see lumber with blue stains, it may have been salvaged from an MPB infested stand.
- Mountain pine beetles can survive very cold temperatures, below -40°C. Mild winters and warm summers contribute to the spread of mountain pine beetle.

**Last updated:** March 2024  
**Update frequency:** annually

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# What we are doing

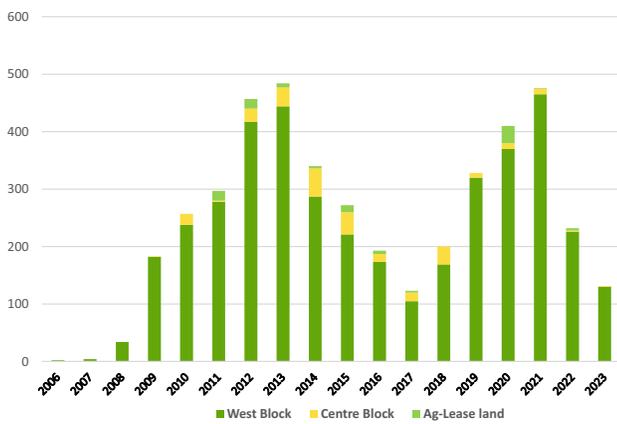
In Saskatchewan, MPB surveillance is conducted in the boreal northwest and in Cypress Hills Interprovincial Park. The ministry conducts ground-based monitoring in highly susceptible jack pine forests in the northwest boreal forest. Between 2011 and 2017, the ministry established a network of helicopter landing and tree-baiting sites to improve access and capacity to detect the leading edge of MPB infestation in the boreal forest. Trees, baited with MPB attractant chemicals, are established in 57 areas where highly susceptible pine exists throughout northwest Saskatchewan. Fifty sites are located north and south of the Cold Lake Air Weapons Range, and seven sites are located within the Air Weapons Range.

Survey and monitoring data support a framework that is crucial to the integrity of a long-term forest health management plan for Saskatchewan. The measure for MPB in the boreal forest is currently its presence or absence. Currently, no MPB have been detected in the boreal monitoring area. With the reduced risk of MPB in Alberta, the tree baiting network has been suspended and we will continue to monitor risk in east-central Alberta.

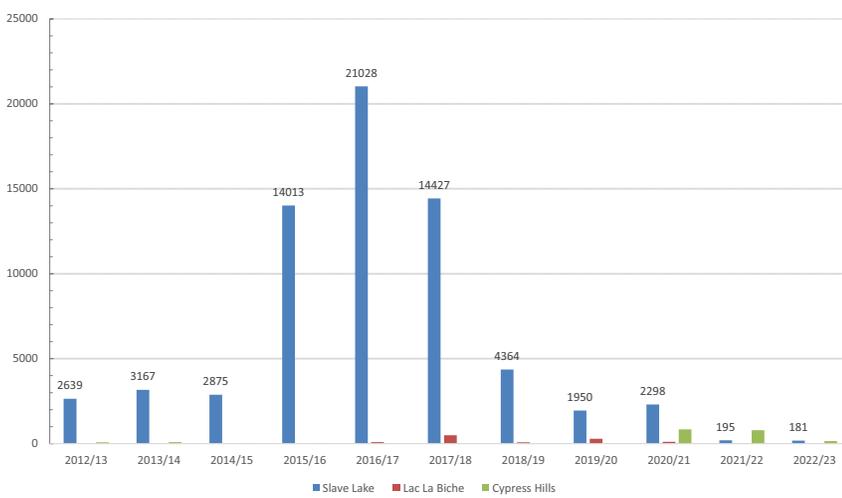
The MPB is a natural component of the lodgepole pine forest ecosystem in Cypress Hills Interprovincial Park and is being actively managed through aerial and ground surveys. All lodgepole pine stands within Cypress Hills Interprovincial Park (Centre Block and West Block), and adjacent forested Agricultural leased lands around the park (excluding Alberta) are surveyed. If beetles are found, surveyors expand their search area in a circle around infested trees, to locate all the trees attacked in the current year.

Once infested trees are found and marked, the next step is a quick and aggressive control response. The most effective control method is to find the beetle-infested trees in fall and winter months, cut them down, and pile and burn them before the beetles can leave and spread and attack healthy pine trees in the late spring or early summer the following year. MPB infested trees are controlled within Cypress Hills Interprovincial Park by the Ministry of Parks, Culture and Sport.

**Number of MPB trees controlled in Cypress Hills Provincial Park, 2006-2023**



**Pine trees controlled in Eastern Alberta and the Cypress Hills 2012-2023**



# Annual timber harvest



### Quick Facts

- The sustainable timber harvest from the commercial forest and fringe forest zones is 8.96 million cubic metres.
- In 2020-21, timber harvest from the commercial forest and fringe forest zones was 4.15 million cubic metres (46 per cent of the sustainable timber harvest).

**Last updated:** June 2022  
**Update frequency:** annually

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## Why we measure this

Healthy forests provide many benefits such as clean air, fresh water, healthy soils, habitat for plants and animals, and materials for building homes and printing books. Forest management is based on the concept that forests change over time; young trees grow and reach maturity. During this time a forest may be cut for wood products, be burned in wildfires, or continue growing until it becomes old and eventually falls over or is killed by insects or disease.

Forest management plans are developed by professional foresters to care for the forest. When trees are cut following these plans, the harvest is sustainable, meaning that the forests and the benefits they provide will always be there. In Saskatchewan's managed forests, more trees are growing back than are being cut. This means that the forest will grow older than planned, and more tree cutting may be needed to help the forests stay healthy.

## What's happening

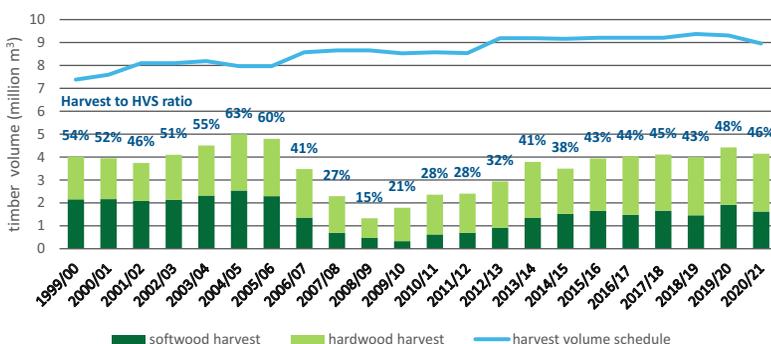
| State      | Trend     | Information | Extent            |
|------------|-----------|-------------|-------------------|
| mixed/fair | improving | adequate    | commercial forest |

For each timber supply area in the commercial forest and fringe forest (Crown agriculture) zones, a harvest volume schedule (HVS) is calculated. The HVS in Saskatchewan is also known as the annual allowable cut or the sustainable wood supply in other Canadian jurisdictions. The HVS is determined based on the results of a timber supply analysis, which assesses the selected long-term forest resource management strategy using complex computer modelling. To ensure forest sustainability, the amount of timber harvested must not exceed the HVS for a specified term. Timber harvesting on private and federal lands is not regulated in Saskatchewan. For this indicator, timber harvested from private and federal lands have been included and the HVS has been estimated.

HVS compared to actual harvest is a key performance indicator of sustainable forest management. This comparison provides information on the over- or under-utilization of available wood supply and how the forestry industry is performing relative to its allocation of timber. Additionally, it highlights potential investment opportunities in the forestry sector. A higher ratio of actual harvest to HVS can be an indicator that the forest industry is performing well, whereas a low ratio may indicate a downturn.

The low actual harvest to HVS ratios observed between 2006 and 2009 in Saskatchewan's commercial forest zone mirrored a period of global economic recession. Since then, as the forest industry recovers, the ratio of actual harvest to HVS has increased. However, the ratio has not yet returned to pre-recession levels. In 2020-21, of the 8.96 million cubic metre provincial HVS, 4.15 million cubic metres of timber were harvested from Saskatchewan's commercial forest and fringe forest zones. This represents a 46 per cent harvest to HVS ratio. As a result, Saskatchewan's commercial forest and fringe forest zone will age and potentially be more susceptible to natural disturbances, such as wildfires, insects and disease.

### Timber harvest and HVS in Saskatchewan



## What we are doing

Licensees are required to ensure their timber harvest levels do not exceed the HVS and stakeholders want assurance that overharvesting is not occurring in provincial forests. This indicator provides stakeholders with evidence that the harvest at the provincial scale is being conducted in a sustainable manner.

For more information on the forest sector in Saskatchewan, visit [saskatchewan.ca/forestry](http://saskatchewan.ca/forestry).

# Indigenous involvement in the forestry sector



### Quick Facts

- Approximately 30 per cent of the provincial timber supply is allocated to Indigenous businesses, by far the largest of any province.

**Last updated:** January 2023  
**Update frequency:** allocation and employment – annually

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## Why we measure this

The Government of Saskatchewan is committed to promoting the use of provincial forest resources in an economically, socially and environmentally sustainable manner. Indigenous involvement is critical to the success of the forestry sector in Saskatchewan.

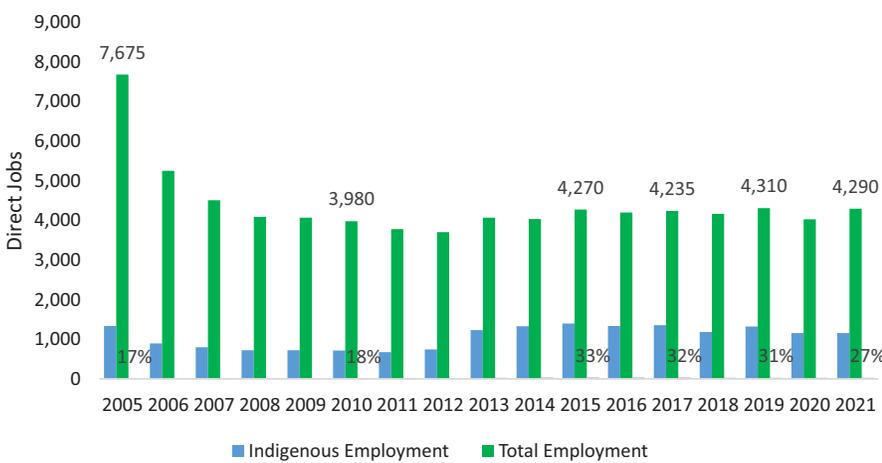
Northern Saskatchewan contains a significant population of Indigenous people. The largest industries in the region are forestry and mining. Saskatchewan has several large and small Indigenous forestry businesses that are major employers of Indigenous people in northern Saskatchewan.

## What's happening

| State | Trend | Information | Extent            |
|-------|-------|-------------|-------------------|
| good  | mixed | adequate    | provincial forest |

Indigenous people represent approximately 27 per cent of the forestry sector workforce in Saskatchewan, which is by far the largest of any province.

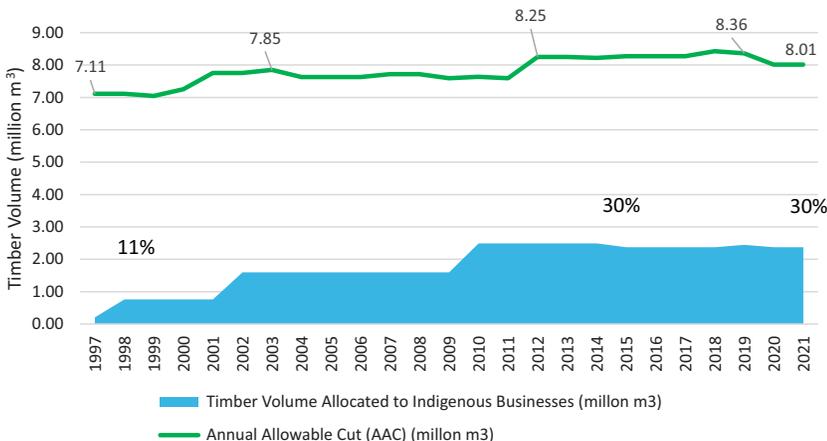
### Indigenous employment in the forest sector



## What we are doing

The annual allowable cut allocated to Indigenous businesses is one indicator of the level of economic involvement and benefits derived from the forestry sector by Indigenous people. NorSask Forest Products, located in Meadow Lake, is the largest First Nations-owned and operated sawmill in Canada.

