



Resource Inventory Notes

No. 7

July 1976

4PEA SAMPLING

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4PEA Sampling? What's that you ask? Is it some type of legume nutrient study being carried on by a frozen food company? Is it some new and exotic design replacing 3P or P.P.S.? Sorry to disappoint you. 4PEA sampling has been around for quite some time and perhaps you have even been using it.

How often have you or someone else you've known conducted an inventory, survey or cruise in the following manner?

1. The investigator (cruiser, range conservationist, wildlife specialist, etc.), due to very limited funding, establishes a sampling frame in accessible areas where access costs are low.
2. The investigator drives down the road or walks the trail to an area that looks average.
3. The investigator runs the transect, tosses the hoop, or establishes the plot cluster in whichever direction appears typical.
4. The investigator expands the data collected in the accessible area to the entire area being inventoried.

The assumptions in this type of a design are that: (a) the

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investigation is unbiased, and that (b) the population in the immediate vicinity has the same attributes and expectations as the larger population. If these assumptions are true, this type of sampling can be used to economic advantage.

But how can we be sure that these two assumptions are met? What happens if the area selected for sampling was not really average? What happens if the cruiser, either consciously or subconsciously, chose higher yielding sites to measure? What if the range conservationist selected a deteriorated area that needs improvement in an effort to get more funds for the entire allotment?

What happens if, instead of driving to a typical area, the investigation was carried out where there was a spot in the road wide enough to park the vehicle? What if, instead of choosing a random direction to run the transect or establish the plot, the investigator chose a place where the going is easiest? What if accessible areas were not typical of the whole inventory unit?

If any of these situations occur, we have what may facetiously be called 4PEA sampling -- Picking Plots by Personal Prejudice and/or Ease of Access.

If 4PEA sampling is used then, because of likely bias in plot location, there is no way to calculate meaningful sampling errors, variance or estimates for what is really present. Because the entire population did not stand a chance of being sampled, the data collected and study conclusions can only be applied to the immediate area in which the plots were taken. All that one gets from curbside cruises and saddleback surveys is a subjective opinion for a limited area.

Many agencies and industries are 4PEA sampling - either knowingly or unknowingly. They claim they can't afford time and money required for a statistical sample which would bypass the bias of 4PEA. Others say they don't have a need to know variances and sampling errors. Essentially, they are saying that they don't care how precise the inventory is. If they don't care about the reliability of the estimates, why take measurements at all.

A sound inventory that is objective and unbiased will provide meaningful, useful estimates. Very often, the statistically

designed sample will cost less in the long run than methods that could lead to 4PEA. Try to eliminate the bias created by ease of access. If accessibility is truly a factor in the study, then use some type of stratified sampling scheme. If not, use some type of random sample or systematic sample to determine plot layout.

Personal prejudice may be reduced by having objective and clear-cut instructions and forms.

1. The instructions should be well written, limiting or reducing to a bare minimum, decisions based on the professional experience or judgment of the observer.

2. Forms should call for quantified data rather than qualified information. For example, instead of the investigator recording whether or not the slope is level to gentle, moderate or extreme, he should record the actual percent slope so there is no room for misrepresentation or misinterpretation.

3. Measurements should be taken in such a manner that if the sample is repeated by another investigator, he would come up with the same or nearly the same results as the first investigator.

4. Data should be expanded only to areas sampled.

Before undertaking an inventory, think through your proposed procedures. Is there any possibility that biased 4PEA sampling is being applied? If so, revise your plan to eliminate 4PEA.

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CURRENT LITERATURE

"An Evaluation of Several Types of Gear For Sampling Fish Populations" by McWilliams, Mitzner and Mayhew describes the sampling methods and results of seine samples, Fyke net sampling and experimental gill net sampling. Ask for Iowa Fisheries Research Technical Series No. 74-2 from the State Conservation Commission, Fisheries Section, 300 Fourth Street, Des Moines, Iowa 50319.

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Publication No. R-76-1 "Studies in Landscape Perception" edited by E. H. Zube, will be of interest to planners and recreation specialists. Subjects such as predicting scenic resource values, and numerical and perceptual landscape classifications are discussed. Copies may be obtained from Institute for Man and

Environment, University of Massachusetts, Amherst, Massachusetts 01002.

