

CONDITION AND OPERATION STUDIES

... recreation ...

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CONDITION AND OPERATION STUDIES - RECREATION

Section I: Evaluation of Operational Effectiveness of Recreation Sites
Section II: Investment Analysis of Recreation Facility Development

A Report Submitted to:

U.S. Army Engineer Institute for Water Resources
Kingman Building
Fort Belvoir, Virginia 22060

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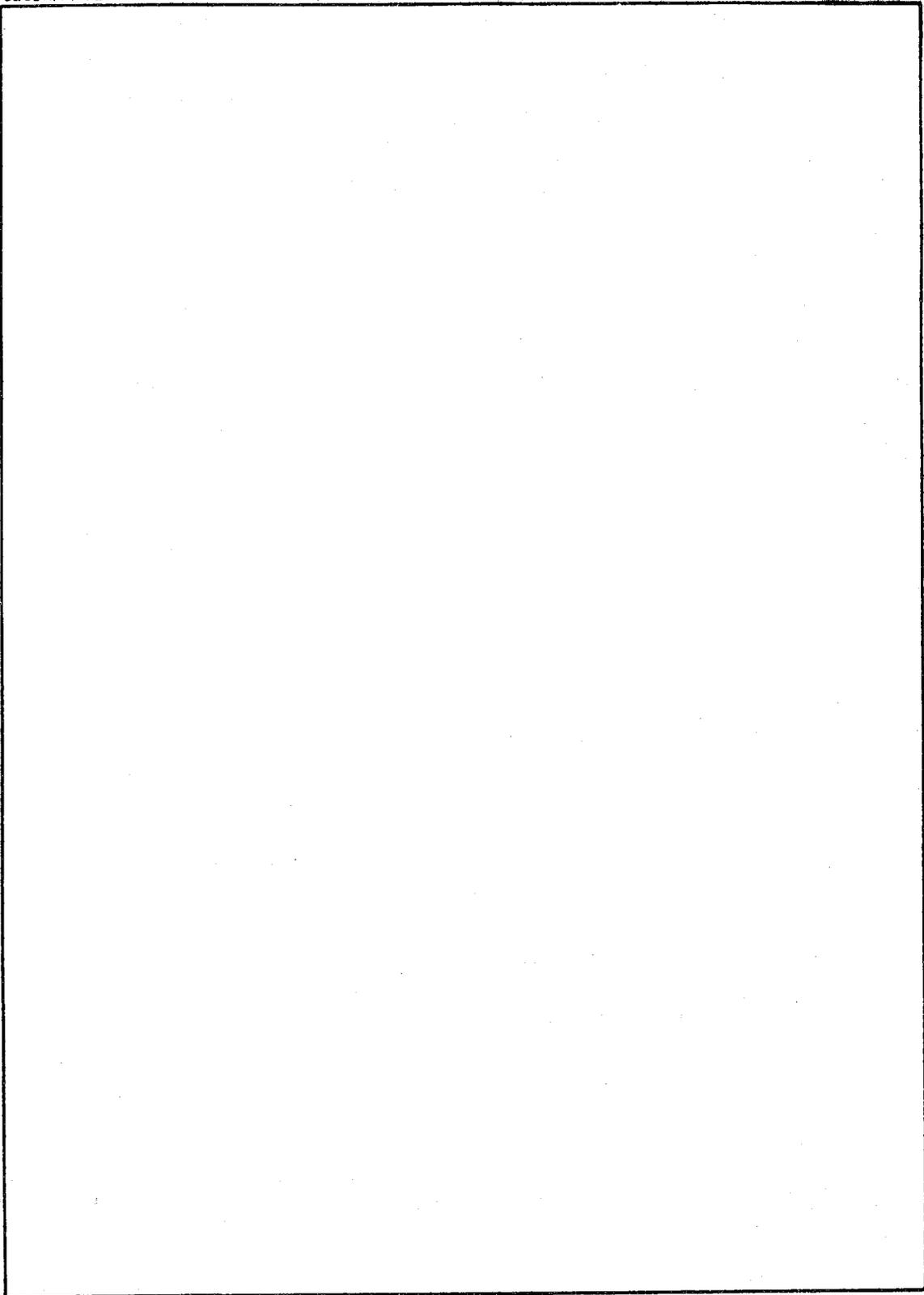
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FOREWORD

This report is in two sections. Section I evaluates visitor response to various recreation sites. Section II evaluates the use of economic efficiency criteria in developing recreational facilities. The visitor response study was based on a survey of nine U.S. Army Corps of Engineer lakes, and the economic efficiency study was based on cost data from seven recreational sites selected from 24 sites at the nine lakes.

In Section I, customer responses were compared to what Corps design standards and Corps recreational planners and managers assert to be effective development. Not surprisingly, views of effective development vary considerably between visitors and Corps professionals.

Section II analyzes the cost-effectiveness of several recreational sites with respect to operation and maintenance costs. It argues that economic efficiency appears to be an obvious but underutilized criterion for determining what kind and how many facilities should be included at a recreation site, and indeed, whether the site should be developed. One major problem, in utilizing benefit cost analysis to make a determination, is the difficulty in estimating a marginal change in benefits resulting from a marginal change in design costs. On the other hand, cost data are much more available, thus a cost-effective criteria may be a logical intermediate procedure.

The study team members were Richard E. Brown and William J. Hansen assisted by John N. Hourigan. The study was conducted under the direct supervision of Fred Kindel of the Sacramento District. Technical oversight was provided by Dale A. Crane of the Office, Chief of Engineers. Draft reports were edited for final publication by IWR. Special appreciation is extended to the field personnel at the nine study lakes who collected the data which provide the basis for this report. All data reflect 1973 conditions and price levels.

Section I Evaluation of Operational Effectiveness
of Recreation Sites

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INTRODUCTION

The created and natural resources of civil works projects are the public property of both present and future generations. The objective of all Corps resources management activity is the continued enjoyment and maximum sustained use by the public of the lands, waters, forests, and associated recreational resources, consistent with their carrying capacity and their aesthetic and biological values.¹

The attainment of this objective is an ongoing process. This study was assigned by the Office, Chief of Engineers and undertaken as part of the continuing effort to improve the Corps recreation program. The goal was to describe the effectiveness of Corps of Engineers standards and present practices in achieving the objectives of the development and management of park and recreation areas.

Recreational visitors were interviewed at park and recreation areas on nine different lakes during the months June-September 1972 for their views on the effectiveness of the recreational developments. On-site sample surveys of visitor preferences, expectations, satisfactions and dissatisfactions were taken. The resource professionals at these nine lakes were also interviewed to determine the park managers' judgment of the effectiveness of their own areas. Concurrently, the study team inventoried each study area to ascertain to what degree the recreational developments conformed with existing Corps of Engineers planning and design criteria. However, this report focuses primarily on the views of the recreational visitor.

THE VISITOR SURVEY

The Lakes Studied

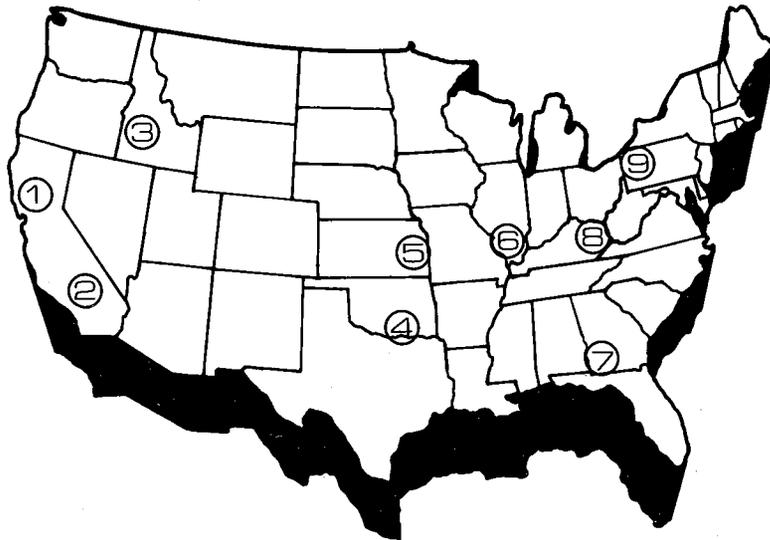
The Corps of Engineers maintains recreational attendance and facility development records for some 300 reservoirs. Those reservoirs excluded from this study were: (1) areas with no permanent pool, (2) recreation areas managed exclusively by a nonfederal agency, and (3) areas where recorded attendance appeared too small to yield enough information to warrant sampling. Consequently, the study lakes' population constitutes approximately half of what are regarded as Corps of Engineers recreational lakes.

Most of these remaining lakes offer the visitor similar recrea-

¹U.S. Army Corps of Engineers, Engineer Regulation No. 1165-2-400, Recreational Planning, Development, and Management Policies, 3 Aug. 1970

tional opportunities. The more common activities at Corps projects are: swimming, camping, picnicking, fishing, boating and water skiing. The lakes studied are a judgment sample, selected by considering some of their dissimilarities. These were: their geographic region, population distributions about the lakes, prevalent activities, number of visitors traveling long distances, age of recreation developments, and programmed facility needs as reported by the administering Corps district. Lake locations are listed and illustrated in Figure 1.

The park and recreation areas at Corps lakes vary appreciably, not only between lakes, but also among the areas at each lake in ease of access, capacity, amenities, and degree of naturalness. Therefore, a minimum of two areas per lake, differing where possible in quantity and quality of developments, were selected for the on-site interviews. The intent was to get visitor response to specific developments. Some minimal developments had too few visitors to interview, and some highly developed state parks were atypical of the Corps projects. The result was a tendency toward "medium" developments.



- | | | |
|--------------------|-----------------|------------------|
| 1. LAKE MENDOCINO | 4. LAKE TEXOMA | 7. LAKE SEMINOLE |
| 2. ISABELLA LAKE | 5. POMONA LAKE | 8. GRAYSON LAKE |
| 3. LUCKY PEAK LAKE | 6. CARLYLE LAKE | 9. SHENANGO LAKE |

Figure 1
Lake Locations

Lake Mendocino is the smallest lake in the group with 15 miles of shoreline. The recreation areas, all managed by the Corps of Engineers, accommodate intensive recreational use by day visitors and campers. One picnic-swimming area and two camping areas are included in the study as most of the recreation at the lake takes place in these three areas. Access to the lake is excellent; Mendocino is just off State Route 20 and U.S. Route 101, six miles from Ukiah, California.

Isabella Lake is developed primarily for camper fishermen. The recreation areas were developed jointly by the Corps of Engineers and Kern County, California, and are currently managed by the Corps. Two multiple-purpose camping areas are included in the study. Because the study period was an extremely dry one for Isabella, total visitation was below normal. Approach to the lake is fair; Isabella is 45 miles northeast of Bakersfield off State Route 178. Nevertheless, many visitors come a considerable distance, originating from the major population concentration around Los Angeles.

Lucky Peak Lake is predominantly a day visitor lake. The recreation areas were developed jointly by the Corps of Engineers and the State of Idaho. The heavier use areas are administered by the state, and the shoreline by the Corps. There are boat access shelters constructed by private parties and the Corps. One picnic-swimming area and one area consisting of the primitive shoreline developments are included in the study. Entry to the lake is good; Lucky Peak is located on State Route 21, ten miles from Boise, Idaho.

Lake Texoma is the largest lake included, with 580 miles of shoreline at average recreational pool. It also has by far the greatest reported visitation. Recreation areas on Lake Texoma are numerous and include developments by the Corps, the States of Oklahoma and Texas, local governments, quasi-private and private entities. The five multiple-use areas included in the study were developed and are managed by the Corps of Engineers. Entry to the selected lake areas is good. Access to the lake from Dallas, Texas, the nearest major population center, is excellent.

Pomona Lake has nine public access areas, two of which have been developed by the State of Kansas and the remainder by the Corps, some of which have only minimum development. Three areas are included in the study; all are managed by the Corps and are used by day visitors and campers. Two are developed with good access. The third has only primitive facilities and requires several miles of travel over gravel roads. Pomona is within 45 miles of the cities of Topeka and Lawrence, and the Kansas City metropolitan area is approximately 75 miles from the lake.

Carlyle Lake has recreation areas developed by the Corps, the State of Illinois, and private parties. The two areas included in the study were developed by the Corps and are intensively used by both campers and

day visitors. One of these areas offers more amenities than any of the other Corps areas studied. Access to the lake is excellent. Carlyle is bordered by State Route 127 and U.S. Routes 50 and 51 and the St. Louis metropolitan area is only 50 miles away.

Lake Seminole is known as a fisherman's lake. Recreation area investors include the States of Georgia and Florida, local governments, concessionaires, and private parties as well as the Corps of Engineers. A beach area and two camping areas developed and managed by the Corps are included in the study. Access to these areas is good. Seminole is located just north of U.S. Route 90 at Chattahoochee, Florida.

Grayson Lake is the newest lake in the study. Public recreational development is primitive, but additional investments by the Corps and the State of Kentucky are underway. A camping area developed by the Corps and administered by the State of Kentucky and a limited access, non-facility area administered by the Corps are included in the study. Entry to the lake is good; Grayson is located south of U.S. Route 60 on State Route 7. The nearest population concentration is the Ashland, Kentucky-Huntington, West Virginia area.