### Annual allowable cut allocated to Indigenous businesses



# Forestry sector contributions to the provincial economy



### Quick Facts

- Forest product sales exceed \$1 billion annually.
- The forestry sector supports nearly 12,000 direct and indirect jobs.

**Last updated:** January 2023  
**Update frequency:** annually

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## Why we measure this

This indicator measures the economic benefits derived from harvesting timber and manufacturing forest products in the province.

Sustainable forest management includes balancing social, economic and environmental benefits from forest management activities. Full utilization of the annual allowable cut has the potential to generate more than \$2.2 billion in forest product sales annually, and support nearly 12,000 direct and indirect jobs.

## What's happening

| State    | Trend         | Information  | Extent              |
|----------|---------------|--------------|---------------------|
| <br>good | <br>improving | <br>adequate | <br>entire province |

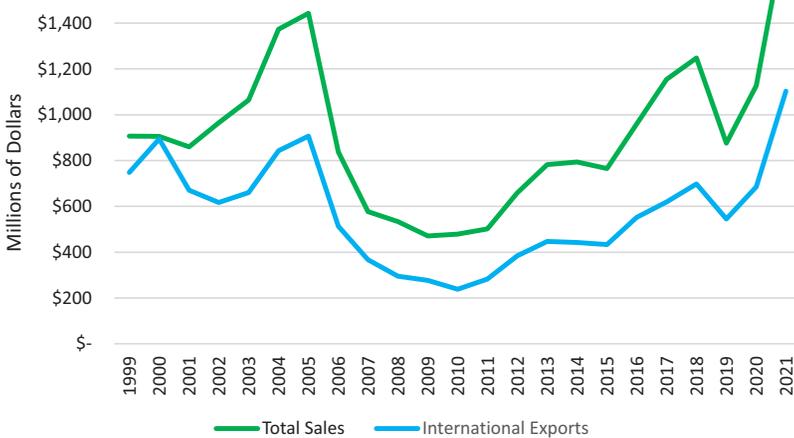
In 2021, forestry was the largest industry and a major employer in northern Saskatchewan, representing approximately one per cent of the provincial gross domestic product. Forestry provides economic development and employment opportunities, resulting in improved quality of life for the people of northern Saskatchewan.

Saskatchewan currently has 7 large primary forest products manufacturing facilities (2 pulp mills, 2 OSB mills, 3 saw mills), as well as many smaller primary and secondary forest products manufacturing facilities.

## What we are doing

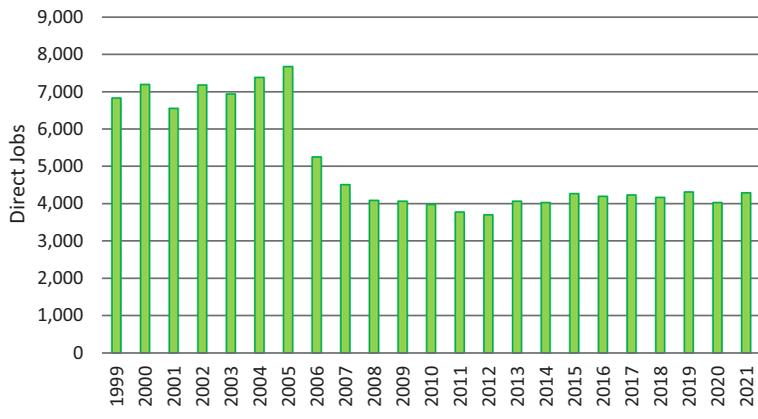
In 2021, the forestry sector sold \$1.8 billion worth of forest products, 61 per cent of which was exported to other countries.

### Forest products sales and exports



In 2021, the forest sector supported nearly 4,300 direct jobs.

### Forestry sector direct employment



# Economic value of select non-timber forest uses



Hunting, trapping and fishing licence sales impact the economy directly through revenue collected by the province and indirectly by supporting local businesses through food, lodging and supply purchases. Licence sales and revenue are a measure of non-timber forest activity and value in the province.

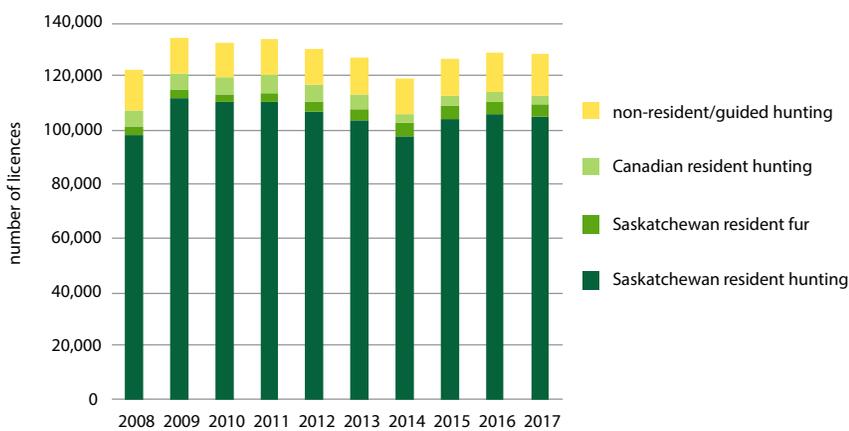
## What's happening

| State | Trend           | Information | Extent          |
|-------|-----------------|-------------|-----------------|
| good  | mixed/no change | adequate    | entire province |

## What we are doing

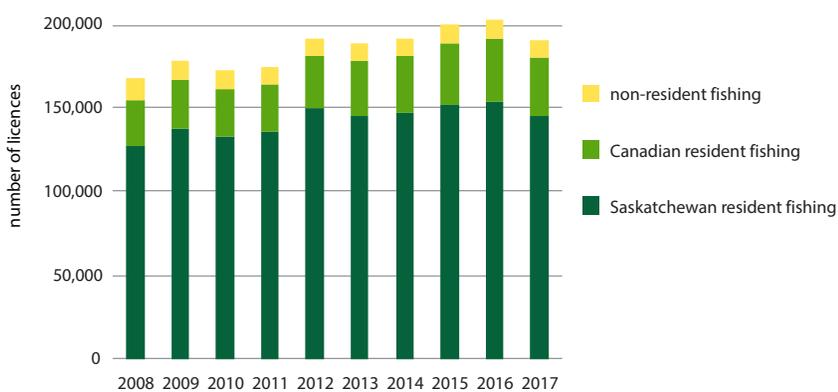
The number of licences available in both the forest and agricultural regions of the province can vary annually based on wildlife populations and management objectives. Variations in the number of licences available have not created a drastic change in licence sales over the past 10 years.

**Number of hunting and fur licences sold by year**



Canadian, non-resident/guided and fur licence sales have remained consistent over time. Saskatchewan resident hunting licence sales have increased but are considered stable. Hunting and fur licences include big game animals, game birds and furbearers.

**Number of fishing licences sold by year**



### Quick Facts

- Including fishing licence sales, investments and expenditures by Saskatchewan anglers exceeds \$300 million annually.

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Non-resident fishing licence sales have remained consistent over time while Saskatchewan and Canadian resident fishing licence sales have increased. Licence revenues in both the forest and agricultural regions of the province can vary annually but have not changed significantly over the past 10 years.

Total revenue from hunting, angling and fur licences exceeded \$16.8 million in 2017.

## Why it matters

Fishing, hunting and fur licence sales, and the revenue generated from licensing, are as a measure of natural resource activity and value throughout the province. Approximately 15 per cent of provincial regulated hunting and trapping activity occurs north of the provincial forest boundary.

Hunting and trapping licence sales impact the economy directly through licence sale revenue, and indirectly by supporting local businesses through food, lodging and supply purchases.

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**Last updated:** July 17, 2018  
**Update frequency:** annually  
**Source:** Fish, Wildlife and Lands Branch, Ministry of Environment  
**Keywords:** fish, wildlife, license, licence, sales, revenue

## Forest type and age



The type and age of forests are important factors to consider when managing Saskatchewan's natural resources. Aging forests are more vulnerable to wildfire and disease. Forest management in Saskatchewan is designed to result in a forest age structure that emulates natural disturbance. By emulating natural disturbances, the natural range of ecosystems should be maintained, resulting in a more resilient system.

### What's happening

| State     | Trend               | Information | Extent                                                               |
|-----------|---------------------|-------------|----------------------------------------------------------------------|
| <br>mixed | <br>mixed/no change | <br>partial | <br>Province, provincial forest* and greater commercial forest zone* |

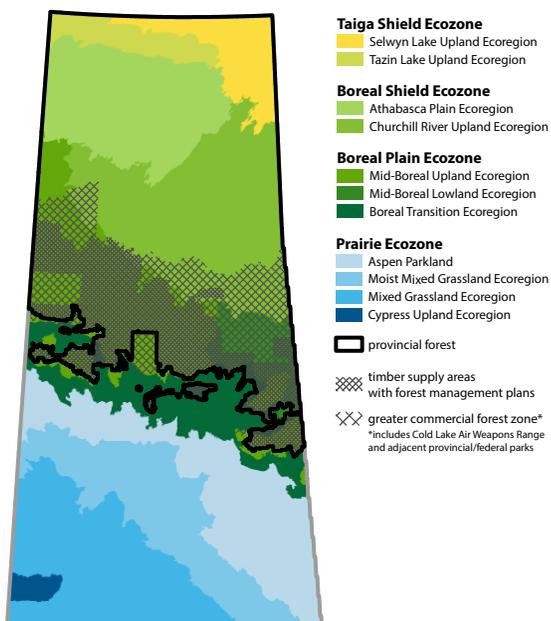
### What we are doing

The province of Saskatchewan covers an area of approximately 65.2 million hectares. The northern half of the province is largely covered by upland forests, wetlands and water. Grass and agricultural lands cover 36 per cent of the province, mainly in the south.

Four ecozones are found within the province: Taiga Shield, Boreal Shield, Boreal Plain and Prairie. The provincial forest covers approximately 34 million hectares within the Taiga Shield, Boreal Shield and Boreal Plain ecozones.

About 64 per cent of the provincial forest is an upland forest (41 per cent softwood, eight per cent mixedwood, seven per cent hardwood, and eight per cent open productive/shrub forest types). Wetlands and water each account for 17 per cent of the provincial forest. Grass, barren rock/sand, agricultural and anthropogenic areas make up the remaining 2 per cent of the landcover.

#### Ecozones and analysis areas



#### Quick Facts

- The northern half of Saskatchewan is the provincial forest. Of this area, 65 per cent is forested, an area roughly the size of the entire United Kingdom.

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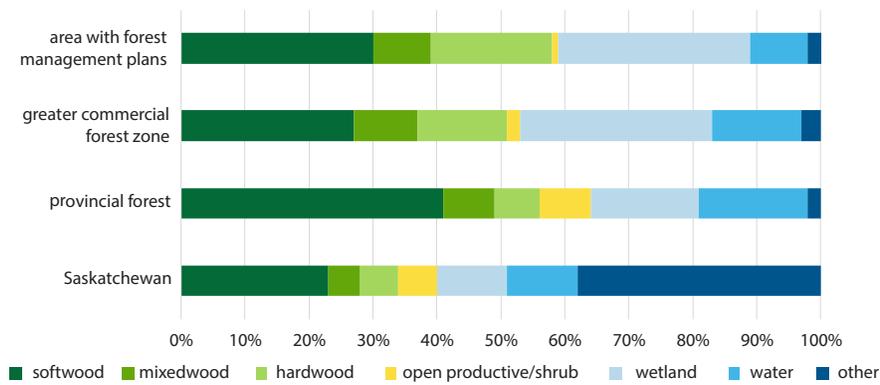
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\*For the purposes of this indicator, the 11.7 million hectare commercial forest zone has been expanded to include the Cold Lake Air Weapons Range, and provincial and national parks within and adjacent to the commercial forest zone. Within the provincial forest, the greatest amount of human activity occurs within this 14.3 million-hectare area referred to as the greater commercial forest zone.

The greater commercial forest zone is largely softwood, but features a greater proportion of hardwood and mixedwood forest types compared to the provincial forest. Wetlands also feature prominently within the greater commercial forest zone, covering nearly a third of the area.

Most forest-based economic activity and fire suppression occurs within the greater commercial forest zone. The greater commercial forest zone is subdivided into a number of timber supply areas. Presently, there are six active forest management plans, covering 8.3 million hectares.

