Indicator 2.13:

Annual harvest of wood products by volume and as a percentage of net growth or sustained yield

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What is the indicator and why is it important?

This indicator compares net growth with wood harvest (removals) on timberland. The ratio of growth to removals is frequently used to assess whether wood harvesting is reducing the total volume of trees available for wood production on timberland. As defined here, growth is the average annual net increase in growing-stock volume between inventories after accounting for mortality effects but before accounting for harvest effects. Removals are a measure of the average annual volume of growing-stock trees harvested between inventories. Timberland is assumed to be the subset of forest land on which some level of wood harvesting is potentially allowed. So long as average annual net growth exceeds average annual removals, the volume of trees on timberland is considered sustainable from a simple materials balance standpoint. This measure, however, conveys no information about ecological quality, biodiversity, other ecological attributes, or management objectives, and should be considered in conjunction with other indicators to monitor the sustainability of a specific species, resource attributes, or the forest ecosystem as a whole.

What does the indicator show?

Across the United States, average annual net growth in 2016 (25 billion cubic feet) was twice average annual removals (13 billion cubic feet). Removals were stable from 2011 through 2016 (fig. 13-1). As shown in figure 13-2, in the North, growth outpaced removals by 2.4 to 1.

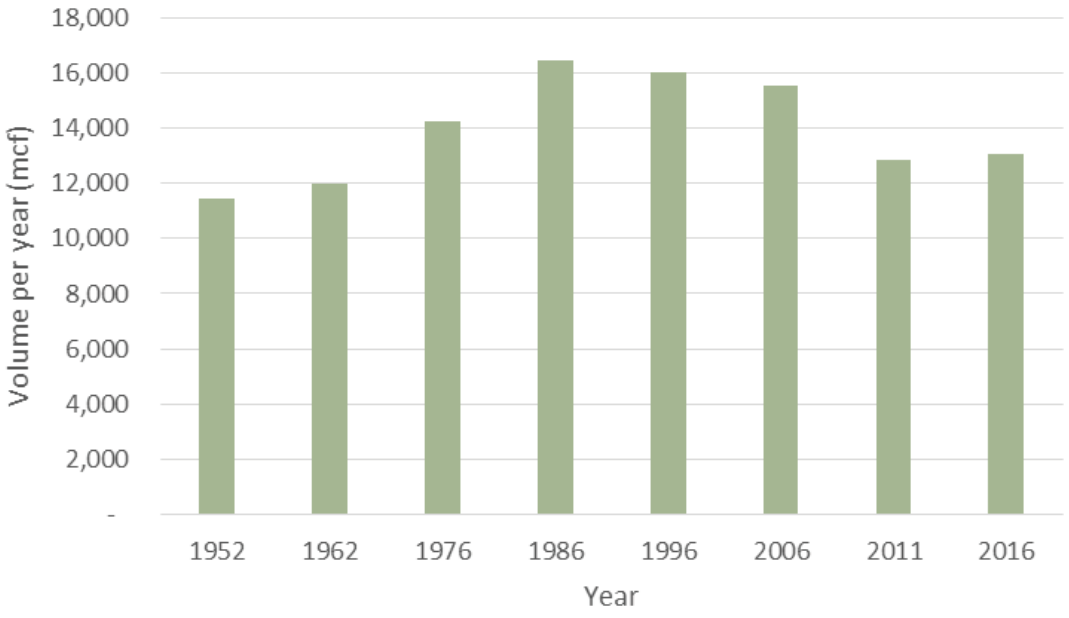

Figure 13-1—Average annual removal volume by inventory year, 1976 to 2016 (Source: Oswalt et al. 2019).

Southern average annual net growth was 1.8 times that of average annual removals. Growth was twice removals in the Pacific Coast, while removals outpaced growth in the Rocky Mountains due to high mortality rates.

Average annual net growth per-acre was highest on private land at 57 cubic feet per acre, and lowest on National Forest System land at 20 cubic feet per acre. Net growth accounts for mortality, yielding clues about the low net growth on National Forests. Mortality was highest on National Forest System land, and lowest on private land. Removals were, conversely, highest on private land (32 cubic feet/acre) and lowest on National Forest System land (5 cubic feet/acre; fig. 13-3).