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The Forestry Chronicle has had several interesting articles recently. These include:

- "Pointless Timber Estimates - Newer, Faster, Easier" by Mike Bonnor. August 1975, 51(4):128-129.
- "Canadian Forest Inventory Methods" by Victor G. Smith. Feb. 1976, 52(1):9-14.
- "Compatible Systems for the Estimation of Tree and Stand Volume" by Felix Evert. Feb. 1976, 52(1):15-16.

Information regarding the Forestry Chronicle may be obtained from the Canadian Institute of Forestry, Box 5000, MacDonald College, Quebec HOA 1C0.

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Publication No. R-104 "Management Guidelines for Selected Deer Habitats in Nevada" by Tueller and Monroe, describes in part the procedures and methods for deer range evaluation. Write the Agricultural Experiment Station, College of Agriculture, University of Nevada, Reno, Nevada 89507 for a copy.

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Several publications that are of interest are available from the Pacific Northwest Forest and Range Experiment Station, P.O. Box 3141, Portland, Oregon 97208. These include:

- "Volume Tables for Permanent Sample Plots" 1953.
- Research Note PNW-30 "Sample Sizes for Timber Cruiser" by Floyd Johnson, 1965.
- Reprint "Multipurpose Surveys: A Question of optimal Design" by Promnitz and Hazard, 1973.
- Resource Bulletin PNW-62. "Timber Resource Statistics for the Copper River Inventory Unit, Alaska, 1968" by Karl M. Hegg, 1975.

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Those interested in computer modelling should get a copy of Research Report R2635 "FOREST: A computer model for simulating

the growth and reproduction of mixed species forest stands" from the School of Natural Resources, College of Agricultural and Life Sciences, University of Wisconsin, Madison, Wisconsin 53706.

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An older publication that inventory specialists will find interesting is "Computer Simulation and Economic Efficiency in Forest Sampling" by Arvanitis and O'Regan. Write to Agricultural Publications, University Hall, University of California, Berkeley, California 94720 and ask for HILGARDIA Vol. 38, No. 2, March 1967. Also ask for a copy of Bulletin 866, "Estimators for Use in Weight Scaling of Sawlogs" by Lee Wensel.

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Reprint "Estimating Individual Tree Volumes With Spiegel Relascope and Barr and Stroud Dendrometer" by Herb Yocam and Dave Bower is available from the Southern Forest Experiment Station, T-10210 Postal Service Building, 701 Loyola Avenue, New Orleans, Louisiana 70113.

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Being bugged? Dave Grimble and Carl Palm describe "Drop traps to estimate the relative abundance of red pine scale crawlers" in A.F.R.I. Research Note No. 20. Copies may be obtained from the Applied Forestry Research Institute, State University of New York, College of Environmental Science and Forestry, Syracuse, New York 13210.

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"Evaluation of Plot Size for Arthropod Studies in Cotton" is available from the Texas Agricultural Experiment Station, Texas A&M University System, College Station, TX 77843. Ask for MP-1215C.

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Report Series 219 "Different Methods of Sampling for Clouded and Tarnished Plant Bugs in Arkansas Cotton Fields" may also be of interest. This is available from Agricultural Experiment Station, Division of Agriculture, University of Arkansas, Fayetteville, Arkansas 72701.

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The Journal of Range Management vol. 29, No. 1, pages 74-77, 1976

has an article on "Sampling Herbaceous Native Vegetation with an Electronic Capacitance Instrument" by Neal, Currie and Morris. Reprints are available from the Rocky Mountain Forest and Range Experiment Station, 240 West Prospect, Ft. Collins, CO 80521. Also ask for General Technical Report RM-20 "Principal Range Plants of the Central and Southern Rocky Mountains: Names and Symbols."

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What's in the future in forest inventory? Write USDA Forest Service, Northeastern Forest Experiment Station, 6816 Market Street, Upper Darby, Pennsylvania 19082 for a copy of "Forest Inventory Research Priorities in the Northeast" prepared by Carl Mayer and Bill Stiteler.