Shenango Lake is developed primarily for day visitors. There are recreational developments by the Corps, a local government, a concessionaire, and quasi-private organizations. One selected area includes a limited capacity camping area; the other is a day visitor only area. Both are relatively new, intensively used areas developed and administered by the Corps. Access to Shenango is excellent; Pennsylvania Route 18 crosses the lake just north of U.S. Route 62.

The Questionnaire

Visitor interviews were conducted during the summer months, predominantly on weekends, by distributing and collecting questionnaires (see Appendix A) in the study areas. Because of the timing and distribution method, the questionnaires may not accurately reflect the characteristics and opinions of the "average" visitor. However, they do describe the visitors on an average summer weekend, and this is the population for which facilities are planned and developed. In addition, it is these periods of time that pose the greatest management problems.

Three types of information are requested on the questionnaire. The first part requests general information describing the visitors, the second relates to activity participation, enjoyment and dissatisfactions, and the third part is a checklist to determine the effectiveness of various facilities and services. General information and the activity participation data were requested for two reasons: first for basic data on the sample visitors and their activity participation; and second, to determine any correlation between visitor characteristics and dissatisfactions with facilities or services.

A total of 3,302 questionnaires was collected and of these, 3,238 gave at least partially useful responses. The following sections provide a summary of visitor characteristics and activity participations. Responses related to the effectiveness of facilities and services, and the primary purpose of the questionnaire, are summarized later in Effectiveness of the Developments. All responses to the questionnaire are summarized in the Appendix A.

The Sample Visitors

Visitors were asked to indicate whether they were (1) alone, (2) a single family, (3) more than one family, (4) a group of friends, or (5) an organized group. Only two lakes had less than 60 percent family groups. These were Lucky Peak (58 percent) and Shenango (57 percent). In each instance, this reflects a high "group of friends" percentage associated with the inclusion of an urban-use swimming area. More significant than the preponderance of family groups is that about 46 percent of all family groups were multiple family groups.

The questionnaires represent input for 20,415 visitors, (data from responses are shown in Appendix A). The age distribution of the sample visitors is indicated in Figure 2. The predominance of visitors in the younger age categories may be slightly exaggerated by the non-random selection of respondents. However, the age distribution was remarkably consistent over all nine lakes.

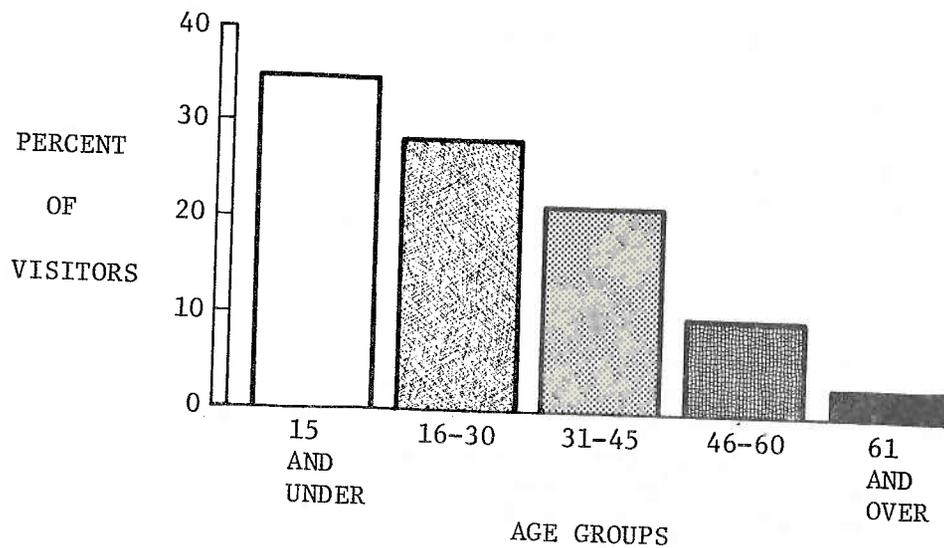


Figure 2
Age Groups of Visitors

Activity Participation, Enjoyment and Dissatisfactions

Several of the recreational activities listed on the questionnaire have been mutually exclusive by definition in past surveys. For example, picnicking has been defined (for some purposes) as a day-use activity exclusive of camping. "Sightseeing from car only" has been defined mutually exclusive of everything else. For this survey, however, there is no pair of mutually exclusive activities.

Responses were sought for all activities of any member of the group. In addition, the visitors were asked to indicate which single activity was most enjoyable to most of the group. Only 78 percent indicated a single most enjoyable activity. Table 1 summarizes these responses.

TABLE 1
SUMMARY OF PERCENT PARTICIPATING IN EACH ACTIVITY AND
PERCENT INDICATING ACTIVITY TO BE MOST ENJOYABLE

<u>Activity</u>	<u>Percent Participating</u>	<u>Percent Most Enjoyable</u>
Swimming	82	24
Camping	70	28
Sun Bathing	66	2
Enjoying natural environment	62	7
Picnicking	62	7
Wading	58	-
Bank fishing	44	4
Motor boating	43	5
Boat fishing	34	5
Water skiing	34	14

Although swimming is the most frequent activity of the sample visitors, it is second to camping as the most enjoyable. Similarly, sun bathing and wading rate high in participation but low in degree of enjoyment. On the other hand, water skiing ranks tenth in participation but third most enjoyable. "Enjoying the natural environment" ranks fourth on both categories. Finally, every activity on the questionnaire was regarded by some groups as their most enjoyable activity.

The most enjoyable activities of the three major group types are shown in Table 2. Single family groups rank camping, fishing, and enjoying the environment as most enjoyable more frequently than the other two groups. Groups of friends rank swimming, sun bathing and water skiing more frequently. Multiple family groups ranked picnicking more frequently and between the other groups in frequency of ranking swimming, camping, and water skiing as most enjoyable.

TABLE 2
 BREAKDOWN OF MOST ENJOYABLE RESPONSES BY ACTIVITY
 AND TYPE OF GROUP PARTICIPATING

	<u>Percent Most Enjoyable</u>		
	<u>Single Family</u>	<u>Multiple Family</u>	<u>Group of Friends</u>
Swimming	21	24	28
Camping	36	27	15
Sun bathing	1	1	7
Environment	9	5	7
Picnicking	4	9	6
Wading	1	0	0
Bank fishing	5	2	2
Motor boating	4	7	6
Boat fishing	6	6	2
Water skiing	9	17	21

For any given activity, the sample visitors expressed more satisfaction than dissatisfaction. There were, however, ample dissatisfactions and, as noted on the questionnaire, the reasons included: unsafe, crowded, noisy, dirty, bad weather, not enough time or other. Some 36 percent of the respondents expressed dissatisfaction with at least one activity.

It was possible for the respondents to indicate participation in an activity, to designate that activity as most enjoyable and at the same time express dissatisfaction with that activity. A tabulation of those designating an activity as most enjoyable and also expressing dissatisfaction with the activity is shown in Table 3. The five activities listed are those most often reported as most enjoyable.

TABLE 3
 PERCENT OF PARTICIPANTS WHO INDICATED ACTIVITY TO BE MOST
 ENJOYABLE, THE DISSATISFACTION OR BOTH

	<u>Most Enjoyable</u>	<u>Dissatisfaction</u>	<u>Both</u>
Swimming	18.3	15.5	3.4
Camping	31.1	12.4	4.2
Enjoying the, Environment	9.1	1.2	0.3
Picnicking	8.2	5.4	1.1
Water Skiing	31.7	12.2	5.9

It is interesting to note that the number who rate swimming most enjoyable is closely rivaled by the number who express dissatisfaction. Water skiing exhibits a different phenomenon; of those who express dissatisfaction, about one-half still designate it most enjoyable. The relatively low percent who indicate dissatisfaction with "enjoying the natural environment" may be explained by the supposition that if there was dissatisfaction, the activity was simply not checked.

EFFECTIVENESS OF THE DEVELOPMENTS

1. Facilities and Services

The visitors were asked to indicate the adequacy of 21 different facilities and services. Non-response on these items varied from a low of 3 percent on roads to a high of 37 percent on hiking trails. Satisfaction with the facilities and services was related to the appropriateness of the development criteria which the areas meet. Dissatisfactions, on the other hand, may imply the appropriateness of existing but unmet criteria.

Resource management personnel were interviewed at the lakes to obtain information regarding their appraisal of the effectiveness of their areas. As part of these appraisals the resource managers were asked to give subjective estimates of how they expected visitors to respond to facility and service questions. There were some consistent differences between management expectations and visitor responses.

Other studies, ". . . suggest that campers and managers subscribe to similar goals associated with camping, but they disagree about the types of activities appropriate to attaining these goals."² An extension of this apparent disagreement was explored concerning the type of facilities deemed appropriate for general recreation.

The 24 recreational areas studied offer a wide range of facilities and services. A few of the areas are clearly deficient in basic amenities. Deficiencies were observed which appeared obvious to the resource managers, the study team, and the visiting public. Conversely, the study team found a few areas with an obvious overabundance of some facilities. However, information obtained in this study does not define what constitutes a threshold level of development, one that is both necessary and sufficient.

Following is a description of the effectiveness of the sample developments. For each facility or service, a description of the effectiveness criteria from current Corps of Engineers Regulations and Manuals pertaining to recreation development is presented. Differences in visitor satisfactions are related to differences in facility developments as identified by the study team. Comparisons are also made, when pertinent, between the managers' estimates of the effectiveness of their facilities and the actual visitor responses. The study team concludes with a discussion of the effectiveness of existing developments and planning criteria.

² Clark, Roger N., et al., Values, Behavior, and Conflict in Modern Camping Culture, Journal of Leisure Research, Vol. 3, No. 3, Summer 1971, pp. 143-159

2. Signs and Information Services

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"Install the minimum adequate number of signs consistent with public recreational atmosphere of the project area."³ This general guidance is implemented in myriad ways. A few recreation areas have a conglomeration of metal traffic control signs and garishly printed wood informational signs. A minority of areas have a well-coordinated sign system that blends rather than clashes with the rustic atmosphere.

The Corps of Engineers Regulations and Manuals emphasize public safety. Rigorous prescriptions are given for sign placement and general characteristics are given for vehicular, pedestrian, and boat traffic control. Informational signs and services are typically prescribed on an as-needed basis. Throughout the directives, there are reminders that the systems of signs should harmonize with the environment.

It is obvious that the design, maintenance, and use of signs and informational displays compose a single system. It was not expected, however, that the objectives emphasized by the designers, managers, and visitors would be as disparate as they were. Park designers insist upon a minimal number of unobtrusive directional devices which blend with and avoid unnecessary conflict with visitors' perception of the surroundings. Managers want a minimum/maintenance system which can withstand vandals, souvenir collectors and shotgun practice. The visitors simply want assistance, and their tolerance toward things that the professionals regard as objectionable is quite high.

Concerning signs, little correlation was found between visitor response and management expectations, between visitor response and existing services, or between regulatory guidelines and existing services. Over all 24 areas, 86 percent of the visitor responses were expressions of satisfactions. The only expression of dissatisfaction of any consequence was the 12 percent "not enough."

Four recreation areas elicited 20-40 percent "not enough" response. An examination of the written comments revealed that for only one area did the dissatisfaction pertain primarily to the conditions found on the project. This was a large recreation area with very few directional signs. At the other three areas, the dissatisfaction was more with off-project directional signs. Discontent with off-project directional signs was also common at other areas where satisfaction was greater. Often it was specific to Corps park areas. The visitors complained that off-project directional signs led to the main dam observation area or state or local parks, but they had to hunt for the Corps recreation areas.

³U.S. Army Corps of Engineers, Engineer Manual No. 1110-2-400, Recreation Planning and Design Criteria, 1 September 1971.

In summary, the signs and information services were generally satisfactory to visitors, primarily because visitor expectations were low. Where dissatisfactions were noted, they were due to too-little directional and information assistance. There was no expressed displeasure with too many signs or with unaesthetic quality. Increased cooperation with state and local agencies is needed to improve off-project directional signs. These signs should also indicate the recreational opportunities available. Aesthetic quality may continue to be an important criterion, but increased attention should be given to the practical needs of both management and visitors.

3. Roads

Within recreation sites and areas, no road or other circulation system should be designed simply as a connecting device to link points of interest. Every segment of every recreation road should relate to the environment through which it passes in a meaningful way and should, to the extent possible, constitute an enjoyable and informative experience in itself.⁴

This general guidance tends to expect quite a bit of a road. In addition, the more specific planning and design criteria tend to contradict the underlying concept. For example, the suggested design speed for circulation roads is 30 miles per hour with a maximum curvature of 25 degrees.⁵ For roads circulating through most of the areas which would enable the kind of considerations noted above, 30 miles per hour is too fast and a 25 degree curvature is not enough.

Observations by the study team and interview with project resource personnel indicate that, typically, the alignment and construction of access and circulation roads conform primarily to engineering criteria with evidence of varying budgetary constraints. Visitors indicated little disapproval with these criteria. Of the total responses, 90 percent were expressions of satisfaction. Resource managers' expecta-

⁴U.S. Army Corps of Engineers, Engineer Manual No. 1110-2-400, Recreation Planning and Design Criteria, 1 September 1971.

⁵U.S. Army Corps of Engineers, Engineer Regulation No. 1110-2-400, Design of Recreation Sites, Areas and Facilities, February 1971.

tions had some correlation ($r=0.52$)⁶ with visitor responses, but there was a distinct tendency toward underestimating satisfactions.

