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FOREST RECREATION RESEARCH AT THE PACIFIC SOUTHWEST  
FOREST AND RANGE EXPERIMENT STATION

By  
Robert H. Twiss<sup>1/</sup> and Harry W. Camp<sup>2/</sup>

ABSTRACT: As a land use, an activity, and an industry, forest recreation is rapidly growing in importance. But it is relatively new in terms of objective data and theory. Critical problems are being met by an interdisciplinary research team drawing on seven fields of knowledge. Research problems, approaches, studies, and plans are summarized.

Outdoor recreation is a major forest use and a growing industry. Most planners and natural resource managers have some subjective knowledge of recreation problems, but they often are hard pressed for objective data for plans and investments. Fortunately, definitive knowledge is accumulating rapidly through administrative studies, experience, and research.

Still, wide gaps exist in our knowledge of this field. This lack of knowledge affects the businessman wondering if he can "make a go" of his new recreation venture; it hinders the banker or government agency underwriting development. Further, lack of information hampers the community that wonders what forest recreation offers in terms of economic stability. It impedes the private or government resource manager who wants to integrate recreation into his management plans. Finally, it affects directly the quantity and quality of recreation resources and facilities available to the public.

<sup>1/</sup> Acting project leader, recreation research.  
<sup>2/</sup> Assistant director for resource use and recreation research.

Outdoor recreation poses an especially important challenge in land use in California, because much of the State's development can be attributed to the amenities of climate and landscape and to opportunities for recreation. These recreation resources help new industries in metropolitan centers to attract competent managers, scientists, and skilled workers. More directly, recreation supports many concessions, resorts, and service facilities in forested areas.

### Problems

A great potential exists for an expanding recreation-based industry and for continued recreation of high quality. But some critical problems must be overcome if we are to meet the needs of forest visitors, resolve conflicts in land use, and develop plans to relieve economic and social side effects that may attend the recreation industry. Crowding is one problem. For example, skiers sometimes must often endure long waits at ski lifts on California's National Forests, but adding more facilities to overcome crowding would be done in the face of radical seasonal fluctuation in use. The very area that is so crowded at the height of the season, may stand idle for most of the year.

Recreation may prove to be an important source of economic growth because it is an expanding industry. New recreation developments should attract private enterprise and private capital. But many preconditions to successful enterprise have in the past often been overlooked. These need careful consideration in the future. About 44 percent of all business failures in the United States are associated with a lack of knowledge or experience (Dun & Bradstreet n/d). That is, problems stem not so often from natural disaster, fraud, or neglect, but more often from an apparent lack of prior information on such factors as market capacity, competition, and location. Research may be of help to the businessman, and some studies at this Station have been planned with this in mind.

Forest visitors, by their sheer numbers, can overtax facilities. At many popular recreation sites, prolonged use has worn away screening vegetation to the point where campers must improvise with canvas and blankets to get some degree of privacy. The result usually has a drastic effect on the esthetics of the area. Human activity can hinder natural regeneration of screening vegetation. In one heavily used forest campground, for example, fir trees over 35 years old were less than 22 inches high (Magill 1962).

### The Future

Looking ahead, we can see a rising demand for forest recreation. By 1975 California's population may exceed 24 million--an increase of 60 percent.<sup>3/</sup> Per capita income should be up 25 percent. Our propensity to travel may double at least. Free time available for recreation should increase by about 15 percent (California Public Outdoor Recreation Plan Committee 1960).

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<sup>3/</sup> California State Chamber of Commerce. Economic Survey Series 19, 1 p., 1962.

This means that a general trend of rapid growth of outdoor recreation can be anticipated, but it does not necessarily follow that more and more of the presently important types of facilities must be provided. The picture is far more complicated. Participation in most outdoor recreation activities tends to increase as family income increases--as it does, for example, with sightseeing, boating, and many other activities; on the other hand, participation in camping appears to level off and then drop for families with per capita incomes over 2,500 (Outdoor Recreation Resources Review Commission 1962).<sup>4/</sup> Thus, future changes in population and levels of per capita income may elicit a complicated pattern of response for camping and some other activities. Elementary "straight line" projections are apt to be highly misleading. More information and more complete models of recreation behavior are needed if resource managers, businessmen, and planning groups are to have the data they need for making rational decisions. This is especially important if limited funds are to be invested to best advantage in providing for recreation activities that will be in greatest demand in the future.

#### Research Approach

To meet the increasing requirements for knowledge about recreation and the resources, people, and institutions involved, scientists from many disciplines must be employed. Accordingly, this Station's forest recreation research team has been expanded to include scientists trained in ecology, forestry, econometrics, economics, sociology, psychology, and resource planning. This team is conducting and planning both specialized and interdisciplinary studies.

