



**US Army Corps
of Engineers**

Waterways Experiment
Station

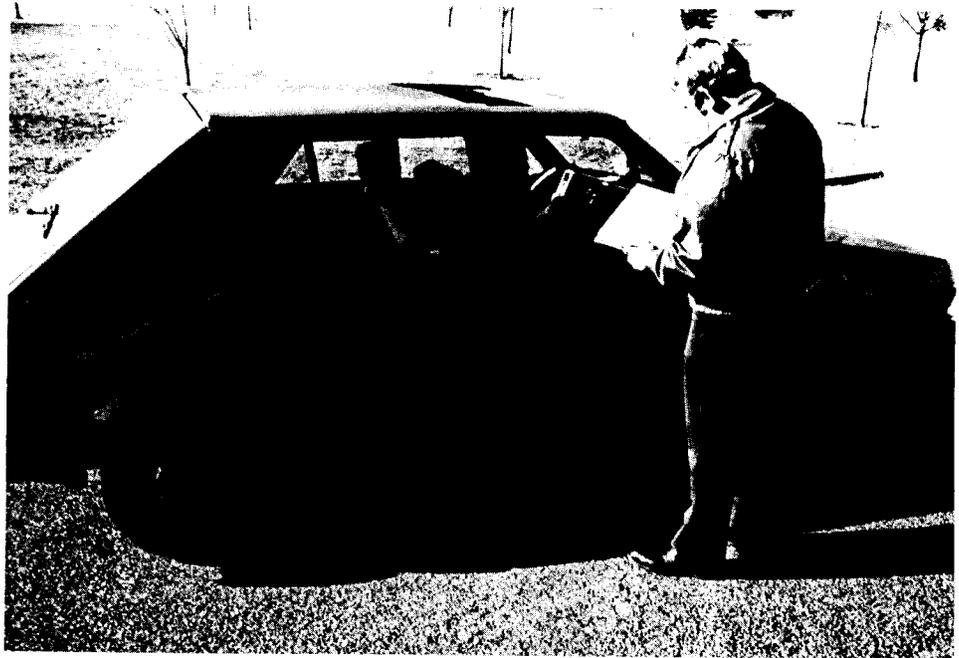
RECNOTES

NATURAL
RESOURCES
RESEARCH
PROGRAM

VOL R-84-3

INFORMATION EXCHANGE BULLETIN

MAY 1984



ABSTRACT—Engineer regulations require annual statistical reports of project visitation as part of the Natural Resources Management System. The data are also useful for managers and planners. Discussions include methods for estimating recreation use, selecting and calibrating traffic-count meters, using in-house versus contract traffic-stop surveyors (shown above), and applying visitation information.

SOME THOUGHTS ON USE-ESTIMATION SURVEYS

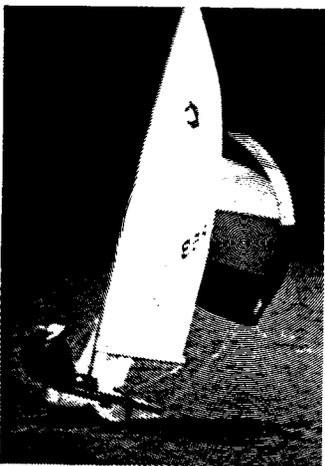
M. Kathleen Perales

Environmental Resources Division, EL

“Reading the meters” is a time-consuming task for many project personnel. Many a mile is logged by the time all the meters are read and the readings are carefully recorded. The readings are manipulated to create a monthly visitation report. Yearly visitation totals are processed through Corps districts and divisions to the Office, Chief of Engineers (OCE), as part of the Natural Resource Management System. Unfortunately, in many instances, the hours of fieldwork and number crunching are overshadowed by procedural uncertainties and undocumented adjustments.

