

Black cherry

Prunus serotina



Black cherry volume increased dramatically prior to 2011, but appears to have stalled in the years since. The number of trees of all size classes has increased but particularly among 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 oven-dry weight but because of low volume, would probably not be a major source of biomass.

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Modelling future volume

"How has the black cherry resource changed?"

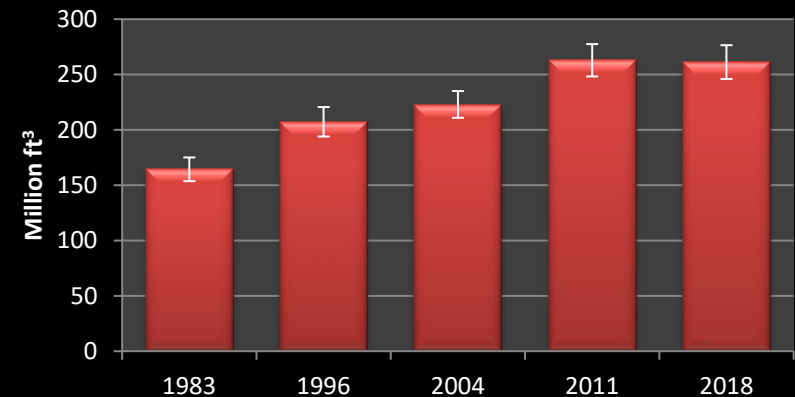
Growing stock volume and diameter class distribution

The [growing stock volume](#) of black cherry in 2018 was about 261 million cft or about 1.2% of total statewide volume (chart on right). Volume has increased 59% since 1983 but has remained essentially unchanged since 2011.

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 21% in this time (chart below left).

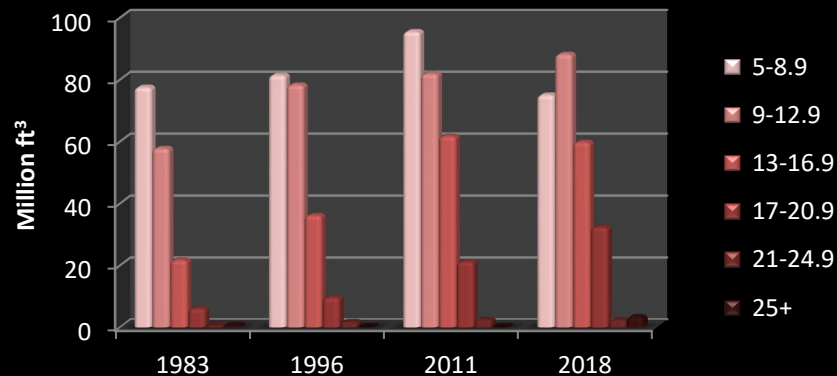
Since 2004, the numbers of [saplings](#), [poles](#) and [sawtimber-sized](#) trees have all increased (chart below right).

Growing stock volume of black cherry



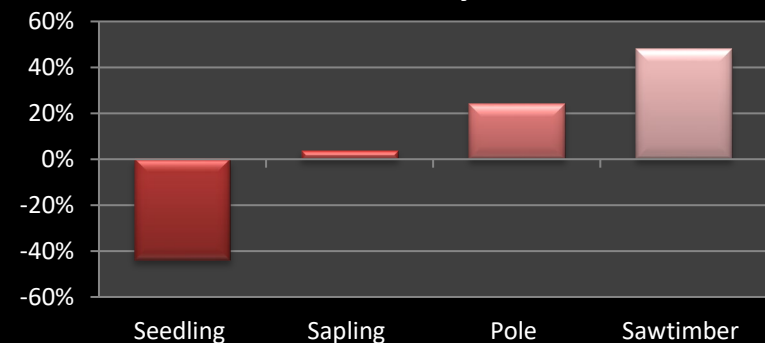
Growing stock volume (million cubic feet) by inventory year.
Source: USDA Forest Inventory and Analysis data

Volume of black cherry by diameter class



Growing stock volume (trees over 5 inches dbh) in million cubic feet by diameter class (in).
Source: USDA Forest Inventory and Analysis data

