Black cherry volume is increasing dramatically, especially volume in larger trees and especially in southwest Wisconsin. The number of trees of all size classes has increased but particularly sawtimber trees. It’s a fast-growing species but mortality is beginning to increase as trees age. The only major pest is the eastern tent caterpillar which rarely causes mortality but can affect growth. Future volumes are predicted to increase steadily through 2054.

Black cherry is an important timber species for its valuable sawlogs and veneer, but removals are not high. We harvest only one third of new growth.

Black cherry has an average ovendry weight but because of low volume, would probably not be a major source of biomass.
The **growing stock volume** of black cherry in 2016 was about 261 million cft or about 1.2% of total statewide volume (chart on right). Volume has risen steadily since 1968 with a 32% increase since 1996.

The black cherry resource has aged since 1983. For instance, the volume in large trees (13+ inches in diameter) has more than tripled while the volume in smaller trees has increased by 32% in this time (chart below left).

Since 1996, the number of *saplings*, *poles* and *sawtimber-sized* trees has increased significantly (chart below right).
“Where is black cherry found in Wisconsin?”
Growing stock volume by region with map

About 63% of all black cherry volume is located in southern Wisconsin.

Black cherry is a component of several forest types including white oak / red oak / hickory, aspen, sugar maple / beech / yellow birch and the cherry forest type.

Growing stock volume (million cft) by species and region of the state.

<table>
<thead>
<tr>
<th>Species</th>
<th>Central</th>
<th>North east</th>
<th>North west</th>
<th>South east</th>
<th>South west</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black cherry</td>
<td>33</td>
<td>44</td>
<td>21</td>
<td>67</td>
<td>96</td>
<td>261</td>
</tr>
</tbody>
</table>

Source: USDA Forest Service, Forest Inventory and Analysis

For a table on Volume by County go to: http://dnr.wi.gov/topic/ForestBusinesses/documents/tables/VolumeCountySpecies.pdf
The majority of black cherry growing stock volume is found on dry-mesic to mesic and mesic habitat types (chart below). Only 19% occurs on dry or dry-mesic sites and less than 10% on wetter habitat types.

The majority of black cherry growing stock volume is found in stands with site indices between 60 and 80 (chart on left). Three-quarters of volume is located on sites with site index greater than 60.

The average site index by volume for black cherry is 70, slightly higher than the average for all species, 66.

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The highest volume growth for black cherry is in the southern part of the state but growth rates are high throughout its range.

The average ratio of net growth to volume for black cherry is 2.8%, slightly higher than the statewide average of 2.6% for all species.

For a table of **Average annual growth, mortality and removals by region** go to:  
Average annual mortality of black cherry from 2011 to 2016 was about 4.3 million cft, or 1.8% of statewide mortality (chart on right). Mortality has almost quadrupled since 1983 and increased significantly since 2009.

The ratio of mortality to volume is about 1.7% for black cherry. This is higher than the average for all species in Wisconsin which is 1.1%.

### Mortality, volume, and the ratio of mortality to volume

<table>
<thead>
<tr>
<th>Species</th>
<th>Average annual mortality (cft)</th>
<th>Growing stock volume (cft)</th>
<th>Mortality / growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black cherry</td>
<td>4,306,316</td>
<td>260,882,719</td>
<td>1.7%</td>
</tr>
</tbody>
</table>

Average annual mortality (million cubic feet) by inventory year.
Source: USDA Forest Inventory & Analysis data

The eastern tent caterpillar, *Malacosoma americanum*, is a pest native to North America. Populations fluctuate from year to year, with outbreaks occurring every several years. While tent caterpillars can nearly defoliate a tree when numerous, the tree will usually recover and survive.

In Wisconsin, an outbreak occurred from 2008 to 2012 mainly in the south and central parts of the state. An analysis of Forest Inventory data shows a significant increase in crown dieback from 2007-2012 (figure on right). This defoliation however did not lead to increased mortality.

**Eastern tent caterpillars overwinter as eggs.** They hatch in early spring and together spin a silken tent in a crotch of a tree (figure on left) from which they will emerge to feed on leaves.

As the larvae feed on the foliage, they increase the size of the web until it is a foot or more in length. In 4 to 6 weeks the caterpillars are full grown. At this time, they begin to wander away individually from the nest in search of protected areas to spin a cocoon.

The adult moth emerges from the cocoon about 3 weeks later. Moths mate and females begin to lay eggs on small branches. The eggs will hatch next spring. There is just one generation per year.
In 2013, Wisconsin produced about 0.8 million cft of black cherry roundwood, or about 0.3% of the total production (chart on right).

Sawlogs and veneer account for almost 90% of black cherry roundwood production but this is less than 1% of total sawlogs and veneer statewide.

Removals of black cherry totaled 3.2 million cubic feet per year from 2011 to 2016. This is about 1.1% of total removals in the state.

The ratio of average annual net growth to removals is 2.3 for black cherry, much higher than the statewide average of 1.7 (chart on left). Growth of cherry is relatively high and removals are relatively low. This ratio has remained unchanged since 1996.

For a table of Average annual growth, mortality and removals by region go to: http://dnr.wi.gov/topic/ForestBusinesses/documents/tables/GrowthMortalityRemovals.pdf
There were 11.6 million short tons of aboveground biomass in live black cherry trees in 2016, up from about 6.5 million tons in 1983, an increase of 79%. This is equivalent to approximately 5.8 million tons of carbon and represents 1.8% of all aboveground biomass statewide. As with volume, most black cherry is located in southern Wisconsin (chart below).

**B**lack cherry wood has a specific gravity of 0.5 compared to 0.51 for all species and an ovendry weight is 31.2 pounds per cubic foot compared to 31.4 for all species.

A**pproximately, 67% of all black cherry biomass is located in the merchantable stem, 14% in the bark and 20% in tops and limbs.

For a table of **Biomass by County** go to:
“Can we predict the future of black cherry?”

Predicted volumes based on current rates of mortality and harvest

The ratios of removals to volume of growing stock is significantly lower for black cherry compared to all species in the state (chart on right). However, the mortality and growth ratios are slightly higher.

The Forest Vegetation Simulator (FVS) was used to predict future volumes of black cherry through 2054. Three scenarios are forecast. One with current rates of mortality and removals (i.e. average annual mortality and removals for 2009 to 2014). Another with current mortality rates and the lower 67% confidence interval for current removals and another with the upper 67% confidence interval for removals.

Volume increases in all three scenarios, 25% by 2054 for current removal levels, 32% for low removals and 15% for high removals. Volume peaks in 2049 using current levels of harvest, never peaks for low harvest levels and peaks in 2044 for high levels of harvest.

According to the model, black cherry will continue to be a prominent species, even if harvest levels, which are currently low, increase in the future.

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1 The Forest Vegetation Simulator is a forest growth and yield simulation model created by the USDA Forest Service, see http://www.fs.fed.us/fmsc/fvs/.