



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Diminishing physical returns therefore does not present the same problem in relation to the economic rate of feeding as it does in the production of milk. But the economic problem does appear in choosing the ingredients that enter a mixed poultry ration and in the choice between "high efficiency" and "standard" rations. The evidence on "high efficiency" rations for egg production is still in the experimental stage but the prospect is that it will be striking. A somewhat similar situation arises in the choice made between farm-produced feeds and purchased concentrates for those who mix their own rations. The general principle involved is a choice between a lower cost and less productive ration on the one hand and a higher cost but more productive ration on the other.

The chief economy that is possible in the use of feed for production of eggs still arises from cull-

ing the low producers. The culling process may involve economic as well as physical decisions because the rate of culling may be varied profitably under different relative conditions of price, provided practical means are available for measuring egg production from individual hens. This conclusion emphasizes the need for devoting research attention to the problem of providing practical means of identifying individual rates of lay more accurately under the usual conditions of commercial flocks. Some form of trapnesting for limited periods may be feasible in some cases. Perhaps more rapid and accurate methods of manual examination can be developed. Some advances appear to have been made recently with methods involving both internal and external examination. Any such leads may well be vigorously pursued and thoroughly tested.

Conducting a Survey of Ownership of Forest Land in California

By Adon Poli

An extensive type of forest-ownership survey has been under way in California since 1947. This article describes the procedure that was developed for this study and illustrates with a few basic tables the kind of information obtained. The integration of the ownership study with the forest-inventory data obtained by foresters in their regular Forest Survey is an example of the mutual interests of the physical and social scientists.

OWNERSHIP as a factor influencing the management of forest land is a comparatively new line of research among foresters and forest economists. Interest stems mainly from the realization that attitudes of owners influence the use and management of land. All kinds of individuals and public and private agencies own forest land. They acquire it in many ways, including purchase, inheritance, homestead, gift, and grant. They own it in units of varying sizes, in contiguous and non-contiguous tracts, by itself and in combination with

agricultural and other kinds of land. They keep it for different reasons, only one of which may be for growing timber.

All these factors combined produce complex patterns of land ownership and complex situations which strongly influence public and private programs for management. Studies in land ownership furnish knowledge about the people who own the land and of the patterns their land holdings make. This knowledge helps those who are responsible for administering land-use and land-manage-

ment policies of forest land to do a better job.

Research in this subject is relatively new and the methods are still somewhat experimental. Most of this research has been done since about 1940. Two of the most recent studies were conducted in the South and in New England;¹ still another is now in progress in California.

This study differs from most other land-ownership studies in that it is an extensive type of survey designed to cover an area involving millions of acres. It was begun in 1947 as part of the regular Nation-wide Forest Survey made by the Forest Service which, in California, is being conducted by the Division of Forest Economics of the California Forest and Range Experiment Station. To obtain a more detailed consideration of privately owned forest land than had been possible in previous forest surveys, the Forest Service entered into a cooperative agreement with the Bureau of Agricultural Economics to have the Bureau assist in the gathering, compiling, and interpreting, of land-ownership data.

The ownership study was originally set up to cover all of the forest, range, and farm-forest land in California, estimated to be about 45 million acres. At the moment, work has been completed for an area of about 19 million acres, and tabulations for statistical and other reports are in progress, by counties and by forest regions.

The tables shown here are typical of a more elaborate series usually prepared for a complete statistical report for a county or forest area. Figures for Mendocino County are used because this county contains a sufficient number of owners of forest land and a forest acreage large enough to be representative of situations typical of certain forest areas in California. Furthermore, a previous and somewhat similar study was made for a large part of this county—but it was on a non-sample basis.² Figures from this earlier study were available for comparison with those derived through sampling procedure.

¹ JAMES, LEE M. DETERMINING FOREST LAND OWNERSHIP AND ITS RELATION TO TIMBER MANAGEMENT. *Jour. Forestry*. 48(4): 257-260. April 1950.

BARRACLOUGH, SOLON, and RETTIE, JAMES C. THE OWNERSHIP OF SMALL PRIVATE FOREST-LAND HOLDINGS IN 23 NEW ENGLAND TOWNS. *Northeastern Forest Experiment Station, Upper Darby. Station Paper No. 34.* March 1950.