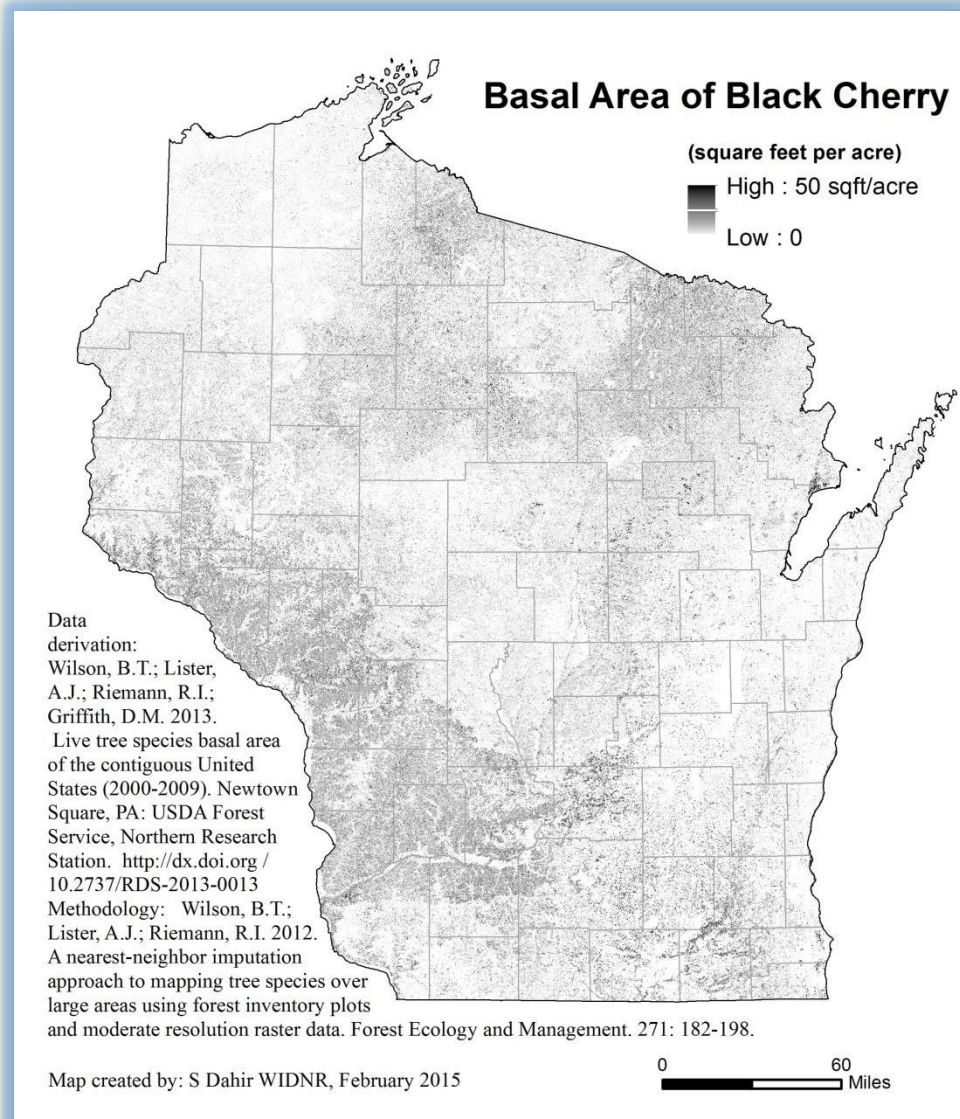
Percentage change in tree numbers: Black cherry



Percentage change in the number of live trees by size class between 2004 and 2018.
Source: USDA Forest Inventory and Analysis data 2004 and 2018.

"Where is black cherry found in Wisconsin?"

Growing stock volume by region with map



About 62% 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 ft³) by species and region of the state.