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"Landsat: Space Technology in Natural Resource Planning" by Tessar, Meyer, Verlaque, and Elkjer is available from Governmental Research Bureau, University of South Dakota, Vermillion, SD 57069. Ask for Public Affairs No. 64.

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A "Wildland Planning Glossary", General Technical Report PSW-13, is available from the Pacific Southwest Forest and Range Experiment Station, P.O. Box 245, Berkeley, CA 94701. Also available is a reprint by Bob Aldrich on "Detecting Disturbances in a Forest Environment" which appeared in Photogrammetric Engineering and Remote Sensing Vol. 41 No. 1, pages 39-48, 1975.

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The proceedings on the "Systems Analysis and Forest Resource Management" Symposium sponsored by the Society of American Foresters' Systems Analysis Working Group held last August is available. The 457 paged proceeding contains papers on multiple-use and land-use planning, timber management, harvesting and transportation, fire, data management as well as miscellaneous papers on Multiple Resource Inventory Systems, etc. Copies of the proceedings are available from the Society of American Foresters, 5400 Grosvenor Lane, Bethesda, MD 20014. The price is about \$6.00.

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The May 1975 issue of Maine Forest Review has an interesting article on "Forest Remeasurement CFI (Continuous Forest Inventory) on Indiana Township, Maine" by Hatch and Corcoran. Copies of the Review may be obtained from Editor, Maine Forest Review, A.D. Nutting Hall, University of Maine, Orono, Maine 04473. While writing the University, ask for a copy of Technical Note No. 57, "A Programmed Assay For Tree Growth Formulization in Maine."

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"RAP - Resource Analysis Procedure - User's Manual" by Gary Rockwood and Tony Wilcox is available from the Bureau of Economic and Business Research, College of Business, University of Utah, Salt Lake City, Utah 84108. RAP is a computer mapping model.

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MEETINGS

Resource Data Management Symposium

This symposium, sponsored by the Society of American Foresters' Inventory and Systems Analysis Working Groups and the Purdue University Department of Forestry and Natural Resources, will be held at Purdue University August 17 & 18, 1976. For further information, contact Dr. John W. Moser, Department of Forestry and Natural Resources, Purdue University, West Lafayette, Indiana 47906.

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The Society of American Foresters' Inventory Working Group will hold its annual business meeting at the 1976 SAF National Convention in New Orleans at 5 p.m., Oct. 4. The meeting place will be posted at the convention. All members (and potential members) of the working group are invited to attend.

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Sampling and Data Processing

This workshop will be sponsored by the University of New Hampshire, the Society of American Foresters' Inventory Working Group and the USDA Forest Service. The workshop consists of two concurrent sessions: One on sampling and the other on data processing. The dates are November 8-12, 1976, to be held at Durham, New Hampshire. Contact Dr. James P. Barrett, James Hall, Institute of Natural Resources, University of New Hampshire, Durham, N.H. 03824, for additional details.

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MISCELLANEOUS

Steve Curry, Inventory Forester for the Western Washington Region of Boise Cascade, P.O. Box 1170, Aberdeen, WA 98520 is looking for a copy of "Forest Inventory" by Stephen H. Spurr, Ronald Press, 1952. Anyone who has an extra copy or knows where Steve might obtain a copy, should contact Mr. Curry directly.

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Elvin Birth, Consulting Forester in Beckley, West Virginia, passes this bit of sage advice regarding inventory designs. "Any design for a specific purpose may also stand in support of another design for some other purpose." Thanks Elvin!

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This issue concludes the series of Resource Inventory Notes being published by the U. S. Forest Service, Northeastern Area, State and Private Forestry.

Starting with the next issue (No. 8), the notes will be published by the U. S. Department of the Interior, Bureau of Land Management. The current mailing list will be maintained by the Bureau of Land Management. Any problems or questions, or items you wish to have included in the notes, should now be sent to:

U. S. Dept. of the Interior
Bureau of Land Management
Service Center (D-340)
Building 50, Denver Federal Center
Denver, Colorado 80225
ATTN: Resource Inventory Notes

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