An attempt is being made to view forest recreation problems in terms of dynamic planning processes, so as to better key research results to administrative and business decisions (Gould 1961).

#### Current Work

Specifically, in the field of ecology, we have conducted a comprehensive survey to determine the condition of soil and plants on 137 campgrounds and picnic areas within 13 National Forests throughout California. Two of the most common problems found were soil compaction, and lack of adequate vegetation between campsites. Follow-up studies have used the "pantallometer," a new instrument which we developed specially to give a quantitative indication of screening density, and the soil penetrometer, a device used to measure soil penetration resistance.<sup>5/</sup> From these studies we are seeking to develop guidelines for use in campground site selection and rehabilitation.

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<sup>4/</sup> A per capita family income of \$2,500, would equal a total family income of about \$8,000.

<sup>5/</sup> Nord, Eamor C., and Magill, Arthur W. A device for gaging campground screening. Journal of Forestry (in press).

Potential conflicts in the use of forest lands for timber production and recreation have been analyzed for three National Forests in California (Amidon and Gould 1962). While we hear much talk about how serious such timber-recreation conflicts could become, this careful study indicates that even if recreation capacity were increased to its maximum potential--about 10 times the present level--only a 13 percent reduction in sustained yield timber capacity would result.

Other studies now in progress will estimate the amount of forest recreation use, and measure patterns of users' behavior (Marcus, Gould, and Bury 1961). Because, in most cases, recreation use is dispersed over wide areas with only minimum control over local movement, it is difficult to know within reliable limits how many people are using such facilities as campgrounds, beaches, roads, and trails. Yet knowledge of the amount of use is important to the planning and design of facilities.

Extreme fluctuation in use is one of the principal features of the recreation business, and it would be beneficial if we could better understand and predict changes in levels of attendance and types of use. Direct counting or censusing of use is ~~so~~ expensive and time-consuming that we have been developing and testing various indirect measures or indices of forest use against actual on-the-ground counts. Most visitors come by car. Pneumatic traffic counters were tested, and found to have marked shortcomings, especially in snow and on unsurfaced roads. On the other hand, measures of waterflow through campground water supply systems and some other indices have yielded estimates that come within 20 percent of actual count.

We are finding that we could estimate attendance in groups of campgrounds within a given district by counting attendance in only a few of them. With the statistical procedures developed, we could in one case estimate reliably campground attendance in an entire ranger district by counting use on only one campground that was found to be representative of the district.

Recreation resources and facilities are put to a wide variety of uses, and these uses change over time. We are beginning to supplement this general view with quantitative data that will help in planning recreation investments. For example, our researchers found that campsites designed as single-family, single-car units were actually serving multi-family groups in 20 percent of the cases surveyed. In the forest campgrounds studied, nearly one camping group in five brought a trailer or coach even though utility connections were not available. Although nearly everyone used the camp tables provided, only about half of the campers surveyed used the fire grates--relatively expensive items. These studies show that managers will want to continually re-evaluate their facilities, and stress flexibility in design to meet changing needs.

## Plans

We plan to continue studies on the natural features of recreation areas, and especially to provide ecological data for improved campground site selection and rehabilitation. We are continuing to study ways of estimating the amount of recreation use and interpreting the changing tastes in recreation in order to provide practical guides for recreation planners and managers.

In addition, we are planning a comprehensive study of outdoor recreation and its relationship to population growth, metropolitan planning, and rural area development. Studies of the economic, resource-management, and social aspects of recreation will seek to provide useful guides for resource managers, entrepreneurs, forest communities, and regional planning groups.

The aims of forest recreation research at this Station are to provide the basic information that will help to (a) meet the public's growing needs for diversification and freedom of choice in forest recreation; (b) accomplish recreation growth within the context of an informed and healthy economy; and (c) within this general picture of growth safeguard the forest environment for continued recreation of high quality.

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1. A numbered series, U.S. Forest Service Research Papers.
2. A numbered series, U.S. Forest Service Research Notes.
3. A numbered series, U.S. Forest Service Resource Bulletins.

The publishing unit will be identified by letters before the number, and the numbers will be consecutive in the order of publication dates. For example, this Station's first Note in 1963 is designated U.S. Forest Service Research Note PSW-1. Certain miscellaneous material, such as annual reports and experimental forest guides, will continue to be issued as unnumbered, nonserial publications.

The Research Note series formerly published by this Station closed with the release of Research Note No. 211, 1962.