Species	Central	North east	North west	South east	South west	Total
Black cherry	35	43	21	66	97	261
% of total	13%	17%	8%	25%	37%	100%

Source: USDA Forest Service, Forest Inventory and Analysis

For a table on **Volume by County** go to:

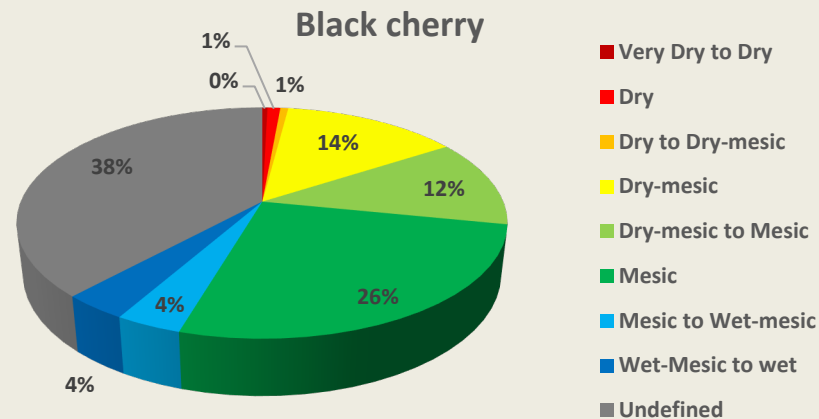
<http://dnr.wi.gov/topic/ForestBusinesses/documents/tables/VolumeCountySpecies.pdf>



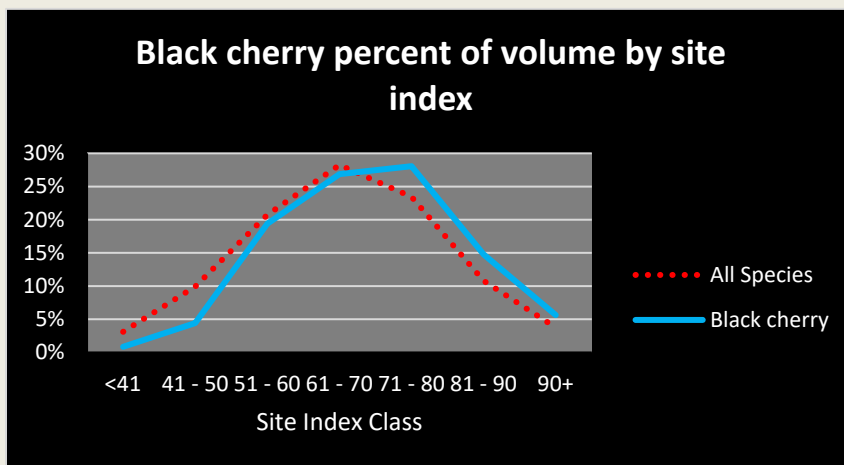
"What kind of sites does black cherry grow on?"

Habitat type and site index distribution

The majority of black cherry growing stock volume is found on dry- mesic to mesic and mesic habitat types (chart below).



Percent distribution of growing stock volume by habitat type group¹ (USDA Forest Inventory & Analysis data).



Percent distribution of growing stock volume by site index class (USDA Forest Inventory & Analysis data).

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.

¹ For more information on habitat types see Schmidt, Thomas L. 1997. Wisconsin forest statistics, 1996. Resource Bulletin NC-183. St. Paul, MN: U.S. Dept. of Agriculture, Forest Service, North Central



"How fast is black cherry growing?"