² POLI, ADON, and GRIFFITH, DONALD T. FOREST LAND OWNERSHIP IN NORTHERN MENDOCINO COUNTY, CALIFORNIA. *California Forest and Range Experiment Station, Berkeley.* (Forest Survey Release No. 5.) June 1, 1948.

Line-Sampling Procedure³

Conventional methods of obtaining data on ownership could not be employed because of the vast acreage involved. However, the public records in California, especially those of the assessor and tax collector, are such that an experienced person can derive considerable reliable basic data of the kind desired. But the existence of county plat maps showing the land of all owners in the county mapped in place made possible the line-sampling technique devised for this study. In utilizing these plat maps for the ownership study, parallel lines spaced 2 miles apart are drawn east and west on base maps. Then intercepts of ownership boundaries, as shown on the county plat maps, are marked along the parallel lines, and the proportion of the total line traversing an ownership class is taken as the proportion of the total acreage in that particular class. The acreage so obtained is an estimate of the true area within each ownership class. This acreage can be reclassified further by measuring the intercepts of the various vegetation and timber-stand classifications used in the Forest Survey.

In the regular process of selecting the ownership sample from the county plat maps, intercepts of ownership boundaries are placed on base maps. The names of owners of properties intercepted by the sample lines are recorded on cards and are keyed by numbers to each individual line segment shown on the base maps. Each county tax collector's office in California has an index that lists the names of all recorded property owners and the parcels of land they own in the county. The names of the sample owners are located in this index and each parcel of land is listed. Other related information is then obtained from the regular property-tax rolls which accompany the tax collector's index. By using these property records one can readily obtain the address of the owner, and the acreage, legal description, and assessed value of each parcel of land. Information from this source is used to classify private ownerships and land area by size and individual owners by residence.

The next step is to learn how the land is used, how and why the present owner acquired it, why he holds it, and his principal occupation. To each

³ For a more complete appraisal of the statistical reliability of the line-sampling technique than is given here, see HASEL, A. A. and POLI, ADON, A NEW APPROACH TO FOREST OWNERSHIP SURVEYS. *Land Economics* 25 (1):1-10. February 1949.

owner, at the address obtained from the tax rolls, is mailed a simple, return-stamped, self-addressed questionnaire card containing a check list on which the questions can be answered with practically no writing. Complete replies were received from about one-third to one-half of the owners selected in each county. Information pertaining to land of non-respondents is obtained by a field follow-up, in which key informants are questioned in local public offices and in the communities where owners have their land. Sufficient information was obtained from the questionnaire cards and field interviews to classify from 94 to 100 percent of all owners of rural land and the total land area in Mendocino County.

Reliability of Estimates

The earlier, nonsample study provides a check as to accuracy of the estimates.⁴ Data obtained then are reasonably comparable with those gained by the present study, although some change has undoubtedly occurred since the first study was made. As size of ownerships seemed the least likely to have changed appreciably during the interval it is given here for comparative purposes.

Table 1 illustrates how figures derived through the line-sampling procedure for the whole county compare, generally, with those obtained from the earlier complete survey of almost two-thirds of the county. Despite the difference in time and area covered by the two surveys there is enough similarity in these distributions to indicate that figures derived by line sampling are generally in line with those obtained by total area coverage. The obvious discrepancy in the percentage acreage figures of the 20,000 to 29,999 size class is explainable, to some extent, by the differences in the size of the areas covered in the two studies. The size classification used in 1944 is based on acreage owned in only two-thirds of the county, whereas the 1948 classification is based on acreage owned in all the county. Some of the large ownerships that had acreages extending into that third of the county not covered by the 1944 survey naturally would shift into the next higher group in the 1948 classification, and would increase the acreage in that group accordingly.

Table 2 compares actual known acreages of three major public ownerships with estimates derived by

⁴ Poli and Griffith, *op. cit.*, June 1, 1948.