Nationwide, average annual net growth was about 3 percent of standing inventory volume, while average annual removals and total mortality were about 1 percent each. While national growth has continued to exceed removals and standing growing-stock inventory appears to be plentiful, removals did exceed average annual net growth in three western States: Colorado, Utah, and Wyoming. In those States, mortality was exceedingly high, resulting in negative net growth. Removals were not the cause of the negative growth rates, as average annual removals were quite low, at 9 million cubic feet in Colorado, 2 million cubic feet in Utah, and 13 million cubic feet in Wyoming. Softwood species in those States were primarily affected.

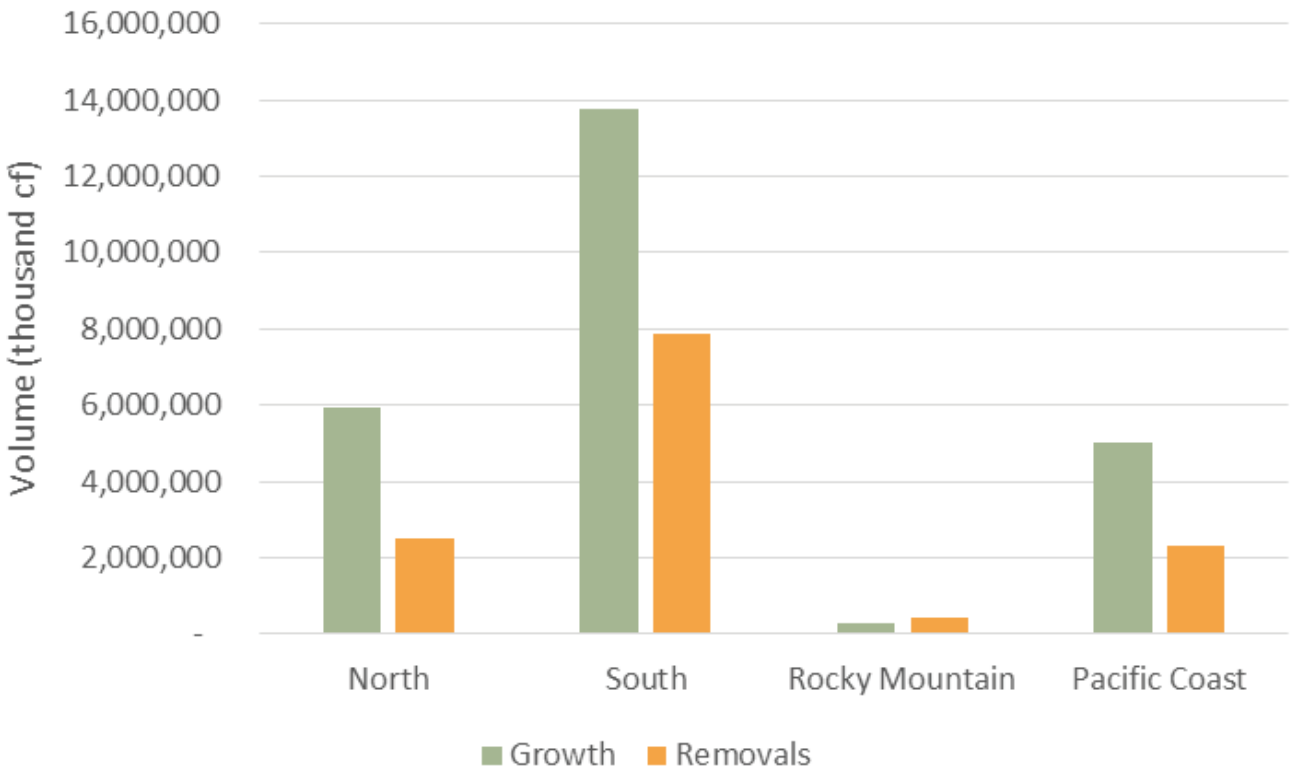

Figure 13-2—Growth and removals by region (Source: Oswalt et al. 2019).