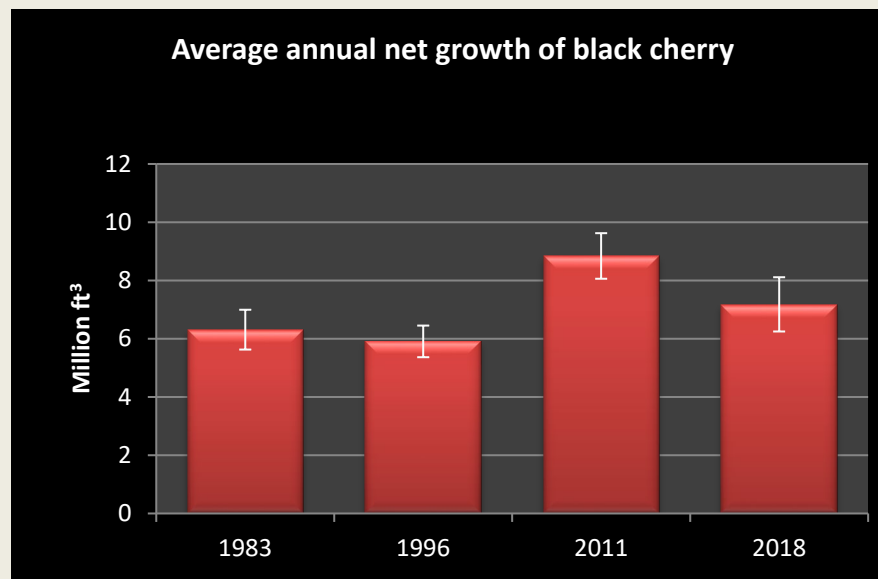
Average annual net growth: trends and ratio of growth to volume

Average annual net growth of black cherry, about 7.2 million cubic feet per year from 2012 to 2018, accounts for 1.3% of total statewide growth (chart on right). The growth rate increased by 22% since 1996. Black cherry accounts for 1.2% of total volume and 1.3% of total growth in the state.

Average annual net growth (million cft/year) and ratio of growth to volume by region of the state.

Region	Net growth	Percent of Total	Ratio of growth to volume
Northeast	1.1	16%	2.6%
Northwest	0.6	8%	3.0%
Central	1.0	14%	2.9%
Southwest	2.9	40%	3.0%
Southeast	1.5	21%	2.3%
Statewide	7.2	100%	2.7%

Source: USDA Forest Inventory and Analysis



Average annual net growth (million cubic feet).

Source: USDA Forest Inventory & Analysis data

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 2.7%, 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:

<http://dnr.wi.gov/topic/ForestBusinesses/documents/tables/GrowthMortalityRemovals.pdf>

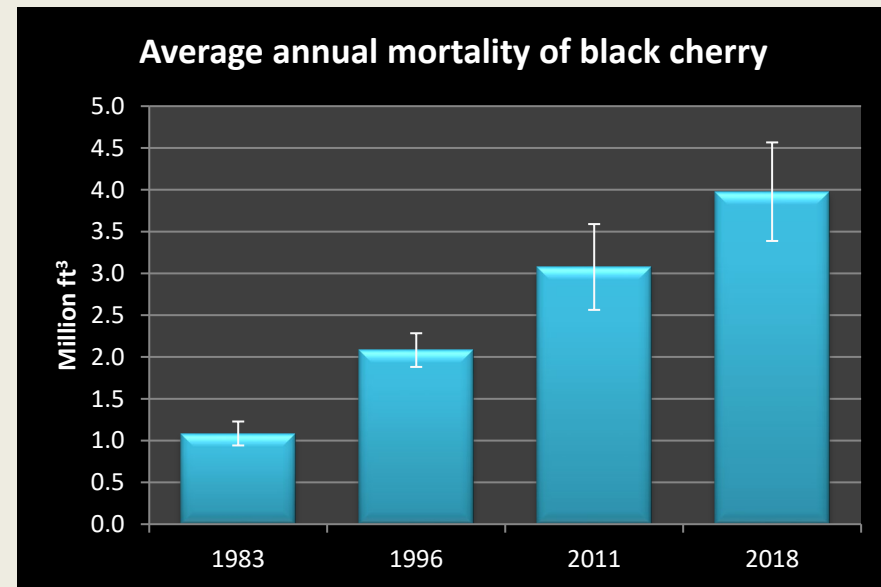
"How healthy is black cherry in Wisconsin?"

Average annual mortality: trends and ratio of mortality to volume



Average annual mortality of black cherry from 2011 to 2016 was about 4.0 million cft, or 1.7% of statewide mortality (chart on right). Mortality has almost quadrupled since 1983 and increased significantly since 2011.

The ratio of mortality to volume is about 1.5% for black cherry. This is higher than the average for all species in Wisconsin which is 1.1%.



