FOREST AGE MATTERS
Old forests are good. Centuries-old forests are best.

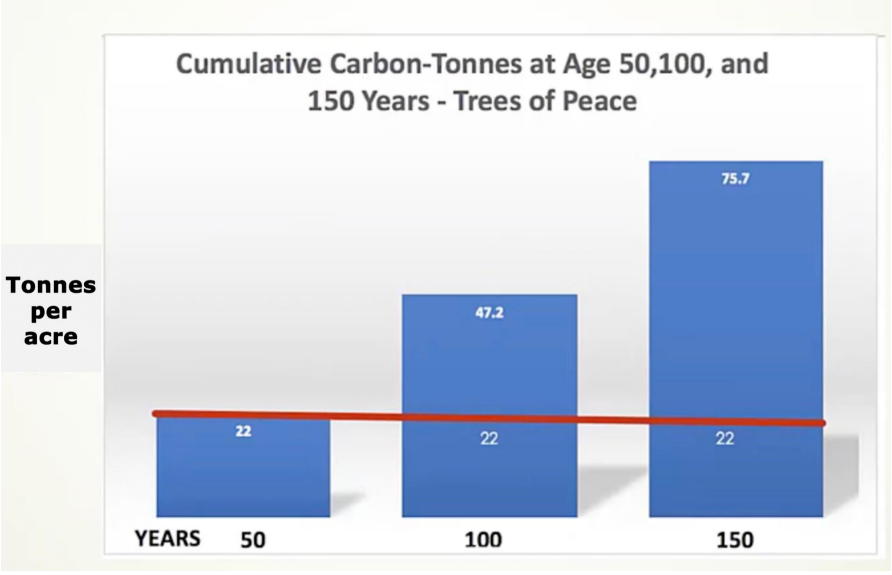
Mature (+80 years) forests, if left wild and unmanaged, continue to grow and get better and better for centuries. Forest characteristics: carbon accumulation, biodiversity, water retention, fire resistance, pest resistance, invasive species, structural diversity, species diversity, *all improve with age.*

Myth: Young trees sequester more carbon at a faster rate than older trees.

Fact: Trees store and capture more and more carbon at an increasing rate as they age and grow and can continue to do so for centuries.

The current practice of harvesting mature and old trees to maintain "forest health" is based on the claim that because younger trees grow faster, they store more carbon than older trees. This assumption ignores the constant, massive increase in volume and carbon accumulation for one hundred and fifty years. A study that compared aboveground biomass in New England forests found that forests with average tree age of 350-400 years held maximum biomass (carbon content).[1]

Bob Leverett, cofounder of the Native Tree Society, measured aboveground carbon accumulation per acre in a Massachusetts white pine stand.[2] This graph, based on his calculations, shows that the trees accumulated more carbon in the second 50 years between 50 and 100 years than they did in the first 50 years, and a still **greater** amount of carbon during the third 50 year period up to 150 years. Thus the rate of carbon accumulation increased with the age of a stand of trees for the time period studied.



[1] Keeton, William S, Andrew Whitman, Gregory McGee, and Christine Goodale. "Late-Successional Biomass Development in Northern Hardwood-Conifer Forests of the Northeastern United States." *Forest Science* 57, no. 6 (2011): 489. https://doi.org/10.1093/forestscience/57.6.489

[2] Leverett, Robert T., Susan A. Masino, and William R. Moomaw. "Older Eastern White Pine Trees and Stands Accumulate Carbon for Many Decades and Maximize Cumulative Carbon." *Frontiers in Forests and Global Change* 4 (2021): 40. https://doi.org/10.3389/ffgc.2021.620450.

Sometimes foresters look at tree rings and conclude that young trees store more carbon because tree rings of young trees are wider than the rings for the same tree at an older age. There are two problems with this argument. First, the narrower rings at an older age have a much greater circumference, which may add up to a larger ring surface area, depending on the width of the ring. Second, the older tree is much taller than it was as a young tree, so the vertical extent of the wood in the rings must also be considered.[3]

"US forests have the potential to grow and accumulate additional carbon for centuries. This means that current forest carbon densities are much lower than their potential, and could be grown to accumulate much more carbon. Instead of regularly harvesting on all of the 70% of U.S. forest land designated as "timberlands" by the US Forest Service, setting aside sufficient areas as Climate and Biodiversity Strategic Reserves (30% by 2030, 50% by 2050) would significantly increase the amount of accumulated carbon between now and 2050 to 2100. Continuing commercial harvesting on the remaining lands would continue to adequately supply a sustainable forestry." [4]

The ultimate goal, therefore, should not be just to "save old-growth" trees, but to allow mature trees to grow and accumulate massive amounts of carbon for centuries, extensively increasing the range of old-growth forests.

[3] *Myth Busters: What the Forest Industry Wants Us to Believe About Cutting Forests*, 2022. https://www.youtube.com/watch?v=W01fsmDyxUs.

[4] Law, Beverly, William R Moomaw, and William H. Schlesinger. "The Status of Science on Forest Carbon Management to Mitigate Climate Change and Protect Water and Biodiversity," n.d. https://olyclimate.files.wordpress.com/2020/08/lawetal2020.pdf.