**Forest and non-forest landcover types within the province, the provincial forest, the greater commercial forest zone\* and those timber supply areas with active forest management plans**

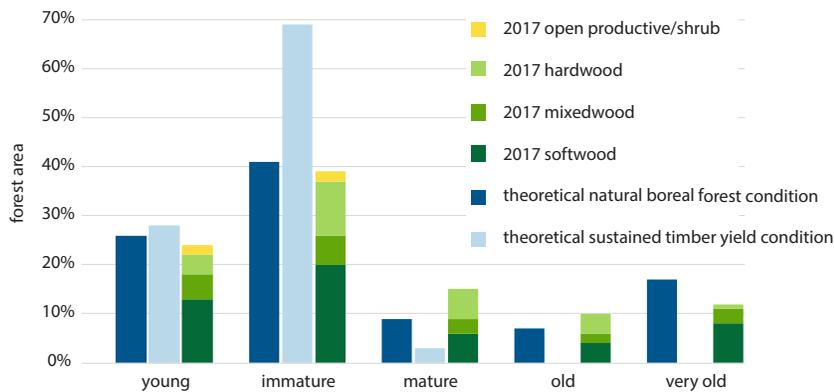


\*Including Cold Lake Air Weapons Range and provincial and federal parks within or adjacent to the commercial forest zone

Boreal forests, when uninfluenced by human activities, are shaped by natural disturbances like fire, insects, disease and wind. In theory, the greatest amount of forest area is typically found in the youngest forest ages, and the least amount of forest area is typically found in the oldest forest ages. In contrast, forests managed solely to sustain timber yield are evenly distributed among young, immature and mature forest ages with very little forest area in the old and very old forest ages. The greater commercial forest zone's current forest age structure falls between these two theoretical patterns.

Forest management in Saskatchewan is designed to result in a forest age structure that emulates natural disturbance, unlike a sustained timber yield approach. By emulating natural disturbances, the natural range of ecosystems should be maintained, resulting in a more resilient system.

**Forest area in the greater commercial forest zone\* by forest age and type**



\*including Cold Lake Air Weapons Range and provincial or federal parks within and adjacent to commercial forest zone

Within the Boreal Shield ecozone, where fire suppression has been less intensive, forests typically follow a natural boreal forest pattern. This is evident for the portion of the greater commercial forest zone within the Churchill River Upland ecoregion.

Within the Boreal Plain ecozone, where protection from fire and insect damage has been a priority for over six decades, the proportion of mature and old forest ages are high relative to what is expected under natural boreal forest conditions. This is evident for the portion of the greater commercial forest zone within the Mid-Boreal Upland and Boreal Transition ecoregions, where the majority of Saskatchewan's forest harvesting has taken place. Here, from fire and insects has protection ensured a supply of mature and old age forest, and regulated harvesting has created a supply of young and immature forest. For the portion of the greater commercial forest zone within the Mid-Boreal Lowland ecoregion, where forest harvesting has been minimal, the forest is aging.

**Why it matters**

Forests must be managed in such a way as to balance habitat needs, recreational opportunities and economic growth. Like a well-diversified financial portfolio makes it easier to adapt to economic market changes, biological diversity makes it possible for ecosystems and species to respond and adapt to environmental change. Generally, forest management practices over the last number of decades in Saskatchewan have shifted the distribution of forest ages towards older classes in the greater commercial forest zone.

Where humans have been putting out wildfires for decades, the forest has become older than it would under natural boreal forest conditions. This can lead to more intense wildfires and more serious insect infestations. Letting wildfire play its natural role when safe and feasible is one way to address this age imbalance; carefully planned forest harvesting can be another.

Native plant and animal species are often associated with certain forest and wetland types and certain forest ages. The availability of habitat for various species may be partially assessed through the abundance and distribution of forest types, forest ages and wetlands. Maintaining the natural range of ecosystems results in a more resilient system, helping to sustain overall biological diversity. Ecosystem diversity, the variety and relative abundance of ecosystems and their plant and animal communities, is necessary for species preservation.

The ideal distribution of forest ages for any management area depends on the ecology and management goals for that area. In reality, the target forest age structure is somewhere in between the natural pattern and that of a forest managed solely for timber. What is important is that wood fiber, habitat and ecosystems are maintained.

Saskatchewan's forest management planning process emulates natural disturbances, allowing ecosystems to be maintained, resulting in a more resilient system. Resilient systems sustain biological diversity, protect habitat, maintain recreational opportunities and ensure economic growth.

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**Last updated:** September 2018  
**Update frequency:** every 10 years  
**Source:** Forest Services Branch, Ministry of Environment  
**Keywords:** forest type, forest age, disturbance, resilience  
**References:**  
Seymour, R. and Hunter, M. 1999. Principles of ecological forestry. In *Managing biodiversity in forested ecosystems*, edited by Hunter, M. Cambridge: Cambridge University Press. pp 22-61.  
Van Wagner, C.E. 1978. Age-class distribution and the forest fire cycle. *Can. J. For. Res.* 8: 220-227.

## Protected areas



Ecosystem diversity, the variety and relative abundance of ecosystems and their plant and animal communities, is necessary for species preservation. Many ecosystems found throughout Saskatchewan support their own unique range of species. Protecting unique ecosystems, along with those representative of the landscape, helps to maintain biological diversity.

### What's happening

| State      | Trend     | Information | Extent                              |
|------------|-----------|-------------|-------------------------------------|
|            |           |             |                                     |
| mixed/fair | improving | partial     | entire province and specified areas |

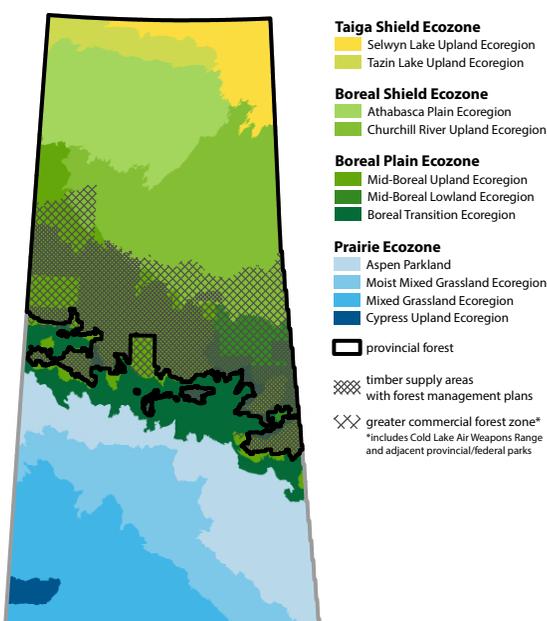
### What we are doing

The province of Saskatchewan covers an area of approximately 65.2 million hectares. Of this, nine per cent is under some form of ecological protection under the [Saskatchewan Representative Areas Network \(RAN\)](#) program. Protected areas represent different landscapes which have been set aside to preserve natural or cultural features. Protected areas can also serve as benchmarks for the ministry to monitor the impact of human activities and their effect on the environment. The selection of natural areas is largely based on soil and vegetation, as well as unique features such as bogs, land formations and species habitats. The goal of RAN is to preserve ecologically important land and aquatic areas across the province. The target for the program is to have 12 per cent of the province protected.

Four ecozones are found within the province: Taiga Shield, Boreal Shield, Boreal Plain and Prairie. The provincial forest covers approximately 34 million hectares within the Taiga Shield, Boreal Shield and Boreal Plain ecozones.

Like the province as a whole, nine per cent of the provincial forest is protected. At the ecozone level, 13 per cent of the Taiga Shield, six per cent of the Boreal Shield, and 12 per cent of the Boreal Plain ecozones within the provincial forest are protected. Upland forests account for 62 per cent of protected areas in the provincial forest (32 per cent softwood, 13 per cent mixedwood, 9 per cent hardwood, and 8 per cent open productive/shrub forest types). Wetlands and water account for 18 per cent and 17 per cent of the provincial forest's protected areas, respectively. Grass, agricultural, barren rock / sand, anthropogenic and other areas make up the remaining 3 per cent of the landcover.

#### Ecozones and analysis area



#### Quick Facts

- Nine per cent of Saskatchewan is under some form of protection. Twelve per cent of the greater commercial forest zone is protected.

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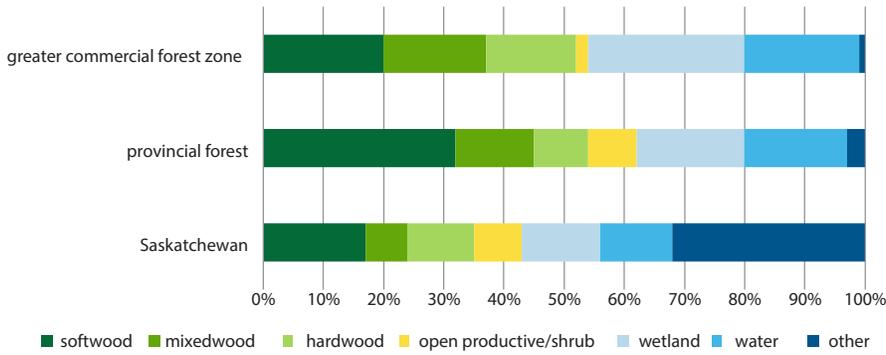


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For the purposes of this indicator, the 11.7 million ha commercial forest zone has been expanded to include the Cold Lake Air Weapons Range, and provincial and national parks within and adjacent to the commercial forest zone. Within the provincial forest, the greatest amount of human activity occurs within this 14.3 million-hectare area referred to as the greater commercial forest zone. Protected areas within and adjacent to the greater commercial forest zone account for 12 per cent of its area.

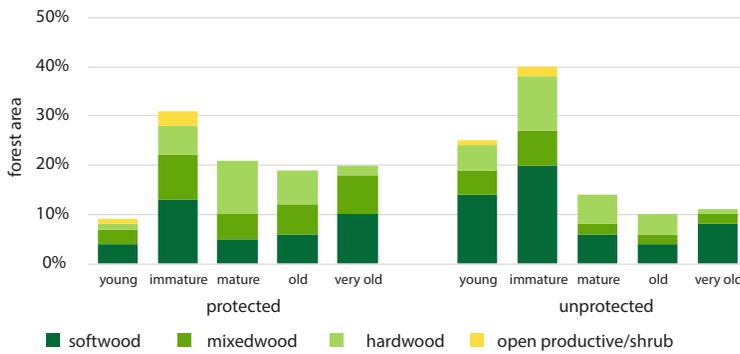
Over half of protected areas within the greater commercial forest zone are upland forests, nearly evenly split between softwood (20 per cent), mixedwood (17 per cent) and hardwood (15 per cent) forest types. Wetlands also feature prominently within greater commercial forest zone protected areas, covering over a quarter of the area.

**Protected forest and non-forest landcover types within the province, the provincial forest\*, and the greater commercial forest zone\***



\*Including Cold Lake Air Weapons Range and provincial and federal parks within or adjacent to the provincial forest and commercial forest zone

**Protected and unprotected forest area in the greater commercial forest zone\* by forest age and type**

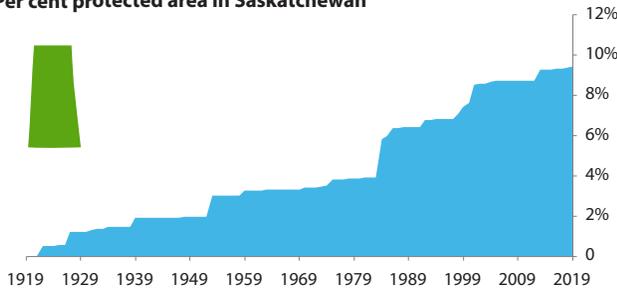


\*including Cold Lake Air Weapons Range and provincial or federal parks within and adjacent to commercial forest zone

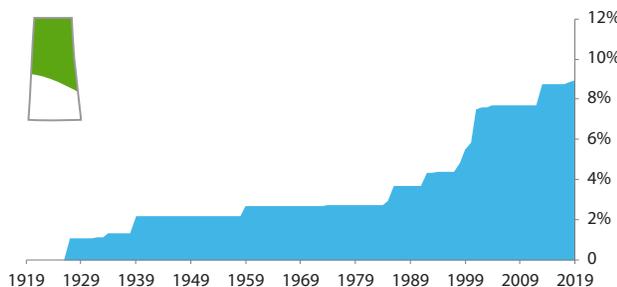
Over the last century, lands designated as protected in Saskatchewan's provincial forest and in the province as a whole have increased gradually to their current nine per cent level. While this current state is less than the 12 per cent provincial protection target, the trend continues to move in a positive direction. Between 2000 and 2009, areas protected in Saskatchewan increased by 710,000 ha to 5.68 million hectares. Over the last 10 years (2010-2019), an additional 470,000 hectares have been placed under protection in Saskatchewan, for a total of 6.15 million hectares.

