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## A TEST OF A COMPOSITE LOCAL AERIAL STAND VOLUME TABLE OUTSIDE THE LOCALITY OF ORIGIN<sup>1/</sup>

Robert H. Lamont, Richard C. Trochlil and Merle P. Meyer<sup>2/</sup>

In the process of research involving the development and possible application of aerial stand classification tables, the question arose as to how far distant from the point of origin such tables were applicable. Consequently, a composite aerial stand volume table recently developed for the Cloquet area of Minnesota (1) was subjected to test on the Effie District of the Mando Division, Boise-Cascade Corporation operating area. This placed the test site in northern Itasca County 100 miles northwest of the point of table development data sources.

Fifty-two 1-acre plots were used in the test, each of which was ground-measured in the manner described by Avery and Meyer (2). Each plot center was pinpricked on the photos and subsequently measured by 11 trained photo interpreters. Photo measurements on each plot consisted of five height measurements of dominant trees and a crown density estimate of trees deemed to be of merchantable size. Photography employed was fair quality fall panchromatic at a scale of 1:20,000. Following ground and photo measurements, the plot information was recorded on machine cards and these data were analyzed using Medcomp Programs IMPO04 and IMPO33 (t) on the IBM 1401 Computer.

Table 1. Mean ground and photo volume comparisons based upon measurements of 52 1-acre plots in Itasca County by 11 interpreters.

Plot size, ground & photo	Photo inter- preter	Volume (cuft/acre)		Volume diff. (%)	Std. error of estimate		df	T	Level of signif- icance*
		Ground	Photo		Ground	Photo			
1-acre	H		2300	65.5		17.95		(6.039)	(.001)
	K		1580	13.7		10.03		1.752	NS
	A		1570	12.9		12.21		1.394	NS
	C		1550	11.5		12.73		1.374	NS
	D		1540	10.8		11.98		1.351	NS
	F	1390	1500	7.9	10.85	9.06	51	.923	NS
	I		1470	5.8		11.58		.692	NS
	B		1390	0		13.28		.011	NS
	J		1360	-2.2		10.49		.288	NS
	G		1280	-7.9		8.64		1.010	NS
	E		1220	-12.2		9.36		1.537	NS
ALL	1390	1520	9.3	10.85	9.59	51	.495	NS	

\*"NS" indicates the mean photo volume estimate does not differ significantly from the mean ground volume measurement.

<sup>1/</sup> Resources for the collection of field data were provided by the Mando Division, Boise-Cascade Corporation.  
<sup>2/</sup> Research assistant, Mando Graduate Research Scholar and Professor, respectively, University of Minnesota School of Forestry.

Table 2. Relationship of individual interpreter photo volume estimates to ground measurements.

Plot size, ground & photo	Photo interpreter	Correlation coefficient (per cent)	"A" factor	"B" factor	df	T	Level of significance*
1-acre	D	56.0	61.199	.507		4.77	.001
	H	54.2	63.567	.327		4.56	.001
	C	49.7	73.217	.423		4.05	.001
	K	46.3	59.925	.500		3.69	.001
	E	43.6	77.247	.436		3.42	.01
	I	43.3	79.266	.406	50	3.39	.01
	A	39.9	83.469	.354		3.08	.01
	G	37.6	78.780	.471		2.86	.01
	F	37.3	72.317	.446		2.84	.01
	J	34.5	90.776	.356		2.59	.05
	B	31.9	102.838	.260		2.37	.05
ALL		54.0	51.191	.610	50	4.53	.001

\*Level indicates the degree to which the slope of the line differs significantly from zero.

Although Table 1 indicates that 10 of the 11 interpreters obtained mean photo estimates which did not differ significantly from the mean ground measurement, Table 2 shows a noticeable reduction in the correlation coefficients (i.e., a range of 56.0-31.9%, as compared to 69.4% for the table). The fact that smaller scale photography of poorer quality was used in the test area might have contributed to this in affecting the pattern of height measurement errors encountered in the test area. Note in Table 3 that the average interpreter tended to get a different photo height/ground height line slope than was encountered in the construction of the table. In both cases negative errors of photo height measurements tended to increase with taller trees, but at a greater rate in the test area than was encountered at Cloquet.

Table 3. Comparative differences in average photo stand height measurement errors at the Cloquet and test locations, respectively.

Location	Ground-measured height class (feet)				
	30	40	50	60	70
	--ave. photo height measurement error (feet)--				
Cloquet vicinity	0	-5	-10	-15	-20
Test area	5	0	-10	-20	-30

In summary, it appears that the Cloquet table fits the test area fairly well but could be strengthened considerably by including the 52 test plots in a recalculation of the volume regression equation.

#### Literature Cited

- (1) Lamont, R. H., H. H. John and M. P. Meyer. 1966. A composite aerial stand volume table for the Cloquet, Minnesota vicinity. Minnesota For. Notes No. 167.
- (2) Avery, T. E. and M. P. Meyer. 1959. Volume tables for aerial timber estimating in northern Minnesota. U.S.F.S., Lake States Forest Expt. Sta. Paper 78, 21 pp.

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