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

Mortality, volume, and the ratio of mortality to volume

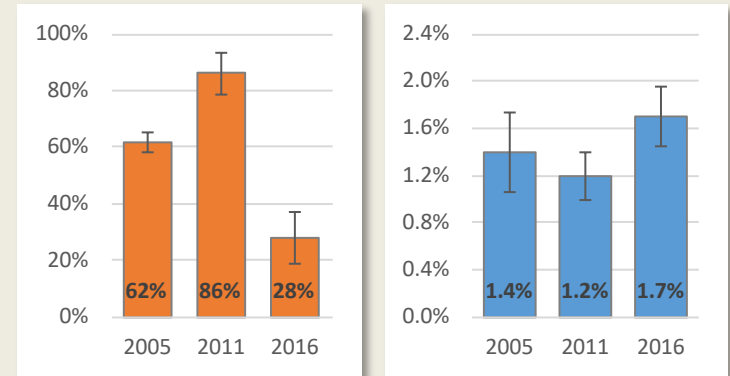
Species	Average annual mortality (ft³)	Growing stock volume (ft³)	Mortality / growth
Black cherry	3,977,164	261,246,952	1.5%

For a table of **Average annual growth, mortality and removals by region** go to:
<http://dnr.wi.gov/topic/ForestBusinesses/documents/tables/GrowthMortalityRemovals.pdf>

"Does black cherry have any major disease or pest issues?"
Eastern tent caterpillar: biology, symptoms and impact

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.



Left. Percent of trees with crown dieback over 1%. Right. Ratio of mortality to volume by inventory year. Error bars represent the 67% confidence interval.



Left. Silken tent built by caterpillars in the crotch of tree branch. Upper right. Eastern tent caterpillar Lower right. Eastern tent moth.

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.

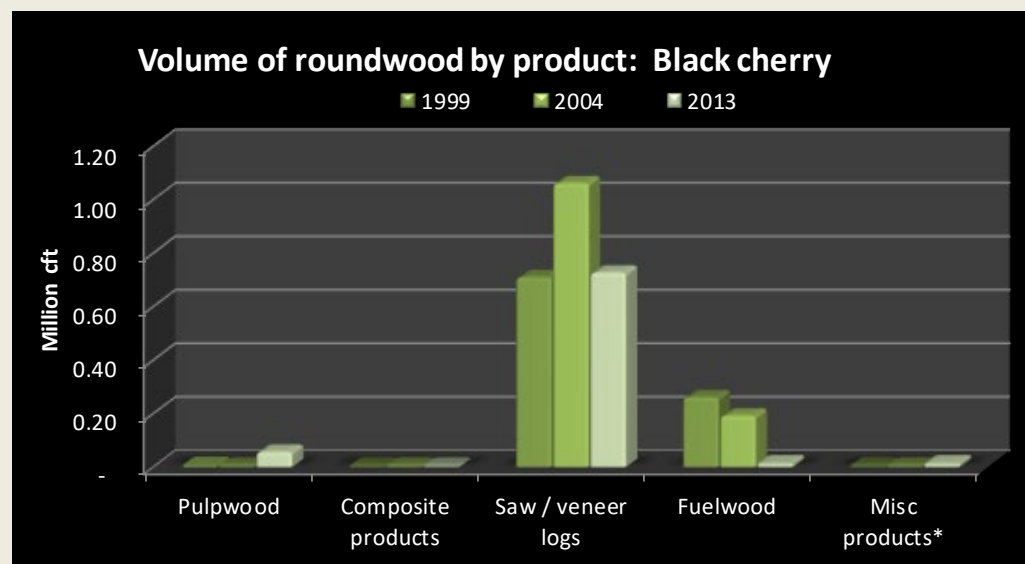


"How much black cherry do we harvest?"

Roundwood production by product and ratio of growth to removals

In 2013, Wisconsin produced about 0.8 million cft of black cherry [roundwood](#), or about 0.3% of the total production (chart on right).