Within the greater commercial forest zone, where the majority of forest-based economic activity occurs, the 12 per cent protection target is achieved. As this zone is where forest land use pressures are highest, protection is of greatest importance. Current land use pressures in the portion of the provincial forest north of the greater commercial forest zone are relatively minor, suggesting that the majority of this landscape is in a natural state. The relative lack of forest land use pressures in this portion of the provincial forest suggests that the functional area protected is greater than the nine per cent with official protection designations. However, with continued interest in development, there may soon be a need to establish more protected areas in Saskatchewan's northern provincial forest.

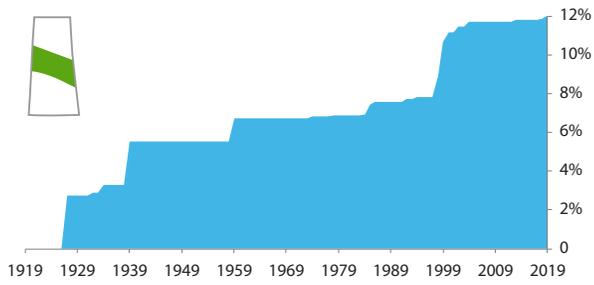
**Per cent protected area in Saskatchewan**



**Per cent area protected in the provincial forest and adjacent parks**



**Per cent protected area in the greater commercial forest zone and adjacent parks**



## Why it matters

Protecting portions of Saskatchewan's land helps maintain the natural range of ecosystems, helps sustain biological diversity and results in a more resilient system. The protection of unique and representative ecosystems sustains habitat for fish, wildlife, plants and people while supporting recreation and economic opportunities for the future.

Protected natural areas may protect species at risk or preserve areas with unique physical features such as waterfalls, badlands or sand dunes. Management of protected areas allows for appropriate recreational, educational and research opportunities while minimizing damage for the future.

---

**Last updated:** November 2018

**Update frequency:** every 5-10 years, depending on the availability of data

**Source:** Forest Service Branch and Fish, Wildlife and Lands Branch, Ministry of Environment

**Keywords:** protected, representative area network, ecological, preserve, conserve, land use

**References:**

World Commission on Environment and Development (WCED). 1987. Our Common Future ("Brundtland Report"). Oxford University Press: Oxford, UK. 400 p.

For this indicator, protected areas include: ecological reserves, wilderness parks, representative area ecological reserves, natural environment parks, national parks, historic parks, protected areas, national historic sites, fish and wildlife development fund lands, game preserves, migratory bird sanctuaries, national wildlife areas, private conservation lands, wildlife refuges, crown conservation easements, recreation parks, recreation sites, former federal and provincial pastures, watershed authority lands, and wildlife habitat protection lands. Not included in this indicator are regional parks, and areas removed from harvesting eligibility through the forest management planning process due to operability and other constraints. For example: steep slopes, low merchantability stands, remote stands, riparian zones, and areas removed from harvesting eligibility due to stakeholder accommodations.

# Woodland caribou habitat



The quantity, quality and availability of habitat is an essential component of species management. Habitat connectivity, barriers to animal movement and the amount of human disturbance are monitored to develop range plans for species of interest.

## What's happening

| State                                                                                        | Trend                                                                                          | Information                                                                                    | Extent                                                                                                   |
|----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| <br>mixed | <br>unknown | <br>partial | <br>provincial forest |

## What we are doing

Woodland caribou are listed as “threatened” under the federal Species at Risk Act (SARA). In 2015, range planning was initiated across the province, with a focus on the central Boreal Plain. The final Range Plan for Woodland Caribou in Saskatchewan: Boreal Plain Ecozone for the SK2 Central and SK2 West caribou administration units were released in July 2019, and October 2021 respectively. Range plans for the other caribou administrative and conservation unit are in development.

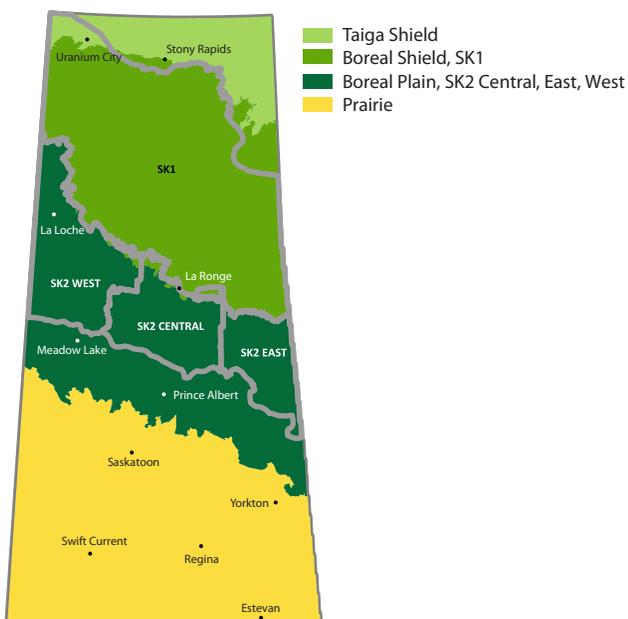
The [Woodland Caribou Range Assessment Program](#) incorporates research to help determine the status of woodland caribou populations and habitat and provides important data for range planning. Research projects are examining population status, structure and distribution, and habitat availability and use. Currently, population trends are known for SK1 (stable) and SK2 Central (declining). Population trends for SK2 West and SK2 East require one more year of data collection, with anticipated results in 2023.

As required under SARA, Canada developed and released the [Recovery Strategy for the Woodland Caribou Boreal Population in Canada](#) in October 2012. The document identifies 65 per cent undisturbed habitat in a range as the disturbance management threshold, which provides a measurable probability (60 per cent) for a local population to be self-sustaining.

The proportion of each ecosite reflected within the Boreal Plain ecozone reflects the quantity of potential habitat available to any number of species, but does not take into account effects of human activities on the current suitability of the ecosite. By interpreting the relative importance of these ecosites for species of interest (e.g., woodland caribou), we can assess if sufficient quantities of habitat are available to them. [The Forest Management Planning Standard of the Saskatchewan Environmental Code](#) helps reduce the likelihood of habitat loss.

Range assessment and planning activities have been divided into the Boreal Shield (SK1) and Boreal Plain (SK2) conservation units as identified in the provincial and federal management strategies.

### Caribou conservation unit and ecozones



### Quick Facts

- Woodland caribou naturally exist at low densities - about one caribou for every 20 to 30 km<sup>2</sup>. Females normally only have one calf, so their population growth is slow.
- Unlike the barren-ground caribou, woodland caribou are not migratory. They are always on the move within their home range.
- Woodland caribou habitat with the highest potential value is found in very different ecosystems. They prefer jack pine/lichen or black spruce treed bog ecosites.

**Last updated:** September 2021

**Update frequency:** as data becomes available

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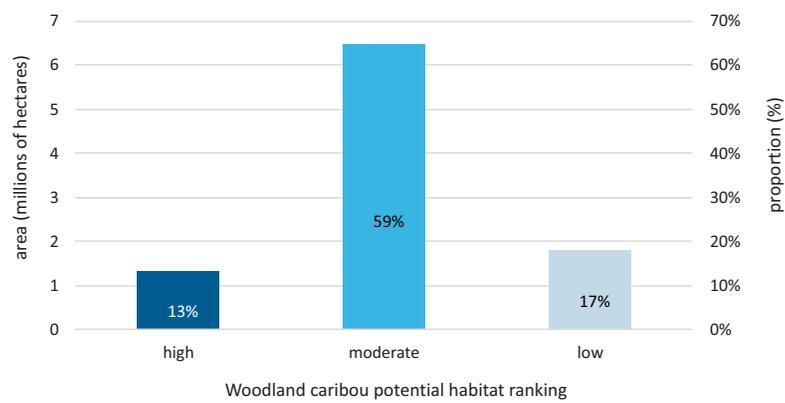
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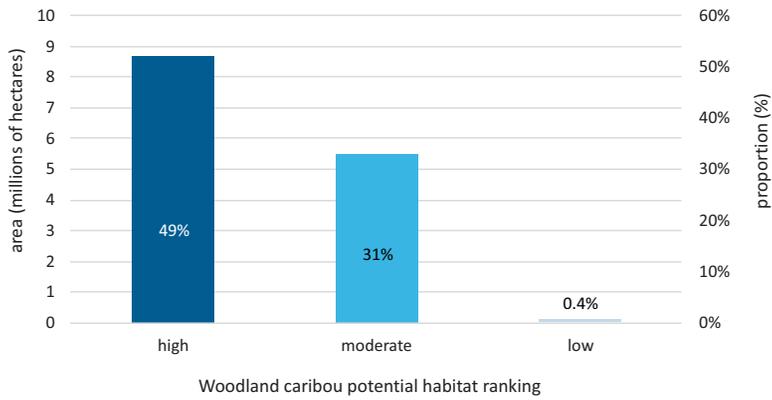


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### Area and proportion of potential woodland caribou habitat in SK2

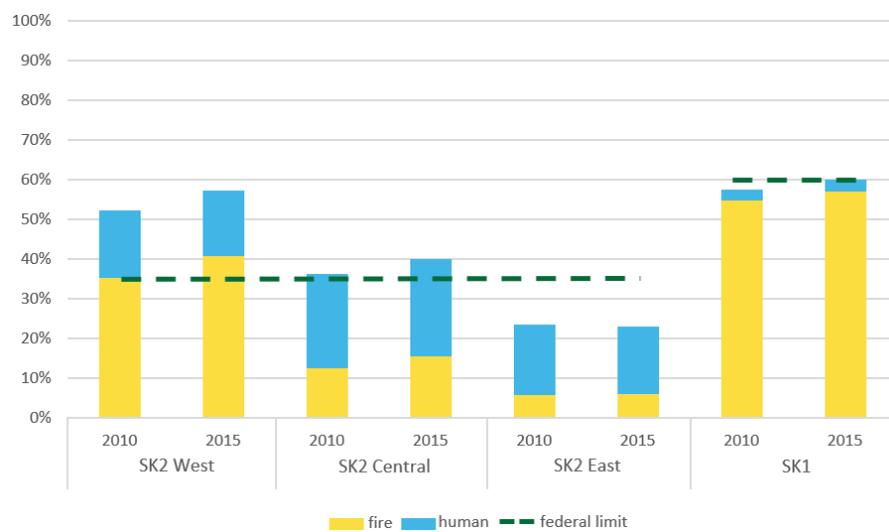


### Area and proportion of potential woodland caribou habitat in SK1



\* - Data source for woodland caribou habitat potential is available from - The Saskatchewan Ministry of Environment GeoHub: <https://environment-saskatchewan.hub.arcgis.com/maps/saskatchewan::woodland-caribou-habitat-potential/about>

### Per cent disturbed woodland caribou habitat in Saskatchewan



\* - Data source for woodland caribou habitat disturbance is available from - Environment and Climate Change Canada: <https://open.canada.ca/data/en/dataset/890a5d8d-3dbb-4608-b6ce-3b6d4c3b7dce>  
<https://open.canada.ca/data/en/dataset/a71ab99c-6756-4e56-9d2e-2a63246a5e94>

Saskatchewan's focus is on maintaining healthy forest landscapes for woodland caribou and other species. This will be achieved by managing human-caused disturbance, altering the patterns of human-caused disturbance, and maintaining adequately-sized patches of undisturbed high-value caribou habitat of various ages with connectivity between and within caribou administration units. Within the SK2 Central area, landscape management goals are:

1. Maintain or reduce the amount of human-caused disturbance based on current levels.
2. Maintain greater than or equal to 80 per cent of high-potential woodland caribou habitat in a condition unaffected by direct and/or indirect human-caused disturbance.
3. Maintain adequate connectivity between different areas of SK2 Central and adjacent caribou administration units and the SK1 caribou administrative unit.
4. Through forest harvesting, create natural forest patterns that more closely resemble the range of variation of natural disturbances, both in distribution and scale.
5. Decrease the total amount of non-permanent legacy roads.