The Waterways Experiment Station (WES) became involved in developing

procedures for estimating use at Corps recreation areas by preparing a use-estimation manual in 1979 and assisting the Rock Island and Mobile districts in 1981. After a period of field testing and a number of workshops to standardize Corps visitation reporting, the survey procedures were modified to meet management information needs and OCE reporting requirements. In keeping with an Office of Management and Budget directive to standardize visitation reporting by all federal agencies, the procedures provide use estimates in visitor hours. (*A visitor hour is when one or more visitors are continuously, intermittently, or simultaneously present at an area for the*



purpose of recreation for periods of time aggregating to 60 minutes. For instance, if a group of five visitors spent one hour at a recreation area, their trip would be represented as five visitor hours. If two visitors spent one and one-half hours, a total of three visitor hours would be incurred.) The procedures also allow the continuation of estimates in recreation days, so visitation trends can be monitored. (A recreation day is defined as a person visiting a recreation area to pursue one or more recreation activities during all or any reasonable portion of a 24-hour period. For example, a party of three spending six hours at an area would count as three recreation days.)

Detailed information on reporting requirements, preparation of survey schedules, and interview instructions will be in the upcoming Engineer Regulation 1130-2-430. A brief summary of the survey procedures and insights gained through field applications are presented in this article.

METHOD FOR ESTIMATING RECREATION USE

A traffic-stop survey at individual meter locations was selected as the method best suited for estimating use at developed recreation areas with limited access. During predetermined sampling periods, all vehicles exiting a recreation area are stopped and the occupants interviewed. Survey data are recorded on Engineer (ENG) Form 4835 (formerly WES Form 2163-R). This recording form is used in conjunction with a questionnaire to ensure standardized interviews. The data are used to determine the respondents' contribution to project and area visitation. The survey results are applied to vehicle counts so subsequent use estimates can be generated from the monthly meter readings.

Meter Equipment

Magnetic loop meters are gaining wide acceptance throughout the Corps. This meter exhibits some distinct advantages over the popular pneumatic hose meter. Activation of the magnetic loop causes much less drain on the battery than does the conventional pneumatic hose, particularly during periods of cold weather. Damage by snow plows is less of a problem because the magnetic loops are embedded in the pavement, which also eliminates the problem of vandalism associated with pneumatic hoses. Magnetic loop meters provide greater accuracy in areas with wide or winding roadways. Pneumatic hoses, however, have their own advantages. They are cheaper, easier to move, and can be placed on unpaved roadways. A project can use a

mix of meter types, though it is recommended that each recreation area maintain only one type of meter.

Calibrating Traffic Meters

The meter serves as a continual monitor of the volume of traffic traveling through a recreation area. The survey form and questionnaire are used to sample the composition of the traffic crossing the meter. From the data collected, vehicles are classified as recreation, return recreation, or non-recreation vehicles. For each recreation vehicle not returning after exiting the area, information is collected on the number of people in the vehicle, length of stay, and activities in which they participated. This information is processed and load factors are developed. Load factors are calibration numbers for multiplying monthly meter readings to estimate recreation use and activity participation. Their use compensates for such factors as nonrecreation and return recreation traffic, average number of persons per vehicle, and activity participation.

Each meter on a project must have an associated set of load factors. Typically this means that a survey is conducted at each meter location. There are, however, instances where it is not necessary to conduct a survey at every meter. A recreation area having two metered exits may only require one survey site location. If the exits are close together, one could be blocked while surveys are conducted at the other. A single set of load factors would be developed and applied to both meters.

The number of surveys may also be reduced if several recreation areas are expected to have similar traffic composition and use patterns. It is possible to group similar areas and conduct surveys at a selected sample of meter locations within the group. The load factors developed from surveys at selected meters are then applied to all meters within the group. For example, project access areas might fall into three major categories: fishing access, hunting access, and fishing and hunting access, with each category having two or more metered recreation areas. One area in each category would be randomly selected and surveyed. The load factors generated from a surveyed area would then be used at all areas in the same category.

