

FOREST SERVICE
U.S. DEPARTMENT OF AGRICULTURE
P.O. BOX 245, BERKELEY, CALIFORNIA 94701

PACIFIC SOUTHWEST Forest and Range Experiment Station

CAMPGROUND USERS...a computerized method for summarizing where they come from and how long they stay

Gary H. Elsner

*USDA Forest Service
Research Note PSW-258
1971*

Information on the residence of outdoor recreationists would benefit planners, managers, and researchers. For campground owners and managers, the data are useful in understanding what population areas their recreation sites are serving. For regional planners, such information is helpful in determining overlapping and missing market areas served by a system of recreation sites. Furthermore, the information is useful in studying geographical patterns of recreation use and in tracing the impact of specific population centers on such use.

Much information is already recorded each year—for other purposes—which can be useful in determining point-of-origin and length-of-stay. Typically, the information exists in permits issued to users of campgrounds that charge a fee.

A new computerized method has been developed to obtain information about campground visitors on National Forest lands. It can rapidly estimate and summarize data on county-of-origin and length-of-stay from campground permits. The method ought to be equally useful for private campground owners. The main considerations are that the basic source material be available and can be processed according to the prescribed format. The data may be obtained by means other than through campground registration or questionnaires.

The computer programs described are available upon request to: Director, Pacific Southwest Forest and Range Experiment Station, P. O. Box 245, Berkeley, California 94701, Attention: Computer Sciences Librarian. Include with your request a standard seven-track, one-half-inch computer tape at least 1,200 feet long. The tape will be written in UNIVAC EXEC II Symbolic CUR format.

Also available upon requests are supplements to this note that explain...

- Relationships between ZIP code areas and counties.

Abstract: A computerized method for gathering market area information from campground permits has been developed. Point-of-origin and length-of-stay of campground users can be estimated and summarized quickly and inexpensively. The method should be equally useful for public as well as private campgrounds—provided basic registration data are available and can be processed according to the prescribed format.

Oxford: 907.2—U796.4—U002.4:U681.3.

Retrieval Terms: forest recreation; campground users; market analysis; campground planning; computer programs.

- Assumptions and rules used in handling incomplete data on forms.
- Instructions on keypunching data.
- Instructions on setting up data decks and computer jobs.

METHOD

In general two types of actions are required in the process: (1) data preparation, including editing, keypunching, and verifying; (2) using computer programs to determine county residence, calculate length-of-stay, and print summary tables (*fig. 1*).

(I) Data Preparation

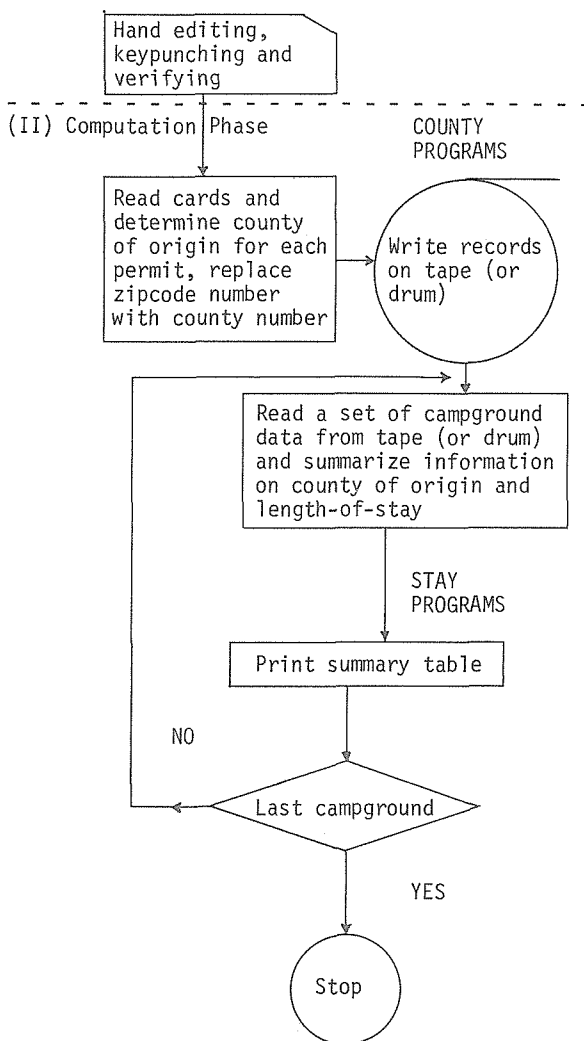


Figure 1—Work-flow in using the MARKET computer programs to estimate and summarize recreation use information from campground permits.

Data Preparation

After permits have been collected during the season and placed in an envelope marked with the campground's name (and National Forest) they are first sorted into groups, by camp unit number. If the unit number is missing from a permit or cannot be deciphered, the permit is not considered in the analysis. Permits are then sorted within each unit according to date. If more than one permit was completed by a group (as indicated by the same camp unit number, license, and ZIP code), all are stapled together. This occurs from some one-day permits since campers may be required to fill out a new permit each day of their stay. The earliest and latest dates on all these permits are recorded on the top permit—and only that permit is used in keypunching.