Within the SK2 West caribou administrative unit, landscape management goals are:

1. Reduce the amount of human-caused disturbance.
2. Maintain greater than or equal to 80 per cent of high potential woodland caribou habitat in a condition unaffected by human-caused disturbance.
3. Maintain adequate connectivity between the SK2 West and adjacent caribou administration units and jurisdictions.
4. Increase forest harvest event sizes to more closely emulate natural forest patterns.
5. Decrease the total amount of non-permanent linear features.

Qualitative data collected from traditional ecological knowledge suggests that populations of woodland caribou have been declining across the SK2 caribou conservation unit, which largely overlaps with the commercial forest. Woodland caribou range retraction and reductions in population size are associated with higher levels of human disturbance. The greatest contributor by total area to human disturbance across the commercial forest is forest harvesting.

Saskatchewan has identified five primary management strategies that can be taken to reduce landscape disturbance. These strategies include reclamation and restoration, mitigation offsets for new disturbances, forest harvest patterns, access management and avoidance.

## Why it matters

Woodland caribou do not contribute directly to the economy of Saskatchewan, as it is not a game species for which licences are issued. Caribou are an indicator species that help represent the overall condition of ecosystem health and ecological integrity.

Due to woodland caribou being ranked nationally as a threatened species, allowing further decline of either the population or its habitat could result in emergency orders that would have a significant effect on Saskatchewan's northern industrial sectors.

The goal of the Saskatchewan Woodland Caribou Range Plan is to achieve and maintain a self-sustaining population by managing habitat availability while allowing for continued economic activity in northern Saskatchewan.

Range plans are being prepared to mitigate the negative effects of human disturbance on woodland caribou. These plans will identify strategies and actions that work towards maintaining a self-sustaining population of woodland caribou. One of the strategies identified includes following a natural forest pattern of harvesting that more similarly reflects natural disturbance patterns, distribution, and area of disturbance. This strategy is also reflected in the [Forest Management Planning Standard of the Saskatchewan Environmental Code](#).

# Genetic conservation of native commercial tree species



Genetic diversity is important for maintaining commercially or culturally important traits of tree species. Genetic variation is required for long-term species survival and evolution.

## What's happening

| State                                                                                       | Trend                                                                                                  | Information                                                                                     | Extent                                                                                                  |
|---------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| <br>good | <br>mixed/no change | <br>adequate | <br>commercial forest |

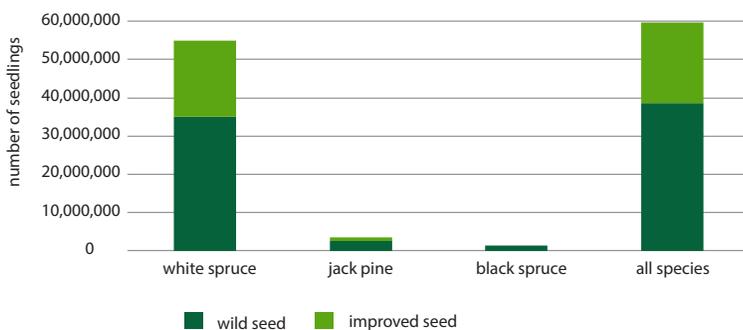
## What we are doing

An important part of forest regeneration is the genetic diversity of the seeds used to renew the forest in Saskatchewan. Seeds are collected from two sources: tree improvement programs and wild stands. Seed from wild stands is usually collected from the geographic area and seed zone where the seedlings will be planted. Wild seed is considered more genetically diverse than seed from orchards. Introducing improved seedlings from a seed orchard, or a tree improvement program into a harvested area, will improve the overall genetics of the subsequent offspring in that area. A tree improvement program is a selective breeding process where the parent trees are bred to improve the genetic traits of the offspring.

The current improved seed inventory has been collected from a seed orchard established by Weyerhaeuser in the 1980s as part of the company's tree improvement program. Genetic traits such as disease resistance, tree height or branch straightness are selected in the parent trees and then used to produce the improved offspring seedlings. Parent selections were collected from across the commercial forest to create a genetically diverse breeding program.

Genetic modification, or genetic engineering, is different from a tree improvement program and involves transferring genetic material from one organism to another. Genetic modification is not occurring in Saskatchewan, and all forest licence holders in Saskatchewan have committed to not deploying any genetically modified seedlings.

### Improved and wild seed trees planted by forest management agreement licensees from 2006 to 2015



White spruce is the seedling species that makes up almost all of the seedlings that are planted in the province (92 per cent) from 2006 to 2015. More than half of the white spruce seedlings planted during this time period are from wild stand collections. The genetic diversity for planted white spruce will be maintained across the province because the wild stand seed lots are contributing to that diversity.

## Why it matters

The main reason for maintaining the genetic diversity of tree seed is to avoid widespread crop failure when the stock is poorly adapted to a site. The seed source is important to the growth and survival of trees. Forest managers consider the geographic origin of tree seed when making planting decisions. The major commercial tree species in the provincial forest include white spruce, black spruce, jack pine, trembling aspen and balsam fir. Approximately 42 per cent of white spruce seedlings are grown from improved seed. A loss of genetic diversity would be a concern if improved seed sources were the only

### Quick Facts

- Ninety-two per cent of all the seedlings planted in Saskatchewan between 2006 and 2015 were white spruce, six per cent were jack pine, and two per cent were black spruce.

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seed source for planted seedlings, which is not the case in Saskatchewan. Both wild seed and improved seed sources are planted across Saskatchewan's harvest blocks. Even when improved seed sources are planted there is natural ingress of wild source white spruce seed from mature seed trees on the block boundary and in retention patches.

To ensure that genetic diversity is maintained into the future, each new forest management plan tracks the amount of improved seed and wild stand seed planted each year. There is also a commitment to ensure that 100 per cent of the seedlings planted each year are produced from non-genetically modified seed sources.

---

**Last updated:** November 2018  
**Update frequency:** annually  
**Source:** Forest Service Branch, Ministry of Environment  
**Keywords:** genetics, seed, improvement, seedling, orchard, diversity  
**References:**  
*Maintaining genetic diversity on Weyerhaeuser's Prince Albert FMA.* August 5, 2004. S.E.T. John. Isabella Point Forestry Ltd. Salt Spring Island, BC.  
*Standards for Tree Improvement in Alberta, ASRD 2003,* Appendix 36

## Species at risk in the commercial forest



Despite many programs focused on maintaining and enhancing wildlife populations, some species have become threatened with extinction and require special attention to help ensure their survival. The mission of the Saskatchewan species at risk program is to protect species from extirpation or extinction and to prevent new species from becoming threatened with extinction.

### What's happening

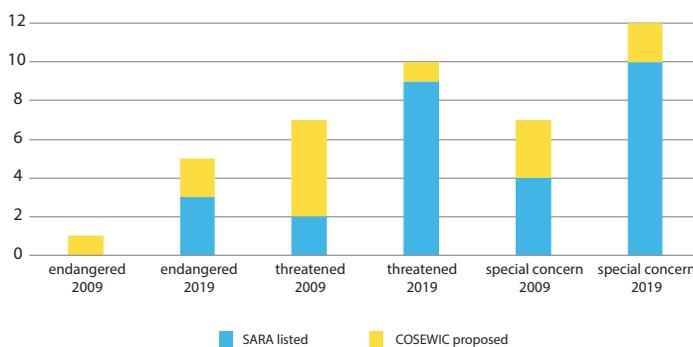
| State                                                                                             | Trend                                                                                          | Information                                                                                    | Extent                                                                                                   |
|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| <br>mixed/fair | <br>unknown | <br>partial | <br>commercial forest |

### What we are doing

Environment and Climate Change Canada and the [Committee on the Status of Wildlife in Canada \(COSEWIC\)](#) have been working through a backlog of species assessments. This work resulted in multiple new federal listings under the federal [Species at Risk Act \(SARA\)](#). In 2019 there are 22 federally listed species at risk and a further five species proposed for listing in the commercial forests of Saskatchewan. In 2009, six federally listed species at risk were known to occur in the commercial forest, and a further nine species proposed for listing.

COSEWIC continues to assess species on a bi-annual basis. Additional species will be recommended for addition to the SARA registry following these assessments. Knowledge of species in the forest is incomplete due to the large area and the inability to conduct complete surveys over the extent of the commercial forest.

Number and status of species at risk in the commercial forest 2009 and 2019



#### Quick Facts

- There are currently three wildlife endangered species in the commercial forest. Another two species are proposed to be listed as endangered.

#### Definitions

- **Extinction:** the termination of a species.
- **Extirpated:** no longer exists in the wild in Saskatchewan, but exists in the wild outside of Saskatchewan. There are no extirpated species identified in the commercial forest.
- **Endangered:** threatened with imminent extirpation or extinction.
- **Threatened:** likely to become endangered if the factors leading to its endangerment are not reversed.
- **Vulnerable:** of special concern because of low or declining numbers due to human activities or natural events but that is not endangered or threatened.

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**SARA listed species and species proposed by COSEWIC for SARA listing that occur in Saskatchewan's commercial forest**

**Species at Risk Act (SARA) species in the commercial forest**

| common name              | scientific name                   | status          |
|--------------------------|-----------------------------------|-----------------|
| Little Brown Myotis      | <i>Myotis lucifugus</i>           | Endangered      |
| Northern Myotis          | <i>Myotis septentrionalis</i>     | Endangered      |
| Gypsy Cuckoo Bumble Bee  | <i>Bombus bohemicus</i>           | Endangered      |
| Barn Swallow             | <i>Hirundo rustica</i>            | Threatened      |
| Canada Warbler           | <i>Cardellina canadensis</i>      | Threatened      |
| Chimney Swift            | <i>Chaetura pelagica</i>          | Threatened      |
| Common Nighthawk         | <i>Chordeiles minor</i>           | Threatened      |
| Eastern Whip-poor-will   | <i>Antrostomus vociferus</i>      | Threatened      |
| Olive-sided Flycatcher   | <i>Contopus cooperi</i>           | Threatened      |
| Shortjaw Cisco           | <i>Coregonus zenithicus</i>       | Threatened      |
| Woodland caribou         | <i>Rangifer tarandus caribou</i>  | Threatened      |
| Bank Swallow             | <i>Riparia riparia</i>            | Threatened      |
| Horned Grebe             | <i>Podiceps auritus</i>           | Special Concern |
| Monarch                  | <i>Danaus plexippus</i>           | Special Concern |
| Northern Leopard Frog    | <i>Lithobates pipiens</i>         | Special Concern |
| Rusty Blackbird          | <i>Euphagus carolinus</i>         | Special Concern |
| Short-eared Owl          | <i>Asio flammeus</i>              | Special Concern |
| Western Grebe            | <i>Aechmophorus occidentalis</i>  | Special Concern |
| Wolverine                | <i>Gulo gulo</i>                  | Special Concern |
| Yellow Rail              | <i>Coturnicops noveboracensis</i> | Special Concern |
| Eastern Wood-pewee       | <i>Contopus virens</i>            | Special Concern |
| Yellow-banded Bumble Bee | <i>Bombus terricola</i>           | Special Concern |

**Committee on the Status of Endangered Wildlife in Canada (COSEWIC) species in the commercial forest**

| common name              | scientific name                     | status          |
|--------------------------|-------------------------------------|-----------------|
| Lake Sturgeon            | <i>Acipenser fulvescens</i>         | Endangered      |
| Nine-spotted Lady Beetle | <i>Coccinella novemnotata</i>       | Endangered      |
| Bison                    | <i>Bos bison bison</i>              | Threatened      |
| Evening Grosbeak         | <i>Coccothraustes vespertinus</i>   | Special Concern |
| Transverse Lady Beetle   | <i>Coccinella transversoguttata</i> | Special Concern |

## Why it matters

Habitat protection has benefits for the province's flora and fauna and helps to maintain a healthy environment for all of Saskatchewan's wildlife. The number of species at risk indicates that there is some risk of extirpation in Saskatchewan for those species listed. Most, but not all, are at risk from the impacts of human activities and resource use. The ministry continues to adjust practices to mitigate some of the impacts to the commercial forest which includes timing of operations and working toward larger cut block sizes that mimic natural disturbance.