Significant visitor discontent with existing road systems (over 20 percent of the respondents) were noted at only four of the study areas and at each of these areas the project resource manager anticipated the visitor complaints. The most common complaint at these four areas was "too dirty" noted by an average of 21 percent of the visitors. Study team members observed significant dust problems in each of these areas, either from lengthy gravel access roads or from dirt or gravel circulation roads in the immediate vicinity of picnic and camp sites.

Several areas with more than 80 percent respondents expressing satisfaction have dirt or gravel access or circulation roads. With one exception, dust was no particular problem; the roads were either relatively dust free naturally or they were oiled to prevent dust. The exception was an area with a single, dusty circulation road; yet 98 percent of the responses indicated satisfaction. Visitors to this particular area are primarily from local communities and have selected this area for repeated visits. They consistently expressed higher levels of satisfaction with most facilities than did visitors to other areas with comparable developments and recreation opportunities.

In summary, engineering criteria for roads have generally satisfied public needs. Where substantial visitor complaints occurred, the resource managers were aware of the problems. Typically, the solutions were inhibited by budgetary constraints. Visitor resources indicate paved roads are not always necessary, but dust proofing is desirable near recreation sites. Therefore, determination of the grade or quality of the roads, above a minimal convenience and safety level, should be primarily a function of engineering economy considerations.

4. Parking

Parking is solely an auxiliary facility. Published criteria for parking are primarily in the form of bounds on capacity, and they vary by type of area served. Managers' expectations were correlated with responses ($r = 0.55$), but again there was a tendency toward underestimating satisfactions. Where deficiencies are recognized, they

⁶ The resource managers were asked to estimate the percentage of visitors that would note satisfaction with each of the 21 facilities and services provided at their study areas. The correlation being measured is the correlation between the managers' estimates of user satisfaction with the facility and the actual visitor responses for each area. The correlation coefficient, r , is a relative measure of the degree of association between these two variables and can assume a value between +1 and -1. Coefficients near zero mean that no correlation exists, while correlation of one indicates perfect correlation.

are judged more serious by resource managers than by the visitors.

Over all 24 areas, 83 percent of the responses were expressions of satisfaction. The most repeated dissatisfaction was 13 percent "not enough." At five areas this complaint was severe (22-37 percent). These were all predominantly day-use areas, which on summer Sunday afternoons accommodate near (or even excess) capacity parking pressures. Where overflow parking was available, it was not popular; day use visitors do not like to walk.

In summary, parking accommodations are generally adequate. There was as much underutilization as there was overcapacity of the parking areas. However, in the interests of public safety, inadequate overflow parking is the more serious condition. Also, in heavily used areas, even where overflow parking is available, parking control is often required to prevent dangerous, congestive, roadside parking.

5. Swimming Areas

Planning and design criteria for shoreline swimming beaches are relatively specific. Alternative developments are included in the regulations but project practice infrequently resembles these guidelines. The study team grouped variations of practice into three reasonably distinct, development and management categories.

Five beach areas were designed in accordance with existing directives and are characterized by superior management services. Sixty-nine percent of the responses on these beaches expressed satisfaction. The primary dissatisfaction was "not enough" (10 percent). Although each had a designated beach area and a zoned swimming area, an average of 3 percent of the responses checked the swimming beach as "unsafe." A majority of these references were to the absence of lifeguards.

Ten beach areas not developed or designated as swimming beaches were grouped into a second category. Sixty-eight percent of the responses on swimming beaches expressed satisfaction. Primary dissatisfactions were "not enough" (13 percent) and "not available" (2 percent). Five percent indicated the beach was "unsafe."

Nine areas are characterized by limited management either because there is no attractive site or because the site used by the public is not supposed to be a beach. Responses for these areas averaged only 35 percent satisfaction. Primary complaints averaged "not enough" (20 percent) and "not available" (16 percent). Eleven percent indicated the beach was "unsafe." The comments on safety were substantiated by frequently observed mingling of swimmers and power boats.

Over all areas, 58 percent of the respondents expressed satisfaction with the swim beaches. This low percentage has two sources. Some recreation areas, due to soil composition, slope gradient

or distance from the water, are physically unsuited for swimming. At several sites where there is no zoned swimming areas, swimming does occur, and on occasion is the prevalent activity. Boat launching areas are frequently adopted by the public as swimming areas. When this unplanned use of an area is also unmanaged, the result is a dangerous conflict.

Swimming areas thus present an activity where there is a great divergence between planning and design units and resource managers' expectations and visitor satisfaction. Planners and managers need to be more adaptable to visitor preferences if serious safety hazards are to be avoided. Swimming also requires more positive management action than many other activities.

6. Restrooms

Planning and design criteria for restrooms are classified by type of area. Essentially, if expected visitation is below some arbitrary level (e.g., 50,000 annually at picnic areas), then vault-type restrooms are prescribed. Above this level, larger capacity, waterborne restrooms are prescribed. Pit-type restrooms are supposed to be used only in the sparsely visited areas. Criteria include the approximate distances from other facilities.

The study areas contained waterborne, vault, pit, or combinations of these restrooms. The type of facility was, as prescribed, closely related to the relative intensity of expected recreation use. There was a high correlation between the level of development and visitor satisfaction; the correlation coefficient was 0.70.⁷ However, the correlation between the resource managers' expectation and the level of development was only 0.30.

On the other hand, the correlation between manager expectations and visitor responses was 0.60. The divergence between the two is an interesting and consistent one. For the higher developed restrooms, managers overestimate visitor satisfaction; for the lower developed restrooms, managers underestimate visitor satisfactions. The tendency is to exaggerate the influence of type of restroom on visitor approval.

Twelve areas had waterborne restrooms only. Visitor satisfaction at those areas ranged from 46-93 percent and averaged 76 percent. Primary dissatisfaction was "not enough" (10 percent), "too dirty" (8 percent), and "too far" (6 percent).

⁷ Derived by assigning a point value (1-4) to the areas in relation to the level of development (e.g., areas with only waterborne units were assigned a 4) and then correlating the visitors' responses with the point values.

Six areas had a combination of waterborne and vault or pit restrooms. The visitor expressions of satisfaction ranged from 46-60 percent and averaged 52 percent. The average responses of primary dissatisfaction were "not enough" (24 percent), "too far" (15 percent), and "too dirty" (14 percent).

Five areas with restrooms (one area had no facilities) had either vault or pit units. The visitor responses ranged from 16-73 percent satisfaction and averaged 47 percent. Primary dissatisfactions were "too dirty" (25 percent), "not enough" (21 percent), and "too far" (10 percent).

Over all areas, 66 percent of the visitors indicated satisfaction with the restrooms (a higher response than for swimming facilities). Primary dissatisfactions were "not enough" (14 percent), "too dirty" (13 percent), and "too far" (8 percent). Primitive restrooms are more repugnant than modern ones, but visitor satisfaction is much higher than resource managers or design criteria suggest.

7. Water Supply

Planning and design criteria for water supply vary by type of area and are generally in terms of available minimum quantities per visitor. Design criteria are typically more rigorous than practice. For example, 3 of the 24 study areas have no water supply. At seven other areas water is available, but not with the convenience of availability prescribed by the current directives. There was little correlation between resource managers' expectations and visitor responses of satisfaction with water supply. Resource managers overestimated satisfactions at 17 of the 21 areas with water.

For those areas which have a prescribed water supply and distribution system, an average of 82 percent of the visitors were satisfied with the service. Primary dissatisfactions expressed were "not enough" (12 percent) and "too far" (4 percent).

In general, the complaints were directed at the inconvenience of the water supply. Contrary to average manager expectations, the existence of a water supply is not enough; a distribution of outlets, more in accordance with existing planning criteria, is required.

8. Showers

Existing planning criteria prescribe showers for camping and swimming areas. At camping areas with over 50 spaces, hot water showers are to be offered in conjunction with a washhouse. At swimming areas with an expected attendance of more than 600 swimmers on a normal summer weekend day, showers are supposed to be included in the bathhouse.

Eight camp areas, at five different lakes, have some form of shower facility. They vary from cold water, outdoor showers at a single

restroom to hot water, stall showers in an elaborate washhouse. Visitors expressing satisfaction with showers at these eight areas ranged from 40 to 87 percent. The higher-ranked facilities offered enclosed, hot water showers either as part of a centrally located washhouse or as part of the restrooms distributed about the camping area. The lowest-ranked facility consisted of two cold water nozzles attached to the outside of a restroom located on the periphery of the main camp area. In general, inconvenient locations tended to draw the most disapproval.

Of the five designated swimming areas, only two have showers. These were cold water showers enclosed in restrooms. Visitor expressions of satisfaction averaged 83 percent. It is interesting to note that only 11 percent of the respondents at these areas indicated that they were not interested in using shower facilities, while 26 percent of visitors at swimming areas without showers were not interested in shower facilities.

In summary, although showers are a desired convenience, they by no means determine the adequacy of a camp or swim area, and hot water showers may not be as important as sound site-planning. Current planning and design criteria are more in consonance with the public preferences than the existing developments seem to be.

9. Campgrounds

The existing criteria for camp areas prescribe considerably more amenities than those observed in most of the study campgrounds. In more than one instance, camp areas were originally designed as picnic areas, although camping use developed. Some of the newer camp areas are of smaller capacity and more casual than prescribed.

Two of the camp areas are primitive. One is accessible only by boat, and yet it is the only place on the lake where camping is allowed. Sanitation facilities consist of pit toilets, and there is no water supply. The other area is a campground with a purported 200 primitive campsites. The designation "primitive" is based on minimal development. There is a dirt circulation road through part of the area lined with some trash receptacles, a row of six pit toilets, and a well with a hand pump. Visitor satisfactions at these two areas averaged 53 percent; primary dissatisfactions were: "not enough" (22 percent), "not available" (11 percent), and "too crowded" (13 percent). All three sources of dissatisfaction could be the same basic perception of visitors.

Eleven areas provide campgrounds facilities but are distinguished by their lack of designated sites. Camping and parking occur at random throughout these areas, and consequently estimates of camper capacity are quite arbitrary. Some of these areas were originally developed as day use areas, but just as many were never fully developed. Expressions of satisfactions for these areas ranged from 77 to 98 percent, and

averaged 83 percent. The primary dissatisfaction was an average of 10 percent "not enough." The top ranked campground (as measured by visitor satisfaction) was included in this group, but in general the areas with random camping were ranked lower than those with designated sites.

Six campgrounds have predominantly designated campsites. Each site usually has the prescribed parking space and equipment. Frequently, there are natural or artificial barriers delimiting the individual sites. One of these areas has only 38 sites and operates at full capacity throughout the summer. It is not unusual for campers to wait in line at the campground entrance for sites to be vacated. Satisfaction with this area was low, 36 percent; the dissatisfaction expressed was 58 percent "not enough." The remaining five areas with designated sites elicited expressions of satisfaction from 83 to 95 percent of the visitors with an average of 90 percent. The primary dissatisfaction was again "not enough," but this was expressed by only 4 percent of the visitors. Because of the site identification, resource capacity becomes more meaningful with designated sites, and the area is more amenable to resource management. Also, designated sites have a residual, enhancing effect on auxiliary facilities, such as restrooms, since they enable more efficient site planning.

There is quite a disparity between the planning and design criteria for camp areas and most of the campgrounds studied. Typically, camper satisfactions are higher for those areas which more closely resemble the criteria, and they are appreciably higher than managers' expectations. The criteria, however, are applied to new developments and (if the study sample is representative) not to the more than 1500 existing camp areas at Corps lakes. It seems rather incongruous that effective criteria should be applied to future development and not to camp areas which currently serve the public.

10. Boating Accommodations

The criteria for boat launching facilities relate primarily to design: vertical limits, slope, length, and surfacing. A permanent ramp is prescribed for any area with 40,000 annual visitors or with an expected 40 launchings per normal weekend day. Any non-concrete ramp is defined as temporary. Courtesy piers are prescribed under the 40 launchings per day criterion, but no more than two per launch site.

Boat launching ramps are provided at 18 of the studied areas. (At each of the other areas there is a launching facility nearby. As a consequence, visitor responses were very similar but directed toward an area adjacent to the one studied). Satisfactions with the ramps ranged from 47 to 95 percent of the visitors and averaged 77 percent. An average of 15 percent of the visitors indicated "not enough" ramps. The managers' expectations of satisfactions were not correlated with the visitor responses.

Twelve of the eighteen areas with launching ramps also provide boat docks. Satisfaction with the docks ranged from 35 to 86 percent of the visitors and averaged 68 percent. The primary dissatisfactions expressed averaged "not enough" (19 percent) and "not available" (6 percent). The managers' estimates were correlated ($r = 0.41$) with the visitor responses.

Although the primary visitor complaint on boating facilities was "not enough," there was little evidence of overuse. Generally, boat launchings are well accommodated. Crowding is more likely in the boat and trailer parking lots. Satisfaction with the boating facilities tended to be a function of type of boating activity; visitors who are motorboating or water skiing tend to have higher dissatisfactions than those who are boat fishing.

11. Concession Services

Responses were sought on boat rentals and concession stands. Boat rentals had the highest response rate of "not interested" of any facility or service (53 percent). Primarily because of the low interest, 70 percent of the visitors could be described as satisfied with the boat rental services provided. At the nine areas offering rental boats, visitor satisfaction ranged from 67 to 91 percent and averaged 81 percent.

Concession stands serving some form of prepared food are available at four areas. Visitor satisfaction ranged from 56 to 79 percent and averaged 71 percent. "Too expensive" was the highest average dissatisfaction, as indicated by 8 percent of the responses. Over the 20 areas without food service, an average of 39 percent of the visitors expressed satisfaction (primarily "not interested"). The major dissatisfactions were "not available" (36 percent) and "not enough" (15 percent). For the latter, the areas with the higher levels of satisfied visitors have access to nearby services.