Caution should be exercised whenever areas are grouped, as the underlying assumption is that the type of use and vehicle composition in each area is identical, i.e. the proportion of recreation, return recreation, and nonrecreation vehicles, as well as the number of people per vehicle, length of stay,

and types of activities, are assumed to be equal within a group. Two areas offering the same facilities does not guarantee they have the same use patterns. Adjacent land uses (e.g., commercial and residential development), proximity to major highways, and natural features can have an effect on the traffic composition in an area and should be considered. If possible, all areas should be surveyed once. This will indicate the areas that could be grouped in later surveys. Extensive grouping solely for the sake of convenience defeats the intent of the survey procedure.

Since the survey procedure is designed to calibrate a particular meter, surveys must be repeated if the meter is moved to a different location or if use in the area or the traffic crossing the meter (recreational or nonrecreational) appears to have changed. Similarly, a survey should be conducted for any meter added to a project.

The number of survey seasons required for each meter varies depending on recreation use patterns and length of time the meter is operational in the area. Most projects require four sampling periods (seasons), though some areas within a project may require fewer. For instance, if a survey is conducted in mid July, it is assumed that the recreation use recorded is typical of the summer season. The load factors generated from that survey would not be comparable to those occurring at the same area in mid November. Therefore separate sets of load factors would be required to account for seasonal differences.

Since survey data are applied to meter readings, surveys are only useful when the meter is operational. If the meter is removed seasonally (e.g., because of winter weather conditions), there is no need to collect data for that location during that season.

SURVEYORS

Surveys can be conducted by either in-house staff or contractors. Recently in-house staffs have been responsible for data collection in the Kansas City and Vicksburg districts, while the St. Louis and Sacramento districts utilized contractors extensively. There are pros and cons to each method. Advantages of using in-house staff include increased scheduling flexibility and improved quality control. However, in-house manpower limitations often dictate the need to contract surveys. It is likely that some projects within a district are more suited to one means of data collection than the other. Similarly, during some seasons data collection may be contracted while in-house staff can be utilized during other seasons.

OTHER RESOURCE SETTINGS AND SURVEY TECHNIQUES

Traffic-stop surveys are applicable only to those areas where use can be effectively monitored by meters. This procedure will not be efficient in dispersed-use settings. For those settings, a systematic sampling technique must be developed and implemented to estimate the use contributed by each to total project visitation. Sampling procedures such as mail-back surveys related to vehicle counts or household surveys can provide visitation data in instances where traffic-stop surveys are not appropriate.

APPLICATIONS OF VISITATION INFORMATION

Data on project visitation can supply useful information for managers and planners in addition to meeting the reporting requirements. Use-estimation surveys provide an opportunity to more fully understand the visitor. For instance, a market analysis of visitors at developed areas has been done by the Kansas City District using information obtained from the traffic-stop surveys. Similarly, knowledge or data on the recreation patterns of adjacent homeowners can aid in the assessment of lakeshore management needs and problems. Visitor surveys can also be utilized to verify use of low-density recreation areas in project master plans. In addition, progress in wildlife management programs can be monitored by hunter surveys. These surveys can include not only visitation data, but information on hunter satisfaction, game sightings, and harvests.

For additional information, contact, Ms. M. Kathleen Perales, (601) 634-3779, FTS 542-3779.

RECENT PUBLICATION

Monty L. Christiansen. 1983. *Vandalism Control Management for Parks and Recreation Areas*, Venture Publishing, Inc., 1640 Oxford Circle, State College, PA 16801 (128 pages, price \$9.95).

A comprehensive examination of vandalism and its control in parks and recreation settings was prepared for the National Park Service, Park and Recreation Technical Services Division (Northeast Service Area). The book includes methods for assessing vandalism; establishing vandalism-control management objectives; and developing, implementing, and evaluating the control strategies. The appendices provide a compendium of vandalism-control techniques, a glossary of vandalism behavior, and selected references.

Nashville District Contributes Inr

Submitted by:

Jim Robbins, Park Ranger
Old Hickory Lake, Tenn.

HEAVY-DUTY PICNIC TABLES

In an effort to reduce vandalism and theft of picnic tables in recreation areas, the Nashville District has begun using heavy-duty picnic tables.