**Last updated:** January 2019

**Update frequency:** annually

**Source:** Fish, Wildlife and Lands Branch, Ministry of Environment

**Keywords:** species at risk, endangered, extirpated, threatened, special concern, habitat, COSEWIC, SARA

References:

<https://www.canada.ca/en/environment-climate-change/services/committee-status-endangered-wildlife.html>

<https://www.canada.ca/en/services/environment/wildlife-plants-species/species-risk.html>

<http://www.environment.gov.sk.ca/Default.aspx?DN=c2e39ae8-cbf1-4f07-8d9a-b50ce3f4fd01>  
The Wild Species at Risk Regulations

# Moose in the provincial forest



Moose (*Alces alces*) are found in a variety of habitats throughout the boreal forest and non-forested landscapes of Saskatchewan. In the boreal forest, moose select different habitats throughout the year and require a diversity of forest landscapes to meet their various needs.

## What's happening

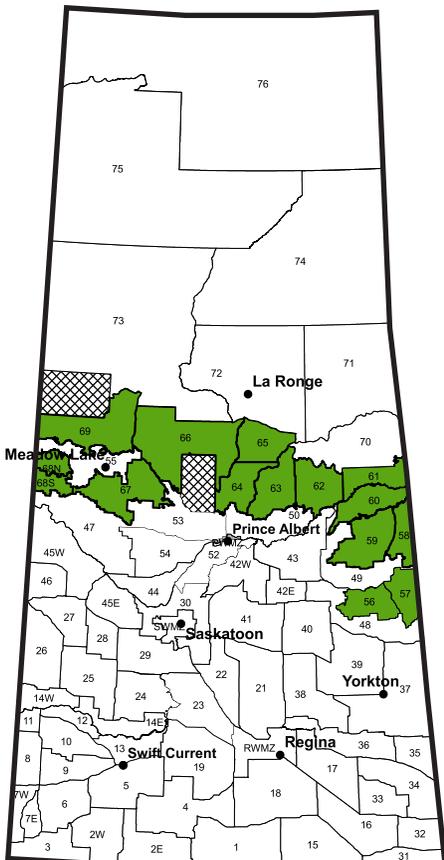
| State                                                                                             | Trend                                                                                                | Information                                                                                    | Extent                                                                                                   |
|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| <br>mixed/fair | <br>deteriorating | <br>partial | <br>commercial forest |

## What we are doing

Moose use landscapes that are a mixture of closed, mature coniferous stands for cover from both heat and cold, young regenerating deciduous areas for browsing, and aquatic foraging areas in the summer. The need for cover and availability of forage are primary considerations in moose habitat selection, making landscapes with a mixture of these habitat types most suitable.

Moose benefit from disturbances in the forest, such as fire and logging activities, due to the abundance of young forage associated with forest regeneration. They may also be negatively impacted by forestry activities through the opening of roads in areas previously free from vehicle access and linear disturbance. The impacts of linear disturbances and logging activity result in fragmentation of habitat, increased and improved access for humans and predators, and disruption of travel corridors. There is also a higher risk of predation associated with larger clearcuts where the distance to cover is increased.

### Select wildlife management zones within the commercial forest with moose harvest gathered from the hunter harvest survey.



### Quick Facts

- Moose populations are declining throughout the southern boreal forest in Saskatchewan and the reason is currently unknown.
- Populations have also been declining in other jurisdictions, including Manitoba and British Columbia.

Last updated: September 2021  
Update frequency: annually

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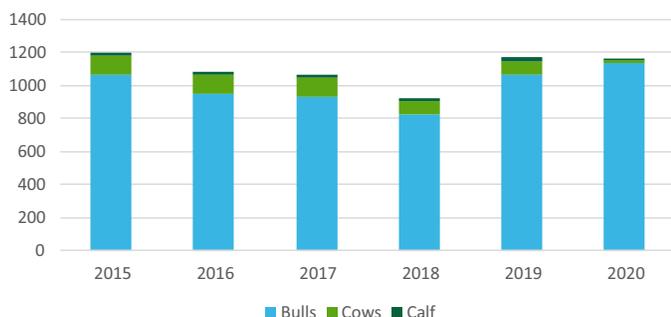
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In the boreal forest, hunter success can be influenced not only by the availability of moose, but also by increased access from new roads and changes in animal behaviour in response to areas with high hunting pressure (avoidance behaviour). Also, advances in hunting equipment allow greater access and precision and therefore greater success. As access increases, hunter success may stay the same or increase, despite a drop in population.

Hunter harvest success is calculated from the number of animals harvested per hunter who submitted a hunter harvest survey. Response rates vary from year to year, but are generally around 25 per cent. Hunter harvest was assessed in 15 wildlife management zones between 2015 and 2020. Hunter harvest success can be a useful population measure when used with other information sources, including aerial surveys and anecdotal information gathered from hunters and conservation officers who spend significant periods on the land observing wildlife and hunter dynamics.

Based on aerial surveys, moose in the southern commercial forest wildlife management zones are declining. Anecdotal information and reports from field staff have confirmed similar trends across all the southern boreal forest wildlife management zones.

#### Hunter harvest of moose in the WMZs 56-69 from 2015-2020



Moose populations have been declining across North America, including the southern portions of Saskatchewan's commercial forest. For example, a 2018 aerial survey in WMZ 67 showed a 30 per cent decline from a survey 10 years earlier. A 2004 aerial survey of WMZ 67 showed an estimated population of 2,021 individuals (+/- 25.1 per cent) and the 2018 survey showed a population estimate of 1,340 individuals (+/-19.4 per cent). This means that there are less than half as many moose per square kilometre now, compared to 2004.

***A variety of factors may contribute to the current population declines in the southern portions of the commercial forest. Habitat change, disease, parasites, increased access leading to elevated risk from predators and hunters can all contribute to moose population decline. Further study is required to evaluate the current moose population and understand this regional decline.***

## Why it matters

Moose are a high-value species to all hunters in Saskatchewan. They are an important component of the diet and culture of Indigenous people along the forest fringe and southern boreal forest. Resident and non-resident moose hunting contributes significantly to local economies throughout the province. In 2020, there were 6,448 regular licences and 4,999 draw licences sold for moose. Outfitting for non-Saskatchewan residents is authorized in the province, with approximately 300 guided moose licenses available annually.

The ministry is taking steps to better understand forest moose populations with a moose survey planned for WMZs 56 and 57 in early 2022, which will help inform population trends. A moose research project is also planned for fall 2021 in the east-central part of the province, where cow moose will be radio-collared. This will allow wildlife managers to determine cause-specific mortality of cow moose and help inform management direction. Moose populations have been declining in a number of jurisdictions in the last decade. Manitoba saw severe moose declines that led to a total closure of hunting in multiple regions of the province in 2011 and again in 2015. Closures were still in place for Manitoba's 2020 hunting season, and populations are still below desired levels, though a halt in decline and a slight increase has been observed since closing hunting seasons. British Columbia experienced severe moose declines in 2013-14 that were observed through aerial surveys. Minnesota moose populations were also declining steeply from 2006 through 2017 (approximately 60 per cent), but declines have levelled out as of 2018. A four-year study in Minnesota showed that major sources of mortality included parasitic infections, wolf kills and compounding factors such as underlying health problems that may have contributed to higher wolf kills.

# Marten populations in the provincial forest



Marten (*Martes americana*) are an important part of the food chain in the boreal transition area of the province. A member of the weasel family, martens are typically associated with mature coniferous forests and achieve maximum populations when prey such as voles, mice, grouse and squirrels are abundant.

## What's happening

| State    | Trend               | Information  | Extent                |
|----------|---------------------|--------------|-----------------------|
| <br>good | <br>mixed/no change | <br>adequate | <br>provincial forest |

## What we are doing

Marten populations can be maintained in a harvested forest, provided that partial cutting techniques are used – which maintain the amount of debris, standing dead wood and living trees required by the species. Clearcutting with reserves is a form of partial cutting where some trees are left within the cutblock to provide wildlife habitat. Marten populations do better in mature forests away from road access.

Number of marten pelts marketed and average pelt price



Almost all commercially trapped marten in Saskatchewan are exported to market. Trappers or fur dealers require an export permit before shipping fur, and these permits provide the information used to track harvest volume and distribution by northern fur block. This population status assessment uses harvest reports as a measure of population trends.

Marten harvest can act as a proxy for assessing the general status of marten populations. A healthy marten population is indicated when harvest tracks the market price. Since market price is established in the months following the annual trapping effort, harvest effort and volume will typically trail market trends by a full year.

*The harvest trend over the last 10-year period continues to consistently follow market prices. Decreases in harvest are attributed to low market prices after historically high levels in the early 2010's, rather than fluctuations in populations.*

A survey that asks trappers to assess current populations of marten (and all other furbearers) in their area has been recently added as part of the online hunter harvest survey. Adding the online component has resulted in an immediate significant spike in reporting on this survey. It is anticipated that sample sizes going forward will allow this survey to act as a second metric of marten population trends.

### Quick Facts

- Marten pelts are marketed internationally as Canadian sable.

**Last updated:** October 2021  
**Update frequency:** annually

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## Why it matters

Marten is a valuable fur species that is widely sought after by northern trappers. More than 10,000 marten are harvested in years when pelt prices are strong, resulting in local revenues of more than \$1.5 million.

Timber harvesting activities frequently cause significant marten population collapses, and are an ongoing concern to trappers and other northern residents. However, there is no indication that timber harvesting activities are having significant impacts on provincial marten population levels.

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# Compliance collection of royalties and forest management fees



The provincial Crown timber dues system is market-based, and timber dues reflect provincial market conditions. The collection of management fees funds forest renewal activities and supports the sustainability and productivity of Saskatchewan's forests.

## What's happening

| State    | Trend         | Information  | Extent                |
|----------|---------------|--------------|-----------------------|
| <br>good | <br>improving | <br>adequate | <br>provincial forest |

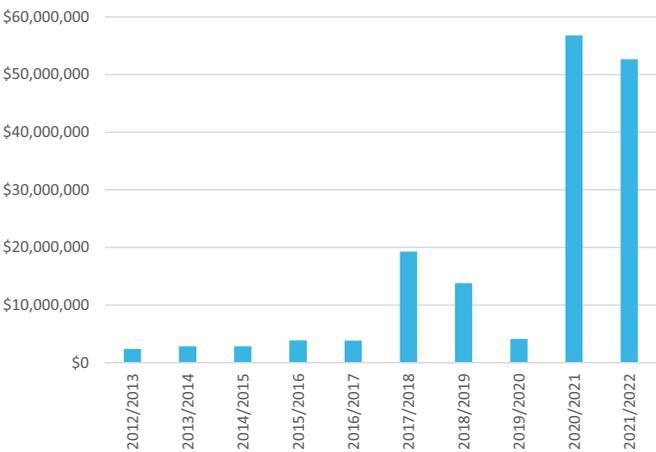
## What we are doing

Forest companies calculate the volume of wood harvested (scaling) and submit their information and payments to the ministry for verification of the calculated timber dues and forest management fees. The ministry monitors the accuracy of volume calculations and the timeliness of fee payment through inspections and audits.

### Timely and accurate compliance rates for collection of timber dues and forest management fees



### Timber dues revenue (as collected for that year for the last 10 years)



**The ministry inspection and audit process results in 100 per cent compliance once corrected reports are re-submitted and the annual year-end reconciliations are finalized.**

## Why it matters

Forestry timber dues and forest management fees provide a fair return to the people of Saskatchewan in exchange for the use of forest product resources. Forest management fees are used to protect and renew the forest resource, which sustains the Saskatchewan forest industry and supplies job opportunities. Currently, the wood products market is robust, and the industry makes significant contributions to the province's economy.

The forest industry provides significant benefits to the people of Saskatchewan by generating employment opportunities for pulp mills and sawmills, oriented strand board (OSB) plants and value-added product facilities.

### Quick Facts

- In 2021-22, the government received \$52.6 million in timber dues a little short of the record high of \$56.7 million in 2020-21. The 10-year average is \$16.2million.

**Last updated:** December 2022  
**Update frequency:** annually

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# Compliance and enforcement of the forest industry



The forest industry is regulated through legislation, the Saskatchewan Environmental Code, licenses, forest management plans and operating plans.

## What's happening

| State                                                                                      | Trend                                                                                      | Information                                                                                   | Extent                                                                                                  |
|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| <br>good | <br>fair | <br>partial | <br>commercial forest |

## What we are doing

The ministry focuses staff training and proponent education and compliance efforts on higher-risk items identified through data analysis and compliance planning. Priority compliance areas include riparian areas, water crossings, roads, soil protection, data submission, renewal and activities that affect landscape-level forest management objectives.