Concession services are relatively unmentioned in the planning and design directives. These services at Corps lakes are frequently initiated by nonfederal governments, commonly through third party leases. Normally, this is a service that is permitted rather than provided.

12. Public Telephones

Electric power and telephone service is prescribed ". . . for all major recreation site developments and for all overnight areas except

primitive areas."⁸ In fact, only nine of the study areas have public telephones. At these areas, user satisfactions ranged from 70 to 93 percent and averaged 77 percent. Primary dissatisfactions were "not enough" and "not available." The sum of these responses ranged from 4 to 24 percent of the visitors and averaged 15 percent. The resource managers overestimated visitor satisfaction at six of the nine areas. At the other three, the response "not enough" was greatly overestimated by resource managers. The areas which elicited the highest visitor approval have conspicuously decorated telephones near the entrances. They were not designed to fit a park theme, but they are the most effective.

Visitor satisfaction at the 15 areas without public telephones were all less than 50 percent and averaged 29 percent of the responses. "Not enough" and "not available" were again the primary dissatisfactions, averaging 59 percent. Many visitors at these areas, particularly the more remote areas, added written comments on the need for telephone service in emergencies.

A need for telephone service is indicated by the planning and design criteria, voiced by the visitors, and acknowledged by the resource managers. Still, the number of areas offering this service is small, apparently because of various difficulties with phone companies. In at least one instance, telephone service was interpreted as a concession service. In another, the phone had been so vandalized that the phone company refused to reinstall. In general, the obstacle appears to be that profit potentials are poor because of limited use and vandalism.

13. Trails and Displays

Trails and interpretive displays are prescribed on an as needed basis. There are few trails and fewer nature or historic displays offered at the study areas. Where they exist, they are little known by the visitors. Part of the reason for including these items on the questionnaire was to ascertain if the visitors perceived a need for them. Apparently they do not.

"Not interested" was a more frequent response for not using either marked nature trails or hiking trails than "not available." The reverse was true for nature or historic displays, but the ratio was only 1.13 to 1. There was little difference between the responses at areas with the facilities and those without. Nor was there any consistent differences between day-use areas. Although visitor interest in these items is not pronounced, nature and hiking displays are preferred over marked nature trails and hiking trails.

⁸ U.S. Army Corps of Engineers, Engineer Manual No. 1110-2-400, Recreation Planning and Design Criteria, 1 September 1971.

14. Ranger on Duty and Enforcement of Regulations

"The District Engineer should assure that a sufficient number of competent rangers is provided at each project insofar as funds permit"⁹ supposed to be skilled in forest management, fish and wildlife management, safety and rescue operations, public relations, and visitor-facility protection.

Typically, the visitors were very satisfied with the rangers on duty; 88 percent of the responses expressed satisfaction. Regulations enforcement elicited only slightly lower (84 percent) satisfactory responses. The primary dissatisfaction with both was "not enough;" 8 percent for rangers and 13 percent for enforcement.

The lower-ranked areas fall into two general categories. One group gets little or no attention from any rangers and consists mostly of low visitation, and, therefore, low priority, areas. The second category is a group of ill-designed or poorly managed campgrounds. Typically, there is dense use, non-camper through traffic, late hour noise, and many thefts. In contrast with this group, the highest ranked area had 24-hour fixed capacity control and no non-camper traffic.

15. Overview of the Developments

The 24 areas were ranked by visitor satisfaction for each facility and service on the questionnaire and these rankings were combined into a single ranking of the areas. Visitor dissatisfaction with an individual park or recreational area may not imply corrective action at that area. "This is so because visitors are often unaware of the physical characteristics that determine the capacity of an area in producing recreation opportunities on a sustained-yield basis."¹⁰ An example is the 38 site campground with capacity controlled to prevent overuse. However, complaints of insufficient opportunities to camp at this area may imply a need to develop another campground at the lake. With this kind of exception it is difficult to quarrel with the visitors' judgment in ranking the areas.

The higher-ranked areas have different levels of development (e.g., vault versus waterborne restrooms and no showers versus cold showers versus hot showers), but they most closely comply with existing planning and design criteria. Where there are both campgrounds and picnic

⁹ U.S. Army Corps of Engineers, Engineer Regulation No. 1130-2-400, Recreation-Resource Management of Civil Works Water Resource Projects, 28 May 1971.

¹⁰ Michigan State University, Department of Resource Development, The Quality of Outdoor Recreation: As Evidenced by User Satisfaction, ORRRC Study Report 5, Washington, DC., 1962.

grounds, they are separate, and swim areas are zoned. It is evident that for the most part these areas were developed with the recreational visitor in mind. Generally, the distribution of facilities and designated sites is convenient to the visitors and amenable to management.

At the lower end of the scale, two areas (both at the same lake, ranked 22 and 23) receive their low ranking due primarily to overcrowded use conditions. However the others that visitor responses rank near the bottom earn their ranking from being poorly designed, underdeveloped or unmanaged. There are different levels of development at these areas also, but there is a common need for remedial development. The resource managers perceived the need for corrections, but typically cited lack of authority or funds as the reason for no action.

It is difficult to believe that some of the lower-ranked areas were planned to be the way they are. Presumably, the underdeveloped areas exist because of perpetually inadequate funding. At some lakes there was evidence that it is far more effective to minimize the number of underdeveloped areas and to concentrate on the available investment. For those underdeveloped areas, however, there is a possibility for corrections. This is because annual inventories of facilities and recorded attendance will indicate underdevelopment, which eventually can receive attention. This is not necessarily so for those recreational areas earning their low ranking from poor design.

Poor design does not refer to subtle aesthetic oversights. Rather, it refers to wasted investment in understandably unused facilities. For example, engineering regulations prescribe one charcoal stove for every two picnic tables. One area complies with picnic tables approximately 75 feet apart and the stove directly in the middle. (The inconvenience of the stove relative to either table does not really bother anyone, because the tables are along a road out of view of the lake and nobody uses them). Picnic tables next to circulation roads, out of the shade, and ignored by the visitors, are not uncommon at older areas. Apparently it was the easiest place to install them during an era when recreation was not considered overly important.

An additional difficulty for the poorly designed areas over the underdeveloped areas is that annual facility inventories indicate that more sufficient accommodations exist. Once a facility is placed in an area it becomes permanent input into the calculus estimating future requirements. For example, most of the study areas have an adequate total number of restrooms, but when half of them are distant from the recreation areas, the total number is meaningless. Visitor dissatisfaction occurs from too few restrooms, while records show an adequate supply exists. This phenomenon also ranges from poorly placed picnic tables to a mislocated marina. Again, lack of an effective administrative way to declare nonserviceable facilities defunct inhibits remedial actions.

16. Recreation Management

Tables 4 and 5 show the visitors assessment of the effects of dissatisfactions and corrections of dissatisfactions on future visits. Negative responses (no effect or no responses) were in substantial majority.

TABLE 4
EFFECTS OF DISSATISFACTIONS (on future-visits)

No effect	64%
Will not stay as long	5
Will not come as often	15
Will never return	1
Other	3
No response	<u>12</u>
TOTAL	100%

TABLE 5
EFFECTS OF CORRECTIONS (on future visits)

No effect	39%
Would stay longer	7
Would come more often	36
Other	2
No Response	<u>16</u>
TOTAL	100%

The study emphasized the physical attributes of the areas, but it should be noted that the adequacy of the developments cannot be divorced from the recreation management. The effectiveness of the Corps management hierarchy obviously varied over the different lakes. Not infrequently, and not surprisingly, the areas with the more satisfactory responses on facilities had resourceful resource managers or rangers who exhibited good rapport with the next management echelon.

It is the Corps policy to encourage and accommodate sustained public use of the recreation resource. "This broad viewpoint is termed 'recreation-resource management,' and means managing both the people-oriented aspects and the natural resources to provide a sound recreational base for present and future generations."¹¹ This emphasis on recreation-resource management rather than operation and maintenance of recreational areas is relatively new to the Corps. As recently as

¹¹ U.S. Army Corps of Engineers, Engineer Pamphlet No. 1130-2-401, Recreational Statistics, 1972.

1970 an independent appraisal of recreation at Corps reservoirs defined several problem areas which amounted to inadequate management. "Prevalent was a practice of lax, indifferent, or loose administration founded on the philosophy of leaving people alone to do what they want". . . .Loose administration is believed partly deliberate policy, partly a feeling of helplessness, and partly the result of insensitivity, frustration, and immobility of Corps personnel."¹² Despite policy pronouncements, these conditions can still be found, since management, like development, involves costs.

However, during the study period and probably partly the result of the 1970 appraisal, the Corps policy on enforcement and the associated effect upon recreation management were undergoing change. Subsequently, the user fees policy was reevaluated and further changes are underway affecting the managing of the "people-oriented aspects" of the Corps recreation-resource management.

CONCLUSIONS

1. Facilities and services which rank lowest in visitor satisfactions and highest in dissatisfaction include swimming areas, restrooms, showers, concession stands without food service and public telephones.
2. Facilities and services which rank highest in visitor satisfaction and lowest in dissatisfaction include roads, signs and information services, parking, water supply, campgrounds, boating accommodations, and concession services providing boat rental and food services.
3. The correlation between resource manager expectation of visitor responses and the actual responses were invariably poor.
4. Visitor responses indicate that facilities designed to standards well below those implied by Corps regulations are acceptable.
5. Administrative procedures for declaring old, poorly utilized and nonserviceable facilities to be defunct, are needed.

¹² Crafts, Edward C., How to Meet Public Recreation Needs at Corps of Engineers Reservoirs, Washington, DC 1970.

Section II Investment Analysis of Recreation
Facility Development

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INTRODUCTION

The Corps of Engineers may not be perceived as a recreation agency, but the Corps is very much in the recreation business. Approximately 1,500 day-use recreational areas and 950 overnight areas have been developed for recreation at lakes and waterways projects administered by the Corps. The estimated attendance at these areas was over 300 million recreation days annually in 1973.¹

The Flood Control Act of 1944 authorized the addition of recreation to federal water reservoir projects, although limits were imposed on the degree of federal interest in recreation. In general, there was no formal acknowledgement that recreation was a legitimized economic output prior to 1962. (Senate Document 97); recreation developments were add-on, relatively unattended project features. During the succeeding decade, outdoor recreation increased in importance as a water resource output, and the attention and effort devoted to recreation planning and management increased accordingly. This evolving concern is accelerating, and expected recreation benefits currently allow substantial investments in recreation lands and facilities at newly constructed reservoir projects. The Federal Water Project Recreation Act of 1965 asserted that recreation be considered fully and equitably with other project purposes, and be defined as a cost-sharing policy. The act described the limits to which recreation costs could assume in a federal project.

Corps regulation for investments in recreation developments include considerations of the visiting public and the land and water resources:

Recreation developments and facilities should be of the highest quality, should be safe and should promote the health, welfare and aesthetic enjoyment of the public.²

Development of project resources will be planned to protect, conserve, maintain and manage public park, recreation, fish and wildlife, and other environmental values so as not to degrade or deplete the resources while obtaining the maximum sustained public benefits.³

An important, specific investment criterion during project

¹ U.S. Army Corps of Engineers, Engineer Pamphlet No. 1130-2-401, Recreation Statistics, 1972

² U.S. Army Corps of Engineers, Engineer Regulation No. 1110-2-400, Recreation Planning and Design Criteria, 1 September 1971

³ U.S. Army Corps of Engineers, Engineer Regulation No. 1120-2-400, Recreation Resources Planning, 1 November 1971

formulation is that the economic benefits attributable to recreation must equal or exceed the costs incurred by adding the recreation purpose to the project. The benefits are computed by estimating the expected number of recreation days and ascribing a unit value, regarded as an approximation of the average willingness to pay, to each recreation day. One implicit assumption is that there will be sufficient investment in land and facilities to accommodate the expected number of recreation days. The estimates of use, therefore, are independent of any specific recreation development or management plan.

The costs, however, are a function of the recreation plans, and alternative plans pose alternative costs. There are always alternative plans with alternative costs which can accommodate a given quantity of recreation. Intuitive quality considerations and implicit cost considerations are probably the most important factors in determining the alternative plan developed (e.g., consideration of topographical features and facility layouts during site planning). However, there is typically no explicit cost criterion which assists recreation investment planning (other than not exceeding the upper bound of total benefits).

Incremental benefit-cost analysis assist the design of the dams, lakes and waterways projects which form the basic recreation resource. It is therefore appropriate to consider similar analysis of recreational facility investments. This report describes an investigation of the potential for incorporating economic analysis into the planning, design and management of Corps recreation areas.

BENEFIT-COST ANALYSIS

The optimal use of resources in any endeavor is to seek maximum excess of benefits over costs. To accomplish this, one would invest in a recreation site until the last unit of costs produces an equal unit of benefits. One qualifier is that legal, safety, and other important criteria must be satisfied. Thus, the practice is to follow constrained optimization criteria.

The following example shows three alternative recreation development plans with estimated average annual equivalent costs and benefits. If one were following optimizing criteria of maximizing net benefits, plan B would be selected over other plans. All three plans would cost less than the expected benefits which could be accrued; but plan C costs \$33,000 more than plan B and yields only \$13,000 more benefit, while plan B costs only \$3,000 more than plan A and yields \$40,000 more benefit.