The tables are constructed of treated pine boards 4" thick and 6" to 10" wide. Weighing between 350 to 500 lb, the tables are too heavy for most thieves. They can be moved somewhat, however, by campers and picnickers, who are seldom satisfied with a permanently attached table. The tables can also be moved without dismantling if they need to be relocated to another site or used in a group for special events. The weight of the tables also eliminates a lighter table's potential for tilting and falling when two people are seated on the same side.



Costs of the material needed to build a table of this type averages between \$90 and \$175 ... a reasonable figure considering that only one such table placed at four different lakes in the Nashville District has been destroyed or stolen in the past three years.



LIFE-SAVING JUGS

Hundreds of people drown each year as on-lookers, who either can't swim or are afraid to risk their own lives at the hands of a panic-stricken victim, stand by helplessly. Many could have been saved if there had been some type of throwable, floatable object available.

The Cumberland Basin Water Safety Council has developed a simple and inexpensive way to provide a handy device for this purpose. Two one-gallon plastic jugs are tied together with 4 ft of nylon cord with a loop in the center and weighted with just enough sand, water, or gravel to make them easy to toss to a drowning person. The tops of the jugs are then glued on with rubber cement or silicone.

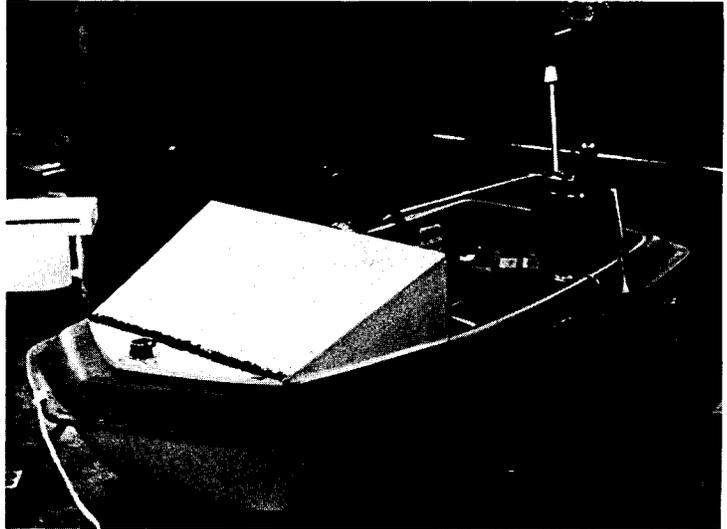
Two sets of the jugs are hung on posts placed at intervals along swimming beaches. A metal sign on the post explains their purpose and cautions people not to use them as playthings.

ovative Management Ideas

PORTABLE WATER SAFETY DEMONSTRATION

The increasing number of boating accidents and drowning fatalities is often directly related to the lack of training or instruction received by victims. Dan Hendrickson, a Corps of Engineers Park Technician on Lake Barkley in western Kentucky, suggested use of portable boating and water safety demonstration units, consisting of small boats and water safety equipment. The unit is transported in a small two-wheel trailer towed by a medium-size car or truck to campgrounds and day-use area for on-site water safety instruction.

Program topics include Boating Operations, Personal Flotation Devices, First Aid, Navigation Aids, CPR, and Knots. The highlight of the program is a hands-on demonstration using a small (39 in. wide × 84 in. long) fiberglass boat. Powered by fisherman's trolling motor, this craft safely introduces trainees to actual on-the-water boating procedures, boat-handling exercises, and boating safety requirements.



This portable unit allows an instructor to reach large numbers of people who are actively using water recreation facilities.