**Inspections:** ministry inspections provide compliance information on activities such as harvesting, licensing and approval administration, timber scaling, renewal, road building/maintenance/reclamation, water crossing installations/maintenance/reclamation, forest grazing and haying. The ministry inspects approximately five per cent of high-risk sites in any given year.

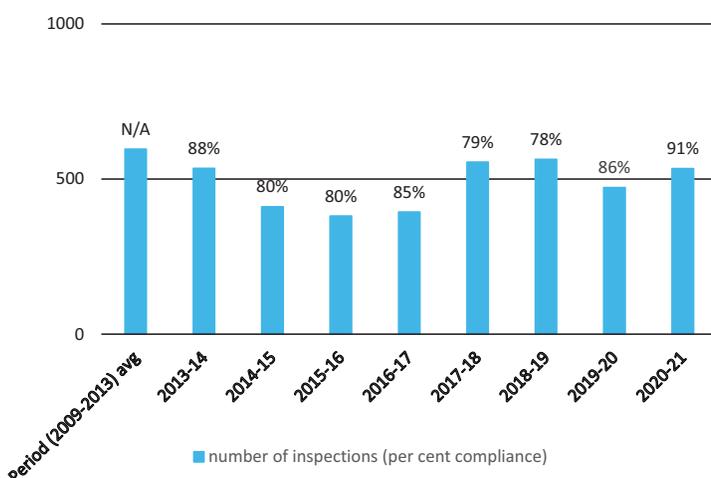
**Inspection items:** for each inspection conducted, multiple inspection items may be assessed for compliance. Compliance items range from, but are not limited to, timber utilization, harvesting standards, forest management plan VOITS (values, objectives, indicators and targets), visual resource management, cut control, aquatic habitat protection and temporary work camp permit items.

**Observations:** are compliance education opportunities given to proponents after an inspection, when activities are still in compliance but trending toward and potentially leading to a non-compliant situation.

**Voluntary compliance opportunity (VCO):** a VCO is a compliance tool that applies to minor non-compliances which are normally first offences or where self-reporting has occurred. A VCO is an option used by the ministry when the proponent is willing and able to remedy the non-compliance. This compliance option allows the proponent an opportunity to rectify the non-compliance in a timely and effective manner.

**Warnings, orders, administrative penalties, and prosecutions:** where a non-compliance is more serious, or if the proponent fails to comply with a VCO, further enforcement action is required to compel the proponent into compliance. Several enforcement tools, including warnings, orders, administrative penalties, or prosecutions are available for use. The ministry takes a stepped approach within its compliance model, applying a range of enforcement tools as the situation warrants.

Number of inspections and compliance rate vs. number of inspection items and compliance rate



### Quick Facts

- The ministry focuses its compliance efforts on higher-risk areas such as water crossings and riparian areas.

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**Update frequency:** annually

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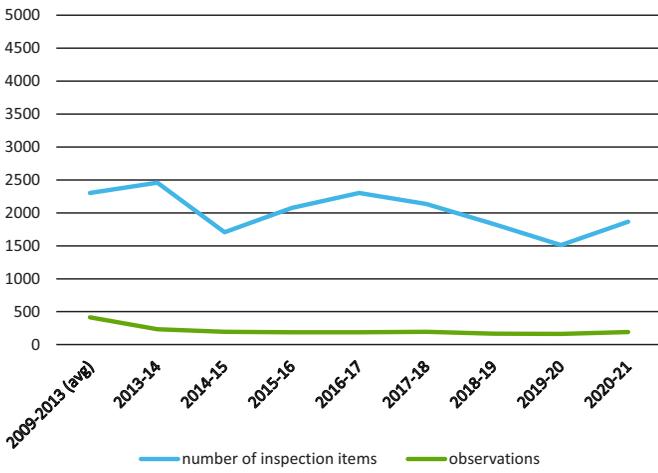
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### Number of observations by inspection items



The number of inspections over the past 10 years on forestry operations remain steady between 400 and 600. In 2020-21 for example 521 inspections were conducted by the ministry on forestry operations covering a total of 1,816 inspection items. Inspection data does not include company self-reporting, immediate investigations, or outside inquiries of complaints. The trend for forest industry compliance rate is steady and is considered good but could be improved. When VCOs were implemented in 2012-13, they were frequently used. However, in recent years, the usage has been trending downward. VCOs are typically applied to minor non-compliances that can be easily remedied, so their use may fluctuate based on the amount of industry self-reporting of non-compliances, reoccurrence of offences which lead to other actions, more serious offences occurring, or it may have even been due to performance improvement which led to less actions being taken. This can be seen in 2020-21 where there was a decline in total enforcement actions.

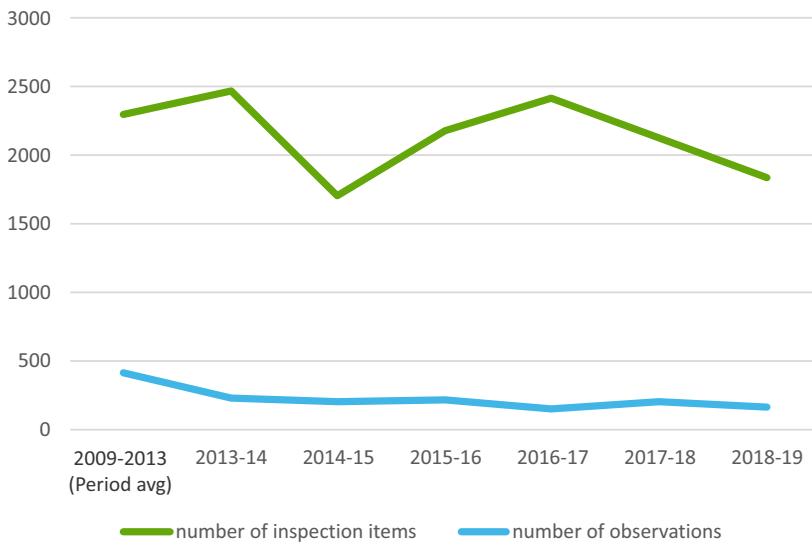
The ministry is modernizing its compliance database to improve compliance analytics and reporting capabilities.

### Why it matters

The forest industry maintains a competitive advantage provincially, nationally, and internationally through responsible stewardship of forest resources. Achieving high rates of compliance aids industry in maintaining a licence to operate, and third-party certification which gives companies greater access to product markets.

The public expects the ministry, as a regulator, to ensure that resource extraction activities balance environmental protection, economic opportunities and social benefits of Saskatchewan's forests. The compliance statistics presented here demonstrate that the ministry is conducting compliance assurance activities and ensuring non-compliances are remedied through use of its compliance tools and enforcement actions when necessary.

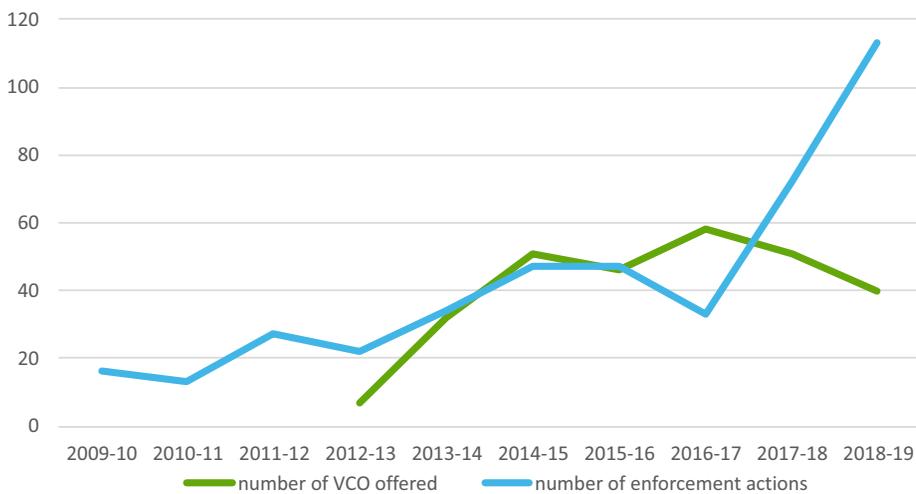
### Number of observations by inspection items



**Voluntary compliance opportunity (VCO):** a VCO is a compliance tool that applies to minor non-compliances which are normally first offences and where self-reporting has occurred. A VCO is an option used by the ministry when the proponent is willing and able to remedy the non-compliance. This compliance option allows the proponent an opportunity to rectify the non-compliance in a timely and effective manner.

**Warnings, orders, administrative penalties and prosecutions:** where a non-compliance is more serious, or if the proponent fails to comply with a VCO, further enforcement action is required to compel the proponent into compliance. A number of enforcement tools, including warnings, orders, administrative penalties and prosecutions are available for use. The ministry uses a stepped compliance model, applying a range of enforcement tools as the situation warrants.

### Number of voluntary compliance opportunities and enforcement actions



Compliance-related data guides compliance assurance activities. Risk is determined by looking at how effective our controls are and if compliance education, compliance monitoring and enforcement are resulting in industry achieving compliance. Voluntary compliance opportunities were implemented in 2012-13 as a compliance assurance tool.

Inspection data does not include company self-reporting, immediate investigations or outside inquiries of complaints. The ministry is modernizing its compliance database to improve compliance analytics and reporting capabilities.

## Why it matters

The forest industry maintains a competitive advantage provincially, nationally and internationally through responsible stewardship of forest resources. Achieving high rates of compliance aids industry in maintaining certification, which gives companies greater access to product markets.

The public expects the ministry, as a regulator, to ensure that resource extraction activities balance environmental protection, economic opportunities and social benefits. Forest industry compliance rates show that the ministry is conducting compliance assurance on forest industry activities and is deterring and remedying non-compliance through compliance options and enforcement actions when necessary.

## Client services available online and in person



The modernization of client services improves access to information for land managers, stakeholders and the public.

The Government of Saskatchewan is continuously improving its service delivery through online services.

### What's happening

| State    | Trend         | Information  | Extent              |
|----------|---------------|--------------|---------------------|
| <br>good | <br>improving | <br>adequate | <br>entire province |

### What we are doing

The Ministry of Environment is committed to increasing online business transactions for the business it conducts. Technological investments are made to meet client needs and expectations.

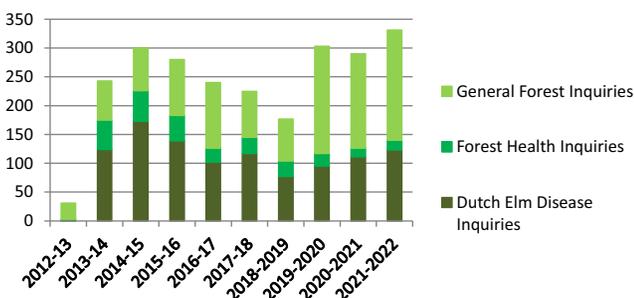
The ministry maintains a general inquiry phone line for clients and the public. Complex inquiries are forwarded to subject matter experts for resolution. Forestry-related inquiries are categorized as general forest, forest health or Dutch elm disease.

The following tools and resources may assist you in accessing forestry-related information and services:

- [Sask Interactive Mapping](#) - Digital mapping app
- [General inquiry phone line](#) - General inquiry phone line and email
- [Confidential Online TIPP Information System](#) - form is used to report known or suspected environmental, fisheries, wildlife, or forestry violations.
- [Environment Online Service](#) - In a forestry context, it is to be used for Hazardous Spills reporting by industry
- [HABISASK](#) - Hunting, angling and biodiversity information app
- Web-based State of the Environment reporting site
- \*New in 2021 [Forest Resource Inventory](#) – Explore spatial data on general land cover, terrain, growing stock and more on GEOHUB

Development of digital client-focused services related to provincial forest management has steadily progressed since 2006 with the release of Sask Interactive Mapping.

#### Number of forest related inquiries to the general inquiry line



### Why it matters

The modernization of ministry programs meets the pace of business and client service expectations. Clients have access to information and assistance through tools such as Sask Interactive Mapping and HABISask. Access to current and reliable habitat information, population and spatial data helps clients and the government make important management decisions.

Calls to the general inquiry phone line can also be used to detect the presence or movement of invasive insects and disease within the province as well as other matters of concern. The more recent increase in general forestry inquiries can be attributed to increased inquiries related to timber permits, including own-use and fuelwood permits as well as questions on where to cut a Christmas tree.

#### Quick Facts

- In 2021-22, the ministry's Inquiry Centre received a total of 21,256 public inquiries.