TABLE 1.—Percentage distribution of private ownerships and privately owned land in Mendocino Co., Calif., by size of ownership, 1944 and 1948

Size of ownership (acres)	Number of ownerships		Land area	
	1944 ¹	1948 ²	1944 ¹	1948 ²
	Percent of total	Percent of total	Percent of total	Percent of total
0 - 179	73.2	72.3	10.3	12.0
180 - 379	11.0	11.7	6.1	7.2
380 - 699	6.8	5.9	7.4	7.6
700 - 1,299	3.7	3.6	7.4	6.5
1,300 - 2,599	2.5	3.3	9.4	12.3
2,600 - 4,999	1.3	1.7	9.7	11.5
5,000 - 9,999	0.7	0.7	10.2	8.5
10,000 - 19,999	0.5	0.5	12.0	11.9
20,000 - 29,999	0.2	0.1	12.5	3.1
30,000 and over	0.1	0.2	15.0	19.4
All classified ownerships	100.0	100.0	100.0	100.0

¹ Based on complete coverage of 61.9 percent of the total county area.

² Based on line-sampling procedure for the entire county.

line sampling, using a 2-mile spacing. These estimates are reasonably close to actual acreages, considering the relatively small area involved in each ownership.

Examples of Information Obtained

Two general types of data were obtained in the study of forest ownership. The first pertained exclusively to ownership and included such items as the methods and purposes of acquisition, operating tenure, land use, occupation, and residence of the owner. The second, and probably more significant, were those that integrated the data on ownership with the forest-inventory data that were obtained by the foresters in connection with the regular Forest Survey. These cross-tabulations were greatly facilitated by the use of machine tabulation from punch-cards. Because of the extensive nature of the study, the resulting information is somewhat generalized and should not be used as conclusive evidence of the cause or effect of certain conditions present in a local area. On the other hand, the data can be used advantageously to show the general over-all ownership patterns of the forest regions and to reveal certain localized conditions that are in need of further observation and perhaps more intensive study.

For example, forest-land area by types and sizes of ownership can be segregated into acreages of various kinds of forest land as in tables 3 and 4. Figures from table 3 show that most of the land (including the best timberland) of this county is

TABLE 2.—Difference between estimated and actual land area of major types of public ownerships in Mendocino Co., Calif., 1948

Type of public ownership	Estimated land area by line sampling method	Actual land area from records of agencies listed	Difference	
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Percent</i>
National Forest	173,552	166,939	6,613	3.96
Public Domain	164,688	162,220	2,468	1.52
State Forest	50,461	52,304	1,843	3.52
All types	388,701	381,463	7,238	1.90

in private ownership. On basis of land acreages controlled, range livestock farming and timber operations are dominant industries, with livestock farmers controlling a large share of the acreage of commercial timberland. The relatively low proportion of timberland remaining in old growth and the high proportionate acreage of young growth as revealed by figures from another table not shown here suggests a past policy of too rapid depletion of physical timber inventories, which may result in an early end of the operations of some of the lumbermen now working there. Similarly, the large proportion of nonstocked timberland of range-livestock farmers who, as a group, control much valuable timber acreage, suggests the existence of land-management policies that are unfavorable to

regrowth of timber in a large proportion of the area. A special study might be made to analyze this situation in detail.

Relationships between size of holdings and kind of timberland within each size class were also explored. The largest ownerships consist almost entirely of commercial timberland, but much valuable timberland is found in many ownerships that are usually considered too small for efficient management of timber. This might suggest the consideration of a land program designed to deal with the management of these small holdings of timber.

The ownership of much timberland by many non-resident owners, some of whom live far from the State, discloses the possibility of a special problem in the formulation of unified policies and programs for forest-land management in this county. Communication with nonresident owners is usually difficult, and they are often indifferent toward local programs for land improvement.

The analysis of the data obtained from the questionnaires and field interviews also revealed that purchase, inheritance, and homesteading, were the leading methods by which owners had acquired private lands in Mendocino County. The timber operators had bought nearly all of their land; others had procured theirs by this and other methods. Farming, residence, and recreation were major reasons for getting land, but some owners were also

TABLE 3.—Major classes of land in Mendocino Co., Calif., by type of ownership, 1948

