

COMPARISON OF THREE ANNUAL INVENTORY DESIGNS, A PERIODIC DESIGN, AND A MIDCYCLE UPDATE DESIGN

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ABSTRACT.—Three annual inventory designs, a periodic design, and a periodic measurement with midcycle update design are compared using a population created from 14,754 remeasured Forest Inventory and Analysis plots. Two of the annual designs and the midcycle update design allow updating of plots using sampling with partial replacement procedures. Individual year and moving average estimates are determined. The moving average estimates are compared to both the population means of the most recent year used in the average, and to population averages covering the same period as the estimate. Comparisons for net cubic-foot volume per acre and annual change in volume are based on root mean square error (RMSE) and estimator bias. Among annual designs, the rotating panel design produced the smallest RMSE for volume. For multiple year comparisons, the rotating panel and periodic designs resulted in the smallest RMSE's, while for single year comparisons, the periodic design resulted in the smallest RMSE. For annual change, the smallest RMSE's were produced by the periodic design, while among annual designs, the rotating panel design resulted in the smallest RMSE's for multiple year comparisons, and the rotating panel and balanced annual partial remeasurement designs resulted in the smallest RMSE's for single year comparisons.

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