Computation

The computer programs actually consist of two sets of programs: The first, controlled by the subroutine COUNTY, estimates the county in which the recreationist resides; and the second, controlled by the subroutine STAY, calculates and prints summary information on number of visitors and lengths-of-stay from each county for which some use originated. Both sets of programs are activated by the MARKET mainline program.

To determine county of residence, it was necessary to relate ZIP code areas¹ to county areas, which are generally quite different.

Unfortunately campers often leave some part of the permit incomplete.² This problem is so widespread that special attention was devoted to constructing a set of reasonable assumptions, rules, and methods for dealing with the problem as satisfactorily as possible. The manner in which these rules are programed allows them to be easily refined and increased in complexity. The STAY programs use these assumptions and rules when necessary. For instance, when the "number of people in party" is not recorded on the permit the number is assumed to be the average number of people per party for permits with this information recorded. And similarly, when the length-of-stay computed from incomplete data—with reasonable assumptions—exceeds the longest length-of-stay for permits with complete data, then it is assumed to be equal to the average length-of-stay for permits with this data complete.

All registration permits (18,852) from 20 Forest Service campgrounds in California were collected and used in developing and testing the programs and methods described in this study. About 45 percent of

the keypunched permits had at least one item of requested information missing.

Most campgrounds had about the same percent of permits with any particular item not recorded. For example, the ZIP code was not recorded on 23 percent of the total permits. Eagle campground had only 15 percent of this information omitted, while Hirz Bay had the highest percent (40) missing. Part of the permits used were of an older form which did not request the ZIP code. The new forms all ask for ZIP codes. Therefore the range of missing information on this item will be even more narrow in future years.

The arrival date was more often completely recorded than the departure date (*table 1*). For instance, the arrival month was only missing from 6 percent of the permits; the departure month was missing from 14 percent of the permits.

RESULTS

The STAY programs summarize the permit information and produce a brief report for each campground. This report has five columns of information on counties contributing some use to the campground. The COUNTY programs determine county of residence for all counties in California, Arizona, Nevada, and Oregon. Other ZIP codes are identified

only by State. All counties in selected other States, particularly in the West, will have information about the county corresponding to the ZIP code added to the COUNTY programs.

The five columns of figures provided data on how many permits were analyzed from each county, the number of people and the percent of total people (visitors) from each county, and estimates of total occupancy days from each county and the percent of total occupancy days of use for the campground (*fig. 2*). An occupancy day is defined as one person occupying a camp unit for 24 hours.

Additional information is contained in the six lines following the body of the table. These lines include summary statistics on average length-of-stay per group as well as information on the average and maximum number of people per group.

Even if the assumptions developed for handling incompletely filled out permits are applied, it is often impossible to use each permit in summarizing market area and length-of-stay estimates. The residence of the user cannot be estimated by this method unless the ZIP code is correctly recorded. The fourth line following the table states how many permits had unusable ZIP codes. This number can then be compared with the total results analyzed (column 1) to determine what percent were used. For example,

Table 1—Registration items not recorded on 18,852 California campground permits, by campground

Campground	Number of people	Arrival				Departure				ZIP code
		Month	Day	Hour	AM-PM	Month	Day	Hour	AM-PM	
	Percent									
Table Mountain	6	5	4	13	11	26	25	41	36	19
Burnt Rancheria	19	6	5	25	24	8	7	33	30	29
Twin Lakes	22	12	10	27	26	25	23	43	38	33
Gray's Meadow	8	7	6	15	14	10	10	31	23	22
O'Neil Creek	5	4	4	9	9	12	12	28	22	16
Eagle	5	5	4	18	15	9	8	39	30	15
Almanor	4	4	3	9	8	8	8	27	21	16
Potatoe Patch	8	7	6	15	14	9	8	34	28	24
Sunset	26	12	11	35	33	15	15	44	39	39
Lone Rock	7	6	5	11	11	11	10	31	24	17
Chilcoot	11	4	4	17	14	12	11	31	25	25
Coldbrook	7	9	7	46	45	32	31	53	50	22
Marion Mountain	8	6	4	14	11	9	8	21	15	22
South Fork	12	6	6	17	15	13	13	26	23	24
Hirz Bay	31	4	3	36	35	25	25	51	46	40
Fawn	16	4	4	20	18	16	16	35	31	26
Oak Grove	18	3	2	21	20	18	18	32	28	30
Dorabelle	7	6	4	13	11	9	8	28	20	21
Indian Valley	2	5	2	8	7	11	10	27	23	17
Indian Springs	3	4	2	7	7	8	7	22	19	17
Average percent missing	11	6	5	19	18	14	14	34	29	23