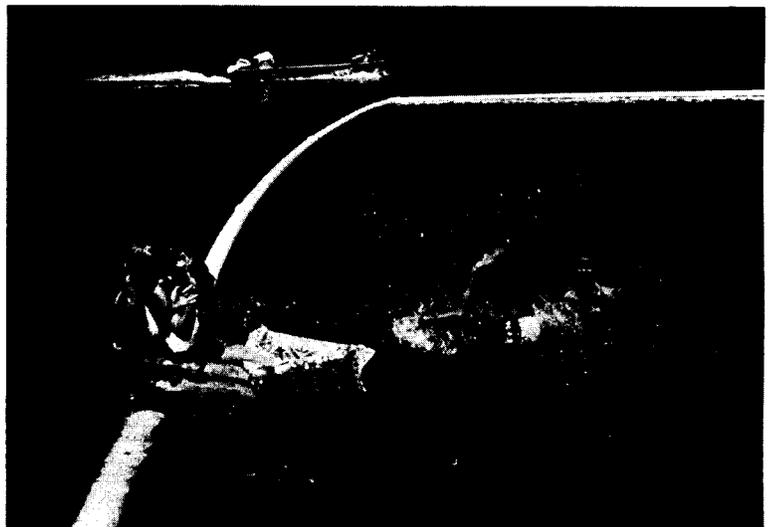
Hendrickson received a Department of the Army Award for his suggestion.

BETTER BEACH MARKER

A hazard is often created at lake and river swimming beaches by boaters who either cross the buoy/cable line into the swimming area or tie the bow of their boat to the cable, which usually causes the rear end of the boat to swing over the line. Injuries to swimmers and damages to the cable and the boats have resulted when inattentive boaters have started their engines in this dangerous zone.

Todd Yann, Corps of Engineers Ranger on Lake Barkley in western Kentucky, suggested that swimming areas be marked off with 12- to 20-ft sections of 6- or 8-in. PVC pipe filled with foam and capped on each end. The foam adds strength, water-tightness, and flotation. Each cap has an eye bolt that is linked to other sections by the use of a swivel. The line is secured to the shoreline by steel shackles that allow it to adjust to changes in the water level.

This formidable barrier effectively prohibits the intrusion of boats into the swimming area, while



also serving as a psychological barrier to keep swimmers and bathers on air mattresses from venturing out too far. Initial costs that are higher than that of buoy/cable lines are offset by significant savings in the long term, and a safer recreational experience is provided for swimmers.



These fishermen may spend significant dollars while visiting a Corps recreation area

RESEARCH INITIATED ON ECONOMIC BENEFITS AND IMPACTS

William Hansen

Environmental Resources Division, EL

What are the economic benefits of Corps recreation developments to users? What are the economic impacts of recreation development in terms of jobs and sales in leisure-related industries? These are two of the questions to be addressed by two tasks in a work unit being initiated this year.

ECONOMIC BENEFITS

The Water Resource Council's report entitled "Economic and Environmental Principles and Guidelines for Water and Related Resources Implementation Studies" recommends regional use-estimating models for forecasting recreation use and benefit evaluation. Data collected from recent visitor surveys at Corps lakes (refer to "Some Thoughts on Use-Estimation Surveys" in this issue) will be used to develop and test such regional models. Problems to be solved include model formulation, accounting for substitute recreation opportunities and management attributes, and methods for addressing the value of travel time. The

travel cost approach will be used to derive user benefits from the regional models. A handbook will be prepared that describes regional model development and the application of the models in recreation benefit estimation.

ECONOMIC IMPACTS

A separate but related study will address the economic impacts, in terms of jobs and revenues, that result from Corps recreation developments. The study is concerned with the direct impacts from sales of such leisure-related goods as fishing gear and bait, as well as tracing the indirect impacts to wholesalers, distributors, and manufacturers of leisure-related goods and services as well as the suppliers of these support industries.

As part of this task, a cooperative research effort has been initiated with the U.S. Forest Service (USFS) Southeastern Forest Experiment Station (Dr. Ken Cordell) concerning the economic impact

(Continued on page 7)

MICROCOMPUTERIZED ENERGY MANAGEMENT PROGRAM

*Johnny Clay, Reservoir Manager
Georgetown Project Office, Fort Worth District*

An existing microcomputer has been used with commercially available hardware and software to create an energy management program for the Georgetown Project Office at a relatively low cost. The program could be used to supplement an existing system or as a primary system.