Type of ownership	Major classes of land				
	Total land area		Commercial forest land ¹	Noncommercial forest land	Nonforest land
	<i>Acres</i>	<i>Percent</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
National Forest	173,552	7.7	92,598	69,052	11,902
Indian Land	21,036	0.9	10,393	3,981	6,662
Public Domain	164,688	7.3	54,714	102,396	7,578
State Park	600	—	—	62	538
State Forest	50,461	2.2	48,435	1,725	301
Tax Deeded	46,603	2.1	40,592	4,516	1,495
Other State	1,334	0.1	171	334	829
County and municipal	2,848	0.1	1,884	620	344
Timber operating company	330,812	14.7	321,796	4,735	4,281
Timber holding company	76,167	3.4	71,281	3,133	1,753
Timber operating individual	41,596	1.9	35,660	4,574	1,362
Timber holding individual	87,057	3.9	72,865	11,094	3,098
Range livestock farming company	77,686	3.5	37,536	22,845	17,305
Range livestock farming individual	766,493	34.1	333,644	266,689	166,160
Other farmers	127,437	5.7	49,097	38,292	40,048
Recreational property owners	113,247	5.1	71,451	34,023	7,773
Other classified owners	94,204	4.2	53,904	27,618	12,682
Other unclassified owners	70,579	3.1	8,528	14,092	47,959
All types	2,246,400	100.0	1,304,549	609,781	332,070

¹ Commercial forest lands were further classified according to the age class of the timber, recognizing the following classes: (1) Old growth, (2) old growth-young growth, (3) young growth-old growth, (4) large young growth, (5) small young growth, and (6) nonstocked.

TABLE 4.—*Privately owned land in Mendocino Co., Calif., by major classes of land and by size of ownership, 1948*

Size of ownership (acres)	Ownerships		Major classes of land				
			Total land area		Commercial forest land	Noncommercial forest land	Nonforest land
	<i>Number</i>	<i>Percent</i>	<i>Acres</i>	<i>Percent</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
1 - 179	2,338	72.3	204,914	12.0	116,411	54,838	33,665
180 - 379	379	11.7	122,862	7.2	67,500	35,174	20,188
380 - 699	191	5.9	130,234	7.6	70,012	41,271	18,951
700 - 1,299	117	3.6	110,943	6.5	63,083	30,221	17,639
1,300 - 2,599	107	3.3	211,049	12.4	104,179	67,538	39,332
2,600 - 4,999	54	1.7	197,072	11.5	101,270	56,579	39,223
5,000 - 9,999	23	0.7	146,001	8.5	77,355	40,493	28,153
10,000 - 19,999	16	0.5	203,422	11.9	123,737	44,738	34,947
20,000 - 29,999	2	0.1	52,386	3.1	35,745	10,170	6,471
30,000 - 49,999	4	0.1	133,703	7.8	91,865	28,915	12,923
50,000 and over	2	0.1	197,358	11.5	193,441	1,647	2,270
All classified ownerships	3,233	100.0	1,709,944	100.0	1,044,598	411,584	253,762
Unclassified ownerships	—	—	75,334	—	11,164	15,511	48,659
Total acreage	—	—	1,785,278	—	1,055,762	427,095	302,421

TABLE 5.—*Major land use of privately owned land, Mendocino Co., Calif., 1948¹*

Major land use	Ownerships		Land area	Average size	Percentage distribution	
					Ownerships	Area
	<i>Number</i>	<i>Acres</i>	<i>Acres</i>	<i>Percent</i>	<i>Percent</i>	
Timber operations	105	327,122	3,115	3.2	19.1	
Farming	1,148	712,695	621	35.5	41.7	
Recreation	330	64,919	197	10.2	3.8	
Residence	432	26,088	60	13.4	1.5	
Idle	1,006	186,832	186	31.1	10.9	
Other uses and combinations of 2 or more	212	392,288	1,850	6.6	23.0	
All uses	3,233	1,709,944	529	100.0	100.0	

¹ Because of space limitations, only a condensed version of the complete tabulation by major land use is given here. The basic tables show both land use and purpose of acquisition by size of ownership classes.

speculators who hoped to resell at a profit. Those who intended to operate timber enterprises generally favored larger holdings; those who had recreation or residence in mind generally got smaller acreages.

Table 5 indicates that many of these owners followed through with their original proposed use, but almost one-third have not as yet achieved their original aim, and so their land is idle. A few apparently have deviated from their original intention and are using their land for other purposes. This is suggested in part by the fact that a larger

number of owners now actually have timber operations under way than had originally intended to use the land this way when they bought.

Generalized observations like these, although perhaps not conclusive evidence of "what is" and "what is not," do provide clues as to why certain conditions exist. Extensive surveys like this one are useful in showing the broad general picture of a large county, area, or State, and in revealing critical areas in which further intensive study of ownership and management of forest land is desirable.