<u>Plan</u>	<u>Cost</u>	<u>Benefit</u>	<u>Cost</u>	<u>Benefit</u>
A	\$537,000	\$1,360,000		
B	540,000	1,400,000	\$ 3,000	\$40,000
C	573,000	1,413,000	33,000	13,000

It should be noted that if benefits are estimated ignoring the development plan, then they will be the same for each alternative. Where that is the case, the analysis will always suggest that the alternative with the minimum cost is the best. This is rational but not necessarily realistic. Current planning and design criteria prescribe presumed minimum quality and quantity standards for recreation facilities. However, the rigorous use of standards as a planning tool is usually impractical because of variable conditions. Alternative recreation plans which differ in quality and quantity of development have to be considered, even if the appropriate alternatives are no more than variously sized incremental deviations from the prescribed standards.

Current planning practice is to develop a recreation plan to accommodate the use and activity distribution expected on an average weekend day during the peak use month of some predetermined design year. Benefit-cost analysis would alternatively consider the incremental benefits and costs associated with different activities and different peak loads. While incremental cost estimates are relatively straightforward when the relevant records are kept, the use of benefit-cost analysis as a recreation facility planning tool has been constrained by lack of acceptable procedures for estimating incremental benefits.

Normal recreation benefit analysis yields an average value, for an assumed mix of activities. Consequently, there is no distinct benefit estimate associated with any investment in those facilities which are required to pursue a particular activity (e.g., picnic tables, boat ramps). In addition, with an average unit value, there is no recognition that the incremental benefit to a visitor in a peak period recreation day may be quite different from that obtained in less crowded conditions.

Theoretically, incremental benefits derived from additional lands and facilities of a given quality decrease as the amount of lands and facilities already provided increases. An initial set of facilities may be used much of the year, but as facilities are added, they will tend to be less used during off peak periods. On the other hand, incremental costs of additional facilities can be expected to increase as the more readily developed sites are used. Eventually, the benefits derived from the use of increased facilities will be less than the cost of providing them. Net benefits are maximized at that investment level where the incremental benefits equal the incremental costs.

For example, consider the following campground development planned in accordance with existing planning and design criteria. The area has an estimated physical capacity of 90 campsites; 60 are to be developed initially and 30 in the future. The initial cost of the campground is \$600,000, which, if amortized at 5 percent over an expected life of 50 years, equals \$32,868 average annual cost.

The estimated flow of recreation days of camping to be supported by the initial development is tabulated in the following table:

<u>Year</u>	<u>Campers</u>	<u>Year</u>	<u>Campers</u>
1	3,500	30	15,500
10	11,400	40	19,000
20	12,950	50	21,000

The average benefit for all recreational visitors at this particular lake is assumed at \$1.50 per recreation day. If this average value were applied to campers, then the average annual equivalent benefit accrued over 50 years discounted at 5 percent is \$17,274, which is less than the investment costs. However, the benefits for camping are undoubtedly higher than for many other activities included in the average recreation day value of \$1.50. By converting the costs into average annual values it is possible to see what the average value of camping would have to be to warrant the investment. For this example, this average value would have to be approximately \$2.85 plus operation and maintenance costs.⁴ This implies that the lower bound value to a camping party (assuming an average of 3.5 persons per party) has to average approximately \$10.00 a night.

This does not mean that every camping party would be willing to pay this price; it is again an average value. It is entirely possible that \$10.00 per night is judged an acceptable value for these campsites. It is also possible that this much value cannot be expected to accrue from the planned development, and that alternative plans (e.g., a smaller campground initially, or one with fewer facilities) should be considered. In either event, it is certainly feasible to consider the incremental benefits implied by the incremental costs actually incurred and probably irrational not to do so.

This report does not address the benefit estimation problems described above, but makes a simplifying assumption. That is, a cost effectiveness analysis that assumes equal benefits from various design concepts for a recreation area can lead to better use of investment and operation resources than sole reliance on a single design criterion.

⁴ If the benefits are to be equal to the costs incurred, then the ratio of camping value to costs incurred must equal the ratio of the ascribed unit value to the average annual benefits derived at this value; i.e., (average annual unit cost/\$32,868 = \$1.50/\$17,274).

INVESTMENT ANALYSIS

Alternative types of support facilities differ in initial cost, maintenance costs, expected life, and capacity. Determining the efficiency of alternative grades and levels of these facilities and associated services requires measurements of these differences. Accordingly, detailed monthly records of operation, maintenance and replacement expenditures were requested for 17 recreation areas at 7 different lakes during 1973. Certain historical investment and expenditure data and engineering specifications for the existing roads and parking lots were also requested. Tables 1-4 detail requested data.

PROJECT:

TABLE 1
RECREATION INVESTMENTS AND EXPENDITURES
(HISTORICAL)

	Cumulative Total Thru FY 67	FY 68	FY 69	FY 70	FY 71	FY 72
<u>Recreation O&M</u>						
1. Project						
2. District <u>1/</u>						
3. Division <u>1/</u>						
Total Recreation O&M						
<u>Capital Investments</u>						
1. Corps						
2. Non-Corps						
Total Capital Investment						

1/ Indicate only those District or Division Recreation O&M Expenditures specifically charged to the above project.

TABLE 2
CAPITAL INVESTMENTS (HISTORICAL)

AREA:	Cumulative Total Thru FY 67 Investment (\$)	FY 68		FY 69		FY 70		FY 71		FY 72	
		Invest. (\$)	Expected Life (Years)								
Corps Investments For:											
1. Roads											
a. Paved Double Lane											
b. Paved Single Lane											
c. Unpaved Double Lane											
d. Unpaved Single Lane											
2. Parking Lots											
a. Paved											
b. Unpaved											
3. Restrooms											
a. Waterborne											
b. Vault											
c. Pit											
d. Disposal											
4. Water Supply & Dist.											
5. Boat Ramps & Marina Facilities											
6. Other facilities											
7. Engineering & Design											
8. Supervision & Administration											
9. Other											
10. Total Corps											
11. Non-Corps											
12. Total Capital Inv.											

TABLE 3
ROAD AND PARKING LOT DESCRIPTIONS

	Quantity (1) 1/	Lane Width (2)	Surface Course		Base Course		Shoulders		Number Lots (10)	Spaces (11)	Car & Trailer Spaces (12)
			Material (3)	Thickness (4)	Material (5)	Thickness (6)	Material (8)	Thickness (9)			
1. Roads											
a. Paved Double Lane											
" " "											
" " "											
b. Paved Single Lane											
" " "											
" " "											
c. Unpaved Double Lane											
" " "											
" " "											
d. Unpaved Single Lane											
" " "											
" " "											
2. Parking Lots											
a. Paved											
" " "											
" " "											
" " "											
b. Unpaved											
" " "											
" " "											
" " "											

1/ For roads, length in miles; for lots area in square yards.

Project:

Area:

Month

TABLE 4
OPERATION AND MAINTENANCE COSTS

Facilities and Services	Equipment						Labor				(6) Admin & Supervision	(7) Materials and Supplies	(8) Contract Services	(9) Other	Total	
	(1) Light		(2) Heavy		(3) Misc.		(4) Wage Rate		(5) Employee							Total Labor Cost
	Hours	Costs	Hours	Costs	Hours	Costs	Hours	Costs	Hours	Costs						
1. Roads																
a. Paved Double Lane																
b. Paved Single Lane																
c. Unpaved Double Lane																
d. Unpaved Single Lane																
2. Parking Lots																
a. Paved																
b. Unpaved																
3. Restrooms																
a. Waterborne																
b. Vault																
c. Pit																
d. Disposal																
4. Trash Services																
5. Water Supply																
6. Ranger Services																

7. Total Recreation O&M Costs _____

9. Traffic Meter Reading _____

8. Area Attendance _____

10. Fees Collected _____

The lakes were seven of the nine that participated in a recreation user preference study described in Section 1 of this report. To reduce the possibility of unavailable data, only areas that had been initially developed and were currently managed by the Corps were included in this portion of the data collection. However, even with this restriction, the data collection was relatively unsuccessful.

Monthly records for the entire calendar year were provided for only eight areas over three different lakes. Only one of the Corps districts administering these lakes was able to provide most of the requested historical investment and expenditure data and the engineering specifications. One other provided only the engineering specifications and a limited portion of the expenditure data for the lake as a whole. Past record-keeping methods prevented the breaking down of any capital investments by type of facility for the study areas. One district did not return any of the forms.

One of the remaining four districts provided monthly records at two areas for one month. None of these remaining four districts returned any of the historical investment and expenditure data or the engineering specifications. In developing the data requests, it was realized that some of the study areas had been initially developed during a period when recreation at Corps-built lakes was considered an incidental amenity and concise records of expenditures during that period might not be available. The data requests noted that it was ". . . the minimum data required" and that ". . . it is recognized that some of the items requested may not be recorded or adequately documented. Consequently, it is requested that, where estimates are made, a note describing them be attached." Apparently, no estimates were attempted. The lack of success in obtaining recreational investment and cost data was informative. During FY 71 the Corps budgeted approximately \$30 million for recreation development at its water resources projects as well as approximately \$15 million for the operation and development of recreational areas.⁵ Some accounting is essential if any meaningful efficiency criteria are to be explicitly incorporated into future planning and management of the recreation resources. Follow up requests for the data elicited the following major reasons for not providing the information: (1) information not available, (2) manpower to compile the information not available, and (3) status of form unknown. Therefore, the available data provided to be much less than hoped for, but enough were provided to be informative and useful.

⁵ Crafts, Edward C., How to Meet Public Recreation Needs at Corps of Engineers Reservoir, Washington, DC, 1970

BENEFITS, COSTS AND MANAGEMENT DECISIONS

For any year, the recreation management is confronted with a relatively fixed development and a limited budget. Decisions are made to allocate resources between different recreational areas, facilities and services. Tradeoffs must be made - should the funds be spent on additional ranger services to reduce theft or on road improvements to reduce dust?

These decisions are usually made with only implicit consideration given to their incremental benefits and costs. Whether a decision represents an optimal allocation will depend on the manager's perception of the relevant benefits and costs. The user preference study (Section I) indicates that the manager's perceptions of user satisfactions, a significant indicator of the benefits of the management program, were sometimes quite perceptive, but there were some consistent differences between management expectations and visitor responses. Data from the available monthly OM&R records, presented in subsequent paragraphs indicate that there are some significant differences between the actual costs associated with certain operational decisions and management's perceptions of these costs.

Table 5 presents the attendance and OM&R expenditures reported for seven study areas in 1973 as well as the costs per recreation day (rd) served.⁶ The data are presented for illustration and are not necessarily typical of all Corps recreational areas. Comparisons with historical data, where available, and discussions with project personnel indicate that the attendance and expenditure levels are, however, typical of the subject areas. Details of operation and maintenance costs for each area in 1973 are included in Appendix B.

⁶ As previously mentioned, monthly records for 1973 were received for eight areas. However, one of these areas was substituted by an area that was closed for upgrading during 1973. Data from the substitute area are not included in the analysis.

TABLE 5
1973 Attendance and OM&R Expenditures

Area	Attendance (Recreation Days)	OM&R Expenditures	Expenditures/ Recreation Day
1	20,707	\$21,380	\$1.032
2	88,900	17,463	0.196
3	133,700	16,844	0.126
4	191,800	24,954	0.130
5	218,214	39,531	0.181
6	508,800	91,571	0.180
7	987,835	99,011	0.100

Source: Monthly Operation, Maintenance and Replacement (OM&R) records from participating projects.

a. Area 1 is the least developed and has the most remote access of the seven. Access roads are primarily gravel. Some of the circulation roads are paved; others are dirt. Restroom facilities are vault type. Picnic and campsites are informal with some tables and grills provided. There is no designated swimming beach. There is no water supply system (a water tank trailer was provided during one summer month in 1973).

b. Areas 2-6 are typical of most of the recreation areas at the seven lakes. The areas are all located relatively short distances from major federal or state highways and all have paved access roads. Most of the circulation roads are paved. All areas have a water supply and flush restrooms; at some areas additional vault facilities are provided. Camping and picnicking activities are intermixed. None of the areas has a designated beach or zoned swimming area, although all have areas that have been adapted as informal beaches by the visitors.

c. Area 7 is the most developed and offers more amenities than any of the other areas studied. It is located immediately adjacent to a major federal highway and includes the project administration area. Except for a short circulation road in an overflow campground, all roads are paved. There is a sandy beach with a zoned swimming area. Camping and day-use activities are separated. All restrooms are flush-type; a wash house in the main campground has hot showers and coin-operated laundry facilities. Campsites in the main campground are designated and non-camper traffic is prohibited.

Of the 24 areas included in the User Preference Study, Area 7 ranked highest in overall user satisfaction. Area 1 was ranked 18th while Areas 2-6 had rankings which ranged from 11th (Area 3) to 21st (Area 6). Area 1 earned its low ranking primarily because of absence of a water supply. The low rankings of Areas 2-6 resulted primarily from inferior site planning which resulted in inconveniently located restrooms. Most of the areas were originally designed as picnic areas but now accommodate a mixture of day-use and camping activities.