The Georgetown system contains manual override switches with power lights for each electrical device being controlled so that computer control of a device can be overridden at any time. The software that drives the system is user-friendly and can be modified at will.

The computer is left running while the office is closed so that a device can be switched at any time. If a power failure occurs, the system will automatically reboot when power is restored, look back in the time schedule, and reset all devices to

current status. Control signals are sent through the building's existing electrical wiring so that little modification is needed. The devices that are now being computer-controlled are the central air conditioner, water heater, security lights, and fuel pumps (for security).

Purchase of all components and installation of this system in a typical field office would cost less than \$600. All of the components are available on the local market; the installation should be done by a licensed electrician. Descriptions of the components and details of the system installation will be furnished on request.

In accomplishing the energy management objective of the system, energy conservation has resulted in reduced power costs.

CORRECTION

In the last issue of RECNOTES, we printed the wrong name for the Wilmington District NRRP point of contact. It should read:

Daniel Grimsley/SAWCO-R,
Telephone 919-343-4826

RESEARCH INITIATED...

(Continued)

work. Dr. Dennis Propst, Department of Parks and Recreation Resources of Michigan State University, is conducting a review of previous economic impact studies and existing economic impact models under terms of a cooperative agreement with the USFS. Dr. Propst will provide recommendations for further data collection and analysis. Based on these recommendations, detailed case studies will be conducted at select Corps lakes and Forest Service recreation areas. Procedures will be developed for estimating not only the magnitude of the economic impacts but also their incidence by geographic area and economic sector.

ONE-STOP R&D SERVICE AVAILABLE

Engineer Circular EC-70-1-12 (30 Aug 83) provides a list of direct contacts for the technical expertise that exists in the Corps' research and development community by any requestor. The total range of technology addressed by the Corps' R&D community is divided into selected research areas. A specific individual is designated as point of contact (POC) for each of the research areas. Under the one-stop R&D concept, the service is free up to two man-days of effort.

To obtain assistance on a problem, identify the appropriate research area and call the POC. The POC will respond directly or will enlist the aid of those persons most qualified to respond. The POC will monitor the contact throughout any subsequent activity to ensure a satisfactory response.

For a list of the POCs for the various research areas, consult EC-70-1-12.



**NATURAL
RESOURCES
RESEARCH
PROGRAM**

This bulletin is published in accordance with AR 310-2. It has been prepared and distributed as one of the information dissemination functions of the Environmental Laboratory of the Waterways Experiment Station. It is primarily intended to be a forum whereby information pertaining to and resulting from the Corps of Engineers' nationwide Natural Resources Research Program can be rapidly and widely disseminated to OCE and Division, District, and project offices as well as to other Federal agencies concerned with outdoor recreation. Local reproduction is authorized to satisfy additional requirements. Contributions of notes, news, reviews, or any other types of information are solicited from all sources and will be considered for publication as long as they are relevant to the theme of the Natural Resources Research Program, i.e., to improve the effectiveness and efficiency of the Corps in managing the natural resources while providing recreation opportunities at its water resources development projects. This bulletin will be issued on an irregular basis as dictated by the quantity and importance of information to be disseminated. Communications are welcomed and should be addressed to the Environmental Laboratory, ATTN: A. J. Anderson, U.S. Army Engineer Waterways Experiment Station, P.O. Box 631, Vicksburg, Mississippi 39180, or call AC 601, 634-3657 (FTS 542-3657).

TILFORD C. CREEL
Colonel, Corps of Engineers
Commander and Director

WESEP-R

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, \$300

DEPARTMENT OF THE ARMY
WATERWAYS EXPERIMENT STATION, CORPS OF ENGINEERS
P O BOX 631
VICKSBURG, MISSISSIPPI 39180

BULK RATE
POSTAGE & FEES PAID
DEPARTMENT OF THE ARMY
PERMIT NO. G-5