DORABELLE CAMPGROUND SIERRA NATIONAL FOREST					
ORIGIN	NUMBER OF PERMITS	NUMBER OF PEOPLE	PERCENT OF TOTAL PEOPLE	AMOUNT OF USE (O/D)	PERCENT OF TOTAL USE
CALIFORNIA COUNTIES					
ALAMEDA	13	57	1.81	323.1	2.11
CONTRA COSTA	1	2	.06	2.4	.02
FRESNO	88	413	13.09	1770.0	11.58
IMPERIAL	1	6	.19	21.0	.14
INYO	1	14	.44	54.2	.36
KERN	38	170	5.39	749.1	4.90
KINGS	15	67	2.12	338.5	2.22
LAKE	1	2	.06	23.5	.15
LOS ANGELES	322	1479	46.88	8214.2	53.76
MADERA	3	9	.29	31.3	.20
MARIN	1	5	.16	2.1	.01
MERCED	3	10	.32	19.8	.13
MONTEREY	5	16	.51	71.6	.47
ORANGE	53	271	8.59	1075.4	7.04
RIVERSIDE	10	36	1.14	210.6	1.38
SAN BERNARDINO	17	88	2.79	262.6	1.72
SAN DIEGO	17	69	2.19	298.8	1.96
SAN FRANCISCO	2	10	.32	22.0	.14
SAN LUIS OBISPO	5	18	.57	56.9	.37
SAN MATEO	8	38	1.20	101.0	.66
SANTA BARBARA	9	40	1.27	196.3	1.28
SANTA CLARA	19	80	2.54	183.7	1.20
SANTA CRUZ	1	8	.25	57.3	.38
STANISLAUS	2	9	.29	45.1	.30
TULARE	14	55	1.74	252.5	1.65
VENTURA	27	140	4.44	740.7	4.85
ARIZONA COUNTIES					
MARICOPA	1	7	.22	35.6	.23
YUMA	1	6	.19	55.2	.36
OTHER STATES					
FLORIDA	1	7	.22	14.6	.10
INDIANA	1	8	.25	13.3	.09
IOWA	1	2	.06	7.9	.05
NEW YORK	1	2	.06	3.3	.02
PENNSYLVANIA	1	2	.06	3.8	.03
TEXAS	1	6	.19	12.7	.08
VIRGINIA	1	3	.10	9.6	.06
TOTAL	685	3883	100.00	18273.6	100.00
AVERAGE LENGTH OF STAY IN OCCUPANCY DAYS PER GROUP					4.62
AVERAGE NUMBER OF PEOPLE PER GROUP					5.67
MAXIMUM NUMBER OF PEOPLE PER GROUP					17
205 PERMITS LACKED USABLE ZIPCODES.					
99 % OF PERMITS WITH USABLE ZIPCODES HAD USABLE OCCUPANCY DATA.					
THE 132 DAY SEASON ANALYZED WAS FROM 18 JUN 70 THRU 27 OCT 70.					

Figure 2—Example of a summary table that can be produced by the STAY computer programs. This table is for Dorabelle Campground, Sierra National Forest, California.

fig. 2 indicates that 77 percent of the permits were used, i.e., $685/(685 + 205) = 0.77$. The next to the last line notes what percent of the permits with usable ZIP code data also had usable occupancy data.

The STAY program also automatically prints the camping season, as indicated by the earliest and latest dates on the permits both in terms of total days in the season and in terms of the observed starting and ending calendar dates. Actually the program considers only beginning and ending months in which more than one permit was issued. This condition rules out many erroneously filled out permits.

Dorabelle Campground—used as an example in fig. 2—is about 282 miles northeast of Los Angeles. About 47 percent of the people who visited it came from Los Angeles, while more than 53 percent of the use was contributed by visitors from Los Angeles. Whereas, the county in which the campground is located—Fresno—contributed about equal percents of visitors and occupancy days. One might expect that the further campers travel the longer they will stay, but only with this kind of information can we start to quantify the relationships and pinpoint the exceptions.

Acknowledgments: The over-all design and assumptions incorporated in the computer programs described in this note resulted from discussions with Warren W. Walters and Carl G. Westrate, both of the Division of Recreation, California Region, Forest Service, U.S. Department of Agriculture, San Francisco, Calif. The programs and correspondence between ZIP code and county were developed and tested by Mrs. Kathleen J. Wigton, with the advice of Michael R. Travis, both of the Forest Recreation research staff, Pacific Southwest Forest and Range Experiment Station.

NOTES

¹ZIP code area definitions available in June 1971 are used by the COUNTY programs. As the definitions of these areas change and increase in number the basic data references should be modified accordingly.

²Young, Robert A. *Characteristics differ between self-registering and nonregistering campers at a campground in southern Illinois*. Univ. Ill. Agr. Exp. Sta. Forest Res. Rep. 70-6. 5 p. 1970.

The Author

GARY H. ELSNER is in charge of forest recreation and landscape management research. He earned a B.S. degree (1962) at the University of Arkansas, and M.S. (1964), and Ph.D. (1966) degrees at the University of California, Berkeley. He joined the Forest Service in 1966.



The Forest Service of the U.S. Department of Agriculture

- ... Conducts forest and range research at more than 75 locations from Puerto Rico to Alaska and Hawaii.
- ... Participates with all State forestry agencies in cooperative programs to protect and improve the Nation's 395 million acres of State, local, and private forest lands.
- ... Manages and protects the 187-million-acre National Forest System for sustained yield of its many products and services.

The Pacific Southwest Forest and Range Experiment Station

represents the research branch of the Forest Service in California and Hawaii.