It is generally assumed that the higher the level of development, e.g., paved versus gravel roads, the lower the expected annual costs for operation, maintenance and replacement. The data presented in Table 5 tend to substantiate this hypothesis. The highest expenditures per recreation day served were reported at Area 1, the least developed, the lowest expenditures at Area 7, the most intensively developed. However, there are differences between the study areas other than the level of development which also contribute to differences in expenditure levels. Two factors directly contributing to the higher OM&R costs per recreation day served at Area 1 are its remote access and the low percentage of design capacity presently being accommodated. Since incremental operating costs tend to decrease until design capacity is reached, the lower the percent of design capacity being accommodated, the higher the OM&R costs per recreation day served. Field observation and discussions with personnel at the study projects indicate Area 1 is serving the lowest and Area 7 the highest use not only in absolute number but also when measured as a percentage of developed design capacity.

Most significant in Table 5 is not the relative rankings of the areas but the magnitude of the costs reported at Area 1. The \$1.032 per recreation day served is more than five times the cost reported at Area 2, the next highest area, and almost six times the cost for Area 5, an area located at the same project as Area 1.

Areas 1 and 5 offer basically the same recreational opportunities. Camping, boating, fishing, picnicking and swimming are accommodated at both areas although neither has a designated swimming beach. Area 1 does provide access to a more remote portion of the lake, and accommodates lower use densities, but it does not offer any unique recreational opportunities, although the experience is different. Area 5 has good access provided by paved roads with paved and gravel circulation roads. A water supply and waterborne restroom containing hot showers are provided in the main campground at Area 5. Supplemental vault restrooms are provided in less heavily used portions of the area. Area 5 is located immediately across the main dam from the project administration area and receives practically continuous ranger patrol from early morning until midnight. Ranger patrols to Area 1 are best described as sporadic. Even with the additional services provided at Area 5, the OM&R cost per recreation day served in 1973 was approximately one-sixth of that reported for Area 1.

As mentioned earlier, in developing an annual recreation program the project manager is usually confronted with a relatively fixed development and a limited annual operating budget. However, even with these constraints he may have several alternative operational plans available to him. An example is the study project at which Areas 1 and 5 are located. There are 10 public use areas located at this project, one of which was developed and is currently managed by the State park system. In addition to Areas 1 and 5, the Corps-managed areas consist of: an observation area; one day-use only area used primarily for boat launching; one multiple-use area located below the main dam and along the downstream channel; two multiple-use areas with access and development similar to Area 5; and two remote access areas with development similar to Area 1. One of the latter two areas is used primarily for fishing access, since it is located on a portion of the lake where the trees were left standing to provide good fish habitat.

Given this existing development, several alternatives are available to the project manager in relation to the remote access areas. Sufficient capacity is available at other project areas to accommodate all of the use presently occurring at the three remote access areas except for occasional peak holiday weekends. The three areas could, therefore, be operated as overflow areas open to the public only when needed to accommodate such peak crowds. Another alternative would be to close one (or two) of the areas and concentrate the use and management responsibilities in the remaining areas (or area). A third alternative would be to continue the current management program of opening all three areas to the public to provide maximum project access.

Definite trade-offs of both costs and benefits are associated with each of the three alternative operational programs. Closing all three areas would reduce all but boat access to a significant portion of the lake and especially to one of the better fishing areas. It would also eliminate the more isolated camping available at the less heavily used remote access areas. Operating only one or two of the areas would reduce the total number of access areas but would not significantly reduce the general areas of the lake to which access is provided. Camping densities would probably increase at the remote areas or area left open, but they would probably still not be as dense as at the more accessible areas. Continuing the current management program would provide the maximum number of access areas and would minimize the camping densities at the three remote access areas.

The current management decision assumes that by providing minimal services to the three remote access areas, maximum project access could be provided at "reasonable" costs. The management's perception of the costs associated with operating the three areas was used to measure the reasonableness of the management alternative. As indicated in Table 1, over \$21,000 of OM&R expenditures were incurred at Area 1 in 1973 serving less than 21,000 recreation days of use, while less than \$41,000 was expended at Area 5 accommodating 220,000 recreation days of use. Whether the \$1.032 per recreation day serviced is a reasonable cost for the services provided is a decision to be made by the project

management. But at least by maintaining the records of their OM&R expenditures, they are now explicitly aware of the magnitudes of costs associated with this particular management decision.

The discussion of OM&R expenditures thus far has only considered total annual costs associated with the operation of individual areas, the basic information requested for the Recreation-Resource Management Data System, a centrally located Data System maintained at Office, Chief of Engineers⁷. The project management is also concerned with the costs of providing particular types of facilities or services, such as restrooms and ranger services, and the costs of alternative methods of providing such facilities or services, such as with project personnel or through contract services. Such costs were recorded for the seven study areas in 1973.

Tables 6 and 7 and the subsequent paragraphs summarize the data collected. A more detailed presentation of the cost data is included in Table A (see end of report). Table 6 presents the percentages of each area's OM&R expenditures incurred in providing the following types of facilities and services: roads and parking, restrooms, trash services, water supply, ranger services and "other." Table 7 presents for each area the OM&R costs per recreation day for providing these services.

Immediately apparent from these data is that the extremely high costs noted at Area 1 resulted from higher OM&R costs in general and not from the provision of any one particular facility or service.

⁷ Recreation Resource Management Branch of Operations Division, Civil Works Directorate, Office of the Chief of Engineers.

TABLE 6
Percent of Total 1973 OM&R Expenditure by Service Provided¹

Area	Roads and Parking	Restrooms	Trash Services	Water Supply	Ranger Services	Other Services
1	18%	8%	28%	1%	11%	34%
2	29	8	15	1	28	20
3	38	11	12	1	22	16
4	33	13	19	1	16	19
5	20	14	19	3	12	33
6	13	9	15	1	40	22
7	1	18	12	2	29	38

1. Area totals may not sum to 100% because of rounding.

TABLE 7
1973 OM&R Costs Per Recreation Day for Service Provided

Area	Roads & Parking	Restrooms	Trash Services	Water Supply	Ranger Services	Other Services	Total
1	\$0.183	\$0.079	\$0.293	\$0.007	\$0.119	\$0.351	\$1.032
2	0.056	0.015	0.030	0.001	0.055	0.039	0.196
3	0.048	0.014	0.015	0.002	0.027	0.020	0.126
4	0.042	0.017	0.024	0.001	0.021	0.025	0.130
5	0.035	0.025	0.035	0.005	0.002	0.059	0.161
6	0.023	0.017	0.027	0.001	0.072	0.040	0.180
7	0.001	0.018	0.012	0.002	0.029	0.038	0.100

Source: Monthly OM&R records from participating projects.

Roads and parking. - The widest variation noted in OM&R expenditures at the study areas for any facility or service was for roads and parking, both as a percentage of total OM&R expenditures (1 to 38 percent) and as a cost per recreation day serviced (\$0.001 to \$0.183). Although insufficient engineering specifications were returned to make quantitative comparisons of the existing facilities, field inspections indicated that, in general, Area 7 has the most intensively developed road and parking system and Area 1 the least developed. Area 7 reported the lowest and Area 1 the highest OM&R expenditures per recreation day served for roads and parking facilities. At the remaining five areas the costs ranged from \$0.023 to \$0.056 per recreation day served. At three study areas, Areas 1, 5, and 7, all of the OM&R work for roads and parking was done by Corps personnel in 1973. At the remaining areas most of the work, 74 to 96 percent of the expenditures, was done through contract services. At Areas 2, 3, 4, and 7, all of the expenditures for roads and parking were expended on paved facilities; while at Areas 1, 5 and 6 expenditures for paved facilities were 42, 49 and 96 percent, respectively.

Restrooms. - Expenditures for restroom services at the study areas ranged from 8 to 18 percent of total OM&R expenditures and from \$0.014 to \$0.079 per recreation day served. Areas 1 and 5 reported the highest expenditures per recreation day served (\$0.079 and \$0.025 respectively). At these two areas, project personnel did practically all of the maintenance and repair associated with the restrooms, including cleaning. At the five remaining areas, cleaning was done primarily through contract, with repairs and other maintenance provided by project personnel. At these five areas, expenditures per recreation day served ranged from \$0.014 to \$0.018.

Trash services. - Expenditures for trash services ranged from 12 to 28 percent of total expenditures and from \$0.012 to \$0.293 per recreation day served. At all but one area most of the expenditures for trash services were on contracted services. At Area 2, 46 percent of the total expenditures for trash services was expended through contract services, while at the remaining areas the range was from 65 percent (Area 5) to 91 percent (Area 3). Contract services were used throughout the calendar year for providing at least a portion of the trash services at areas 2, 3, 4 and 6. At Areas 1, 5 and 7, trash services were provided entirely by Corps personnel during the off-season, winter months and by a combination of Corps personnel and contract services during the rest of the year.

Water supply. - OM&R expenditures for water supply services were extremely small at all of the areas when measured both as a percentage of total expenditures and as the cost per recreation day served. From 1 to 3 percent of total expenditures was spent in servicing the water supply system; costs per recreation day served ranged from \$0.001 to

\$0.007. Sources of water at the study areas included a local municipal system, wells, and the lakes themselves. The data suggest that in planning a water supply system, primary consideration should be given to the initial investment cost of developing the system and its long-term reliability.

Ranger services. - As measured by a percentage of total expenditures, the second highest variation in expenditures between study areas was reported for expenditures for ranger services. The range was from 11 percent at Area 1 to 40 percent at Area 6. Costs per recreation day served ranged from \$0.021 at Area 4 to \$0.119 at Area 1. It is interesting to note the similar percentages of total expenditures (Table 7) at Areas 1 and 5 even though the cost per recreation day was over five times as great as Area 1 and the intensity of ranger patrols, as previously described, was much less. Area 6 reported the highest percentage of OM&R expenditures expended on ranger services and the second highest cost per recreation day served. As indicated by its reported attendance, Area 6 accommodates substantial use levels. Visitors at the area have made numerous complaints of thefts and late hour noise and rowdyism by local area youths. In order to overcome these problems, the project management is providing practically continuous surveillance of the area with two-man ranger patrols provided throughout the night. The intensity of ranger services provided at Area 6 is much greater than at most of the other study areas.

Other services. - OM&R expenditures for services other than the five previously discussed ranged from 16 to 34 percent of total expenditures at the study areas and from \$0.020 to \$0.351 per recreation day served. The types of services for which significant other expenditures were incurred varied between study areas. However, at all three areas reporting more than 30 percent of total expenditures as "other," project personnel indicated that grass-mowing services were one of the major contributors to "other" expenditures. As an example, supplemental information provided by the project manager indicated that at Areas 1 and 5, \$1,050 and \$3,643, respectively, were expended through contract services for mowing at these areas during May and June. This represented 15 and 33 percent, respectively, of total OM&R expenditures during this period at these two areas and are summarized in lines 6 and 7 in the "Other Services" column.

At the seven study areas, from 60 to 83 percent of their 1973 OM&R expenditures were incurred in providing just four general types of facilities and services: roads and parking, restrooms, trash services, and ranger services. The data indicate that an elaborate record keeping system is not required to provide a useful accounting of OM&R expenditures at most Corps recreational areas. A simple accounting structure could assist the Corps recreation management in evaluating current operational programs as well as in developing future recreational areas.

Benefits, Costs and Planning Decisions. - Historical OM&R expenditures can also be of value to the recreation planner in developing master plans by indicating the magnitudes of annual operating costs that can be expected for different types of development in accommodating a given attendance level. However, to select the optimal plan of development, the planner must also know the relative magnitudes of alternative investment costs and compare initial investment and annual operating costs on an equivalent basis.

Historical investment data were provided for only two study areas, Areas 1 and 5. Although some disaggregation of these data by general categories of facilities was provided (e.g., roads and parking versus restrooms), little disaggregation was provided for different levels of development (e.g., paved versus unpaved facilities). Because of these data limitations, rigorous comparisons of the investment costs associated with alternative levels of development of specific facilities cannot be made. Instead, the data are only used to illustrate an application of engineering economy techniques in recreation planning by estimating the total annual costs associated with the development and operation of these two areas.

The total costs associated with the operation of Area 1 and Area 5 in 1973 are equal to the sum of their annual OM&R costs plus the amortization (average annual equivalent) costs of their capital investments to date. The 1973 OM&R expenditures for Areas 1 and 5 were reported in Table 6. Data from the administering district indicate that capital investments through FY 1972 totalled \$88,880 at Area 1 and \$146,222 at Area 5.

Neither the expected life of the facilities nor the precise timing of all previous capital investments were provided for the development at Areas 1 and 5. Therefore, for the purpose of this illustration, it is assumed that the useful life of all facilities is 25 years,⁸ that the facilities have no significant salvage value at the end of the period, and that all previous development was completed during one accounting period. The applicable discount rate is assumed to be 5 percent.

The capital-recovery factor for an investment with a 5 percent interest rate and a time period of 25 years is 0.07095. Multiplying this factor times the capital investments to date yields the average annual equivalent costs, which are \$6,300 for Area 1 and \$10,375 for Area 5. Total annual costs in 1973 were therefore \$27,680 and \$39,906, respectively. For illustrative purposes, the capital costs per recreation day served in 1973 can also be computed. However, it should

⁸ U.S. Army Corps of Engineers, Multiple Letter, Subject: "Recreation Development at Completed Projects - Code 710 Program (Cost Sharing)" 19 February 1974.

be noted that since the average annual equivalent costs of the investments are the same for each year of the life of the investment, the annual capital costs per recreation day served will vary with changes in attendance throughout this period. The 1973 capital costs per recreation day served should not be interpreted as the absolute capital costs per recreation day served at Areas 1 and 5, but they do depict the relative magnitudes of the capital costs associated with the attendance levels they are currently accommodating.