**Last updated:** January 2023  
**Update frequency:** annually

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# Opportunity for engagement in forest management planning



In Saskatchewan, the government and industry work to engage citizens in the management of Publicly owned forests. The government ensures sustainable forest management through long-term strategic forest management plans for certain types of forest tenures.

## What's happening

| State    | Trend         | Information  | Extent                |
|----------|---------------|--------------|-----------------------|
| <br>good | <br>improving | <br>adequate | <br>commercial forest |

## What we are doing

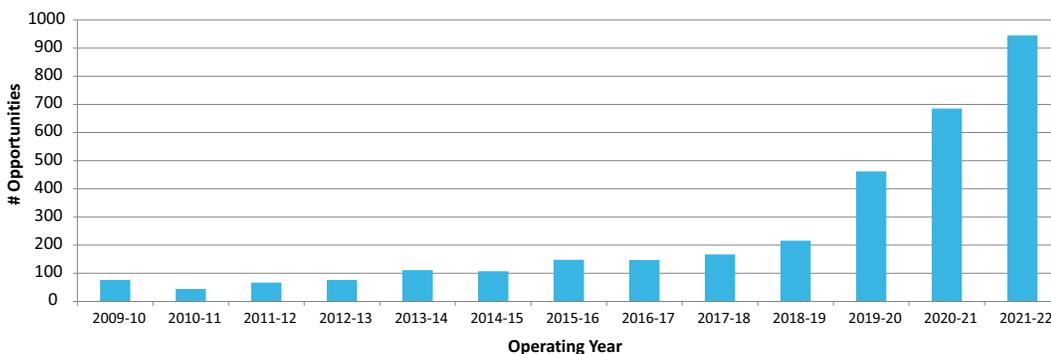
The *Forest Resources Management Act* requires the holder of a forest management agreement (FMA) to develop a forest management plan (FMP) that covers 20 years. FMPs help ensure sustainability and balance social, economic and environmental values. An approved FMP is required for FMA licence holders to operate.

The [Forest Management Planning Standard](#) of the Saskatchewan Environmental Code guides development of FMPs. This standard, among other things, outlines comprehensive requirements for industry to demonstrate how it has engaged with other forest users, Indigenous communities and the public throughout the various stages in the planning process.

What constitutes engagement is largely left to the proponent's discretion and varies by the proponent. Examples of the types of engagement are open houses, advisory group meetings, public or community meetings to review operating plans, field tours, documented communications, phone calls or individual invitation letters that are evidence of the opportunity to attend such meetings. Since 2020, the popularity of virtual engagement has increased, so licensees are now offering a combination of in-person and virtual engagement opportunities.

The overall number of opportunities is trending upwards, this is due to a rise in engagement activities conducted as part of FMP amendments by three licensees (to align their plan with Saskatchewan's Caribou Range Planning) and increased licensee communications with stakeholders for operating plan reviews. Each FMP amendment has taken a year to complete and required engagement with indigenous communities, the public and stakeholders.

### Opportunities provided for Indigenous communities, the public and stakeholder engagement



## Why it matters

First Nations and Métis communities and stakeholders such as outfitters, trappers, recreation users, hunters, gatherers, environmental groups, leaseholders, municipalities, resource developers and other governmental departments provide valuable information and perspectives. Stakeholder input can help to mitigate the potential for conflict, improve transparency, provide for greater accountability and ensure the best possible forest management and policy decisions.

Licensees have a wide variety of management areas and diverse numbers of stakeholders. It is unsuitable to compare the number of engagement opportunities between licensees. In their FMP, each licensee is required to establish targets for engagement opportunities and to report on their performance annually.

### Quick Facts

- The Forest Service recently revised the Forest Management Planning Standard (2023). The revised standard requires forestry companies to engage with the public, Indigenous communities, advisory groups and other stakeholders at three different stages of the forest management planning development process as opposed to two.

**Last updated:** October 2023  
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## Research and education



Forest research and education are important activities carried out by government and industry to improve the current state of forest management. Increasing public knowledge and awareness through education initiatives allows stakeholders to assess and address forest management in an informed way.

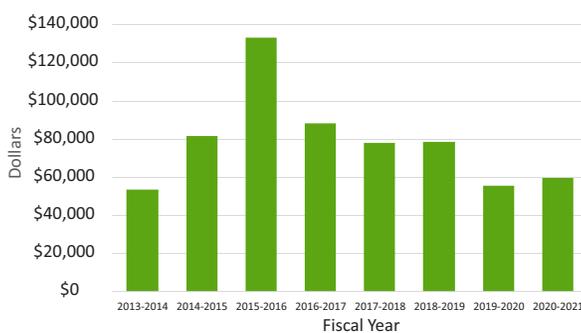
### What's happening

| State      | Trend | Information | Extent          |
|------------|-------|-------------|-----------------|
|            |       |             |                 |
| mixed/fair | mixed | partial     | entire province |

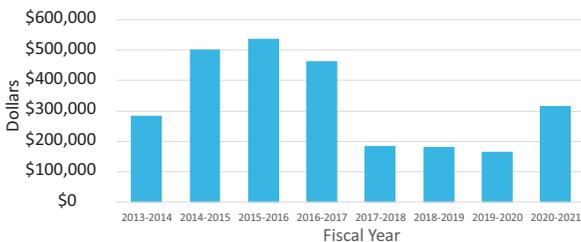
### What we are doing

Forest research and education slowed down with the decline in the forestry sector in 2008-09 but began to recover in 2012. Over the last eightseven years, the ministry has invested an average of \$73,400 \$78,600 per year in education activities (not including in-kind activities). Some of the educational activities and tools supported by the ministry include: Focus on Forests, a program for students from K to 12; an innovative project on communicating forest age effectively to the public; forestry teacher's tours; and various workshops and presentations throughout the year.

Annual ministry forest education expenditures



Annual ministry forest research expenditures



Many research and innovation initiatives are focused on the priority needs of government and industry to inform and support legislation and strategic planning. The ministry contributes to research and innovation through projects such as the development of forestry-related Environmental Code chapters, climate change and adaptation research, province-specific growth and yield projects, enhanced forest inventory projects, research on natural forest patterns, and work related to insect and disease management. Significant contributions have been made to support forest inventory projects using new technologies and innovative approaches such as Lidar mapping. This in turn has helped inform the development of a Forest Inventory Code Chapter which provides industry with resources and best-practices for updating their forest inventories. This inventory work has helped facilitate a large scale forest resource inventory of Saskatchewan's forest fringe area. Over the last eight years, the ministry has invested an average of \$329,700 per year towards forestry related research.

#### Quick Facts

- Current government research is focused on forest inventory, forest insects and diseases and mitigation of potential climate change impacts to improve current and future forest management in Saskatchewan.

**Last updated:** October 2021  
**Update frequency:** annually

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## Why it matters

Forest education helps to support informed dialogue and engagement with stakeholders and the public. Fostering an understanding of sustainable forest management improves relations and supports the social license for industry activities.

Research and innovation support sustainable forest management practices and can inform forest managers on how to adapt practices to regenerate forests into the future with a changing climate. Research can also allow for a more efficient and timely assessment of forest pests and diseases for proactive protection of the forest.

# Timber Allocation and Forest Licensing



The Government of Saskatchewan allocates timber to large forest companies and small forestry businesses where there are sound business plans in place for timber use. The right to harvest is acquired via licencing pursuant to *The Forest Resources Management Act*. There are various types of licences available to encourage and maintain commercial and sustainable use of the forest.

## What's happening

| State    | Trend         | Information  | Extent                |
|----------|---------------|--------------|-----------------------|
| <br>fair | <br>improving | <br>adequate | <br>commercial forest |

## What we are doing

The Ministry of Environment uses different forms of licensing arrangements to secure economic benefits and ensure the environmental sustainability of the public forest resource. Sixty-three per cent of the province's commercial forest has long-term licensing arrangements with forest management agreements in place. Forest management agreements (FMA) grant the licensee the right to harvest crown timber within a defined licence area for 20 years; the licence is reviewed and extended and additional five years at every five year interval if all obligations are being met. This type of licence is the most comprehensive and requires a forest management plan to be in place for the timber supply area. The FMA provides long-term security for the forest company.

Area-based term supply licences (TSLs) are granted for some timber supply areas. Area-based TSLs are typically issued for five years, with the possibility of being reissued at the end of the term. This licence must have a silviculture trust fund into which forest management fees are paid. The silviculture trust fund is intended to cover the costs associated with subsequent silviculture activities, such as reforestation. Approximately nineteen per cent of the commercial forest is licensed under area-based TSLs.

A volume-based term supply licence is a short-term licence issued for two to five years which affords more security than an annual commercial forest product permit (FPP). Both volume-based TSLs and FPPs can overlap timber supply areas that have FMA and area-based term supply licences. These two licences can be granted to small and large business forestry ventures.

The timber supply areas solely managed through volume-based TSLs and by commercial FPPs with no area-based licence holder, covers eighteen per cent of the commercial forest. These types of licences require an individual or small company to prepare an operating plan and require the government to make the arrangements for forest renewal. An example of a timber supply area managed through volume-based TSLs and FPPs is in the Island Forests, which is comprised of the Canwood, Nisbet, Fort-a-la-Corne and Torch River Provincial Forests.

### Quick Facts

A Forest Products Permit or a Licence is not needed for the following provincial forest activities:

- harvesting berries, fruits and mushrooms for commercial or own-use, or subsistence gathering;
- gathering of dead or down trees for fuelwood for own-use; and
- harvesting a Christmas tree for own-use, provided the trees are under four meters tall and should be taken from road and powerline right of ways.

**Last updated:** September 2023  
**Update frequency:** annually

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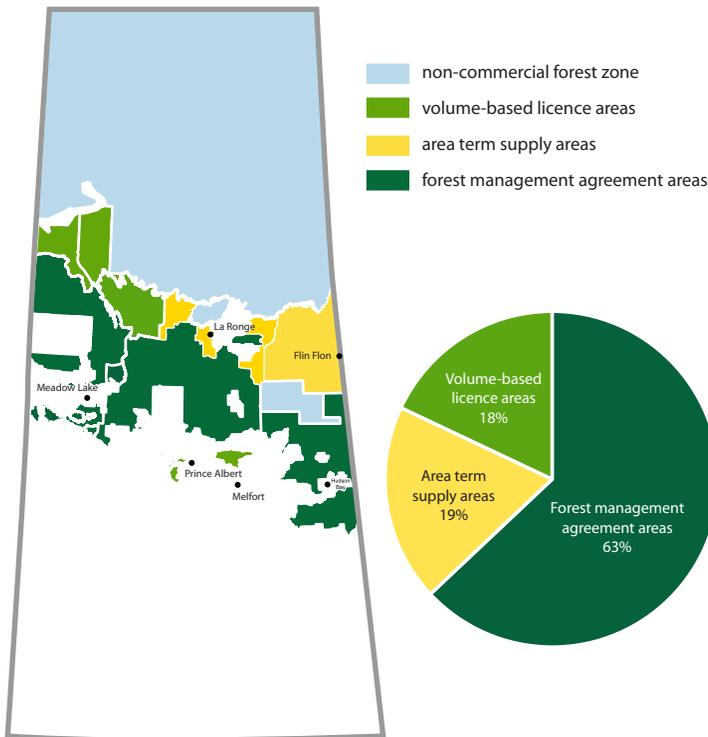
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## Forest management agreement areas, area-based term supply and volume-based term supply in the commercial forest



## Why it matters

Forest licences outline the legislative requirements, codes and standards licensees are required to follow in order to practice sustainable forest management.

Forest management agreements provide the greatest assurance of sustainable forest management – requiring forest management plans, which are equivalent to environmental impact assessments, plus renewal obligations.

Whether it is for timber or non-timber products, aesthetics or wildlife, the boreal forest is valued by Indigenous peoples and a wide variety of stakeholders including hikers, hunters, outfitters, cabin owners and forestry companies. All forest operations require public engagement and Indigenous consultation for proposed forestry activities during the planning processes. Under an FMA, engagement and consultation occur during the development of a 20-year forest management plan and annually during the development of the annual operating plan. For TSLs, engagement and consultation occur during annual operating planning development. This provides an opportunity for all parties to give input and direction on how licensees can maintain a balance between the environmental, economic, and social forest values.

The timber allocations provide the opportunity for economic development for timber processing facilities of various sizes and for the northern communities that depend on forestry. Licences encourage co-operation between licensees to fully utilize timber allocations for the best value and product.