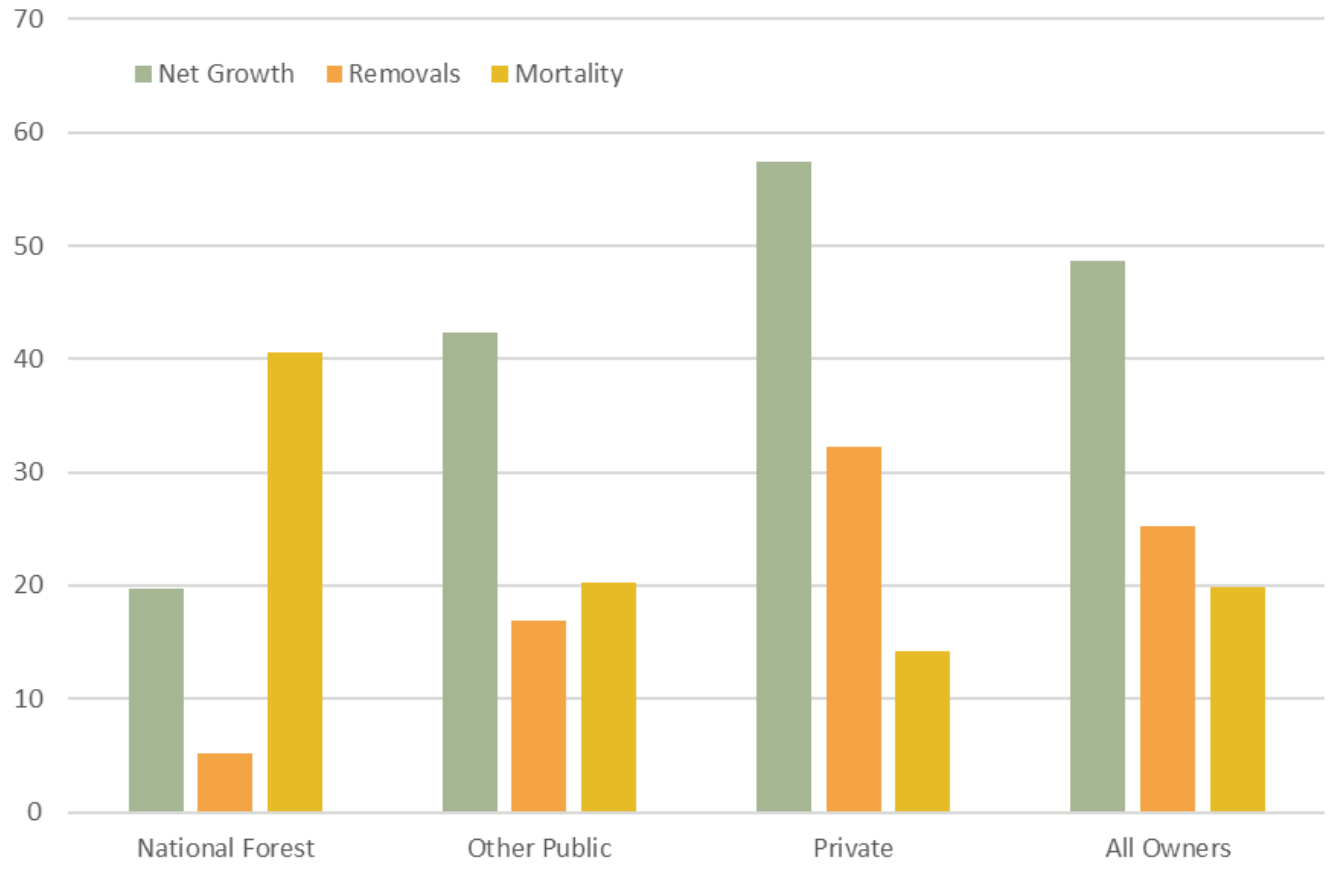

Figure 13-3—Average annual net growth (gross growth minus mortality), average annual mortality, and average annual net removals by ownership group (Source: Oswalt et al. 2019).

What has changed since 2011?

Growth continued to exceed removals nationally, while three States in the western United States experienced negative growth rates due to excessive mortality. Despite high rates of mortality in those three States, mortality at the national scale declined from 11 million cubic feet to 10 million cubic feet. Annual average removals of growing stock have remained relatively stable at 13 million cubic feet, nationally, and remain approximately 1 percent of total standing volume in the United States.

References

Oswalt, S.N.; Smith, W.B.; Miles, P.D.; Pugh, S.A., coords. 2019. Forest resources of the United States, 2017: a technical document supporting the Forest Service 2020 RPA Assessment. Gen. Tech. Rep. WO-97. Washington, DC: U.S. Department of Agriculture, Forest Service, Washington Office. 223 p. https://doi.org/10.2737/WO-GTR-97.