In 1973 the amortization costs per recreation day served were \$0.305 at Area 1 and \$0.048 at Area 5; and the total annual costs, amortization plus OM&R, were \$1.337 and \$0.229, respectively. As previously discussed, the higher OM&R costs per recreation day served at Area 1 were expected. However, when considering the additional amenities and the better quality of development provided at Area 5, the lower annual investment costs per recreation day served incurred at this area were not necessarily expected. Part of the high investment costs at Area 1 directly result from its remote access. Through FY 72 almost one-half of the total recreational investment at Area 1, \$43,130 of \$88,880, was for road and parking facilities as compared with about one-seventh at Area 5, \$19,774 of \$146,222. However, even excluding the investments in road and parking facilities, the 1973 amortization costs per recreation day served were still almost four times higher at Area 1 than Area 5; and Area 1 does not provide hot showers, flush restrooms or even a water supply.

Through FY 72 the Corps has invested \$793,000 in the development of recreational facilities at the lake where Areas 1 and 5 are located. Approximately 11 percent of this investment has been incurred at Area 1 and 18 percent at Area 5. Historical data indicate that about 10 to 15 percent of the Corps' annual OM&R expenditure at the project is incurred at Area 1 and 15-22 percent at Area 5; yet, Area 1 supports less than 5 percent of the use accommodated at Corps-managed areas while Area 5 supports about 25 percent. In 1973 both the amortization costs and the OM&R costs per recreation day served were approximately six times higher at Area 1 than at Area 5.

The level of expenditure incurred at Area 1 in relation to those at Area 5 is justified only if the recreational opportunities offered are of some unique character such that the users are benefiting more from their experiences than at Area 5, or if Area 1 provided the next best alternative for accommodating existing use because of capacity restraints at other areas. As previously discussed, field observations indicate that sufficient capacity does exist at other areas to accommodate the use presently occurring at Area 1. Whether the recreation management assumes that the recreational opportunities provided at Area 1 are worth more than those at Area 5 is not known. However camping fees, under P.L. 93-303 are limited to areas which include minimum standard facilities and water supply. This criterion omits user fees at Area 1, which does not have water supply. The Corps management has indicated even if fees could be charged at Area 1, the visitors would be unwilling to pay comparable fees for the recreation

opportunities because of the lack of facilities and services.

It should not be inferred from the preceding discussion that minimizing costs, per se, should be the sole objective of the recreation management program. Other environmental, economic or social objectives can be and often are incorporated into the management program. However, there are specific incremental benefits and costs associated with every management decision, and although it is often very difficult to quantify the incremental benefits associated with these decisions, the costs as illustrated above can almost always be explicitly determined. The value of such measurements is that they provide the recreation planner and manager with a "yardstick" for comparing alternative development plans or operational programs. They may not always provide definitive answers to the optimal plan, but relative comparisons of alternative incremental costs could improve future allocations of the limited resources available to the Corps recreation management program.

CONCLUSIONS

1. The available data indicate that a simple recordkeeping system can provide a useful accounting of OM&R expenditures. However, efforts expended to collect and record routine or special study information on recreation at Corps of Engineers lakes are generally too casual.

2. Pursuant to a routine cost accounting at the public recreation areas, the use of the economic efficiency criterion in addition to non-monetary considerations could improve the Corps recreation-resources management program.

3. Enough estimates are made during the normal development of recreation master plans to use benefit-cost analysis in evaluating alternative plans. It is therefore feasible to consider routinely the amount of benefits required to meet incremental costs incurred.

4. Current planning practice may be incompatible with efficiency criteria. Planning for an average weekend day during the peak use month results in some facilities having such a low capacity utilization that the benefits accrued cannot cover the costs incurred.

APPENDIX A

THE QUESTIONNAIRE AND SUMMARY OF RESPONSES

CORPS OF ENGINEERS
RECREATION USER SURVEY

DEAR VISITOR:

We need your help in finding out which people visit recreation areas, what they do there, and how well they are satisfied with the recreation opportunities available. Your cooperation in completing this questionnaire will be greatly appreciated and all information will be treated confidentially.

THANK YOU

Lake Area _____ Date _____

1. WHERE IS YOUR PRESENT HOME? (Please print)

_____ (nearest city or town) _____ (state) _____ (zip code)

2. WHICH OF THE FOLLOWING BEST DESCRIBES YOUR GROUP? (Check one, please)

1. ONE PERSON ALONE 3. MORE THAN ONE FAMILY 5. AN ORGANIZED GROUP
2. A SINGLE FAMILY 4. A GROUP OF FRIENDS 6. OTHER

3. PLEASE WRITE IN THE NUMBER OF PEOPLE IN YOUR GROUP WHO ARE:

_____ 15 YEARS OLD AND UNDER _____ 31 TO 45 YEARS OLD _____ 61 YEARS AND OVER
_____ 16 TO 30 YEARS OLD _____ 46 TO 60 YEARS OLD

4. IS THIS VISIT YOUR? (Check one, please)

1. MAIN DESTINATION 2. ONE OF SEVERAL DESTINATIONS 3. OTHER _____

5. WHAT IS THE LENGTH OF THIS VISIT?

_____ HOURS OR _____ NIGHTS

6. DURING THE PAST TWELVE MONTHS

APPROXIMATELY HOW MANY TIMES HAVE YOU VISITED THIS LAKE? (Including this visit) _____
APPROXIMATELY HOW MANY TIMES HAVE YOU VISITED OTHER LAKES? _____

7. WHICH OF THE ACTIVITIES LISTED BELOW DID ANY MEMBER OF THE GROUP DO WHILE HERE? (Please check all boxes that apply)

- | | | |
|--|---|---|
| 1. <input type="checkbox"/> BANK FISHING | 7. <input type="checkbox"/> CANOEING | 13. <input type="checkbox"/> NATURE WALKS |
| 2. <input type="checkbox"/> BOAT FISHING | 8. <input type="checkbox"/> MOTOR BIKING | 14. <input type="checkbox"/> TRAIL HIKING |
| 3. <input type="checkbox"/> PICNICKING | 9. <input type="checkbox"/> SUN BATHING | 15. <input type="checkbox"/> WALKING TO SCENIC POINTS |
| 4. <input type="checkbox"/> CAMPING | 10. <input type="checkbox"/> SWIMMING | 16. <input type="checkbox"/> SIGHTSEEING FROM CAR ONLY |
| 5. <input type="checkbox"/> MOTORBOATING | 11. <input type="checkbox"/> WADING | 17. <input type="checkbox"/> ENJOYING THE NATURAL ENVIRONMENT |
| 6. <input type="checkbox"/> SAILING | 12. <input type="checkbox"/> WATER SKIING | 18. <input type="checkbox"/> OTHER _____ |

8. OF THE ACTIVITIES YOU CHECKED IN THE LAST QUESTION, WOULD YOU PLEASE CIRCLE THAT ONE WHICH WAS THE MOST ENJOYABLE TO MOST OF YOUR GROUP.

9. IN THE TABLE BELOW, INDICATE WHICH ACTIVITIES YOUR GROUP DID, BUT THAT YOU WERE NOT SATISFIED WITH, AND CHECK THE REASON YOU WERE NOT SATISFIED. IF ALL ACTIVITIES WERE SATISFACTORY, CHECK HERE.

ACTIVITY NUMBER	REASON FOR DISSATISFACTION						
	UNSAFE	CROWDED	NOISY	DIRTY	BAD WEATHER	NOT ENOUGH TIME	OTHER

10. IN THE TABLE BELOW, INDICATE WHICH ACTIVITIES YOUR GROUP WANTED TO DO, BUT DIDN'T, AND CHECK THE REASON WHY YOUR GROUP DIDN'T DO THEM. IF YOU DID EVERYTHING YOU WANTED TO DO, CHECK HERE.

ACTIVITY NUMBER	REASON FOR NOT DOING						
	UNSAFE	CROWDED	NOISY	DIRTY	BAD WEATHER	NOT ENOUGH TIME	OTHER

(Please complete reverse side)

11. PLEASE FILL OUT THE CHECKLISTS FOR THE FOLLOWING FACILITIES AND SERVICES. FILL IT OUT BOTH FOR THOSE YOU USED AND THOSE YOU DIDN'T USE. (Please check at least one column for each facility or service.)

FACILITIES AND SERVICES	FOR THOSE USED										FOR THOSE NOT USED							
	SATISFACTORY	ADEQUATE	NOT SATISFACTORY BECAUSE								NOT INTERESTED IN USING	NOT AVAILABLE FOR USE	TOO DIRTY	TOO CROWDED	UNSAFE	TOO EXPENSIVE	TOO FAR	OTHER
			NOT ENOUGH	TOO DIRTY	TOO CROWDED	UNSAFE	TOO EXPENSIVE	TOO FAR	OTHER									
ROADS																		
PARKING																		
SIGNS AND INFORMATION SERVICES																		
SWIMMING BEACH																		
CHANGE HOUSE																		
WATER SUPPLY																		
RESTROOMS																		
SHOWERS																		
CAMPGROUNDS																		
PICNIC GROUNDS																		
CONCESSION STANDS																		
TRASH SERVICES																		
BOAT RAMPS																		
BOAT RENTALS																		
BOAT DOCKS																		
MARKED NATURE TRAIL																		
HIKING TRAIL																		
NATURE OR HISTORIC DISPLAY																		
PUBLIC TELEPHONES																		
RANGER ON DUTY																		
ENFORCEMENT OF REGULATIONS																		
OTHER																		

12. IF DISSATISFACTIONS ARE NOTED ABOVE, HOW WILL THEY AFFECT YOUR PLANS FOR FUTURE VISITS? (Check one, please)

- PROBABLY:
- 1. NO EFFECT
 - 2. WILL NOT STAY AS LONG
 - 3. WILL NOT COME AS OFTEN
 - 4. WILL NEVER RETURN
 - 5. OTHER

13. IF THE CAUSES OF THE DISSATISFACTIONS WERE CORRECTED, HOW WOULD THAT AFFECT YOUR PLANS FOR FUTURE VISITS?

- PROBABLY:
- 1. NO EFFECT
 - 2. WOULD STAY LONGER
 - 3. WOULD COME MORE OFTEN
 - 4. OTHER

14. THIS SPACE IS FOR YOUR COMMENTS. PLEASE FEEL FREE TO OFFER ANY SUGGESTIONS TO HELP US SERVE YOU BETTER.

I - VISITOR CHARACTERISTICS (Questions 2-6)

<u>GROUP TYPE</u>	<u>Number</u>	<u>Distribution</u>
One person alone	70	2.2%
Single family	1,285	39.7
Group of families	1,096	33.8
Group of friends	601	18.5
Organized group	129	4.0
Other	<u>57</u>	<u>1.8</u>
TOTAL	3,238	100.0%

<u>AGE DISTRIBUTION</u>	<u>Number</u>	<u>Distribution</u>
15 and under	7,432	36.4%
16-30	5,904	28.9
31-45	4,388	21.5
46-60	2,107	10.3
61 and over	<u>584</u>	<u>2.9</u>
TOTAL	20,415	100.0%

<u>VISIT TYPE</u>	<u>Number</u>	<u>Distribution</u>
Main destination	2,587	79.9%
One of several destinations	522	16.1
Other	<u>129</u>	<u>4.0</u>
TOTAL	3,238	100.0%

AVERAGE DURATION OF VISITS

Day visits	5.6 hours
Overnight visits	4.0 nights

<u>AVERAGE NUMBER OF VISITS</u>	<u>Trips Per Year</u>
At survey lake	11.2
At other lakes	6.4

II - ACTIVITY PARTICIPATION (Questions 7-10)

ACTIVITY	PERCENT PARTICIPATION ^{1/}	MOST ENJOYABLE	
		Percent of Total ^{2/}	Percent By Activity ^{3/}
Bank fishing	44	3	6
Boat fishing	34	4	11
Picnicking	62	5	8
Camping	70	22	31
Motor boating	43	4	10
Sailing	3	1	23
Canoeing	3	-	5
Motor biking	11	1	5
Sun bathing	65	2	3
Swimming	82	18	1
Wading	58	-	1
Water skiing	34	11	32
Nature walks	29	-	2
Trail hiking	13	-	-
Walking to scenic points	14	-	-
Sightseeing from car only	18	-	1
Enjoying the natural environment	62	6	9
Other	6	1	17

- Less than 0.5%.

^{1/} For each activity, percent of all questionnaires on which participation in that activity was noted.

^{2/} For each activity, percent of all questionnaires on which that activity was noted as Most Enjoyable. On 726 questionnaires (22%), a single Most Enjoyable activity was not noted, therefore this column does not sum to 100%.

^{3/} For each activity, of questionnaires noting participation in the activity, percent that also noted that activity as Most Enjoyable.