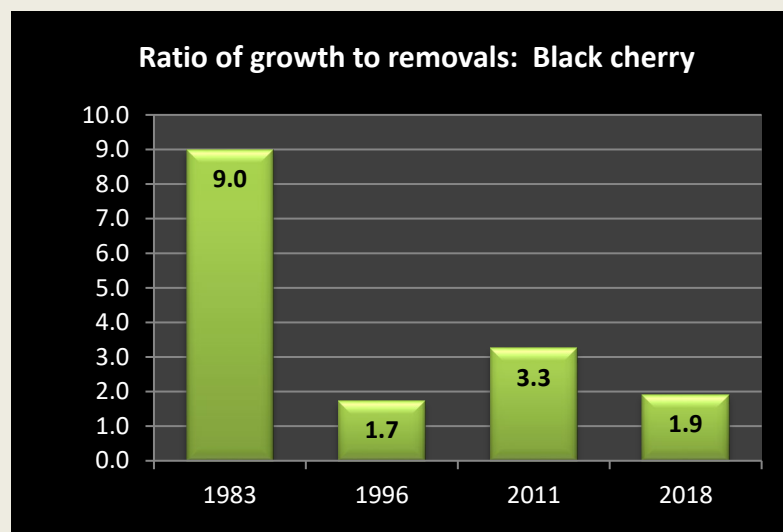
Sawlogs and veneer account for almost 90% of black cherry roundwood production but this is less than 1% of total sawlogs and veneer statewide.



Volume of roundwood. * Miscellaneous products include poles, posts and pilings.
Source: Ronald Piva, USDA Forest Service, Northern Research Station, St. Paul MN

Removals of black cherry totaled 3.8 million cubic feet per year from 2012 to 2018. This is about 1.3% of total removals in the state.

The ratio of average annual net growth to removals is 1.9 for black cherry, which equals the statewide average of 1.9 (chart on left). This ratio is similar to what it was in 1996.



Source: USDA Forest Inventory & Analysis data

For a table of **Average annual growth, mortality and removals by region** go to:

<http://dnr.wi.gov/topic/ForestBusinesses/documents/tables/GrowthMortalityRemovals.pdf>

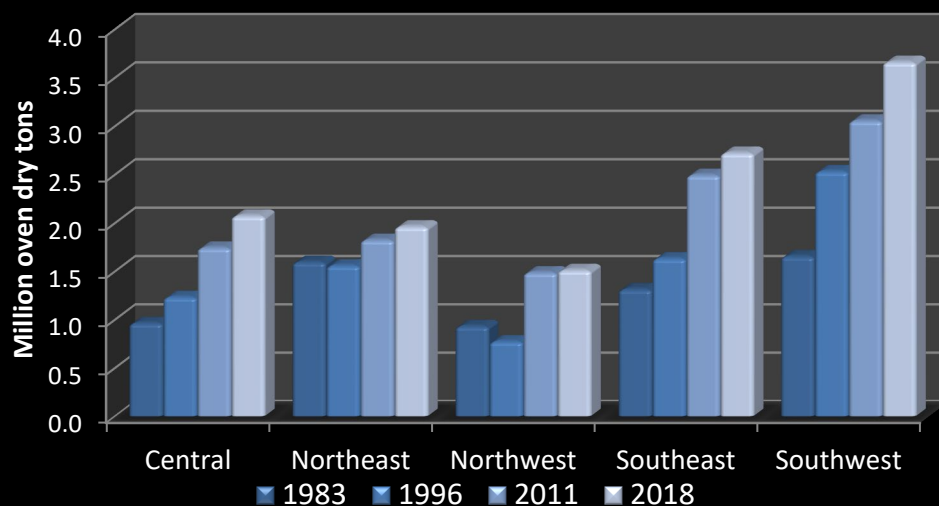


"How much black cherry biomass do we have?"

Tons of aboveground biomass by region of the state

There were 11.9 million short tons of aboveground [biomass](#) in live black cherry trees in 2018, up from about 6.5 million tons in 1983, an increase of 85%. This is equivalent to approximately 6.0 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).

Biomass of all live trees: Black cherry



Biomass (above ground dry weight of live trees >1 in dbh, short tons) by year and region of the state.

