

## Item #38: Timber Yield Projections

**Evaluation Question:** What are the actual timber growth trends compared to the timber yield projections used in the forest plan?

**Resources to be measured:** Timber growth

**Data Sources:**

- FIA Summary Report: Forest Resources of the Flathead National Forest, RMRS July 1999
- Draft Western Montana Planning Zone (WMPZ) document on Timber Harvest Projections 7/18/2006
- On-line FIA summary information: ([11/25/2008 3:31:21 PM View comma delimited table: 1. tablehttp://ncrs2.fs.fed.us/4801/fiadb/temp2/j515303111.htm](http://ncrs2.fs.fed.us/4801/fiadb/temp2/j515303111.htm))

This monitoring item was established to validate timber yield projections used in the Forest Plan. Growth and age class distributions were projected for the future forest based on 1974 timber inventory data. The current best source of forest-wide is the forest inventory and analysis (FIA) system, a nationally established grid of plots which is re-measured on a periodic basis. It takes a 10-year cycle for re-measurement to be complete, so this system is not able to capture short-term changes (such as recent large fires). FIA is the only systematic forest-wide sample that will provide a, long-term picture of forest conditions and trends.

Forest Plan Appendix F projects future forest conditions in terms of total forest growth and mortality, for the suitable and unsuitable base:

**Table 38-1.** Annual Net Growth & Mortality on Suitable/Unsuitable Lands, Flathead NF

		Suitable Lands	Unsuitable Lands	All Lands
Annual Net Growth	MMCF	26.0	40.2	66.2
	MMBF	104.0	140.9	244.9
Annual Mortality	MMCF	7.2	7.3	14.5
	MMBF	28.7	25.7	54.4

This prediction shows mortality as approximately 18% of growth.

A published FIA Report of 1994 data estimated net growth of 72 million cubic feet of timber, and 35.8 million cubic feet of mortality. Mortality was about one-third of gross growth on the forest overall. About 70% of the mortality was in just two species, subalpine fir and lodgepole pine. Mortality was estimated to be 42% caused by disease and another 27% by insects. This report did not separate out suitable lands.

Subsequent analysis of this FIA data by Ken Hodgekiss of the Western Montana Planning Zone team, did split out estimates for the current Forest Plan suitable timber base. These estimates

were 18.7 MMCF annual growth (+/- 25.3% standard error) and 16.4 MMCF annual mortality (+/- 23.8% standard error).

These figures indicate greater both overall growth and mortality than the Forest Plan predictions on all lands, while growth within the suitable timber base is less than the Forest Plan projection.

More current FIA data, obtained through their online summary database, indicates an estimated net growth of 32.5 million cubic feet of timber, and 44.6 million cubic feet of mortality (all lands). Based on this data, mortality is increased to about 58% of gross growth on the forest. These values show net growth to be less than one half of original forest plan predictions of two decades ago, while mortality is three times the predicted value.

Some of these differences can be attributed to the modeling techniques used, and the difference between modeled and actual measured data. Modeling techniques had, and still have, a difficult time accounting for the complexity of drought, fire, and insects and disease interacting at the landscape scale.

However, just looking at FIA data, there appears to be a trend of mortality representing an increasing proportion of gross forest growth. This is due to a combination of factors. In our fire-adapted ecosystems, where stand-replacing fire is a dominant agent of change, levels of growth and mortality are cyclic. Overall the forest is getting older, with increasing fuel loadings. Thus it is more susceptible to drought stress, insects and disease and fire, all of which contribute to mortality. The scale of these trends likely overwhelms any impact of reduced timber harvest in comparison to plan projections.

**Recommended Actions:** In the future, FIA data can be used to monitor actual forest growth and mortality, and provide statistical confidence intervals, to track trends on a long term (10 year) basis.