III - FACILITIES AND SERVICES (Questions 11-13)

FACILITIES AND SERVICES ^{1/}	QUESTIONNAIRES	FOR THOSE USED										FOR THOSE NOT USED						
		SATISFACTORY	ADEQUATE	NOT SATISFACTORY BECAUSE							NOT INTERESTED IN USING	NOT AVAILABLE FOR USE	TOO DIRTY	TOO CROWDED	UNSAFE	TOO EXPENSIVE	TOO FAR	OTHER
				NOT ENOUGH	TOO DIRTY	TOO CROWDED	UNSAFE	TOO EXPENSIVE	TOO FAR	OTHER								
ROADS	3117	53	37	3	4	2	2	0	1	1	-	-	0	-	-	0	0	-
PARKING	3137	47	36	13	1	3	-	0	1	-	-	-	-	-	-	0	0	3
SIGNS AND INFORMATION SERVICES	3028	45	40	12	-	0	-	-	-	1	1	1	0	0	0	0	-	-
SWIMMING BEACH	2895	28	23	13	12	5	7	-	4	4	7	6	1	-	-	0	1	1
CHANGE HOUSE	2702	20	22	10	5	2	-	-	4	1	17	20	-	-	0	0	1	1
WATER SUPPLY	3070	38	34	15	1	-	-	-	7	1	3	2	-	0	-	0	1	-
RESTROOMS	3145	36	29	14	13	2	1	-	8	3	2	1	-	-	-	0	-	-
SHOWERS	2913	20	14	14	2	1	-	-	4	5	12	28	-	-	-	0	1	1
CAMPGROUNDS	2590	45	22	10	1	4	-	-	-	5	9	5	-	-	0	-	-	1
PICNIC GROUNDS	2269	40	26	10	1	3	-	0	-	2	18	1	-	-	0	-	-	1
CONCESSION STANDS	2783	15	17	12	0	1	-	4	4	2	19	25	-	-	-	1	1	-
TRASH SERVICES	3096	53	35	9	-	-	-	0	1	-	1	-	0	0	0	0	-	-
BOAT RAMPS	2620	27	21	13	-	2	1	-	2	1	30	2	0	-	-	-	-	2
BOAT RENTALS	2512	9	8	3	-	-	-	3	-	1	53	17	-	-	-	2	-	3
BOAT DOCKS	2602	16	15	15	-	1	1	1	1	1	37	10	-	-	-	-	1	2
MARKED NATURE TRAIL	2225	6	6	4	-	-	-	0	-	1	40	38	-	0	-	0	-	5
HIKING TRAIL	2035	5	5	3	0	-	-	0	-	-	44	37	-	0	-	0	1	5
NATURE OR HISTORIC DISPLAY	2615	10	11	9	-	-	-	0	-	1	30	34	0	-	0	0	-	4
PUBLIC TELEPHONES	2869	15	19	17	-	-	-	-	5	1	16	23	-	0	0	-	1	2
RANGER ON DUTY	2933	59	25	8	-	-	-	0	-	1	4	2	-	0	0	0	-	1
ENFORCEMENT OF REGULATIONS	2886	48	32	13	-	-	-	-	-	2	3	1	0	0	-	-	-	1
OTHER	166	6	4	7	2	0	1	1	1	11	2	63	0	0	0	1	1	2

- Less than 0.5%.

^{1/} The first column contains the number of questionnaires on which one or more responses were noted for the listed facility or service. The remaining columns contain the percent of questionnaires in column one on which each of the possible responses were noted. Again, since multiple responses were permitted, the sum of the percentages for any facility or service may exceed 100%.

IV - WRITTEN COMMENTS (Question 14)

COMMENTED ON: 1/

Satisfaction	16%
Desire for electrical hook-ups	6
Desire for sanitary disposal station	2
Lake fluctuations	2
Dissatisfaction with fees or fee system	1
Willingness to pay more	1
Desire for diving board	1
Desire for lifeguard	1
Desire for trail bike area	1

1/ Most common subjects on which written comments were received.

ACTIVITY	PERCENT ^{1/} DISSATISFIED	REASONS FOR DISSATISFACTION ^{2/}						
		Unsafe	Crowded	Noisy	Dirty	Bad Weather	Not Enough Time	Other
Bank fishing	6	6	10	7	19	20	13	50
Boat fishing	7	17	3	0	5	48	13	32
Picnicking	5	5	49	12	20	11	7	37
Camping	12	3	31	32	15	15	11	32
Motor boating	6	33	27	3	11	35	19	14
Sailing	6	17	33	0	0	67	17	0
Canoeing	5	80	20	0	0	20	0	20
Motor biking	6	27	18	18	9	9	5	55
Sun bathing	2	6	28	11	34	30	4	21
Swimming	15	34	15	3	62	10	4	20
Wading	3	29	7	3	62	2	0	26
Water skiing	12	32	40	1	8	29	11	14
Nature walks	1	17	17	0	0	0	50	33
Trail hiking	2	10	0	10	10	0	10	80
Walking to scenic points	1	17	0	0	0	50	33	17
Sightseeing from car only	1	25	25	0	75	0	25	25
Enjoying the natural environment	1	0	13	29	25	4	25	29
Other	73	6	17	10	15	20	50	8

^{1/} For each activity, of questionnaires noting participation in the activity, percent that also noted Dissatisfaction with that activity.

^{2/} For each activity, of questionnaires noting Dissatisfaction with the activity, percent that noted each Reason For Dissatisfaction. The sum of these percentages may exceed 100% for any activity, since more than one Reason For Dissatisfaction could be checked by each respondent.

APPENDIX B

1973 OPERATION AND MAINTENANCE COST

FOR EACH AREA

TABLE B-1

Area 1 1973 OM&R Expenditures

Facilities and Services	Equipment Costs	Labor Costs	Administration and Supervision	Materials and Supplies	Contract Services	Other	Total
<u>Roads</u>							
Paved	\$430.60	\$ 436.73	\$ 83.84	\$520.00	-	-	\$ 1,471.17
Unpaved	223.60	227.47	93.84	-	-	-	544.91
<u>Parking Lots</u>							
Paved	24.40	90.03	22.42	-	-	-	136.85
Unpaved	666.00	899.11	75.00	-	-	-	1,640.11
<u>Restrooms</u>							
Waterborne	-	-	-	-	-	300.00	300.00
Vault	338.50	735.70	118.84	91.00	-	-	1,284.04
Disposal	12.00	28.00	-	20.00	-	-	60.00
<u>Trash Services</u>	298.20	574.18	86.42	158.80	4,950.00	-	6,067.60
<u>Water Supply</u>	64.0	95.04	-	-	-	-	159.04
<u>Ranger Services</u>	545.20	1,727.76	146.00	35.00	-	-	2,453.96

Subtotal \$14,117.68
 Other Services 7,262.10
 Total \$21,379.78

Area Attendance: 20,707

TABLE B-2

Area 2 - 1973 OMR Expenditures

Facilities and Services	Equipment Costs	Labor Costs	Administration and Supervision	Materials and Supplies	Contract Services	Other Costs	Total
<u>Roads</u>							
Paved	\$ 42.00	\$ 365.00	\$132.00	\$ 22.00	\$4,337.00	-	\$ 4,898.00
Unpaved	-	-	-	-	-	-	-
<u>Parking Lots</u>							
Paved	2.00	21.00	-	2.00	60.00	-	85.00
Unpaved	-	-	-	-	-	-	-
<u>Restrooms</u>							
Waterborne	3.00	19.00	-	-	1,113.00	\$95.00	1,230.00
Vault	-	-	-	-	45.00	-	45.00
Disposal	-	-	-	-	60.00	-	60.00
<u>Trash Services</u>	222.00	852.00	-	361.00	1,201.00	-	2,636.00
<u>Water Supply</u>	3.00	26.00	-	1.00	35.00	50.00	115.00
<u>Ranger Services</u>	836.00	4,035.00	-	-	-	-	4,871.00
Subtotal							13,940.00
Other Services							3,523.00
Total							\$17,463.00

Area Attendance: 88,900

TABLE B-3

Area 3 - 1973 OM&R Expenditures

Facilities and Services	Equipment Costs	Labor Costs	Administration and Supervision	Materials and Supplies	Contract Services	Other Costs	Total
<u>Roads</u>							
Paved	\$ 14.00	\$ 180.00	\$180.00	-	\$5,973.00	-	\$ 6,347.00
Unpaved	-	-	-	-	-	-	-
<u>Parking Lots</u>							
Paved	1.00	27.00	-	-	80.00	-	108.00
Unpaved	-	-	-	-	-	-	-
<u>Restrooms</u>							
Waterborne	10.00	72.00	-	\$3.00	1,226.00	\$135.00	1,446.00
Vault	2.00	30.00	-	5.00	356.00	-	393.00
Disposal	2.00	27.00	-	-	20.00	-	49.00
<u>Trash Services</u>	26.00	129.00	-	25.00	1,851.00	-	2,031.00
<u>Water Supply</u>	7.00	65.00	-	5.00	45.00	87.00	209.00
<u>Ranger Services</u>	593.00	3,040.00	-	-	-	-	3,633.00
Subtotal							14,216.00
Other Services							2,628.00
Total							\$16,844.00
Area Attendance: 133,700							

TABLE B-4

Area 4 - 1973 OM&R Expenditures

Facilities and Services	Equipment Costs	Labor Costs	Administration and Supervision	Materials and Supplies	Contract Services	Other Costs	Total
<u>Roads</u>							
Paved	\$ 3.00	\$ 53.00	\$230.00	\$ 7.00	\$7,703.00	-	\$ 7,996.00
Unpaved	-	-	-	-	-	-	-
<u>Parking Lots</u>							
Paved	-	-	-	-	133.00	-	133.00
Unpaved	-	-	-	-	-	-	-
<u>Restrooms</u>							
Waterborne	7.00	30.00	-	3.00	2,172.00	\$55.00	2,267.00
Vault	25.00	258.00	-	85.00	396.00	-	764.00
Disposal	10.00	95.00	-	-	-	-	105.00
<u>Trash Services</u>	249.00	544.00	-	30.00	3,851.00	-	4,674.00
<u>Water Supply</u>	11.00	136.00	-	1.00	-	48.00	196.00
<u>Ranger Services</u>	664.00	3,409.00	-	-	-	-	4,073.00
<hr/>							
Subtotal							20,208.00
Other Services							4,746.00
Total							\$24,954.00
Area Attendance: 191,800							

TABLE B-5

Area 5 - 1973 OM&R Expenditures

Facilities and Services	Equipment Costs	Labor Costs	Administration and Supervision	Materials and Supplies	Contract Services	Other Costs	Total
<u>Roads</u>							
Paved	\$ 675.40	\$1,196.79	\$176.00	\$1,495.00	-	\$67.68	\$ 3,610.87
Unpaved	1,277.00	1,174.52	160.00	801.25	-	-	3,412.77
<u>Parking Lots</u>							
Paved	49.60	83.84	45.00	28.00	-	-	206.44
Unpaved	134.60	264.56	30.00	60.00	-	-	489.16
<u>Restrooms</u>							
Waterborne	535.80	1,337.08	145.00	266.75	-	-	2,284.63
Vault	281.40	669.92	65.00	103.50	-	-	1,119.82
Disposal	582.60	1,077.10	155.00	94.50	\$ 50.00	-	1,959.20
<u>Trash Services</u>	581.50	1,712.78	75.00	263.80	5,000.00	-	7,633.08
<u>Water Supply</u>	87.30	321.57	84.50	550.56	26.19	-	1,070.12
<u>Ranger Services</u>	988.50	3,096.41	341.00	345.00	-	-	4,770.91
Subtotal							26,557.00
Other Services							12,973.52
Total							\$39,530.52

Area Attendance: 218,214

TABLE B-6

Area 6 - 1973 OM&R Expenditures

Facilities and Services	Equipment Costs	Labor Costs	Administration and Supervision	Materials and Supplies	Contract Services	Other Costs	Total
<u>Roads</u>							
Paved	\$ 184.00	\$ 1,626.00	\$230.00	\$ 179.00	\$ 8,216.00	-	\$10,435.00
Unpaved	54.00	117.00	-	-	-	-	171.00
<u>Parking Lots</u>							
Paved	11.00	180.00	-	60.00	300.00	-	551.00
Unpaved	13.00	279.00	-	-	-	-	292.00
<u>Restrooms</u>							
Waterborne	59.00	1,194.00	-	1,584.00	2,246.00	\$135.00	5,218.00
Vault	31.00	433.00	-	118.00	2,347.00	-	2,929.00
Disposal	16.00	281.00	-	-	-	-	297.00
<u>Trash Services</u>	269.00	1,182.00	-	203.00	12,004.00	-	13,658.00
<u>Water Supply</u>	16.00	382.00	-	204.00	20.00	81.00	703.00
<u>Ranger Services</u>	5 544.00	31,056.00	-	-	-	80.00	36,680.00

Subtotal 70,934

Other Services 20,637

Total \$91,571

Area Attendance: 508,800

TABLE B-7

Area 7 - 1973 OM&R Expenditures

Facilities and Services	Equipment Costs	Labor Costs	Administration and Supervision	Materials and Supplies	Contract Services	Other Costs	Total
<u>Roads</u>							
Paved	\$ 83.77	\$ 487.56	-	-	-	-	\$ 571.33
Unpaved	-	-	-	-	-	-	-
<u>Parking Lots</u>							
Paved	6.00	101.44	-	-	-	-	107.44
Unpaved	-	-	-	-	-	-	-
<u>Restrooms</u>							
Waterborne	199.45	2,440.86	-	-	\$ 9,229.94	-	11,870.25
Vault	-	-	-	-	-	-	-
Disposal	602.30	4,140.02	-	\$1,004.08	324.00	-	6,070.40
<u>Trash Services</u>	138.06	1,407.40	-	-	10,554.72	-	12,100.18
<u>Water Supply</u>	25.25	431.12	-	1,000.53	-	-	1,456.90
<u>Ranger Services</u>	1,323.33	27,655.08	-	-	-	-	28,978.41
					Subtotal		61,154.91
					Other Services		37,855.73
					Total		\$99,010.64
			Area Attendance: 987,835				