Source: USDA Forest Inventory & Analysis data

Black cherry wood has a specific gravity of 0.5 compared to 0.51 for all species and an oven-dry weight is 31.2 pounds per cubic foot compared to 31.4 for all species.

Approximately, 61% of all black cherry biomass is located in the merchantable stem, 17% in saplings, 5% in stumps, and 18% in tops and limbs.

For a table of **Biomass by County** go to:

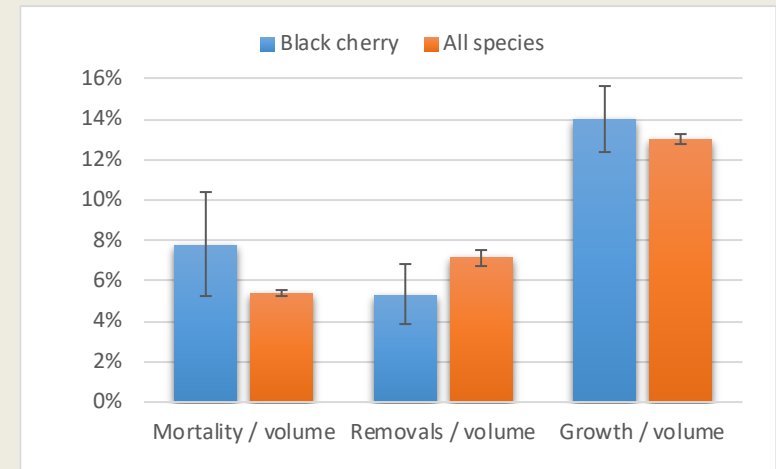
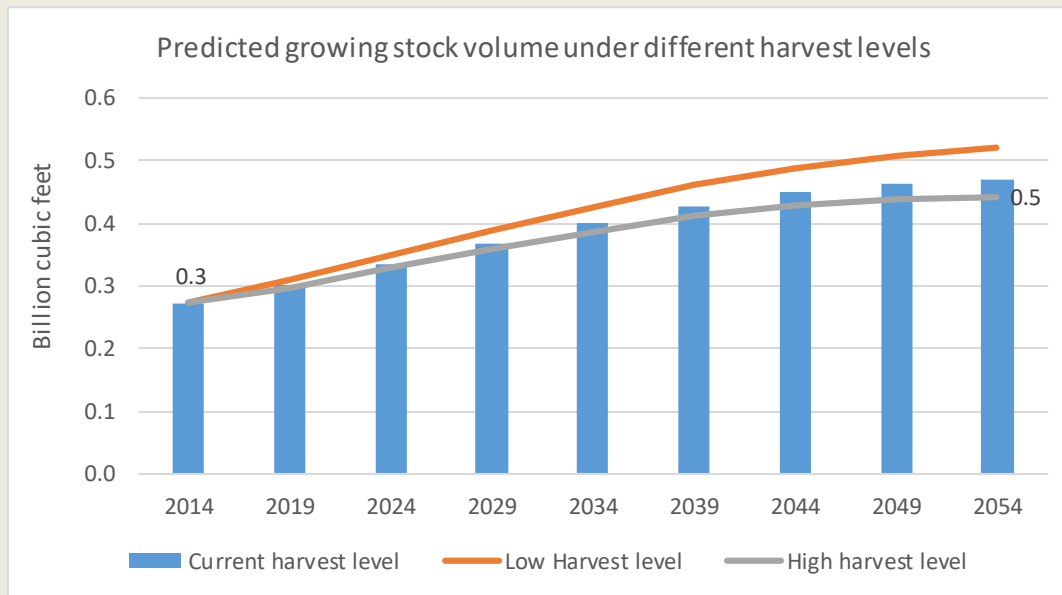
<http://dnr.wi.gov/topic/ForestBusinesses/documents/tables/BiomassByCounty.pdf>

"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 (FVS¹) 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.



Five year rates of mortality, removals and growth to volume of growing stock
Source: USDA Forest Inventory and Analysis

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.

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/fmnc/fvs/>.